CF User's Guide

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1.1 CFS CFDP Introduction

Scope

This document provides a design and operational overview along with a complete specification for the commands and telemetry associated with the CFS CFDP (CF) application software.

The document is intended primarily for users of the software (operations personnel, test engineers, and maintenance personnel). The deployment guide section, is intended for mission developers when deploying and configuring the CF application software for a mission flight software build environment.

CFS CFDP Version

Acronyms

Acronym	Description
API	Application Programming Interface
ATP	Absolute Time Processor
ATS	Absolute Time tagged command Sequence
CCSDS	Consultative Committee for Space Data Systems
C&DH	Command and Data Handling
CFE	Core Flight Executive
CFS	Core Flight System
CI	Command Ingest
Cmd	Command
CPU	Central Processing Unit
EDAC	Error Detection and Correction
FDS	Flight Data System
FM	File Manager
FSW	Flight Software
GN&C	Guidance Navigation & Control
GSFC	Goddard Space Flight Center
HK	Housekeeping
HW, H/W	Hardware
ICD	Interface Control Document
ISR	Interrupt Service Routine
OS	Operating System
OSAL	Operating System Abstraction Layer
Pkts	Packets
RAM	Random-Access Memory
RTOS	Real Time Operating System
RTP	Relative Time Processor
RTS	Relative Time tagged command Sequence
SB	Software Bus Service
SBC	Single Board Computer
SC	Stored Commands task
SW, S/W	Software
TBD	To Be Determined
TBL	Table
TLM	Telemetry
UTC	Universal time code

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1.2 CFS CFDP Overview

CF is a cFS application for providing CFDP (CCSDS File Delivery Protocol) services that was designed to interface to the Core Flight Executive (cFE). Its primary function is to provide file receive and transmit functionality to this protocol. It works by mapping CFDP PDUs on and off cFS's software bus.

CF is a highly configurable application that is designed to be used on a wide range of flight missions. CF obtains its initial configuration through a configuration table and its platform and mission configuration files. The table contains default configuration settings and is loaded during CF initialization. The platform and mission configuration files are compile-time configuration parameters.

To transfer files using CFDP, the CF application must communicate with a CFDP compliant peer. CF may be configured to have any number of peers. The ASIST and ITOS ground systems contain a compliant peer that may be used for flight to ground (and ground to flight) transfers.

CF sends and receives file information and file-data in Protocol Data Units (PDUs) that are compliant with the CFDP standard protocol defined in the CCSDS 727.0-B-5 Blue Book. The PDUs are transferred to and from the CF application via CCSDS packets on the software bus. The system must be configured to get the PDU packets from the peer to the software bus (and vice-versa).

On a typical spacecraft using the cFE, science files and engineering files are continuously being created and queued for downlink. When transmission begins, the files are converted into a series of PDUs by CF, one after another essentially creating a continuous stream of file-data PDUs.

The CFS CFDP application is a CFDP implementation written specifically for CFS. The goal was bounded, small, time and space-efficient implementation of the CFDP features necessary for flight. CF implements Class 1 and 2 send and receive, as well as logic to cancel, suspend, resume, abandon, freeze, etc. Messages utilize "zero-copy" software bus buffers. CF configuration is mainly through the configuration table.

There are special features listed in the CFDP standard that are not applicable to flight software and are therefore not supported by this version of CF. See the constraints section of this document for more information.

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1.3 CFS CFDP Design

The CF Application has an operational interface consisting of one table, two different telemetry messages and twenty commands.

CF is an event-driven, single-threaded application that wakes up when one of the following four messages are received on its software bus pipe. Ground command, Housekeeping Request command, Incoming PDU or the Wake-up command. The Wake-up command tells CF to do file transaction processing. This command is typically sent periodically by the scheduler. The amount of file-transaction processing that is executed when this command is received, is configurable through the table parameter engine-cycles per wake-up.

Key differences from CF v2.X

- There's no more text-based ground commands where strings are sent for commands.
- There's no more memory pool. Everything is set up with limits both in platform config for static memory limits and the configuration table for dynamic timing and functionality limits.
- Much smaller code footprint. CF 3.0 is light-weight flight-only app. It does not provide any ground engine support.

For simplicity, the examples throughout this document refer to a typical operational scenario whereby the peer to the CF application is located on the ground. The CF application knows only of incoming file transactions and outgoing file transactions. The terms uplink, downlink and playback are often used, but only apply when the peer is located on the ground. CF may be configured to have more than one peer. One peer may be located onboard the spacecraft while another is located on the ground.

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Next: CFS CFDP Operation

1.4 CFS CFDP Operation

Initialization

CF initialization is the same for Power On Resets and Processor Resets. Standard application initialization activities are performed such as status and tracking initialization, message initialization and subscription, table initialization and registering with event services.

Outgoing Messages

The priority of CF's use of available outgoing messages on each wakeup is:

1. Send any pending message required for RX transaction
2. Re-send any message required for TX transaction if timer expired (for example, send EOF, or re-send EOF if ACK timer expired)
3. Send a filedata PDU in response to a NAK request. Per wakeup, one will be sent per each transaction in the TX wait state.
4. Once all TX wait transactions have processed their needs to send, the currently active TX transfer will send new filedata PDUs. It will keep sending them until there are no more messages on that wakeup (or the throttling semaphore stops it.)

Incoming Messages

Operationally, the flow of input packets from ground into CF should be throttled at some rate appropriate for ingest. CF has a per-channel configuration item for max number of RX messages processed per wakeup, and both CF and the ingest app need to be able to handle this.

Temporary file and directory use

Currently the temporary directory is only used to store class 2 RX file data in temporary files on a transaction that has not yet received a metadata PDU. When/if the metadata is received for that transaction, OS_mv is used to transition the temporary file to the desired destination location. Note that OS_mv attempts a rename first (faster but does not work across file systems), and if that fails then attempts a copy/delete (slower). Due to this the most efficient temporary directory configuration is for it to be on the same file system as the destination. Note that currently this only impacts class 2 RX with an out of order metadata packet, but there's future work being considered to use the temporary location for all receipts with an atomic transfer of the file after successful reception and verification (where applicable) of all the file data.

Engine

The CF application has a single internal core referred to as the engine. The engine is capable of transmitting and receiving a configurable number of transactions simultaneously. The engine builds outgoing Protocol Data Units (PDUs) and interprets the incoming PDUs. It handles all details regarding the CFDP standard protocol which is defined in the CCSDS 727.0-B-5 Blue Book. The engine processes the file transactions when it is 'cycled'. The number of engine cycles per wake up is a configuration parameter defined in the table. At most one PDU will be sent on a single engine cycle. Typically, the peer node also has an engine. When CF is transferring files to and from the ground, the peer is sometimes referred to as the ground engine. When faults and timeouts occur, it is important to indicate which engine detected the event.

Starting a Transaction

To transfer a file from the ground to the spacecraft, a 'put' request is given to the ground engine. There is no ground command telling CF to 'get' a file. The first indication to CF that an uplink transaction has started, is the receipt of the first PDU sent by the ground and received by CF.

To transfer a file from the spacecraft to the ground, a transmit file ground command is sent to CF. This ground command translates into a 'put' request to the flight engine.

The CFDP protocol does not support the concept of a 'get' request. The request to transfer a file is always made with a 'put' request at the source peer (i.e. where the file is located).

Transaction Class

All transfers are sent and received in one of two modes, class 1 or class 2. The CF application is capable of sending and receiving in class 1 and class 2. Class 1 transfers are similar to UDP in that they send the data once and expect no feedback from the peer. Class 2 transfers are more reliable and attempt to fill in data that may have been dropped on the first attempt. Class 2 transfers are analogous to TCP.

Queue Entries

The CF application keeps track of files in queue entries. There is one queue entry per transaction. The queue entries contain information such as filename and path, priority, class, channel etc. about each transaction. For incoming file transactions, the queue entry starts on the incoming active queue and is moved to the incoming history queue when the transaction is complete. For outgoing transactions, all queue entries start out on the pending queue (in response to a playback file command for example). The queue entry is then moved to the outgoing active queue when the transaction begins and to the history queue when complete.

Queues

The CF application tracks pending transactions, active transactions and completed transactions in its queues. For downlink (or outgoing) transactions there are three queues per channel, a pending queue, an active queue and a history queue. All queues hold queue entries that are described in the 'Queue Entries' section of this document. When a request to downlink a file is received, a queue entry is created and placed on the pending queue. When the transaction begins, the corresponding queue entry is moved from the pending queue to the active queue. After the transaction completes, (whether successful or not) the queue entry is moved from the active queue to the history queue. The history queue has a fixed depth, defined by the user in the CF configuration table. If a transaction is added when the history queue is full, the oldest queue entry is deleted.

For uplink (or incoming) transactions there are two queues, an active queue and a history queue. Uplink transactions do not have a pending queue as with outgoing transactions. When an uplink transaction begins, a queue entry is added to the active queue. When the transaction completes, the queue entry is moved from the active queue to the history queue. The history queue depth is specified by the user in the CF configuration table. When the history queue is full and an active transaction finishes, the oldest entry on the history queue is deleted.

Incoming File Transactions

When files are transferred in the uplink direction, the ground peer receives the initial request to send the file. This action causes the ground peer to send a series of PDUs that are routed to the CF application. The CF application does not get a request to receive a file. The first indication to the CF application that an uplink transaction has started, is the receipt of the first PDU of the transaction.

The CF application is capable of receiving files in class 1 or class 2 mode on a per-file basis. The class mode is embedded in the PDUs received.

The message ID for incoming PDUs is defined in the CF configuration table.

When a file is uploaded to the spacecraft in class 2 mode, the CF app must acknowledge the receipt of the file by sending an acknowledgment PDU to the ground. This response must be sent on a specified output channel (output channels are described later). The channel number for this response is defined by the user in the configuration table.

The CF application keeps a list of all incoming transactions in its internal queues. There are two queues designated for incoming transfers. The incoming active queue holds information about all incoming transactions that are currently active. The incoming history queue holds information about all incoming transactions that are complete. The full contents of either queue can be viewed on command. The depth of the history queue is defined in the table.

Outgoing File Transactions

All outgoing file transactions are initiated by the CF application in response to a playback file command, a playback directory command or a file found in a polling directory. The peer entity does not request to receive a file. All outgoing file transactions are inserted into a pending queue by CF before they are actually sent. The CF application reads the pending queue (if reading is enabled) and starts the next transaction immediately after the data from the previous file has been sent. This process of queueing files and sending them sequentially, prevents the engine from being inundated when the user requests to send multiple files. Once the transactions begins, the queue entry is moved to the outgoing active queue and then to the outgoing history queue when it's complete. The engine processes the outgoing file transactions when it is 'cycled'. The number of engine cycles per wake up is defined in the table. At most one PDU will be sent on a single engine cycle.

Output Channels

The CF application supports sending files to a configurable number of destinations. The output channels are configured through table parameters. Each channel has a pending queue, active queue and history queue. All queue entries for outgoing transactions start out on the pending queue, then get moved to the active queue when the transaction begins. After the transaction is complete the queue entry is moved to the history queue. The queues may be viewed by command at any time. The pending queue reads may be enabled or disabled at any time. Each channel has a dedicated throttling semaphore, peer entity ID, message ID for outgoing PDUs and a configurable number of polling directories. File output transactions may occur simultaneously on different channels. The engine processes all active outgoing transactions in a round-robin fashion so as not to starve any one transaction. CF is not capable of prioritizing across channels.

Queueing Files for Output

There are three ways to request a file (or files) to be sent. The file transmit command, the directory playback command or through poll directory processing. The CF polling directory feature continually checks a directory for files and after detecting a new file in the directory, inserts a queue entry containing the file name (and other info) on the pending queue.

Priority

Each file-send transaction has an associated priority which is specified by the user. The priority of the transaction determines where it is inserted in the pending queue. High priority transactions get inserted toward the front of the queue. There are 256 levels of priority, zero being the highest. Priority is given as a command parameter for the playback file command and the playback directory command. For poll directory processing, each polling directory has an associated priority given as a table parameter. Please note that this priority applies only within a channel. CF does not support prioritization across channels. Prioritization across channels (if needed) would typically be implemented by the application receiving the PDUs.

Preserve Setting

When an outgoing file transaction is successfully complete, the user may want the file to be deleted by CF. The preserve setting allows the user to specify whether the file is deleted or not. The preserve setting gives two choices, delete or keep. This setting is specified as a parameter in the transmit file command, the playback directory command and on each polling directory. If a file transaction is not successful, the file cannot be deleted by CF.

Throttling Semaphore

Throttling outgoing PDUs may be necessary when the application that receives the outgoing PDUs (typically TO) needs to control the flow of packets. The throttling semaphore is a counting semaphore that is shared between another application and CF. Throttling may be configured as in-use or not-in-use on a per-channel basis. To configure as in-use, the receiving app must create a counting semaphore during initialization, using the name defined in the CF table. After creation, the receiving app must 'give' the semaphore each time it is ready to receive a PDU. On the CF side, CF attempts to get the semaphore ID by calling an OSAL function to Get-SemaphoreID-by-Name during CF initialization. The name defined in the table is given as a parameter to this call. CF has code to ensure that this call is executed after the receiving app initializes. If the attempt to Get-SemaphoreID-by-Name fails, then throttling on that channel is not-in-use and PDUs are sent whenever the engine has a PDU ready to output. If successful, each time the engine has a PDU to output, CF will attempt a non-blocking 'take' on the throttling semaphore. If the 'take' is successful, the green light counter in telemetry is incremented and the PDU is sent on the software bus. If the 'take' is not successful, the PDU is held by the engine, the red-light counter is incremented and the 'take' is called again on the next engine cycle.

Polling Directories

A polling directory is a directory that is polled by CF periodically. CF does not create these directories. They must be created before they can be enabled. When files are found in a polling directory that is enabled, the files are automatically queued by CF for output. The polling rate is configurable and each channel has a configurable number of polling directories. Each polling directory has an enable, a class setting, a priority setting, a destination directory. When enabled, CF will periodically check the polling directories for files. When a file is found, CF will place the file information on the pending queue if it is closed and not already on the queue and not currently active. All polling directories are checked at the same frequency which is defined by the table parameter NumWakeupsPerPollDirChk. Setting this parameter to one will cause CF to check the polling directories at the fastest possible rate, every time it receives a 'wake-up' command. Checking polling directories is a processor-intensive effort, it is best to keep the polling rate as low as possible.

Failed Transmit and directory use

Currently, the fail directory is used only to store class 2 TX files that failed during transmission from a polling directory. When a file fails during transmission from a polling directory, it is deleted from the polling directory to prevent an infinite loop and moved to the fail directory. However, if a file fails during a class 2 TX outside of a polling directory, the file will not be deleted.

Efficiency

The CF application can be a processor intensive application. Some operating systems have significant overhead associated with file system operations. Opening and closing a file, querying the file system for file size, deleting the file, opening directories, looping through a directory list can consume a considerable amount of processor time. For this reason, transmitting small files at a high rate for long periods of time may be a worst-case-timing scenario. File system overhead is less of an issue when file sizes are large. The terms 'large' and 'small' used here are relative to the downlink rate. With a downlink rate of 1 Mbps for example, a good file size would be 1 MByte or larger.

Also, it is best to keep the number of files on the pending queue to a minimum. When the number of files on the pending queue is high, (such as hundreds) prioritization and standard checking causes CF processing to be significant each time a file is added to the queue.

Polling directory processing is also subject to file system overhead. It is recommended that the rate of poll processing be kept low and unused polling directories should be disabled.

Memory Use

CF uses statically allocated memory based on configuration parameters defined in the platform configuration file. This static memory is used for queue entries. The life cycle of a queue entry begins when a request to queue a file for downlink is received. Or in the case of incoming transactions, the queue entry is reserved when the meta-data PDU is received by CF. For the incoming transaction case, the queue entry starts out on the incoming active queue, then the entry is moved to the history queue when the transaction completes. For outgoing transactions, the queue entry starts out on the pending queue, then moves to the active queue when the transaction begins, then moves to the history queue when the transaction is complete.

The history queue has a sliding window effect. When the queue is full and a new transaction needs to be added, the oldest transaction will be removed, making room for the new transaction.

The history queue depth is a configuration parameter and specified in the CF configuration table. When the queue entry is 'pushed-off' the history queue, the memory for the queue will be available.

For incoming file transactions, CF writes file data from the incoming packet directly to the file without the use of an internal buffer. Incoming transaction size is limited by the underlying transport layer.

For outgoing file transactions CF requests a buffer from SB sized for CF_MAX_PDU_SIZE, the CCSDS header size, and CF_PDU_ENCAPSULATION_EXTRA_TRAILING_BYTES. Outgoing packets are then filed up to this maximum value for transmission. Note the maximum outgoing size can also be limited by the table or set parameter command for outgoing_file_chunk_size.

Generation of packets can be flow controlled via a throttling semaphore defined in the CF configuration table.

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Next: CFS CFDP Deployment Guide

1.5 CFS CFDP Deployment Guide

Follow the general guidelines below for platform deployment of the CFDP app.

Configuration

CF uses two sets of configuration parameters: compile-time configurable parameters in the cf_platform_cfg.h file and run-time configurable parameters in the cf_def_config.c file. Most parameters are included in the cf_def_config.c file for maximum flexibility.

cf_platform_cfg.h uses macro definitions for configurable options, while cf_def_config.c uses a table. cf_def_config.c parameters can be accessed using the get/set functions CF_GetParamCmd() and CF_SetParamCmd().

CF expects to receive a CF_WAKEUP_MID message from the SCH (scheduler) app at a fixed rate. The number of wakeups per second is reflected in the configuration table. This drives CF's timing.

Channels CF version 3.0 has a concept of "channels" which have their own configuration. The channel configuration is done in the cf_def_config.c file and allows message IDs for incoming and outgoing PDUs to be unique per channel. Each channel can be configured with polling directories as well.

Flow Control By default, CF assumes that a per-channel semaphore is provided by the Telemetry Output (TO) application or an equivalent application. The semaphore name is defined in the CF configuration table and must match the name of the semaphore created by TO. If TO does not create a semaphore, the semaphore name can be left as an empty string in the configuration table indicating that a semaphore should not be used. If a semaphore is expected and not found, the application will terminate during initialization. If no semaphore is used, the outgoing messages per wakeup may need to be more limited. It's a valid configuration to have both the semaphore and maximum outgoing messages per wakeup as well.

Integration

Software Bus Each channel has an input message ID that is subscribed on, and a message ID to publish its messages on.

Scheduler CF as a whole expects the CF_WAKEUP_MID message as described earlier at a fixed rate. If the number of wakeups per second is changed in SCH, then the ticks_per_second configuration parameter in the CF configuration table must also be updated.

Endianness CF is endian agnostic and no longer requires specific compile time configuration/defines to handle different endian systems.

Integration with TO TO's pipe needs to be able to receive packets of CF_MAX_PDU_SIZE

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Next: CFS CFDP Configuration

1.6 CFS CFDP Configuration

The CF application provides the user with a set of compile-time configuration parameters as well as a set of run-time configuration parameters. All compile-time configuration parameters are specified in headers files. There are three header files used by the CF application, cf_platform_cfg.h, cf_perfids.h and cf_msgids.h. For details regarding the compile-time configuration parameters, refer to the header files.

CFS CFDP Mission Configuration

CFS CFDP Platform Configuration

All run-time configuration parameters are specified in the CF configuration table.

CFS CFDP Table Definitions

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1.7 CFS CFDP Table Definitions

The CF application has one table used for configuration. This table is accessed during initialization and updated by CF when changes to the table parameters are made through CF commands or CFE table services.

The table contains default configuration settings. Many table configuration settings can be adjusted by command. These adjustments will modify the table and are therefore reflected if the table is dumped. These adjustments will also change the table checksum. The configuration table is loaded at the time the application is started. CF supports table updates during runtime only when the engine is disabled.

CF utilizes a CFS table for run-time configuration defined by CF_ConfigTable_t. The channel configuration is in CF_ConfigTable_t.chan which contains a polling element defined by CF_PollDir_t.

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Next: CFS CFDP Constraints

1.8 CFS CFDP Commands

CFS CFDP Command Descriptions

CFS CFDP Command Message IDs

CFS CFDP Command Structures

CFS CFDP Command Codes

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Next: CFS CFDP Telemetry

1.8.1 CFS CFDP Command Descriptions

Noop Command

The CF Noop command is sent to CF using message ID CF_CMD_MID with command code CF_NOOP_CC. This command is useful for verifying that the command interface to the CF Application is working. It also causes an event message to be generated that contains the CF Application's version information. It should be noted that the version information can also be obtained when the Application starts up. After CF has successfully initialized itself, an event message is generated that indicates successful initialization and also includes the Application's version information. Both of these event messages are 'Informational' and are NOT filtered by default.

Reset Counters Command

The CF Reset counters command is sent to CF using message ID CF_CMD_MID with command code CF_RESET_CC. This command is used to reset the counters in the housekeeping telemetry packet. All counters can be reset or they can be reset by category. The categories are command counters, fault counters, incoming file counters and outgoing file counters.

When the command is executed successfully, the command counter will be zero and an event message will be generated.

If the command is not successful, the command error counter will increment and an error event will be generated indicating the reason for failure.

```
     *  \par Command Structure
     *       #CF_UnionArgs_Payload_t where byte[0] specifies the counters type, byte[1-3] don't care:
     *       - 0 = all counters
     *       - 1 = command counters
     *       - 2 = fault counters
     *       - 3 = up counters
     *       - 4 = down counters
     typedef union CF_UnionArgs_Payload
     {
         uint32 dword;
         uint16 hword[2];
         uint8  byte[4];
     }
CF_UnionArgs_Payload_t;
```

```
The command parameter byte[0] identifies which category of counters to
    reset.counters. The value should be set to one of five possible values defined in the reset enumeration.
```

```
typedef enum {
            CF_Reset_all     = 0,
            CF_Reset_command = 1,
            CF_Reset_fault   = 2,
            CF_Reset_up      = 3,
            CF_Reset_down    = 4
        } CF_Reset_t;
```

Transmit File Command

The CF Transmit File command is sent to CF using message ID CF_CMD_MID with command code CF_TX_FILE_CC.

This command is used to queue a file to be sent by the CF application. To 'transmit' a file means to output, or send a file.

When the command is executed successfully, the command counter will increment and an event will be generated.

If the command is not successful, the command error counter will increment and an error event will be generated indicating the reason for failure. File will not be deleted if the 'transmit' failed (unless in an polling directories).

```
typedef struct CF_TxFileCmd
{
    CFE_MSG_CommandHeader_t cmd_header;
    uint8                   cfdp_class;
    uint8                   keep;
    uint8                   chan_num;
    uint8                   priority;
    CF_EntityId_t           dest_id;
    char                    src_filename[CF_FILENAME_MAX_LEN];
    char                    dst_filename[CF_FILENAME_MAX_LEN];
} CF_TxFileCmd_t;
```

The first parameter, `cfdp_class`, identifies whether the file will be transferred using CF_CFDP_CLASS_1 or CF_CFDP_CLASS_2. For Class 1 transfers, CF will send the data once and expect no feedback from the peer. Class 2 transfers are more reliable and attempt to fill in data that may have been dropped on the first attempt.

The second parameter, `keep`, specifies whether the file will be deleted or preserved by CF after the transfer successfully completes. To have the file deleted by CF, set this parameter to zero. If this parameter is set to one, the file will not be deleted. Regardless of the setting, if the file-transfer is not successful the file will not be deleted.

The third parameter, `chan_num`, specifies the output channel in which the file will be sent. The value range for this parameter is 0 to (CF_NUM_CHANNELS - 1). CF_NUM_CHANNELS is specified in the CF platform configuration file.

The fourth parameter, `priority`, specifies where the file is placed on the pending queue. High priority files are placed at the front of the queue. A value of zero is the highest priority. A value of 255 is the lowest priority.

The fifth parameter, `src_filename`, specifies the path name and filename to send. This parameter is a string with max size equal to CF_FILENAME_MAX_LEN bytes. The src_filename must be an existing file. The string must begin with a forward slash, have no spaces and be properly terminated.

The last parameter, `dst_filename`, specifies the destination path name and filename. This parameter is a string with max size equal to CF_FILENAME_MAX_LEN bytes. This parameter is delivered to the peer so that the peer knows where to store the file. The peer engine dictates the requirements of this string. The CF application allows this string to be NULL in which case the peer engine will store the incoming file in the default directory. If the string is not NULL, CF requires that it is properly terminated and contains no spaces. This parameter can be used to rename the file after it's received at the destination.

Playback Directory Command

The CF Playback Directory command is sent to CF using message ID CF_CMD_MID with command code CF_PLAYBACK_DIR_CC. The command causes an event message to be generated. This command is used to queue the files that are located in the specified directory at the time the command is received.

If the command is not successful, the command error counter will increment and an error event will be generated indicating the reason for failure.

To 'playback' a directory means to send all files in that directory. To queue the files for sending, the class must be 1 or 2, the channel must be in-use, the files must be closed and not be active or pending, the preserve parameter must be 0 (Delete) or 1 (Keep), the path names must include no spaces and be properly terminated. The src_filename must begin and end with a forward slash. All possible values for Priority are valid. A priority value of zero is the highest priority.

```
typedef CF_TxFileCmd_t CF_PlaybackDirCmd_t;
typedef struct CF_TxFileCmd
{
    CFE_MSG_CommandHeader_t cmd_header;
    uint8                   cfdp_class;
    uint8                   keep;
    uint8                   chan_num;
    uint8                   priority;
    CF_EntityId_t           dest_id;
    char                    src_filename[CF_FILENAME_MAX_LEN];
    char                    dst_filename[CF_FILENAME_MAX_LEN];
} CF_TxFileCmd_t;
```

The first parameter, `cfdp_class`, identifies whether the files will be transferred using CF_CFDP_CLASS_1 or CF_CFDP_CLASS_2. For Class 1 transfers, CF will send the data once and expect no feedback from the peer. Class 2 transfers are more reliable and attempt to fill in data that may have been dropped on the first attempt.

The second parameter, `keep`, specifies whether the files will be deleted or preserved by CF after the transfer successfully completes. To have the files deleted by CF, set this parameter to zero. If this parameter is set to one, the file will not be deleted. Regardless of the setting, if the file-transfer is not successful the file will not be deleted.

The third parameter, `chan_num`, specifies the output channel in which the files will be sent. All files in the directory will be sent on the specified channel. The value range for this parameter is 0 to (CF_NUM_CHANNELS

- 1). CF_NUM_CHANNELS is specified in the CF platform configuration file.

The fourth parameter, `priority`, specifies where the files are placed on the pending queue. All files in the directory will be queued with the given priority. High priority files are placed at the front of the queue. A value of zero is the highest priority. A value of 255 is the lowest priority.

The fifth parameter, `src_filename`, specifies the path name where the files are located. The string must have no spaces, be properly terminated and have a forward slash as the last character. This parameter is a string with max size equal to CF_FILENAME_MAX_LEN characters.

The last parameter, `dst_filename`, specifies where the files are to be stored after they are received by the peer. This parameter is a string with max size equal to CF_FILENAME_MAX_LEN bytes. This parameter is delivered to the peer so that the peer knows where to store the file. The peer engine dictates the requirements of this string. The CF application allows this string to be NULL in which case the peer engine will store the incoming files in the default directory. If the string is not NULL, CF requires that it is properly terminated, contains no spaces and ends with a forward slash. There is no way to rename the files at the destination as in the Playback File command.

Freeze Command

The CF Freeze command is sent to CF using message ID CF_CMD_MID with command code CF_FREEZE_CC. The freeze command has no command parameters. This command is used to freeze all transactions. The freeze command should be applied to both the source and destination peers at nearly the same time.

When the command is executed successfully, the command counter is incremented and an event message will be generated. This event message is an 'Informational' type and is NOT filtered by default. If the command is not successful, the command error counter will increment and an error event will be generated indicating the reason for failure.

Thaw Command

The CF Thaw command is sent to CF using message ID CF_CMD_MID with command code CF_THAW_CC. The thaw command has no command parameters. This command is used to thaw all transactions that were commanded to 'freeze' earlier. The thaw command should be applied to both the source and destination peers at nearly the same time.

When the command is executed successfully, the command counter is incremented and an event message will be generated. This event message is an 'Informational' type and is NOT filtered by default. If the command is not successful, the command error counter will increment and an error event will be generated indicating the reason for failure.

Suspend Command

The CF Suspend command is sent to CF using message ID CF_CMD_MID with command code CF_SUSPEND_CC. This command is used to suspend one or all transactions. The suspend command has one command parameter that indicates what transaction to suspend. See details below. The suspend command should be applied to both the source and destination peers at nearly the same time.

When the command is executed successfully, the command counter is incremented and an event message will be generated. This event message is an 'Informational' type and is NOT filtered by default. If the command is not successful, the command error counter will increment and an error event will be generated indicating the reason for failure.

NOTE: Suspending an outgoing transaction before EOF is sent, will pause the flow of PDUs on that channel. This happens because the next file is started when the current file EOF is sent. If a user wishes to stop the current transaction (before the EOF is sent) and still allow the next pending file to begin, the current transaction should be cancelled (or abandoned) in lieu of being suspended. Canceling is always a better option than abandoning.

NOTE: When a suspended transaction is cancelled, the cancel does not take effect until the transaction is resumed.

```
typedef struct CF_Transaction_Payload
{
    CF_TransactionSeq_t     ts;
    CF_EntityId_t           eid;
    uint8                   chan;
    uint8                   spare[3];
} CF_Transaction_Payload_t;
```

The `ts` parameter specifies the transaction sequence number to suspend. The `eid` parameter specifies the entity id used in the transaction. The `chan` parameter can specify a single channel, all channels, or the channel corresponding to the transaction sequence number.

Resume Command

The CF Resume command is sent to CF using message ID CF_CMD_MID with command code CF_RESUME_CC. This command is used to resume a suspended transaction or all transactions. The resume command has one command parameter that indicates what transaction to resume. See details below. The resume command should be applied to both the source and destination peers at nearly the same time.

When the command is executed successfully, the command counter is incremented and an event message will be generated. This event message is an 'Informational' type and is NOT filtered by default. If the command is not successful, the command error counter will increment and an error event will be generated indicating the reason for failure.

```
typedef struct CF_Transaction_Payload
{
    CF_TransactionSeq_t     ts;
    CF_EntityId_t           eid;
    uint8                   chan;
    uint8                   spare[3];
} CF_Transaction_Payload_t;
```

The `ts` parameter specifies the transaction sequence number to resume. The `eid` parameter specifies the entity id used in the transaction. The `chan` parameter can specify a single channel, all channels, or the channel corresponding to the transaction sequence number.

Cancel Command

The CF Cancel command is sent to CF using message ID CF_CMD_MID with command code CF_CANCEL_CC. This command is used to cancel a transaction or all transactions. The cancel command has one command parameter that indicates what transaction to cancel. See details below. The cancel command should be sent to the source entity only. For example, uplink transactions should be cancelled at the ground engine. The CF application should not receive a cancel command in this case. The CF application will learn of the cancel request through the protocol messages. Downlink transactions and outgoing transactions (with respect to CF) should be cancelled by sending this CF cancel command.

When the command is executed successfully, the command counter is incremented and an event message will be generated. This event message is an 'Informational' type and is NOT filtered by default. If the command is not successful, the command error counter will increment and an error event will be generated indicating the reason for failure.

NOTE: If a Cancel command is received by CF on an outgoing transaction that is suspended, the cancel does not take effect until the transaction is resumed.

```
typedef struct CF_Transaction_Payload
{
    CF_TransactionSeq_t     ts;
    CF_EntityId_t           eid;
    uint8                   chan;
    uint8                   spare[3];
} CF_Transaction_Payload_t;
```

The `ts` parameter specifies the transaction sequence number to cancel. The `eid` parameter specifies the entity id used in the transaction. The `chan` parameter can specify a single channel, all channels, or the channel corresponding to the transaction sequence number.

Abandon Command

The CF Abandon command is sent to CF using message ID CF_CMD_MID with command code CF_ABANDON_CC. This command is used to abandon a transaction or all transactions. The abandon command has one command parameter that indicates what transaction to abandon. See details below. The abandon command should be applied to both the source and destination peers at nearly the same time.

When the command is executed successfully, the command counter is incremented and an event message will be generated. This event message is an 'Informational' type and is NOT filtered by default.

If the command is not successful, the command error counter will increment and an error event will be generated indicating the reason for failure. When the command is executed successfully, the command counter is incremented and an event message will be generated. This event message is an 'Informational' type and is NOT filtered by default. If the command is not successful, the command error counter will increment and an error event will be generated indicating the reason for failure.

NOTE: Unlike the cancel command, if a suspended transaction is abandoned, the transaction will be abandoned at the time the abandon command is received. Likewise, if a frozen transaction is abandoned, the transaction will be abandoned when the abandoned cmd is received.

```
typedef struct CF_Transaction_Payload
{
    CF_TransactionSeq_t     ts;
    CF_EntityId_t           eid;
    uint8                   chan;
    uint8                   spare[3];
} CF_Transaction_Payload_t;
```

The `ts` parameter specifies the transaction sequence number to abandon. The `eid` parameter specifies the entity id used in the transaction. The `chan` parameter can specify a single channel, all channels, or the channel corresponding to the transaction sequence number.

Set MIB Parameter Command

The CF Set MIB Parameter command is sent to CF using message ID CF_CMD_MID with command code CF_SET_PARAM_CC. This command is used to change the flight engine Message Information Base (MIB). The MIB is a term used in the CCSDS blue book that can be interpreted as the engine configuration parameters. The command has two command parameters, Param indicates which parameter to change, and Value indicates the new setting.

When the command is executed successfully, the command counter is incremented and an event message will be generated displaying the parameter values received. This event message is an 'Informational' type and is NOT filtered by default.

If the command is not successful, the command error counter will increment and an error event will be generated indicating the reason for failure.

This command may be used to change any flight MIB parameter.

NOTE: Changing these parameters will change the actual table values, thereby changing the checksum of the CF configuration table.

```
typedef struct CF_SetParamCmd
{
    CFE_MSG_CommandHeader_t cmd_header;
    uint32                  value;
    uint8                   key;
    uint8                   chan_num;
    uint8                   spare[2];
} CF_SetParamCmd_t;
```

The `value` parameter specifies the new value of the engine parameter.

The `key` parameter specifies which engine parameter to set.

The `chan_num` parameter specifies the channel number to set.

Get MIB Parameter Command

The CF Set MIB Parameter command is sent to CF using message ID CF_CMD_MID with command code CF_GET_PARAM_CC. This command is used to view a single Message Information Base (MIB) parameter. The MIB is a term used in the CCSDS blue book that can be interpreted as the engine configuration parameters.

The command has two command parameter, key indicates which parameter to view and the channel number specifies the channel configuration to use. The parameter given and its current setting will be displayed in the event.

When the command is executed successfully, the command counter is incremented and an event message will be generated displaying the given parameter value and the current setting for that parameter. This event message is an 'Informational' type and is NOT filtered by default.

If the command is not successful, the command error counter will increment and an error event will be generated indicating the reason for failure.

This command may be used to view any flight MIB parameter.

```
typedef struct CF_GetParamCmd
{
    CFE_MSG_CommandHeader_t cmd_header;
    uint8                   key;
    uint8                   chan_num;
} CF_GetParamCmd_t;
```

The `key` parameter specifies which engine parameter to get.

The `chan_num` parameter specifies the channel number to get the data from.

Write Queue Information Command

The CF Write Queue Information command is sent to CF using message ID CF_CMD_MID with command code CF_WRITE_QUEUE_CC.

This command is used to write the contents of a single queue to a file. CF has a pending, queue, an active queue and a history queue for each output channel. CF also has an active queue and a history queue for incoming transactions.

When the command is executed successfully, the command counter is incremented and an event message will be generated.

If the command is not successful, the command error counter will increment and an error event will be generated indicating the reason for failure.

```
typedef struct CF_WriteQueueCmd
{
    CFE_MSG_CommandHeader_t cmd_header;
    uint8                   type;
    uint8                   chan;
    uint8                   queue;
    uint8                   spare;

    char filename[CF_FILENAME_MAX_LEN];
} CF_WriteQueueCmd_t;
```

The first parameter, `type`, specifies the queue type. The queue type may be uplink (incoming), or downlink (outgoing), or both,

The second parameter, `chan`, is necessary only if the type parameter is set to a value of two (downlink). If the Type parameter is set to a value of one (uplink), the code does not read this parameter. Chan specifies the downlink channel that owns the queue. The value range for this parameter is 0 to (CF_NUM_CHANNELS - 1). CF_NUM_CHANNELS is specified in the CF platform configuration file.

The third parameter, `queue`, identifies which queue contents will be written to the file. A value of 0 for pending queue, 1 for active and 2 for history. Because there is no uplink pending queue, a value of zero is not valid when the Type parameter is set to one (uplink).

The fourth parameter, `filename`, specifies the name of the file that will receive the queue data. This parameter is a string with max size equal to CF_FILENAME_MAX_LEN bytes specified in the CF platform configuration file.

Enable Dequeue Command

The CF Enable Dequeue command is sent to CF using message ID CF_CMD_MID with command code CF_ENABLE_DEQUEUE_CC.

This command is used to enable reading from the pending queue on a particular channel. It has one parameter (channel) and is sent when the pending queue reads are disabled for that channel. The pending queue holds the names of the files that are waiting to be sent out by CF. This command has no effect on incoming file transactions.

When the command is executed successfully, the command counter is incremented and an event message will be generated.

If the command is not successful, the command error counter will increment and an error event will be generated indicating the reason for failure.

```
     *       Command Structure
     *       #CF_UnionArgs_Payload_t where byte[0] specifies the channel number or all channels
     *       - 255 = all channels
     *       - else = single channel
     typedef union CF_UnionArgs_Payload
{
    uint32 dword;
    uint16 hword[2];
    uint8  byte[4];
} CF_UnionArgs_Payload_t;
```

The first and only parameter, `byte`[0], specifies which pending queue to enable. Each channel has one pending queue. The value range for this parameter is 0 to

1. A value of 255 specifies all channels. All other values are for a single channel.

Disable Dequeue Command

The CF Enable Dequeue command is sent to CF using message ID CF_CMD_MID with command code CF_DISABLE_DEQUEUE_CC.

This command is used to disable reading from the pending queue on a particular channel. It has one parameter (channel) and sent when the user would like to stop sending files on a particular channel.

NOTE: This command does not stop a file transaction that is in progress on the specified channel. Use the cancel command to stop a file transaction that is in progress.

When the command is executed successfully, the command counter is incremented and then an event message will be generated.

If the command is not successful, the command error counter will increment and an error event will be generated indicating the reason for failure.

```
     *       Command Structure
     *       #CF_UnionArgs_Payload_t where byte[0] specifies the channel number or all channels
     *       - 255 = all channels
     *       - else = single channel

     typedef union CF_UnionArgs_Payload
{
    uint32 dword;
    uint16 hword[2];
    uint8  byte[4];
} CF_UnionArgs_Payload_t;
```

The first and only parameter, `byte`[0], specifies which pending queue to enable. Each channel has one pending queue. The value range for this parameter is 0 to

1. A value of 255 specifies all channels. All other values are for a single channel.

Enable Directory Polling Command

The CF Enable Directory Polling command is sent to CF using message ID CF_CMD_MID with command code CF_ENABLE_DIR_POLLING_CC.

This command is used to enable one or all polling directories on a particular channel. CF will check polling directories for filenames and queue them for output, only if the polling directory is enabled. Polling directory processing consumes a fair amount of CPU utilization. Opening directories periodically and looping through hidden files, closed files and files that have already been queued can take a substantial amount of CPU time. It is recommended to keep polling directories disabled when they are not actively receiving files.

When the command is executed successfully, the command counter is incremented and an event message will be generated.

If the command is not successful, the command error counter will increment and an error event will be generated indicating the reason for failure.

```
    *       Command Structure
    *       #CF_UnionArgs_Payload_t
    *
    *       byte[0] specifies the channel number or all channels
    *       - 255 = all channels
    *       - else = single channel
    *
    *       byte[1] specifies the polling directory index
    *       - 255 = all polling directories
    *       - else = single polling directory index
    *

    typedef union CF_UnionArgs_Payload
{
     uint32 dword;
     uint16 hword[2];
     uint8  byte[4];
} CF_UnionArgs_Payload_t;
```

The first parameter, `byte`[0], specifies which channel contains the polling directory to enable. The value range for this parameter is 0 to 255. A value of 255 specifies all channels. All other values are for a single channel.

The second parameter, `byte`[1], specifies which polling directory to enable. To enable all polling directories on a specific channel, set this parameter to 0xFF. The polling directories are numbered from zero to (CF_MAX_POLLING↩_DIRS_PER_CHAN - 1). CF_MAX_POLLING_DIRS_PER_CHAN is specified in the CF platform configuration file. The polling directory number may be obtained by viewing the contents of the CF configuration table.

Disable Directory Polling Command

The CF Enable Directory Polling command is sent to CF using message ID CF_CMD_MID with command code CF_DISABLE_DIR_POLLING_CC.

This command is used to disable one or all polling directories on a particular channel. CF will check polling directories for filenames and queue them for output, only if the polling directory is enabled. Polling directory processing consumes a fair amount of CPU utilization. Opening directories periodically and looping through hidden files, closed files and files that have already been queued can take a substantial amount of CPU time. It is recommended to keep polling directories disabled when they are not actively receiving files.

When the command is executed successfully, the command counter is incremented and an event message will be generated.

If the command is not successful, the command error counter will increment and an error event will be generated indicating the reason for failure.

```
     *       Command Structure
     *       #CF_UnionArgs_Payload_t
     *
     *       byte[0] specifies the channel number or all channels
     *       - 255 = all channels
     *       - else = single channel
     *
     *       byte[1] specifies the polling directory index
     *       - 255 = all polling directories
     *       - else = single polling directory index
     *

    typedef union CF_UnionArgs_Payload
{
     uint32 dword;
     uint16 hword[2];
     uint8  byte[4];
} CF_UnionArgs_Payload_t;
```

The first parameter, `byte`[0], specifies which channel contains the polling directory to disable. The value range for this parameter is 0 to 255. A value of 255 specifies all channels. All other values are for a single channel.

The second parameter, `byte`[1], specifies which polling directory to disable. To disable all polling directories on a specific channel, set this parameter to 0xFF. The polling directories are numbered from zero to (CF_MAX_POLLING↩ _DIRS_PER_CHAN - 1). CF_MAX_POLLING_DIRS_PER_CHAN is specified in the CF platform configuration file. The polling directory number may be obtained by viewing the contents of the CF configuration table.

Purge Queue Command

The CF Write Queue Information command is sent to CF using message ID CF_CMD_MID with command code CF_PURGE_QUEUE_CC.

This command is used to remove all entries on a single queue. CF has a pending queue, an active queue, and a history queue for each channel. Only the pending and history queues can be purged.

When the command is executed successfully, the command counter is incremented and an event message will be generated indicating that the node has been removed.

If the command is not successful, the command error counter will increment and an error event will be generated indicating the reason for failure.

```
     *       Command Structure
     *       #CF_UnionArgs_Payload_t
     *
     *       byte[0] specifies the channel number or all channels
     *       - 255 = all channels
     *       - else = single channel
     *
     *       byte[1] specifies the queue
     *       - 0 = Pending queue
     *       - 1 = History queue
     *       - 2 = Both pending and history queue
     *

    typedef union CF_UnionArgs_Payload
{
     uint32 dword;
     uint16 hword[2];
     uint8  byte[4];
} CF_UnionArgs_Payload_t;
```

The first parameter, `byte`[0], specifies a single channel id or a value indicating all channels.

The second parameter, `byte`[1], identifies which queue will be purged. A value of 0 for pending queue, 1 for history and 2 for both.

Enable Engine Command

The CF Enable Engine command is sent to CF using message ID CF_CMD_MID with command code CF_ENABLE_ENGINE_CC. The command has no command parameters and is used to reinitialize engine and enable processing. Note configuration table updates are not processed while the engine is enabled.

Enable Disable Command

The CF Enable Engine command is sent to CF using message ID CF_CMD_MID with command code CF_DISABLE_ENGINE_CC. The command has no command parameters and is used to disable engine processing. Note configuration table updates can be performed while the engine is disabled, and when the engine is re-enabled the new configuration will take effect.

Prev: CFS CFDP Configuration
Next: CFS CFDP Telemetry

1.9 CFS CFDP Telemetry

CFS CFDP Telemetry Descriptions

CFS CFDP Telemetry Message IDs

CFS CFDP Telemetry

Prev: CFS CFDP Commands
Next: CFS CFDP Events

1.9.1 CFS CFDP Telemetry Descriptions

CF Housekeeping Telemetry Packet

The Housekeeping Telemetry packet is sent by CF to the software bus on command. When CF receives the CF_SE↩ ND_HK_MID command, a packet is constructed and sent by CF. CF typically receives this command every four or five seconds.

CF End of Transaction Packet

The End of Transaction packet is sent to the software bus upon completion of a file send or receive transaction. A packet with message ID CF_EOT_TLM_MID is constructed and sent by CF. The packet contains information about the last completed transaction which includes sequence number, channel, direction, state, status, EID, file size, CRC result, and filenames.

Prev: CFS CFDP Telemetry
Next: CFS CFDP Table Definitions

1.10 CFS CFDP Events

CFS CFDP Event IDs

Prev: CFS CFDP Telemetry
Next: CFS CFDP Constraints

1.11 CFS CFDP Constraints

CF is currently limited by the Software Bus performance. Future work may include implementing a point-to-point interface for high speed transfers.

The CFDP standard CCSDS 727.0-B-5 allows a variety of data-type sizes for Source and Destination Entity ID's, Transaction ID and PDU Header length. Currently, this application does not support the following:

1. an Entity ID length other than the size defined in cf_platform_cfg.h
2. a transaction ID length other than the size defined in cf_platform_cfg.h
3. a PDU header size greater than CF_CFDP_MAX_HEADER_SIZE bytes

The stack size for the CF application must be monitored and must be no less than 16384 bytes. Depending on the CF configuration, the stack size may need to be set higher than 16384. The stack size is specified in the cfe_es_startup.scr file that is located in the /mission/build/xxx/exe area.

Poll directories must not have subdirectories, otherwise errors will occur at put request time.

All files in polling directories must be closed.

The same file cannot be sent on two channels at same time.

Spaces are not allowed in filenames.

Segmentation control as described in the blue book is not supported by this version of CFS CF application. All outgoing transactions will have the segmentation control bit in the meta-data PDU set to - 'Recorded Boundaries Not Respected'.

This version of CF does not support keep alive procedures that are detailed in section 4.1.6.5 of CFDP CCSDS 727.0-B-5 Blue Book.

Invalid file structures are not supported by this version of the CF application. Invalid file structures are described in 4.1.↩ 6.1.1.8 of CFDP CCSDS 727.0-B-5 Blue Book and apply only when record boundaries are respected (see segmentation control above).

Only transmission modes unacknowledged (class 1) and acknowledged (class 2) are supported by the CF application.

The CFDP Application will fail on startup if the following conditions are not met:

- Unable to create a Software Bus Pipe

- Unable to subscribe to the CF Command Message
- Unable to subscribe to the CF Housekeeping Request Message
- Unable to register for cFE Event Services
- Unable to register the CF Configuration Table with cFE Table Services
- Unable to load the CF Configuration Table with a default table file
- Unable to acquire a pointer to the CF Configuration Table

Each one of these conditions will generate a unique event message and will cause the CF Application to terminate before processing any CF command pipe messages.

Prev: CFS CFDP Events
Next: CFS CFDP Frequently Asked Questions

1.12 CFS CFDP Frequently Asked Questions

No CF specific FAQ's have been identified/documented.

Prev: CFS CFDP Constraints
Next: CFS CFDP Lessons Learned

1.13 CFS CFDP Lessons Learned

These are the lessons learned setting up CF application:

- If you get a "PDU too short":
  - The ground system might not be setting the "length" in the CCSDS header correctly.
- If you get an "EOF PUD too short" or missing 2 bytes from an uploaded file:
  - The current version of CF does not support PDU CRC. The ground system needs to set the "CRC Flag" to false.
- If you get a "CRC mismatch for R trans":
  - This is referencing the "checksum" and not the "PDU CRC".
  - Make sure you are using the modular checksum calculation (Type 0) in your ground system.
  - The PDU can be truncated. Check the "max PDU size" in your CF application and the "max ingest" of the CI application (increase as necessary). Otherwise set the "max file segment" smaller in the ground system.
- If you get an "inactivity timer expired" after the ground system sends an EOF PDU:
  - If you are sending the file in acknowledge mode, it could be the checksum calculation is taking longer than your "inactivity timer". You can increase the "inactivity timer" or increase the "max number of bytes per wakeup to calculate CRC".

2 Core Flight Executive Documentation

- General Information and Concepts
  - Background
  - Applicable Documents
  - Version Numbers
  - Dependencies
  - Acronyms
  - Glossary of Terms
- Executive Services (ES)
  - cFE Executive Services Overview
  - cFE Executive Services Commands
  - cFE Executive Services Telemetry
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- Events Services (EVS)
  - cFE Event Services Overview
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- Time Services (TIME)
  - cFE Time Services Overview
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  - cFE Time Services Configuration Parameters

- cFE Event Message Cross Reference
- cFE Command Mnemonic Cross Reference
- cFE Telemetry Mnemonic Cross Reference
- cFE Application Programmer's Interface (API) Reference

2.1 Background

The Core Flight Executive (cFE) is an application development and run-time environment. The cFE provides a set of core services including Software Bus (messaging), Time, Event (Alerts), Executive (startup and runtime), and Table services. The cFE defines an application programming interface (API) for each service which serves as the basis for application development.

The cFE Software Bus service provides a publish and subscribe messaging system that allows applications to easily plug and play into the system. Applications subscribe to cFE services at runtime, making system modifications easy. Facilitating rapid prototyping, new applications can be compiled, linked, loaded, and started without requiring the entire system to be rebuilt.

Each service comes complete with a built in application that allows users to interface with each service. To support reuse and project independence, the cFE contains a configurable set of requirements and code. The configurable parameters allow the cFE to be tailored for each environment including desk-top and closed loop simulation environments. This provides the ability to run and test software applications on a developer's desktop and then deploy that same software without changes to the embedded system. In addition the cFE includes the following software development tools:

- Unit Test Framework (UTF) for unit testing applications developed via the cFE
- Software Timing Analyzer that provides visibility into the real-time performance of embedded systems software
- Table Builder
- Command and Telemetry utilities

The cFE is one of the components of the Core Flight System (cFS), a platform and project independent reusable software framework and set of reusable software applications. There are three key aspects to the cFS architecture: a dynamic run-time environment, layered software, and a component based design. The combination of these key aspects along with an implementation targeted to the embedded software domain makes it suitable for reuse on any number of NASA flight projects and/or embedded software systems.

The pivotal design feature, abstracting the software architecture from the hardware and forming the basis of reuse, is component layering. Each layer of the architecture "hides" its implementation and technology details from the other layers by defining and using standard Application Programming Interfaces (APIs). The internals of a layer can be changed without affecting other layers' internals and components.

The layers include an OS Abstraction Layer (OSAL), Platform Support Package (PSP) layer, core Flight Executive (cFE) layer, and an Application layer. The cFE layer runs on top of the PSP and OSAL layers. The cFE comes complete with a build environment, deployment guide, API reference guide, and provides a sample PSP. The OSAL is available open source and once integrated into the cFE build environment, developers will be ready to build and run the system and start developing their mission/project specific applications that easily plug and play into the system.

2.1.1 Core Flight Executive (cFE) Goals

The main long term goal of the cFE is to form the basis for a platform and project independent reusable software framework. The cFE with the OSAL allow the development of portable embedded system software that is independent of a particular Real Time Operating System and hardware platform. A secondary long term goal is to create a standardized, product-line approach for development of embedded aerospace flight software.

2.1.1.1 Functional and Community Goals The cFE allows embedded system software to be developed and tested on desktop workstations and ported to the target platform without changing a single line of code, providing a shorter development and debug time. The cFE is an enabler of software collaboration amongst all users promoting the growth of the application and library layers where new applications, libraries, tools, and lessons learned can be contributed and shared.

It is important for application developers to realize the long term and functional goals of the cFE. With a standard set of services providing a standard API, all applications developed with the cFE have an opportunity to become useful on future missions through code reuse. In order to achieve this goal, applications must be written with care to ensure that their code does not have dependencies on specific hardware, software or compilers. The cFE and the underlying generic operating system API (OS API) have been designed to insulate the cFE Application developer from hardware and software dependencies. The developer, however, must make the effort to identify the proper methods through the cFE and OS API to satisfy their software requirements and not be tempted to take a "short-cut" and accomplish their goal with a direct hardware or operating system software interface.

2.2 Applicable Documents

Document Title	Link
cFE System (L4) Requirements Document	cfe/docs/'cfe requirements.docx'
cFE Functional (L5) Requirements Document	cfe/docs/cFE_FunctionalRequirements.csv
cFE Application Developers Guide	cfe/docs/'cFE Application Developers Guide.md'
cFE User's Guide (includes API)	Autogenerated from code, provided with releases in cFE repository
OS Abstraction Layer (OSAL) API	Autogenerated from code, provided with releases in OSAL repository

2.3 Version Numbers

2.3.1 Version Number Semantics

The version number is a sequence of four numbers, generally separated by dots when written. These are, in order, the Major number, the Minor number, the Revision number, and the Mission Revision number.

It is important to note that version numbers are only updated upon official releases of tagged versions, **NOT** on development builds. We aim to follow the Semantic Versioning v2.0 specification with our versioning.

The MAJOR number is incremented on release to indicate when there is a change to an API that may cause existing, correctly-written cFS components to stop working. It may also be incremented for a release that contains changes deemed to be of similar impact, even if there are no actual changes to the API.

The MINOR number is incremented on release to indicate the addition of features to the API which do not break the existing code. It may also be incremented for a release that contains changes deemed to be of similar impact, even if there are no actual updates to the API.

The REVISION number shall be incremented on changes that benefit from unique identification such as bug fixes or major documentation updates. The Revision number may also be updated if there are other changes contained within a release that make it desirable for applications to distinguish one release from another. WARNING: The revision number is set to the number 99 in development builds. To distinguish between development builds refer to the BUILD_NUMBER and BUILD_BASELINE detailed in the section "Identifying Development Builds".

The Mission Rev Version number is set to zero in all official releases, and is reserved for the mission use.

2.3.2 How and Where Defined

The version numbers are provided as simple macros defined in the cfe_version.h header file as part of the API definition; these macros must expand to simple integer values, so that they can be used in simple if directives by the macro preprocessor.

Note the Mission Rev number is provided for missions to be able to identify unique changes they have made to the released software (via clone and own). Specicifally, the values 1-254 are reserved for mission use to denote patches/customizations while 0 and 0xFF are reserved for cFS open-source development use (pending resolution of nasa/cFS#440).

2.3.3 Identifying Development Builds

In order to distinguish between development versions, we also provide a BUILD_NUMBER.

The BUILD_NUMBER reflects the number of commits since the BUILD_BASELINE, a baseline git tag, for each particular component. The BUILD_NUMBER integer monotonically increases for a given baseline. The BUILD_BASELINE identifies the current development cycle and is a git tag with format vMAJOR.MINOR.REVISION. The Codename used in the version string also refers to the current development cycle. When a new baseline tag and codename are created, the BUILD_NUMBER resets to zero and begins increasing from a new baseline.

2.3.4 Templates for the short and long version string

See cfe_version.h for the standard layout and definition of version information. The apps and repositories follow the same pattern by replacing the CFE_ prefix with the appropriate name; for example, osal uses OS_, psp uses CFE_P↩SP_IMPL, and so on.

Suggested pattern for development:

- CFSCOMPONENT_SRC_VERSION: REFERENCE_GIT_TAG"+dev"BUILD_NUMBER
  - Example: "v6.8.0-rc1+dev123"
- CFSCOMPONENT_VERSION_STRING: "CFSCOMPONENT DEVELOPMENT BUILD "CFSCOMPONENT_S↩RC_VERSION" (Codename: CFSCONSTELLATION), Last Official Release: MAJOR.MINOR.REVISION"
  - Example: "cFE DEVELOPMENT BUILD v6.8.0-rc1+dev123 (Codename: Bootes), Last Official Release: cfe v6.7.0"

Suggested pattern for official releases:

- CFSCOMPONENT_SRC_VERSION: OFFICIAL_GIT_TAG
  - Example: "v7.0.0"
- COMPONENT_VERSION_STRING: "CFSCOMPONENT OFFICIAL RELEASE "CFSCOMPONENT_SRC_VE↩ RSION" (Codename: CFSCONSTELLATION)"
  - Example: "cFE OFFICIAL RELEASE v7.0.0 (Codename: Caelum)"

2.4 Dependencies

The Core Flight Executive (cFE) is required to be built with the Operating System Abstraction Layer (OSAL) and Platform Support Package (PSP) components of the Core Flight System (cFS). It is always recommended to build with the latest versions of each of the components as backward compatibility may not be supported.

Several internal data structures within the cFE use the "char" data type. This data type is typically 1 byte in storage size with a value range -128 to 127 or 0 to 255. The size of the "char" data type and whether or not the type is signed or unsigned can change across platforms. The cFE assumes use of the "char" data type as an **8-bit type.**

2.5 Acronyms

Acronym	Description
AC	Attitude Control
ACE	Attitude Control Electronics
ACS	Attitude Control System
API	Application Programming Interface
APID	CCSDS Application ID
App	Application
CCSDS	Consultative Committee for Space Data Systems
CDH, C&DH	Command and Data Handling
cFE	core Flight Executive
cFS	core Flight System
CM	Configuration Management
CMD	Command
CPU	Central Processing Unit
EDAC	Error Detection and Correction
EEPROM	Electrically Erasable Programmable Read-Only Memory
ES	Executive Services
EVS	Event Services
FC	Function Code
FDC	Failure Detection and Correction
FSW	Flight Software
HW, H/W	Hardware
ICD	Interface Control Document

Acronym	Description
MET	Mission Elapsed Time
MID	Message ID
OS	Operating System
OSAL	Operating System Abstraction Layer
PID	Pipeline ID
PKT	Packet
PSP	Platform Support Package
RAM	Random-Access Memory
SB	Software Bus
SDO	Solar Dynamics Observatory
ST5	Space Technology Five
STCF	Spacecraft Time Correlation Factor
SW, S/W	Software
TAI	International Atomic Time
TBD	To Be Determined
TBL	Table Services
TID	Task ID
TIME	Time Services
TLM	Telemetry
UTC	Coordinated Universal Time

2.6 cFE Executive Services Overview

Executive Services (ES) is one of the five core Flight Executive components. ES is the primary interface to the underlying Operating System, providing a high level interface to system control facilities. The ES component is responsible for starting up and restarting the cFE, starting up, shutting down, and restarting cFE Applications, logging errors and performance data, and providing a persistent memory store for cFE Applications.

The interfaces to the ES task include the Ground Interface (commands and telemetry) and the Application Programmer Interfaces (APIs). The ES task interfaces to the OS through the OS Abstraction Layer (OSAL) and platform through the Platform Support Package (PSP).

The functionality provided by the ES task include Software Reset, Application and Child Task Management, Basic File System, Performance Data Collection, Critical Data Store, Memory Pool, System Log, Shell Command.

For additional detail on Executive Services, see the following sections:

- Terminology
- Software Reset
  - Reset Types and Subtypes
  - Exception and Reset (ER) Log

- Application and Child Task Management
  - Starting an Application
  - Stopping an Application
  - Restarting an Application
  - Reloading an Application
  - Listing Current Applications
  - Listing Current Tasks
  - Loading Common Libraries
- Basic File System
- Performance Data Collection
- Critical Data Store
- Memory Pool
- System Log
- Version Identification
- Frequently Asked Questions about Executive Services

2.6.1 Terminology

The following sections describe terminology that is very relevant to understanding the Executive Services:

- "Application" and "cFE Application"
- "Task"
- "Startup Script"

2.6.1.1 "Application" and "cFE Application"

Application

The term 'Application' as defined in the Glossary of Terms is *a set of data and functions that is treated as a single entity by the cFE. cFE resources are allocated on a per-Application basis. Applications are made up of a Main Task and zero or more Child Tasks.*

cFE Application

A 'cFE Application' is an application that is external to the cFE and designed to interface to the cFE through the APIs. It is created through an entry in the "Startup Script" (with the 'Object Type' field set to CFE_APP) or by way of the CFE_ES_START_APP_CC ground command.

When referring to one of the five applications internal to the cFE (ES, EVS, SB, TIME or TBL), the term 'Service' or 'Core Application' is typically used.

A listing of cFE applications can be acquired by using the CFE_ES_QUERY_ALL_CC ground command. This listing will include the cFE internal applications as well as cFE applications that are loaded and running.

2.6.1.2 "Task" A Task is a thread of execution in the operating system, often associated with a cFE Application. Each cFE Application has a Main task providing its CPU context, stack and other OS resources. In addition, each cFE Application can create multiple Child Tasks which are closely associated with the Parent Task and cFE Application.

In a traditional Real Time Operating System such as vxWorks, the cFE Application Main task and child tasks end up being mapped to these OS tasks in the same shared memory space. For example, a Stored Command cFE Application that consists of a cFE Main Task and 10 Relative Time Sequence Child Tasks would have 11 tasks on a vxWorks system. The only association between these tasks exists in the cFE.

In a memory protected process oriented Operating System, the intention is to have a cFE Application implemented as a memory protected process with its own virtual address space. In this Process Model, each cFE Child Task would be a thread in the parent Process, much like a Unix process with multiple threads. In this model, the Stored Command example with a cFE Main Task and 10 Relative Time Sequence Child Tasks would consist of a Unix Process and 10 pthreads, all under the same virtual address space.

2.6.1.3 "Startup Script" The startup script is a text file, written by the user that contains a list of entries (one entry for each application) and is used by the ES application for automating the startup of applications. For a processor reset, ES checks for the CFE_PLATFORM_ES_VOLATILE_STARTUP_FILE first, and if it doesn't exist or for a power on reset ES uses the file passed in to CFE_ES_Main (typically CFE_PLATFORM_ES_NONVOL_STARTUP_FILE but dependent on the PSP).

The fields in a single entry include:

Object Type	`CFE_APP` for an Application, or `CFE_LIB` for a library.
Path/Filename	This is a cFE Virtual filename, not a vxWorks device/pathname
Entry Point	This is the name of the "main" function for App.
CFE Name	The cFE name for the APP or Library
Priority	This is the Priority of the App, not used for a Library
Stack Size	This is the Stack size for the App, not used for a Library
Load Address	This is the Optional Load Address for the App or Library. It is currently not implemented so it should always be 0x0.
Exception Action	This is the Action the cFE should take if the Application has an exception. • 0 = Do a cFE Processor Reset • Non-Zero = Just restart the Application

Immediately after the cFE completes its initialization, the ES Application first looks for the volatile startup script. The location in the file system is defined by the cFE platform configuration parameter named CFE_PLATFORM_ES_VOLATILE_STARTUP_FILE. This configuration parameter contains a path as well as a filename. If the file is found, ES begins to startup the applications that are listed in the file. If ES does not find the file, it attempts to open the CFE_PLATFORM_ES_NONVOL_STARTUP_FILE.

If ES finds the volatile startup script, the attempt to open the nonvolatile startup script is bypassed.

Any errors encountered in the startup script processing are written to the System Log. The System Log may also contain positive acknowledge messages regarding the startup script processing.

The startup script delivered with the cFE (`cfe_es_startup.scr`) also has some detailed information about the fields and the settings.

2.6.2 Software Reset

The ES Software Reset provides a command to reset the cFE as well as resetting individual applications. Because applications are dependent on the cFE services, it is not possible to reset the cFE without affecting the applications. Therefore, a command to reset the cFE will also reset every application that is running at the time the command is received.

Also include is the Exception and Reset (ER) Log, which has a command for dumping or clearing the log and telemetry to show the number of entries in the log. In addition to the ER log, the user may find information about the most recent reset in the ES task housekeeping telemetry.

The ES Software Reset also provides a command to set the maximum number of processor resets before ES issues a power-on reset. There is a corresponding 'processor resets' counter in ES housekeeping telemetry that may be reset through another ES command.

2.6.3 Reset Types and Subtypes

The Reset Type is sent to the ground in the ES housekeeping packet and tells how the current running version of the cFE was invoked. The possible Reset Types expected in the telemetry field are CFE_PSP_RST_TYPE_POWERON and CFE_PSP_RST_TYPE_PROCESSOR. There is a third Reset Type defined in the ES code as CFE_ES_APP_RESTART which applies only to restarting an individual application and is covered in more detail in the section titled Application and Child Task.

The Reset Subtype is also sent in the ES housekeeping packet and gives more detail about the type of reset that started the execution of the current running version of the cFE. The possible Reset Subtypes are CFE_PSP_RST_SUBTYPE_POWER_CYCLE, CFE_PSP_RST_SUBTYPE_PUSH_BUTTON, CFE_PSP_RST_SUBTYPE_HW_SPECIA CFE_PSP_RST_SUBTYPE_HW_WATCHDOG, CFE_PSP_RST_SUBTYPE_RESET_COMMAND, CFE_PSP_RST_SUBTYPE_EXCEP CFE_PSP_RST_SUBTYPE_UNDEFINED_RESET, CFE_PSP_RST_SUBTYPE_HWDEBUG_RESET, CFE_PSP_RST_SUBTYPE_BAN

2.6.4 Exception and Reset (ER) Log

The Exception and Reset Log contains detailed information about past resets and exceptions. To view the information the CFE_ES_WRITE_ER_LOG_CC command must be sent. This command will write the log to a binary file. The path and filename may be specified in the command. If the filename command field contains an empty string, the configuration parameter CFE_PLATFORM_ES_DEFAULT_ER_LOG_FILE is used to specify the path and filename. Use the ground system to get the file and display the contents. There is also a command to clear the ER log, CFE_ES_CLEAR_ER_LOG_CC.

The size of the ER log is defined by the platform configuration parameter CFE_PLATFORM_ES_ER_LOG_ENTRIES This log is preserved after a processor reset and held in the ES reset area.

A count of the number of entries in the log is present in the ES housekeeping telemetry. This count can be used with the configuration parameter CFE_PLATFORM_ES_ER_LOG_ENTRIES to calculate the fullness of the log.

The information contained in a single log entry is defined by the structure CFE_ES_ERLog_t.

2.6.5 Application and Child Task Management

The ES Application and Child Task Management provides the user with full control over starting and stopping applications as well as querying information regarding applications, tasks and library routines.

There is no command to start or stop a child task. Child tasks can be controlled (started, stopped or deleted) only by the parent application through an API call.

This provides a way for the user to load a set of library routines, (via the startup script) without starting a corresponding task. See the section related to library routines for more detail.

The ES task maintains a counter for the number of registered applications, number of registered child tasks and the number of registered libraries in the ES housekeeping data.

2.6.6 Starting an Application

There are two ways to start an application, through the ground command CFE_ES_START_APP_CC or through the startup script. In either case, the object file must be loaded on board before the command is sent or before the startup script is executed. The startup script contains a list of applications and library routines to load and start immediately after the cFE finishes its startup sequence. The parameters in the command, match the elements of an entry in the startup script.

The format of the Start Application command, is defined in the structure CFE_ES_StartAppCmd_t. The members of the structure include, application name, entry point, filename, stack size, load address, exception action and priority.

If the command fails for any reason, an error event will be sent stating the reason for the failure. There may be additional information in the system log that can be viewed by sending the ES command to dump the system log.

After starting an application, the ES task sends an informational event message displaying the application name, filename of the object and the application ID. The new application will then show up in the query list downloaded in response to the CFE_ES_QUERY_ALL_CC command.

2.6.7 Stopping an Application

Stopping an application can be done through the ground command CFE_ES_STOP_APP_CC. This command will terminate the application execution and all child tasks created by the application, free the system resources that it allocated and delete the corresponding object file.

The process of stopping an application is done in a controlled manner when the application is properly using the return code from the call to the CFE_ES_RunLoop. When the application properly uses this function, the ES task starts a timer and (via the return code) tells the application to exit at its own convenience. This gives the application time to free its own resources and do any cleanup that may be required before terminating itself by calling CFE_ES_ExitApp. If the timer expires and the application still exists, then ES must 'kill' the application. When the application is killed, ES attempts to cleanup the applications resources as best it could. In this case there is no guarantee that all the system resources are properly released.

The format of the Stop Application command, is defined in the structure CFE_ES_StopAppCmd_t. The only parameter in the command is an application name.

If the command fails for any reason, an error event will be sent stating the reason for the failure. There may be additional information in the system log that can be viewed by sending the ES command to dump the system log.

After stopping an application, the ES task sends a debug message stating the name of the application. After executing the command, the application (or any resources it allocated) should no longer be listed in any cFE tables or files.

2.6.8 Restarting an Application

The CFE_ES_RESTART_APP_CC command is used to restart an application using the same file name as the last start.

This command checks for file existence, the application is running, and the application is not a core app. If valid, the application restart is requested.

When requested, ES stops the application, unloads the object file, loads the object file using the previous file name, and restarts an application using the parameters defined when the application was previously started, either through the startup script or by way of the CFE_ES_START_APP_CC command.

2.6.9 Reloading an Application

The CFE_ES_RELOAD_APP_CC command is used to reload an application using a new file name.

This command performs the same actions as CFE_ES_RESTART_APP_CC only using the new file.

2.6.10 Listing Current Applications

There are two options for receiving information about applications, the CFE_ES_QUERY_ONE_CC command can be used to get details about a single application. This command takes an application name as its only parameter and the application information is sent as a software bus packet that can be telemetered to the ground.

Or the CFE_ES_QUERY_ALL_CC command can be used to get information about all the applications that are currently registered with ES. This command writes the application data to a file and has a one parameter which specifies the path and filename of the output file.

For either command, the following Application information is made available:

- **Application ID** - The Application ID assigned by the cFE to the Application
- **Type Identifier** - Identifies whether the Application is a CORE App or an EXTERNAL App
- **Name** - The Application Name
- **Entry Point** - The symbolic name for the entry point into the Application
- **Filename** - The name of the file the Application was loaded from
- **Stack Size** - The number of bytes allocated for the Application's stack
- **Load Address** - The starting address of memory where the Application was loaded
- **Load Size** - The size, in bytes, of the Application when loaded into memory
- **Start Address** - The physical address that maps to the Entry Point
- **Exception Action** - A flag that identifies whether the Processor should undergo a Restart or whether just the Application should restart upon an exception condition within the Application
- **Priority** - The assigned priority for the Application
- **Main Task ID** - The Task ID assigned to the main task associated with the Application
- **Main Task Name** - The name of the main task associated with the Application
- **Number of Child Tasks** - The number of child tasks spawned by the main task

For a description of the format in which this data is dumped, see CFE_ES_AppInfo_t.

2.6.11 Listing Current Tasks

The CFE_ES_QUERY_ALL_TASKS_CC command is used to get a list of child tasks that are currently registered with ES. The following information is provided for each registered task:

- **Task ID** - The Task ID associated with the specified task
- **Task Name** - The name of the Task
- **Application ID** - The ID for the Application the Task is associated with
- **Application Name** - The name of the Application the Task is associated with

2.6.12 Loading Common Libraries

Library routines may be loaded only through the startup script. There is an option that allows a library routine initialization function to be executed after the library is loaded. Refer to the cFE Application Developers Guide for more information regarding Library Routines and startup scripts. The startup script delivered with the cFE (`cfe_es_startup.scr`) also has some detailed information about library routines.

2.6.13 Basic File System

ES provides minimal functionality to initialize, read, and write cfe File headers.

2.6.14 Performance Data Collection

The Performance Data Collection provides precise timing information for each software application similar to how a logic analyzer can trigger and filter data.

API calls are inserted by the development team at key points in the code. The basic operation is to start the data collection, wait some amount of time, then send the command to stop the data collection. When the stop command is received, the ES task writes all the data from the buffer to a file. The file can then be imported to analysis tools for viewing. The size of the buffer is configurable through the CFE_PLATFORM_ES_PERF_DATA_BUFFER_SIZE platform configuration parameter.

Additional information follows:

- Performance Data Collection Trigger Masks
- Starting to Collect Performance Data
- Stopping the Collection of Performance Data
- Viewing the Collection of Performance Data

2.6.14.1 Performance Data Collection Trigger Masks The trigger mask is used to control precisely when to start collecting the data. There is a bit in the trigger mask for every marker used in the code. After a start command is received, the trigger mask is read and dictates when to begin storing data in the buffer.

If the trigger mask is set to all zeros, then the collection will begin immediately after the start command and continue until a stop command is received. In this case the buffer behaves in a 'circular' manner.

2.6.14.2 Starting to Collect Performance Data The CFE_ES_START_PERF_DATA_CC command is used to start the data collection process. The ES task sends a debug event when the command is received. It is not possible to start a collection if the buffer-to-file write is in process from an earlier collection. There is an ES telemetry point that can be used to ensure there is not a buffer-to-file write in progress. This ES telemetry point is called 'Perf Data to Write' and begins counting down from 'Data Count' to zero. If this counter is zero, it is ok to send the start command. If any errors are encountered when the start command is received, the details will be displayed in an error event message.

2.6.14.3 Stopping the Collection of Performance Data The CFE_ES_STOP_PERF_DATA_CC command is used to stop the data collection process and write the buffer data to a file. The path and filename may be specified in the command. If the filename command field contains an empty string, the configuration parameter CFE_PLATFORM_ES_DEFAULT_PERF_DUMP_FILENAME is used to specify the path and filename. The number of entries written to the file is determined by the 'data count' variable, which is sent in the ES housekeeping telemetry packet. To ensure cpu hogging does not occur during the write process, ES creates a low priority child task to perform the file write operation. This child task will write a number of entries, then sleep for a short time to give tasks of lower priority a chance to run. The number of entries between delays, and the delay time is displayed in the debug event at the time the stop command is received.

2.6.14.4 Viewing the Collection of Performance Data To view the performance data, the file created as a result of the stop command must be transferred to the ground and imported into a viewing tool. See `https://github.com/nasa/perfutils-java` as an example.

2.6.15 Critical Data Store

Some missions are required, for health, safety and mission success criteria, to survive Processor Resets. These mission requirements frequently flow down to Attitude Control and/or Command and Data Handling requirements that force an Application developer to design a mechanism for retaining software state information through a Processor Reset. The cFE provides the Critical Data Store to assist the developer in meeting these requirements.

The Critical Data Store is an area of memory that is not cleared during a Processor Reset. In addition, the contents of memory are validated when accessed with a Data Integrity Value that helps to ensure the contents have not been corrupted. Each processor platform, through the design of its Board Support Package, can implement this area of memory in a number of ways to ensure the contents survive a Processor Reset. Applications can allocate a section of this memory for their use in a way similar to the cFE Table Services Overview.

When an Application registers a Critical Data Store (CDS), the Executive Services allocates a section of the Critical Data Store memory for the application's use and assigns the Application specified name to the memory area. The operator can find and learn the characteristics of these Critical Data Stores by using the Dump CDS Registry Command. This command will dump the contents of the CDS Registry maintained by the Executive Services into a file that can be downlinked and examined by the operator.

The CDS Registry dump will identify the following information for each registered CDS:

- **Handle** - the numeric identifier used by an Application to access the contents of the CDS
- **Size** - the number of bytes allocated to the specified CDS
- **Table Flag** - a flag that indicates whether the CDS is associated with a Critical Tables (when non-zero) or not (when equal to zero).
- **Name** - a processor specific name that uniquely identifies the CDS. The name comes in two parts, "`AppName.CDSName`". `AppName` identifies which Application registered the CDS. `CDSName` is the name the Application assigned to the CDS.

The format of the CDS Registry Dump File is a cFE Standard File header (see CFE_FS_Header_t) followed by one or more CDS Registry Dump File Records (see CFE_ES_CDSRegDumpRec_t).

2.6.16 Memory Pool

Refer to the cFE Application Developers Guide for additional information.

Applications that are designed for generic missions, frequently have to wait until run-time before allocating memory for buffers, data records, etc.

The cFE provides a memory allocation algorithm that may be used by an application to manage its block of memory. The user provides a pointer to its memory block and a list of block sizes and the cFE provides 'get' and 'put' API's to the user for managing its memory pool.

Run-time memory allocation in an embedded system can be risky because of the potential problem of memory fragmentation. Memory fragmentation is also referred to as External Fragmentation and is defined in the wikipedia as:

```
External fragmentation is the phenomenon in which free storage becomes divided
into many small pieces over time. It is a weakness of certain storage
allocation algorithms, occurring when an application allocates and deallocates
("frees") regions of storage of varying sizes, and the allocation algorithm
responds by leaving the allocated and deallocated regions interspersed. The
result is that, although free storage is available, it is effectively unusable
because it is divided into pieces that are too small to satisfy the demands of
the application. The term "external" refers to the fact that the unusable
storage is outside the allocated regions.
```

To help prevent this from happening, the cFE has integrated a memory allocation algorithm that is designed to create blocks at run-time, based on the size of the blocks requested. After a reset, there are no blocks created, the memory pool is said to be unconfigured. As requests for memory blocks are made, the memory pool first tries to use blocks that have been created but are no longer in use. If it cannot find an available block, it will create a new one. The created blocks remain until a reset occurs.

This algorithm is recommended when the size of the requests and the peak rate of requests can be pre-determined. It is highly recommended that adequate margin is designed into the pool size. The memory pool should never get close to being fully configured (i.e. not enough memory to create a new block). If the memory does become fully configured, requests for new size blocks will fail, regardless of whether the created blocks are in-use or not. The margin on the memory pool can be monitored by viewing the 'free bytes' member of the memory pool statistics. The memory pool statistics are dumped only when commanded by way of the ES command CFE_ES_SEND_MEM_POOL_STATS_CC.

A user of the ES memory pool begins by tailoring the memory pool for the particular use, by defining a list of block sizes and allocating a block of memory. These block size definitions simply give the memory pool a set of sizes to choose from. They do not configure the memory pool in any way and they do not affect the size of the pool. The cFE defines a default set of block sizes in the cfe_platform_cfg.h file.

If the default block sizes are used, the application will create the pool using the simpler CFE_ES_PoolCreate API. This API takes a pointer to the first byte of the memory pool (allocated by the application) and a size parameter. The API returns a handle to be used for the get and put requests.

If the defaults are not sufficient, the user must define the block sizes and use the CFE_ES_PoolCreateEx API.

After receiving a positive response from the PoolCreate API, the memory pool is ready to accept requests, but at this point it is completely unconfigured (meaning there are no blocks created). The first valid request (via CFE_ES_GetPoolBuf API) after creating the pool will always cause the memory pool to create a block and return a pointer to the new block. The size of the block depends on the size definitions mentioned earlier. If there is not an exact match between the requested and defined sizes, then the memory pool will create and return the smallest block that meets the following criteria: is a defined size and large enough to hold the request.

If another request for that size comes in before the first block was released through the CFE_ES_PutPoolBuf A↩ PI, then the memory pool will create a second block of that size and return a pointer to the second block. If both blocks were then released through the CFE_ES_PutPoolBuf API and the memory pool statistics were dumped via the CFE_ES_SEND_MEM_POOL_STATS_CC command, the number of blocks created would be two. The number of 'free bytes' in the pool would be the size of the pool minus the sum of the following items:

- the size of the two blocks created (even though they are not 'in-use').
- a buffer descriptor for each of the two blocks created ($2 * 12$ bytes)
- a 168 byte pool descriptor Refer to the cFE Applications Developers Guide for more details.

This allocation algorithm does have its limits. There are certain conditions that can place the memory pool in an undesired state. For instance, if a burst of get requests were received for the same block size, the memory pool may create a large number of blocks of that size. If this is a one-time burst, the memory pool would be configured with this large number of blocks that may no longer be needed. This scenario would use up the 'free bytes' margin in an undesired way. It should be noted that once the blocks are created, they cannot be deleted by any means other than a processor or power-on reset. It is highly recommended that the memory pool statistics be carefully monitored to ensure that the 'free-bytes' margin is sufficient (which is typically dictated by mission requirements).

An operator can obtain information about an Application's Memory Pool by using the Telemeter Memory Pool Statistics Command.

This command will cause Executive Services to extract pertinent statistics from the data used to manage the Memory Pool and telemeter them to the ground in the Memory Pool Statistics Telemetry Packet.

In order to obtain the statistics associated with a memory pool, the operator **MUST** have the correct Memory Handle as reported by the Application who owns the Memory Pool. **It should be noted that an inappropriate Memory Pool Handle can *(and likely will)* cause the system software to crash!** Within the cFE itself, there are three cFE Core Applications that make use of the Executive Services Memory Pool API. These are Software Bus (SB), Event Services (EVS) and Table Services (TBL). Each of these cFE Core Applications report their memory pool handles in telemetry.

The Memory Pool Statistics Telemetry Packet contains the following information:

- **Memory Pool Handle** - the handle, as provided by the operator in the Telemeter Memory Pool Statistics Command. This repeating of the handle in telemetry ensures the operator knows which Memory Pool Statistics are being viewed

- **Pool Size** - The total size of the memory pool (in bytes)
- **Number Blocks Requested** - The total number of memory blocks requested for allocation
- **Number of Errors** - The total number of errors encountered when a block was released
- **Number of Free Bytes** - The total number of bytes in the Memory Pool that have never been allocated to a Memory Block
- **Block Statistics** - For each specified size of memory block (of which there are CFE_MISSION_ES_POOL_MAX_BUCKETS), the following statistics are kept
  - **Block Size** - The size, in bytes, of all blocks of this type
  - **Number of Blocks Allocated** - The number of this sized block which are currently allocated and in use
  - **Number of Blocks Free** - The number of this size block which have been in use previously but are no longer being used

2.6.17 System Log

The System Log is an array of bytes that contains back-to-back printf type messages from applications. The cFE internal applications use this log when errors are encountered during initialization before the Event Manager is fully initialized. To view the information the CFE_ES_WRITE_SYS_LOG_CC command must be sent. This command will write the log to a binary file. The path and filename may be specified in the command. If the filename command field contains an empty string, the configuration parameter CFE_PLATFORM_ES_DEFAULT_SYSLOG_FILE is used to specify the path and filename. Use the ground system to get the file and display the contents. The CFE_ES_CLEAR_SYS_LOG_CC is used to clear the System log.

The size of the System log is defined by the platform configuration parameter CFE_PLATFORM_ES_SYSTEM_LOG_SIZE. This log is preserved after a processor reset and held in the ES reset area.

A count of the number of entries in the log is present in the ES housekeeping telemetry.

2.6.18 Version Identification

Version information is reported at startup, and upon receipt of a No-op command

2.6.19 Frequently Asked Questions about Executive Services

None submitted

2.7 cFE Executive Services Commands

Upon receipt of any command, the Executive Services application will confirm that the message length embedded within the header (from `CFE_MSG_GetSize()`) matches the expected length of that message, based on the size of the C structure defining that command. If there is any discrepancy between the expected and actual message size, ES will generate the CFE_ES_LEN_ERR_EID event, increment the command error counter ($sc_$cpu_ES_CMDEC), and the command will *not* be accepted for processing.

The following is a list of commands that are processed by the cFE Executive Services Task.

Global CFE_ES_CLEAR_ER_LOG_CC
Clears the contents of the Exception and Reset Log

Global CFE_ES_CLEAR_SYS_LOG_CC
Clear Executive Services System Log

Global CFE_ES_DELETE_CDS_CC
Delete Critical Data Store

Global CFE_ES_DUMP_CDS_REGISTRY_CC
Dump Critical Data Store Registry to a File

Global CFE_ES_NOOP_CC
Executive Services No-Op

Global CFE_ES_OVER_WRITE_SYS_LOG_CC
Set Executive Services System Log Mode to Discard/Overwrite

Global CFE_ES_QUERY_ALL_CC
Writes all Executive Services Information on all loaded modules to a File

Global CFE_ES_QUERY_ALL_TASKS_CC
Writes a list of All Executive Services Tasks to a File

Global CFE_ES_QUERY_ONE_CC
Request Executive Services Information on a specified module

Global CFE_ES_RELOAD_APP_CC
Stops, Unloads, Loads from the command specified File and Restarts an Application

Global CFE_ES_RESET_COUNTERS_CC
Executive Services Reset Counters

Global CFE_ES_RESET_PR_COUNT_CC
Resets the Processor Reset Counter to Zero

Global CFE_ES_RESTART_APP_CC
Stops, Unloads, Loads using the previous File name, and Restarts an Application

Global CFE_ES_RESTART_CC
Executive Services Processor / Power-On Reset

Global CFE_ES_SEND_MEM_POOL_STATS_CC
Telemeter Memory Pool Statistics

Global CFE_ES_SET_MAX_PR_COUNT_CC
Configure the Maximum Number of Processor Resets before a Power-On Reset

Global CFE_ES_SET_PERF_FILTER_MASK_CC

Set Performance Analyzer's Filter Masks

Global CFE_ES_SET_PERF_TRIGGER_MASK_CC

Set Performance Analyzer's Trigger Masks

Global CFE_ES_START_APP_CC

Load and Start an Application

Global CFE_ES_START_PERF_DATA_CC

Start Performance Analyzer

Global CFE_ES_STOP_APP_CC

Stop and Unload Application

Global CFE_ES_STOP_PERF_DATA_CC

Stop Performance Analyzer and write data file

Global CFE_ES_WRITE_ER_LOG_CC

Writes Exception and Reset Log to a File

Global CFE_ES_WRITE_SYS_LOG_CC

Writes contents of Executive Services System Log to a File

2.8 cFE Executive Services Telemetry

The following are telemetry packets generated by the cFE Executive Services Task.

Global CFE_ES_HousekeepingTlm_Payload_t

Executive Services Housekeeping Packet

Global CFE_ES_HousekeepingTlm_Payload_t

Executive Services Housekeeping Packet

Global CFE_ES_HousekeepingTlm_t

Executive Services Housekeeping Packet

Global CFE_ES_HousekeepingTlm_t

Executive Services Housekeeping Packet

Global CFE_ES_MemStatsTlm_t

Memory Pool Statistics Packet

Global CFE_ES_MemStatsTlm_t

Memory Pool Statistics Packet

Global CFE_ES_OneAppTlm_Payload_t

Single Application Information Packet

Global CFE_ES_OneAppTlm_Payload_t

Single Application Information Packet

Global CFE_ES_OneAppTlm_t

Single Application Information Packet

Global CFE_ES_OneAppTlm_t

Single Application Information Packet

Global CFE_ES_PoolStatsTlm_Payload_t

Memory Pool Statistics Packet

Global CFE_ES_PoolStatsTlm_Payload_t

Memory Pool Statistics Packet

2.9 cFE Executive Services Configuration Parameters

The following are configuration parameters used to configure the cFE Executive Services either for each platform or for a mission as a whole.

Global CFE_MISSION_ES_CDS_MAX_FULL_NAME_LEN

Maximum Length of Full CDS Name in messages

Maximum Length of Full CDS Name in messages

Global CFE_MISSION_ES_CDS_MAX_NAME_LENGTH

Maximum Length of CDS Name

Maximum Length of CDS Name

Global CFE_MISSION_ES_DEFAULT_CRC

Mission Default CRC algorithm

Mission Default CRC algorithm

Global CFE_MISSION_ES_MAX_APPLICATIONS

Mission Max Apps in a message

Mission Max Apps in a message

Global CFE_MISSION_ES_PERF_MAX_IDS

Define Max Number of Performance IDs for messages

Define Max Number of Performance IDs for messages

Global CFE_MISSION_ES_POOL_MAX_BUCKETS

Maximum number of block sizes in pool structures

Maximum number of block sizes in pool structures

Global CFE_PLATFORM_CORE_MAX_STARTUP_MSEC

CFE core application startup timeout

Global CFE_PLATFORM_ES_APP_KILL_TIMEOUT

Define ES Application Kill Timeout

Define ES Application Kill Timeout

Global CFE_PLATFORM_ES_APP_SCAN_RATE

Define ES Application Control Scan Rate

Define ES Application Control Scan Rate

Global CFE_PLATFORM_ES_CDS_MAX_NUM_ENTRIES

Define Maximum Number of Registered CDS Blocks

Define Maximum Number of Registered CDS Blocks

Global CFE_PLATFORM_ES_CDS_MEM_BLOCK_SIZE_01

Define ES Critical Data Store Memory Pool Block Sizes

Define ES Critical Data Store Memory Pool Block Sizes

Global CFE_PLATFORM_ES_CDS_SIZE

Define Critical Data Store Size

Define Critical Data Store Size

Global CFE_PLATFORM_ES_DEFAULT_APP_LOG_FILE

Default Application Information Filename

Default Application Information Filename

Global CFE_PLATFORM_ES_DEFAULT_CDS_REG_DUMP_FILE

Default Critical Data Store Registry Filename

Default Critical Data Store Registry Filename

Global CFE_PLATFORM_ES_DEFAULT_ER_LOG_FILE

Default Exception and Reset (ER) Log Filename

Default Exception and Reset (ER) Log Filename

Global CFE_PLATFORM_ES_DEFAULT_PERF_DUMP_FILENAME

Default Performance Data Filename

Default Performance Data Filename

Global CFE_PLATFORM_ES_DEFAULT_POR_SYSLOG_MODE

Define Default System Log Mode following Power On Reset

Define Default System Log Mode following Power On Reset

Global CFE_PLATFORM_ES_DEFAULT_PR_SYSLOG_MODE

Define Default System Log Mode following Processor Reset

Define Default System Log Mode following Processor Reset

Global CFE_PLATFORM_ES_DEFAULT_STACK_SIZE

Define Default Stack Size for an Application

Define Default Stack Size for an Application

Global CFE_PLATFORM_ES_DEFAULT_SYSLOG_FILE

Default System Log Filename

Default System Log Filename

Global CFE_PLATFORM_ES_DEFAULT_TASK_LOG_FILE

Default Application Information Filename

Default Application Information Filename

Global CFE_PLATFORM_ES_ER_LOG_ENTRIES

Define Max Number of ER (Exception and Reset) log entries

Define Max Number of ER (Exception and Reset) log entries

Global CFE_PLATFORM_ES_ER_LOG_MAX_CONTEXT_SIZE

Maximum size of CPU Context in ES Error Log

Maximum size of CPU Context in ES Error Log

Global CFE_PLATFORM_ES_MAX_APPLICATIONS

Define Max Number of Applications

Define Max Number of Applications

Global CFE_PLATFORM_ES_MAX_GEN_COUNTERS

Define Max Number of Generic Counters

Define Max Number of Generic Counters

Global CFE_PLATFORM_ES_MAX_LIBRARIES

Define Max Number of Shared libraries

Define Max Number of Shared libraries

Global CFE_PLATFORM_ES_MAX_MEMORY_POOLS

Maximum number of memory pools

Maximum number of memory pools

Global CFE_PLATFORM_ES_MAX_PROCESSOR_RESETS

Define Number of Processor Resets Before a Power On Reset

Define Number of Processor Resets Before a Power On Reset

Global CFE_PLATFORM_ES_MEM_BLOCK_SIZE_01

Define Default ES Memory Pool Block Sizes

Define Default ES Memory Pool Block Sizes

Global CFE_PLATFORM_ES_MEMPOOL_ALIGN_SIZE_MIN

Define Memory Pool Alignment Size

Define Memory Pool Alignment Size

Global CFE_PLATFORM_ES_NONVOL_DISK_MOUNT_STRING

Default virtual path for persistent storage

Default virtual path for persistent storage

Global CFE_PLATFORM_ES_NONVOL_STARTUP_FILE

ES Nonvolatile Startup Filename

ES Nonvolatile Startup Filename

Global CFE_PLATFORM_ES_OBJECT_TABLE_SIZE

Define Number of entries in the ES Object table

Define Number of entries in the ES Object table

Global CFE_PLATFORM_ES_PERF_CHILD_MS_DELAY

Define Performance Analyzer Child Task Delay

Define Performance Analyzer Child Task Delay

Global CFE_PLATFORM_ES_PERF_CHILD_PRIORITY

Define Performance Analyzer Child Task Priority

Define Performance Analyzer Child Task Priority

Global CFE_PLATFORM_ES_PERF_CHILD_STACK_SIZE

Define Performance Analyzer Child Task Stack Size

Define Performance Analyzer Child Task Stack Size

Global CFE_PLATFORM_ES_PERF_DATA_BUFFER_SIZE

Define Max Size of Performance Data Buffer

Define Max Size of Performance Data Buffer

Global CFE_PLATFORM_ES_PERF_ENTRIES_BTWN_DLYS

Define Performance Analyzer Child Task Number of Entries Between Delay

Define Performance Analyzer Child Task Number of Entries Between Delay

Global CFE_PLATFORM_ES_PERF_FILTMASK_ALL

Define Filter Mask Setting for Enabling All Performance Entries

Define Filter Mask Setting for Enabling All Performance Entries

Global CFE_PLATFORM_ES_PERF_FILTMASK_INIT

Define Default Filter Mask Setting for Performance Data Buffer

Define Default Filter Mask Setting for Performance Data Buffer

Global CFE_PLATFORM_ES_PERF_FILTMASK_NONE

Define Filter Mask Setting for Disabling All Performance Entries

Define Filter Mask Setting for Disabling All Performance Entries

Global CFE_PLATFORM_ES_PERF_TRIGMASK_ALL

Define Filter Trigger Setting for Enabling All Performance Entries

Define Filter Trigger Setting for Enabling All Performance Entries

Global CFE_PLATFORM_ES_PERF_TRIGMASK_INIT

Define Default Filter Trigger Setting for Performance Data Buffer

Define Default Filter Trigger Setting for Performance Data Buffer

Global CFE_PLATFORM_ES_PERF_TRIGMASK_NONE

Define Default Filter Trigger Setting for Disabling All Performance Entries

Define Default Filter Trigger Setting for Disabling All Performance Entries

Global CFE_PLATFORM_ES_POOL_MAX_BUCKETS

Maximum number of block sizes in pool structures

Maximum number of block sizes in pool structures

Global CFE_PLATFORM_ES_RAM_DISK_MOUNT_STRING

Default virtual path for volatile storage

Default virtual path for volatile storage

Global CFE_PLATFORM_ES_RAM_DISK_NUM_SECTORS

ES Ram Disk Number of Sectors

ES Ram Disk Number of Sectors

Global CFE_PLATFORM_ES_RAM_DISK_PERCENT_RESERVED

Percentage of Ram Disk Reserved for Decompressing Apps

Percentage of Ram Disk Reserved for Decompressing Apps

Global CFE_PLATFORM_ES_RAM_DISK_SECTOR_SIZE

ES Ram Disk Sector Size

ES Ram Disk Sector Size

Global CFE_PLATFORM_ES_START_TASK_PRIORITY

Define ES Task Priority

Define ES Task Priority

Global CFE_PLATFORM_ES_START_TASK_STACK_SIZE

Define ES Task Stack Size

Define ES Task Stack Size

Global CFE_PLATFORM_ES_STARTUP_SCRIPT_TIMEOUT_MSEC

Startup script timeout

Startup script timeout

Global CFE_PLATFORM_ES_STARTUP_SYNC_POLL_MSEC

Poll timer for startup sync delay

Poll timer for startup sync delay

Global CFE_PLATFORM_ES_SYSTEM_LOG_SIZE

Define Size of the cFE System Log.

Define Size of the cFE System Log.

Global CFE_PLATFORM_ES_USER_RESERVED_SIZE

Define User Reserved Memory Size

Define User Reserved Memory Size

Global CFE_PLATFORM_ES_VOLATILE_STARTUP_FILE

ES Volatile Startup Filename

ES Volatile Startup Filename

Global CFE_PLATFORM_EVS_START_TASK_PRIORITY

Define EVS Task Priority

Define EVS Task Priority

Global CFE_PLATFORM_EVS_START_TASK_STACK_SIZE

Define EVS Task Stack Size

Define EVS Task Stack Size

Global CFE_PLATFORM_SB_MEM_BLOCK_SIZE_01

Define SB Memory Pool Block Sizes

Define SB Memory Pool Block Sizes

Global CFE_PLATFORM_SB_START_TASK_PRIORITY

Define SB Task Priority

Define SB Task Priority

Global CFE_PLATFORM_SB_START_TASK_STACK_SIZE

Define SB Task Stack Size

Define SB Task Stack Size

Global CFE_PLATFORM_TBL_START_TASK_PRIORITY

Define TBL Task Priority

Define TBL Task Priority

Global CFE_PLATFORM_TBL_START_TASK_STACK_SIZE

Define TBL Task Stack Size

Define TBL Task Stack Size

2.10 cFE Event Services Overview

Event Services (EVS) provides centralized control for the processing of event messages originating from the EVS task itself, other cFE core applications (ES, SB, TIME, and TBL), and from cFE applications. Event messages are asynchronous messages that are used to inform the operator of a significant event from within the context of a registered application or core service. EVS provides various ways to filter event messages in order to manage event message generation.

Note for messages outside the context of a registered application (for example early in app initialization or if registration fails) CFE_ES_WriteToSysLog can be used for reporting.

For more information on cFE Event Services, see the following sections:

- Event Message Format

- Local Event Log
- Event Message Control
- Event Message Filtering
- EVS Registry
- EVS Counters
- Resetting EVS Counters
- Effects of a Processor Reset on EVS
- EVS squelching of misbehaving apps
- Frequently Asked Questions about Event Services

2.10.1 Event Message Format

Event messages are software bus messages that contain the following fields:

- Timestamp
- Event Type
- Spacecraft ID
- Processor ID
- Application Name
- Event ID
- Message

The *Timestamp* corresponds to when the event was generated, in spacecraft time. The *Event Type* is one of the following: DEBUG, INFO, ERROR or CRITICAL. The *Spacecraft ID* and *Processor ID* identify the spacecraft and processor from which the event was generated. Note that the *Spacecraft ID* is defined in the cfe_mission_cfg.h file; The *Processor ID* is defined in the appropriate cfe_platform_cfg.h file. The *Application Name* refers to the Application that issued the event message as specified on application startup (either startup script or app start command). The *Event ID* is an Application unique number that identifies the event. The *Message* is an ASCII text string describing the event. Event messages may have parameters associated with the event message. EVS formats the parameters such that they are part of the ASCII text string that make up the event message.

In order to accommodate missions that have limited telemetry bandwidth, EVS can be configured such that the ASCII text string part of the event message is omitted, thus reducing the size of each event message. This is referred to as *Short Format*; Event messages including the ASCII text string are referred to as *Long Format*. The default setting is specified in the cfe_platform_cfg.h file. EVS also provides commands in order to set the mode (short or long).

Since the design of the cFE's Software Bus is based on run-time registration, no predetermined message routing is defined, hence it is not truly correct to say that events are generated as telemetry. Technically, EVS generates events in the form of software bus messages. Applications such as Telemetry Output and Data Storage can then subscribe to these messages making them telemetry. For the purposes of this document, any references to telemetry assumes that a telemetry application subscribes to the EVS event software bus message and routes it to the ground as telemetry. Note that short format event messages on the Software Bus have different message lengths than long form messages and do not include any part of the long format message string.

The EVS can be configured via ground command to send event messages out one or more message ports. These message ports may include ports such as debug, console, and UART. Messages sent out of the message ports will be in ASCII text format. This is generally used for lab purposes. Note that the event mode (short or long) does affect the event message content sent out these message ports.

2.10.2 Local Event Log

In addition to generating a software bus message, EVS logs the event message to a Local Event Log. Note that this is an optional feature that must be enabled via the cfe_platform_cfg.h file. The Local Event Log resides on the same processor as the EVS which is used to store events without relying on an external bus. In multi-processor cFE configurations the Local Event Buffer preserves event messages during non-deterministic processor initialization sequences and during failure scenarios. In order to obtain the contents of the Local Event Log, a command must be sent to write the contents of the buffer to a file which can then be sent to the ground via a file transfer mechanism. Note that event messages stored in the EVS Local Event Log are always long format messages and are not affected by the event mode (short or long).

EVS provides a command in order to clear the Local Event Log .

2.10.2.1 Local Event Log Mode EVS can be configured to control the Local Event Log to either discard or overwrite the contents of the log when it becomes full. If the mode is set to overwrite, the log is treated like a circular buffer, overwriting the oldest event message contained in the log first. This control is configured by default in the cfe_↩ platform_cfg.h file but can be modified by a command .

2.10.3 Event Message Control

In order for an application to be serviced by EVS, it must be registered with EVS. EVS provides various commands in order to control the event messages that are generated as software bus messages.

2.10.3.1 Event Message Control - By Type The highest level of event message control that EVS provides is the ability to enable and disable event message types. As mentioned above, there are four event types. They are:

1. DEBUG
2. INFORMATION
3. ERROR
4. CRITICAL

When commands are sent to enable or disable a particular type of event message, ALL event messages of the specified type are affected. Typically, event messages of type DEBUG are disabled on-orbit. Note that EVS provides the capability to affect multiple types within one command using a bit mask. Note also that the configuration parameter CFE_PLATFORM_EVS_DEFAULT_TYPE_FLAG in the cfe_platform_cfg.h file specifies which event message types are enabled/disabled by default.

2.10.3.2 Event Message Control - By Application Commands are available to enable and disable the generation of event messages for a particular application. The result is that ALL event messages for the specified Application are affected (i.e. enabled or disabled).

2.10.3.3 Event Message Control - By Event Type for an Application EVS also provides the capability to enable / disable an event type for a particular application. Note that EVS provides the capability to affect multiple event types within one command using a bit mask.

2.10.3.4 Event Message Control - Individual Events There are two ways to control the generation of individual events depending on whether the application's event message has been registered with EVS or not.

2.10.3.4.1 Modifying a registered event message filter When an application registers with EVS, the application has the option of specifying the events that it wants to register for filtering along with the Event Message Filtering (only the Binary Filtering Scheme exists currently). Note that applications are limited in the number of events that they can register for filtering (see CFE_PLATFORM_EVS_MAX_EVENT_FILTERS in cfe_platform_cfg.h for the mission defined limit). The filtering method uses a mask to determine if the message is forwarded to the software bus, making it available in telemetry (see Event Message Filtering for a description on filtering). Commands are available to modify the filter mask for any registered event.

An on-orbit mission, for example, might be experiencing a problem resulting in an application's event message being repeatedly issued, flooding the downlink. If the event message for the application is registered with EVS, then a command can be issued to set the event message filter to the specified value in order to prevent flooding of the downlink.

2.10.3.4.2 Adding/Removing an event message for filtering Commands are also available to add filtering for those events that are not registered for filtering. Once an event is registered for filtering , the filter can be modified (see above) or removed .

An on-orbit mission, for example, might be experiencing a problem resulting in an event message being repeatedly issued, flooding the downlink. If the event message was not registered with EVS for filtering then the ground can add (i.e. register) the offending application's event for filtering (much like an application registers the event during initialization).

EVS also supports the ability to remove (i.e. unregister) an application's event message. Once it is removed, the event will no longer be filtered. Note that commands issued to disable events by event type, by application or by event type for an application are still valid and could affect this particular event.

2.10.4 Event Message Filtering

EVS uses a hexadecimal bit mask that controls how often a message is filtered. An event's filter mask is bit-wise ANDed with the event's event counter. There is one event counter for each event ID. If the result of the ANDing is zero then the message is sent.

Filter masks can be set so that one out of 1, 2, 4, 8 events are sent. Some examples of masks that use this pattern are: (0x0000, Every one), (0x0001, One of every 2), (0x0003, One of every 4), and (0x0007, One of every 8.

Filter masks can also be set so that only the first n events are sent. For example, the mask 0xFFFF generates one event message and then stops. Note that when the filter counter is reset to zero by command, this will restart the counting and enable n more events to be sent.

Event messages will be filtered until CFE_EVS_MAX_FILTER_COUNT events of the filtered event ID from the application have been received. After this, the filtering will become locked (no more of that event will be received by the ground) until the filter is either reset or deleted by ground command. This is to prevent the counter from rolling over, which would cause some filters to behave improperly. An event message will be sent when this maximum count is reached.

The following shows an example of how filtering works using a filter mask of x'0001', resulting in sending every other event:

	packet x	**packet X+1**	**packet X+2**	**packet X+3**	**packet X+4**	**...**
Event ID counter	x'0000'	x'0001'	x'0002'	x'0003'	x'0004'	
Event Filter mask	x'0001'	x'0001'	x'0001'	x'0001'	x'0001'	
Bitwise AND results	x'0000'	x'0001'	x'0000'	x'0001'	x'0000'	
Send event?	Yes	No	Yes	No	Yes	

In this example, the ground uses a filter mask of x'FFFE' resulting in the first two events being sent and then no more.

	packet x	**packet X+1**	**packet X+2**	**packet X+3**	**packet X+4**	**...**
Event ID counter	x'0000'	x'0001'	x'0002'	x'0003'	x'0004'	
Event Filter mask	x'FFFE'	x'FFFE'	x'FFFE'	x'FFFE'	x'FFFE'	
Bitwise AND results	x'0000'	x'0000'	x'0002'	x'0002'	x'0004'	
Send event?	Yes	Yes	No	No	No	

See cfe_evs.h for predefined macro values which can be used for masks.

2.10.5 EVS Registry

EVS maintains information on each registered application and all events registered for an application.

The registry contains the following information for each Registered Application:

- Active Flag - If equal to FALSE (0), all events from this Application are Filtered
- Event Count - Total number of events issued by this Application. Note that this value stop incrementing at 65535.

  The following information for each Filtered Event (up to CFE_PLATFORM_EVS_MAX_EVENT_FILTERS)↩ :

- Event ID - Event ID for event whose filter has been defined
- Mask - Binary Filter mask value (see Event Message Filtering for an explanation)
- Count - Current number of times this Event ID has been issued by this Application

2.10.6 EVS Counters

There are 2 types of counters in EVS housekeeping telemetry:

- Total events sent counter
- Number of events sent for each Application

The difference is that the first one is the sum of all of the event messages sent. Both of these represent events that are actually sent (by EVS to the software bus). If an event message is filtered or disabled, neither counter is incremented.

There are other counters available that show how many event messages were generated by an App, however, these are only available for those events that are registered for filtering hence if you have a message that is not registered for filtering and the message type (e.g. DEBUG) is disabled then you won't know if the event was ever issued by an application. These counters are available by sending a command to write the EVS Application Data and transferring the file to the ground.

2.10.7 Resetting EVS Counters

As far as reset commands, there are 4 commands available:

1. Reset the total events sent counter

2. Reset the events sent counter for a particular Application - e.g. reset the LC application events counter

3. Reset all of the event counters for a particular registered event for a particular Application - e.g. Reset event counter for Event ID 5 for the LC Application.

4. Reset all of the event counters for ALL registered events for a particular App - e.g. Reset all registered event counters for LC.

Note that there is currently no way to reset ALL of the events sent counters for all of the Apps with one command.

2.10.8 Effects of a Processor Reset on EVS

On a processor reset, the EVS Registry is cleared such that applications must re-register with EVS in order to use EVS services. All counters are also cleared with the exceptions of those listed below.

On a processor reset, the following EVS data is preserved (if the cFE is configured to include an Local Event Log):

- Local Event Log if the Local Event Log Mode is configured to Discard (1). If the Local Event Log Mode is configured to Overwrite (0), the contents of the log may be overwritten depending on the size and contents of the log prior to the reset.

- Local Event Log Full Flag

- Local Event Log overflow counter

The Local Event Log Mode (overwrite/discard) is set to the configured value specified in the cfe_platform_cfg.h file. The default value is Discard (1). Discard mode will guarantee the contents of the event log are preserved over a processor restart.

This provides the ground with the capability to write the Local Event Log to a file and transfer it to the ground in order to help debug a reset.

2.10.9 EVS squelching of misbehaving apps

Event squelching is an optional feature for suppressing excessive events from misbehaving apps. It is enabled by setting CFE_PLATFORM_EVS_MAX_APP_EVENT_BURST to a nonzero positive value, and CFE_PLATFORM_EVS_APP_EVENTS_PER_SEC equal to or less than that value.

CFE_PLATFORM_EVS_MAX_APP_EVENT_BURST controls the maximum events that can be sent at a given moment, and CFE_PLATFORM_EVS_APP_EVENTS_PER_SEC is the sustained event throughput per second.

The suppression mechanism initializes with CFE_PLATFORM_EVS_MAX_APP_EVENT_BURST $*$ 1000 credits. Each event costs 1000 credits. Credits are restored at a rate of CFE_PLATFORM_EVS_APP_EVENTS_PER_SEC $*$ 1000 up to a maximum balance of CFE_PLATFORM_EVS_MAX_APP_EVENT_BURST$*$1000, and the maximum "debt" is -CFE_PLATFORM_EVS_MAX_APP_EVENT_BURST $*$ 1000. When the credit count crosses from positive to negative, a squelched event message is emitted and events are supppressed, until the credit count becomes positive again.

Figure EVS-1 is a notional state diagram of the event squelching mechanism.

Figure 1 Figure EVS-1: EVS Squelching State Diagram

2.10.10 Frequently Asked Questions about Event Services

(Q) My telemetry stream is being flooded with the same event message. How do I make it stop?

The most direct way to stop an event message from flooding your downlink stream is to send a command to EVS to filter the offending event (see Event Message Control or $sc_$cpu_EVS_SetBinFltrMask). In order to stop the event

message from being sent, a bit mask of `'0xFFFF'` should be used. If the event is not currently registered for filtering, the event message must be added using the command $sc_$cpu_EVS_AddEvtFltr .

(Q) I filtered an event message and would now like to see it again. What do I do in order to see those events again?

If the event message that you are interested is registered with EVS for filtering, then you have 2 options:

1. *You can use the $sc_$cpu_EVS_SetBinFltrMask command using a bit mask of `'0x0000'` which will result in getting all of the events for that Event Id*
2. *You can remove the registration of that event with EVS (see $sc_$cpu_EVS_DelEvtFltr).*

   Note that option (1) is the preferred method.

(Q) What is the purpose of DEBUG event messages?

Event message of type "DEBUG" are primarily used during flight software development in order to provide information that is most likely not needed on orbit. Some commands send debug event messages as verification that a command request was received. When writing the EVS local event log to a file, for example, an event message of type DEBUG is issued. On orbit, this event message is probably not needed. Instead, the command counter is used for command verification.

(Q) How do I find out which events are registered for filtering?

EVS provides a command ($sc_$cpu_EVS_WriteAppData2File) which generates a file containing all of the applications that have registered with EVS and all of the filters that are registered for each application. Note that EVS merely generates the file. The file must be transferred to the ground in order to view it.

(Q) Why do I see event messages in my console window?

By default, the events are configured to transmit out a "port" that shows event messages in the console

(Q) What is the difference between event services and the ES System Log

Events are within the context of an App or cFE Service (requires registration with ES). The system log can be written to outside of the Application or cFE Service context, for example during application startup to report errors before registration.

2.11 cFE Event Services Commands

Upon receipt of any command, the Event Services application will confirm that the message length embedded within the header (from `CFE_MSG_GetSize()`) matches the expected length of that message, based on the size of the C structure defining that command. If there is any discrepancy between the expected and actual message size, EVS will generate the CFE_EVS_LEN_ERR_EID event, increment the command error counter ($sc_$cpu_EVS_CMDEC), and the command will *not* be accepted for processing.

The following is a list of commands that are processed by the cFE Event Services Task.

Global CFE_EVS_ADD_EVENT_FILTER_CC

Add Application Event Filter

Global CFE_EVS_CLEAR_LOG_CC
Clear Event Log

Global CFE_EVS_DELETE_EVENT_FILTER_CC
Delete Application Event Filter

Global CFE_EVS_DISABLE_APP_EVENT_TYPE_CC
Disable Application Event Type

Global CFE_EVS_DISABLE_APP_EVENTS_CC
Disable Event Services for an Application

Global CFE_EVS_DISABLE_EVENT_TYPE_CC
Disable Event Type

Global CFE_EVS_DISABLE_PORTS_CC
Disable Event Services Output Ports

Global CFE_EVS_ENABLE_APP_EVENT_TYPE_CC
Enable Application Event Type

Global CFE_EVS_ENABLE_APP_EVENTS_CC
Enable Event Services for an Application

Global CFE_EVS_ENABLE_EVENT_TYPE_CC
Enable Event Type

Global CFE_EVS_ENABLE_PORTS_CC
Enable Event Services Output Ports

Global CFE_EVS_NOOP_CC
Event Services No-Op

Global CFE_EVS_RESET_ALL_FILTERS_CC
Reset All Event Filters for an Application

Global CFE_EVS_RESET_APP_COUNTER_CC
Reset Application Event Counters

Global CFE_EVS_RESET_COUNTERS_CC
Event Services Reset Counters

Global CFE_EVS_RESET_FILTER_CC
Reset an Event Filter for an Application

Global CFE_EVS_SET_EVENT_FORMAT_MODE_CC
Set Event Format Mode

Global CFE_EVS_SET_FILTER_CC
Set Application Event Filter

Global CFE_EVS_SET_LOG_MODE_CC
Set Logging Mode

Global CFE_EVS_WRITE_APP_DATA_FILE_CC
Write Event Services Application Information to File

Global CFE_EVS_WRITE_LOG_DATA_FILE_CC
Write Event Log to File

2.12 cFE Event Services Telemetry

The following are telemetry packets generated by the cFE Event Services Task.

Global CFE_EVS_HousekeepingTlm_Payload_t

Event Services Housekeeping Telemetry Packet

Global CFE_EVS_HousekeepingTlm_Payload_t

Event Services Housekeeping Telemetry Packet

Global CFE_EVS_LongEventTlm_Payload_t

Event Message Telemetry Packet (Long format)

Global CFE_EVS_LongEventTlm_Payload_t

Event Message Telemetry Packet (Long format)

Global CFE_EVS_ShortEventTlm_Payload_t

Event Message Telemetry Packet (Short format)

Global CFE_EVS_ShortEventTlm_Payload_t

Event Message Telemetry Packet (Short format)

2.13 cFE Event Services Configuration Parameters

The following are configuration parameters used to configure the cFE Event Services either for each platform or for a mission as a whole.

Global CFE_MISSION_EVS_MAX_MESSAGE_LENGTH

Maximum Event Message Length

Maximum Event Message Length

Global CFE_PLATFORM_EVS_APP_EVENTS_PER_SEC

Sustained number of event messages per second per app before squelching

Sustained number of event messages per second per app before squelching

Global CFE_PLATFORM_EVS_DEFAULT_APP_DATA_FILE

Default EVS Application Data Filename

Default EVS Application Data Filename

Global CFE_PLATFORM_EVS_DEFAULT_LOG_FILE

Default Event Log Filename

Default Event Log Filename

Global CFE_PLATFORM_EVS_DEFAULT_LOG_MODE

Default EVS Local Event Log Mode

Default EVS Local Event Log Mode

Global CFE_PLATFORM_EVS_DEFAULT_MSG_FORMAT_MODE

Default EVS Message Format Mode

Default EVS Message Format Mode

Global CFE_PLATFORM_EVS_DEFAULT_TYPE_FLAG

Default EVS Event Type Filter Mask

Default EVS Event Type Filter Mask

Global CFE_PLATFORM_EVS_LOG_MAX

Maximum Number of Events in EVS Local Event Log

Maximum Number of Events in EVS Local Event Log

Global CFE_PLATFORM_EVS_MAX_APP_EVENT_BURST

Maximum number of event before squelching

Maximum number of event before squelching

Global CFE_PLATFORM_EVS_MAX_EVENT_FILTERS

Define Maximum Number of Event Filters per Application

Define Maximum Number of Event Filters per Application

Global CFE_PLATFORM_EVS_PORT_DEFAULT

Default EVS Output Port State

Default EVS Output Port State

2.14 cFE Software Bus Overview

The Software Bus (SB) handles communication between software tasks on a processor. All tasks communicate with each other, with hardware devices, and with the ground by sending command and telemetry messages. The software bus provides an application programming interface (API) to other tasks for sending and receiving messages. This API is independent of the underlying operating system so that tasks can use the same interface regardless of which processor they reside on. Refer to the cFE Application Programmer's Interface (API) Reference for detailed information about the API functions.

The software bus is used internally by the flight software, and normally does not require attention from the ground. However, because of the scalability and the dynamic nature of the software bus, it is strongly recommended that each project carefully review the SB statistics and SB memory pool to be sure adequate margin is met on the configurable items.

The cFE software bus uses a dynamic protocol and builds its routing table at run-time through the SB subscribe API's. Also the cFE software bus pipes are created at run-time through the CFE_SB_CreatePipe API. Because the routing is established, and pipes are created at run-time, it is necessary to have a clear view of the routing details on command. The cFE software bus allows the user to dump the routing table, the pipe table, the message map and the statistics packet. Each of these items are described in detail in the corresponding section of this document.

- Software Bus Terminology
- Autonomous Actions
- Operation of the SB Software
- Frequently Asked Questions about Software Bus

2.14.1 Software Bus Terminology

In order to fully understand the Software Bus, it is imperative that the basic terms used to describe its features are also understood. Below are the critical terms that help identify what the Software Bus accomplishes for each Application:

- Messages
- Pipes
- Subscriptions
- Memory

2.14.1.1 Messages The sole purpose of the software bus is to provide applications a way to send messages to each other. The term message and the term packet are used interchangeably throughout this document. A message is a combined set of bytes with a predefined format that is used as the basis of communication on a spacecraft. All commands, telemetry, and other data that are passed between the ground and the spacecraft, and between subsystems of the spacecraft, are considered to be messages. The most common message format is CCSDS (Consultative Committee for Space Data Systems) in `CCSDS Space Packet Protocol`, but can be customized by replacing the message module.

There are two general types of messages - commands (or command packets) and telemetry (or telemetry packets). Command packets are sent to a particular software task from the ground (or another task). Telemetry packets are sent from a particular software task to the ground (or other tasks).

The concept of a message identifier is utilized to provide abstraction from header implementation, often abbreviated as message ID, MsgId, or MID. Header and message identifier values should not be accessed directly to avoid implementation specific dependencies.

Telemetry packets typically contain a timestamp that indicates when the packet was produced. Command packets typically contain a command code that identifies the particular type of command.

The message module provides APIs for 'setting' and 'getting' the fields in the header of the message. The message module was separated from software bus to enable users to customize message headers without requiring clone and own of the entire cfe repository. To customize, remove the built in msg module from the build and replace with custom implementation. See sample target definitions folder for examples.

Following the header is the user defined message data.

2.14.1.2 Pipes The destinations to which messages are sent are called pipes. These are queues that can hold messages until they are read out and processed by a task. Each pipe is created at run-time through the CFE_SB_CreatePipe API. The pipe name and the pipe depth are given as arguments in the API. The pipe identifier (or PipeId) is given back to the caller after the API is executed. Each pipe can be read by only one task, but a task may read more than one pipe. Only the pipe owner is allowed to subscribe to messages on the pipe.

The Pipe IDs are specific to a particular processor (that is, the same ID number may refer to a different pipe on each processor). The pipe information for all pipes that have been created, may be requested at anytime by sending the 'Write Pipe Info' SB command . The software bus also provides a set of figures regarding capacity, current utilization and high water marks relevant to pipes. This information may be requested by sending the command to dump the SB statistics packet .

2.14.1.3 Subscriptions A subscription is a run-time request for a particular message to be sent to a particular pipe. If the caller of the subscribe API is not the owner of the pipe, the request is rejected and an error event is sent. The application that creates the pipe is considered the owner of the pipe. The pipe specified in the subscription is sometimes referred to as the destination of the message. There are a maximum number of destinations for a particular message. This value is specified by the platform configuration parameter CFE_PLATFORM_SB_MAX_DEST_PER_PKT.

As subscriptions are received, the destinations are added to the head of a linked list. During the sending of a message, the list is traversed beginning at the head of the list. Therefore the message will first be sent to the last subscriber. If an application has timing constraints and needs to receive a message in the shortest possible time, the developer may consider holding off its subscription until other applications have subscribed to the message.

The message limit specifies the maximum number of messages (with the specified Message ID) that are allowed on the specified pipe at any time. This limit is specified by the application at the time of the subscription. If the application uses the CFE_SB_Subscribe API, a message limit default value of four is used. If this default value is not sufficient, the caller would use the CFE_SB_SubscribeEx API that allows the message limit to be specified.

The software bus also provides the user with an option to unsubscribe to a message. The unsubscribe API takes two parameters, Message ID and Pipe ID. Only the owner of a pipe may unsubscribe to messages on that pipe.

2.14.1.4 Memory The software bus statically allocates a block of memory for message buffers and subscription blocks. The size of this memory block is defined by the platform configuration parameter CFE_PLATFORM_SB_BUF_MEMORY_BYTES. The memory is managed by the cFE ES memory pool and is used only by the software bus. The ES memory pool allows an application to define the block sizes for the pool at compile time. These sizes are defined by the platform configuration parameters prefixed with CFE_SB_MEM_BLOCK_SIZE (for example, CFE_PLATFORM_SB_MEM_BLOCK_SIZE_01). It is recommended that a project tailor these values for the mission, based on the software bus packet sizes.

At the time a message is sent, two buffers are allocated from the pool. One for a buffer descriptor (CFE_SB_BufferD_t) and one for the size of the packet. Both buffers are returned to the pool when the message has been received by all recipients. More precisely, if there is one recipient for a message, the message buffers will be released on the following call to CFE_SB_ReceiveBuffer for the pipe that received the buffer.

Also when subscriptions are received through the subscribe API's, the software bus allocates a subscription block (CFE_SB_DestinationD_t) from the pool. The subscription blocks are returned to the pool if and when the subscription is nullified through a CFE_SB_Unsubscribe call.

The software bus provides a set of figures regarding memory capacity, current memory utilization and high water marks relevant to the SB memory pool. This information may be requested by sending the command to dump the SB statistics packet. In addition, the current memory utilization value and the 'unmarked memory' value (CFE_PLATFORM_SB_BUF_MEMORY_BYTES minus peak memory in use) are sent in software bus housekeeping telemetry. The unmarked memory value should be monitored regularly to ensure that the value (in bytes) does not continue to decline or approach zero. If this value were to approach zero, there is a possibility that memory requests would fail which may inhibit the sending of a message. The current memory utilization value should also be monitored to ensure the system contains no memory leaks. The value (in bytes) should remain stable under nominal conditions. Refer to the ES users guide for more information regarding the ES Memory Pool.

2.14.2 Autonomous Actions

The software bus is primarily a set of library routines that are called by other software tasks to send and receive packets. The software bus does not perform any operations autonomously, except for sending event messages if errors are detected during the transfer of packets.

As do other tasks, the SB task sends out housekeeping telemetry when requested through the 'Send Housekeeping Data' command.

2.14.3 Operation of the SB Software

- Initialization
- All Resets
- Message Routing
- Packet Sequence Values
- Message Limit Error
- Pipe Overflow Error
- SB Event Filtering
- Diagnostic Data
- Control of Packet Routing
- Quality of Service
- Known Problem

2.14.3.1 Initialization No action is required by the ground to initialize the software bus. The software bus initializes internal data structures and tables the same way regardless of the type of reset.

2.14.3.2 All Resets The software bus does not preserve any information across a reset of any kind. The software bus initializes internal data structures and tables the same way regardless of the type of reset. The routing is reestablished as the system initializes. It is normal procedure for each task of the system to create the pipe or pipes it needs and do all of its subscriptions during task initialization.

After any reset the following statements are true:

- The routing table is cleared and does not contain any routes.
- All subscriptions are lost and must be regenerated.
- The pipe table contains no data, all pipes must be recreated.
- Any packets in transit at the time of the reset are lost.
- The sequence counters for telemetry packets will begin again with a value of one.

2.14.3.3 Message Routing In the software bus, all messages are processed in a similar way. The software bus uses the Message ID and the packet length fields (contained in the header) for routing the message to the destination pipe. If either of these two fields do not pass validation, the software bus generates an error event and aborts the delivery process. The software bus performs some validation checks by simply checking message header values against mission or platform configuration parameters. Messages originating from various tasks or instruments are routed to one or more pipes, where they wait until read by a task. The routing configuration for each message is established when applications call one of the SB subscribe APIs. The subscribe APIs take a Message ID and a Pipe ID as parameters. The routing for each packet is stored in SB memory and may be requested at any time by sending the 'Send Routing Info' command. The software bus also provides a set of figures regarding capacity, current utilization and high water marks relevant to the routing. This information may be requested by sending the command to dump the SB statistics packet.

2.14.3.4 Packet Sequence Values The sequence count behavior depends on if the message is a command type or telemetry type.

The sequence counter for command messages is not altered by the software bus.

For a telemetry message, the behavior is controlled via API input parameters when sending. When enabled, the software bus will populate the packet sequence counter using an internal counter that gets initialized upon the first subscription to the message (first message will have a packet sequence counter value of 1). From that point on each send request will increment the counter by one, regardless of the number of destinations or if there is an active subscription.

After a rollover condition the sequence counter will be a value of zero for one instance. The sequence counter is incremented after all the checks have passed prior to the actual sending of the message. This includes the parameter checks and the memory allocation check.

When disabled, the original message will not be altered. This method of message delivery is recommended for situations where the sender did not generate the packet, such as a network interface application passing a packet from a remote system to the local software bus.

2.14.3.5 Message Limit Error Before placing a message on a pipe, the software bus checks the message limit to ensure the maximum number of packets in transit to the destination is not exceeded. If placing the message on the pipe would exceed the message limit, then the action of sending to that pipe is aborted and the 'Message Limit Error' event is sent. This condition will typically occur when an application that receives the packets does not respond quickly enough, or if the sender of the packets produces them too quickly.

This condition occurs often during development and during integration, for example when a remote processor gets reset or a 1553 cable becomes disconnected. Because of the common occurrences, the event may have filtering associated with it. Any filtering for this event would be performed by the cFE Event Services (EVS). Filtering for SB events may be specified in the cFE platform configuration file or may be commanded after the system initializes.

If this error occurs during nominal conditions, it could be an indication that the 'message limit' is not set correctly. The message limit is given at the time of the subscription and given as a parameter in the subscribe API. With the CFE_SB_Subscribe API, the SB uses a default message limit value specified by CFE_PLATFORM_SB_DEFAULT_MSG_LIMIT. This constant is currently set to a value of four. If the default value is insufficient, the message limit value can be specified in the CFE_SB_SubscribeEx API.

A related failure is the pipe overflow condition, which can occur if the total number of packets (of all kinds) sent to a particular pipe is too large.

2.14.3.6 Pipe Overflow Error Another common error that occurs during the send process is the pipe overflow error. This condition occurs if the total number of packets (of all kinds) sent to a particular pipe is too large. If this error occurs too frequently, it may be an indication that the pipe depth is not set correctly. The pipe depth is given at the time the pipe is created as a parameter in the CFE_SB_CreatePipe API.

2.14.3.7 SB Event Filtering Most filtering for SB events is performed by the cFE Event Services (EVS). Filtering for SB events may be specified in the cFE platform configuration file or may be commanded after the system initializes. There is no SB event log that limits the number of events based on the capacity of the log, as in the heritage software bus.

There is one case in which events are filtered by the software bus instead of event services. This occurs when the software bus needs to suppress events so that a fatal recursive event condition does not transpire. Because error cases encountered when sending a message generate an event, and events cause a message to be sent a calling sequence could cause a stack overflow if the recursion is not properly terminated. The cFE software bus detects this condition and properly terminates the recursion. This is done by using a set of flags (one flag per event in the Send API) which determine whether an API has relinquished its stack. If the software bus needs to send an event that may cause recursion, the flag is set and the event is sent. If sending the event would cause the same event again, the event call will be bypassed, terminating the recursion. The result is that the user will see only one event instead of the many events that would normally occur without the protection. The heritage software bus did not have this condition because it stored events in the software bus event log and another thread would read them out at a later time.

2.14.3.8 Diagnostic Data The cFE software bus provides a set of commands to dump SB diagnostic data to help troubleshoot problems or check configuration settings. These commands allow the user to view the routing table, the pipe table or the message map. The message map is a lookup table used during a send operation to give fast access to the routing table index that corresponds to the message being sent.

The software bus also provides a statistics packet that can be used to tune the configuration parameters. This information is sent to the ground in the form of an SB packet when the corresponding command is received. The cFE limits the number of system pipes, unique Message IDs, buffer memory, messages on a pipe and subscriptions per Message ID. These limits are configurable through cFE platform and mission configuration parameters. The statistics packet was designed to let the project verify that these user settings provide the necessary margin to meet requirements.

The SB statistics information shows 'Currently In Use' figures, 'High Water Mark' figures and 'Max Allowed' figures for the following: buffer memory, messages on each pipe (pipe depth stats), System Pipes, Unique Message IDs and total subscriptions.

Depending on the task-scheduling implementation details of the operating system, it is possible to see the peak messages on a pipe occasionally exceed the depth of the pipe. The "Peak Messages In Use" parameter is included in the SB statistics packet under the pipe depth stats.

2.14.3.9 Control of Packet Routing The software bus allows the ground to disable and enable the sending of packets of a specified Message ID to a specified pipe. All destinations that are needed for normal operation are enabled by default. Modifying the routing of packets may be required for the following reasons:

- In flight, one can enable diagnostic packets to see them on the ground.
- During testing, one can disable a destination to simulate an anomaly.

2.14.3.10 Quality of Service The software bus has a parameter in the CFE_SB_SubscribeEx API named Quality, which means Quality of Service (QOS) for off-board routing and is of the type CFE_SB_Qos_t. This structure has two members named priority and reliability. The Quality parameter is currently unused by the software bus. It is a placeholder to be used with the future software bus capability of inter-processor communication. Although currently the software bus does not implement quality of service.

A default quality of services is provided via the CFE_SB_DEFAULT_QOS macro.

2.14.3.11 Known Problem The software bus may perform unexpectedly under an unlikely corner-case scenario. This scenario was revealed in a stress test. The stress test was designed to deplete the Software Bus memory pool by having a high priority application continuously send 1000 byte packets to a lower priority application until the memory pool code returned an error code and sent the following event. "CFE_ES:getPoolBuf err:Request won't fit in remaining memory" At this point the higher priority sending application would stop executing. This would allow the lower priority receiving application to begin receiving the 1000 byte packets. After the receiving app processed all of the packets, the memory was restored to the memory pool as expected. The SB memory-in-use telemetry was zero because there were no software bus packets in transit. At this point any attempt to send a new-sized packet on the software bus was be rejected. The ES memory pool stated that the "... Request won't fit in remaining memory" even though there was currently no memory in use.

The simplest way to prevent this behavior is to ensure that there is margin when sizing the SB memory pool. To check the margin, monitor the "Peak Memory in Use" vs. the configuration parameter CFE_PLATFORM_SB_BUF_MEMORY_BYTES which indicates the amount allocated.

2.14.4 Frequently Asked Questions about Software Bus

(Q) How is the memory pool handle (sent in SB housekeeping telemetry) intended to be used?

The memory pool handle is used to analyze the SB memory pool statistics. The cFE ES command (CFE_ES_SEND_MEM_POOL_STATS_CC) to dump the memory pool statistics takes the pool handle as a parameter. These statistics tell how the SB memory pool is configured and gives details on margin. An improperly configured SB memory pool may inhibit communication. This may occur if there is not enough margin to create a block of the size needed for a transfer. Refer to the ES memory pool users guide for more details. Memory Pool

(Q) When sending a message, what message header fields are critical for routing the message?

To route the message properly, the software bus uses only the Message ID and packet length fields from the header of the message. If the packet length field is incorrect, then the buffer allocation for the message will also be incorrect. This may appear to the receiver as a truncated message or a message with unknown data added to the end of the message.

(Q) How many copies of the message are performed in a typical message delivery?

There is a single copy of the message performed when sending a message (from the callers memory space) using CFE_SB_TransmitMsg. When transmitting the message, the software bus copies the message from the callers memory space into a buffer in the software bus memory space. There is also the option to request a buffer from SB, write directly to the buffer and send via CFE_SB_TransmitBuffer. This is equivalent to the previous zero copy implementation. The CFE_SB_ReceiveBuffer API gives the user back a pointer to the buffer. When working with the buffers, the additional complexity to be aware of is the buffer is only available to the app from the request to send (on the sending side), or from the receive until the next receive on the same pipe on the receiving side. If the data is required outside that scope, the app needs a local copy.

(Q) When does the software bus free the buffer during a typical message delivery process? Or how long is the message, and the pointer to the buffer in the CFE_SB_ReceiveBuffer valid?

After receiving a buffer by calling CFE_SB_ReceiveBuffer, the buffer received is valid until the next call to CFE_SB_ReceiveBuffer with the same Pipe Id. If the caller needs the message longer than the next call to CFE_SB_ReceiveBuffer, the caller must copy the message to its memory space.

(Q) The first parameter in the CFE_SB_ReceiveBuffer API is a pointer to a pointer which can get confusing. How can I be sure that the correct address is given for this parameter.

Typically a caller declares a ptr of type CFE_SB_Buffer_t (i.e. CFE_SB_Buffer_t ∗Ptr) then gives the address of that pointer (&Ptr) as this parameter. After a successful call to CFE_SB_ReceiveBuffer, Ptr will point to the first byte of the software bus buffer. This should be used as a read-only pointer. In systems with an MMU, writes to this pointer may cause a memory protection fault.

(Q) Why am I not seeing expected Message Limit error events or Pipe Overflow events?

It is possible the events are being filtered by cFE Event Services. The filtering for this event may be specified in the platform configuration file or it may have been commanded after the system initializes.
There is a corresponding counter for each of these conditions. First verify that the condition is happening by viewing the counter in SB HK telemetry. If the condition is happening, you can view the SB filter information through the EVS App Data Main page by clicking the 'go to' button for SB. The event Id for these events can be learned through a previous event or from the cfe_sb_eventids.h file.

(Q) Why does the SB provide event filtering through the platform configuration file?

To give the user the ability to filter events before an EVS command can be sent. During system initialization, there are many conditions occurring that can cause a flood of SB events such as No Subscribers, Pipe Overflow and MsgId to Pipe errors. This gives the user a way to limit these events.

(Q) Why does SB have so many debug event messages?

The SB debug messages are positive acknowledgments that an action (like receiving a cmd, creating a pipe or subscribing to a message) has occurred. They are intended to help isolate system problems. For instance, if an expected response to a command is not happening, it may be possible to repeat the scenario with the debug event turned on to verify that the command was successfully received.

(Q) How is the QOS parameter in the CFE_SB_SubscribeEx used by the software bus?

The QOS parameter is currently unused by the software bus. It is a placeholder to be used with the future software bus capability of inter-processor communication. Setting the QOS as CFE_SB_DEFAULT_QOS will ensure seamless integration when the software bus is expanded to support inter-processor communication.

(Q) Can I confirm my software bus buffer was delivered?

There is no built in mechanism for confirming delivery (it could span systems). This could be accomplished by generating a response message from the receiver.

2.15 cFE Software Bus Commands

Upon receipt of any command, the Software Bus application will confirm that the message length embedded within the header (from `CFE_MSG_GetSize()`) matches the expected length of that message, based on the size of the C structure defining that command. If there is any discrepancy between the expected and actual message size, SB will generate the CFE_SB_LEN_ERR_EID event, increment the command error counter ($sc_$cpu_SB_CMDEC), and the command will *not* be accepted for processing.

The following is a list of commands that are processed by the cFE Software Bus Task.

Global CFE_SB_DISABLE_ROUTE_CC

Disable Software Bus Route

Global CFE_SB_DISABLE_SUB_REPORTING_CC
Disable Subscription Reporting Command

Global CFE_SB_ENABLE_ROUTE_CC
Enable Software Bus Route

Global CFE_SB_ENABLE_SUB_REPORTING_CC
Enable Subscription Reporting Command

Global CFE_SB_NOOP_CC
Software Bus No-Op

Global CFE_SB_RESET_COUNTERS_CC
Software Bus Reset Counters

Global CFE_SB_SEND_PREV_SUBS_CC
Send Previous Subscriptions Command

Global CFE_SB_SEND_SB_STATS_CC
Send Software Bus Statistics

Global CFE_SB_WRITE_MAP_INFO_CC
Write Map Info to a File

Global CFE_SB_WRITE_PIPE_INFO_CC
Write Pipe Info to a File

Global CFE_SB_WRITE_ROUTING_INFO_CC
Write Software Bus Routing Info to a File

2.16 cFE Software Bus Telemetry

The following are telemetry packets generated by the cFE Software Bus Task.

Global CFE_SB_AllSubscriptionsTlm_Payload_t
SB Previous Subscriptions Packet

Global CFE_SB_AllSubscriptionsTlm_Payload_t
SB Previous Subscriptions Packet

Global CFE_SB_HousekeepingTlm_Payload_t
Software Bus task housekeeping Packet

Global CFE_SB_HousekeepingTlm_Payload_t
Software Bus task housekeeping Packet

Global CFE_SB_SingleSubscriptionTlm_Payload_t
SB Subscription Report Packet

Global CFE_SB_SingleSubscriptionTlm_Payload_t
SB Subscription Report Packet

Global CFE_SB_StatsTlm_Payload_t
SB Statistics Telemetry Packet

Global CFE_SB_StatsTlm_Payload_t
SB Statistics Telemetry Packet

2.17 cFE Software Bus Configuration Parameters

The following are configuration parameters used to configure the cFE Software Bus either for each platform or for a mission as a whole.

Global CFE_MISSION_SB_MAX_PIPES

Maximum Number of pipes that SB command/telemetry messages may hold

Maximum Number of pipes that SB command/telemetry messages may hold

Global CFE_MISSION_SB_MAX_SB_MSG_SIZE

Maximum SB Message Size

Maximum SB Message Size

Global CFE_PLATFORM_ENDIAN

Platform Endian Indicator

Global CFE_PLATFORM_SB_BUF_MEMORY_BYTES

Size of the SB buffer memory pool

Size of the SB buffer memory pool

Global CFE_PLATFORM_SB_DEFAULT_MAP_FILENAME

Default Message Map Filename

Default Message Map Filename

Global CFE_PLATFORM_SB_DEFAULT_MSG_LIMIT

Default Subscription Message Limit

Default Subscription Message Limit

Global CFE_PLATFORM_SB_DEFAULT_PIPE_FILENAME

Default Pipe Information Filename

Default Pipe Information Filename

Global CFE_PLATFORM_SB_DEFAULT_ROUTING_FILENAME

Default Routing Information Filename

Default Routing Information Filename

Global CFE_PLATFORM_SB_FILTERED_EVENT1

SB Event Filtering

SB Event Filtering

Global CFE_PLATFORM_SB_HIGHEST_VALID_MSGID

Highest Valid Message Id

Highest Valid Message Id

Global CFE_PLATFORM_SB_MAX_DEST_PER_PKT

Maximum Number of unique local destinations a single MsgId can have

Maximum Number of unique local destinations a single MsgId can have

Global CFE_PLATFORM_SB_MAX_MSG_IDS

Maximum Number of Unique Message IDs SB Routing Table can hold

Maximum Number of Unique Message IDs SB Routing Table can hold

Global CFE_PLATFORM_SB_MAX_PIPES

Maximum Number of Unique Pipes SB Routing Table can hold

Maximum Number of Unique Pipes SB Routing Table can hold

2.18 cFE Table Services Overview

Applications often organize sets of their parameters into logical units called tables. These are typically constant parameters that can change the behavior of a flight software algorithm and are only intended to be modified by operations personnel. Examples of this would be attitude control gains, sensor scalefactors, telemetry filter settings, etc.

Table Services (TBL) provides a centralized control of flight software tables. Operations personnel would interact with TBL in order to dump the contents of current tables, load new table images, verify the contents of a table image and manage Critical tables.

None of the cFE core applications (EVS, SB, ES, TIME, or TBL) use tables, and it is possible to build cFE without Table Services if not needed or an alternative parameter management mechanism is to be utilized.

For additional detail on Tables and how to manage them, see the following sections:

- Managing Tables
- cFE Table Types and Table Options
- Table Registry
- Table Services Telemetry
- Effects of Processor Reset on Tables
- Frequently Asked Questions about Table Services

2.18.1 Managing Tables

In order to effectively manage tables, an operator needs to understand how cFE Applications manage tables from their end. There are a number of methods that cFE Applications typically use to manage their tables. Each method is appropriate based upon the nature of the contents of the table.

cFE Applications are required to periodically check to see if their table is to be validated, updated (or in the case of dump-only tables, dumped). Most Applications perform this periodic management at the same time as housekeeping requests are processed. This table management is performed by the cFE Application that "owns" a table (ie - the cFE Application that registered the table with cFE Table Services). It is possible for cFE Applications to "share" a table with other cFE Applications. An Application that shares a table does not typically perform any of the management duties associated with that table.

A table can have one of two different types and a number of different options. These are discussed further in later sections. An operator should understand the chosen type and selected options for a particular table before attempting to modify a table's contents.

To understand the methods of maintaining a table, it is important that the terminology be clear. A table has two images: "Active" and "Inactive". The Active table is the one that a cFE Application is currently accessing when it executes. The

Inactive table is a copy of the Active table that an operator (or on-board process such as a stored command processor) can manipulate and change to have a newly desired set of data.

To create an Inactive table image on board, the operator would be required to perform a "Load" to the table. Loads are table images stored in on-board files. The Load can contain either a complete table image or just a part of a table image. If the Load contains just a portion, the Inactive image is first initialized with the contents of the Active image and then the portion identified in the Load file is written on top of the Active image. After the initial Load, an operator can continue to manipulate the Inactive table image with additional partial table load images. This allows the operator to reconfigure the contents of multiple portions of the table before deciding to "Validate" and/or "Activate" it.

Some cFE Applications provide special functions that will examine a table image to determine if the contents are logically sound. This function is referred to as the "Validation Function." When a cFE Application assigns a Validation Function to a table during the table registration process, it is then requiring that a Validation be performed before the table can be Activated. When an operator requests a Validation of a table image, they are sending a request to the owning Application to execute the associated Validation Function on that image. The results of this function are then reported in telemetry. If the Validation is successful, the operator is free to perform a table Activation. If the Validation fails, the operator would be required to make additional changes to the Inactive table image and attempt another Validation before commanding an Activation.

To change an Inactive table image into the Active table image, an operator must Activate a table. When an operator sends the table Activation command, they are notifying the table's owning Application that a new table image is available. It is then up to the Application to determine when is the best time to perform the "Update" of the table. When an Application performs an Update, the contents of the Inactive table image become the Active table image.

2.18.2 cFE Table Types and Table Options

A cFE Application Developer has several choices when creating a cFE Application. There are two basic types of tables: single buffered and double buffered. In addition to these two basic types there are a small variety of options possible with each table. These options control special characteristics of the table such as whether it is dump-only, critical or whether it has an application defined location in memory.

Each choice has its advantages and disadvantages. The developer chooses the appropriate type based upon the requirements of the application. Anyone operating a particular cFE Application must understand the nature of the type and options selected for a particular table before they can successfully understand how to perform updates, validations, etc.

For more information on the different types of tables available, see the following sections:

- Table Types
  - Single Buffered Tables
  - Double Buffered Tables
- Table Options
  - Tables with Validation Functions
  - Critical Tables
  - User Defined Address Tables
  - Dump Only Tables

2.18.2.1 Single Buffered Tables The default table type for a cFE Application to use is a single buffered table. The principle advantage of a single buffered table is that it can share one of several shared table buffers for uploaded and pending table images. Since many cFE Applications have relatively small tables that are not changed at time critical moments or are not changed very often during a mission, single buffered tables represent the most memory resource efficient method of being managed.

The number of single buffered tables that can have inactive table images being manipulated at one time is specified by a TBL Services configuration parameter (CFE_PLATFORM_TBL_MAX_SIMULTANEOUS_LOADS) found in the cfe↩_platform_cfg.h file associated with the processor in question. This parameter identifies the number of shared table buffers that are available.

Since inactive single buffered table images share a common resource, it may not be prudent for an operator to load an image and then delay on the image's activation for an extended period of time.

Single buffered tables are allowed to be critical (see Critical Tables), dump-only (see Dump Only Tables) and/or have a user-defined address (see User Defined Address Tables).

2.18.2.2 Double Buffered Tables Under certain conditions, a cFE Application Developer may choose to use a double buffered table type within their application. Double buffered tables retain a dedicated inactive image of the table data. With a dedicated inactive table image available, double buffered tables are then capable of efficiently swapping table contents and/or delaying the activation of a table's contents for an indeterminate amount of time.

Some cFE Applications prefer to delay the Activation of a table until a specified time (e.g. - a Spacecraft Ephemeris). These tables are typically defined as double buffered tables so that the Inactive image can be left sitting untouched for an extended period of time without interfering with shared resources for other tables. Then the Application can perform the Update when the time is right.

Applications which have unusually large tables may decide to conserve memory resources by making them double buffered. This is because the shared buffers used by single buffered tables must be sized to match the largest table. If there is one table that is unusually large, there is little reason to allocate up to CFE_PLATFORM_TBL_MAX_SIMULTANEOUS_LOADS number of buffers that size. A double buffered table will only allocate ONE extra buffer of that size.

Performance minded Applications that are required to perform processing with tight timing deadlines may choose to use double buffered tables because the Update for a double buffered table is deterministic and quick.

2.18.2.3 Tables with Validation Functions Applications that associate Validation Functions with their tables when the tables are registered are effectively requiring that the contents of a table be logically Validated before it is Activated. The cFE will refuse to let a table with an associated Validation Function be Activated until a successful Validation on the Inactive table image has occurred.

Tables that are NOT assigned a Validation Function are assumed to be valid regardless of the contents of the table image. These tables do not require a Validation Command prior to Activation.

2.18.2.4 Critical Tables Applications that must be able to recover quickly from a Processor Reset may select the "Critical" table option when registering their table. Table Services automatically creates a Critical Data Store for the table and ensures that the contents of the Critical Data Store are updated whenever a Table Activation occurs.

If a Processor Reset happens, when the Application attempts to Register the table again, Table Services automatically locates the associated Critical Data Store and initializes the Table with the saved contents.

2.18.2.5 User Defined Address Tables In order to provide a mechanism for Flight Software Maintenance teams to quickly create a table image for dumping contents of memory that isn't normally loaded by the ground, there is an option to create User-Defined Address tables. These tables, when they are first registered, provide a memory address where the Active image of the table is to be maintained. Normally, the address is specified by Table Services from its memory pool.

By specifying the address, the Flight Software Maintenance team can create a Dump-Only table that contains the contents of a data structure that is not normally accessible via telemetry or table dumps. Then, on command, the Flight Software Maintenance team can periodically dump the data structure's contents to an on-board file(s) that can then be transferred to the ground for later analysis.

2.18.2.6 Dump Only Tables On occasion, cFE Applications require a segment of memory in which the Application writes data. The typical cFE Table is not normally modified directly by an Application but only via Load and Activate commands from either the Ground or Stored Command Processor. However, for those situations where an Application wishes to modify the contents of a data structure and the Application is limited in its telemetry bandwidth so that the modified data cannot be telemetered, the Application can create a Dump-Only table.

Dump-Only tables are not allowed to be modified via the Load/Validate/Activate process most other tables are. They are only supposed to be modified by onboard Applications. The Operator can still command a Dump which will be processed by the table's owning Application when it manages its tables. By letting the Application perform the dump, the Operator can feel confident that the table contents are a complete snapshot in time and not corrupted by taking a snapshot while the Application was in the process of modifying its contents.

2.18.3 Table Registry

When Applications register tables, Table Services retains pertinent information on the table in the Table Registry. The following information (along with other information that is less important for an operator) is kept for each table:

- The Application ID of the Application that Registered the table
- The full name of the table
- The size, in bytes, of the table
- Pointers to the start addresses of the Table's image buffers, Active and Inactive (if appropriate)
- A pointer to the start address of a Validation Function
- A flag indicating whether a table image has been loaded into an Inactive buffer
- A flag indicating whether the table is Critical and its associated CDS Handle if it is
- A flag indicating whether the table has ever been loaded (initialized)
- A flag indicating whether the table is Dump Only
- A flag indicating whether the table has an Update Pending
- A flag indicating whether the table is double buffered or not
- The System Time when the Table was last Updated
- The filename of the last file loaded into the table
- The File Creation Time for the last file used to load the contents of the table

This information can be obtained by either sending the Dump Registry command which will put all of the information from the Table Registry into an onboard file for later downlink or the operator can send a command to Telemeter the Registry Entry for a single table. This will cause the pertinent registry entry for a single table to be sent via a telemetry packet.

The API function CFE_TBL_Register() returns either CFE_SUCCESS or CFE_TBL_INFO_RECOVERED_TBL to indicate that the table was successfully registered. The difference is whether the table data was recovered from CDS as part of the registration. There are several error return values that describe why the function failed to register the table but nothing related to why the restoration from CDS might have failed. There is, however, a message written to the System Error Log by Table Services that can be dumped by the ground to get this information. Note that failure to restore a table from CDS is not an expected error and requires some sort of data corruption to occur.

2.18.4 Table Services Telemetry

Table Services produces two different telemetry packets. The first packet, referred to as the Table Services Housekeeping Packet, is routinely produced by Table Services upon receipt of the Housekeeping Request message that is typically sent to all Applications by an on board scheduler. The contents and format of this packet are described in detail at CFE_TBL_HousekeepingTlm_t.

2.18.5 Effects of Processor Reset on Tables

When a processor resets, the Table Registry is re-initialized. All Applications must, therefore, re-register and re-initialize their tables. The one exception, however, is if the Application has previously tagged a table as "Critical" during Table Registration, then Table Services will attempt to locate a table image for that table stored in the Critical Data Store. Table Services also attempts to locate the Critical Table Registry which is also maintained in the Critical Data Store.

If Table Services is able to find a valid table image for a Critical table in the Critical Data Store, the contents of the table are automatically loaded into the table and the Application is notified that the table does not require additional initialization.

2.18.6 Frequently Asked Questions about Table Services

(Q) Is it an error to load a table image that is smaller than the registered size?

Table images that are smaller than the declared size of a table fall into one of two categories.

If the starting offset of the table image (as specified in the Table Image secondary file header) is not equal to zero, then the table image is considered to be a "partial" table load. Partial loads are valid as long as a table has been previously loaded with a non-"partial" table image.

If the starting offset of the table image is zero and the size is less than the declared size of the table, the image is considered "short" but valid. This feature allows application developers to use variable length tables.

(Q) I tried to validate a table and received the following event message that said the event failed:

```
MyApp validation failed for Inactive 'MyApp.MyTable', Status=0x####
```

What happened?

The event message indicates the application who owns the table has discovered a problem with the contents of the image. The code number following the 'Status' keyword is defined by the Application. The documentation for the specified Application should be referred to in order to identify the exact nature of the problem.

(Q) What commands do I use to load a table with a new image?

There are a number of steps required to load a table.

1. *The operator needs to create a cFE Table Services compatible table image file with the desired data contained in it. This can be accomplished by creating a 'C' source file, compiling it with the appropriate cross compiler for the onboard platform and then running the* `elf2cfetbl` *utility on the resultant object file.*

2. *The file needs to be loaded into the onboard processor's filesystem using whichever file transfer protocol is used for that mission.*

3. *The Load Command is sent next to tell Table Services to load the table image file into the Inactive Table Image Buffer for the table identified in the file.*

4. *The Validate Command is then sent to validate the contents of the inactive table image. This will ensure the file was not corrupted or improperly defined. The results of the validation are reported in Table Services Housekeeping Telemetry. If a table does not have a validation function associated with it, the operator may wish to compare the computed CRC to verify the table contents match what was intended.*

5. *Upon successful validation, the operator then sends the Activate Command. The application owning the table should, within a reasonable amount of time, perform a table update and send an event message.*

(Q) What causes cFE Table Services to generate the following sys log message:

`CFE_TBL:GetAddressInternal-App(%d) attempt to access unowned Tbl Handle=%d`

When an application sharing its table(s) with one or more applications is reloaded, the reloaded application's table handle(s) are released. cFE Table Services sees that the table(s) are shared and keeps a 'shadow' version of the table in the Table Services registry. The registry will show the released, shared tables with no name. When the applications sharing the table attempt to access the table via the 'old', released handle, Table Services will return an error code to the applications and generate the sys log message. The applications may then unregister the 'old' handle(s) in order to remove the released, shared table(s) from the Table Services registry and share the newly loaded application table(s).

(Q) When does the Table Services Abort Table Load command need to be issued?

The Abort command should be used whenever a table image has been loaded but the application has not yet activated it and the operator no longer wants the table to be loaded.

The purpose of the Abort command is to free a previously allocated table buffer. It should be noted, however, that multiple table loads to the SAME table without an intervening activation or abort, will simply OVERWRITE the previous table load using the SAME buffer.

Therefore, the most likely scenarios that would lead to a needed abort are as follows:

1. *Operator loads a table and realizes immediately that the load is not wanted.*

2. *Operator loads a table and performs a validation on it. Regardless of whether the table passes or fails the validation, if the operator no longer wants to activate the table, the abort command should be issued.*

   It should be noted that a table image that fails activation is retained in the inactive buffer for diagnosis, if necessary. It is NOT released until it is aborted or overwritten and successfully validated and activated.

3. *A table image was loaded; the image was successfully validated; the command for activation was sent; but the application fails to perform the activation.*

   The Abort command will free the table buffer and clear the activation request.

   This situation can occur when either the application is improperly designed and fails to adequately manage its tables (sometimes seen in the lab during development) or the application is "hung" and not performing as it should.

2.19 cFE Table Services Commands

Upon receipt of any command, the Table Services application will confirm that the message length embedded within the header (from `CFE_MSG_GetSize()`) matches the expected length of that message, based on the size of the C structure defining that command. If there is any discrepancy between the expected and actual message size, TBL will generate the CFE_TBL_LEN_ERR_EID event, increment the command error counter ($sc_$cpu_TBL_CMDEC), and the command will *not* be accepted for processing.

The following is a list of commands that are processed by the cFE Table Services Task.

Global CFE_TBL_ABORT_LOAD_CC
Abort Table Load

Global CFE_TBL_ACTIVATE_CC
Activate Table

Global CFE_TBL_DELETE_CDS_CC
Delete Critical Table from Critical Data Store

Global CFE_TBL_DUMP_CC
Dump Table

Global CFE_TBL_DUMP_REGISTRY_CC
Dump Table Registry

Global CFE_TBL_LOAD_CC
Load Table

Global CFE_TBL_NOOP_CC
Table No-Op

Global CFE_TBL_RESET_COUNTERS_CC
Table Reset Counters

Global CFE_TBL_SEND_REGISTRY_CC
Telemeter One Table Registry Entry

Global CFE_TBL_VALIDATE_CC
Validate Table

2.20 cFE Table Services Telemetry

The following are telemetry packets generated by the cFE Table Services Task.

Global CFE_TBL_HousekeepingTlm_Payload_t
Table Services Housekeeping Packet

Global CFE_TBL_HousekeepingTlm_Payload_t
Table Services Housekeeping Packet

Global CFE_TBL_TblRegPacket_Payload_t
Table Registry Info Packet

Global CFE_TBL_TblRegPacket_Payload_t
Table Registry Info Packet

2.21 cFE Table Services Configuration Parameters

The following are configuration parameters used to configure the cFE Table Services either for each platform or for a mission as a whole.

Global CFE_MISSION_TBL_MAX_FULL_NAME_LEN

Maximum Length of Full Table Name in messages

Maximum Length of Full Table Name in messages

Global CFE_MISSION_TBL_MAX_NAME_LENGTH

Maximum Table Name Length

Maximum Table Name Length

Global CFE_PLATFORM_TBL_BUF_MEMORY_BYTES

Size of Table Services Table Memory Pool

Size of Table Services Table Memory Pool

Global CFE_PLATFORM_TBL_DEFAULT_REG_DUMP_FILE

Default Filename for a Table Registry Dump

Default Filename for a Table Registry Dump

Global CFE_PLATFORM_TBL_MAX_CRITICAL_TABLES

Maximum Number of Critical Tables that can be Registered

Maximum Number of Critical Tables that can be Registered

Global CFE_PLATFORM_TBL_MAX_DBL_TABLE_SIZE

Maximum Size Allowed for a Double Buffered Table

Maximum Size Allowed for a Double Buffered Table

Global CFE_PLATFORM_TBL_MAX_NUM_HANDLES

Maximum Number of Table Handles

Maximum Number of Table Handles

Global CFE_PLATFORM_TBL_MAX_NUM_TABLES

Maximum Number of Tables Allowed to be Registered

Maximum Number of Tables Allowed to be Registered

Global CFE_PLATFORM_TBL_MAX_NUM_VALIDATIONS

Maximum Number of Simultaneous Table Validations

Maximum Number of Simultaneous Table Validations

Global CFE_PLATFORM_TBL_MAX_SIMULTANEOUS_LOADS

Maximum Number of Simultaneous Loads to Support

Maximum Number of Simultaneous Loads to Support

Global CFE_PLATFORM_TBL_MAX_SNGL_TABLE_SIZE

Maximum Size Allowed for a Single Buffered Table

Maximum Size Allowed for a Single Buffered Table

Global CFE_PLATFORM_TBL_VALID_PRID_1

Processor ID values used for table load validation

Processor ID values used for table load validation

Global CFE_PLATFORM_TBL_VALID_PRID_COUNT

Number of Processor ID's specified for validation

Number of Processor ID's specified for validation

Global CFE_PLATFORM_TBL_VALID_SCID_1

Spacecraft ID values used for table load validation

Spacecraft ID values used for table load validation

Global CFE_PLATFORM_TBL_VALID_SCID_COUNT

Number of Spacecraft ID's specified for validation

Number of Spacecraft ID's specified for validation

2.22 cFE Time Services Overview

The cFE Time Service (TIME) is one of the cFE core services. TIME provides time correlation, distribution and synchronization services. TIME exists in two varieties: a Time Server responsible for maintaining the master time reference for all remote systems, and a Time Client responsible for synchronizing to that master time reference.

Since TIME is a generic implementation aimed to meet the needs of a variety of mission configurations, there are numerous configuration parameters, which dictate the behavior of TIME (see cfe_mission_cfg.h and cfe_platform_cfg.h for the specific mission configuration).

With the exception of those sections specific to Time Clients and Servers, this document assumes the most common physical environment - one instantiation of cFE installed on a single processor. Therefore, TIME represents cFE Time Services configured as a Time Server.

For additional detail on Time Services and how to manage it, see the following sections:

- Time Components
- Time Structure
- Time Formats
- Time Configuration
  - Time Format Selection
  - Enabling Fake Tone Signal
  - Selecting Tone and Data Ordering
  - Specifying Tone and Data Window
  - Specifying Time Server/Client

  - Specifying Time Tone Byte Order
  - Virtual MET
  - Specifying Time Source
  - Specifying Time Signal

- Time Services Paradigm(s)
- Flywheeling
- Time State
- Initialization
  - Power-On Reset
  - Processor Reset
- Initialization
  - Power-On Reset
  - Processor Reset
- Normal Operation
  - Client
  - Server
    - Setting Time
    - Adjusting Time
    - Setting MET
- Frequently Asked Questions about Time Services

2.22.1 Time Components

Time knowledge is stored in several pieces, so that the time information can more easily be manipulated and utilized. These components include:

The **Ground Epoch** is an arbitrary date and time that establishes the zero point for spacecraft time calculations. The selection of the epoch is mission specific, although in the past, it was common to select the same epoch as defined for the Operating System used by the computers hosting the ground system software. Recent mission epoch selections have also included using zero seconds after midnight, Jan 1, 2001.

Spacecraft Time is the number of seconds (and fraction of a second) since the ground epoch. Spacecraft time is the sum of **Mission Elapsed Time** (MET) and the **Spacecraft Time Correlation Factor** (STCF). By definition, MET is a measure of time since launch or separation. However, for most missions the MET actually represents the amount of time since powering on the hardware containing the MET timer. The STCF correlates the MET to the ground epoch.

The **Tone** is the signal that MET seconds have incremented. In most hardware configurations, the tone is synonymous with the **1 PPS** signal. The tone signal may be generated by a local hardware timer, or by an external event (G↩PS receiver, spacewire time tick, 1553 bus signal, etc). TIME may also be configured to simulate the tone for lab environments that do not have the necessary hardware to provide a tone signal. Note that MET sub-seconds will be zero at the instant of the tone.

Time at the Tone is the spacecraft time at the most recent "valid" tone.

Time since the Tone is the amount of time since the tone (usually less than one second). This value is often measured using the local processor clock. Upon detecting the tone signal, TIME stores the contents of the local processor clock to facilitate this measurement.

Thus, **Current Spacecraft Time** is the sum of "time at the tone" and "time since the tone".

Leap Seconds occur to keep clocks correlated to astronomical observations. The modern definition of a second (9,192,631,770 oscillations of a cesium-133 atom) is constant while the earth's rotation has been slow by a small fraction of a second per day. The **International Earth Rotation and Reference System Service** (IERS) maintains the count of leap seconds as a signed whole number that is subject to update twice a year. Although it is possible to have a negative leap second count if the earth rotates too fast, it is highly unlikely. The initial count of leap seconds (10) was established in January of 1972 and the first leap second was added to the initial count in June of 1972. The most recent leap seconds are announced by the International Earth Rotation Service (IERS): https://www.iers.org in IERS Bulletin C (leap second announcements). Search the IERS site for "Bulletin C" to obtain the latest issue/announcement.

2.22.2 Time Structure

The cFE implementation of the **System Time Structure** is a modified version of the CCSDS Unsegmented Time Code (CUC) which includes 4 bytes of seconds, and 4 bytes of subseconds, where a subsecond is equivalent to 1/(2^32) seconds. The system time structure is used by TIME to store current time, time at the tone, time since the tone, the MET, the STCF and command arguments for time adjustments. Note that typically the 32 bits of seconds and the upper 16 bits of subseconds are used for time stamping Software bus messages, but this is dependent on the underlying definition.

The system time structure is defined as follows:

```
typedef struct {
      uint32      Seconds;      /* Number of seconds */
      uint32      Subseconds;   /* Number of 2^(-32) subseconds */
} CFE_TIME_SysTime_t;
```

2.22.3 Time Formats

International Atomic Time (TAI) is one of two time formats supported by cFE TIME. TAI is the number of seconds and sub-seconds elapsed since the ground epoch as measured with the atomic clock previously described. TAI has no reference to leap seconds and is calculated using the following equation:

```
TAI = MET + STCF
```

It should be noted that TAI is only "true" TAI when the selected ground epoch is the same as the TAI epoch (zero seconds after midnight, January 1, 1958). However, nothing precludes configuring cFE TIME to calculate time in the TAI format and setting the STCF to correlate to any other epoch definition.

Coordinated Universal Time (UTC) is the other time format supported by cFE TIME. UTC differs from TAI in the fact that UTC includes a leap seconds adjustment. TIME computes UTC using the following equation:

```
UTC = TAI - Leap Seconds.
```

The preceding UTC equation might seem to imply that TAI includes leap seconds and UTC does not - which is not the case. In fact, the UTC calculation includes a leap seconds adjustment that subtracts leap seconds from the same time components used to create TAI. Alternatively, it might be less confusing to express the UTC equation as follows:

```
UTC = MET + STCF - Leap Seconds
```

2.22.4 Time Configuration

All configurations of TIME require a local processor source for a 1Hz interrupt and access to a local clock with a resolution fine enough that it can be used to measure short periods of elapsed time. The local interrupt is used to wake-up TIME at a regular interval for the purpose of verifying that the tone is being received. The local clock is used to measure time since the tone and to provide coarse verification that the tone is occurring at approximately one second intervals. The presumption is that the tone is the most accurate timer in the system and, within reason, is to be trusted. Note that nothing precludes the use of the MET as the local clock, assuming the MET is both local and provides sub-second data. However, the tone must not be used as the source for the local 1Hz interrupt.

Consider the following brief description of three hypothetical hardware configurations. These sample systems may be used as reference examples to help clarify the descriptions of the various TIME configuration selections.

In the first system, there is no MET timer and therefore no tone signal. The MET is a count of the number of "fake" tones generated by TIME software. There is no validation performed regarding the quality of time data. This hardware configuration is a common lab environment using COTS equipment.

In the second system, the MET timer is a hardware register that is directly accessible by TIME. When MET seconds increment, a processor interrupt signals the tone. Upon detecting the tone, TIME can read the MET to establish the time at the tone. To verify that the tone is valid, TIME need only validate that this tone signal occurred approximately one second after the previous tone signal (as measured with the local clock).

In the third system, the MET is located on hardware connected via spacewire. When MET seconds increment, a spacewire time tick triggers a local processor interrupt to signal the tone. Shortly after announcing the tone, the hardware containing the MET also generates a spacewire data packet containing the MET value corresponding to the tone. T↩ IME must wait until both the tone and data packet have been received before validating the tone. The tone must have occurred approximately one second after the previous tone signal and the data packet must have been received within a specified window in time following the tone.

The hardware design choice for how the tone signal is distributed is not material to TIME configuration. The software detecting the tone need only call the cFE API function announcing the arrival of the tone. This function is designed to be called from interrupt handlers.

For detail on each of the individual configuration settings for cFE Time Services, see the following sections:

- Time Format Selection
- Enabling Fake Tone Signal
- Selecting Tone and Data Ordering
- Specifying Tone and Data Window
- Specifying Time Server/Client
- Specifying Time Tone Byte Order
- Virtual MET
- Specifying Time Source
- Specifying Time Signal

2.22.4.1 Time Format Selection

Time format is defined in the mission configuration header file.

This selection defines the default time format as TAI or UTC. The API functions to get time in either specific format are still enabled, but the API function to get time in the default format will follow this selection. Enable one, and **only one**, of the following time format definitions:

```
#define CFE_MISSION_TIME_CFG_DEFAULT_TAI  TRUE
#define CFE_MISSION_TIME_CFG_DEFAULT_UTC  FALSE
```

or

```
#define CFE_MISSION_TIME_CFG_DEFAULT_TAI  FALSE
#define CFE_MISSION_TIME_CFG_DEFAULT_UTC  TRUE
```

The choice of time format is a mission specific decision and is not directly affected by the hardware configuration.

See also

CFE_MISSION_TIME_CFG_DEFAULT_TAI, CFE_MISSION_TIME_CFG_DEFAULT_UTC

2.22.4.2 Enabling Fake Tone Signal

The fake tone is defined in the mission configuration header file.

If this selection is set to TRUE, TIME will generate a "fake" tone signal by calling the same API function as would be called upon detection of the "real" tone signal. Enable the fake tone only for hardware configurations that do not provide a tone signal.

```
#define CFE_MISSION_TIME_CFG_FAKE_TONE  TRUE
```

Hypothetical hardware configuration number one (described above) would enable the fake tone signal.

See also

CFE_MISSION_TIME_CFG_FAKE_TONE

2.22.4.3 Selecting Tone and Data Ordering

Tone and data order is defined in the mission configuration header file.

This selection defines which comes first - the tone or the time at the tone data. Does the time data describe the tone that already occurred, or the tone that has not yet occurred? This decision may be driven by the hardware design but can also be arbitrary. Enable one, and only one, of the following:

```
#define CFE_MISSION_TIME_AT_TONE_WAS
#define CFE_MISSION_TIME_AT_TONE_WILL_BE
```

Hypothetical hardware configuration number three (described Time Configuration above) would enable "time at the tone was".

See also

CFE_MISSION_TIME_AT_TONE_WAS, CFE_MISSION_TIME_AT_TONE_WILL_BE

2.22.4.4 Specifying Tone and Data Window

The tone and data window is defined in the mission configuration header file.

In concert with the definition of tone and data order, this selection defines the valid window in time for the second of the pair to follow the first. Both must be defined, units are micro-seconds.

```
#define CFE_MISSION_TIME_MIN_ELAPSED  0
#define CFE_MISSION_TIME_MAX_ELAPSED  100000
```

Hypothetical hardware configuration number three (described above) might use these values which describe a window that begins immediately after the tone and lasts for one tenth of a second.

See also

CFE_MISSION_TIME_MIN_ELAPSED, CFE_MISSION_TIME_MAX_ELAPSED

2.22.4.5 Specifying Time Server/Client Configure TIME as a client only when the target system has multiple processors running separate instantiations of the cFE. One instantiation must be configured as the server and the remainder configured as clients. If the target system has only one processor running the cFE, then TIME must be configured as a server.

Enable one, and only one, of the following definitions in the platform configuration header file:

```
#define CFE_PLATFORM_TIME_CFG_SERVER   TRUE
#define CFE_PLATFORM_TIME_CFG_CLIENT   FALSE
```

or

```
#define CFE_PLATFORM_TIME_CFG_SERVER   FALSE
#define CFE_PLATFORM_TIME_CFG_CLIENT   TRUE
```

See also

CFE_PLATFORM_TIME_CFG_SERVER, CFE_PLATFORM_TIME_CFG_CLIENT

2.22.4.6 Specifying Time Tone Byte Order By default, the CFE time tone message is a payload of integers in platform-endian order (containing the tone's timestamp, the leap seconds, and state information.) In some configurations, it may be better to have the payload produced in big-endian order–particularly in mixed-endian environments.

In order to force the tone message to be in big-endian order, you must define the following:

```
#define CFE_PLATFORM_TIME_CFG_BIGENDIAN
```

2.22.4.7 Virtual MET This configuration option refers to whether the MET is local to this instantiation of TIME. If the MET is not local then TIME must be configured as using a virtual MET.

Therefore, all TIME clients must be configured as using a virtual MET. If the MET was local to any TIME client, then that instantiation of TIME would have to be the server.

TIME servers must be configured as using a virtual MET

2.22.4.8 Specifying Time Source TIME configuration provides the ability to specify where the source for time data is originating - either internal or external. In hypothetical system one, the MET is internal. In system two, TIME cannot directly read the MET, therefore time data must be received from an external source.

This selection also enables a command interface to switch between internal and external input. When commanded to use internal time data, TIME will ignore the external data. However, TIME will continue to use the API function as the trigger to generate a "time at the tone" command packet regardless of the internal/external command selection.

Set the following definition to TRUE only for TIME servers using an external time data source.

```
#define CFE_PLATFORM_TIME_CFG_SOURCE  TRUE
```

The remainder of this section pertains only to TIME servers configured to accept external time data.

When configured to accept external time data, TIME requires an additional definition for the type of external data (GPS, MET, spacecraft time, etc.). This selection will enable an API function specific to the selected data type. Regardless of how the time data is received, the receiver need only pass the data to the appropriate API function.

TIME servers using an external time data source must set one, and only one, of the following to TRUE, for example:

```
#define CFE_PLATFORM_TIME_CFG_SRC_MET   TRUE
#define CFE_PLATFORM_TIME_CFG_SRC_GPS   FALSE
#define CFE_PLATFORM_TIME_CFG_SRC_TIME  FALSE
```

configuration definitions for the particular source.

If the cfe_platform_cfg.h file contains "#define CFE_PLATFORM_TIME_CFG_SOURCE TRUE" then time is configured to allow switching between internal and external time sources (see CFE_TIME_SET_SOURCE_CC). If this configuration parameter is set to FALSE then the command to set the source will be rejected.

If this configuration parameter is set to TRUE then ONE and ONLY ONE of the following configuration parameters must also be set TRUE in order to specify the external time source, for example:

```
#define CFE_PLATFORM_TIME_CFG_SRC_MET   TRUE
#define CFE_PLATFORM_TIME_CFG_SRC_GPS   FALSE
#define CFE_PLATFORM_TIME_CFG_SRC_TIME  FALSE
```

Note that Internal MET source depends on available hardware. It may be the local count of tone signals, the contents of a hardware register or an OS specific time function.

Note also that when configured to use an external time source, commands to set the time will be overwritten.

See also

CFE_PLATFORM_TIME_CFG_SRC_MET, CFE_PLATFORM_TIME_CFG_SRC_GPS, CFE_PLATFORM_TIME_CFG_SRC_TIME

2.22.4.9 Specifying Time Signal Some hardware configurations support a primary and redundant tone signal selection. Setting the following configuration definition to TRUE will result in enabling a TIME command to select the active tone signal.

```
#define CFE_PLATFORM_TIME_CFG_SIGNAL  TRUE
```

Note: this feature requires additional custom software to make the physical signal switch.

See also

CFE_PLATFORM_TIME_CFG_SIGNAL

2.22.5 Time Format Selection

Time format is defined in the mission configuration header file.

This selection defines the default time format as TAI or UTC. The API functions to get time in either specific format are still enabled, but the API function to get time in the default format will follow this selection. Enable one, and **only one**, of the following time format definitions:

```
#define CFE_MISSION_TIME_CFG_DEFAULT_TAI  TRUE
#define CFE_MISSION_TIME_CFG_DEFAULT_UTC  FALSE
```

or

```
#define CFE_MISSION_TIME_CFG_DEFAULT_TAI  FALSE
#define CFE_MISSION_TIME_CFG_DEFAULT_UTC  TRUE
```

The choice of time format is a mission specific decision and is not directly affected by the hardware configuration.

See also

CFE_MISSION_TIME_CFG_DEFAULT_TAI, CFE_MISSION_TIME_CFG_DEFAULT_UTC

2.22.6 Enabling Fake Tone Signal

The fake tone is defined in the mission configuration header file.

If this selection is set to TRUE, TIME will generate a "fake" tone signal by calling the same API function as would be called upon detection of the "real" tone signal. Enable the fake tone only for hardware configurations that do not provide a tone signal.

```
#define CFE_MISSION_TIME_CFG_FAKE_TONE  TRUE
```

Hypothetical hardware configuration number one (described above) would enable the fake tone signal.

See also

CFE_MISSION_TIME_CFG_FAKE_TONE

2.22.7 Selecting Tone and Data Ordering

Tone and data order is defined in the mission configuration header file.

This selection defines which comes first - the tone or the time at the tone data. Does the time data describe the tone that already occurred, or the tone that has not yet occurred? This decision may be driven by the hardware design but can also be arbitrary. Enable one, and only one, of the following:

```
#define CFE_MISSION_TIME_AT_TONE_WAS
#define CFE_MISSION_TIME_AT_TONE_WILL_BE
```

Hypothetical hardware configuration number three (described Time Configuration above) would enable "time at the tone was".

See also

CFE_MISSION_TIME_AT_TONE_WAS, CFE_MISSION_TIME_AT_TONE_WILL_BE

2.22.8 Specifying Tone and Data Window

The tone and data window is defined in the mission configuration header file.

In concert with the definition of tone and data order, this selection defines the valid window in time for the second of the pair to follow the first. Both must be defined, units are micro-seconds.

```
#define CFE_MISSION_TIME_MIN_ELAPSED  0
#define CFE_MISSION_TIME_MAX_ELAPSED  100000
```

Hypothetical hardware configuration number three (described above) might use these values which describe a window that begins immediately after the tone and lasts for one tenth of a second.

See also

CFE_MISSION_TIME_MIN_ELAPSED, CFE_MISSION_TIME_MAX_ELAPSED

2.22.9 Specifying Time Server/Client

Configure TIME as a client only when the target system has multiple processors running separate instantiations of the cFE. One instantiation must be configured as the server and the remainder configured as clients. If the target system has only one processor running the cFE, then TIME must be configured as a server.

Enable one, and only one, of the following definitions in the platform configuration header file:

```
#define CFE_PLATFORM_TIME_CFG_SERVER   TRUE
#define CFE_PLATFORM_TIME_CFG_CLIENT   FALSE
```

or

```
#define CFE_PLATFORM_TIME_CFG_SERVER   FALSE
#define CFE_PLATFORM_TIME_CFG_CLIENT   TRUE
```

See also

CFE_PLATFORM_TIME_CFG_SERVER, CFE_PLATFORM_TIME_CFG_CLIENT

2.22.10 Specifying Time Tone Byte Order

By default, the CFE time tone message is a payload of integers in platform-endian order (containing the tone's timestamp, the leap seconds, and state information.) In some configurations, it may be better to have the payload produced in big-endian order–particularly in mixed-endian environments.

In order to force the tone message to be in big-endian order, you must define the following:

```
#define CFE_PLATFORM_TIME_CFG_BIGENDIAN
```

2.22.11 Virtual MET

This configuration option refers to whether the MET is local to this instantiation of TIME. If the MET is not local then TIME must be configured as using a virtual MET.

Therefore, all TIME clients must be configured as using a virtual MET. If the MET was local to any TIME client, then that instantiation of TIME would have to be the server.

TIME servers must be configured as using a virtual MET

2.22.12 Specifying Time Source

TIME configuration provides the ability to specify where the source for time data is originating - either internal or external. In hypothetical system one, the MET is internal. In system two, TIME cannot directly read the MET, therefore time data must be received from an external source.

This selection also enables a command interface to switch between internal and external input. When commanded to use internal time data, TIME will ignore the external data. However, TIME will continue to use the API function as the trigger to generate a "time at the tone" command packet regardless of the internal/external command selection.

Set the following definition to TRUE only for TIME servers using an external time data source.

```
#define CFE_PLATFORM_TIME_CFG_SOURCE  TRUE
```

The remainder of this section pertains only to TIME servers configured to accept external time data.

When configured to accept external time data, TIME requires an additional definition for the type of external data (GPS, MET, spacecraft time, etc.). This selection will enable an API function specific to the selected data type. Regardless of how the time data is received, the receiver need only pass the data to the appropriate API function.

TIME servers using an external time data source must set one, and only one, of the following to TRUE, for example:

```
#define CFE_PLATFORM_TIME_CFG_SRC_MET   TRUE
#define CFE_PLATFORM_TIME_CFG_SRC_GPS   FALSE
#define CFE_PLATFORM_TIME_CFG_SRC_TIME  FALSE
```

configuration definitions for the particular source.

If the cfe_platform_cfg.h file contains "#define CFE_PLATFORM_TIME_CFG_SOURCE TRUE" then time is configured to allow switching between internal and external time sources (see CFE_TIME_SET_SOURCE_CC). If this configuration parameter is set to FALSE then the command to set the source will be rejected.

If this configuration parameter is set to TRUE then ONE and ONLY ONE of the following configuration parameters must also be set TRUE in order to specify the external time source, for example:

```
#define CFE_PLATFORM_TIME_CFG_SRC_MET   TRUE
#define CFE_PLATFORM_TIME_CFG_SRC_GPS   FALSE
#define CFE_PLATFORM_TIME_CFG_SRC_TIME  FALSE
```

Note that Internal MET source depends on available hardware. It may be the local count of tone signals, the contents of a hardware register or an OS specific time function.

Note also that when configured to use an external time source, commands to set the time will be overwritten.

See also

CFE_PLATFORM_TIME_CFG_SRC_MET, CFE_PLATFORM_TIME_CFG_SRC_GPS, CFE_PLATFORM_TIME_CFG_SRC_TIME

2.22.13 Specifying Time Signal

Some hardware configurations support a primary and redundant tone signal selection. Setting the following configuration definition to TRUE will result in enabling a TIME command to select the active tone signal.

```
#define CFE_PLATFORM_TIME_CFG_SIGNAL  TRUE
```

Note: this feature requires additional custom software to make the physical signal switch.

See also

CFE_PLATFORM_TIME_CFG_SIGNAL

2.22.14 Time Services Paradigm(s)

In order for the cFE Time Services to work for a particular mission, the methods of obtaining time, distributing time and translating time must follow some standard paradigms used in previous missions. The following describes this expected context:

Mission dependent hardware provides the Tone. When this Tone message is received, TIME latches the local time based on the local clock. Note that in lab environments, a simulated Tone capability exists which uses an SB message. Mission dependent hardware also provides the "time at the tone" message based on the hardware latched time and the reference times stored by TIME Server. The TIME Client then updates its local reference time based on the local hardware latched time at the Tone and the provided Time-at-Tone message packet when certain checks (such as the Validity bit being set) pass.

When used in an environment that includes multiple processors, each running a separate instantiation of cFE software, the presumption is that TIME will be distributed in a client/server relationship. In this model, one processor will have TIME configured as the server and the other processors as clients. The TIME server will maintain the various time components and publish a "time at the tone" message to provide synchronized time to the TIME clients. Environments that have only a single instance of TIME must be configured as a TIME server.

In all configurations, the final step in calculating the time "right now" for any instantiation of TIME is to use a local processor clock to measure the "time since the tone".

The specific MET hardware properties will determine whether the MET value can be modified. However, the cFE design is such that there should never be a need to purposefully change or reset the MET.

Regardless of the physical hardware implementation for the MET (elapsed seconds, elapsed ticks, etc.), cFE TIME will convert the hardware MET value into a System Time Format structure for time calculations and will report the converted value in telemetry. cFE TIME will also maintain and report the STCF in a System Time Format structure.

cFE TIME has no knowledge of the current epoch; it is up to the user to keep time on the spacecraft correlated to an epoch. An exception might appear to be the epoch definition required in the cFE mission configuration definition file. However, this definition is for use only by the API functions that convert spacecraft time and file system time, and the API function that prints spacecraft time as a date and time text string. The cFE "get time" functions are independent of the ground epoch.

The mission configuration parameters, CFE_MISSION_TIME_CFG_DEFAULT_TAI and CFE_MISSION_TIME_CFG_DEFAULT_UTC specify the default time format. Applications are encouraged to use the CFE_TIME_GetTime API, which returns time in the format specified by this configuration parameter.

2.22.15 Flywheeling

Flywheeling occurs when TIME is not getting a valid tone signal or external "time at the tone" message. While this has minimal impact on internal operations, it can result in the drifting apart of times being stored by different spacecraft systems.

Flywheeling occurs when at least one of the following conditions is true:

- loss of tone signal
- loss of "time at the tone" data packet
- signal and packet not within valid window
- commanded into fly-wheel mode

If the TIME server is in Flywheel mode then the TIME client is also in flywheel mode.

2.22.16 Time State

Clock state is a combination of factors, most significantly whether the spacecraft time has been accurately set and whether Time Service is operating in FLYWHEEL mode. A ground command is provided to set the state to reflect when the ground has determined the spacecraft time is now correct, or that time is no longer correct. This information will be distributed to Time Clients, and in turn, to any interested sub-systems. If time has not been set then TIME services reports the state of time as invalid, regardless of whether time is flywheeling or not. Also, this command may be used to force a Time Server or Time Client into FLYWHEEL mode. Use of FLYWHEEL mode is mainly for debug purposes although, in extreme circumstances, it may be of value to force Time Service not to rely on normal time updates. Note that when commanded into FLYWHEEL mode, the Time Service will remain so until receipt of another "set state" command setting the state into a mode other than FLYWHEEL. Note also that setting the clock state to VALID or INV↩ALID on a Time Client that is currently getting time updates from the Time Server will have very limited effect. As soon as the Time Client receives the next time update, the VALID/INVALID selection will be set to that of the Time Server. However, setting a Time Client to FLYWHEEL cannot be overridden by the Time Server since the Time Client will ignore time updates from the Time Server while in FLYWHEEL mode.

2.22.17 Initialization

No action is required by the ground to initialize the TIME software; however, time variables in the TIME Server must be set by command to allow correct time to propagate.

For a description of what happens during each type of reset, see below:

- Power-On Reset
- Processor Reset

2.22.17.1 Power-On Reset TIME initializes all counters in housekeeping telemetry, sets the Validity state to Invalid, and initializes the STCF, Leap Seconds, and 1 Hz Adjustment to zero.

2.22.17.2 Processor Reset In the event of a processor reset, the following time values are preserved:

- MET
- STCF
- Leap Seconds
- Clock Signal Selection
- Current Time Client Delay (if applicable)

Note that since it is virtually impossible for TIME services to validate the actual data that is saved across a processor reset, a signature pattern is written to the preserved area. On a processor reset, TIME queries that signature to make sure that it matches what is expected. If the signature does not match, then TIME is initialized as if a cFE power-on reset occurred.

2.22.18 Power-On Reset

TIME initializes all counters in housekeeping telemetry, sets the Validity state to Invalid, and initializes the STCF, Leap Seconds, and 1 Hz Adjustment to zero.

2.22.19 Processor Reset

In the event of a processor reset, the following time values are preserved:

- MET
- STCF
- Leap Seconds
- Clock Signal Selection
- Current Time Client Delay (if applicable)

Note that since it is virtually impossible for TIME services to validate the actual data that is saved across a processor reset, a signature pattern is written to the preserved area. On a processor reset, TIME queries that signature to make sure that it matches what is expected. If the signature does not match, then TIME is initialized as if a cFE power-on reset occurred.

2.22.20 Initialization

No action is required by the ground to initialize the TIME software; however, time variables in the TIME Server must be set by command to allow correct time to propagate.

For a description of what happens during each type of reset, see below:

- Power-On Reset
- Processor Reset

2.22.20.1 Power-On Reset TIME initializes all counters in housekeeping telemetry, sets the Validity state to Invalid, and initializes the STCF, Leap Seconds, and 1 Hz Adjustment to zero.

2.22.20.2 Processor Reset In the event of a processor reset, the following time values are preserved:

- MET
- STCF
- Leap Seconds
- Clock Signal Selection
- Current Time Client Delay (if applicable)

Note that since it is virtually impossible for TIME services to validate the actual data that is saved across a processor reset, a signature pattern is written to the preserved area. On a processor reset, TIME queries that signature to make sure that it matches what is expected. If the signature does not match, then TIME is initialized as if a cFE power-on reset occurred.

2.22.21 Power-On Reset

TIME initializes all counters in housekeeping telemetry, sets the Validity state to Invalid, and initializes the STCF, Leap Seconds, and 1 Hz Adjustment to zero.

2.22.22 Processor Reset

In the event of a processor reset, the following time values are preserved:

- MET
- STCF
- Leap Seconds
- Clock Signal Selection
- Current Time Client Delay (if applicable)

Note that since it is virtually impossible for TIME services to validate the actual data that is saved across a processor reset, a signature pattern is written to the preserved area. On a processor reset, TIME queries that signature to make sure that it matches what is expected. If the signature does not match, then TIME is initialized as if a cFE power-on reset occurred.

2.22.23 Normal Operation

The following sections describe the operator's responsibilities for maintaining time under nominal conditions:

- Client
- Server

2.22.23.1 Client Under normal operation, TIME Client systems do not require any attention from the ground, however TIME clients do provide commands to set the persistent latency between the server and client. Latency can be either added or subtracted to the current TIME client time calculation to account for the latency.

2.22.23.2 Server TIME Servers require maintenance by the operations team to ensure the spacecraft is maintaining a time that can be successfully correlated to other entities. The following sections describe the commands that the operations team can use to help maintain a proper time reference:

- Setting Time
- Adjusting Time
- Setting MET

2.22.23.2.1 Setting Time The Time Server provides commands to set time. The new time value represents the desired offset from mission-defined time epoch and takes effect immediately upon execution of this command. Time Service will calculate a new STCF value based on the current MET and the desired new time using one of the following:

If Time Service is configured to compute current time as TAI:

```
STCF = new time - current MET
current time =  current MET + STCF
```

If Time Service is configured to compute current time as UTC:

```
STCF = ((new time) - (current MET)) + Leap Seconds
current time = ((current MET) + STCF) - Leap Seconds
```

See also

CFE_TIME_SET_TIME_CC

2.22.23.2.2 Adjusting Time The TIME Server includes commands to set the STCF, Leap Seconds, and Validity state. The STCF should be set implicitly using the CFE_TIME_SET_TIME_CC or explicitly using CFE_TIME_SET_STCF_CC. TIME provides the ability to command a one time adjustment (CFE_TIME_ADD_ADJUST_CC and CFE_TIME_SUB_ADJUST_CC) to the current STCF. In addition there is a 1Hz adjustment (CFE_TIME_ADD_ONE_HZ_ADJUSTMEN and CFE_TIME_SUB_ONE_HZ_ADJUSTMENT_CC) that can be made to the STCF to compensate for oscillator drift. Mission specific ground correlation should be used to assist in determining the proper values to use. The Leap Seconds should be set to the current TAI-UTC. Note that the International Earth Rotation and Reference Systems Service Bulletin C, which defines the current difference, reports it as UTC-TAI, and thus that value must be negated. **The Leap Seconds value will always be a positive number.** The Validity state does not have to be set to invalid to change the STCF or Leap Seconds, and should be set to valid at any time that the TIME Server time reference should be synchronized to by the other systems.

See also

CFE_TIME_ADD_ADJUST_CC, CFE_TIME_SUB_ADJUST_CC, CFE_TIME_SET_STCF_CC, CFE_TIME_ADD_ONE_HZ_ADJUS
CFE_TIME_SUB_ONE_HZ_ADJUSTMENT_CC, CFE_TIME_SET_LEAP_SECONDS_CC

2.22.23.2.3 Setting MET The TIME Server provides the capability to set the MET. Note that the MET (as implemented for cFE Time Service) is a logical representation and not a physical timer. Thus, setting the MET is not dependent on whether the hardware supports a MET register that can be written to. Note also that Time Service "assumes" that during normal operation, the MET is synchronized to the tone signal. Therefore, unless operating in FLYWHEEL mode, the sub-seconds portion of the MET will be set to zero at the next tone signal interrupt. The new MET takes effect immediately upon execution of this command.

See also

CFE_TIME_SET_MET_CC

2.22.24 Client

Under normal operation, TIME Client systems do not require any attention from the ground, however TIME clients do provide commands to set the persistent latency between the server and client. Latency can be either added or subtracted to the current TIME client time calculation to account for the latency.

2.22.25 Server

TIME Servers require maintenance by the operations team to ensure the spacecraft is maintaining a time that can be successfully correlated to other entities. The following sections describe the commands that the operations team can use to help maintain a proper time reference:

- Setting Time
- Adjusting Time
- Setting MET

2.22.25.0.1 Setting Time The Time Server provides commands to set time. The new time value represents the desired offset from mission-defined time epoch and takes effect immediately upon execution of this command. Time Service will calculate a new STCF value based on the current MET and the desired new time using one of the following:

If Time Service is configured to compute current time as TAI:

```
STCF = new time - current MET
current time =  current MET + STCF
```

If Time Service is configured to compute current time as UTC:

```
STCF = ((new time) - (current MET)) + Leap Seconds
current time = ((current MET) + STCF) - Leap Seconds
```

See also

CFE_TIME_SET_TIME_CC

2.22.25.0.2 Adjusting Time The TIME Server includes commands to set the STCF, Leap Seconds, and Validity state. The STCF should be set implicitly using the CFE_TIME_SET_TIME_CC or explicitly using CFE_TIME_SET_STCF_CC. TIME provides the ability to command a one time adjustment (CFE_TIME_ADD_ADJUST_CC and CFE_TIME_SUB_ADJUST_CC) to the current STCF. In addition there is a 1Hz adjustment (CFE_TIME_ADD_ONE_HZ_ADJUSTMEN and CFE_TIME_SUB_ONE_HZ_ADJUSTMENT_CC) that can be made to the STCF to compensate for oscillator drift. Mission specific ground correlation should be used to assist in determining the proper values to use. The Leap Seconds should be set to the current TAI-UTC. Note that the International Earth Rotation and Reference Systems Service Bulletin C, which defines the current difference, reports it as UTC-TAI, and thus that value must be negated. **The Leap Seconds value will always be a positive number.** The Validity state does not have to be set to invalid to change the STCF or Leap Seconds, and should be set to valid at any time that the TIME Server time reference should be synchronized to by the other systems.

See also

CFE_TIME_ADD_ADJUST_CC, CFE_TIME_SUB_ADJUST_CC, CFE_TIME_SET_STCF_CC, CFE_TIME_ADD_ONE_HZ_ADJUS
CFE_TIME_SUB_ONE_HZ_ADJUSTMENT_CC, CFE_TIME_SET_LEAP_SECONDS_CC

2.22.25.0.3 Setting MET The TIME Server provides the capability to set the MET. Note that the MET (as implemented for cFE Time Service) is a logical representation and not a physical timer. Thus, setting the MET is not dependent on whether the hardware supports a MET register that can be written to. Note also that Time Service "assumes" that during normal operation, the MET is synchronized to the tone signal. Therefore, unless operating in FLYWHEEL mode, the sub-seconds portion of the MET will be set to zero at the next tone signal interrupt. The new MET takes effect immediately upon execution of this command.

See also

CFE_TIME_SET_MET_CC

2.22.26 Setting Time

The Time Server provides commands to set time. The new time value represents the desired offset from mission-defined time epoch and takes effect immediately upon execution of this command. Time Service will calculate a new STCF value based on the current MET and the desired new time using one of the following:

If Time Service is configured to compute current time as TAI:

```
STCF = new time - current MET
current time =  current MET + STCF
```

If Time Service is configured to compute current time as UTC:

```
STCF = ((new time) - (current MET)) + Leap Seconds
current time = ((current MET) + STCF) - Leap Seconds
```

See also

CFE_TIME_SET_TIME_CC

2.22.27 Adjusting Time

The TIME Server includes commands to set the STCF, Leap Seconds, and Validity state. The STCF should be set implicitly using the CFE_TIME_SET_TIME_CC or explicitly using CFE_TIME_SET_STCF_CC. TIME provides the ability to command a one time adjustment (CFE_TIME_ADD_ADJUST_CC and CFE_TIME_SUB_ADJUST_CC) to the current STCF. In addition there is a 1Hz adjustment (CFE_TIME_ADD_ONE_HZ_ADJUSTMENT_CC and CFE_TIME_SUB_ONE_HZ_ADJUSTMENT_CC) that can be made to the STCF to compensate for oscillator drift. Mission specific ground correlation should be used to assist in determining the proper values to use. The Leap Seconds should be set to the current TAI-UTC. Note that the International Earth Rotation and Reference Systems Service Bulletin C, which defines the current difference, reports it as UTC-TAI, and thus that value must be negated. **The Leap Seconds value will always be a positive number.** The Validity state does not have to be set to invalid to change the STCF or Leap Seconds, and should be set to valid at any time that the TIME Server time reference should be synchronized to by the other systems.

See also

CFE_TIME_ADD_ADJUST_CC, CFE_TIME_SUB_ADJUST_CC, CFE_TIME_SET_STCF_CC, CFE_TIME_ADD_ONE_HZ_ADJUS
CFE_TIME_SUB_ONE_HZ_ADJUSTMENT_CC, CFE_TIME_SET_LEAP_SECONDS_CC

2.22.28 Setting MET

The TIME Server provides the capability to set the MET. Note that the MET (as implemented for cFE Time Service) is a logical representation and not a physical timer. Thus, setting the MET is not dependent on whether the hardware supports a MET register that can be written to. Note also that Time Service "assumes" that during normal operation, the MET is synchronized to the tone signal. Therefore, unless operating in FLYWHEEL mode, the sub-seconds portion of the MET will be set to zero at the next tone signal interrupt. The new MET takes effect immediately upon execution of this command.

See also

CFE_TIME_SET_MET_CC

2.22.29 Frequently Asked Questions about Time Services

None submitted

2.23 cFE Time Services Commands

Upon receipt of any command, the Time Services application will confirm that the message length embedded within the header (from `CFE_MSG_GetSize()`) matches the expected length of that message, based on the size of the C structure defining that command. If there is any discrepancy between the expected and actual message size, TIME will generate the CFE_TIME_LEN_ERR_EID event, increment the command error counter ($sc_$cpu_TIME_CMDEC), and the command will *not* be accepted for processing.

The following is a list of commands that are processed by the cFE Time Services Task.

Global CFE_TIME_ADD_ADJUST_CC

Add Delta to Spacecraft Time Correlation Factor

Global CFE_TIME_ADD_DELAY_CC

Add Time to Tone Time Delay

Global CFE_TIME_ADD_ONE_HZ_ADJUSTMENT_CC

Add Delta to Spacecraft Time Correlation Factor each 1Hz

Global CFE_TIME_NOOP_CC

Time No-Op

Global CFE_TIME_RESET_COUNTERS_CC

Time Reset Counters

Global CFE_TIME_SEND_DIAGNOSTIC_CC

Request TIME Diagnostic Telemetry

Global CFE_TIME_SET_LEAP_SECONDS_CC

Set Leap Seconds

Global CFE_TIME_SET_MET_CC

Set Mission Elapsed Time

Global CFE_TIME_SET_SIGNAL_CC

Set Tone Signal Source

Global CFE_TIME_SET_SOURCE_CC

Set Time Source

Global CFE_TIME_SET_STATE_CC

Set Time State

Global CFE_TIME_SET_STCF_CC

Set Spacecraft Time Correlation Factor

Global CFE_TIME_SET_TIME_CC

Set Spacecraft Time

Global CFE_TIME_SUB_ADJUST_CC

Subtract Delta from Spacecraft Time Correlation Factor

Global CFE_TIME_SUB_DELAY_CC

Subtract Time from Tone Time Delay

Global CFE_TIME_SUB_ONE_HZ_ADJUSTMENT_CC

Subtract Delta from Spacecraft Time Correlation Factor each 1Hz

2.24 cFE Time Services Telemetry

The following are telemetry packets generated by the cFE Time Services Task.

Global CFE_TIME_DiagnosticTlm_Payload_t

Time Services Diagnostics Packet

Global CFE_TIME_DiagnosticTlm_Payload_t

Time Services Diagnostics Packet

Global CFE_TIME_HousekeepingTlm_Payload_t

Time Services Housekeeping Packet

Global CFE_TIME_HousekeepingTlm_Payload_t

Time Services Housekeeping Packet

2.25 cFE Time Services Configuration Parameters

The following are configuration parameters used to configure the cFE Time Services either for each platform or for a mission as a whole.

Global CFE_MISSION_TIME_AT_TONE_WAS

Default Time and Tone Order

Default Time and Tone Order

Global CFE_MISSION_TIME_CFG_DEFAULT_TAI

Default Time Format

Default Time Format

Global CFE_MISSION_TIME_CFG_FAKE_TONE

Default Time Format

Default Time Format

Global CFE_MISSION_TIME_DEF_MET_SECS

Default Time Values

Default Time Values

Global CFE_MISSION_TIME_EPOCH_YEAR

Default EPOCH Values

Default EPOCH Values

Global CFE_MISSION_TIME_FS_FACTOR

Time File System Factor

Time File System Factor

Global CFE_MISSION_TIME_MIN_ELAPSED

Min and Max Time Elapsed

Min and Max Time Elapsed

Global CFE_PLATFORM_TIME_CFG_LATCH_FLY

Define Periodic Time to Update Local Clock Tone Latch

Define Periodic Time to Update Local Clock Tone Latch

Global CFE_PLATFORM_TIME_CFG_SERVER

Time Server or Time Client Selection

Time Server or Time Client Selection

Global CFE_PLATFORM_TIME_CFG_SIGNAL

Include or Exclude the Primary/Redundant Tone Selection Cmd

Include or Exclude the Primary/Redundant Tone Selection Cmd

Global CFE_PLATFORM_TIME_CFG_SOURCE

Include or Exclude the Internal/External Time Source Selection Cmd

Include or Exclude the Internal/External Time Source Selection Cmd

Global CFE_PLATFORM_TIME_CFG_SRC_MET

Choose the External Time Source for Server only

Choose the External Time Source for Server only

Global CFE_PLATFORM_TIME_CFG_START_FLY

Define Time to Start Flywheel Since Last Tone

Define Time to Start Flywheel Since Last Tone

Global CFE_PLATFORM_TIME_CFG_TONE_LIMIT

Define Timing Limits From One Tone To The Next

Define Timing Limits From One Tone To The Next

Global CFE_PLATFORM_TIME_CFG_VIRTUAL

Time Tone In Big-Endian Order

Local MET or Virtual MET Selection for Time Servers

Time Tone In Big-Endian Order

Local MET or Virtual MET Selection for Time Servers

Global CFE_PLATFORM_TIME_MAX_DELTA_SECS

Define the Max Delta Limits for Time Servers using an Ext Time Source

Define the Max Delta Limits for Time Servers using an Ext Time Source

Global CFE_PLATFORM_TIME_MAX_LOCAL_SECS

Define the Local Clock Rollover Value in seconds and subseconds

Define the Local Clock Rollover Value in seconds and subseconds

Global CFE_PLATFORM_TIME_START_TASK_PRIORITY

Define TIME Task Priorities

Define TIME Task Priorities

Global CFE_PLATFORM_TIME_START_TASK_STACK_SIZE

Define TIME Task Stack Sizes

Define TIME Task Stack Sizes

2.26 cFE Event Message Cross Reference

The following cross reference maps the text associated with each cFE Event Message to its Event Message Identifier. A user can search this page for the text of the message they wish to learn more about and then click on the associated Event Message Identifier to obtain more information.

2.27 cFE Command Mnemonic Cross Reference

The following cross reference maps the cFE command codes to Command Mnemonics. To learn about the details of a particular command, click on its associated command code.

Global CFE_ES_CLEAR_ER_LOG_CC

$sc_$cpu_ES_ClearERLog

Global CFE_ES_CLEAR_SYS_LOG_CC

$sc_$cpu_ES_ClearSysLog

Global CFE_ES_DELETE_CDS_CC

$sc_$cpu_ES_DeleteCDS

Global CFE_ES_DUMP_CDS_REGISTRY_CC

$sc_$cpu_ES_WriteCDS2File

Global CFE_ES_NOOP_CC

$sc_$cpu_ES_NOOP

Global CFE_ES_OVER_WRITE_SYS_LOG_CC

$sc_$cpu_ES_OverwriteSysLogMode

Global CFE_ES_QUERY_ALL_CC

$sc_$cpu_ES_WriteAppInfo2File

Global CFE_ES_QUERY_ALL_TASKS_CC

$sc_$cpu_ES_WriteTaskInfo2File

Global CFE_ES_QUERY_ONE_CC

$sc_$cpu_ES_QueryApp

Global CFE_ES_RELOAD_APP_CC

$sc_$cpu_ES_ReloadApp

Global CFE_ES_RESET_COUNTERS_CC

$sc_$cpu_ES_ResetCtrs

Global CFE_ES_RESET_PR_COUNT_CC

$sc_$cpu_ES_ResetPRCnt

Global CFE_ES_RESTART_APP_CC

$sc_$cpu_ES_ResetApp

Global CFE_ES_RESTART_CC

$sc_$cpu_ES_ProcessorReset, $sc_$cpu_ES_PowerOnReset

Global CFE_ES_SEND_MEM_POOL_STATS_CC

$sc_$cpu_ES_PoolStats

Global CFE_ES_SET_MAX_PR_COUNT_CC

$sc_$cpu_ES_SetMaxPRCnt

Global CFE_ES_SET_PERF_FILTER_MASK_CC

$sc_$cpu_ES_LAFilterMask

Global CFE_ES_SET_PERF_TRIGGER_MASK_CC

$sc_$cpu_ES_LATriggerMask

Global CFE_ES_START_APP_CC

$sc_$cpu_ES_StartApp

Global CFE_ES_START_PERF_DATA_CC

$sc_$cpu_ES_StartLAData

Global CFE_ES_STOP_APP_CC

$sc_$cpu_ES_StopApp

Global CFE_ES_STOP_PERF_DATA_CC

$sc_$cpu_ES_StopLAData

Global CFE_ES_WRITE_ER_LOG_CC

$sc_$cpu_ES_WriteERLog2File

Global CFE_ES_WRITE_SYS_LOG_CC

$sc_$cpu_ES_WriteSysLog2File

Global CFE_EVS_ADD_EVENT_FILTER_CC

$sc_$cpu_EVS_AddEvtFltr

Global CFE_EVS_CLEAR_LOG_CC

$sc_$cpu_EVS_ClrLog

Global CFE_EVS_DELETE_EVENT_FILTER_CC

$sc_$cpu_EVS_DelEvtFltr

Global CFE_EVS_DISABLE_APP_EVENT_TYPE_CC

$sc_$cpu_EVS_DisAppEvtType, $sc_$cpu_EVS_DisAppEvtTypeMask

Global CFE_EVS_DISABLE_APP_EVENTS_CC

$sc_$cpu_EVS_DisAppEvGen

Global CFE_EVS_DISABLE_EVENT_TYPE_CC

$sc_$cpu_EVS_DisEventType, $sc_$cpu_EVS_DisEventTypeMask

Global CFE_EVS_DISABLE_PORTS_CC

$sc_$cpu_EVS_DisPort, $sc_$cpu_EVS_DisPortMask

Global CFE_EVS_ENABLE_APP_EVENT_TYPE_CC

$sc_$cpu_EVS_EnaAppEvtType, $sc_$cpu_EVS_EnaAppEvtTypeMask

Global CFE_EVS_ENABLE_APP_EVENTS_CC

$sc_$cpu_EVS_EnaAppEvGen

Global CFE_EVS_ENABLE_EVENT_TYPE_CC

$sc_$cpu_EVS_EnaEventType, $sc_$cpu_EVS_EnaEventTypeMask

Global CFE_EVS_ENABLE_PORTS_CC

$sc_$cpu_EVS_EnaPort, $sc_$cpu_EVS_EnaPortMask

Global CFE_EVS_NOOP_CC

$sc_$cpu_EVS_NOOP

Global CFE_EVS_RESET_ALL_FILTERS_CC

$sc_$cpu_EVS_RstAllFltrs

Global CFE_EVS_RESET_APP_COUNTER_CC

$sc_$cpu_EVS_RstAppCtrs

Global CFE_EVS_RESET_COUNTERS_CC

$sc_$cpu_EVS_ResetCtrs

Global CFE_EVS_RESET_FILTER_CC

$sc_$cpu_EVS_RstBinFltrCtr

Global CFE_EVS_SET_EVENT_FORMAT_MODE_CC

$sc_$cpu_EVS_SetEvtFmt

Global CFE_EVS_SET_FILTER_CC

$sc_$cpu_EVS_SetBinFltrMask

Global CFE_EVS_SET_LOG_MODE_CC

$sc_$cpu_EVS_SetLogMode

Global CFE_EVS_WRITE_APP_DATA_FILE_CC

$sc_$cpu_EVS_WriteAppData2File

Global CFE_EVS_WRITE_LOG_DATA_FILE_CC

$sc_$cpu_EVS_WriteLog2File

Global CFE_SB_DISABLE_ROUTE_CC

$sc_$cpu_SB_DisRoute

Global CFE_SB_DISABLE_SUB_REPORTING_CC

$sc_$cpu_SB_DisSubRptg

Global CFE_SB_ENABLE_ROUTE_CC

$sc_$cpu_SB_EnaRoute

Global CFE_SB_ENABLE_SUB_REPORTING_CC

$sc_$cpu_SB_EnaSubRptg

Global CFE_SB_NOOP_CC

$sc_$cpu_SB_NOOP

Global CFE_SB_RESET_COUNTERS_CC

$sc_$cpu_SB_ResetCtrs

Global CFE_SB_SEND_PREV_SUBS_CC

$sc_$cpu_SB_SendPrevSubs

Global CFE_SB_SEND_SB_STATS_CC

$sc_$cpu_SB_DumpStats

Global CFE_SB_WRITE_MAP_INFO_CC

$sc_$cpu_SB_WriteMap2File

Global CFE_SB_WRITE_PIPE_INFO_CC

$sc_$cpu_SB_WritePipe2File

Global CFE_SB_WRITE_ROUTING_INFO_CC

$sc_$cpu_SB_WriteRouting2File

Global CFE_TBL_ABORT_LOAD_CC

$sc_$cpu_TBL_LOADABORT

Global CFE_TBL_ACTIVATE_CC

$sc_$cpu_TBL_ACTIVATE

Global CFE_TBL_DELETE_CDS_CC

$sc_$cpu_TBL_DeleteCDS

Global CFE_TBL_DUMP_CC

$sc_$cpu_TBL_DUMP

Global CFE_TBL_DUMP_REGISTRY_CC

$sc_$cpu_TBL_WriteReg2File

Global CFE_TBL_LOAD_CC

$sc_$cpu_TBL_Load

Global CFE_TBL_NOOP_CC

$sc_$cpu_TBL_NOOP

Global CFE_TBL_RESET_COUNTERS_CC

$sc_$cpu_TBL_ResetCtrs

Global CFE_TBL_SEND_REGISTRY_CC

$sc_$cpu_TBL_TLMReg

Global CFE_TBL_VALIDATE_CC

$sc_$cpu_TBL_VALIDATE

Global CFE_TIME_ADD_ADJUST_CC

$sc_$cpu_TIME_AddSTCFAdj

Global CFE_TIME_ADD_DELAY_CC

$sc_$cpu_TIME_AddClockLat

Global CFE_TIME_ADD_ONE_HZ_ADJUSTMENT_CC

$sc_$cpu_TIME_Add1HzSTCF

Global CFE_TIME_NOOP_CC

$sc_$cpu_TIME_NOOP

Global CFE_TIME_RESET_COUNTERS_CC

$sc_$cpu_TIME_ResetCtrs

Global CFE_TIME_SEND_DIAGNOSTIC_CC

$sc_$cpu_TIME_RequestDiag

Global CFE_TIME_SET_LEAP_SECONDS_CC

$sc_$cpu_TIME_SetClockLeap

Global CFE_TIME_SET_MET_CC

$sc_$cpu_TIME_SetClockMET

Global CFE_TIME_SET_SIGNAL_CC

$sc_$cpu_TIME_SetSignal

Global CFE_TIME_SET_SOURCE_CC

$sc_$cpu_TIME_SetSource

Global CFE_TIME_SET_STATE_CC

$sc_$cpu_TIME_SetState

Global CFE_TIME_SET_STCF_CC

$sc_$cpu_TIME_SetClockSTCF

Global CFE_TIME_SET_TIME_CC

$sc_$cpu_TIME_SetClock

Global CFE_TIME_SUB_ADJUST_CC

$sc_$cpu_TIME_SubSTCFAdj

Global CFE_TIME_SUB_DELAY_CC

$sc_$cpu_TIME_SubClockLat

Global CFE_TIME_SUB_ONE_HZ_ADJUSTMENT_CC

$sc_$cpu_TIME_Sub1HzSTCF

2.28 cFE Telemetry Mnemonic Cross Reference

The following cross reference maps the cFE telemetry packet members to their associated ground system telemetry mnemonics.

Global CFE_ES_AppInfo::AddressesAreValid

$sc_$cpu_ES_AddrsValid

Global CFE_ES_AppInfo::BSSAddress

$sc_$cpu_ES_BSSAddress

Global CFE_ES_AppInfo::BSSSize

$sc_$cpu_ES_BSSSize

Global CFE_ES_AppInfo::CodeAddress

$sc_$cpu_ES_CodeAddress

Global CFE_ES_AppInfo::CodeSize

$sc_$cpu_ES_CodeSize

Global CFE_ES_AppInfo::DataAddress

$sc_$cpu_ES_DataAddress

Global CFE_ES_AppInfo::DataSize

$sc_$cpu_ES_DataSize

Global CFE_ES_AppInfo::EntryPoint [CFE_MISSION_MAX_API_LEN]

$sc_$cpu_ES_AppEntryPt[OS_MAX_API_NAME]

Global CFE_ES_AppInfo::ExceptionAction

$sc_$cpu_ES_ExceptnActn

Global CFE_ES_AppInfo::ExecutionCounter

$sc_$cpu_ES_ExecutionCtr

Global CFE_ES_AppInfo::FileName [CFE_MISSION_MAX_PATH_LEN]

$sc_$cpu_ES_AppFilename[OS_MAX_PATH_LEN]

Global CFE_ES_AppInfo::MainTaskId

$sc_$cpu_ES_MainTaskId

Global CFE_ES_AppInfo::MainTaskName [CFE_MISSION_MAX_API_LEN]

$sc_$cpu_ES_MainTaskName[OS_MAX_API_NAME]

Global CFE_ES_AppInfo::Name [CFE_MISSION_MAX_API_LEN]

$sc_$cpu_ES_AppName[OS_MAX_API_NAME]

Global CFE_ES_AppInfo::NumOfChildTasks

$sc_$cpu_ES_ChildTasks

Global CFE_ES_AppInfo::Priority

$sc_$cpu_ES_Priority

Global CFE_ES_AppInfo::ResourceId

$sc_$cpu_ES_AppID

Global CFE_ES_AppInfo::StackSize

$sc_$cpu_ES_StackSize

Global CFE_ES_AppInfo::StartAddress

$sc_$cpu_ES_StartAddr

Global CFE_ES_AppInfo::Type

$sc_$cpu_ES_AppType

Global CFE_ES_HousekeepingTlm_Payload::BootSource

$sc_$cpu_ES_BootSource

Global CFE_ES_HousekeepingTlm_Payload::CFECoreChecksum

$sc_$cpu_ES_CKSUM

Global CFE_ES_HousekeepingTlm_Payload::CFEMajorVersion

$sc_$cpu_ES_CFEMAJORVER

Global CFE_ES_HousekeepingTlm_Payload::CFEMinorVersion

$sc_$cpu_ES_CFEMINORVER

Global CFE_ES_HousekeepingTlm_Payload::CFEMissionRevision

$sc_$cpu_ES_CFEMISSIONREV

Global CFE_ES_HousekeepingTlm_Payload::CFERevision

$sc_$cpu_ES_CFEREVISION

Global CFE_ES_HousekeepingTlm_Payload::CommandCounter

$sc_$cpu_ES_CMDPC

Global CFE_ES_HousekeepingTlm_Payload::CommandErrorCounter

$sc_$cpu_ES_CMDEC

Global CFE_ES_HousekeepingTlm_Payload::ERLogEntries

$sc_$cpu_ES_ERLOGENTRIES

Global CFE_ES_HousekeepingTlm_Payload::ERLogIndex

$sc_$cpu_ES_ERLOGINDEX

Global CFE_ES_HousekeepingTlm_Payload::HeapBlocksFree

$sc_$cpu_ES_HeapBlocksFree

Global CFE_ES_HousekeepingTlm_Payload::HeapBytesFree

$sc_$cpu_ES_HeapBytesFree

Global CFE_ES_HousekeepingTlm_Payload::HeapMaxBlockSize

$sc_$cpu_ES_HeapMaxBlkSize

Global CFE_ES_HousekeepingTlm_Payload::MaxProcessorResets

$sc_$cpu_ES_MaxProcResets

Global CFE_ES_HousekeepingTlm_Payload::OSALMajorVersion

$sc_$cpu_ES_OSMAJORVER

Global CFE_ES_HousekeepingTlm_Payload::OSALMinorVersion

$sc_$cpu_ES_OSMINORVER

Global CFE_ES_HousekeepingTlm_Payload::OSALMissionRevision

$sc_$cpu_ES_OSMISSIONREV

Global CFE_ES_HousekeepingTlm_Payload::OSALRevision

$sc_$cpu_ES_OSREVISION

Global CFE_ES_HousekeepingTlm_Payload::PerfDataCount

$sc_$cpu_ES_PerfDataCnt

Global CFE_ES_HousekeepingTlm_Payload::PerfDataEnd

$sc_$cpu_ES_PerfDataEnd

Global CFE_ES_HousekeepingTlm_Payload::PerfDataStart

$sc_$cpu_ES_PerfDataStart

Global CFE_ES_HousekeepingTlm_Payload::PerfDataToWrite

$sc_$cpu_ES_PerfData2Write

Global CFE_ES_HousekeepingTlm_Payload::PerfFilterMask [CFE_MISSION_ES_PERF_MAX_IDS/32]

$sc_$cpu_ES_PerfFltrMask[MaskCnt]

Global CFE_ES_HousekeepingTlm_Payload::PerfMode

$sc_$cpu_ES_PerfMode

Global CFE_ES_HousekeepingTlm_Payload::PerfState

$sc_$cpu_ES_PerfState

Global CFE_ES_HousekeepingTlm_Payload::PerfTriggerCount

$sc_$cpu_ES_PerfTrigCnt

Global CFE_ES_HousekeepingTlm_Payload::PerfTriggerMask [CFE_MISSION_ES_PERF_MAX_IDS/32]

$sc_$cpu_ES_PerfTrigMask[MaskCnt]

Global CFE_ES_HousekeepingTlm_Payload::ProcessorResets

$sc_$cpu_ES_ProcResetCnt

Global CFE_ES_HousekeepingTlm_Payload::PSPMajorVersion

$sc_$cpu_ES_PSPMAJORVER

Global CFE_ES_HousekeepingTlm_Payload::PSPMinorVersion

$sc_$cpu_ES_PSPMINORVER

Global CFE_ES_HousekeepingTlm_Payload::PSPMissionRevision

$sc_$cpu_ES_PSPMISSIONREV

Global CFE_ES_HousekeepingTlm_Payload::PSPRevision

$sc_$cpu_ES_PSPREVISION

Global CFE_ES_HousekeepingTlm_Payload::RegisteredCoreApps

$sc_$cpu_ES_RegCoreApps

Global CFE_ES_HousekeepingTlm_Payload::RegisteredExternalApps

$sc_$cpu_ES_RegExtApps

Global CFE_ES_HousekeepingTlm_Payload::RegisteredLibs

$sc_$cpu_ES_RegLibs

Global CFE_ES_HousekeepingTlm_Payload::RegisteredTasks

$sc_$cpu_ES_RegTasks

Global CFE_ES_HousekeepingTlm_Payload::ResetSubtype

$sc_$cpu_ES_ResetSubtype

Global CFE_ES_HousekeepingTlm_Payload::ResetType

$sc_$cpu_ES_ResetType

Global CFE_ES_HousekeepingTlm_Payload::SysLogBytesUsed

$sc_$cpu_ES_SYSLOGBYTEUSED

Global CFE_ES_HousekeepingTlm_Payload::SysLogEntries

$sc_$cpu_ES_SYSLOGENTRIES

Global CFE_ES_HousekeepingTlm_Payload::SysLogMode

$sc_$cpu_ES_SYSLOGMODE

Global CFE_ES_HousekeepingTlm_Payload::SysLogSize

$sc_$cpu_ES_SYSLOGSIZE

Global CFE_ES_MemPoolStats::BlockStats [CFE_MISSION_ES_POOL_MAX_BUCKETS]

$sc_$cpu_ES_BlkStats[BLK_SIZES]

Global CFE_ES_MemPoolStats::CheckErrCtr

$sc_$cpu_ES_BlkErrCTR

Global CFE_ES_MemPoolStats::NumBlocksRequested

$sc_$cpu_ES_BlksREQ

Global CFE_ES_MemPoolStats::NumFreeBytes

$sc_$cpu_ES_FreeBytes

Global CFE_ES_MemPoolStats::PoolSize

$sc_$cpu_ES_PoolSize

Global CFE_ES_PoolStatsTlm_Payload::PoolHandle

$sc_$cpu_ES_PoolHandle

Global CFE_EVS_AppTlmData::AppEnableStatus

$sc_$cpu_EVS_APP[CFE_PLATFORM_ES_MAX_APPLICATIONS].APPENASTAT

Global CFE_EVS_AppTlmData::AppID

$sc_$cpu_EVS_APP[CFE_PLATFORM_ES_MAX_APPLICATIONS].APPID

Global CFE_EVS_AppTlmData::AppMessageSentCounter

$sc_$cpu_EVS_APP[CFE_PLATFORM_ES_MAX_APPLICATIONS].APPMSGSENTC

Global CFE_EVS_AppTlmData::AppMessageSquelchedCounter

$sc_$cpu_EVS_APP[CFE_PLATFORM_ES_MAX_APPLICATIONS].SQUELCHEDC

Global CFE_EVS_HousekeepingTlm_Payload::AppData [CFE_MISSION_ES_MAX_APPLICATIONS]

$sc_$cpu_EVS_APP[CFE_PLATFORM_ES_MAX_APPLICATIONS]

Global CFE_EVS_HousekeepingTlm_Payload::CommandCounter

$sc_$cpu_EVS_CMDPC

Global CFE_EVS_HousekeepingTlm_Payload::CommandErrorCounter

$sc_$cpu_EVS_CMDEC

Global CFE_EVS_HousekeepingTlm_Payload::LogEnabled

$sc_$cpu_EVS_LOGENABLED

Global CFE_EVS_HousekeepingTlm_Payload::LogFullFlag

$sc_$cpu_EVS_LOGFULL

Global CFE_EVS_HousekeepingTlm_Payload::LogMode

$sc_$cpu_EVS_LOGMODE

Global CFE_EVS_HousekeepingTlm_Payload::LogOverflowCounter

$sc_$cpu_EVS_LOGOVERFLOWC

Global CFE_EVS_HousekeepingTlm_Payload::MessageFormatMode

$sc_$cpu_EVS_MSGFMTMODE

Global CFE_EVS_HousekeepingTlm_Payload::MessageSendCounter

$sc_$cpu_EVS_MSGSENTC

Global CFE_EVS_HousekeepingTlm_Payload::MessageTruncCounter

$sc_$cpu_EVS_MSGTRUNC

Global CFE_EVS_HousekeepingTlm_Payload::OutputPort

$sc_$cpu_EVS_OUTPUTPORT

Global CFE_EVS_HousekeepingTlm_Payload::Spare1

$sc_$cpu_EVS_HK_SPARE1

Global CFE_EVS_HousekeepingTlm_Payload::Spare2

$sc_$cpu_EVS_HK_SPARE2

Global CFE_EVS_HousekeepingTlm_Payload::Spare3

$sc_$cpu_EVS_HK_SPARE3

Global CFE_EVS_HousekeepingTlm_Payload::UnregisteredAppCounter

$sc_$cpu_EVS_UNREGAPPC

Global CFE_EVS_LongEventTlm_Payload::Message [CFE_MISSION_EVS_MAX_MESSAGE_LENGTH]

$sc_$cpu_EVS_EVENT[CFE_MISSION_EVS_MAX_MESSAGE_LENGTH]

Global CFE_EVS_LongEventTlm_Payload::Spare1

$sc_$cpu_EVS_SPARE1

Global CFE_EVS_LongEventTlm_Payload::Spare2

$sc_$cpu_EVS_SPARE2

Global CFE_EVS_PacketID::AppName [CFE_MISSION_MAX_API_LEN]

$sc_$cpu_EVS_APPNAME[OS_MAX_API_NAME]

Global CFE_EVS_PacketID::EventID

$sc_$cpu_EVS_EVENTID

Global CFE_EVS_PacketID::EventType

$sc_$cpu_EVS_EVENTTYPE

Global CFE_EVS_PacketID::ProcessorID

$sc_$cpu_EVS_PROCESSORID

Global CFE_EVS_PacketID::SpacecraftID

$sc_$cpu_EVS_SCID

Global CFE_SB_HousekeepingTlm_Payload::CommandCounter

$sc_$cpu_SB_CMDPC

Global CFE_SB_HousekeepingTlm_Payload::CommandErrorCounter

$sc_$cpu_SB_CMDEC

Global CFE_SB_HousekeepingTlm_Payload::CreatePipeErrorCounter

$sc_$cpu_SB_NewPipeEC

Global CFE_SB_HousekeepingTlm_Payload::DuplicateSubscriptionsCounter

$sc_$cpu_SB_DupSubCnt

Global CFE_SB_HousekeepingTlm_Payload::GetPipeIdByNameErrorCounter

$sc_$cpu_SB_GetPipeIDByNameEC

Global CFE_SB_HousekeepingTlm_Payload::InternalErrorCounter

$sc_$cpu_SB_InternalEC

Global CFE_SB_HousekeepingTlm_Payload::MemInUse

$sc_$cpu_SB_MemInUse

Global CFE_SB_HousekeepingTlm_Payload::MemPoolHandle

$sc_$cpu_SB_MemPoolHdl

Global CFE_SB_HousekeepingTlm_Payload::MsgLimitErrorCounter

$sc_$cpu_SB_MsgLimEC

Global CFE_SB_HousekeepingTlm_Payload::MsgReceiveErrorCounter

$sc_$cpu_SB_MsgRecEC

Global CFE_SB_HousekeepingTlm_Payload::MsgSendErrorCounter

$sc_$cpu_SB_MsgSndEC

Global CFE_SB_HousekeepingTlm_Payload::NoSubscribersCounter

$sc_$cpu_SB_NoSubEC

Global CFE_SB_HousekeepingTlm_Payload::PipeOptsErrorCounter

$sc_$cpu_SB_PipeOptsEC

Global CFE_SB_HousekeepingTlm_Payload::PipeOverflowErrorCounter

$sc_$cpu_SB_PipeOvrEC

Global CFE_SB_HousekeepingTlm_Payload::Spare2Align [1]

$sc_$cpu_SB_Spare2Align[2]

Global CFE_SB_HousekeepingTlm_Payload::SubscribeErrorCounter

$sc_$cpu_SB_SubscrEC

Global CFE_SB_HousekeepingTlm_Payload::UnmarkedMem

$sc_$cpu_SB_UnMarkedMem

Global CFE_SB_PipeDepthStats::CurrentQueueDepth

$sc_$cpu_SB_Stat.SB_SMPDS[CFE_PLATFORM_SB_MAX_PIPES].SB_PDINUSE

Global CFE_SB_PipeDepthStats::MaxQueueDepth

$sc_$cpu_SB_Stat.SB_SMPDS[CFE_PLATFORM_SB_MAX_PIPES].SB_PDDEPTH

Global CFE_SB_PipeDepthStats::PeakQueueDepth

$sc_$cpu_SB_Stat.SB_SMPDS[CFE_PLATFORM_SB_MAX_PIPES].SB_PDPKINUSE

Global CFE_SB_PipeDepthStats::PipeId

$sc_$cpu_SB_Stat.SB_SMPDS[CFE_PLATFORM_SB_MAX_PIPES].SB_PDPIPEID

Global CFE_SB_PipeDepthStats::Spare

$sc_$cpu_SB_Stat.SB_SMPDS[CFE_PLATFORM_SB_MAX_PIPES].SB_PDSPARE

Global CFE_SB_StatsTlm_Payload::MaxMemAllowed

$sc_$cpu_SB_Stat.SB_SMMBMALW

Global CFE_SB_StatsTlm_Payload::MaxMsgIdsAllowed

$sc_$cpu_SB_Stat.SB_SMMMIDALW

Global CFE_SB_StatsTlm_Payload::MaxPipeDepthAllowed

$sc_$cpu_SB_Stat.SB_SMMPDALW

Global CFE_SB_StatsTlm_Payload::MaxPipesAllowed

$sc_$cpu_SB_Stat.SB_SMMPALW

Global CFE_SB_StatsTlm_Payload::MaxSubscriptionsAllowed

$sc_$cpu_SB_Stat.SB_SMMSALW

Global CFE_SB_StatsTlm_Payload::MemInUse

$sc_$cpu_SB_Stat.SB_SMBMIU

Global CFE_SB_StatsTlm_Payload::MsgIdsInUse

$sc_$cpu_SB_Stat.SB_SMMIDIU

Global CFE_SB_StatsTlm_Payload::PeakMemInUse

$sc_$cpu_SB_Stat.SB_SMPBMIU

Global CFE_SB_StatsTlm_Payload::PeakMsgIdsInUse

$sc_$cpu_SB_Stat.SB_SMPMIDIU

Global CFE_SB_StatsTlm_Payload::PeakPipesInUse

$sc_$cpu_SB_Stat.SB_SMPPIU

Global CFE_SB_StatsTlm_Payload::PeakSBBuffersInUse

$sc_$cpu_SB_Stat.SB_SMPSBBIU

Global CFE_SB_StatsTlm_Payload::PeakSubscriptionsInUse

$sc_$cpu_SB_Stat.SB_SMPSIU

Global CFE_SB_StatsTlm_Payload::PipeDepthStats [CFE_MISSION_SB_MAX_PIPES]

$sc_$cpu_SB_Stat.SB_SMPDS[CFE_PLATFORM_SB_MAX_PIPES]

Global CFE_SB_StatsTlm_Payload::PipesInUse

$sc_$cpu_SB_Stat.SB_SMPIU

Global CFE_SB_StatsTlm_Payload::SBBuffersInUse

$sc_$cpu_SB_Stat.SB_SMSBBIU

Global CFE_SB_StatsTlm_Payload::SubscriptionsInUse

$sc_$cpu_SB_Stat.SB_SMSIU

Global CFE_TBL_HousekeepingTlm_Payload::ActiveBuffer

$sc_$cpu_TBL_LastValBuf

Global CFE_TBL_HousekeepingTlm_Payload::ByteAlignPad1

$sc_$cpu_TBL_ByteAlignPad1

Global CFE_TBL_HousekeepingTlm_Payload::CommandCounter

$sc_$cpu_TBL_CMDPC

Global CFE_TBL_HousekeepingTlm_Payload::CommandErrorCounter

$sc_$cpu_TBL_CMDEC

Global CFE_TBL_HousekeepingTlm_Payload::FailedValCounter

$sc_$cpu_TBL_ValFailedCtr

Global CFE_TBL_HousekeepingTlm_Payload::LastFileDumped [CFE_MISSION_MAX_PATH_LEN]

$sc_$cpu_TBL_LastFileDumped[OS_MAX_PATH_LEN]

Global CFE_TBL_HousekeepingTlm_Payload::LastFileLoaded [CFE_MISSION_MAX_PATH_LEN]

$sc_$cpu_TBL_LastFileLoaded[OS_MAX_PATH_LEN]

Global CFE_TBL_HousekeepingTlm_Payload::LastTableLoaded [CFE_MISSION_TBL_MAX_FULL_NAME_LEN]

$sc_$cpu_TBL_LastTableLoaded[CFE_TBL_MAX_FULL_NAME_LEN]

Global CFE_TBL_HousekeepingTlm_Payload::LastUpdatedTable [CFE_MISSION_TBL_MAX_FULL_NAME_L↩EN]

$sc_$cpu_TBL_LastUpdTblName[CFE_TB_MAX_FULL_NAME_LEN]

Global CFE_TBL_HousekeepingTlm_Payload::LastUpdateTime

$sc_$cpu_TBL_LastUpdTime, $sc_$cpu_TBL_SECONDS, $sc_$cpu_TBL_SUBSECONDS

Global CFE_TBL_HousekeepingTlm_Payload::LastValCrc

$sc_$cpu_TBL_LastValCRC

Global CFE_TBL_HousekeepingTlm_Payload::LastValStatus

$sc_$cpu_TBl_LastValS

Global CFE_TBL_HousekeepingTlm_Payload::LastValTableName [CFE_MISSION_TBL_MAX_FULL_NAME_L↩EN]

$sc_$cpu_TBL_LastValTblName[CFE_TB_MAX_FULL_NAME_LEN]

Global CFE_TBL_HousekeepingTlm_Payload::MemPoolHandle

$sc_$cpu_TBL_MemPoolHandle

Global CFE_TBL_HousekeepingTlm_Payload::NumFreeSharedBufs

$sc_$cpu_TBL_NumFreeShrBuf

Global CFE_TBL_HousekeepingTlm_Payload::NumLoadPending

$sc_$cpu_TBL_NumUpdatesPend

Global CFE_TBL_HousekeepingTlm_Payload::NumTables

$sc_$cpu_TBL_NumTables

Global CFE_TBL_HousekeepingTlm_Payload::NumValRequests

$sc_$cpu_TBL_ValReqCtr

Global CFE_TBL_HousekeepingTlm_Payload::SuccessValCounter

$sc_$cpu_TBL_ValSuccessCtr

Global CFE_TBL_HousekeepingTlm_Payload::ValidationCounter

$sc_$cpu_TBL_ValCompltdCtr

Global CFE_TBL_TblRegPacket_Payload::ActiveBufferAddr

$sc_$cpu_TBL_ActBufAdd

Global CFE_TBL_TblRegPacket_Payload::ByteAlign4

$sc_$cpu_TBL_Spare4

Global CFE_TBL_TblRegPacket_Payload::Crc

$sc_$cpu_TBL_CRC

Global CFE_TBL_TblRegPacket_Payload::Critical

$sc_$cpu_TBL_Spare3

Global CFE_TBL_TblRegPacket_Payload::DoubleBuffered

$sc_$cpu_TBL_DblBuffered

Global CFE_TBL_TblRegPacket_Payload::DumpOnly

$sc_$cpu_TBL_DumpOnly

Global CFE_TBL_TblRegPacket_Payload::FileTime

$sc_$cpu_TBL_FILECTIME

Global CFE_TBL_TblRegPacket_Payload::InactiveBufferAddr

$sc_$cpu_TBL_IActBufAdd

Global CFE_TBL_TblRegPacket_Payload::LastFileLoaded [CFE_MISSION_MAX_PATH_LEN]

$sc_$cpu_TBL_LastFileUpd[OS_MAX_PATH_LEN]

Global CFE_TBL_TblRegPacket_Payload::LoadPending

$sc_$cpu_TBL_UpdatePndng

Global CFE_TBL_TblRegPacket_Payload::Name [CFE_MISSION_TBL_MAX_FULL_NAME_LEN]

$sc_$cpu_TBL_Name[CFE_TB_MAX_FULL_NAME_LEN]

Global CFE_TBL_TblRegPacket_Payload::OwnerAppName [CFE_MISSION_MAX_API_LEN]

$sc_$cpu_TBL_OwnerApp[OS_MAX_API_NAME]

Global CFE_TBL_TblRegPacket_Payload::Size

$sc_$cpu_TBL_SIZE

Global CFE_TBL_TblRegPacket_Payload::TableLoadedOnce

$sc_$cpu_TBL_LoadedOnce

Global CFE_TBL_TblRegPacket_Payload::TimeOfLastUpdate

$sc_$cpu_TBL_TimeLastUpd, $sc_$cpu_TBL_TLUSECONDS, $sc_$cpu_TBL_TLUSUBSECONDS

Global CFE_TBL_TblRegPacket_Payload::ValidationFuncPtr

$sc_$cpu_TBL_ValFuncPtr

Global CFE_TIME_DiagnosticTlm_Payload::AtToneDelay

$sc_$cpu_TIME_DLatentS, $sc_$cpu_TIME_DLatentSs

Global CFE_TIME_DiagnosticTlm_Payload::AtToneLatch

$sc_$cpu_TIME_DTValidS, $sc_$cpu_TIME_DTValidSs

Global CFE_TIME_DiagnosticTlm_Payload::AtToneLeapSeconds

$sc_$cpu_TIME_DLeapS

Global CFE_TIME_DiagnosticTlm_Payload::AtToneMET

$sc_$cpu_TIME_DTMETS, $sc_$cpu_TIME_DTMETSs

Global CFE_TIME_DiagnosticTlm_Payload::AtToneSTCF

$sc_$cpu_TIME_DSTCFS, $sc_$cpu_TIME_DSTCFSS

Global CFE_TIME_DiagnosticTlm_Payload::ClockFlyState

$sc_$cpu_TIME_DFlywheel

Global CFE_TIME_DiagnosticTlm_Payload::ClockSetState

$sc_$cpu_TIME_DValid

Global CFE_TIME_DiagnosticTlm_Payload::ClockSignal

$sc_$cpu_TIME_DSignal

Global CFE_TIME_DiagnosticTlm_Payload::ClockSource

$sc_$cpu_TIME_DSource

Global CFE_TIME_DiagnosticTlm_Payload::ClockStateAPI

$sc_$cpu_TIME_DAPIState

Global CFE_TIME_DiagnosticTlm_Payload::ClockStateFlags

$sc_$cpu_TIME_DStateFlags, $sc_$cpu_TIME_DFlagSet, $sc_$cpu_TIME_DFlagFly, $sc_$cpu_TIME_DFlagSrc, $sc_$cpu_TIME_DFlagPri, $sc_$cpu_TIME_DFlagSfly, $sc_$cpu_TIME_DFlagCfly, $sc_$cpu_TIME_DFlagAdjd, $sc_$cpu_TIME_DFlag1Hzd, $sc_$cpu_TIME_DFlagClat, $sc_$cpu_TIME_DFlagSorC, $sc_$cpu_TIME_DFlag↩NIU

Global CFE_TIME_DiagnosticTlm_Payload::CurrentLatch

$sc_$cpu_TIME_DLocalS, $sc_$cpu_TIME_DLocalSs

Global CFE_TIME_DiagnosticTlm_Payload::CurrentMET

$sc_$cpu_TIME_DMETS, $sc_$cpu_TIME_DMETSs

Global CFE_TIME_DiagnosticTlm_Payload::CurrentTAI

$sc_$cpu_TIME_DTAIS, $sc_$cpu_TIME_DTAISS

Global CFE_TIME_DiagnosticTlm_Payload::CurrentUTC

$sc_$cpu_TIME_DUTCS, $sc_$cpu_TIME_DUTCSS

Global CFE_TIME_DiagnosticTlm_Payload::DataStoreStatus

$sc_$cpu_TIME_DataStStat

Global CFE_TIME_DiagnosticTlm_Payload::DelayDirection

$sc_$cpu_TIME_DLatentDir

Global CFE_TIME_DiagnosticTlm_Payload::Forced2Fly

$sc_$cpu_TIME_DCMD2Fly

Global CFE_TIME_DiagnosticTlm_Payload::LocalIntCounter

$sc_$cpu_TIME_D1HzISRCNT

Global CFE_TIME_DiagnosticTlm_Payload::LocalTaskCounter

$sc_$cpu_TIME_D1HzTaskCNT

Global CFE_TIME_DiagnosticTlm_Payload::MaxElapsed

$sc_$cpu_TIME_DMaxWindow

Global CFE_TIME_DiagnosticTlm_Payload::MaxLocalClock

$sc_$cpu_TIME_DWrapS, $sc_$cpu_TIME_DWrapSs

Global CFE_TIME_DiagnosticTlm_Payload::MinElapsed

$sc_$cpu_TIME_DMinWindow

Global CFE_TIME_DiagnosticTlm_Payload::OneHzAdjust

$sc_$cpu_TIME_D1HzAdjS, $sc_$cpu_TIME_D1HzAdjSs

Global CFE_TIME_DiagnosticTlm_Payload::OneHzDirection

$sc_$cpu_TIME_D1HzAdjDir

Global CFE_TIME_DiagnosticTlm_Payload::OneTimeAdjust

$sc_$cpu_TIME_DAdjustS, $sc_$cpu_TIME_DAdjustSs

Global CFE_TIME_DiagnosticTlm_Payload::OneTimeDirection

$sc_$cpu_TIME_DAdjustDir

Global CFE_TIME_DiagnosticTlm_Payload::ServerFlyState

$sc_$cpu_TIME_DSrvFly

Global CFE_TIME_DiagnosticTlm_Payload::TimeSinceTone

$sc_$cpu_TIME_DElapsedS, $sc_$cpu_TIME_DElapsedSs

Global CFE_TIME_DiagnosticTlm_Payload::ToneDataCounter

$sc_$cpu_TIME_DTatTCNT

Global CFE_TIME_DiagnosticTlm_Payload::ToneDataLatch

$sc_$cpu_TIME_DTDS, $sc_$cpu_TIME_DTDSs

Global CFE_TIME_DiagnosticTlm_Payload::ToneIntCounter

$sc_$cpu_TIME_DTsISRCNT

Global CFE_TIME_DiagnosticTlm_Payload::ToneIntErrorCounter

$sc_$cpu_TIME_DTsISRERR

Global CFE_TIME_DiagnosticTlm_Payload::ToneMatchCounter

$sc_$cpu_TIME_DVerifyCNT

Global CFE_TIME_DiagnosticTlm_Payload::ToneMatchErrorCounter

$sc_$cpu_TIME_DVerifyER

Global CFE_TIME_DiagnosticTlm_Payload::ToneOverLimit

$sc_$cpu_TIME_DMaxSs

Global CFE_TIME_DiagnosticTlm_Payload::ToneSignalCounter

$sc_$cpu_TIME_DTSDetCNT

Global CFE_TIME_DiagnosticTlm_Payload::ToneSignalLatch

$sc_$cpu_TIME_DTTS, $sc_$cpu_TIME_DTTSs

Global CFE_TIME_DiagnosticTlm_Payload::ToneTaskCounter

$sc_$cpu_TIME_DTsTaskCNT

Global CFE_TIME_DiagnosticTlm_Payload::ToneUnderLimit

$sc_$cpu_TIME_DMinSs

Global CFE_TIME_DiagnosticTlm_Payload::VersionCounter

$sc_$cpu_TIME_DVersionCNT

Global CFE_TIME_DiagnosticTlm_Payload::VirtualMET

$sc_$cpu_TIME_DLogicalMET

Global CFE_TIME_HousekeepingTlm_Payload::ClockStateAPI

$sc_$cpu_TIME_DAPIState

Global CFE_TIME_HousekeepingTlm_Payload::ClockStateFlags

$sc_$cpu_TIME_StateFlg, $sc_$cpu_TIME_FlagSet, $sc_$cpu_TIME_FlagFly, $sc_$cpu_TIME_FlagSrc, $sc_↩ $cpu_TIME_FlagPri, $sc_$cpu_TIME_FlagSfly, $sc_$cpu_TIME_FlagCfly, $sc_$cpu_TIME_FlagAdjd, $sc_$cpu↩ _TIME_Flag1Hzd, $sc_$cpu_TIME_FlagClat, $sc_$cpu_TIME_FlagSorC, $sc_$cpu_TIME_FlagNIU

Global CFE_TIME_HousekeepingTlm_Payload::CommandCounter

$sc_$cpu_TIME_CMDPC

Global CFE_TIME_HousekeepingTlm_Payload::CommandErrorCounter

$sc_$cpu_TIME_CMDEC

Global CFE_TIME_HousekeepingTlm_Payload::LeapSeconds

$sc_$cpu_TIME_LeapSecs

Global CFE_TIME_HousekeepingTlm_Payload::Seconds1HzAdj

$sc_$cpu_TIME_1HzAdjSecs

Global CFE_TIME_HousekeepingTlm_Payload::SecondsDelay

$sc_$cpu_TIME_1HzAdjSecs

Global CFE_TIME_HousekeepingTlm_Payload::SecondsMET

$sc_$cpu_TIME_METSecs

Global CFE_TIME_HousekeepingTlm_Payload::SecondsSTCF

$sc_$cpu_TIME_STCFSecs

Global CFE_TIME_HousekeepingTlm_Payload::Subsecs1HzAdj

$sc_$cpu_TIME_1HzAdjSSecs

Global CFE_TIME_HousekeepingTlm_Payload::SubsecsDelay

$sc_$cpu_TIME_1HzAdjSSecs

Global CFE_TIME_HousekeepingTlm_Payload::SubsecsMET

$sc_$cpu_TIME_METSubsecs

Global CFE_TIME_HousekeepingTlm_Payload::SubsecsSTCF

$sc_$cpu_TIME_STCFSubsecs

3 Glossary of Terms

Term	Definition
Application (or App)	A set of data and functions that is treated as a single entity by the cFE. cFE resources are allocated on a per-Application basis. Applications are made up of a Main Task and zero or more Child Tasks.
Application ID	A processor unique reference to an Application. **NOTE: This is different from a CCSDS Application ID which is referred to as an "APID."**
Application Programmer's Interface (API)	A set of routines, protocols, and tools for building software applications
Platform Support Package (PSP)	A collection of user-provided facilities that interface an OS and the cFE with a specific hardware platform. The PSP is responsible for hardware initialization.
Child Task	A separate thread of execution that is spawned by an Application's Main Task.

Term	Definition
Command	A Software Bus Message defined by the receiving Application. Commands can originate from other onboard Applications or from the ground.
Core Flight Executive (cFE)	A runtime environment and a set of services for hosting FSW Applications
Critical Data Store (CDS)	A collection of data that is not modified by the OS or cFE following a Processor Reset.
Cyclic Redundancy Check	A polynomial based method for checking that a data set has remained unchanged from one time period to another.
Developer	Anyone who is coding a cFE Application.
Event Data	Data describing an Event that is supplied to the cFE Event Service. The cFE includes this data in an Event Message.
Event Filter	A numeric value (bit mask) used to determine how frequently to output an application Event Message defined by its Event ID.
Event Format Mode	Defines the Event Message Format downlink option: short or long. The short format is used when there is limited telemetry bandwidth and is binary. The long format is in ASCII and is used for logging to a Local Event Log and to an Event Message Port.
Event ID	A numeric literal used to uniquely name an Application event.
Event Type	A numeric literal used to identify the type of an Application event. An event type may be CFE_EVS_EventType_DEBUG, CFE_EVS_EventType_INFORMATION, CFE_EVS_EventType_ERROR, or CFE_EVS_EventType_CRITICAL.
Event Message	A data item used to notify the user and/or an external Application of a significant event. Event Messages include a time-stamp of when the message was generated, a processor unique identifier, an Application ID, the Event Type (DEBUG,INFO,ERROR or CRITICAL), and Event Data. An Event Message can either be real-time or playback from a Local Event Log.

4 cFE Application Programmer's Interface (API) Reference

4.1 Executive Services API

- cFE Entry/Exit APIs
  - CFE_ES_Main - cFE Main Entry Point used by Board Support Package to start cFE
  - CFE_ES_ResetCFE - Reset the cFE Core and all cFE Applications.
- cFE Application Control APIs
  - CFE_ES_RestartApp - Restart a single cFE Application.
  - CFE_ES_ReloadApp - Reload a single cFE Application.
  - CFE_ES_DeleteApp - Delete a cFE Application.
- cFE Application Behavior APIs
  - CFE_ES_RunLoop - Check for Exit, Restart, or Reload commands.
  - CFE_ES_WaitForStartupSync - Allow an Application to Wait for the "OPERATIONAL" global system state.
  - CFE_ES_WaitForSystemState - Allow an Application to Wait for a minimum global system state.

  - CFE_ES_IncrementTaskCounter - Increments the execution counter for the calling task.
  - CFE_ES_ExitApp - Exit a cFE Application.
- cFE Information APIs
  - CFE_ES_GetResetType - Return the most recent Reset Type.
  - CFE_ES_GetAppID - Get an Application ID for the calling Application.
  - CFE_ES_GetTaskID - Get the task ID of the calling context.
  - CFE_ES_GetAppIDByName - Get an Application ID associated with a specified Application name.
  - CFE_ES_GetLibIDByName - Get a Library ID associated with a specified Library name.
  - CFE_ES_GetAppName - Get an Application name for a specified Application ID.
  - CFE_ES_GetLibName - Get a Library name for a specified Library ID.
  - CFE_ES_GetAppInfo - Get Application Information given a specified App ID.
  - CFE_ES_GetTaskInfo - Get Task Information given a specified Task ID.
  - CFE_ES_GetLibInfo - Get Library Information given a specified Resource ID.
  - CFE_ES_GetModuleInfo - Get Information given a specified Resource ID.
- cFE Child Task APIs
  - CFE_ES_CreateChildTask - Creates a new task under an existing Application.
  - CFE_ES_GetTaskIDByName - Get a Task ID associated with a specified Task name.
  - CFE_ES_GetTaskName - Get a Task name for a specified Task ID.
  - CFE_ES_DeleteChildTask - Deletes a task under an existing Application.
  - CFE_ES_ExitChildTask - Exits a child task.
- cFE Critical Data Store APIs
  - CFE_ES_RegisterCDS - Reserve space (or re-obtain previously reserved space) in the Critical Data Store (CDS)
  - CFE_ES_GetCDSBlockIDByName - Get a CDS Block ID associated with a specified CDS Block name.
  - CFE_ES_GetCDSBlockName - Get a Block name for a specified Block ID.
  - CFE_ES_CopyToCDS - Save a block of data in the Critical Data Store (CDS)
  - CFE_ES_RestoreFromCDS - Recover a block of data from the Critical Data Store (CDS)
- cFE Memory Manager APIs
  - CFE_ES_PoolCreate - Initializes a memory pool created by an application while using a semaphore during processing.
  - CFE_ES_PoolCreateEx - Initializes a memory pool created by an application with application specified block sizes.
  - CFE_ES_PoolCreateNoSem - Initializes a memory pool created by an application without using a semaphore during processing.
  - CFE_ES_PoolDelete - Deletes a memory pool that was previously created.
  - CFE_ES_GetPoolBuf - Gets a buffer from the memory pool created by CFE_ES_PoolCreate or CFE_ES_PoolCreateNoSem.
  - CFE_ES_PutPoolBuf - Releases a buffer from the memory pool that was previously allocated via CFE_ES_GetPoolBuf.
  - CFE_ES_GetMemPoolStats - Extracts the statistics maintained by the memory pool software.
  - CFE_ES_GetPoolBufInfo - Gets info on a buffer previously allocated via CFE_ES_GetPoolBuf.

- cFE Performance Monitor APIs
  - CFE_ES_PerfLogEntry - Entry marker for use with Software Performance Analysis Tool.
  - CFE_ES_PerfLogExit - Exit marker for use with Software Performance Analysis Tool.
  - CFE_ES_PerfLogAdd - Adds a new entry to the data buffer.
- cFE Generic Counter APIs
  - CFE_ES_RegisterGenCounter - Register a generic counter.
  - CFE_ES_DeleteGenCounter - Delete a generic counter.
  - CFE_ES_IncrementGenCounter - Increments the specified generic counter.
  - CFE_ES_SetGenCount - Set the specified generic counter.
  - CFE_ES_GetGenCount - Get the specified generic counter count.
  - CFE_ES_GetGenCounterIDByName - Get the Id associated with a generic counter name.
  - CFE_ES_GetGenCounterName - Get a Counter name for a specified Counter ID.
- cFE Miscellaneous APIs
  - CFE_ES_BackgroundWakeup - Wakes up the CFE background task.
  - CFE_ES_CalculateCRC - Calculate a CRC on a block of memory.
  - CFE_ES_WriteToSysLog - Write a string to the cFE System Log.
  - CFE_ES_ProcessAsyncEvent - Notification that an asynchronous event was detected by the underlying OS/PSP.
  - CFE_ES_StatusToString - Convert status to a string.
- cFE Resource ID APIs
  - CFE_ES_AppID_ToIndex - Obtain an index value correlating to an ES Application ID.
  - CFE_ES_LibID_ToIndex - Obtain an index value correlating to an ES Library ID.
  - CFE_ES_TaskID_ToIndex - Obtain an index value correlating to an ES Task ID.
  - CFE_ES_CounterID_ToIndex - Obtain an index value correlating to an ES Counter ID.

4.2 Events Services API

- cFE Registration APIs
  - CFE_EVS_Register - Register an application for receiving event services.
- cFE Send Event APIs
  - CFE_EVS_SendEvent - Generate a software event.
  - CFE_EVS_SendEventWithAppID - Generate a software event given the specified Application ID.
  - CFE_EVS_SendTimedEvent - Generate a software event with a specific time tag.
- cFE Reset Event Filter APIs
  - CFE_EVS_ResetFilter - Resets the calling application's event filter for a single event ID.
  - CFE_EVS_ResetAllFilters - Resets all of the calling application's event filters.

4.3 File Services API

- cFE File Header Management APIs
  - CFE_FS_ReadHeader - Read the contents of the Standard cFE File Header.
  - CFE_FS_InitHeader - Initializes the contents of the Standard cFE File Header.
  - CFE_FS_WriteHeader - Write the specified Standard cFE File Header to the specified file.
  - CFE_FS_SetTimestamp - Modifies the Time Stamp field in the Standard cFE File Header for the specified file.
- cFE File Utility APIs
  - CFE_FS_GetDefaultMountPoint - Get the default virtual mount point for a file category.
  - CFE_FS_GetDefaultExtension - Get the default filename extension for a file category.
  - CFE_FS_ParseInputFileNameEx - Parse a filename input from an input buffer into a local buffer.
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5.1 OSAL Introduction

The goal of this library is to promote the creation of portable and reusable real time embedded system software. Given the necessary OS abstraction layer implementations, the same embedded software should compile and run on a number of platforms ranging from spacecraft computer systems to desktop PCs.
The OS Application Program Interfaces (APIs) are broken up into core, file system, loader, network, and timer APIs. See the related document sections for full descriptions.

Note

> The majority of these APIs should be called from a task running in the context of an OSAL application and in general should not be called from an ISR. There are a few exceptions, such as the ability to give a binary semaphore from an ISR.

5.2 File System Overview

The File System API is a thin wrapper around a selection of POSIX file APIs. In addition the File System API presents a common directory structure and volume view regardless of the underlying system type. For example, vxWorks uses MS-DOS style volume names and directories where a vxWorks RAM disk might have the volume “RAM:0”. With this File System API, volumes are represented as Unix-style paths where each volume is mounted on the root file system:

- RAM:0/file1.dat becomes /mnt/ram/file1.dat
- FL:0/file2.dat becomes /mnt/fl/file2.dat

This abstraction allows the applications to use the same paths regardless of the implementation and it also allows file systems to be simulated on a desktop system for testing. On a desktop Linux system, the file system abstraction can be set up to map virtual devices to a regular directory. This is accomplished through the OS_mkfs call, OS_mount call, and a BSP specific volume table that maps the virtual devices to real devices or underlying file systems.
In order to make this file system volume abstraction work, a “Volume Table” needs to be provided in the Board Support Package of the application. The table has the following fields:

- Device Name: This is the name of the virtual device that the Application uses. Common names are “ramdisk1”, “flash1”, or “volatile1” etc. But the name can be any unique string.
- Physical Device Name: This is an implementation specific field. For vxWorks it is not needed and can be left blank. For a File system based implementation, it is the “mount point” on the root file system where all of the volume will be mounted. A common place for this on Linux could be a user’s home directory, “/tmp”, or even the current working directory “.”. In the example of “/tmp” all of the directories created for the volumes would be under “/tmp” on the Linux file system. For a real disk device in Linux, such as a RAM disk, this field is the device name “/dev/ram0”.
- Volume Type: This field defines the type of volume. The types are: FS_BASED which uses the existing file system, RAM_DISK which uses a RAM_DISK device in vxWorks, RTEMS, or Linux, FLASH_DISK_FORMAT which uses a flash disk that is to be formatted before use, FLASH_DISK_INIT which uses a flash disk with an existing format that is just to be initialized before it’s use, EEPROM which is for an EEPROM or PROM based system.
- Volatile Flag: This flag indicates that the volume or disk is a volatile disk (RAM disk) or a non-volatile disk, that retains its contents when the system is rebooted. This should be set to TRUE or FALSE.
- Free Flag: This is an internal flag that should be set to FALSE or zero.
- Is Mounted Flag: This is an internal flag that should be set to FALSE or zero. Note that a “pre-mounted” FS_B↩ ASED path can be set up by setting this flag to one.
- Volume Name: This is an internal field and should be set to a space character “ “.
- Mount Point Field: This is an internal field and should be set to a space character “ “.
- Block Size Field: This is used to record the block size of the device and does not need to be set by the user.

5.3 File Descriptors In Osal

The OSAL uses abstracted file descriptors. This means that the file descriptors passed back from the OS_open and OS_creat calls will only work with other OSAL OS_$*$ calls. The reasoning for this is as follows:
Because the OSAL now keeps track of all file descriptors, OSAL specific information can be associated with a specific file descriptor in an OS independent way. For instance, the path of the file that the file descriptor points to can be easily retrieved. Also, the OSAL task ID of the task that opened the file can also be retrieved easily. Both of these pieces of information are very useful when trying to determine statistics for a task, or the entire system. This information can all be retrieved with a single API, OS_FDGetInfo.
All of the possible file system calls are not implemented. "Special" files requiring OS specific control/operations are by nature not portable. Abstraction in this case is not possible, so the raw OS calls should be used (including

open/close/etc). Mixing with OSAL calls is not supported for such cases. OS_TranslatePath is available to support using open directly by an app and maintain abstraction on the file system.
There are some small drawbacks with the OSAL file descriptors. Because the related information is kept in a table, there is a define called OS_MAX_NUM_OPEN_FILES that defines the maximum number of file descriptors available. This is a configuration parameter, and can be changed to fit your needs.
Also, if you open or create a file not using the OSAL calls (OS_open or OS_creat) then none of the other OS_∗ calls that accept a file descriptor as a parameter will work (the results of doing so are undefined). Therefore, if you open a file with the underlying OS's open call, you must continue to use the OS's calls until you close the file descriptor. Be aware that by doing this your software may no longer be OS agnostic.

5.4 Timer Overview

The timer API is a generic interface to the OS timer facilities. It is implemented using the POSIX timers on Linux and vxWorks and the native timer API on RTEMS. The number of timers supported is controlled by the configuration parameter OS_MAX_TIMERS.

6 cFE Mission Configuration Parameters

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cFE Portable Message Numbers for Commands

Global CFE_MISSION_ES_HK_TLM_TOPICID

cFE Portable Message Numbers for Telemetry

Global CFE_MISSION_EVS_CMD_TOPICID

cFE Portable Message Numbers for Commands

Global CFE_MISSION_EVS_HK_TLM_TOPICID

cFE Portable Message Numbers for Telemetry

Global CFE_MISSION_MAX_API_LEN

cFE Maximum length for API names within data exchange structures

cFE Maximum length for API names within data exchange structures

Global CFE_MISSION_MAX_FILE_LEN

cFE Maximum length for filenames within data exchange structures

cFE Maximum length for filenames within data exchange structures

Global CFE_MISSION_MAX_NUM_FILES

cFE Maximum number of files in a message/data exchange

cFE Maximum number of files in a message/data exchange

Global CFE_MISSION_MAX_PATH_LEN

cFE Maximum length for pathnames within data exchange structures

cFE Maximum length for pathnames within data exchange structures

Global CFE_MISSION_SB_CMD_TOPICID

cFE Portable Message Numbers for Commands

Global CFE_MISSION_SB_HK_TLM_TOPICID

cFE Portable Message Numbers for Telemetry

Global CFE_MISSION_TBL_CMD_TOPICID

cFE Portable Message Numbers for Commands

Global CFE_MISSION_TBL_HK_TLM_TOPICID
cFE Portable Message Numbers for Telemetry

Global CFE_MISSION_TIME_CMD_TOPICID
cFE Portable Message Numbers for Commands

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osal/src/os/inc/osapi-timebase.h 1729

osal/src/os/inc/osapi-timer.h 1730

osal/src/os/inc/osapi-version.h 1731

osal/src/os/inc/osapi.h 1734

psp/fsw/inc/cfe_psp.h 1735

psp/fsw/inc/cfe_psp_error.h
CFE PSP Error header 1762

10 Module Documentation

10.1 CFS CFDP Event IDs

Macros

- #define CF_INIT_INF_EID (20)

  CF Initialization Event ID.
- #define CF_INIT_TBL_CHECK_REL_ERR_EID (21)

  CF Check Table Release Address Failed Event ID.
- #define CF_INIT_TBL_CHECK_MAN_ERR_EID (22)

  CF Check Table Manage Failed Event ID.
- #define CF_INIT_TBL_CHECK_GA_ERR_EID (23)

  CF Check Table Get Address Failed Event ID.
- #define CF_INIT_TBL_REG_ERR_EID (24)

  CF Table Registration At Initialization Failed Event ID.
- #define CF_INIT_TBL_LOAD_ERR_EID (25)

  CF Table Load At Initialization Failed Event ID.
- #define CF_INIT_TBL_MANAGE_ERR_EID (26)

  CF Table Manage At Initialization Failed Event ID.
- #define CF_INIT_TBL_GETADDR_ERR_EID (27)

  CF Table Get Address At Initialization Failed Event ID.
- #define CF_MID_ERR_EID (28)

  CF Message ID Invalid Event ID.
- #define CF_INIT_MSG_RECV_ERR_EID (29)

  CF SB Receive Buffer Failed Event ID.
- #define CF_INIT_SEM_ERR_EID (30)

  CF Channel Semaphore Initialization Failed Event ID.
- #define CF_CR_PIPE_ERR_EID (31)

  CF Channel Create Pipe Failed Event ID.
- #define CF_INIT_SUB_ERR_EID (32)

  CF Channel Message Subscription Failed Event ID.

- #define CF_INIT_TPS_ERR_EID (33)

  CF Ticks Per Second Config Table Validation Failed Event ID.
- #define CF_INIT_CRC_ALIGN_ERR_EID (34)

  CF CRC Bytes Per Wakeup Config Table Validation Failed Event ID.
- #define CF_INIT_OUTGOING_SIZE_ERR_EID (35)

  CF Outgoing Chunk Size Config Table Validation Failed Event ID.
- #define CF_PDU_MD_RECVD_INF_EID (40)

  CF Metadata PDU Received Event ID.
- #define CF_PDU_SHORT_HEADER_ERR_EID (41)

  CF PDU Header Too Short Event ID.
- #define CF_PDU_MD_SHORT_ERR_EID (43)

  CF Metadata PDU Too Short Event ID.
- #define CF_PDU_INVALID_SRC_LEN_ERR_EID (44)

  CF Metadata PDU Source Filename Length Invalid Event ID.
- #define CF_PDU_INVALID_DST_LEN_ERR_EID (45)

  CF Metadata PDU Destination Filename Length Invalid Event ID.
- #define CF_PDU_FD_SHORT_ERR_EID (46)

  CF File Data PDU Too Short Event ID.
- #define CF_PDU_EOF_SHORT_ERR_EID (47)

  CF End-Of-File PDU Too Short Event ID.
- #define CF_PDU_ACK_SHORT_ERR_EID (48)

  CF Acknowledgment PDU Too Short Event ID.
- #define CF_PDU_FIN_SHORT_ERR_EID (49)

  CF Finished PDU Too Short Event ID.
- #define CF_PDU_NAK_SHORT_ERR_EID (50)

  CF Negative Acknowledgment PDU Too Short Event ID.
- #define CF_PDU_FD_UNSUPPORTED_ERR_EID (54)

  CF File Data PDU Unsupported Option Event ID.
- #define CF_PDU_LARGE_FILE_ERR_EID (55)

  CF PDU Header Large File Flag Set Event ID.
- #define CF_PDU_TRUNCATION_ERR_EID (56)

  CF PDU Header Field Truncation.
- #define CF_RESET_FREED_XACT_DBG_EID (59)

  Attempt to reset a transaction that has already been freed.
- #define CF_CFDP_RX_DROPPED_ERR_EID (60)

  CF PDU Received Without Existing Transaction, Dropped Due To Max RX Reached Event ID.
- #define CF_CFDP_INVALID_DST_ERR_EID (61)

  CF PDU Received With Invalid Destination Entity ID Event ID.
- #define CF_CFDP_IDLE_MD_ERR_EID (62)

  CF Invalid Metadata PDU Received On Idle Transaction Event ID.
- #define CF_CFDP_FD_UNHANDLED_ERR_EID (63)

  CF Non-metadata File Directive PDU Received On Idle Transaction Event ID.
- #define CF_CFDP_MAX_CMD_TX_ERR_EID (64)

  CF Transmission Request Rejected Due To Max Commanded TX Reached Event ID.
- #define CF_CFDP_OPENDIR_ERR_EID (65)

  CF Playback/Polling Directory Open Failed Event ID.
- #define CF_CFDP_DIR_SLOT_ERR_EID (66)

CF Playback Request Rejected Due to Max Playback Directories Reached Event ID.

- #define CF_CFDP_NO_MSG_ERR_EID (67)

  CF No Message Buffer Available Event ID.
- #define CF_CFDP_CLOSE_ERR_EID (68)

  CF Close File Failed Event ID.
- #define CF_CFDP_R_REQUEST_MD_INF_EID (70)

  CF Requesting RX Metadata Event ID.
- #define CF_CFDP_R_TEMP_FILE_INF_EID (71)

  CF Creating Temp File For RX Transaction Without Metadata PDU.
- #define CF_CFDP_R_NAK_LIMIT_ERR_EID (72)

  CF RX Transaction NAK Limit Reached Event ID.
- #define CF_CFDP_R_ACK_LIMIT_ERR_EID (73)

  CF RX Transaction ACK Limit Reached Event ID.
- #define CF_CFDP_R_CRC_ERR_EID (74)

  CF RX Transaction CRC Mismatch Event ID.
- #define CF_CFDP_R_SEEK_FD_ERR_EID (75)

  CF RX File Data PDU Seek Failed Event ID.
- #define CF_CFDP_R_SEEK_CRC_ERR_EID (76)

  CF RX Class 2 CRC Seek Failed Event ID.
- #define CF_CFDP_R_WRITE_ERR_EID (77)

  CF RX File Data PDU Write Failed Event ID.
- #define CF_CFDP_R_SIZE_MISMATCH_ERR_EID (78)

  CF RX End-Of-File PDU File Size Mismatch Event ID.
- #define CF_CFDP_R_PDU_EOF_ERR_EID (79)

  CF Invalid End-Of-File PDU Event ID.
- #define CF_CFDP_R_CREAT_ERR_EID (80)

  CF RX Transaction File Create Failed Event ID.
- #define CF_CFDP_R_PDU_FINACK_ERR_EID (81)

  CF Class 2 RX Transaction Invalid FIN-ACK PDU Event ID.
- #define CF_CFDP_R_EOF_MD_SIZE_ERR_EID (82)

  CF RX Class 2 Metadata PDU Size Mismatch Event ID.
- #define CF_CFDP_R_RENAME_ERR_EID (83)

  CF RX Class 2 Metadata PDU File Rename Failed Event ID.
- #define CF_CFDP_R_OPEN_ERR_EID (84)

  CF RX Class 2 Metadata PDU File Open Failed Event ID.
- #define CF_CFDP_R_PDU_MD_ERR_EID (85)

  CF Invalid Out-of-order Metadata PDU Received Event ID.
- #define CF_CFDP_R_READ_ERR_EID (86)

  CF Class 2 CRC Read From File Failed Event ID.
- #define CF_CFDP_R_DC_INV_ERR_EID (87)

  CF RX Invalid File Directive PDU Code Received Event ID.
- #define CF_CFDP_R_INACT_TIMER_ERR_EID (88)

  CF RX Inactivity Timer Expired Event ID.
- #define CF_CFDP_S_START_SEND_INF_EID (90)

  CF TX Initiated Event ID.
- #define CF_CFDP_S_SEEK_FD_ERR_EID (91)

  CF TX File Data PDU Seek Failed Event ID.

- #define CF_CFDP_S_READ_ERR_EID (92)

  CF TX File Data PDU Read Failed Event ID.
- #define CF_CFDP_S_SEND_FD_ERR_EID (93)

  CF TX File Data PDU Send Failed Event ID.
- #define CF_CFDP_S_ALREADY_OPEN_ERR_EID (94)

  CF TX Metadata PDU File Already Open Event ID.
- #define CF_CFDP_S_OPEN_ERR_EID (95)

  CF TX Metadata PDU File Open Failed Event ID.
- #define CF_CFDP_S_SEEK_END_ERR_EID (96)

  CF TX Metadata PDU File Seek End Failed Event ID.
- #define CF_CFDP_S_SEEK_BEG_ERR_EID (97)

  CF TX Metadata PDU File Seek Beginning Failed Event ID.
- #define CF_CFDP_S_SEND_MD_ERR_EID (98)

  CF TX Metadata PDU Send Failed Event ID.
- #define CF_CFDP_S_INVALID_SR_ERR_EID (100)

  CF TX Received NAK PDU Bad Segment Request Event ID.
- #define CF_CFDP_S_PDU_NAK_ERR_EID (101)

  CF TX Received NAK PDU Invalid Event ID.
- #define CF_CFDP_S_PDU_EOF_ERR_EID (102)

  CF TX Received EOF ACK PDU Invalid Event ID.
- #define CF_CFDP_S_EARLY_FIN_ERR_EID (103)

  CF TX Received Early FIN PDU Event ID.
- #define CF_CFDP_S_DC_INV_ERR_EID (104)

  CF Invalid TX File Directive PDU Code Event ID.
- #define CF_CFDP_S_NON_FD_PDU_ERR_EID (105)

  CF Received TX Non-File Directive PDU Event ID.
- #define CF_CFDP_S_ACK_LIMIT_ERR_EID (106)

  CF TX EOF PDU Send Limit Reached Event ID.
- #define CF_CFDP_S_INACT_TIMER_ERR_EID (107)

  CF TX Inactivity Timer Expired Event ID.
- #define CF_NOOP_INF_EID (110)

  CF NOOP Command Received Event ID.
- #define CF_RESET_INF_EID (111)

  CF Reset Counters Command Received Event ID.
- #define CF_CMD_GETSET1_INF_EID (112)

  CF Set Parameter Command Received Event ID.
- #define CF_CMD_GETSET2_INF_EID (113)

  CF Get Parameter Command Received Event ID.
- #define CF_CMD_SUSPRES_INF_EID (114)

  CF Suspend/Resume Command Received Event ID.
- #define CF_CMD_WQ_INF_EID (115)

  CF Write Queue Command Received Event ID.
- #define CF_CMD_ENABLE_ENGINE_INF_EID (116)

  CF Enable Engine Command Received Event ID.
- #define CF_CMD_DISABLE_ENGINE_INF_EID (117)

  CF Disable Engine Command Received Event ID.
- #define CF_CMD_TX_FILE_INF_EID (118)

CF Transfer File Command Received Event ID.

- #define CF_CMD_PLAYBACK_DIR_INF_EID (119)

  CF Playback Directory Command Received Event ID.
- #define CF_CMD_FREEZE_INF_EID (120)

  CF Freeze Command Received Event ID.
- #define CF_CMD_THAW_INF_EID (121)

  CF Thaw Command Received Event ID.
- #define CF_CMD_CANCEL_INF_EID (122)

  CF Cancel Command Received Event ID.
- #define CF_CMD_ABANDON_INF_EID (123)

  CF Abandon Command Received Event ID.
- #define CF_CMD_ENABLE_DEQUEUE_INF_EID (124)

  CF Enable Dequeue Command Received Event ID.
- #define CF_CMD_DISABLE_DEQUEUE_INF_EID (125)

  CF Disable Dequeue Command Received Event ID.
- #define CF_CMD_ENABLE_POLLDIR_INF_EID (126)

  CF Enable Polldir Command Received Event ID.
- #define CF_CMD_DISABLE_POLLDIR_INF_EID (127)

  CF Disable Polldir Command Received Event ID.
- #define CF_CMD_PURGE_QUEUE_INF_EID (128)

  CF Purge Queue Command Received Event ID.
- #define CF_CMD_RESET_INVALID_ERR_EID (129)

  CF Reset Counters Command Invalid Event ID.
- #define CF_CMD_CHAN_PARAM_ERR_EID (130)

  CF Command Channel Invalid Event ID.
- #define CF_CMD_TRANS_NOT_FOUND_ERR_EID (131)

  CF Command Transaction Invalid Event ID.
- #define CF_CMD_TSN_CHAN_INVALID_ERR_EID (132)

  CF Command All Transaction Channel Invalid Event ID.
- #define CF_CMD_SUSPRES_SAME_INF_EID (133)

  CF Suspend/Resume Command For Single Transaction State Unchanged Event ID.
- #define CF_CMD_SUSPRES_CHAN_ERR_EID (134)

  CF Suspend/Resume Command No Matching Transaction Event ID.
- #define CF_CMD_POLLDIR_INVALID_ERR_EID (135)

  CF Enable/Disable Polling Directory Command Invalid Polling Directory Index Event ID.
- #define CF_CMD_PURGE_ARG_ERR_EID (136)

  CF Purge Queue Command Invalid Argument Event ID.
- #define CF_CMD_WQ_CHAN_ERR_EID (137)

  CF Write Queue Command Invalid Channel Event ID.
- #define CF_CMD_WQ_ARGS_ERR_EID (138)

  CF Write Queue Command Invalid Queue Event ID.
- #define CF_CMD_WQ_OPEN_ERR_EID (139)

  CF Write Queue Command File Open Failed Event ID.
- #define CF_CMD_WQ_WRITEQ_RX_ERR_EID (140)

  CF Write Queue Command RX Active File Write Failed Event ID.
- #define CF_CMD_WQ_WRITEHIST_RX_ERR_EID (141)

  CF Write Queue Command RX History File Write Failed Event ID.

- #define CF_CMD_WQ_WRITEQ_TX_ERR_EID (142)

  CF Write Queue Command TX Active File Write Failed Event ID.
- #define CF_CMD_WQ_WRITEQ_PEND_ERR_EID (143)

  CF Write Queue Command TX Pending File Write Failed Event ID.
- #define CF_CMD_WQ_WRITEHIST_TX_ERR_EID (144)

  CF Write Queue Command TX History File Write Failed Event ID.
- #define CF_CMD_GETSET_VALIDATE_ERR_EID (145)

  CF Set Parameter Command Parameter Validation Failed Event ID.
- #define CF_CMD_GETSET_PARAM_ERR_EID (146)

  CF Set/Get Parameter Command Invalid Parameter ID Event ID.
- #define CF_CMD_GETSET_CHAN_ERR_EID (147)

  CF Set/Get Parameter Command Invalid Channel Event ID.
- #define CF_CMD_ENABLE_ENGINE_ERR_EID (148)

  CF Enable Engine Command Failed Event ID.
- #define CF_CMD_ENG_ALREADY_ENA_INF_EID (149)

  CF Enable Engine Command Engine Already Enabled Event ID.
- #define CF_CMD_ENG_ALREADY_DIS_INF_EID (150)

  CF Disable Engine Command Engine Already Disabled Event ID.
- #define CF_CMD_LEN_ERR_EID (151)

  CF Command Length Verification Failed Event ID.
- #define CF_CC_ERR_EID (152)

  CF Command Code Invalid Event ID.
- #define CF_CMD_WHIST_WRITE_ERR_EID (153)

  CF Write Entry To File Failed Event ID.
- #define CF_CMD_BAD_PARAM_ERR_EID (154)

  CF Playback Dir Or TX File Command Bad Parameter Event ID.
- #define CF_CMD_CANCEL_CHAN_ERR_EID (155)

  CF Cancel Command No Matching Transaction Event ID.
- #define CF_CMD_ABANDON_CHAN_ERR_EID (156)

  CF Abandon Command No Matching Transaction Event ID.
- #define CF_CMD_TX_FILE_ERR_EID (157)

  CF Transfer File Command Failed Event ID.
- #define CF_CMD_PLAYBACK_DIR_ERR_EID (158)

  CF Playback Directory Command Failed Event ID.
- #define CF_CMD_FREEZE_ERR_EID (159)

  CF Freeze Command Failed Event ID.
- #define CF_CMD_THAW_ERR_EID (160)

  CF Thaw Command Failed Event ID.
- #define CF_CMD_ENABLE_DEQUEUE_ERR_EID (161)

  CF Enable Dequeue Command Failed Event ID.
- #define CF_CMD_DISABLE_DEQUEUE_ERR_EID (162)

  CF Disable Dequeue Command Failed Event ID.
- #define CF_CMD_ENABLE_POLLDIR_ERR_EID (163)

  CF Enable Polldir Command Failed Event ID.
- #define CF_CMD_DISABLE_POLLDIR_ERR_EID (164)

  CF Disable Polldir Command Failed Event ID.
- #define CF_CMD_PURGE_QUEUE_ERR_EID (165)

  CF Purge Queue Command Failed Event ID.

10.1.1 Detailed Description

10.1.2 Macro Definition Documentation

10.1.2.1 CF_CC_ERR_EID `#define CF_CC_ERR_EID (152)`

CF Command Code Invalid Event ID.

Type: ERROR

Cause:

Received command code unrecognized

Definition at line 1375 of file cf_events.h.

10.1.2.2 CF_CFDP_CLOSE_ERR_EID `#define CF_CFDP_CLOSE_ERR_EID (68)`

CF Close File Failed Event ID.

Type: ERROR

Cause:

Failure from file close call

Definition at line 480 of file cf_events.h.

10.1.2.3 CF_CFDP_DIR_SLOT_ERR_EID `#define CF_CFDP_DIR_SLOT_ERR_EID (66)`

CF Playback Request Rejected Due to Max Playback Directories Reached Event ID.

Type: ERROR

Cause:

Command request to playback a directory received when channel is already handling the maximum number of concurrent playback directories

Definition at line 458 of file cf_events.h.

10.1.2.4 CF_CFDP_FD_UNHANDLED_ERR_EID `#define CF_CFDP_FD_UNHANDLED_ERR_EID (63)`

CF Non-metadata File Directive PDU Received On Idle Transaction Event ID.

Type: ERROR

Cause:

File Directive PDU received without the metadata directive code on an idle transaction

Definition at line 423 of file cf_events.h.

10.1.2.5 CF_CFDP_IDLE_MD_ERR_EID `#define CF_CFDP_IDLE_MD_ERR_EID (62)`

CF Invalid Metadata PDU Received On Idle Transaction Event ID.

Type: ERROR

Cause:

Metadata PDU received for an idle transaction failed decoding
Definition at line 412 of file cf_events.h.

10.1.2.6 CF_CFDP_INVALID_DST_ERR_EID `#define CF_CFDP_INVALID_DST_ERR_EID (61)`

CF PDU Received With Invalid Destination Entity ID Event ID.

Type: ERROR

Cause:

PDU without a matching/existing transaction received with an entity ID that doesn't match the receiving channel's entity ID
Definition at line 401 of file cf_events.h.

10.1.2.7 CF_CFDP_MAX_CMD_TX_ERR_EID `#define CF_CFDP_MAX_CMD_TX_ERR_EID (64)`

CF Transmission Request Rejected Due To Max Commanded TX Reached Event ID.

Type: ERROR

Cause:

Command request to transmit a file received when channel is already handling the maximum number of concurrent command transmit transactions
Definition at line 435 of file cf_events.h.

10.1.2.8 CF_CFDP_NO_MSG_ERR_EID `#define CF_CFDP_NO_MSG_ERR_EID (67)`

CF No Message Buffer Available Event ID.

Type: ERROR

Cause:

Failure from SB allocate message buffer call when constructing PDU
Definition at line 469 of file cf_events.h.

10.1.2.9 CF_CFDP_OPENDIR_ERR_EID `#define CF_CFDP_OPENDIR_ERR_EID (65)`

CF Playback/Polling Directory Open Failed Event ID.

Type: ERROR

Cause:

Failure opening directory during playback or polling initialization
Definition at line 446 of file cf_events.h.

10.1.2.10 CF_CFDP_R_ACK_LIMIT_ERR_EID `#define CF_CFDP_R_ACK_LIMIT_ERR_EID (73)`

CF RX Transaction ACK Limit Reached Event ID.

Type: ERROR

Cause:

Condition that triggers an ACK occurred that would meet or exceed the ACK limit
Definition at line 530 of file cf_events.h.

10.1.2.11 CF_CFDP_R_CRC_ERR_EID `#define CF_CFDP_R_CRC_ERR_EID (74)`

CF RX Transaction CRC Mismatch Event ID.

Type: ERROR

Cause:

RX Transaction final CRC mismatch
Definition at line 541 of file cf_events.h.

10.1.2.12 CF_CFDP_R_CREAT_ERR_EID `#define CF_CFDP_R_CREAT_ERR_EID (80)`

CF RX Transaction File Create Failed Event ID.

Type: ERROR

Cause:

Failure in opencreate file call for an RX transaction
Definition at line 608 of file cf_events.h.

10.1.2.13 CF_CFDP_R_DC_INV_ERR_EID `#define CF_CFDP_R_DC_INV_ERR_EID (87)`

CF RX Invalid File Directive PDU Code Received Event ID.

Type: ERROR

Cause:

Unrecognized file directive PDU directive code received for a current transaction
Definition at line 689 of file cf_events.h.

10.1.2.14 CF_CFDP_R_EOF_MD_SIZE_ERR_EID `#define CF_CFDP_R_EOF_MD_SIZE_ERR_EID (82)`

CF RX Class 2 Metadata PDU Size Mismatch Event ID.

Type: ERROR

Cause:

Out-of-order RX Class 2 Metadata PDU received with file size that doesn't match already received EOF PDU file size
Definition at line 631 of file cf_events.h.

10.1.2.15 CF_CFDP_R_INACT_TIMER_ERR_EID `#define CF_CFDP_R_INACT_TIMER_ERR_EID (88)`

CF RX Inactivity Timer Expired Event ID.

Type: ERROR

Cause:

Expiration of the RX inactivity timer
Definition at line 700 of file cf_events.h.

10.1.2.16 CF_CFDP_R_NAK_LIMIT_ERR_EID `#define CF_CFDP_R_NAK_LIMIT_ERR_EID (72)`

CF RX Transaction NAK Limit Reached Event ID.

Type: ERROR

Cause:

Condition that triggers a NAK occurred that would meet or exceed the NAK limit
Definition at line 519 of file cf_events.h.

10.1.2.17 CF_CFDP_R_OPEN_ERR_EID `#define CF_CFDP_R_OPEN_ERR_EID (84)`

CF RX Class 2 Metadata PDU File Open Failed Event ID.

Type: ERROR

Cause:

Failure from file open call after reception of an out-of-order RX Class 2 Metadata PDU
Definition at line 655 of file cf_events.h.

10.1.2.18 CF_CFDP_R_PDU_EOF_ERR_EID `#define CF_CFDP_R_PDU_EOF_ERR_EID (79)`

CF Invalid End-Of-File PDU Event ID.

Type: ERROR

Cause:

End-of-file PDU failed decoding
Definition at line 597 of file cf_events.h.

10.1.2.19 CF_CFDP_R_PDU_FINACK_ERR_EID `#define CF_CFDP_R_PDU_FINACK_ERR_EID (81)`

CF Class 2 RX Transaction Invalid FIN-ACK PDU Event ID.

Type: ERROR

Cause:

ACK PDU failed decoding during Class 2 RX Transaction
Definition at line 619 of file cf_events.h.

10.1.2.20 CF_CFDP_R_PDU_MD_ERR_EID `#define CF_CFDP_R_PDU_MD_ERR_EID (85)`

CF Invalid Out-of-order Metadata PDU Received Event ID.

Type: ERROR

Cause:

Failure to decode out-of-order metadata PDU
Definition at line 666 of file cf_events.h.

10.1.2.21 CF_CFDP_R_READ_ERR_EID `#define CF_CFDP_R_READ_ERR_EID (86)`

CF Class 2 CRC Read From File Failed Event ID.

Type: ERROR

Cause:

Failure from file read call during RX Class 2 CRC calculation
Definition at line 677 of file cf_events.h.

10.1.2.22 CF_CFDP_R_RENAME_ERR_EID `#define CF_CFDP_R_RENAME_ERR_EID (83)`

CF RX Class 2 Metadata PDU File Rename Failed Event ID.

Type: ERROR

Cause:

Failure from file rename call after reception of an out-of-order RX Class 2 Metadata PDU
Definition at line 643 of file cf_events.h.

10.1.2.23 CF_CFDP_R_REQUEST_MD_INF_EID `#define CF_CFDP_R_REQUEST_MD_INF_EID (70)`

CF Requesting RX Metadata Event ID.

Type: INFORMATION

Cause:

RX transaction missing metadata which results in a NAK being sent to request a metadata PDU for the transaction
Definition at line 496 of file cf_events.h.

10.1.2.24 CF_CFDP_R_SEEK_CRC_ERR_EID `#define CF_CFDP_R_SEEK_CRC_ERR_EID (76)`

CF RX Class 2 CRC Seek Failed Event ID.

Type: ERROR

Cause:

Failure of lseek call when calculating CRC from the file at the end of a Class 2 RX transaction
Definition at line 564 of file cf_events.h.

10.1.2.25 CF_CFDP_R_SEEK_FD_ERR_EID `#define CF_CFDP_R_SEEK_FD_ERR_EID (75)`

CF RX File Data PDU Seek Failed Event ID.

Type: ERROR

Cause:

Failure of lseek call when processing out of order file data PDUs
Definition at line 552 of file cf_events.h.

10.1.2.26 CF_CFDP_R_SIZE_MISMATCH_ERR_EID `#define CF_CFDP_R_SIZE_MISMATCH_ERR_EID (78)`

CF RX End-Of-File PDU File Size Mismatch Event ID.

Type: ERROR

Cause:

End-of-file PDU file size does not match transaction expected file size
Definition at line 586 of file cf_events.h.

10.1.2.27 CF_CFDP_R_TEMP_FILE_INF_EID `#define CF_CFDP_R_TEMP_FILE_INF_EID (71)`

CF Creating Temp File For RX Transaction Without Metadata PDU.

Type: INFORMATION

Cause:

RX transaction missing metadata causing creation of a temporary filename to store the data
Definition at line 508 of file cf_events.h.

10.1.2.28 CF_CFDP_R_WRITE_ERR_EID `#define CF_CFDP_R_WRITE_ERR_EID (77)`

CF RX File Data PDU Write Failed Event ID.

Type: ERROR

Cause:

Failure of write to file call when processing file data PDUs
Definition at line 575 of file cf_events.h.

10.1.2.29 CF_CFDP_RX_DROPPED_ERR_EID `#define CF_CFDP_RX_DROPPED_ERR_EID (60)`

CF PDU Received Without Existing Transaction, Dropped Due To Max RX Reached Event ID.

Type: ERROR

Cause:

PDU without a matching/existing transaction received when channel receive queue is already handling the maximum number of concurrent receive transactions
Definition at line 389 of file cf_events.h.

10.1.2.30 CF_CFDP_S_ACK_LIMIT_ERR_EID `#define CF_CFDP_S_ACK_LIMIT_ERR_EID (106)`

CF TX EOF PDU Send Limit Reached Event ID.

Type: ERROR

Cause:

Timed out the limit number of times waiting for an ACK PDU for the EOF PDU on a current transaction
Definition at line 887 of file cf_events.h.

10.1.2.31 CF_CFDP_S_ALREADY_OPEN_ERR_EID `#define CF_CFDP_S_ALREADY_OPEN_ERR_EID (94)`

CF TX Metadata PDU File Already Open Event ID.

Type: ERROR

Cause:

Failure to send metadata PDU due to file already being open
Definition at line 759 of file cf_events.h.

10.1.2.32 CF_CFDP_S_DC_INV_ERR_EID `#define CF_CFDP_S_DC_INV_ERR_EID (104)`

CF Invalid TX File Directive PDU Code Event ID.

Type: ERROR

Cause:

Unrecognized file directive PDU directive code received for a current transaction
Definition at line 864 of file cf_events.h.

10.1.2.33 CF_CFDP_S_EARLY_FIN_ERR_EID `#define CF_CFDP_S_EARLY_FIN_ERR_EID (103)`

CF TX Received Early FIN PDU Event ID.

Type: ERROR

Cause:

Early FIN PDU received prior to completion of a current transaction
Definition at line 852 of file cf_events.h.

10.1.2.34 CF_CFDP_S_INACT_TIMER_ERR_EID `#define CF_CFDP_S_INACT_TIMER_ERR_EID (107)`

CF TX Inactivity Timer Expired Event ID.

Type: ERROR

Cause:

Send transaction activity timeout expired
Definition at line 898 of file cf_events.h.

10.1.2.35 CF_CFDP_S_INVALID_SR_ERR_EID `#define CF_CFDP_S_INVALID_SR_ERR_EID (100)`

CF TX Received NAK PDU Bad Segment Request Event ID.

Type: ERROR

Cause:

Bad segment request values in received NAK PDU relating to a current transaction
Definition at line 817 of file cf_events.h.

10.1.2.36 CF_CFDP_S_NON_FD_PDU_ERR_EID `#define CF_CFDP_S_NON_FD_PDU_ERR_EID (105)`

CF Received TX Non-File Directive PDU Event ID.

Type: ERROR

Cause:

Received a non-file directive PDU on a send transaction
Definition at line 875 of file cf_events.h.

10.1.2.37 CF_CFDP_S_OPEN_ERR_EID `#define CF_CFDP_S_OPEN_ERR_EID (95)`

CF TX Metadata PDU File Open Failed Event ID.

Type: ERROR

Cause:

Failure in file open call when preparing to send metadata PDU
Definition at line 770 of file cf_events.h.

10.1.2.38 CF_CFDP_S_PDU_EOF_ERR_EID `#define CF_CFDP_S_PDU_EOF_ERR_EID (102)`

CF TX Received EOF ACK PDU Invalid Event ID.

Type: ERROR

Cause:

Failure processing received ACK PDU relating to a current transaction
Definition at line 841 of file cf_events.h.

10.1.2.39 CF_CFDP_S_PDU_NAK_ERR_EID `#define CF_CFDP_S_PDU_NAK_ERR_EID (101)`

CF TX Received NAK PDU Invalid Event ID.

Type: ERROR

Cause:

Failure processing received NAK PDU relating to a current transaction
Definition at line 829 of file cf_events.h.

10.1.2.40 CF_CFDP_S_READ_ERR_EID `#define CF_CFDP_S_READ_ERR_EID (92)`

CF TX File Data PDU Read Failed Event ID.

Type: ERROR

Cause:

Failure of read file call when preparing to send file data PDU
Definition at line 737 of file cf_events.h.

10.1.2.41 CF_CFDP_S_SEEK_BEG_ERR_EID `#define CF_CFDP_S_SEEK_BEG_ERR_EID (97)`

CF TX Metadata PDU File Seek Beginning Failed Event ID.

Type: ERROR

Cause:

Failure in file lseek to beginning of file call when preparing to send metadata PDU
Definition at line 794 of file cf_events.h.

10.1.2.42 CF_CFDP_S_SEEK_END_ERR_EID `#define CF_CFDP_S_SEEK_END_ERR_EID (96)`

CF TX Metadata PDU File Seek End Failed Event ID.

Type: ERROR

Cause:

Failure in file lseek to end of file call when preparing to send metadata PDU
Definition at line 782 of file cf_events.h.

10.1.2.43 CF_CFDP_S_SEEK_FD_ERR_EID `#define CF_CFDP_S_SEEK_FD_ERR_EID (91)`

CF TX File Data PDU Seek Failed Event ID.

Type: ERROR

Cause:

Failure of lseek call when preparing to send file data PDU
Definition at line 726 of file cf_events.h.

10.1.2.44 CF_CFDP_S_SEND_FD_ERR_EID `#define CF_CFDP_S_SEND_FD_ERR_EID (93)`

CF TX File Data PDU Send Failed Event ID.

Type: ERROR

Cause:

Failure to send the file data PDU
Definition at line 748 of file cf_events.h.

10.1.2.45 CF_CFDP_S_SEND_MD_ERR_EID `#define CF_CFDP_S_SEND_MD_ERR_EID (98)`

CF TX Metadata PDU Send Failed Event ID.

Type: ERROR

Cause:

Failure to send the metadata PDU
Definition at line 805 of file cf_events.h.

10.1.2.46 CF_CFDP_S_START_SEND_INF_EID `#define CF_CFDP_S_START_SEND_INF_EID (90)`

CF TX Initiated Event ID.

Type: INFORMATION

Cause:

File TX transaction initiated
Definition at line 715 of file cf_events.h.

10.1.2.47 CF_CMD_ABANDON_CHAN_ERR_EID `#define CF_CMD_ABANDON_CHAN_ERR_EID (156)`

CF Abandon Command No Matching Transaction Event ID.

Type: ERROR

Cause:

Abandon command received without a matching transaction
Definition at line 1419 of file cf_events.h.

10.1.2.48 CF_CMD_ABANDON_INF_EID `#define CF_CMD_ABANDON_INF_EID (123)`

CF Abandon Command Received Event ID.

Type: INFORMATION

Cause:

Receipt and successful processing of abandon command
Definition at line 1056 of file cf_events.h.

10.1.2.49 CF_CMD_BAD_PARAM_ERR_EID `#define CF_CMD_BAD_PARAM_ERR_EID (154)`

CF Playback Dir Or TX File Command Bad Parameter Event ID.

Type: ERROR

Cause:

Bad parameter received in playback directory or transfer file command
Definition at line 1397 of file cf_events.h.

10.1.2.50 CF_CMD_CANCEL_CHAN_ERR_EID `#define CF_CMD_CANCEL_CHAN_ERR_EID (155)`

CF Cancel Command No Matching Transaction Event ID.

Type: ERROR

Cause:

Cancel command received without a matching transaction
Definition at line 1408 of file cf_events.h.

10.1.2.51 CF_CMD_CANCEL_INF_EID `#define CF_CMD_CANCEL_INF_EID (122)`

CF Cancel Command Received Event ID.

Type: INFORMATION

Cause:

Receipt and successful processing of cancel command
Definition at line 1045 of file cf_events.h.

10.1.2.52 CF_CMD_CHAN_PARAM_ERR_EID `#define CF_CMD_CHAN_PARAM_ERR_EID (130)`

CF Command Channel Invalid Event ID.

Type: ERROR

Cause:

Command received with channel parameter out of range
Definition at line 1133 of file cf_events.h.

10.1.2.53 CF_CMD_DISABLE_DEQUEUE_ERR_EID `#define CF_CMD_DISABLE_DEQUEUE_ERR_EID (162)`

CF Disable Dequeue Command Failed Event ID.

Type: ERROR

Cause:

Disable dequeue command was unsuccessful
Definition at line 1485 of file cf_events.h.

10.1.2.54 CF_CMD_DISABLE_DEQUEUE_INF_EID `#define CF_CMD_DISABLE_DEQUEUE_INF_EID (125)`

CF Disable Dequeue Command Received Event ID.

Type: INFORMATION

Cause:

Receipt and successful processing of disable dequeue command
Definition at line 1078 of file cf_events.h.

10.1.2.55 CF_CMD_DISABLE_ENGINE_INF_EID `#define CF_CMD_DISABLE_ENGINE_INF_EID (117)`

CF Disable Engine Command Received Event ID.

Type: INFORMATION

Cause:

Receipt and successful processing of disable engine command
Definition at line 990 of file cf_events.h.

10.1.2.56 CF_CMD_DISABLE_POLLDIR_ERR_EID `#define CF_CMD_DISABLE_POLLDIR_ERR_EID (164)`

CF Disable Polldir Command Failed Event ID.

Type: ERROR

Cause:

Disable polldir command was unsuccessful
Definition at line 1507 of file cf_events.h.

10.1.2.57 CF_CMD_DISABLE_POLLDIR_INF_EID `#define CF_CMD_DISABLE_POLLDIR_INF_EID (127)`

CF Disable Polldir Command Received Event ID.

Type: INFORMATION

Cause:

Receipt and successful processing of disable polldir command
Definition at line 1100 of file cf_events.h.

10.1.2.58 CF_CMD_ENABLE_DEQUEUE_ERR_EID `#define CF_CMD_ENABLE_DEQUEUE_ERR_EID (161)`

CF Enable Dequeue Command Failed Event ID.

Type: ERROR

Cause:

Enable Dequeue command was unsuccessful
Definition at line 1474 of file cf_events.h.

10.1.2.59 CF_CMD_ENABLE_DEQUEUE_INF_EID `#define CF_CMD_ENABLE_DEQUEUE_INF_EID (124)`

CF Enable Dequeue Command Received Event ID.

Type: INFORMATION

Cause:

Receipt and successful processing of enable dequeue command
Definition at line 1067 of file cf_events.h.

10.1.2.60 CF_CMD_ENABLE_ENGINE_ERR_EID `#define CF_CMD_ENABLE_ENGINE_ERR_EID (148)`

CF Enable Engine Command Failed Event ID.

Type: ERROR

Cause:

Failed to initialize engine when processing engine enable command
Definition at line 1331 of file cf_events.h.

10.1.2.61 CF_CMD_ENABLE_ENGINE_INF_EID `#define CF_CMD_ENABLE_ENGINE_INF_EID (116)`

CF Enable Engine Command Received Event ID.

Type: INFORMATION

Cause:

Receipt and successful processing of enable engine command
Definition at line 979 of file cf_events.h.

10.1.2.62 CF_CMD_ENABLE_POLLDIR_ERR_EID `#define CF_CMD_ENABLE_POLLDIR_ERR_EID (163)`

CF Enable Polldir Command Failed Event ID.

Type: ERROR

Cause:

Enable polldir command was unsuccessful
Definition at line 1496 of file cf_events.h.

10.1.2.63 CF_CMD_ENABLE_POLLDIR_INF_EID `#define CF_CMD_ENABLE_POLLDIR_INF_EID (126)`

CF Enable Polldir Command Received Event ID.

Type: INFORMATION

Cause:

Receipt and successful processing of enable polldir command
Definition at line 1089 of file cf_events.h.

10.1.2.64 CF_CMD_ENG_ALREADY_DIS_INF_EID `#define CF_CMD_ENG_ALREADY_DIS_INF_EID (150)`

CF Disable Engine Command Engine Already Disabled Event ID.

Type: INFORMATION

Cause:

Disable engine command received while engine is already disabled
Definition at line 1353 of file cf_events.h.

10.1.2.65 CF_CMD_ENG_ALREADY_ENA_INF_EID `#define CF_CMD_ENG_ALREADY_ENA_INF_EID (149)`

CF Enable Engine Command Engine Already Enabled Event ID.

Type: INFORMATION

Cause:

Enable engine command received while engine is already enabled
Definition at line 1342 of file cf_events.h.

10.1.2.66 CF_CMD_FREEZE_ERR_EID `#define CF_CMD_FREEZE_ERR_EID (159)`

CF Freeze Command Failed Event ID.

Type: ERROR

Cause:

Freeze command was unsuccessful
Definition at line 1452 of file cf_events.h.

10.1.2.67 CF_CMD_FREEZE_INF_EID `#define CF_CMD_FREEZE_INF_EID (120)`

CF Freeze Command Received Event ID.

Type: INFORMATION

Cause:

Receipt and successful processing of freeze command
Definition at line 1023 of file cf_events.h.

10.1.2.68 CF_CMD_GETSET1_INF_EID `#define CF_CMD_GETSET1_INF_EID (112)`

CF Set Parameter Command Received Event ID.

Type: INFORMATION

Cause:

Receipt and successful processing of set parameter command
Definition at line 935 of file cf_events.h.

10.1.2.69 CF_CMD_GETSET2_INF_EID `#define CF_CMD_GETSET2_INF_EID (113)`

CF Get Parameter Command Received Event ID.

Type: INFORMATION

Cause:

Receipt and successful processing of get parameter command
Definition at line 946 of file cf_events.h.

10.1.2.70 CF_CMD_GETSET_CHAN_ERR_EID `#define CF_CMD_GETSET_CHAN_ERR_EID (147)`

CF Set/Get Parameter Command Invalid Channel Event ID.

Type: ERROR

Cause:

Invalid channel value received in set or get parameter command
Definition at line 1320 of file cf_events.h.

10.1.2.71 CF_CMD_GETSET_PARAM_ERR_EID `#define CF_CMD_GETSET_PARAM_ERR_EID (146)`

CF Set/Get Parameter Command Invalid Parameter ID Event ID.

Type: ERROR

Cause:

Invalid parameter id value received in set or get parameter command
Definition at line 1309 of file cf_events.h.

10.1.2.72 CF_CMD_GETSET_VALIDATE_ERR_EID `#define CF_CMD_GETSET_VALIDATE_ERR_EID (145)`

CF Set Parameter Command Parameter Validation Failed Event ID.

Type: ERROR

Cause:

Parameter validation failed during processing of set parameter command
Definition at line 1298 of file cf_events.h.

10.1.2.73 CF_CMD_LEN_ERR_EID `#define CF_CMD_LEN_ERR_EID (151)`

CF Command Length Verification Failed Event ID.

Type: ERROR

Cause:

Received command length verification failure
Definition at line 1364 of file cf_events.h.

10.1.2.74 CF_CMD_PLAYBACK_DIR_ERR_EID `#define CF_CMD_PLAYBACK_DIR_ERR_EID (158)`

CF Playback Directory Command Failed Event ID.

Type: ERROR

Cause:

Playback directory command was unsuccessful
Definition at line 1441 of file cf_events.h.

10.1.2.75 CF_CMD_PLAYBACK_DIR_INF_EID `#define CF_CMD_PLAYBACK_DIR_INF_EID (119)`

CF Playback Directory Command Received Event ID.

Type: INFORMATION

Cause:

Receipt and successful processing of playback directory command
Definition at line 1012 of file cf_events.h.

10.1.2.76 CF_CMD_POLLDIR_INVALID_ERR_EID `#define CF_CMD_POLLDIR_INVALID_ERR_EID (135)`

CF Enable/Disable Polling Directory Command Invalid Polling Directory Index Event ID.

Type: ERROR

Cause:

Enable/disable polling directory command received with invalid poling directory index
Definition at line 1188 of file cf_events.h.

10.1.2.77 CF_CMD_PURGE_ARG_ERR_EID `#define CF_CMD_PURGE_ARG_ERR_EID (136)`

CF Purge Queue Command Invalid Argument Event ID.

Type: ERROR

Cause:

Purge Queue command received with invalid queue argument
Definition at line 1199 of file cf_events.h.

10.1.2.78 CF_CMD_PURGE_QUEUE_ERR_EID `#define CF_CMD_PURGE_QUEUE_ERR_EID (165)`

CF Purge Queue Command Failed Event ID.

Type: ERROR

Cause:

Purge queue command was unsuccessful
Definition at line 1518 of file cf_events.h.

10.1.2.79 CF_CMD_PURGE_QUEUE_INF_EID `#define CF_CMD_PURGE_QUEUE_INF_EID (128)`

CF Purge Queue Command Received Event ID.

Type: INFORMATION

Cause:

Receipt and successful processing of purge queue command
Definition at line 1111 of file cf_events.h.

10.1.2.80 CF_CMD_RESET_INVALID_ERR_EID `#define CF_CMD_RESET_INVALID_ERR_EID (129)`

CF Reset Counters Command Invalid Event ID.

Type: ERROR

Cause:

Reset counters command received with invalid parameter
Definition at line 1122 of file cf_events.h.

10.1.2.81 CF_CMD_SUSPRES_CHAN_ERR_EID `#define CF_CMD_SUSPRES_CHAN_ERR_EID (134)`

CF Suspend/Resume Command No Matching Transaction Event ID.

Type: ERROR

Cause:

Suspend/resume command received without a matching transaction
Definition at line 1177 of file cf_events.h.

10.1.2.82 CF_CMD_SUSPRES_INF_EID `#define CF_CMD_SUSPRES_INF_EID (114)`

CF Suspend/Resume Command Received Event ID.

Type: INFORMATION

Cause:

Receipt and successful processing of suspend/resume command
Definition at line 957 of file cf_events.h.

10.1.2.83 CF_CMD_SUSPRES_SAME_INF_EID `#define CF_CMD_SUSPRES_SAME_INF_EID (133)`

CF Suspend/Resume Command For Single Transaction State Unchanged Event ID.

Type: INFORMATION

Cause:

Suspend/resume command received affecting single transaction already set to that state
Definition at line 1166 of file cf_events.h.

10.1.2.84 CF_CMD_THAW_ERR_EID `#define CF_CMD_THAW_ERR_EID (160)`

CF Thaw Command Failed Event ID.

Type: ERROR

Cause:

Thaw command was unsuccessful
Definition at line 1463 of file cf_events.h.

10.1.2.85 CF_CMD_THAW_INF_EID `#define CF_CMD_THAW_INF_EID (121)`

CF Thaw Command Received Event ID.

Type: INFORMATION

Cause:

Receipt and successful processing of thaw command
Definition at line 1034 of file cf_events.h.

10.1.2.86 CF_CMD_TRANS_NOT_FOUND_ERR_EID `#define CF_CMD_TRANS_NOT_FOUND_ERR_EID (131)`

CF Command Transaction Invalid Event ID.

Type: ERROR

Cause:

Command received without a matching transaction
Definition at line 1144 of file cf_events.h.

10.1.2.87 CF_CMD_TSN_CHAN_INVALID_ERR_EID `#define CF_CMD_TSN_CHAN_INVALID_ERR_EID (132)`

CF Command All Transaction Channel Invalid Event ID.

Type: ERROR

Cause:

Command received to act on all transactions with invalid channel
Definition at line 1155 of file cf_events.h.

10.1.2.88 CF_CMD_TX_FILE_ERR_EID `#define CF_CMD_TX_FILE_ERR_EID (157)`

CF Transfer File Command Failed Event ID.

Type: ERROR

Cause:

Transfer file command was unsuccessful
Definition at line 1430 of file cf_events.h.

10.1.2.89 CF_CMD_TX_FILE_INF_EID `#define CF_CMD_TX_FILE_INF_EID (118)`

CF Transfer File Command Received Event ID.

Type: INFORMATION

Cause:

Receipt and successful processing of transfer file command
Definition at line 1001 of file cf_events.h.

10.1.2.90 CF_CMD_WHIST_WRITE_ERR_EID `#define CF_CMD_WHIST_WRITE_ERR_EID (153)`

CF Write Entry To File Failed Event ID.

Type: ERROR

Cause:

Write entry to file did not match expected length
Definition at line 1386 of file cf_events.h.

10.1.2.91 CF_CMD_WQ_ARGS_ERR_EID `#define CF_CMD_WQ_ARGS_ERR_EID (138)`

CF Write Queue Command Invalid Queue Event ID.

Type: ERROR

Cause:

Write Queue command received with invalid queue selection arguments
Definition at line 1221 of file cf_events.h.

10.1.2.92 CF_CMD_WQ_CHAN_ERR_EID `#define CF_CMD_WQ_CHAN_ERR_EID (137)`

CF Write Queue Command Invalid Channel Event ID.

Type: ERROR

Cause:

Write Queue command received with invalid channel argument
Definition at line 1210 of file cf_events.h.

10.1.2.93 CF_CMD_WQ_INF_EID `#define CF_CMD_WQ_INF_EID (115)`

CF Write Queue Command Received Event ID.

Type: INFORMATION

Cause:

Receipt and successful processing of write queue command
Definition at line 968 of file cf_events.h.

10.1.2.94 CF_CMD_WQ_OPEN_ERR_EID `#define CF_CMD_WQ_OPEN_ERR_EID (139)`

CF Write Queue Command File Open Failed Event ID.

Type: ERROR

Cause:

Failure of open file call during processing of write queue command
Definition at line 1232 of file cf_events.h.

10.1.2.95 CF_CMD_WQ_WRITEHIST_RX_ERR_EID `#define CF_CMD_WQ_WRITEHIST_RX_ERR_EID (141)`

CF Write Queue Command RX History File Write Failed Event ID.

Type: ERROR

Cause:

Failure of file write call for RX history during processing of write queue command
Definition at line 1254 of file cf_events.h.

10.1.2.96 CF_CMD_WQ_WRITEHIST_TX_ERR_EID `#define CF_CMD_WQ_WRITEHIST_TX_ERR_EID (144)`

CF Write Queue Command TX History File Write Failed Event ID.

Type: ERROR

Cause:

Failure of file write call for TX history during processing of write queue command
Definition at line 1287 of file cf_events.h.

10.1.2.97 CF_CMD_WQ_WRITEQ_PEND_ERR_EID `#define CF_CMD_WQ_WRITEQ_PEND_ERR_EID (143)`

CF Write Queue Command TX Pending File Write Failed Event ID.

Type: ERROR

Cause:

Failure of file write call for TX pending transactions during processing of write queue command
Definition at line 1276 of file cf_events.h.

10.1.2.98 CF_CMD_WQ_WRITEQ_RX_ERR_EID `#define CF_CMD_WQ_WRITEQ_RX_ERR_EID (140)`

CF Write Queue Command RX Active File Write Failed Event ID.

Type: ERROR

Cause:

Failure of file write call for RX active transactions during processing of write queue command
Definition at line 1243 of file cf_events.h.

10.1.2.99 CF_CMD_WQ_WRITEQ_TX_ERR_EID `#define CF_CMD_WQ_WRITEQ_TX_ERR_EID (142)`

CF Write Queue Command TX Active File Write Failed Event ID.

Type: ERROR

Cause:

Failure of file write call for TX active transactions during processing of write queue command
Definition at line 1265 of file cf_events.h.

10.1.2.100 CF_CR_PIPE_ERR_EID `#define CF_CR_PIPE_ERR_EID (31)`

CF Channel Create Pipe Failed Event ID.

Type: ERROR

Cause:

Failure from create pipe call during engine channel initialization
Definition at line 169 of file cf_events.h.

10.1.2.101 CF_INIT_CRC_ALIGN_ERR_EID `#define CF_INIT_CRC_ALIGN_ERR_EID (34)`

CF CRC Bytes Per Wakeup Config Table Validation Failed Event ID.

Type: ERROR

Cause:

Configuration table CRC bytes per wakeup not aligned or zero
Definition at line 202 of file cf_events.h.

10.1.2.102 CF_INIT_INF_EID `#define CF_INIT_INF_EID (20)`

CF Initialization Event ID.

Type: INFORMATION

Cause:

Successful completion of application initialization
Definition at line 47 of file cf_events.h.

10.1.2.103 CF_INIT_MSG_RECV_ERR_EID `#define CF_INIT_MSG_RECV_ERR_EID (29)`

CF SB Receive Buffer Failed Event ID.

Type: ERROR

Cause:

Failure from SB Receive Buffer call in application run loop
Definition at line 146 of file cf_events.h.

10.1.2.104 CF_INIT_OUTGOING_SIZE_ERR_EID `#define CF_INIT_OUTGOING_SIZE_ERR_EID (35)`

CF Outgoing Chunk Size Config Table Validation Failed Event ID.

Type: ERROR

Cause:

Configuration table outgoing chunk size larger than PDU data size
Definition at line 213 of file cf_events.h.

10.1.2.105 CF_INIT_SEM_ERR_EID `#define CF_INIT_SEM_ERR_EID (30)`

CF Channel Semaphore Initialization Failed Event ID.

Type: ERROR

Cause:

Failure from get semaphore by name call during engine channel initialization, semaphore needs to exist before engine is initialized.
Definition at line 158 of file cf_events.h.

10.1.2.106 CF_INIT_SUB_ERR_EID `#define CF_INIT_SUB_ERR_EID (32)`

CF Channel Message Subscription Failed Event ID.

Type: ERROR

Cause:

Failure from message subscription call during engine channel initialization
Definition at line 180 of file cf_events.h.

10.1.2.107 CF_INIT_TBL_CHECK_GA_ERR_EID `#define CF_INIT_TBL_CHECK_GA_ERR_EID (23)`

CF Check Table Get Address Failed Event ID.

Type: ERROR

Cause:

Failure from get table call during periodic table check
Definition at line 80 of file cf_events.h.

10.1.2.108 CF_INIT_TBL_CHECK_MAN_ERR_EID `#define CF_INIT_TBL_CHECK_MAN_ERR_EID (22)`

CF Check Table Manage Failed Event ID.

Type: ERROR

Cause:

Failure from manage table call during periodic table check
Definition at line 69 of file cf_events.h.

10.1.2.109 CF_INIT_TBL_CHECK_REL_ERR_EID `#define CF_INIT_TBL_CHECK_REL_ERR_EID (21)`

CF Check Table Release Address Failed Event ID.

Type: ERROR

Cause:

Failure from release table address call during periodic table check
Definition at line 58 of file cf_events.h.

10.1.2.110 CF_INIT_TBL_GETADDR_ERR_EID `#define CF_INIT_TBL_GETADDR_ERR_EID (27)`

CF Table Get Address At Initialization Failed Event ID.

Type: ERROR

Cause:

Failure from table get address call during application initialization
Definition at line 124 of file cf_events.h.

10.1.2.111 CF_INIT_TBL_LOAD_ERR_EID `#define CF_INIT_TBL_LOAD_ERR_EID (25)`

CF Table Load At Initialization Failed Event ID.

Type: ERROR

Cause:

Failure from table load call during application initialization
Definition at line 102 of file cf_events.h.

10.1.2.112 CF_INIT_TBL_MANAGE_ERR_EID `#define CF_INIT_TBL_MANAGE_ERR_EID (26)`

CF Table Manage At Initialization Failed Event ID.

Type: ERROR

Cause:

Failure from table manage call during application initialization
Definition at line 113 of file cf_events.h.

10.1.2.113 CF_INIT_TBL_REG_ERR_EID `#define CF_INIT_TBL_REG_ERR_EID (24)`

CF Table Registration At Initialization Failed Event ID.

Type: ERROR

Cause:

Failure from table register call during application initialization
Definition at line 91 of file cf_events.h.

10.1.2.114 CF_INIT_TPS_ERR_EID `#define CF_INIT_TPS_ERR_EID (33)`

CF Ticks Per Second Config Table Validation Failed Event ID.

Type: ERROR

Cause:

Configuration table ticks per second set to zero
Definition at line 191 of file cf_events.h.

10.1.2.115 CF_MID_ERR_EID `#define CF_MID_ERR_EID (28)`

CF Message ID Invalid Event ID.

Type: ERROR

Cause:

Invalid message ID received on the software bus pipe
Definition at line 135 of file cf_events.h.

10.1.2.116 CF_NOOP_INF_EID `#define CF_NOOP_INF_EID (110)`

CF NOOP Command Received Event ID.

Type: INFORMATION

Cause:

Receipt of NOOP command
Definition at line 913 of file cf_events.h.

10.1.2.117 CF_PDU_ACK_SHORT_ERR_EID `#define CF_PDU_ACK_SHORT_ERR_EID (48)`

CF Acknowledgment PDU Too Short Event ID.

Type: ERROR

Cause:

Failure processing acknowledgment PDU
Definition at line 305 of file cf_events.h.

10.1.2.118 CF_PDU_EOF_SHORT_ERR_EID `#define CF_PDU_EOF_SHORT_ERR_EID (47)`

CF End-Of-File PDU Too Short Event ID.

Type: ERROR

Cause:

Failure processing end-of-file PDU
Definition at line 294 of file cf_events.h.

10.1.2.119 CF_PDU_FD_SHORT_ERR_EID `#define CF_PDU_FD_SHORT_ERR_EID (46)`

CF File Data PDU Too Short Event ID.

Type: ERROR

Cause:

Failure processing file data PDU
Definition at line 283 of file cf_events.h.

10.1.2.120 CF_PDU_FD_UNSUPPORTED_ERR_EID `#define CF_PDU_FD_UNSUPPORTED_ERR_EID (54)`

CF File Data PDU Unsupported Option Event ID.

Type: ERROR

Cause:

File Data PDU received with the segment metadata flag set
Definition at line 338 of file cf_events.h.

10.1.2.121 CF_PDU_FIN_SHORT_ERR_EID `#define CF_PDU_FIN_SHORT_ERR_EID (49)`

CF Finished PDU Too Short Event ID.

Type: ERROR

Cause:

Failure processing finished PDU
Definition at line 316 of file cf_events.h.

10.1.2.122 CF_PDU_INVALID_DST_LEN_ERR_EID `#define CF_PDU_INVALID_DST_LEN_ERR_EID (45)`

CF Metadata PDU Destination Filename Length Invalid Event ID.

Type: ERROR

Cause:

Metadata PDU destination filename length exceeds buffer size
Definition at line 272 of file cf_events.h.

10.1.2.123 CF_PDU_INVALID_SRC_LEN_ERR_EID `#define CF_PDU_INVALID_SRC_LEN_ERR_EID (44)`

CF Metadata PDU Source Filename Length Invalid Event ID.

Type: ERROR

Cause:

Metadata PDU source filename length exceeds buffer size
Definition at line 261 of file cf_events.h.

10.1.2.124 CF_PDU_LARGE_FILE_ERR_EID `#define CF_PDU_LARGE_FILE_ERR_EID (55)`

CF PDU Header Large File Flag Set Event ID.

Type: ERROR

Cause:

PDU Header received with the unsupported large file flag set
Definition at line 349 of file cf_events.h.

10.1.2.125 CF_PDU_MD_RECVD_INF_EID `#define CF_PDU_MD_RECVD_INF_EID (40)`

CF Metadata PDU Received Event ID.

Type: INFORMATION

Cause:

Successful processing of metadata PDU
Definition at line 228 of file cf_events.h.

10.1.2.126 CF_PDU_MD_SHORT_ERR_EID `#define CF_PDU_MD_SHORT_ERR_EID (43)`

CF Metadata PDU Too Short Event ID.

Type: ERROR

Cause:

Failure processing metadata PDU
Definition at line 250 of file cf_events.h.

10.1.2.127 CF_PDU_NAK_SHORT_ERR_EID `#define CF_PDU_NAK_SHORT_ERR_EID (50)`

CF Negative Acknowledgment PDU Too Short Event ID.

Type: ERROR

Cause:

Failure processing negative acknowledgment PDU
Definition at line 327 of file cf_events.h.

10.1.2.128 CF_PDU_SHORT_HEADER_ERR_EID `#define CF_PDU_SHORT_HEADER_ERR_EID (41)`

CF PDU Header Too Short Event ID.

Type: ERROR

Cause:

Failure processing PDU header
Definition at line 239 of file cf_events.h.

10.1.2.129 CF_PDU_TRUNCATION_ERR_EID `#define CF_PDU_TRUNCATION_ERR_EID (56)`

CF PDU Header Field Truncation.

Type: ERROR

Cause:

PDU Header received with fields that would be truncated with the cf configuration
Definition at line 360 of file cf_events.h.

10.1.2.130 CF_RESET_FREED_XACT_DBG_EID `#define CF_RESET_FREED_XACT_DBG_EID (59)`

Attempt to reset a transaction that has already been freed.

Type: DEBUG

Cause:

Can be induced via various off-nominal conditions - such as sending a META-data PDU with an invalid file destination.
Definition at line 377 of file cf_events.h.

10.1.2.131 CF_RESET_INF_EID `#define CF_RESET_INF_EID (111)`

CF Reset Counters Command Received Event ID.

Type: INFORMATION

Cause:

Receipt and successful processing of reset counters command
Definition at line 924 of file cf_events.h.

10.2 CFS CFDP Mission Configuration

Macros

- #define CF_PERF_ID_APPMAIN (11)

  Main application performance ID.
- #define CF_PERF_ID_FSEEK (12)

  File seek performance ID.
- #define CF_PERF_ID_FOPEN (13)

  File open performance ID.
- #define CF_PERF_ID_FCLOSE (14)

  File close performance ID.
- #define CF_PERF_ID_FREAD (15)

  File read performance ID.
- #define CF_PERF_ID_FWRITE (16)

  File write performance ID.
- #define CF_PERF_ID_CYCLE_ENG (17)

  Cycle engine performance ID.
- #define CF_PERF_ID_DIRREAD (18)

  Directory read performance ID.
- #define CF_PERF_ID_CREAT (19)

  Create performance ID.
- #define CF_PERF_ID_RENAME (20)

  Rename performance ID.
- #define CF_PERF_ID_PDURCVD(x) (30 + x)

  PDU Received performance ID.
- #define CF_PERF_ID_PDUSENT(x) (40 + x)

  PDU Sent performance ID.

10.2.1 Detailed Description

10.2.2 Macro Definition Documentation

10.2.2.1 CF_PERF_ID_APPMAIN `#define CF_PERF_ID_APPMAIN (11)`

Main application performance ID.
Definition at line 33 of file cf_perfids.h.

10.2.2.2 CF_PERF_ID_CREAT `#define CF_PERF_ID_CREAT (19)`

Create performance ID.
Definition at line 41 of file cf_perfids.h.

10.2.2.3 CF_PERF_ID_CYCLE_ENG `#define CF_PERF_ID_CYCLE_ENG (17)`

Cycle engine performance ID.
Definition at line 39 of file cf_perfids.h.

10.2.2.4 CF_PERF_ID_DIRREAD `#define CF_PERF_ID_DIRREAD (18)`

Directory read performance ID.
Definition at line 40 of file cf_perfids.h.

10.2.2.5 CF_PERF_ID_FCLOSE `#define CF_PERF_ID_FCLOSE (14)`

File close performance ID.
Definition at line 36 of file cf_perfids.h.

10.2.2.6 CF_PERF_ID_FOPEN `#define CF_PERF_ID_FOPEN (13)`

File open performance ID.
Definition at line 35 of file cf_perfids.h.

10.2.2.7 CF_PERF_ID_FREAD `#define CF_PERF_ID_FREAD (15)`

File read performance ID.
Definition at line 37 of file cf_perfids.h.

10.2.2.8 CF_PERF_ID_FSEEK `#define CF_PERF_ID_FSEEK (12)`

File seek performance ID.
Definition at line 34 of file cf_perfids.h.

10.2.2.9 CF_PERF_ID_FWRITE `#define CF_PERF_ID_FWRITE (16)`

File write performance ID.
Definition at line 38 of file cf_perfids.h.

10.2.2.10 CF_PERF_ID_PDURCVD `#define CF_PERF_ID_PDURCVD( x ) (30 + x)`

PDU Received performance ID.
Definition at line 44 of file cf_perfids.h.

10.2.2.11 CF_PERF_ID_PDUSENT `#define CF_PERF_ID_PDUSENT( x ) (40 + x)`

PDU Sent performance ID.
Definition at line 45 of file cf_perfids.h.

10.2.2.12 CF_PERF_ID_RENAME `#define CF_PERF_ID_RENAME (20)`

Rename performance ID.
Definition at line 42 of file cf_perfids.h.

10.3 CFS CFDP Version

Version Numbers

Macros

- #define CF_MAJOR_VERSION (3)

  Major version number.
- #define CF_MINOR_VERSION (0)

  Minor version number.
- #define CF_REVISION (99)

  Revision number.

10.3.1 Detailed Description

Version Numbers

10.3.2 Macro Definition Documentation

10.3.2.1 CF_MAJOR_VERSION `#define CF_MAJOR_VERSION (3)`

Major version number.
Definition at line 35 of file cf_version.h.

10.3.2.2 CF_MINOR_VERSION `#define CF_MINOR_VERSION (0)`

Minor version number.
Definition at line 36 of file cf_version.h.

10.3.2.3 CF_REVISION `#define CF_REVISION (99)`

Revision number.
Definition at line 37 of file cf_version.h.

10.4 CFS CFDP Command Codes

Enumerations

- enum CF_CMDS {
  CF_NOOP_CC = 0, CF_RESET_CC = 1, CF_TX_FILE_CC = 2, CF_PLAYBACK_DIR_CC = 3,
  CF_FREEZE_CC = 4, CF_THAW_CC = 5, CF_SUSPEND_CC = 6, CF_RESUME_CC = 7,
  CF_CANCEL_CC = 8, CF_ABANDON_CC = 9, CF_SET_PARAM_CC = 10, CF_GET_PARAM_CC = 11,
  CF_WRITE_QUEUE_CC = 15, CF_ENABLE_DEQUEUE_CC = 16, CF_DISABLE_DEQUEUE_CC = 17,
  CF_ENABLE_DIR_POLLING_CC = 18,
  CF_DISABLE_DIR_POLLING_CC = 19, CF_PURGE_QUEUE_CC = 21, CF_ENABLE_ENGINE_CC = 22,
  CF_DISABLE_ENGINE_CC = 23,
  CF_NUM_COMMANDS = 24 }

10.4.1 Detailed Description

10.4.2 Enumeration Type Documentation

10.4.2.1 CF_CMDS `enum CF_CMDS`

Enumerator

CF_NOOP_CC	No-op. **Description** No-operation command for aliveness verification and version reporting **Command Structure** No Payload / Arguments **Command Verification** Successful execution of this command may be verified with the following telemetry: • CF_HkPacket_Payload_t.counters CF_HkCmdCounters_t.cmd will increment • CF_NOOP_INF_EID **Error Conditions** This command may fail for the following reason(s): • Command packet length not as expected, CF_CMD_LEN_ERR_EID **Evidence of failure may be found in the following telemetry:** • CF_HkPacket_Payload_t.counters CF_HkCmdCounters_t.err will increment **Criticality** None

Enumerator

CF_RESET_CC	Reset counters. **Description** Resets the requested housekeeping counters **Command Structure** CF_UnionArgs_Payload_t where byte[0] specifies the counters type, byte[1-3] don't care: • 0 = all counters • 1 = command counters • 2 = fault counters • 3 = up counters • 4 = down counters **Command Verification** Successful execution of this command may be verified with the following telemetry: • CF_HkPacket_Payload_t.counters CF_HkCmdCounters_t.cmd will increment • CF_RESET_INF_EID **Error Conditions** This command may fail for the following reason(s): • Command packet length not as expected, CF_CMD_LEN_ERR_EID • Invalid counter type, CF_CMD_RESET_INVALID_ERR_EID **Evidence of failure may be found in the following telemetry:** • CF_HkPacket_Payload_t.counters CF_HkCmdCounters_t.err will increment **Criticality** None

Enumerator

CF_TX_FILE_CC	Transmit file. **Description** Requests transmission of a file **Command Structure** CF_TxFileCmd_t **Command Verification** Successful execution of this command may be verified with the following telemetry: • CF_HkPacket_Payload_t.counters CF_HkCmdCounters_t.cmd will increment • CF_CMD_TX_FILE_INF_EID **Error Conditions** This command may fail for the following reason(s): • Command packet length not as expected, CF_CMD_LEN_ERR_EID • Invalid parameter, CF_CMD_BAD_PARAM_ERR_EID • Transaction initialization failure, CF_CMD_TX_FILE_ERR_EID **Evidence of failure may be found in the following telemetry:** • CF_HkPacket_Payload_t.counters CF_HkCmdCounters_t.err will increment **Criticality** None **See also** CF_PLAYBACK_DIR_CC

Enumerator

CF_PLAYBACK_DIR_CC	Playback a directory. **Description** Transmits all the files in a directory **Command Structure** CF_PlaybackDirCmd_t - note it's currently a typedef of CF_TxFileCmd_t, where the source filename and destination filename are directories **Command Verification** Successful execution of this command may be verified with the following telemetry: • CF_HkPacket_Payload_t.counters CF_HkCmdCounters_t.cmd will increment • CF_CMD_PLAYBACK_DIR_INF_EID **Error Conditions** This command may fail for the following reason(s): • Command packet length not as expected, CF_CMD_LEN_ERR_EID • Invalid parameter, CF_CMD_BAD_PARAM_ERR_EID • Playback initialization failure, CF_CMD_PLAYBACK_DIR_ERR_EID **Evidence of failure may be found in the following telemetry:** • CF_HkPacket_Payload_t.counters CF_HkCmdCounters_t.err will increment **Criticality** None **See also** CF_TX_FILE_CC

Enumerator

CF_FREEZE_CC	Freeze a channel. **Description** Disables the transmission of all PDUs and disables tick processing (timeouts, ACK/NAK, etc) for the specified channel, will still consume all received messages. Note this could cause failures for class 2 transactions in progress. **Command Structure** CF_UnionArgs_Payload_t where byte[0] specifies the channel number or all channels • 255 = all channels • else = single channel **Command Verification** Successful execution of this command may be verified with the following telemetry: • CF_HkPacket_Payload_t.counters CF_HkCmdCounters_t.cmd will increment • CF_CMD_FREEZE_INF_EID **Error Conditions** This command may fail for the following reason(s): • Command packet length not as expected, CF_CMD_LEN_ERR_EID • Invalid channel number, CF_CMD_CHAN_PARAM_ERR_EID • Command processing failure, CF_CMD_FREEZE_ERR_EID **Evidence of failure may be found in the following telemetry:** • CF_HkPacket_Payload_t.counters CF_HkCmdCounters_t.err will increment **Criticality** None **See also** CF_THAW_CC

Enumerator

CF_THAW_CC	Thaw a channel. **Description** Enables the transmission of all PDUs and resumes tick processing (timeouts, ACK/NAK, etc) for the specified channel, note received messages are consumed either way. **Command Structure** CF_UnionArgs_Payload_t where byte[0] specifies the channel number or all channels • 255 = all channels • else = single channel **Command Verification** Successful execution of this command may be verified with the following telemetry: • CF_HkPacket_Payload_t.counters CF_HkCmdCounters_t.cmd will increment • CF_CMD_THAW_INF_EID **Error Conditions** This command may fail for the following reason(s): • Command packet length not as expected, CF_CMD_LEN_ERR_EID • Invalid channel number, CF_CMD_CHAN_PARAM_ERR_EID • Command processing failure, CF_CMD_THAW_ERR_EID **Evidence of failure may be found in the following telemetry:** • CF_HkPacket_Payload_t.counters CF_HkCmdCounters_t.err will increment **Criticality** None **See also** CF_FREEZE_CC

Enumerator

CF_SUSPEND_CC	Suspend a transaction. **Description** Disables the transmission of all PDUs and disables tick processing (timeouts, ACK/NAK, etc) on a single transaction, all channels and transactions, or all transactions on a specific channel. Will still consume all received messages. Note suspension is tracked per transaction, whereas freeze/thaw are tracked per channel. **Command Structure** CF_Transaction_Payload_t **Command Verification** Successful execution of this command may be verified with the following telemetry: • CF_HkPacket_Payload_t.counters CF_HkCmdCounters_t.cmd will increment • CF_CMD_SUSPRES_INF_EID • CF_CMD_SUSPRES_SAME_INF_EID **Error Conditions** This command may fail for the following reason(s): • Command packet length not as expected, CF_CMD_LEN_ERR_EID • Transaction not found using compound key, CF_CMD_TRANS_NOT_FOUND_ERR_EID • Invalid channel number, CF_CMD_TSN_CHAN_INVALID_ERR_EID • No matching transaction, CF_CMD_SUSPRES_CHAN_ERR_EID **Evidence of failure may be found in the following telemetry:** • CF_HkPacket_Payload_t.counters CF_HkCmdCounters_t.err will increment **Criticality** None **See also** CF_RESUME_CC, CF_CANCEL_CC, CF_ABANDON_CC

Enumerator

CF_RESUME_CC	Resume a transaction. **Description** Enables the transmission of all PDUs and resumes tick processing (timeouts, ACK/NAK, etc) on a single transaction, all channels and transactions, or all transactions on a specific channel. Note a suspended transaction still consume all received messages. Note suspension is tracked per transaction, whereas freeze/thaw are tracked per channel. **Command Structure** CF_Transaction_Payload_t **Command Verification** Successful execution of this command may be verified with the following telemetry: • CF_HkPacket_Payload_t.counters CF_HkCmdCounters_t.cmd will increment • CF_CMD_SUSPRES_INF_EID • CF_CMD_SUSPRES_SAME_INF_EID **Error Conditions** This command may fail for the following reason(s): • Command packet length not as expected, CF_CMD_LEN_ERR_EID • Transaction not found using compound key, CF_CMD_TRANS_NOT_FOUND_ERR_EID • Invalid channel number, CF_CMD_TSN_CHAN_INVALID_ERR_EID • No matching transaction, CF_CMD_SUSPRES_CHAN_ERR_EID **Evidence of failure may be found in the following telemetry:** • CF_HkPacket_Payload_t.counters CF_HkCmdCounters_t.err will increment **Criticality** None **See also** CF_SUSPEND_CC, CF_CANCEL_CC, CF_ABANDON_CC

Enumerator

CF_CANCEL_CC	Cancel a transaction. **Description** Cancel transaction processing by taking steps to close out cleanly (based on transaction type and direction) for a single transaction, all channels and transactions, or all transactions on a specific channel. **Command Structure** CF_Transaction_Payload_t **Command Verification** Successful execution of this command may be verified with the following telemetry: • CF_HkPacket_Payload_t.counters CF_HkCmdCounters_t.cmd will increment • CF_CMD_CANCEL_INF_EID **Error Conditions** This command may fail for the following reason(s): • Command packet length not as expected, CF_CMD_LEN_ERR_EID • Transaction not found using compound key, CF_CMD_TRANS_NOT_FOUND_ERR_EID • Invalid channel number, CF_CMD_TSN_CHAN_INVALID_ERR_EID • No matching transaction, CF_CMD_CANCEL_CHAN_ERR_EID **Evidence of failure may be found in the following telemetry:** • CF_HkPacket_Payload_t.counters CF_HkCmdCounters_t.err will increment **Criticality** None **See also** CF_SUSPEND_CC, CF_RESUME_CC, CF_ABANDON_CC

Enumerator

CF_ABANDON_CC	Abandon a transaction. **Description** Abandon transaction processing with an immediate reset (no close out attempted) for a single transaction, all channels and transactions, or all transactions on a specific channel. **Command Structure** CF_Transaction_Payload_t **Command Verification** Successful execution of this command may be verified with the following telemetry: • CF_HkPacket_Payload_t.counters CF_HkCmdCounters_t.cmd will increment • CF_CMD_ABANDON_INF_EID **Error Conditions** This command may fail for the following reason(s): • Command packet length not as expected, CF_CMD_LEN_ERR_EID • Transaction not found using compound key, CF_CMD_TRANS_NOT_FOUND_ERR_EID • Invalid channel number, CF_CMD_TSN_CHAN_INVALID_ERR_EID • No matching transaction, CF_CMD_ABANDON_CHAN_ERR_EID **Evidence of failure may be found in the following telemetry:** • CF_HkPacket_Payload_t.counters CF_HkCmdCounters_t.err will increment **Criticality** None **See also** CF_SUSPEND_CC, CF_RESUME_CC, CF_CANCEL_CC

Enumerator

CF_SET_PARAM_CC	Set parameter. **Description** Sets a configuration parameter **Command Structure** CF_SetParamCmd_t **Command Verification** Successful execution of this command may be verified with the following telemetry: • CF_HkPacket_Payload_t.counters CF_HkCmdCounters_t.cmd will increment • CF_CMD_GETSET1_INF_EID **Error Conditions** This command may fail for the following reason(s): • Command packet length not as expected, CF_CMD_LEN_ERR_EID • Invalid configuration parameter key, CF_CMD_GETSET_PARAM_ERR_EID • Invalid channel number, CF_CMD_GETSET_CHAN_ERR_EID • Parameter value failed validation, CF_CMD_GETSET_VALIDATE_ERR_EID **Evidence of failure may be found in the following telemetry:** • CF_HkPacket_Payload_t.counters CF_HkCmdCounters_t.err will increment **Criticality** None **See also** CF_GET_PARAM_CC

Enumerator

CF_GET_PARAM_CC	Get parameter. **Description** Gets a configuration parameter **Command Structure** CF_GetParamCmd_t **Command Verification** Successful execution of this command may be verified with the following telemetry: • CF_HkPacket_Payload_t.counters CF_HkCmdCounters_t.cmd will increment • CF_CMD_GETSET2_INF_EID **Error Conditions** This command may fail for the following reason(s): • Command packet length not as expected, CF_CMD_LEN_ERR_EID • Invalid configuration parameter key, CF_CMD_GETSET_PARAM_ERR_EID • Invalid channel number, CF_CMD_GETSET_CHAN_ERR_EID **Evidence of failure may be found in the following telemetry:** • CF_HkPacket_Payload_t.counters CF_HkCmdCounters_t.err will increment **Criticality** None **See also** CF_SET_PARAM_CC

Enumerator

CF_WRITE_QUEUE_CC	Write queue. **Description** Writes requested queue(s) to a file **Command Structure** CF_WriteQueueCmd_t **Command Verification** Successful execution of this command may be verified with the following telemetry: • CF_HkPacket_Payload_t.counters CF_HkCmdCounters_t.cmd will increment • CF_CMD_WQ_INF_EID **Error Conditions** This command may fail for the following reason(s): • Command packet length not as expected, CF_CMD_LEN_ERR_EID • Invalid parameter combination, CF_CMD_WQ_ARGS_ERR_EID • Invalid channel number, CF_CMD_WQ_CHAN_ERR_EID • Open file to write failed, CF_CMD_WQ_OPEN_ERR_EID • Write RX data failed, CF_CMD_WQ_WRITEQ_RX_ERR_EID • Write RX history data failed, CF_CMD_WQ_WRITEHIST_RX_ERR_EID • Write TX data failed, CF_CMD_WQ_WRITEQ_TX_ERR_EID • Write TX history data failed, CF_CMD_WQ_WRITEHIST_TX_ERR_EID **Evidence of failure may be found in the following telemetry:** • CF_HkPacket_Payload_t.counters CF_HkCmdCounters_t.err will increment **Criticality** None **See also** CF_PURGE_QUEUE_CC

Enumerator

CF_ENABLE_DEQUEUE_CC	Enable dequeue. **Description** Enables the sending of file data PDUs. **Command Structure** CF_UnionArgs_Payload_t where byte[0] specifies the channel number or all channels • 255 = all channels • else = single channel **Command Verification** Successful execution of this command may be verified with the following telemetry: • CF_HkPacket_Payload_t.counters CF_HkCmdCounters_t.cmd will increment • CF_CMD_ENABLE_DEQUEUE_INF_EID **Error Conditions** This command may fail for the following reason(s): • Command packet length not as expected, CF_CMD_LEN_ERR_EID • Invalid channel number, CF_CMD_CHAN_PARAM_ERR_EID • Enable dequeue failed, CF_CMD_ENABLE_DEQUEUE_ERR_EID **Evidence of failure may be found in the following telemetry:** • CF_HkPacket_Payload_t.counters CF_HkCmdCounters_t.err will increment **Criticality** None **See also** CF_DISABLE_DEQUEUE_CC

Enumerator

CF_DISABLE_DEQUEUE_CC	Disable dequeue. **Description** Disables the sending of file data PDUs. **Command Structure** CF_UnionArgs_Payload_t where byte[0] specifies the channel number or all channels • 255 = all channels • else = single channel **Command Verification** Successful execution of this command may be verified with the following telemetry: • CF_HkPacket_Payload_t.counters CF_HkCmdCounters_t.cmd will increment • CF_CMD_DISABLE_DEQUEUE_INF_EID **Error Conditions** This command may fail for the following reason(s): • Command packet length not as expected, CF_CMD_LEN_ERR_EID • Invalid channel number, CF_CMD_CHAN_PARAM_ERR_EID • Disable dequeue failed, CF_CMD_DISABLE_DEQUEUE_INF_EID **Evidence of failure may be found in the following telemetry:** • CF_HkPacket_Payload_t.counters CF_HkCmdCounters_t.err will increment **Criticality** None **See also** CF_ENABLE_DEQUEUE_CC

Enumerator

CF_ENABLE_DIR_POLLING_CC	Enable directory polling. **Description** Enables the processing of polling directories **Command Structure** CF_UnionArgs_Payload_t byte[0] specifies the channel number or all channels • 255 = all channels • else = single channel byte[1] specifies the polling directory index • 255 = all polling directories • else = single polling directory index **Command Verification** Successful execution of this command may be verified with the following telemetry: • CF_HkPacket_Payload_t.counters CF_HkCmdCounters_t.cmd will increment • CF_CMD_ENABLE_POLLDIR_INF_EID **Error Conditions** This command may fail for the following reason(s): • Command packet length not as expected, CF_CMD_LEN_ERR_EID • Invalid channel number, CF_CMD_CHAN_PARAM_ERR_EID • Invalid polling directory index, CF_CMD_POLLDIR_INVALID_ERR_EID • Enable directory polling failed, CF_CMD_ENABLE_POLLDIR_ERR_EID **Evidence of failure may be found in the following telemetry:** • CF_HkPacket_Payload_t.counters CF_HkCmdCounters_t.err will increment **Criticality** None **See also** CF_DISABLE_DIR_POLLING_CC

Enumerator

CF_DISABLE_DIR_POLLING_CC	Disable directory polling. **Description** Disable the processing of polling directories **Command Structure** CF_UnionArgs_Payload_t byte[0] specifies the channel number or all channels • 255 = all channels • else = single channel byte[1] specifies the polling directory index • 255 = all polling directories • else = single polling directory index **Command Verification** Successful execution of this command may be verified with the following telemetry: • CF_HkPacket_Payload_t.counters CF_HkCmdCounters_t.cmd will increment • CF_CMD_DISABLE_POLLDIR_INF_EID **Error Conditions** This command may fail for the following reason(s): • Command packet length not as expected, CF_CMD_LEN_ERR_EID • Invalid channel number, CF_CMD_CHAN_PARAM_ERR_EID • Invalid polling directory index, CF_CMD_POLLDIR_INVALID_ERR_EID • Disable directory polling failed, CF_CMD_DISABLE_POLLDIR_ERR_EID **Evidence of failure may be found in the following telemetry:** • CF_HkPacket_Payload_t.counters CF_HkCmdCounters_t.err will increment **Criticality** None **See also** CF_ENABLE_DIR_POLLING_CC

Enumerator

CF_PURGE_QUEUE_CC	Purge queue. **Description** Purge the requested queue **Command Structure** CF_UnionArgs_Payload_t byte[0] specifies the channel number or all channels • 255 = all channels • else = single channel byte[1] specifies the queue • 0 = Pending queue • 1 = History queue • 2 = Both pending and history queue **Command Verification** Successful execution of this command may be verified with the following telemetry: • CF_HkPacket_Payload_t.counters CF_HkCmdCounters_t.cmd will increment • CF_CMD_PURGE_QUEUE_INF_EID **Error Conditions** This command may fail for the following reason(s): • Command packet length not as expected, CF_CMD_LEN_ERR_EID • Invalid channel number, CF_CMD_CHAN_PARAM_ERR_EID • Invalid purge queue argument, CF_CMD_PURGE_ARG_ERR_EID • Purge queue failed, CF_CMD_PURGE_QUEUE_ERR_EID **Evidence of failure may be found in the following telemetry:** • CF_HkPacket_Payload_t.counters CF_HkCmdCounters_t.err will increment **Criticality** None **See also** CF_WRITE_QUEUE_CC

Enumerator

CF_ENABLE_ENGINE_CC	Enable engine. **Description** Reinitialize engine and enable processing. Note configuration table updates are not processed while the engine is enabled. **Command Structure** No Payload / Arguments **Command Verification** Successful execution of this command may be verified with the following telemetry: • CF_HkPacket_Payload_t.counters CF_HkCmdCounters_t.cmd will increment • CF_CMD_ENABLE_ENGINE_INF_EID • CF_CMD_ENG_ALREADY_ENA_INF_EID **Error Conditions** This command may fail for the following reason(s): • Command packet length not as expected, CF_CMD_LEN_ERR_EID • Engine initialization failed, CF_CMD_ENABLE_ENGINE_ERR_EID **Evidence of failure may be found in the following telemetry:** • CF_HkPacket_Payload_t.counters CF_HkCmdCounters_t.err will increment **Criticality** None **See also** CF_DISABLE_ENGINE_CC

Enumerator

CF_DISABLE_ENGINE_CC	Disable engine. **Description** Disable engine processing. Note configuration table updates can be performed while the engine is disabled, and when the engine is re-enabled the new configuration will take effect. **Command Structure** No Payload / Arguments **Command Verification** Successful execution of this command may be verified with the following telemetry: • CF_HkPacket_Payload_t.counters CF_HkCmdCounters_t.cmd will increment • CF_CMD_DISABLE_ENGINE_INF_EID • CF_CMD_ENG_ALREADY_DIS_INF_EID **Error Conditions** This command may fail for the following reason(s): • Command packet length not as expected, CF_CMD_LEN_ERR_EID **Evidence of failure may be found in the following telemetry:** • CF_HkPacket_Payload_t.counters CF_HkCmdCounters_t.err will increment **Criticality** None **See also** CF_DISABLE_ENGINE_CC
CF_NUM_COMMANDS	Command code limit used for validity check and array sizing.

Definition at line 41 of file default_cf_fcncodes.h.

10.5 CFS CFDP Platform Configuration

Macros

- #define CF_NUM_CHANNELS (2)

  Number of channels.
- #define CF_NAK_MAX_SEGMENTS (58)

  Max NAK segments supported in a NAK PDU.
- #define CF_MAX_POLLING_DIR_PER_CHAN (5)

  Max number of polling directories per channel.
- #define CF_MAX_PDU_SIZE (512)

  Max PDU size.
- #define CF_FILENAME_MAX_NAME CFE_MISSION_MAX_FILE_LEN

  Maximum file name length.
- #define CF_FILENAME_MAX_LEN CFE_MISSION_MAX_PATH_LEN

  Max filename and path length.
- #define CF_PDU_ENCAPSULATION_EXTRA_TRAILING_BYTES 0

  Number of trailing bytes to add to CFDP PDU.
- #define CF_CHANNEL_NUM_RX_CHUNKS_PER_TRANSACTION

  RX chunks per transaction (per channel)
- #define CF_CHANNEL_NUM_TX_CHUNKS_PER_TRANSACTION

  TX chunks per transaction (per channel)
- #define CF_PIPE_DEPTH (32)

  Application Pipe Depth.
- #define CF_MAX_COMMANDED_PLAYBACK_FILES_PER_CHAN (10)

  Number of max commanded playback files per chan.
- #define CF_MAX_SIMULTANEOUS_RX (5)

  Max number of simultaneous file receives.
- #define CF_MAX_COMMANDED_PLAYBACK_DIRECTORIES_PER_CHAN (2)

  Max number of commanded playback directories per channel.
- #define CF_NUM_HISTORIES_PER_CHANNEL (256)

  Number of histories per channel.
- #define CF_NUM_TRANSACTIONS_PER_PLAYBACK (5)

  Number of transactions per playback directory.
- #define CF_CONFIG_TABLE_NAME ("config_table")

  Name of the CF Configuration Table.
- #define CF_CONFIG_TABLE_FILENAME ("/cf/cf_def_config.tbl")

  CF Configuration Table Filename.
- #define CF_R2_CRC_CHUNK_SIZE (1024)

  R2 CRC calc chunk size.
- #define CF_RCVMSG_TIMEOUT (100)

  Number of milliseconds to wait for a SB message.
- #define CF_STARTUP_SEM_MAX_RETRIES 25

  Limits the number of retries to obtain the CF throttle sem.
- #define CF_STARTUP_SEM_TASK_DELAY 100

  Number of milliseconds to wait if CF throttle sem is not available.

10.5.1 Detailed Description

10.5.2 Macro Definition Documentation

10.5.2.1 CF_CHANNEL_NUM_RX_CHUNKS_PER_TRANSACTION `#define CF_CHANNEL_NUM_RX_CHUNKS_PE↩R_TRANSACTION`

Value:

```
{                                          \
    CF_NAK_MAX_SEGMENTS, CF_NAK_MAX_SEGMENTS \
}
```

RX chunks per transaction (per channel)

Description:

Number of chunks per transaction per channel (RX).

CHUNKS - A chunk is a representation of a range (offset, size) of data received by a receiver.
Class 2 CFDP deals with NAK, so received data must be tracked for receivers in order to generate the NAK. The sender must also keep track of NAK requests and send new file data PDUs as a result. (array size must be CF_N↩UM_CHANNELS) CF_CHANNEL_NUM_RX_CHUNKS_PER_TRANSACTION is an array for each channel indicating the number of chunks per transaction CF_CHANNEL_NUM_TX_CHUNKS_PER_TRANSACTION is an array for each channel indicating the number of chunks to keep track of NAK requests from the receiver per transaction

Limits:

Definition at line 78 of file default_cf_internal_cfg.h.

10.5.2.2 CF_CHANNEL_NUM_TX_CHUNKS_PER_TRANSACTION `#define CF_CHANNEL_NUM_TX_CHUNKS_PER↩_TRANSACTION`

Value:

```
{                                          \
    CF_NAK_MAX_SEGMENTS, CF_NAK_MAX_SEGMENTS \
}
```

TX chunks per transaction (per channel)

Description:

Number of chunks per transaction per channel (TX).

Limits:

Definition at line 92 of file default_cf_internal_cfg.h.

10.5.2.3 CF_CONFIG_TABLE_FILENAME `#define CF_CONFIG_TABLE_FILENAME ("/cf/cf_def_config.tbl")`

CF Configuration Table Filename.

Description:

The value of this constant defines the filename of the CF Config Table

Limits

The length of this string, including the NULL terminator cannot exceed the OS_MAX_PATH_LEN value.

Definition at line 190 of file default_cf_internal_cfg.h.

10.5.2.4 CF_CONFIG_TABLE_NAME `#define CF_CONFIG_TABLE_NAME ("config_table")`

Name of the CF Configuration Table.

Description:

This parameter defines the name of the CF Configuration Table.

Limits

The length of this string, including the NULL terminator cannot exceed the OS_MAX_PATH_LEN value.

Definition at line 178 of file default_cf_internal_cfg.h.

10.5.2.5 CF_FILENAME_MAX_LEN `#define CF_FILENAME_MAX_LEN CFE_MISSION_MAX_PATH_LEN`

Max filename and path length.

Limits:

Definition at line 116 of file default_cf_interface_cfg.h.

10.5.2.6 CF_FILENAME_MAX_NAME `#define CF_FILENAME_MAX_NAME CFE_MISSION_MAX_FILE_LEN`

Maximum file name length.

Limits:

Definition at line 108 of file default_cf_interface_cfg.h.

10.5.2.7 CF_MAX_COMMANDED_PLAYBACK_DIRECTORIES_PER_CHAN `#define CF_MAX_COMMANDED_PLA↩ YBACK_DIRECTORIES_PER_CHAN (2)`

Max number of commanded playback directories per channel.

Description:

Each channel can support this number of ground commanded directory playbacks.

Limits:

Definition at line 143 of file default_cf_internal_cfg.h.

10.5.2.8 CF_MAX_COMMANDED_PLAYBACK_FILES_PER_CHAN `#define CF_MAX_COMMANDED_PLAYBACK_F↩ ILES_PER_CHAN (10)`

Number of max commanded playback files per chan.

Description:

This is the max number of outstanding ground commanded file transmits per channel.

Limits:

Definition at line 119 of file default_cf_internal_cfg.h.

10.5.2.9 CF_MAX_PDU_SIZE `#define CF_MAX_PDU_SIZE (512)`

Max PDU size.

Description:

Limits the maximum possible Tx PDU size. Note the resulting CCSDS packet also includes a CCSDS header and CF_PDU_ENCAPSULATION_EXTRA_TRAILING_BYTES. The outgoing file data chunk size is also limited from the table configuration or by set parameter command, which is checked against this value (+ smallest possible PDU header).

Note:

This does NOT limit Rx PDUs, since the file data is written from the transport packet to the file.

Limits:

Since PDUs are wrapped in CCSDS packets, need to respect any CCSDS packet size limits on the system.

Definition at line 100 of file default_cf_interface_cfg.h.

10.5.2.10 CF_MAX_POLLING_DIR_PER_CHAN `#define CF_MAX_POLLING_DIR_PER_CHAN (5)`

Max number of polling directories per channel.

Description:

This affects the configuration table. There must be an entry (can be empty) for each of these polling directories per channel.

Limits:

Definition at line 79 of file default_cf_interface_cfg.h.

10.5.2.11 CF_MAX_SIMULTANEOUS_RX `#define CF_MAX_SIMULTANEOUS_RX (5)`

Max number of simultaneous file receives.

Description:

Each channel can support this number of file receive transactions at a time.

Limits:

Definition at line 130 of file default_cf_internal_cfg.h.

10.5.2.12 CF_NAK_MAX_SEGMENTS `#define CF_NAK_MAX_SEGMENTS (58)`

Max NAK segments supported in a NAK PDU.

Description:

When a NAK PDU is sent or received, this is the max number of segment requests supported. This number should match the ground CFDP engine configuration as well.

Limits:

Definition at line 67 of file default_cf_interface_cfg.h.

10.5.2.13 CF_NUM_CHANNELS `#define CF_NUM_CHANNELS (2)`

Number of channels.

Description:

The number of channels in the engine. Changing this value changes the configuration table for the application.

Limits:

Must be less <= 200. Obviously it will be smaller than that.

Definition at line 54 of file default_cf_interface_cfg.h.

10.5.2.14 CF_NUM_HISTORIES_PER_CHANNEL `#define CF_NUM_HISTORIES_PER_CHANNEL (256)`

Number of histories per channel.

Description:

Each channel can support this number of file receive transactions at a time.

Limits:

65536 is the current max.

Definition at line 154 of file default_cf_internal_cfg.h.

10.5.2.15 CF_NUM_TRANSACTIONS_PER_PLAYBACK `#define CF_NUM_TRANSACTIONS_PER_PLAYBACK (5)`

Number of transactions per playback directory.

Description:

Each playback/polling directory operation will be able to have this many active transfers at a time pending or active.

Limits:

Definition at line 166 of file default_cf_internal_cfg.h.

10.5.2.16 CF_PDU_ENCAPSULATION_EXTRA_TRAILING_BYTES `#define CF_PDU_ENCAPSULATION_EXTRA_T↩ RAILING_BYTES 0`

Number of trailing bytes to add to CFDP PDU.

Description

Additional padding bytes to be appended to the tail of CFDP PDUs This reserves extra space to the software bus encapsulation buffer for every CFDP PDU such that platform-specific trailer information may be added. This includes, but is not limited to a separate CRC or error control field in addition to the error control field(s) within the the nominal CFDP protocol.

These extra bytes are added at the software bus encapsulation layer, they are not part of the CFDP PDU itself.
Set to 0 to disable this feature, such that the software bus buffer encapsulates only the CFDP PDU and no extra bytes are added.

Limits:

Maximum value is the difference between the maximum size of a CFDP PDU and the maximum size of an SB message.

Definition at line 138 of file default_cf_interface_cfg.h.

10.5.2.17 CF_PIPE_DEPTH `#define CF_PIPE_DEPTH (32)`

Application Pipe Depth.

Description:

Dictates the pipe depth of the cf command pipe.

Limits:

The minimum size of this parameter is 1 The maximum size dictated by cFE platform configuration parameter is CFE_SB_MAX_PIPE_DEPTH

Definition at line 108 of file default_cf_internal_cfg.h.

10.5.2.18 CF_R2_CRC_CHUNK_SIZE `#define CF_R2_CRC_CHUNK_SIZE (1024)`

R2 CRC calc chunk size.

Description

R2 performs CRC calculation upon file completion in chunks. This is the size of the buffer. The larger the size the more stack will be used, but the faster it can go. The overall number of bytes calculated per wakeup is set in the configuration table.

Limits:

Definition at line 204 of file default_cf_internal_cfg.h.

10.5.2.19 CF_RCVMSG_TIMEOUT `#define CF_RCVMSG_TIMEOUT (100)`

Number of milliseconds to wait for a SB message.
Definition at line 209 of file default_cf_internal_cfg.h.

10.5.2.20 CF_STARTUP_SEM_MAX_RETRIES `#define CF_STARTUP_SEM_MAX_RETRIES 25`

Limits the number of retries to obtain the CF throttle sem.

Description

If the CF throttle sem is not available during CF startup, the initialization will retry after a short delay.

See also

CF_STARTUP_SEM_TASK_DELAY

Definition at line 220 of file default_cf_internal_cfg.h.

10.5.2.21 CF_STARTUP_SEM_TASK_DELAY `#define CF_STARTUP_SEM_TASK_DELAY 100`

Number of milliseconds to wait if CF throttle sem is not available.

Description

If the CF throttle sem is not available during CF startup, the initialization will delay for this period of time before trying again

See also

CF_STARTUP_SEM_MAX_RETRIES

Definition at line 231 of file default_cf_internal_cfg.h.

10.6 CFS CFDP Telemetry

Data Structures

- struct CF_HkCmdCounters

  Housekeeping command counters.
- struct CF_HkSent

  Housekeeping sent counters.
- struct CF_HkRecv

  Housekeeping received counters.
- struct CF_HkFault

  Housekeeping fault counters.
- struct CF_HkCounters

  Housekeeping counters.
- struct CF_HkChannel_Data

  Housekeeping channel data.
- struct CF_HkPacket_Payload

  Housekeeping packet.
- struct CF_EotPacket_Payload

  End of transaction packet.
- struct CF_HkPacket

  Housekeeping packet.
- struct CF_EotPacket

  End of transaction packet.

Typedefs

- typedef struct CF_HkCmdCounters CF_HkCmdCounters_t

  Housekeeping command counters.
- typedef struct CF_HkSent CF_HkSent_t

  Housekeeping sent counters.
- typedef struct CF_HkRecv CF_HkRecv_t

  Housekeeping received counters.
- typedef struct CF_HkFault CF_HkFault_t

  Housekeeping fault counters.
- typedef struct CF_HkCounters CF_HkCounters_t

  Housekeeping counters.
- typedef struct CF_HkChannel_Data CF_HkChannel_Data_t

  Housekeeping channel data.
- typedef struct CF_HkPacket_Payload CF_HkPacket_Payload_t

  Housekeeping packet.
- typedef struct CF_EotPacket_Payload CF_EotPacket_Payload_t

  End of transaction packet.
- typedef struct CF_HkPacket CF_HkPacket_t

  Housekeeping packet.
- typedef struct CF_EotPacket CF_EotPacket_t

  End of transaction packet.

10.6.1 Detailed Description

10.6.2 Typedef Documentation

10.6.2.1 CF_EotPacket_Payload_t `typedef struct CF_EotPacket_Payload CF_EotPacket_Payload_t`

End of transaction packet.

10.6.2.2 CF_EotPacket_t `typedef struct CF_EotPacket CF_EotPacket_t`

End of transaction packet.

10.6.2.3 CF_HkChannel_Data_t `typedef struct CF_HkChannel_Data CF_HkChannel_Data_t`

Housekeeping channel data.

10.6.2.4 CF_HkCmdCounters_t `typedef struct CF_HkCmdCounters CF_HkCmdCounters_t`

Housekeeping command counters.

10.6.2.5 CF_HkCounters_t `typedef struct CF_HkCounters CF_HkCounters_t`

Housekeeping counters.

10.6.2.6 CF_HkFault_t `typedef struct CF_HkFault CF_HkFault_t`

Housekeeping fault counters.

10.6.2.7 CF_HkPacket_Payload_t `typedef struct CF_HkPacket_Payload CF_HkPacket_Payload_t`

Housekeeping packet.

10.6.2.8 CF_HkPacket_t `typedef struct CF_HkPacket CF_HkPacket_t`

Housekeeping packet.

10.6.2.9 CF_HkRecv_t `typedef struct CF_HkRecv CF_HkRecv_t`

Housekeeping received counters.

10.6.2.10 CF_HkSent_t `typedef struct CF_HkSent CF_HkSent_t`

Housekeeping sent counters.

10.7 CFS CFDP Command Structures

Data Structures

- union CF_UnionArgs_Payload

  Command payload argument union to support 4 uint8's, 2 uint16's or 1 uint32.
- struct CF_GetParam_Payload

  Get parameter command structure.
- struct CF_SetParam_Payload

  Set parameter command structure.
- struct CF_TxFile_Payload

  Transmit file command structure.
- struct CF_WriteQueue_Payload

  Write Queue command structure.
- struct CF_Transaction_Payload

  Transaction command structure.
- struct CF_NoopCmd

  Noop command structure.
- struct CF_EnableEngineCmd

  EnableEngine command structure.
- struct CF_DisableEngineCmd

  DisableEngine command structure.
- struct CF_ResetCmd

  Reset command structure.
- struct CF_FreezeCmd

  Freeze command structure.
- struct CF_ThawCmd

  Thaw command structure.
- struct CF_EnableDequeueCmd

  EnableDequeue command structure.
- struct CF_DisableDequeueCmd

  DisableDequeue command structure.
- struct CF_EnableDirPollingCmd

  EnableDirPolling command structure.
- struct CF_DisableDirPollingCmd

  DisableDirPolling command structure.
- struct CF_PurgeQueueCmd

  PurgeQueue command structure.
- struct CF_GetParamCmd

  Get parameter command structure.
- struct CF_SetParamCmd

  Set parameter command structure.
- struct CF_TxFileCmd

  Transmit file command structure.
- struct CF_WriteQueueCmd

  Write Queue command structure.
- struct CF_PlaybackDirCmd

  Playback directory command structure.

- struct CF_SuspendCmd

  Suspend command structure.
- struct CF_ResumeCmd

  Resume command structure.
- struct CF_CancelCmd

  Cancel command structure.
- struct CF_AbandonCmd

  Abandon command structure.
- struct CF_SendHkCmd

  Send Housekeeping Command.
- struct CF_WakeupCmd

  Wake Up Command.

Typedefs

- typedef union CF_UnionArgs_Payload CF_UnionArgs_Payload_t

  Command payload argument union to support 4 uint8's, 2 uint16's or 1 uint32.
- typedef struct CF_GetParam_Payload CF_GetParam_Payload_t

  Get parameter command structure.
- typedef struct CF_SetParam_Payload CF_SetParam_Payload_t

  Set parameter command structure.
- typedef struct CF_TxFile_Payload CF_TxFile_Payload_t

  Transmit file command structure.
- typedef struct CF_WriteQueue_Payload CF_WriteQueue_Payload_t

  Write Queue command structure.
- typedef struct CF_Transaction_Payload CF_Transaction_Payload_t

  Transaction command structure.
- typedef struct CF_NoopCmd CF_NoopCmd_t

  Noop command structure.
- typedef struct CF_EnableEngineCmd CF_EnableEngineCmd_t

  EnableEngine command structure.
- typedef struct CF_DisableEngineCmd CF_DisableEngineCmd_t

  DisableEngine command structure.
- typedef struct CF_ResetCmd CF_ResetCmd_t

  Reset command structure.
- typedef struct CF_FreezeCmd CF_FreezeCmd_t

  Freeze command structure.
- typedef struct CF_ThawCmd CF_ThawCmd_t

  Thaw command structure.
- typedef struct CF_EnableDequeueCmd CF_EnableDequeueCmd_t

  EnableDequeue command structure.
- typedef struct CF_DisableDequeueCmd CF_DisableDequeueCmd_t

  DisableDequeue command structure.
- typedef struct CF_EnableDirPollingCmd CF_EnableDirPollingCmd_t

  EnableDirPolling command structure.
- typedef struct CF_DisableDirPollingCmd CF_DisableDirPollingCmd_t

  DisableDirPolling command structure.
- typedef struct CF_PurgeQueueCmd CF_PurgeQueueCmd_t

PurgeQueue command structure.

- typedef struct CF_GetParamCmd CF_GetParamCmd_t

  Get parameter command structure.
- typedef struct CF_SetParamCmd CF_SetParamCmd_t

  Set parameter command structure.
- typedef struct CF_TxFileCmd CF_TxFileCmd_t

  Transmit file command structure.
- typedef struct CF_WriteQueueCmd CF_WriteQueueCmd_t

  Write Queue command structure.
- typedef struct CF_PlaybackDirCmd CF_PlaybackDirCmd_t

  Playback directory command structure.
- typedef struct CF_SuspendCmd CF_SuspendCmd_t

  Suspend command structure.
- typedef struct CF_ResumeCmd CF_ResumeCmd_t

  Resume command structure.
- typedef struct CF_CancelCmd CF_CancelCmd_t

  Cancel command structure.
- typedef struct CF_AbandonCmd CF_AbandonCmd_t

  Abandon command structure.
- typedef struct CF_SendHkCmd CF_SendHkCmd_t

  Send Housekeeping Command.
- typedef struct CF_WakeupCmd CF_WakeupCmd_t

  Wake Up Command.

Enumerations

- enum CF_Reset_t { CF_Reset_all = 0, CF_Reset_command = 1, CF_Reset_fault = 2, CF_Reset_up = 3, CF_Reset_down = 4 }

  IDs for use for Reset cmd.
- enum CF_Type_t { CF_Type_all = 0, CF_Type_up = 1, CF_Type_down = 2 }

  Type IDs for use for Write Queue cmd.
- enum CF_Queue_t { CF_Queue_pend = 0, CF_Queue_active = 1, CF_Queue_history = 2, CF_Queue_all = 3 }

  Queue IDs for use for Write Queue cmd.
- enum CF_GetSet_ValueID_t { CF_GetSet_ValueID_ticks_per_second, CF_GetSet_ValueID_rx_crc_calc_bytes_per_wakeup, CF_GetSet_ValueID_ack_timer_s, CF_GetSet_ValueID_nak_timer_s, CF_GetSet_ValueID_inactivity_timer_s, CF_GetSet_ValueID_outgoing_file_chunk_size, CF_GetSet_ValueID_ack_limit, CF_GetSet_ValueID_nak_limit, CF_GetSet_ValueID_local_eid, CF_GetSet_ValueID_chan_max_outgoing_messages_per_wakeup, CF_GetSet_ValueID_MAX }

  Parameter IDs for use with Get/Set parameter messages.

10.7.1 Detailed Description

10.7.2 Typedef Documentation

10.7.2.1 CF_AbandonCmd_t `typedef struct CF_AbandonCmd CF_AbandonCmd_t`

Abandon command structure.
For command details see CF_ABANDON_CC

10.7.2.2 CF_CancelCmd_t `typedef struct CF_CancelCmd CF_CancelCmd_t`

Cancel command structure.
For command details see CF_CANCEL_CC

10.7.2.3 CF_DisableDequeueCmd_t `typedef struct CF_DisableDequeueCmd CF_DisableDequeueCmd_t`

DisableDequeue command structure.
For command details see CF_DISABLE_DEQUEUE_CC

10.7.2.4 CF_DisableDirPollingCmd_t `typedef struct CF_DisableDirPollingCmd CF_DisableDirPollingCmd_t`

DisableDirPolling command structure.
For command details see CF_DISABLE_DIR_POLLING_CC

10.7.2.5 CF_DisableEngineCmd_t `typedef struct CF_DisableEngineCmd CF_DisableEngineCmd_t`

DisableEngine command structure.
For command details see CF_DISABLE_ENGINE_CC

10.7.2.6 CF_EnableDequeueCmd_t `typedef struct CF_EnableDequeueCmd CF_EnableDequeueCmd_t`

EnableDequeue command structure.
For command details see CF_ENABLE_DEQUEUE_CC

10.7.2.7 CF_EnableDirPollingCmd_t `typedef struct CF_EnableDirPollingCmd CF_EnableDirPollingCmd_t`

EnableDirPolling command structure.
For command details see CF_ENABLE_DIR_POLLING_CC

10.7.2.8 CF_EnableEngineCmd_t `typedef struct CF_EnableEngineCmd CF_EnableEngineCmd_t`

EnableEngine command structure.
For command details see CF_ENABLE_ENGINE_CC

10.7.2.9 CF_FreezeCmd_t `typedef struct CF_FreezeCmd CF_FreezeCmd_t`

Freeze command structure.
For command details see CF_FREEZE_CC

10.7.2.10 CF_GetParam_Payload_t `typedef struct CF_GetParam_Payload CF_GetParam_Payload_t`

Get parameter command structure.
For command details see CF_GET_PARAM_CC

10.7.2.11 CF_GetParamCmd_t `typedef struct CF_GetParamCmd CF_GetParamCmd_t`

Get parameter command structure.
For command details see CF_GET_PARAM_CC

10.7.2.12 CF_NoopCmd_t `typedef struct CF_NoopCmd CF_NoopCmd_t`

Noop command structure.
For command details see CF_NOOP_CC

10.7.2.13 CF_PlaybackDirCmd_t `typedef struct CF_PlaybackDirCmd CF_PlaybackDirCmd_t`

Playback directory command structure.
For command details see CF_PLAYBACK_DIR_CC

10.7.2.14 CF_PurgeQueueCmd_t `typedef struct CF_PurgeQueueCmd CF_PurgeQueueCmd_t`

PurgeQueue command structure.
For command details see CF_PURGE_QUEUE_CC

10.7.2.15 CF_ResetCmd_t `typedef struct CF_ResetCmd CF_ResetCmd_t`

Reset command structure.
For command details see CF_RESET_CC

10.7.2.16 CF_ResumeCmd_t `typedef struct CF_ResumeCmd CF_ResumeCmd_t`

Resume command structure.
For command details see CF_RESUME_CC

10.7.2.17 CF_SendHkCmd_t `typedef struct CF_SendHkCmd CF_SendHkCmd_t`

Send Housekeeping Command.
Internal notification from SCH with no payload

10.7.2.18 CF_SetParam_Payload_t `typedef struct CF_SetParam_Payload CF_SetParam_Payload_t`

Set parameter command structure.
For command details see CF_SET_PARAM_CC

10.7.2.19 CF_SetParamCmd_t `typedef struct CF_SetParamCmd CF_SetParamCmd_t`

Set parameter command structure.
For command details see CF_SET_PARAM_CC

10.7.2.20 CF_SuspendCmd_t `typedef struct CF_SuspendCmd CF_SuspendCmd_t`

Suspend command structure.
For command details see CF_SUSPEND_CC

10.7.2.21 CF_ThawCmd_t `typedef struct CF_ThawCmd CF_ThawCmd_t`

Thaw command structure.
For command details see CF_THAW_CC

10.7.2.22 CF_Transaction_Payload_t `typedef struct CF_Transaction_Payload CF_Transaction_Payload_t`

Transaction command structure.
For command details see CF_SUSPEND_CC, CF_RESUME_CC, CF_CANCEL_CC, CF_ABANDON_CC

10.7.2.23 CF_TxFile_Payload_t `typedef struct CF_TxFile_Payload CF_TxFile_Payload_t`

Transmit file command structure.
For command details see CF_TX_FILE_CC

10.7.2.24 CF_TxFileCmd_t `typedef struct CF_TxFileCmd CF_TxFileCmd_t`

Transmit file command structure.
For command details see CF_TX_FILE_CC

10.7.2.25 CF_UnionArgs_Payload_t `typedef union CF_UnionArgs_Payload CF_UnionArgs_Payload_t`

Command payload argument union to support 4 uint8's, 2 uint16's or 1 uint32.

10.7.2.26 CF_WakeupCmd_t `typedef struct CF_WakeupCmd CF_WakeupCmd_t`

Wake Up Command.
Internal notification from SCH with no payload

10.7.2.27 CF_WriteQueue_Payload_t `typedef struct CF_WriteQueue_Payload CF_WriteQueue_Payload_t`

Write Queue command structure.
For command details see CF_WRITE_QUEUE_CC

10.7.2.28 CF_WriteQueueCmd_t `typedef struct CF_WriteQueueCmd CF_WriteQueueCmd_t`

Write Queue command structure.
For command details see CF_WRITE_QUEUE_CC

10.7.3 Enumeration Type Documentation

10.7.3.1 CF_GetSet_ValueID_t `enum CF_GetSet_ValueID_t`

Parameter IDs for use with Get/Set parameter messages.
Specifically these are used for the "key" field within CF_GetParamCmd_t and CF_SetParamCmd_t message structures.

Enumerator

CF_GetSet_ValueID_ticks_per_second	Ticks per second key.
CF_GetSet_ValueID_rx_crc_calc_bytes_per_wakeup	Receive CRC calculated bytes per wake-up key.
CF_GetSet_ValueID_ack_timer_s	ACK timer in seconds key.
CF_GetSet_ValueID_nak_timer_s	NAK timer in seconds key.
CF_GetSet_ValueID_inactivity_timer_s	Inactivity timer in seconds key.
CF_GetSet_ValueID_outgoing_file_chunk_size	Outgoing file chunk size key.
CF_GetSet_ValueID_ack_limit	ACK retry limit key.
CF_GetSet_ValueID_nak_limit	NAK retry limit key.
CF_GetSet_ValueID_local_eid	Local entity id key.
CF_GetSet_ValueID_chan_max_outgoing_messages_per_wakeup	Max outgoing messages per wake-up key.
CF_GetSet_ValueID_MAX	Key limit used for validity check.

Definition at line 197 of file default_cf_msgdefs.h.

10.7.3.2 CF_Queue_t `enum CF_Queue_t`

Queue IDs for use for Write Queue cmd.

Enumerator

CF_Queue_pend	Queue pending.
CF_Queue_active	Queue active.
CF_Queue_history	Queue history.
CF_Queue_all	Queue all.

Definition at line 183 of file default_cf_msgdefs.h.

10.7.3.3 CF_Reset_t `enum CF_Reset_t`

IDs for use for Reset cmd.

Enumerator

CF_Reset_all	Reset all.
CF_Reset_command	Reset command.
CF_Reset_fault	Reset fault.
CF_Reset_up	Reset up.
CF_Reset_down	Reset down.

Definition at line 161 of file default_cf_msgdefs.h.

10.7.3.4 CF_Type_t `enum CF_Type_t`

Type IDs for use for Write Queue cmd.

Enumerator

CF_Type_all	Type all.
CF_Type_up	Type up.
CF_Type_down	Type down.

Definition at line 173 of file default_cf_msgdefs.h.

10.8 CFS CFDP Command Message IDs

Macros

- #define CF_CMD_MID CFE_PLATFORM_CMD_TOPICID_TO_MIDV(CFE_MISSION_CF_CMD_TOPICID)

  Message ID for commands.
- #define CF_SEND_HK_MID CFE_PLATFORM_CMD_TOPICID_TO_MIDV(CFE_MISSION_CF_SEND_HK_TOPICID)

  Message ID to request housekeeping telemetry.
- #define CF_WAKE_UP_MID CFE_PLATFORM_CMD_TOPICID_TO_MIDV(CFE_MISSION_CF_WAKE_UP_TOPICID)

  Message ID for waking up the processing cycle.

10.8.1 Detailed Description

10.8.2 Macro Definition Documentation

10.8.2.1 CF_CMD_MID `#define CF_CMD_MID CFE_PLATFORM_CMD_TOPICID_TO_MIDV(CFE_MISSION_CF_CMD_TOPICID)`

Message ID for commands.
Definition at line 36 of file default_cf_msgids.h.

10.8.2.2 CF_SEND_HK_MID `#define CF_SEND_HK_MID CFE_PLATFORM_CMD_TOPICID_TO_MIDV(CFE_MISSION_CF_SEND_HK_TOPICID`

Message ID to request housekeeping telemetry.
Definition at line 39 of file default_cf_msgids.h.

10.8.2.3 CF_WAKE_UP_MID `#define CF_WAKE_UP_MID CFE_PLATFORM_CMD_TOPICID_TO_MIDV(CFE_MISSION_CF_WAKE_UP_TOPICID`

Message ID for waking up the processing cycle.
Definition at line 42 of file default_cf_msgids.h.

10.9 CFS CFDP Telemetry Message IDs

Macros

- #define CF_HK_TLM_MID CFE_PLATFORM_TLM_TOPICID_TO_MIDV(CFE_MISSION_CF_HK_TLM_TOPICID)

  Message ID for housekeeping telemetry.
- #define CF_EOT_TLM_MID CFE_PLATFORM_TLM_TOPICID_TO_MIDV(CFE_MISSION_CF_EOT_TLM_TOPICID)

  Message ID for end of transaction telemetry.

10.9.1 Detailed Description

10.9.2 Macro Definition Documentation

10.9.2.1 CF_EOT_TLM_MID

`#define CF_EOT_TLM_MID CFE_PLATFORM_TLM_TOPICID_TO_MIDV(CFE_MISSION_CF_EOT_TLM_TOPICID`

Message ID for end of transaction telemetry.
Definition at line 55 of file default_cf_msgids.h.

10.9.2.2 CF_HK_TLM_MID

`#define CF_HK_TLM_MID CFE_PLATFORM_TLM_TOPICID_TO_MIDV(CFE_MISSION_CF_HK_TLM_TOPICID)`

Message ID for housekeeping telemetry.
Definition at line 52 of file default_cf_msgids.h.

10.10 CFS CFDP Data Interface Message IDs

Macros

- #define CF_CH0_TX_MID CFE_PLATFORM_TLM_TOPICID_TO_MIDV(CFE_MISSION_CF_CH0_TX_TOPICID)
- #define CF_CH1_TX_MID CFE_PLATFORM_TLM_TOPICID_TO_MIDV(CFE_MISSION_CF_CH1_TX_TOPICID)
- #define CF_CH0_RX_MID CFE_PLATFORM_CMD_TOPICID_TO_MIDV(CFE_MISSION_CF_CH0_RX_TOPICID)
- #define CF_CH1_RX_MID CFE_PLATFORM_CMD_TOPICID_TO_MIDV(CFE_MISSION_CF_CH1_RX_TOPICID)

10.10.1 Detailed Description

10.10.2 Macro Definition Documentation

10.10.2.1 CF_CH0_RX_MID

```
#define CF_CH0_RX_MID CFE_PLATFORM_CMD_TOPICID_TO_MIDV(CFE_MISSION_CF_CH0_RX_TOPICID)
```

Definition at line 66 of file default_cf_msgids.h.

10.10.2.2 CF_CH0_TX_MID

```
#define CF_CH0_TX_MID CFE_PLATFORM_TLM_TOPICID_TO_MIDV(CFE_MISSION_CF_CH0_TX_TOPICID)
```

Definition at line 64 of file default_cf_msgids.h.

10.10.2.3 CF_CH1_RX_MID

```
#define CF_CH1_RX_MID CFE_PLATFORM_CMD_TOPICID_TO_MIDV(CFE_MISSION_CF_CH1_RX_TOPICID)
```

Definition at line 67 of file default_cf_msgids.h.

10.10.2.4 CF_CH1_TX_MID

```
#define CF_CH1_TX_MID CFE_PLATFORM_TLM_TOPICID_TO_MIDV(CFE_MISSION_CF_CH1_TX_TOPICID)
```

Definition at line 65 of file default_cf_msgids.h.

10.11 cFE Return Code Defines

Macros

- #define CFE_SUCCESS ((CFE_Status_t)0)

  Successful execution.
- #define CFE_STATUS_NO_COUNTER_INCREMENT ((CFE_Status_t)0x48000001)

  No Counter Increment.
- #define CFE_STATUS_WRONG_MSG_LENGTH ((CFE_Status_t)0xc8000002)

  Wrong Message Length.
- #define CFE_STATUS_UNKNOWN_MSG_ID ((CFE_Status_t)0xc8000003)

  Unknown Message ID.
- #define CFE_STATUS_BAD_COMMAND_CODE ((CFE_Status_t)0xc8000004)

  Bad Command Code.
- #define CFE_STATUS_EXTERNAL_RESOURCE_FAIL ((CFE_Status_t)0xc8000005)

  External failure.
- #define CFE_STATUS_REQUEST_ALREADY_PENDING ((int32)0xc8000006)

  Request already pending.
- #define CFE_STATUS_VALIDATION_FAILURE ((int32)0xc8000007)

  Request or input value failed basic structural validation.
- #define CFE_STATUS_RANGE_ERROR ((int32)0xc8000008)

  Request or input value is out of range.
- #define CFE_STATUS_INCORRECT_STATE ((int32)0xc8000009)

  Cannot process request at this time.
- #define CFE_STATUS_NOT_IMPLEMENTED ((CFE_Status_t)0xc800ffff)

  Not Implemented.
- #define CFE_EVS_UNKNOWN_FILTER ((CFE_Status_t)0xc2000001)

  Unknown Filter.
- #define CFE_EVS_APP_NOT_REGISTERED ((CFE_Status_t)0xc2000002)

  Application Not Registered.
- #define CFE_EVS_APP_ILLEGAL_APP_ID ((CFE_Status_t)0xc2000003)

  Illegal Application ID.
- #define CFE_EVS_APP_FILTER_OVERLOAD ((CFE_Status_t)0xc2000004)

  Application Filter Overload.
- #define CFE_EVS_RESET_AREA_POINTER ((CFE_Status_t)0xc2000005)

  Reset Area Pointer Failure.
- #define CFE_EVS_EVT_NOT_REGISTERED ((CFE_Status_t)0xc2000006)

  Event Not Registered.
- #define CFE_EVS_FILE_WRITE_ERROR ((CFE_Status_t)0xc2000007)

  File Write Error.
- #define CFE_EVS_INVALID_PARAMETER ((CFE_Status_t)0xc2000008)

  Invalid Pointer.
- #define CFE_EVS_APP_SQUELCHED ((CFE_Status_t)0xc2000009)

  Event squelched.
- #define CFE_EVS_NOT_IMPLEMENTED ((CFE_Status_t)0xc200ffff)

  Not Implemented.
- #define CFE_ES_ERR_RESOURCEID_NOT_VALID ((CFE_Status_t)0xc4000001)

  Resource ID is not valid.

- #define CFE_ES_ERR_NAME_NOT_FOUND ((CFE_Status_t)0xc4000002)

  Resource Name Error.
- #define CFE_ES_ERR_APP_CREATE ((CFE_Status_t)0xc4000004)

  Application Create Error.
- #define CFE_ES_ERR_CHILD_TASK_CREATE ((CFE_Status_t)0xc4000005)

  Child Task Create Error.
- #define CFE_ES_ERR_SYS_LOG_FULL ((CFE_Status_t)0xc4000006)

  System Log Full.
- #define CFE_ES_ERR_MEM_BLOCK_SIZE ((CFE_Status_t)0xc4000008)

  Memory Block Size Error.
- #define CFE_ES_ERR_LOAD_LIB ((CFE_Status_t)0xc4000009)

  Load Library Error.
- #define CFE_ES_BAD_ARGUMENT ((CFE_Status_t)0xc400000a)

  Bad Argument.
- #define CFE_ES_ERR_CHILD_TASK_REGISTER ((CFE_Status_t)0xc400000b)

  Child Task Register Error.
- #define CFE_ES_CDS_ALREADY_EXISTS ((CFE_Status_t)0x4400000d)

  CDS Already Exists.
- #define CFE_ES_CDS_INSUFFICIENT_MEMORY ((CFE_Status_t)0xc400000e)

  CDS Insufficient Memory.
- #define CFE_ES_CDS_INVALID_NAME ((CFE_Status_t)0xc400000f)

  CDS Invalid Name.
- #define CFE_ES_CDS_INVALID_SIZE ((CFE_Status_t)0xc4000010)

  CDS Invalid Size.
- #define CFE_ES_CDS_INVALID ((CFE_Status_t)0xc4000012)

  CDS Invalid.
- #define CFE_ES_CDS_ACCESS_ERROR ((CFE_Status_t)0xc4000013)

  CDS Access Error.
- #define CFE_ES_FILE_IO_ERR ((CFE_Status_t)0xc4000014)

  File IO Error.
- #define CFE_ES_RST_ACCESS_ERR ((CFE_Status_t)0xc4000015)

  Reset Area Access Error.
- #define CFE_ES_ERR_APP_REGISTER ((CFE_Status_t)0xc4000017)

  Application Register Error.
- #define CFE_ES_ERR_CHILD_TASK_DELETE ((CFE_Status_t)0xc4000018)

  Child Task Delete Error.
- #define CFE_ES_ERR_CHILD_TASK_DELETE_MAIN_TASK ((CFE_Status_t)0xc4000019)

  Child Task Delete Passed Main Task.
- #define CFE_ES_CDS_BLOCK_CRC_ERR ((CFE_Status_t)0xc400001A)

  CDS Block CRC Error.
- #define CFE_ES_MUT_SEM_DELETE_ERR ((CFE_Status_t)0xc400001B)

  Mutex Semaphore Delete Error.
- #define CFE_ES_BIN_SEM_DELETE_ERR ((CFE_Status_t)0xc400001C)

  Binary Semaphore Delete Error.
- #define CFE_ES_COUNT_SEM_DELETE_ERR ((CFE_Status_t)0xc400001D)

  Counting Semaphore Delete Error.
- #define CFE_ES_QUEUE_DELETE_ERR ((CFE_Status_t)0xc400001E)

Queue Delete Error.

- #define CFE_ES_FILE_CLOSE_ERR ((CFE_Status_t)0xc400001F)

  File Close Error.
- #define CFE_ES_CDS_WRONG_TYPE_ERR ((CFE_Status_t)0xc4000020)

  CDS Wrong Type Error.
- #define CFE_ES_CDS_OWNER_ACTIVE_ERR ((CFE_Status_t)0xc4000022)

  CDS Owner Active Error.
- #define CFE_ES_APP_CLEANUP_ERR ((CFE_Status_t)0xc4000023)

  Application Cleanup Error.
- #define CFE_ES_TIMER_DELETE_ERR ((CFE_Status_t)0xc4000024)

  Timer Delete Error.
- #define CFE_ES_BUFFER_NOT_IN_POOL ((CFE_Status_t)0xc4000025)

  Buffer Not In Pool.
- #define CFE_ES_TASK_DELETE_ERR ((CFE_Status_t)0xc4000026)

  Task Delete Error.
- #define CFE_ES_OPERATION_TIMED_OUT ((CFE_Status_t)0xc4000027)

  Operation Timed Out.
- #define CFE_ES_LIB_ALREADY_LOADED ((CFE_Status_t)0x44000028)

  Library Already Loaded.
- #define CFE_ES_ERR_SYS_LOG_TRUNCATED ((CFE_Status_t)0x44000029)

  System Log Message Truncated.
- #define CFE_ES_NO_RESOURCE_IDS_AVAILABLE ((CFE_Status_t)0xc400002B)

  Resource ID is not available.
- #define CFE_ES_POOL_BLOCK_INVALID ((CFE_Status_t)0xc400002C)

  Invalid pool block.
- #define CFE_ES_ERR_DUPLICATE_NAME ((CFE_Status_t)0xc400002E)

  Duplicate Name Error.
- #define CFE_ES_NOT_IMPLEMENTED ((CFE_Status_t)0xc400ffff)

  Not Implemented.
- #define CFE_FS_BAD_ARGUMENT ((CFE_Status_t)0xc6000001)

  Bad Argument.
- #define CFE_FS_INVALID_PATH ((CFE_Status_t)0xc6000002)

  Invalid Path.
- #define CFE_FS_FNAME_TOO_LONG ((CFE_Status_t)0xc6000003)

  Filename Too Long.
- #define CFE_FS_NOT_IMPLEMENTED ((CFE_Status_t)0xc600ffff)

  Not Implemented.
- #define CFE_SB_TIME_OUT ((CFE_Status_t)0xca000001)

  Time Out.
- #define CFE_SB_NO_MESSAGE ((CFE_Status_t)0xca000002)

  No Message.
- #define CFE_SB_BAD_ARGUMENT ((CFE_Status_t)0xca000003)

  Bad Argument.
- #define CFE_SB_MAX_PIPES_MET ((CFE_Status_t)0xca000004)

  Max Pipes Met.
- #define CFE_SB_PIPE_CR_ERR ((CFE_Status_t)0xca000005)

  Pipe Create Error.

- #define CFE_SB_PIPE_RD_ERR ((CFE_Status_t)0xca000006)

  Pipe Read Error.
- #define CFE_SB_MSG_TOO_BIG ((CFE_Status_t)0xca000007)

  Message Too Big.
- #define CFE_SB_BUF_ALOC_ERR ((CFE_Status_t)0xca000008)

  Buffer Allocation Error.
- #define CFE_SB_MAX_MSGS_MET ((CFE_Status_t)0xca000009)

  Max Messages Met.
- #define CFE_SB_MAX_DESTS_MET ((CFE_Status_t)0xca00000a)

  Max Destinations Met.
- #define CFE_SB_INTERNAL_ERR ((CFE_Status_t)0xca00000c)

  Internal Error.
- #define CFE_SB_WRONG_MSG_TYPE ((CFE_Status_t)0xca00000d)

  Wrong Message Type.
- #define CFE_SB_BUFFER_INVALID ((CFE_Status_t)0xca00000e)

  Buffer Invalid.
- #define CFE_SB_NOT_IMPLEMENTED ((CFE_Status_t)0xca00ffff)

  Not Implemented.
- #define CFE_TBL_ERR_INVALID_HANDLE ((CFE_Status_t)0xcc000001)

  Invalid Handle.
- #define CFE_TBL_ERR_INVALID_NAME ((CFE_Status_t)0xcc000002)

  Invalid Name.
- #define CFE_TBL_ERR_INVALID_SIZE ((CFE_Status_t)0xcc000003)

  Invalid Size.
- #define CFE_TBL_INFO_UPDATE_PENDING ((CFE_Status_t)0x4c000004)

  Update Pending.
- #define CFE_TBL_ERR_NEVER_LOADED ((CFE_Status_t)0xcc000005)

  Never Loaded.
- #define CFE_TBL_ERR_REGISTRY_FULL ((CFE_Status_t)0xcc000006)

  Registry Full.
- #define CFE_TBL_WARN_DUPLICATE ((CFE_Status_t)0x4c000007)

  Duplicate Warning.
- #define CFE_TBL_ERR_NO_ACCESS ((CFE_Status_t)0xcc000008)

  No Access.
- #define CFE_TBL_ERR_UNREGISTERED ((CFE_Status_t)0xcc000009)

  Unregistered.
- #define CFE_TBL_ERR_HANDLES_FULL ((CFE_Status_t)0xcc00000B)

  Handles Full.
- #define CFE_TBL_ERR_DUPLICATE_DIFF_SIZE ((CFE_Status_t)0xcc00000C)

  Duplicate Table With Different Size.
- #define CFE_TBL_ERR_DUPLICATE_NOT_OWNED ((CFE_Status_t)0xcc00000D)

  Duplicate Table And Not Owned.
- #define CFE_TBL_INFO_UPDATED ((CFE_Status_t)0x4c00000E)

  Updated.
- #define CFE_TBL_ERR_NO_BUFFER_AVAIL ((CFE_Status_t)0xcc00000F)

  No Buffer Available.
- #define CFE_TBL_ERR_DUMP_ONLY ((CFE_Status_t)0xcc000010)

Dump Only Error.

- #define CFE_TBL_ERR_ILLEGAL_SRC_TYPE ((CFE_Status_t)0xcc000011)

  Illegal Source Type.
- #define CFE_TBL_ERR_LOAD_IN_PROGRESS ((CFE_Status_t)0xcc000012)

  Load In Progress.
- #define CFE_TBL_ERR_FILE_TOO_LARGE ((CFE_Status_t)0xcc000014)

  File Too Large.
- #define CFE_TBL_WARN_SHORT_FILE ((CFE_Status_t)0x4c000015)

  Short File Warning.
- #define CFE_TBL_ERR_BAD_CONTENT_ID ((CFE_Status_t)0xcc000016)

  Bad Content ID.
- #define CFE_TBL_INFO_NO_UPDATE_PENDING ((CFE_Status_t)0x4c000017)

  No Update Pending.
- #define CFE_TBL_INFO_TABLE_LOCKED ((CFE_Status_t)0x4c000018)

  Table Locked.
- #define CFE_TBL_INFO_VALIDATION_PENDING ((CFE_Status_t)0x4c000019)
- #define CFE_TBL_INFO_NO_VALIDATION_PENDING ((CFE_Status_t)0x4c00001A)
- #define CFE_TBL_ERR_BAD_SUBTYPE_ID ((CFE_Status_t)0xcc00001B)

  Bad Subtype ID.
- #define CFE_TBL_ERR_FILE_SIZE_INCONSISTENT ((CFE_Status_t)0xcc00001C)

  File Size Inconsistent.
- #define CFE_TBL_ERR_NO_STD_HEADER ((CFE_Status_t)0xcc00001D)

  No Standard Header.
- #define CFE_TBL_ERR_NO_TBL_HEADER ((CFE_Status_t)0xcc00001E)

  No Table Header.
- #define CFE_TBL_ERR_FILENAME_TOO_LONG ((CFE_Status_t)0xcc00001F)

  Filename Too Long.
- #define CFE_TBL_ERR_FILE_FOR_WRONG_TABLE ((CFE_Status_t)0xcc000020)

  File For Wrong Table.
- #define CFE_TBL_ERR_LOAD_INCOMPLETE ((CFE_Status_t)0xcc000021)

  Load Incomplete.
- #define CFE_TBL_WARN_PARTIAL_LOAD ((CFE_Status_t)0x4c000022)

  Partial Load Warning.
- #define CFE_TBL_ERR_PARTIAL_LOAD ((CFE_Status_t)0xcc000023)

  Partial Load Error.
- #define CFE_TBL_INFO_DUMP_PENDING ((CFE_Status_t)0x4c000024)

  Dump Pending.
- #define CFE_TBL_ERR_INVALID_OPTIONS ((CFE_Status_t)0xcc000025)

  Invalid Options.
- #define CFE_TBL_WARN_NOT_CRITICAL ((CFE_Status_t)0x4c000026)

  Not Critical Warning.
- #define CFE_TBL_INFO_RECOVERED_TBL ((CFE_Status_t)0x4c000027)

  Recovered Table.
- #define CFE_TBL_ERR_BAD_SPACECRAFT_ID ((CFE_Status_t)0xcc000028)

  Bad Spacecraft ID.
- #define CFE_TBL_ERR_BAD_PROCESSOR_ID ((CFE_Status_t)0xcc000029)

  Bad Processor ID.

- #define CFE_TBL_MESSAGE_ERROR ((CFE_Status_t)0xcc00002a)

  Message Error.
- #define CFE_TBL_ERR_SHORT_FILE ((CFE_Status_t)0xcc00002b)
- #define CFE_TBL_ERR_ACCESS ((CFE_Status_t)0xcc00002c)
- #define CFE_TBL_BAD_ARGUMENT ((CFE_Status_t)0xcc00002d)

  Bad Argument.
- #define CFE_TBL_NOT_IMPLEMENTED ((CFE_Status_t)0xcc00ffff)

  Not Implemented.
- #define CFE_TIME_NOT_IMPLEMENTED ((CFE_Status_t)0xce00ffff)

  Not Implemented.
- #define CFE_TIME_INTERNAL_ONLY ((CFE_Status_t)0xce000001)

  Internal Only.
- #define CFE_TIME_OUT_OF_RANGE ((CFE_Status_t)0xce000002)

  Out Of Range.
- #define CFE_TIME_TOO_MANY_SYNCH_CALLBACKS ((CFE_Status_t)0xce000003)

  Too Many Sync Callbacks.
- #define CFE_TIME_CALLBACK_NOT_REGISTERED ((CFE_Status_t)0xce000004)

  Callback Not Registered.
- #define CFE_TIME_BAD_ARGUMENT ((CFE_Status_t)0xce000005)

  Bad Argument.

10.11.1 Detailed Description

10.11.2 Macro Definition Documentation

10.11.2.1 CFE_ES_APP_CLEANUP_ERR `#define CFE_ES_APP_CLEANUP_ERR ((CFE_Status_t)0xc4000023)`

Application Cleanup Error.

Occurs when an attempt was made to Clean Up an application which involves calling Table, EVS, and SB cleanup functions, then deleting all ES resources, child tasks, and unloading the object module. The approach here is to keep going even though one of these steps had an error. There will be syslog messages detailing each problem.

Definition at line 588 of file cfe_error.h.

10.11.2.2 CFE_ES_BAD_ARGUMENT `#define CFE_ES_BAD_ARGUMENT ((CFE_Status_t)0xc400000a)`

Bad Argument.

Bad parameter passed into an ES API.

Definition at line 399 of file cfe_error.h.

10.11.2.3 CFE_ES_BIN_SEM_DELETE_ERR `#define CFE_ES_BIN_SEM_DELETE_ERR ((CFE_Status_t)0xc400001C)`

Binary Semaphore Delete Error.

Occurs when trying to delete a Binary Semaphore that belongs to a task that ES is cleaning up.

Definition at line 527 of file cfe_error.h.

10.11.2.4 CFE_ES_BUFFER_NOT_IN_POOL `#define CFE_ES_BUFFER_NOT_IN_POOL ((CFE_Status_t)0xc4000025)`

Buffer Not In Pool.

The specified address is not in the memory pool.

Definition at line 605 of file cfe_error.h.

10.11.2.5 CFE_ES_CDS_ACCESS_ERROR

`#define CFE_ES_CDS_ACCESS_ERROR ((CFE_Status_t)0xc4000013)`

CDS Access Error.
The CDS was inaccessible
Definition at line 458 of file cfe_error.h.

10.11.2.6 CFE_ES_CDS_ALREADY_EXISTS

`#define CFE_ES_CDS_ALREADY_EXISTS ((CFE_Status_t)0x4400000d)`

CDS Already Exists.
The Application is receiving the pointer to a CDS that was already present.
Definition at line 415 of file cfe_error.h.

10.11.2.7 CFE_ES_CDS_BLOCK_CRC_ERR

`#define CFE_ES_CDS_BLOCK_CRC_ERR ((CFE_Status_t)0xc400001A)`

CDS Block CRC Error.
Occurs when trying to read a CDS Data block and the CRC of the current data does not match the stored CRC for the data. Either the contents of the CDS Data Block are corrupted or the CDS Control Block is corrupted.
Definition at line 509 of file cfe_error.h.

10.11.2.8 CFE_ES_CDS_INSUFFICIENT_MEMORY

`#define CFE_ES_CDS_INSUFFICIENT_MEMORY ((CFE_Status_t)0xc400000e)`

CDS Insufficient Memory.
The Application is requesting a CDS Block that is larger than the remaining CDS memory.
Definition at line 424 of file cfe_error.h.

10.11.2.9 CFE_ES_CDS_INVALID

`#define CFE_ES_CDS_INVALID ((CFE_Status_t)0xc4000012)`

CDS Invalid.
The CDS contents are invalid.
Definition at line 450 of file cfe_error.h.

10.11.2.10 CFE_ES_CDS_INVALID_NAME

`#define CFE_ES_CDS_INVALID_NAME ((CFE_Status_t)0xc400000f)`

CDS Invalid Name.
The Application is requesting a CDS Block with an invalid ASCII string name. Either the name is too long (> CFE_MISSION_ES_CDS_MAX_NAME_LENGTH) or was an empty string.
Definition at line 433 of file cfe_error.h.

10.11.2.11 CFE_ES_CDS_INVALID_SIZE

`#define CFE_ES_CDS_INVALID_SIZE ((CFE_Status_t)0xc4000010)`

CDS Invalid Size.
The Application is requesting a CDS Block or Pool with a size beyond the applicable limits, either too large or too small/zero.
Definition at line 442 of file cfe_error.h.

10.11.2.12 CFE_ES_CDS_OWNER_ACTIVE_ERR

`#define CFE_ES_CDS_OWNER_ACTIVE_ERR ((CFE_Status_t)0xc4000022)`

CDS Owner Active Error.
Occurs when an attempt was made to delete a CDS when an application with the same name associated with the CDS is still present. CDSs can ONLY be deleted when Applications that created them are not present in the system.
Definition at line 575 of file cfe_error.h.

10.11.2.13 CFE_ES_CDS_WRONG_TYPE_ERR

`#define CFE_ES_CDS_WRONG_TYPE_ERR ((CFE_Status_t)0xc4000020)`

CDS Wrong Type Error.

Occurs when Table Services is trying to delete a Critical Data Store that is not a Critical Table Image or when Executive Services is trying to delete a Critical Table Image.

Definition at line 564 of file cfe_error.h.

10.11.2.14 CFE_ES_COUNT_SEM_DELETE_ERR

`#define CFE_ES_COUNT_SEM_DELETE_ERR ((CFE_Status_t)0xc400001D)`

Counting Semaphore Delete Error.

Occurs when trying to delete a Counting Semaphore that belongs to a task that ES is cleaning up.

Definition at line 536 of file cfe_error.h.

10.11.2.15 CFE_ES_ERR_APP_CREATE

`#define CFE_ES_ERR_APP_CREATE ((CFE_Status_t)0xc4000004)`

Application Create Error.

There was an error loading or creating the App.

Definition at line 358 of file cfe_error.h.

10.11.2.16 CFE_ES_ERR_APP_REGISTER

`#define CFE_ES_ERR_APP_REGISTER ((CFE_Status_t)0xc4000017)`

Application Register Error.

Occurs when a task cannot be registered in ES global tables

Definition at line 482 of file cfe_error.h.

10.11.2.17 CFE_ES_ERR_CHILD_TASK_CREATE

`#define CFE_ES_ERR_CHILD_TASK_CREATE ((CFE_Status_t)0xc4000005)`

Child Task Create Error.

There was an error creating a child task.

Definition at line 366 of file cfe_error.h.

10.11.2.18 CFE_ES_ERR_CHILD_TASK_DELETE

`#define CFE_ES_ERR_CHILD_TASK_DELETE ((CFE_Status_t)0xc4000018)`

Child Task Delete Error.

There was an error deleting a child task.

Definition at line 490 of file cfe_error.h.

10.11.2.19 CFE_ES_ERR_CHILD_TASK_DELETE_MAIN_TASK

`#define CFE_ES_ERR_CHILD_TASK_DELETE_M↩AIN_TASK ((CFE_Status_t)0xc4000019)`

Child Task Delete Passed Main Task.

There was an attempt to delete a cFE App Main Task with the CFE_ES_DeleteChildTask API.

Definition at line 499 of file cfe_error.h.

10.11.2.20 CFE_ES_ERR_CHILD_TASK_REGISTER

`#define CFE_ES_ERR_CHILD_TASK_REGISTER ((CFE_Status_t)0xc400000b)`

Child Task Register Error.

Errors occurred when trying to register a child task.

Definition at line 407 of file cfe_error.h.

10.11.2.21 CFE_ES_ERR_DUPLICATE_NAME

`#define CFE_ES_ERR_DUPLICATE_NAME ((CFE_Status_t)0xc400002E)`

Duplicate Name Error.
Resource creation failed due to the name already existing in the system.
Definition at line 668 of file cfe_error.h.

10.11.2.22 CFE_ES_ERR_LOAD_LIB

`#define CFE_ES_ERR_LOAD_LIB ((CFE_Status_t)0xc4000009)`

Load Library Error.
Could not load the shared library.
Definition at line 391 of file cfe_error.h.

10.11.2.23 CFE_ES_ERR_MEM_BLOCK_SIZE

`#define CFE_ES_ERR_MEM_BLOCK_SIZE ((CFE_Status_t)0xc4000008)`

Memory Block Size Error.
The block size requested is invalid.
Definition at line 383 of file cfe_error.h.

10.11.2.24 CFE_ES_ERR_NAME_NOT_FOUND

`#define CFE_ES_ERR_NAME_NOT_FOUND ((CFE_Status_t)0xc4000002)`

Resource Name Error.
There is no match in the system for the given name.
Definition at line 350 of file cfe_error.h.

10.11.2.25 CFE_ES_ERR_RESOURCEID_NOT_VALID

`#define CFE_ES_ERR_RESOURCEID_NOT_VALID ((CFE_Status_t)0xc40000`

Resource ID is not valid.
This error indicates that the passed in resource identifier (App ID, Lib ID, Counter ID, etc) did not validate.
Definition at line 342 of file cfe_error.h.

10.11.2.26 CFE_ES_ERR_SYS_LOG_FULL

`#define CFE_ES_ERR_SYS_LOG_FULL ((CFE_Status_t)0xc4000006)`

System Log Full.
The cFE system Log is full. This error means the message was not logged at all
Definition at line 375 of file cfe_error.h.

10.11.2.27 CFE_ES_ERR_SYS_LOG_TRUNCATED

`#define CFE_ES_ERR_SYS_LOG_TRUNCATED ((CFE_Status_t)0x44000029)`

System Log Message Truncated.
This information code means the last syslog message was truncated due to insufficient space in the log buffer.
Definition at line 640 of file cfe_error.h.

10.11.2.28 CFE_ES_FILE_CLOSE_ERR

`#define CFE_ES_FILE_CLOSE_ERR ((CFE_Status_t)0xc400001F)`

File Close Error.
Occurs when trying to close a file that belongs to a task that ES is cleaning up.
Definition at line 554 of file cfe_error.h.

10.11.2.29 CFE_ES_FILE_IO_ERR

`#define CFE_ES_FILE_IO_ERR ((CFE_Status_t)0xc4000014)`

File IO Error.
Occurs when a file operation fails
Definition at line 466 of file cfe_error.h.

10.11.2.30 CFE_ES_LIB_ALREADY_LOADED

```
#define CFE_ES_LIB_ALREADY_LOADED ((CFE_Status_t)0x44000028)
```

Library Already Loaded.
Occurs if CFE_ES_LoadLibrary detects that the requested library name is already loaded.
Definition at line 631 of file cfe_error.h.

10.11.2.31 CFE_ES_MUT_SEM_DELETE_ERR

```
#define CFE_ES_MUT_SEM_DELETE_ERR ((CFE_Status_t)0xc400001B)
```

Mutex Semaphore Delete Error.
Occurs when trying to delete a Mutex that belongs to a task that ES is cleaning up.
Definition at line 518 of file cfe_error.h.

10.11.2.32 CFE_ES_NO_RESOURCE_IDS_AVAILABLE

```
#define CFE_ES_NO_RESOURCE_IDS_AVAILABLE ((CFE_Status_t)0xc400
```

Resource ID is not available.
This error indicates that the maximum resource identifiers (App ID, Lib ID, Counter ID, etc) has already been reached and a new ID cannot be allocated.
Definition at line 650 of file cfe_error.h.

10.11.2.33 CFE_ES_NOT_IMPLEMENTED

```
#define CFE_ES_NOT_IMPLEMENTED ((CFE_Status_t)0xc400ffff)
```

Not Implemented.
Current version of cFE does not have the function or the feature of the function implemented. This could be due to either an early build of the cFE for this platform or the platform does not support the specified feature.
Definition at line 679 of file cfe_error.h.

10.11.2.34 CFE_ES_OPERATION_TIMED_OUT

```
#define CFE_ES_OPERATION_TIMED_OUT ((CFE_Status_t)0xc4000027)
```

Operation Timed Out.
Occurs if the timeout for a given operation was exceeded
Definition at line 622 of file cfe_error.h.

10.11.2.35 CFE_ES_POOL_BLOCK_INVALID

```
#define CFE_ES_POOL_BLOCK_INVALID ((CFE_Status_t)0xc400002C)
```

Invalid pool block.
Software attempted to "put" a block back into a pool which does not appear to belong to that pool. This may mean the pool has become unusable due to memory corruption.
Definition at line 660 of file cfe_error.h.

10.11.2.36 CFE_ES_QUEUE_DELETE_ERR

```
#define CFE_ES_QUEUE_DELETE_ERR ((CFE_Status_t)0xc400001E)
```

Queue Delete Error.
Occurs when trying to delete a Queue that belongs to a task that ES is cleaning up.
Definition at line 545 of file cfe_error.h.

10.11.2.37 CFE_ES_RST_ACCESS_ERR

```
#define CFE_ES_RST_ACCESS_ERR ((CFE_Status_t)0xc4000015)
```

Reset Area Access Error.
Occurs when the BSP is not successful in returning the reset area address.
Definition at line 474 of file cfe_error.h.

10.11.2.38 CFE_ES_TASK_DELETE_ERR

```
#define CFE_ES_TASK_DELETE_ERR ((CFE_Status_t)0xc4000026)
```

Task Delete Error.
Occurs when trying to delete a task that ES is cleaning up.
Definition at line 614 of file cfe_error.h.

10.11.2.39 CFE_ES_TIMER_DELETE_ERR

```
#define CFE_ES_TIMER_DELETE_ERR ((CFE_Status_t)0xc4000024)
```

Timer Delete Error.
Occurs when trying to delete a Timer that belongs to a task that ES is cleaning up.
Definition at line 597 of file cfe_error.h.

10.11.2.40 CFE_EVS_APP_FILTER_OVERLOAD

```
#define CFE_EVS_APP_FILTER_OVERLOAD ((CFE_Status_t)0xc2000004)
```

Application Filter Overload.
Number of Application event filters input upon registration is greater than CFE_PLATFORM_EVS_MAX_EVENT_FILTERS
Definition at line 276 of file cfe_error.h.

10.11.2.41 CFE_EVS_APP_ILLEGAL_APP_ID

```
#define CFE_EVS_APP_ILLEGAL_APP_ID ((CFE_Status_t)0xc2000003)
```

Illegal Application ID.
Application ID returned by CFE_ES_GetAppIDByName is greater than CFE_PLATFORM_ES_MAX_APPLICATIONS
Definition at line 267 of file cfe_error.h.

10.11.2.42 CFE_EVS_APP_NOT_REGISTERED

```
#define CFE_EVS_APP_NOT_REGISTERED ((CFE_Status_t)0xc2000002)
```

Application Not Registered.
Calling application never previously called CFE_EVS_Register
Definition at line 258 of file cfe_error.h.

10.11.2.43 CFE_EVS_APP_SQUELCHED

```
#define CFE_EVS_APP_SQUELCHED ((CFE_Status_t)0xc2000009)
```

Event squelched.
Event squelched due to being sent at too high a rate
Definition at line 318 of file cfe_error.h.

10.11.2.44 CFE_EVS_EVT_NOT_REGISTERED

```
#define CFE_EVS_EVT_NOT_REGISTERED ((CFE_Status_t)0xc2000006)
```

Event Not Registered.
CFE_EVS_ResetFilter EventID argument was not found in any event filter registered by the calling application.
Definition at line 294 of file cfe_error.h.

10.11.2.45 CFE_EVS_FILE_WRITE_ERROR

```
#define CFE_EVS_FILE_WRITE_ERROR ((CFE_Status_t)0xc2000007)
```

File Write Error.
A file write error occurred while processing an EVS command
Definition at line 302 of file cfe_error.h.

10.11.2.46 CFE_EVS_INVALID_PARAMETER

```
#define CFE_EVS_INVALID_PARAMETER ((CFE_Status_t)0xc2000008)
```

Invalid Pointer.
Invalid parameter supplied to EVS command
Definition at line 310 of file cfe_error.h.

10.11.2.47 CFE_EVS_NOT_IMPLEMENTED `#define CFE_EVS_NOT_IMPLEMENTED ((CFE_Status_t)0xc200ffff)`

Not Implemented.

Current version of cFE does not have the function or the feature of the function implemented. This could be due to either an early build of the cFE for this platform or the platform does not support the specified feature.

Definition at line 329 of file cfe_error.h.

10.11.2.48 CFE_EVS_RESET_AREA_POINTER `#define CFE_EVS_RESET_AREA_POINTER ((CFE_Status_t)0xc2000005)`

Reset Area Pointer Failure.

Could not get pointer to the ES Reset area, so we could not get the pointer to the EVS Log.

Definition at line 285 of file cfe_error.h.

10.11.2.49 CFE_EVS_UNKNOWN_FILTER `#define CFE_EVS_UNKNOWN_FILTER ((CFE_Status_t)0xc2000001)`

Unknown Filter.

CFE_EVS_Register FilterScheme parameter was illegal

Definition at line 250 of file cfe_error.h.

10.11.2.50 CFE_FS_BAD_ARGUMENT `#define CFE_FS_BAD_ARGUMENT ((CFE_Status_t)0xc6000001)`

Bad Argument.

A parameter given by a caller to a File Services API did not pass validation checks.

Definition at line 692 of file cfe_error.h.

10.11.2.51 CFE_FS_FNAME_TOO_LONG `#define CFE_FS_FNAME_TOO_LONG ((CFE_Status_t)0xc6000003)`

Filename Too Long.

FS filename string is too long

Definition at line 708 of file cfe_error.h.

10.11.2.52 CFE_FS_INVALID_PATH `#define CFE_FS_INVALID_PATH ((CFE_Status_t)0xc6000002)`

Invalid Path.

FS was unable to extract a filename from a path string

Definition at line 700 of file cfe_error.h.

10.11.2.53 CFE_FS_NOT_IMPLEMENTED `#define CFE_FS_NOT_IMPLEMENTED ((CFE_Status_t)0xc600ffff)`

Not Implemented.

Current version of cFE does not have the function or the feature of the function implemented. This could be due to either an early build of the cFE for this platform or the platform does not support the specified feature.

Definition at line 719 of file cfe_error.h.

10.11.2.54 CFE_SB_BAD_ARGUMENT `#define CFE_SB_BAD_ARGUMENT ((CFE_Status_t)0xca000003)`

Bad Argument.

A parameter given by a caller to a Software Bus API did not pass validation checks.

Definition at line 750 of file cfe_error.h.

10.11.2.55 CFE_SB_BUF_ALOC_ERR

`#define CFE_SB_BUF_ALOC_ERR ((CFE_Status_t)0xca000008)`

Buffer Allocation Error.

Returned when the memory in the SB message buffer pool has been depleted. The amount of memory in the pool is dictated by the configuration parameter CFE_PLATFORM_SB_BUF_MEMORY_BYTES specified in the cfe_platform↩_cfg.h file. Also the memory statistics, including current utilization figures and high water marks for the SB Buffer memory pool can be monitored by sending a Software Bus command to send the SB statistics packet.

Definition at line 808 of file cfe_error.h.

10.11.2.56 CFE_SB_BUFFER_INVALID

`#define CFE_SB_BUFFER_INVALID ((CFE_Status_t)0xca00000e)`

Buffer Invalid.

This error code will be returned when a request to release or send a zero copy buffer is invalid, such as if the handle or buffer is not correct or the buffer was previously released.

Definition at line 859 of file cfe_error.h.

10.11.2.57 CFE_SB_INTERNAL_ERR

`#define CFE_SB_INTERNAL_ERR ((CFE_Status_t)0xca00000c)`

Internal Error.

This error code will be returned by the CFE_SB_Subscribe API if the code detects an internal index is out of range. The most likely cause would be a Single Event Upset.

Definition at line 840 of file cfe_error.h.

10.11.2.58 CFE_SB_MAX_DESTS_MET

`#define CFE_SB_MAX_DESTS_MET ((CFE_Status_t)0xca00000a)`

Max Destinations Met.

Will be returned when calling one of the SB subscription API's if the SB routing table cannot accommodate another destination for a particular the given message ID. This occurs when the number of destinations in use meets the platform configuration parameter CFE_PLATFORM_SB_MAX_DEST_PER_PKT.

Definition at line 830 of file cfe_error.h.

10.11.2.59 CFE_SB_MAX_MSGS_MET

`#define CFE_SB_MAX_MSGS_MET ((CFE_Status_t)0xca000009)`

Max Messages Met.

Will be returned when calling one of the SB subscription API's if the SB routing table cannot accommodate another unique message ID because the platform configuration parameter CFE_PLATFORM_SB_MAX_MSG_IDS has been met.

Definition at line 818 of file cfe_error.h.

10.11.2.60 CFE_SB_MAX_PIPES_MET

`#define CFE_SB_MAX_PIPES_MET ((CFE_Status_t)0xca000004)`

Max Pipes Met.

This error code will be returned from CFE_SB_CreatePipe when the SB cannot accommodate the request to create a pipe because the maximum number of pipes (CFE_PLATFORM_SB_MAX_PIPES) are in use. This configuration parameter is defined in the cfe_platform_cfg.h file.

Definition at line 761 of file cfe_error.h.

10.11.2.61 CFE_SB_MSG_TOO_BIG

`#define CFE_SB_MSG_TOO_BIG ((CFE_Status_t)0xca000007)`

Message Too Big.

The size field in the message header indicates the message exceeds the max Software Bus message size. The max size is defined by configuration parameter CFE_MISSION_SB_MAX_SB_MSG_SIZE in cfe_mission_cfg.h

Definition at line 795 of file cfe_error.h.

10.11.2.62 CFE_SB_NO_MESSAGE `#define CFE_SB_NO_MESSAGE ((CFE_Status_t)0xca000002)`

No Message.

When "Polling" a pipe for a message in CFE_SB_ReceiveBuffer, this return value indicates that there was not a message on the pipe.

Definition at line 741 of file cfe_error.h.

10.11.2.63 CFE_SB_NOT_IMPLEMENTED `#define CFE_SB_NOT_IMPLEMENTED ((CFE_Status_t)0xca00ffff)`

Not Implemented.

Current version of cFE does not have the function or the feature of the function implemented. This could be due to either an early build of the cFE for this platform or the platform does not support the specified feature.

Definition at line 870 of file cfe_error.h.

10.11.2.64 CFE_SB_PIPE_CR_ERR `#define CFE_SB_PIPE_CR_ERR ((CFE_Status_t)0xca000005)`

Pipe Create Error.

The maximum number of queues(OS_MAX_QUEUES) are in use. Or possibly a lower level problem with creating the underlying queue has occurred such as a lack of memory. If the latter is the problem, the status code displayed in the event must be tracked.

Definition at line 772 of file cfe_error.h.

10.11.2.65 CFE_SB_PIPE_RD_ERR `#define CFE_SB_PIPE_RD_ERR ((CFE_Status_t)0xca000006)`

Pipe Read Error.

This return value indicates an error at the Queue read level. This error typically cannot be corrected by the caller. Some possible causes are: queue was not properly initialized or created, the number of bytes read from the queue was not the number of bytes requested in the read. The queue id is invalid. Similar errors regarding the pipe will be caught by higher level code in the Software Bus.

Definition at line 785 of file cfe_error.h.

10.11.2.66 CFE_SB_TIME_OUT `#define CFE_SB_TIME_OUT ((CFE_Status_t)0xca000001)`

Time Out.

In CFE_SB_ReceiveBuffer, this return value indicates that a packet has not been received in the time given in the "timeout" parameter.

Definition at line 732 of file cfe_error.h.

10.11.2.67 CFE_SB_WRONG_MSG_TYPE `#define CFE_SB_WRONG_MSG_TYPE ((CFE_Status_t)0xca00000d)`

Wrong Message Type.

This error code will be returned when a request such as CFE_MSG_SetMsgTime is made on a packet that does not include a field for msg time.

Definition at line 849 of file cfe_error.h.

10.11.2.68 CFE_STATUS_BAD_COMMAND_CODE `#define CFE_STATUS_BAD_COMMAND_CODE ((CFE_Status_t)0xc8000004)`

Bad Command Code.

This error code will be returned when a message identification process determined that the command code is does not correspond to any known value

Definition at line 182 of file cfe_error.h.

10.11.2.69 CFE_STATUS_EXTERNAL_RESOURCE_FAIL

```
#define CFE_STATUS_EXTERNAL_RESOURCE_FA↩
IL ((CFE_Status_t)0xc8000005)
```

External failure.

This error indicates that the operation failed for some reason outside the scope of CFE. The real failure may have been in OSAL, PSP, or another dependent library.

Details of the original failure should be written to syslog and/or a system event before returning this error.

Definition at line 194 of file cfe_error.h.

10.11.2.70 CFE_STATUS_INCORRECT_STATE

```
#define CFE_STATUS_INCORRECT_STATE ((int32)0xc8000009)
```

Cannot process request at this time.

The system is not currently in the correct state to accept the request at this time.

Definition at line 227 of file cfe_error.h.

10.11.2.71 CFE_STATUS_NO_COUNTER_INCREMENT

```
#define CFE_STATUS_NO_COUNTER_INCREMENT ((CFE_Status_t)0x48000(
```

No Counter Increment.

Informational code indicating that a command was processed successfully but that the command counter should *not* be incremented.

Definition at line 155 of file cfe_error.h.

10.11.2.72 CFE_STATUS_NOT_IMPLEMENTED

```
#define CFE_STATUS_NOT_IMPLEMENTED ((CFE_Status_t)0xc800ffff)
```

Not Implemented.

Current version does not have the function or the feature of the function implemented. This could be due to either an early build for this platform or the platform does not support the specified feature.

Definition at line 238 of file cfe_error.h.

10.11.2.73 CFE_STATUS_RANGE_ERROR

```
#define CFE_STATUS_RANGE_ERROR ((int32)0xc8000008)
```

Request or input value is out of range.

A message, table, or function call input contained a value that was outside the acceptable range, and the request was rejected.

Definition at line 219 of file cfe_error.h.

10.11.2.74 CFE_STATUS_REQUEST_ALREADY_PENDING

```
#define CFE_STATUS_REQUEST_ALREADY_PENDI↩
NG ((int32)0xc8000006)
```

Request already pending.

Commands or requests are already pending or the pending request limit has been reached. No more requests can be made until the current request(s) complete.

Definition at line 203 of file cfe_error.h.

10.11.2.75 CFE_STATUS_UNKNOWN_MSG_ID

```
#define CFE_STATUS_UNKNOWN_MSG_ID ((CFE_Status_t)0xc8000003)
```

Unknown Message ID.

This error code will be returned when a message identification process determined that the message ID does not correspond to a known value

Definition at line 173 of file cfe_error.h.

10.11.2.76 CFE_STATUS_VALIDATION_FAILURE `#define CFE_STATUS_VALIDATION_FAILURE ((int32)0xc8000007)`

Request or input value failed basic structural validation.

A message or table input was not in the proper format to be understood and processed by an application, and was rejected.

Definition at line 211 of file cfe_error.h.

10.11.2.77 CFE_STATUS_WRONG_MSG_LENGTH `#define CFE_STATUS_WRONG_MSG_LENGTH ((CFE_Status_t)0xc8000002)`

Wrong Message Length.

This error code will be returned when a message validation process determined that the message length is incorrect

Definition at line 164 of file cfe_error.h.

10.11.2.78 CFE_SUCCESS `#define CFE_SUCCESS ((CFE_Status_t)0)`

Successful execution.

Operation was performed successfully

Definition at line 147 of file cfe_error.h.

10.11.2.79 CFE_TBL_BAD_ARGUMENT `#define CFE_TBL_BAD_ARGUMENT ((CFE_Status_t)0xcc00002d)`

Bad Argument.

A parameter given by a caller to a Table API did not pass validation checks.

Definition at line 1281 of file cfe_error.h.

10.11.2.80 CFE_TBL_ERR_ACCESS `#define CFE_TBL_ERR_ACCESS ((CFE_Status_t)0xcc00002c)`

Error code indicating that the TBL file could not be opened by the OS.

Definition at line 1272 of file cfe_error.h.

10.11.2.81 CFE_TBL_ERR_BAD_CONTENT_ID `#define CFE_TBL_ERR_BAD_CONTENT_ID ((CFE_Status_t)0xcc000016)`

Bad Content ID.

The calling Application called CFE_TBL_Load with a filename that specified a file whose content ID was not that of a table image.

Definition at line 1064 of file cfe_error.h.

10.11.2.82 CFE_TBL_ERR_BAD_PROCESSOR_ID `#define CFE_TBL_ERR_BAD_PROCESSOR_ID ((CFE_Status_t)0xcc000029)`

Bad Processor ID.

The selected table file failed validation for Processor ID. The platform configuration file has verification of table files enabled for Processor ID and an attempt was made to load a table with an invalid Processor ID in the table file header.

Definition at line 1252 of file cfe_error.h.

10.11.2.83 CFE_TBL_ERR_BAD_SPACECRAFT_ID `#define CFE_TBL_ERR_BAD_SPACECRAFT_ID ((CFE_Status_t)0xcc000028)`

Bad Spacecraft ID.

The selected table file failed validation for Spacecraft ID. The platform configuration file has verification of table files enabled for Spacecraft ID and an attempt was made to load a table with an invalid Spacecraft ID in the table file header.

Definition at line 1241 of file cfe_error.h.

10.11.2.84 CFE_TBL_ERR_BAD_SUBTYPE_ID

```
#define CFE_TBL_ERR_BAD_SUBTYPE_ID ((CFE_Status_t)0xcc00001B)
```

Bad Subtype ID.
The calling Application tried to access a table file whose Subtype identifier indicated it was not a table image file.
Definition at line 1105 of file cfe_error.h.

10.11.2.85 CFE_TBL_ERR_DUMP_ONLY

```
#define CFE_TBL_ERR_DUMP_ONLY ((CFE_Status_t)0xcc000010)
```

Dump Only Error.
The calling Application has attempted to perform a load on a table that was created with "Dump Only" attributes.
Definition at line 1016 of file cfe_error.h.

10.11.2.86 CFE_TBL_ERR_DUPLICATE_DIFF_SIZE

```
#define CFE_TBL_ERR_DUPLICATE_DIFF_SIZE ((CFE_Status_t)0xcc00000C)
```

Duplicate Table With Different Size.
An application attempted to register a table with the same name as a table that is already in the registry. The size of the new table is different from the size already in the registry.
Definition at line 977 of file cfe_error.h.

10.11.2.87 CFE_TBL_ERR_DUPLICATE_NOT_OWNED

```
#define CFE_TBL_ERR_DUPLICATE_NOT_OWNED ((CFE_Status_t)0xcc0000
```

Duplicate Table And Not Owned.
An application attempted to register a table with the same name as a table that is already in the registry. The previously registered table is owned by a different application.
Definition at line 987 of file cfe_error.h.

10.11.2.88 CFE_TBL_ERR_FILE_FOR_WRONG_TABLE

```
#define CFE_TBL_ERR_FILE_FOR_WRONG_TABLE ((CFE_Status_t)0xcc00
```

File For Wrong Table.
The calling Application tried to load a table using a file whose header indicated that it was for a different table.
Definition at line 1149 of file cfe_error.h.

10.11.2.89 CFE_TBL_ERR_FILE_SIZE_INCONSISTENT

```
#define CFE_TBL_ERR_FILE_SIZE_INCONSISTE↩
NT ((CFE_Status_t)0xcc00001C)
```

File Size Inconsistent.
The calling Application tried to access a table file whose Subtype identifier indicated it was not a table image file.
Definition at line 1114 of file cfe_error.h.

10.11.2.90 CFE_TBL_ERR_FILE_TOO_LARGE

```
#define CFE_TBL_ERR_FILE_TOO_LARGE ((CFE_Status_t)0xcc000014)
```

File Too Large.
The calling Application called CFE_TBL_Load with a filename that specified a file that contained more data than the size of the table OR which contained more data than specified in the table header.
Definition at line 1044 of file cfe_error.h.

10.11.2.91 CFE_TBL_ERR_FILENAME_TOO_LONG

```
#define CFE_TBL_ERR_FILENAME_TOO_LONG ((CFE_Status_t)0xcc00001F)
```

Filename Too Long.
The calling Application tried to load a table using a filename that was too long.
Definition at line 1140 of file cfe_error.h.

10.11.2.92 CFE_TBL_ERR_HANDLES_FULL

`#define CFE_TBL_ERR_HANDLES_FULL ((CFE_Status_t)0xcc00000B)`

Handles Full.

An application attempted to create a table and the Table Handle Array already used all CFE_PLATFORM_TBL_MAX↩ _NUM_HANDLES in it.

Definition at line 967 of file cfe_error.h.

10.11.2.93 CFE_TBL_ERR_ILLEGAL_SRC_TYPE

`#define CFE_TBL_ERR_ILLEGAL_SRC_TYPE ((CFE_Status_t)0xcc000011)`

Illegal Source Type.

The calling Application called CFE_TBL_Load with an illegal value for the second parameter.

Definition at line 1025 of file cfe_error.h.

10.11.2.94 CFE_TBL_ERR_INVALID_HANDLE

`#define CFE_TBL_ERR_INVALID_HANDLE ((CFE_Status_t)0xcc000001)`

Invalid Handle.

The calling Application attempted to pass a Table handle that represented too large an index or identified a Table Access Descriptor that was not used.

Definition at line 884 of file cfe_error.h.

10.11.2.95 CFE_TBL_ERR_INVALID_NAME

`#define CFE_TBL_ERR_INVALID_NAME ((CFE_Status_t)0xcc000002)`

Invalid Name.

The calling Application attempted to register a table whose name length exceeded the platform configuration value of CFE_MISSION_TBL_MAX_NAME_LENGTH or was zero characters long.

Definition at line 894 of file cfe_error.h.

10.11.2.96 CFE_TBL_ERR_INVALID_OPTIONS

`#define CFE_TBL_ERR_INVALID_OPTIONS ((CFE_Status_t)0xcc000025)`

Invalid Options.

The calling Application has used an illegal combination of table options. A summary of the illegal combinations are as follows:

#CFE_TBL_OPT_USR_DEF_ADDR cannot be combined with any of the following:

1. CFE_TBL_OPT_DBL_BUFFER
2. CFE_TBL_OPT_LOAD_DUMP
3. CFE_TBL_OPT_CRITICAL

#CFE_TBL_OPT_DBL_BUFFER cannot be combined with the following:

1. CFE_TBL_OPT_USR_DEF_ADDR
2. CFE_TBL_OPT_DUMP_ONLY

Definition at line 1206 of file cfe_error.h.

10.11.2.97 CFE_TBL_ERR_INVALID_SIZE

`#define CFE_TBL_ERR_INVALID_SIZE ((CFE_Status_t)0xcc000003)`

Invalid Size.

The calling Application attempted to register a table: a) that was a double buffered table with size greater than CFE_PLATFORM_TBL_MAX_DBL_TABLE_SIZE b) that was a single buffered table with size greater than CFE_PLATFORM_TBL_MAX_SNGL_TABLE_SIZE c) that had a size of zero

Definition at line 905 of file cfe_error.h.

10.11.2.98 CFE_TBL_ERR_LOAD_IN_PROGRESS

`#define CFE_TBL_ERR_LOAD_IN_PROGRESS ((CFE_Status_t)0xcc000012)`

Load In Progress.

The calling Application called CFE_TBL_Load when another Application was trying to load the table.

Definition at line 1034 of file cfe_error.h.

10.11.2.99 CFE_TBL_ERR_LOAD_INCOMPLETE

`#define CFE_TBL_ERR_LOAD_INCOMPLETE ((CFE_Status_t)0xcc000021)`

Load Incomplete.

The calling Application tried to load a table file whose header claimed the load was larger than what was actually read from the file.

Definition at line 1158 of file cfe_error.h.

10.11.2.100 CFE_TBL_ERR_NEVER_LOADED

`#define CFE_TBL_ERR_NEVER_LOADED ((CFE_Status_t)0xcc000005)`

Never Loaded.

Table has not been loaded with data.

Definition at line 921 of file cfe_error.h.

10.11.2.101 CFE_TBL_ERR_NO_ACCESS

`#define CFE_TBL_ERR_NO_ACCESS ((CFE_Status_t)0xcc000008)`

No Access.

The calling application either failed when calling CFE_TBL_Register, failed when calling CFE_TBL_Share or forgot to call either one.

Definition at line 949 of file cfe_error.h.

10.11.2.102 CFE_TBL_ERR_NO_BUFFER_AVAIL

`#define CFE_TBL_ERR_NO_BUFFER_AVAIL ((CFE_Status_t)0xcc00000F)`

No Buffer Available.

The calling Application has tried to allocate a working buffer but none were available.

Definition at line 1007 of file cfe_error.h.

10.11.2.103 CFE_TBL_ERR_NO_STD_HEADER

`#define CFE_TBL_ERR_NO_STD_HEADER ((CFE_Status_t)0xcc00001D)`

No Standard Header.

The calling Application tried to access a table file whose standard cFE File Header was the wrong size, etc.

Definition at line 1122 of file cfe_error.h.

10.11.2.104 CFE_TBL_ERR_NO_TBL_HEADER

`#define CFE_TBL_ERR_NO_TBL_HEADER ((CFE_Status_t)0xcc00001E)`

No Table Header.

The calling Application tried to access a table file whose standard cFE Table File Header was the wrong size, etc.

Definition at line 1131 of file cfe_error.h.

10.11.2.105 CFE_TBL_ERR_PARTIAL_LOAD

`#define CFE_TBL_ERR_PARTIAL_LOAD ((CFE_Status_t)0xcc000023)`

Partial Load Error.

The calling Application tried to load a table file whose header claimed the load did not start with the first byte and the table image had NEVER been loaded before. Partial loads are not allowed on uninitialized tables. It should be noted that CFE_TBL_WARN_SHORT_FILE also indicates a partial load.

Definition at line 1180 of file cfe_error.h.

10.11.2.106 CFE_TBL_ERR_REGISTRY_FULL

```
#define CFE_TBL_ERR_REGISTRY_FULL ((CFE_Status_t)0xcc000006)
```

Registry Full.

An application attempted to create a table and the Table registry already contained CFE_PLATFORM_TBL_MAX_NUM_TABLES in it.

Definition at line 930 of file cfe_error.h.

10.11.2.107 CFE_TBL_ERR_SHORT_FILE

```
#define CFE_TBL_ERR_SHORT_FILE ((CFE_Status_t)0xcc00002b)
```

Error code indicating that the TBL file is shorter than indicated in the file header.

Definition at line 1266 of file cfe_error.h.

10.11.2.108 CFE_TBL_ERR_UNREGISTERED

```
#define CFE_TBL_ERR_UNREGISTERED ((CFE_Status_t)0xcc000009)
```

Unregistered.

The calling application is trying to access a table that has been unregistered.

Definition at line 958 of file cfe_error.h.

10.11.2.109 CFE_TBL_INFO_DUMP_PENDING

```
#define CFE_TBL_INFO_DUMP_PENDING ((CFE_Status_t)0x4c000024)
```

Dump Pending.

The calling Application should call CFE_TBL_Manage for the specified table. The ground has requested a dump of the Dump-Only table and needs to synchronize with the owning application.

Definition at line 1190 of file cfe_error.h.

10.11.2.110 CFE_TBL_INFO_NO_UPDATE_PENDING

```
#define CFE_TBL_INFO_NO_UPDATE_PENDING ((CFE_Status_t)0x4c000017
```

No Update Pending.

The calling Application has attempted to update a table without a pending load.

Definition at line 1072 of file cfe_error.h.

10.11.2.111 CFE_TBL_INFO_NO_VALIDATION_PENDING

```
#define CFE_TBL_INFO_NO_VALIDATION_PENDI↩
NG ((CFE_Status_t)0x4c00001A)
```

No Validation Pending

The calling Application tried to validate a table that did not have a validation request pending.

Definition at line 1096 of file cfe_error.h.

10.11.2.112 CFE_TBL_INFO_RECOVERED_TBL

```
#define CFE_TBL_INFO_RECOVERED_TBL ((CFE_Status_t)0x4c000027)
```

Recovered Table.

The calling Application registered a critical table whose previous contents were discovered in the Critical Data Store. The discovered contents were copied back into the newly registered table as the table's initial contents.

NOTE: In this situation, the contents of the table are **NOT** validated using the table's validation function.

Definition at line 1230 of file cfe_error.h.

10.11.2.113 CFE_TBL_INFO_TABLE_LOCKED

```
#define CFE_TBL_INFO_TABLE_LOCKED ((CFE_Status_t)0x4c000018)
```

Table Locked.

The calling Application tried to update a table that is locked by another user.

Definition at line 1080 of file cfe_error.h.

10.11.2.114 CFE_TBL_INFO_UPDATE_PENDING

`#define CFE_TBL_INFO_UPDATE_PENDING ((CFE_Status_t)0x4c000004)`

Update Pending.

The calling Application has identified a table that has a load pending.

Definition at line 913 of file cfe_error.h.

10.11.2.115 CFE_TBL_INFO_UPDATED

`#define CFE_TBL_INFO_UPDATED ((CFE_Status_t)0x4c00000E)`

Updated.

The calling Application has identified a table that has been updated.

NOTE: This is a nominal return code informing the calling application that the table identified in the call has had its contents updated since the last time the application obtained its address or status.

Definition at line 998 of file cfe_error.h.

10.11.2.116 CFE_TBL_INFO_VALIDATION_PENDING

`#define CFE_TBL_INFO_VALIDATION_PENDING ((CFE_Status_t)0x4c00001`

Validation Pending

The calling Application should call CFE_TBL_Validate for the specified table.

Definition at line 1088 of file cfe_error.h.

10.11.2.117 CFE_TBL_MESSAGE_ERROR

`#define CFE_TBL_MESSAGE_ERROR ((CFE_Status_t)0xcc00002a)`

Message Error.

Error code indicating that the TBL command was not processed successfully and that the error counter should be incremented.

Definition at line 1260 of file cfe_error.h.

10.11.2.118 CFE_TBL_NOT_IMPLEMENTED

`#define CFE_TBL_NOT_IMPLEMENTED ((CFE_Status_t)0xcc00ffff)`

Not Implemented.

Current version of cFE does not have the function or the feature of the function implemented. This could be due to either an early build of the cFE for this platform or the platform does not support the specified feature.

Definition at line 1292 of file cfe_error.h.

10.11.2.119 CFE_TBL_WARN_DUPLICATE

`#define CFE_TBL_WARN_DUPLICATE ((CFE_Status_t)0x4c000007)`

Duplicate Warning.

This is an error that the registration is trying to replace an existing table with the same name. The previous table stays in place and the new table is rejected.

Definition at line 940 of file cfe_error.h.

10.11.2.120 CFE_TBL_WARN_NOT_CRITICAL

`#define CFE_TBL_WARN_NOT_CRITICAL ((CFE_Status_t)0x4c000026)`

Not Critical Warning.

The calling Application attempted to register a table as "Critical". Table Services failed to create an appropriate Critical Data Store (See System Log for reason) to save the table contents. The table will be treated as a normal table from now on.

Definition at line 1217 of file cfe_error.h.

10.11.2.121 CFE_TBL_WARN_PARTIAL_LOAD

`#define CFE_TBL_WARN_PARTIAL_LOAD ((CFE_Status_t)0x4c000022)`

Partial Load Warning.

The calling Application tried to load a table file whose header claimed the load did not start with the first byte. It should be noted that CFE_TBL_WARN_SHORT_FILE also indicates a partial load.
Definition at line 1168 of file cfe_error.h.

10.11.2.122 CFE_TBL_WARN_SHORT_FILE `#define CFE_TBL_WARN_SHORT_FILE ((CFE_Status_t)0x4c000015)`

Short File Warning.
The calling Application called CFE_TBL_Load with a filename that specified a file that started with the first byte of the table but contained less data than the size of the table. It should be noted that CFE_TBL_WARN_PARTIAL_LOAD also indicates a partial load (one that starts at a non-zero offset).
Definition at line 1055 of file cfe_error.h.

10.11.2.123 CFE_TIME_BAD_ARGUMENT `#define CFE_TIME_BAD_ARGUMENT ((CFE_Status_t)0xce000005)`

Bad Argument.
A parameter given by a caller to a TIME Services API did not pass validation checks.
Definition at line 1364 of file cfe_error.h.

10.11.2.124 CFE_TIME_CALLBACK_NOT_REGISTERED `#define CFE_TIME_CALLBACK_NOT_REGISTERED ((CFE_Status_t)0xce0`

Callback Not Registered.
An attempt to unregister a cFE Time Services Synchronization callback has failed because the specified callback function was not located in the Synchronization Callback Registry.
Definition at line 1355 of file cfe_error.h.

10.11.2.125 CFE_TIME_INTERNAL_ONLY `#define CFE_TIME_INTERNAL_ONLY ((CFE_Status_t)0xce000001)`

Internal Only.
One of the TIME Services API functions to set the time with data from an external time source has been called, but TIME Services has been commanded to not accept external time data. However, the command is still a signal for the Time Server to generate a "time at the tone" command packet using internal data.
Definition at line 1319 of file cfe_error.h.

10.11.2.126 CFE_TIME_NOT_IMPLEMENTED `#define CFE_TIME_NOT_IMPLEMENTED ((CFE_Status_t)0xce00ffff)`

Not Implemented.
Current version of cFE does not have the function or the feature of the function implemented. This could be due to either an early build of the cFE for this platform or the platform does not support the specified feature.
Definition at line 1307 of file cfe_error.h.

10.11.2.127 CFE_TIME_OUT_OF_RANGE `#define CFE_TIME_OUT_OF_RANGE ((CFE_Status_t)0xce000002)`

Out Of Range.
One of the TIME Services API functions to set the time with data from an external time source has been called, but TIME Services has determined that the new time data is invalid. However, the command is still a signal for the Time Server to generate a "time at the tone" command packet using internal data.
Note that the test for invalid time update data only occurs if TIME Services has previously been commanded to set the clock state to "valid".
Definition at line 1334 of file cfe_error.h.

10.11.2.128 CFE_TIME_TOO_MANY_SYNCH_CALLBACKS

```
#define CFE_TIME_TOO_MANY_SYNCH_CALLBACKS ((CFE_Status_t)0xce000003)
```

Too Many Sync Callbacks.

An attempt to register too many cFE Time Services Synchronization callbacks has been made. Only one callback function is allowed per application. It is expected that the application itself will distribute the single callback to child threads as needed.

Definition at line 1345 of file cfe_error.h.

10.12 cFE Resource ID APIs

Functions

- CFE_Status_t CFE_ES_AppID_ToIndex (CFE_ES_AppId_t AppID, uint32 *Idx)

  Obtain an index value correlating to an ES Application ID.
- int32 CFE_ES_LibID_ToIndex (CFE_ES_LibId_t LibId, uint32 *Idx)

  Obtain an index value correlating to an ES Library ID.
- CFE_Status_t CFE_ES_TaskID_ToIndex (CFE_ES_TaskId_t TaskID, uint32 *Idx)

  Obtain an index value correlating to an ES Task ID.
- CFE_Status_t CFE_ES_CounterID_ToIndex (CFE_ES_CounterId_t CounterId, uint32 *Idx)

  Obtain an index value correlating to an ES Counter ID.

10.12.1 Detailed Description

10.12.2 Function Documentation

10.12.2.1 CFE_ES_AppID_ToIndex()

```
CFE_Status_t CFE_ES_AppID_ToIndex (
    CFE_ES_AppId_t AppID,
    uint32 * Idx )
```

Obtain an index value correlating to an ES Application ID.
This calculates a zero based integer value that may be used for indexing into a local resource table/array.
Index values are only guaranteed to be unique for resources of the same type. For instance, the indices corresponding to two [valid] application IDs will never overlap, but the index of an application and a library ID may be the same. Furthermore, indices may be reused if a resource is deleted and re-created.

Note

There is no inverse of this function - indices cannot be converted back to the original AppID value. The caller should retain the original ID for future use.

Parameters

in	*AppID*	Application ID to convert
out	*Idx*	Buffer where the calculated index will be stored (must not be null)

Returns

Execution status, see cFE Return Code Defines

Return values

CFE_SUCCESS	Successful execution.
CFE_ES_ERR_RESOURCEID_NOT_VALID	Resource ID is not valid.

10.12.2.2 CFE_ES_CounterID_ToIndex()

```
CFE_Status_t CFE_ES_CounterID_ToIndex (
    CFE_ES_CounterId_t CounterId,
    uint32 * Idx )
```

Obtain an index value correlating to an ES Counter ID.
This calculates a zero based integer value that may be used for indexing into a local resource table/array.
Index values are only guaranteed to be unique for resources of the same type. For instance, the indices corresponding to two [valid] Counter IDs will never overlap, but the index of a Counter and a library ID may be the same. Furthermore, indices may be reused if a resource is deleted and re-created.

Note

There is no inverse of this function - indices cannot be converted back to the original CounterID value. The caller should retain the original ID for future use.

Parameters

in	*CounterId*	Counter ID to convert
out	*Idx*	Buffer where the calculated index will be stored (must not be null)

Returns

Execution status, see cFE Return Code Defines

Return values

CFE_SUCCESS	Successful execution.
CFE_ES_ERR_RESOURCEID_NOT_VALID	Resource ID is not valid.

10.12.2.3 CFE_ES_LibID_ToIndex()

```
int32 CFE_ES_LibID_ToIndex (
    CFE_ES_LibId_t LibId,
    uint32 * Idx )
```

Obtain an index value correlating to an ES Library ID.
This calculates a zero based integer value that may be used for indexing into a local resource table/array.
Index values are only guaranteed to be unique for resources of the same type. For instance, the indices corresponding to two [valid] Library IDs will never overlap, but the index of an Library and a library ID may be the same. Furthermore, indices may be reused if a resource is deleted and re-created.

Note

There is no inverse of this function - indices cannot be converted back to the original LibID value. The caller should retain the original ID for future use.

Parameters

in	*LibId*	Library ID to convert
out	*Idx*	Buffer where the calculated index will be stored (must not be null)

Returns

Execution status, see cFE Return Code Defines

Return values

CFE_SUCCESS	Successful execution.
CFE_ES_ERR_RESOURCEID_NOT_VALID	Resource ID is not valid.

10.12.2.4 CFE_ES_TaskID_ToIndex()

```
CFE_Status_t CFE_ES_TaskID_ToIndex (
    CFE_ES_TaskId_t TaskID,
    uint32 * Idx )
```

Obtain an index value correlating to an ES Task ID.
This calculates a zero based integer value that may be used for indexing into a local resource table/array.
Index values are only guaranteed to be unique for resources of the same type. For instance, the indices corresponding to two [valid] Task IDs will never overlap, but the index of a Task and a library ID may be the same. Furthermore, indices may be reused if a resource is deleted and re-created.

Note

There is no inverse of this function - indices cannot be converted back to the original TaskID value. The caller should retain the original ID for future use.

Parameters

in	*TaskID*	Task ID to convert
out	*Idx*	Buffer where the calculated index will be stored (must not be null)

Returns

Execution status, see cFE Return Code Defines

Return values

CFE_SUCCESS	Successful execution.
CFE_ES_ERR_RESOURCEID_NOT_VALID	Resource ID is not valid.
CFE_ES_BAD_ARGUMENT	Bad Argument.

10.13 cFE Entry/Exit APIs

Functions

- void CFE_ES_Main (uint32 StartType, uint32 StartSubtype, uint32 ModeId, const char *StartFilePath)

  cFE Main Entry Point used by Board Support Package to start cFE
- CFE_Status_t CFE_ES_ResetCFE (uint32 ResetType)

  Reset the cFE Core and all cFE Applications.

10.13.1 Detailed Description

10.13.2 Function Documentation

10.13.2.1 CFE_ES_Main()

```
void CFE_ES_Main (
    uint32 StartType,
    uint32 StartSubtype,
    uint32 ModeId,
    const char * StartFilePath )
```

cFE Main Entry Point used by Board Support Package to start cFE

Description

cFE main entry point. This is the entry point into the cFE software. It is called only by the Board Support Package software.

Assumptions, External Events, and Notes:

None

Parameters

in	*StartType*	Identifies whether this was a CFE_PSP_RST_TYPE_POWERON or CFE_PSP_RST_TYPE_PROCESSOR.
in	*StartSubtype*	Specifies, in more detail, what caused the `StartType` identified above. See CFE_PSP_RST_SUBTYPE_POWER_CYCLE for possible examples.
in	*ModeId*	Identifies the source of the Boot as determined by the BSP.
in	*StartFilePath*	Identifies the startup file to use to initialize the cFE apps.

See also

CFE_ES_ResetCFE

10.13.2.2 CFE_ES_ResetCFE()

```
CFE_Status_t CFE_ES_ResetCFE (
    uint32 ResetType )
```

Reset the cFE Core and all cFE Applications.

Description

This API causes an immediate reset of the cFE Kernel and all cFE Applications. The caller can specify whether the reset should clear all memory (CFE_PSP_RST_TYPE_POWERON) or try to retain volatile memory areas (CFE_PSP_RST_TYPE_PROCESSOR).

Assumptions, External Events, and Notes:

None

Parameters

in	*ResetType*	Identifies the type of reset desired. Allowable settings are: • CFE_PSP_RST_TYPE_POWERON - Causes all memory to be cleared • CFE_PSP_RST_TYPE_PROCESSOR - Attempts to retain volatile disk, critical data store and user reserved memory.

Returns

Execution status, see cFE Return Code Defines

Return values

CFE_SUCCESS	Successful execution.
CFE_ES_BAD_ARGUMENT	Bad Argument.
CFE_ES_NOT_IMPLEMENTED	Not Implemented.

See also

CFE_ES_Main

10.14 cFE Application Control APIs

Functions

- CFE_Status_t CFE_ES_RestartApp (CFE_ES_AppId_t AppID)

  Restart a single cFE Application.
- CFE_Status_t CFE_ES_ReloadApp (CFE_ES_AppId_t AppID, const char ∗AppFileName)

  Reload a single cFE Application.
- CFE_Status_t CFE_ES_DeleteApp (CFE_ES_AppId_t AppID)

  Delete a cFE Application.

10.14.1 Detailed Description

10.14.2 Function Documentation

10.14.2.1 CFE_ES_DeleteApp()

```
CFE_Status_t CFE_ES_DeleteApp (
    CFE_ES_AppId_t AppID )
```

Delete a cFE Application.

Description

This API causes a cFE Application to be stopped deleted.

Assumptions, External Events, and Notes:

None

Parameters

in	*AppID*	Identifies the application to be reset.

Returns

Execution status, see cFE Return Code Defines

Return values

CFE_ES_ERR_RESOURCEID_NOT_VALID	Resource ID is not valid.
CFE_SUCCESS	Successful execution.

See also

CFE_ES_RestartApp, CFE_ES_ReloadApp

10.14.2.2 CFE_ES_ReloadApp()

```
CFE_Status_t CFE_ES_ReloadApp (
    CFE_ES_AppId_t AppID,
    const char * AppFileName )
```

Reload a single cFE Application.

Description

This API causes a cFE Application to be stopped and restarted from the specified file.

Assumptions, External Events, and Notes:

The filename is checked for existence prior to load. A missing file will be reported and the reload operation will be aborted prior to unloading the app.

Goes through the standard CFE_ES_CleanUpApp which unloads, then attempts a load using the specified file name. In the event that an application cannot be reloaded due to a corrupt file, the application may no longer be reloaded when given a valid load file (it has been deleted and no longer exists). To recover, the application may be started by loading the application via the ES_STARTAPP command (CFE_ES_START_APP_CC).

Parameters

in	*AppID*	Identifies the application to be reset.
in	*AppFileName*	Identifies the new file to start (must not be null)

Returns

Execution status, see cFE Return Code Defines

Return values

CFE_ES_ERR_RESOURCEID_NOT_VALID	Resource ID is not valid.
CFE_SUCCESS	Successful execution.
CFE_ES_FILE_IO_ERR	File IO Error.

See also

CFE_ES_RestartApp, CFE_ES_DeleteApp, CFE_ES_START_APP_CC

10.14.2.3 CFE_ES_RestartApp()

```
CFE_Status_t CFE_ES_RestartApp (
    CFE_ES_AppId_t AppID )
```

Restart a single cFE Application.

Description

This API causes a cFE Application to be unloaded and restarted from the same file name as the last start.

Assumptions, External Events, and Notes:

The filename is checked for existence prior to load. A missing file will be reported and the reload operation will be aborted prior to unloading the app.

Goes through the standard CFE_ES_CleanUpApp which unloads, then attempts a load using the original file name. In the event that an application cannot be reloaded due to a missing file or any other load issue, the application may no longer be restarted or reloaded when given a valid load file (the app has been deleted and no longer exists). To recover, the application may be started by loading the application via the ES_STARTAPP command (CFE_ES_START_APP_CC).

Parameters

in	*AppID*	Identifies the application to be reset.

Returns

Execution status, see cFE Return Code Defines

Return values

CFE_ES_ERR_RESOURCEID_NOT_VALID	Resource ID is not valid.
CFE_ES_FILE_IO_ERR	File IO Error.
CFE_SUCCESS	Successful execution.

See also

CFE_ES_ReloadApp, CFE_ES_DeleteApp

10.15 cFE Application Behavior APIs

Functions

- void CFE_ES_ExitApp (uint32 ExitStatus)

  Exit a cFE Application.
- bool CFE_ES_RunLoop (uint32 *RunStatus)

  Check for Exit, Restart, or Reload commands.
- CFE_Status_t CFE_ES_WaitForSystemState (uint32 MinSystemState, uint32 TimeOutMilliseconds)

  Allow an Application to Wait for a minimum global system state.
- void CFE_ES_WaitForStartupSync (uint32 TimeOutMilliseconds)

  Allow an Application to Wait for the "OPERATIONAL" global system state.
- void CFE_ES_IncrementTaskCounter (void)

  Increments the execution counter for the calling task.

10.15.1 Detailed Description

10.15.2 Function Documentation

10.15.2.1 CFE_ES_ExitApp() `void CFE_ES_ExitApp ( uint32 ExitStatus )`

Exit a cFE Application.

Description

This API is the "Exit Point" for the cFE application

Assumptions, External Events, and Notes:

None

Parameters

in	*ExitStatus*	Acceptable values are: • CFE_ES_RunStatus_APP_EXIT - Indicates that the Application wants to exit normally. • CFE_ES_RunStatus_APP_ERROR - Indicates that the Application is quitting with an error. • CFE_ES_RunStatus_CORE_APP_INIT_ERROR - Indicates that the Core Application could not Init. • CFE_ES_RunStatus_CORE_APP_RUNTIME_ERROR - Indicates that the Core Application had a runtime failure.

See also

CFE_ES_RunLoop

Referenced by CF_AppMain().

10.15.2.2 CFE_ES_IncrementTaskCounter() `void CFE_ES_IncrementTaskCounter ( void )`

Increments the execution counter for the calling task.

Description

This routine increments the execution counter that is stored for the calling task. It can be called from cFE Application main tasks, child tasks, or cFE Core application main tasks. Normally, the call is not necessary from a cFE Application, since the CFE_ES_RunLoop call increments the counter for the Application.

Assumptions, External Events, and Notes:

NOTE: This API is not needed for Applications that call the CFE_ES_RunLoop call.

See also

CFE_ES_RunLoop

10.15.2.3 CFE_ES_RunLoop() `bool CFE_ES_RunLoop ( uint32 * RunStatus )`

Check for Exit, Restart, or Reload commands.

Description

This is the API that allows an app to check for exit requests from the system, or request shutdown from the system.

Assumptions, External Events, and Notes:

This API updates the internal task counter tracked by ES for the calling task. For ES to report application counters correctly this API should be called from the main app task as part of it's main processing loop.

In the event of a externally initiated app shutdown request (such as the APP_STOP, APP_RELOAD, and APP_RESTART commands) or if a system error occurs requiring the app to be shut down administratively, this function returns "false" and optionally sets the "RunStatus" output to further indicate the specific application state.
If "RunStatus" is passed as non-NULL, it should point to a local status variable containing the requested status to ES. Normally, this should be initialized to CFE_ES_RunStatus_APP_RUN during application start up, and should remain as this value during normal operation.
If "RunStatus" is set to CFE_ES_RunStatus_APP_EXIT or CFE_ES_RunStatus_APP_ERROR on input, this acts as a shutdown request - CFE_ES_RunLoop() function will return "false", and a shutdown will be initiated similar to if ES had been externally commanded to shut down the app.
If "RunStatus" is not used, it should be passed as NULL. In this mode, only the boolean return value is relevant, which will indicate if an externally-initiated shutdown request is pending.

Parameters

in,out	*RunStatus*	Optional pointer to a variable containing the desired run status

Returns

Boolean indicating application should continue running

Return values

true	Application should continue running
false	Application should not continue running

See also

CFE_ES_ExitApp

Referenced by CF_AppMain().

10.15.2.4 CFE_ES_WaitForStartupSync()

```
void CFE_ES_WaitForStartupSync (
    uint32 TimeOutMilliseconds )
```

Allow an Application to Wait for the "OPERATIONAL" global system state.

Description

This is the API that allows an app to wait for the rest of the apps to complete their entire initialization before continuing. It is most useful for applications such as Health and Safety or the Scheduler that need to wait until applications exist and are running before sending out packets to them.

This is a specialized wrapper for CFE_ES_WaitForSystemState for compatibility with applications using this API.

Assumptions, External Events, and Notes:

This API should only be called as the last item of an Apps initialization. In addition, this API should only be called by an App that is started from the ES Startup file. It should not be used by an App that is started after the system is running. (Although it will cause no harm)

Parameters

in	*TimeOutMilliseconds*	The timeout value in Milliseconds. This parameter must be at least 1000. Lower values will be rounded up. There is not an option to wait indefinitely to avoid hanging a critical application because a non-critical app did not start.

See also

CFE_ES_RunLoop

10.15.2.5 CFE_ES_WaitForSystemState()

```
CFE_Status_t CFE_ES_WaitForSystemState (
    uint32 MinSystemState,
    uint32 TimeOutMilliseconds )
```

Allow an Application to Wait for a minimum global system state.

Description

This is the API that allows an app to wait for the rest of the apps to complete a given stage of initialization before continuing.

This gives finer grained control than CFE_ES_WaitForStartupSync

Assumptions, External Events, and Notes:

This API assumes that the caller has also been initialized sufficiently to satisfy the global system state it is waiting for, and the apps own state will be updated accordingly.

Parameters

in	*MinSystemState*	Determine the state of the App
in	*TimeOutMilliseconds*	The timeout value in Milliseconds. There is not an option to wait indefinitely to avoid hanging a critical application because a non-critical app did not start.

Returns

Execution status, see cFE Return Code Defines

Return values

CFE_SUCCESS	State successfully achieved
CFE_ES_OPERATION_TIMED_OUT	(return value only verified in coverage test) Timeout was reached

See also

CFE_ES_RunLoop

10.16 cFE Information APIs

Functions

- int32 CFE_ES_GetResetType (uint32 ∗ResetSubtypePtr)

  Return the most recent Reset Type.
- CFE_Status_t CFE_ES_GetAppID (CFE_ES_AppId_t ∗AppIdPtr)

  Get an Application ID for the calling Application.
- CFE_Status_t CFE_ES_GetTaskID (CFE_ES_TaskId_t ∗TaskIdPtr)

  Get the task ID of the calling context.
- CFE_Status_t CFE_ES_GetAppIDByName (CFE_ES_AppId_t ∗AppIdPtr, const char ∗AppName)

  Get an Application ID associated with a specified Application name.
- CFE_Status_t CFE_ES_GetLibIDByName (CFE_ES_LibId_t ∗LibIdPtr, const char ∗LibName)

  Get a Library ID associated with a specified Library name.
- CFE_Status_t CFE_ES_GetAppName (char ∗AppName, CFE_ES_AppId_t AppId, size_t BufferLength)

  Get an Application name for a specified Application ID.
- CFE_Status_t CFE_ES_GetLibName (char ∗LibName, CFE_ES_LibId_t LibId, size_t BufferLength)

  Get a Library name for a specified Library ID.
- CFE_Status_t CFE_ES_GetAppInfo (CFE_ES_AppInfo_t ∗AppInfo, CFE_ES_AppId_t AppId)

  Get Application Information given a specified App ID.
- CFE_Status_t CFE_ES_GetTaskInfo (CFE_ES_TaskInfo_t ∗TaskInfo, CFE_ES_TaskId_t TaskId)

  Get Task Information given a specified Task ID.
- int32 CFE_ES_GetLibInfo (CFE_ES_AppInfo_t ∗LibInfo, CFE_ES_LibId_t LibId)

  Get Library Information given a specified Resource ID.
- int32 CFE_ES_GetModuleInfo (CFE_ES_AppInfo_t ∗ModuleInfo, CFE_ResourceId_t ResourceId)

  Get Information given a specified Resource ID.

10.16.1 Detailed Description

10.16.2 Function Documentation

10.16.2.1 CFE_ES_GetAppID() `CFE_Status_t CFE_ES_GetAppID ( CFE_ES_AppId_t * AppIdPtr )`

Get an Application ID for the calling Application.

Description

This routine retrieves the cFE Application ID for the calling Application.

Assumptions, External Events, and Notes:

NOTE: **All** tasks associated with the Application would return the same Application ID.

Parameters

out	*AppIdPtr*	Pointer to variable that is to receive the Application's ID (must not be null). ∗AppIdPtr will be set to the application ID of the calling Application.

Returns

Execution status, see cFE Return Code Defines

Return values

CFE_SUCCESS	Successful execution.
CFE_ES_ERR_RESOURCEID_NOT_VALID	Resource ID is not valid.
CFE_ES_BAD_ARGUMENT	Bad Argument.

See also

CFE_ES_GetResetType, CFE_ES_GetAppIDByName, CFE_ES_GetAppName, CFE_ES_GetTaskInfo

10.16.2.2 CFE_ES_GetAppIDByName()

```
CFE_Status_t CFE_ES_GetAppIDByName (
    CFE_ES_AppId_t * AppIdPtr,
    const char * AppName )
```

Get an Application ID associated with a specified Application name.

Description

This routine retrieves the cFE Application ID associated with a specified Application name.

Assumptions, External Events, and Notes:

None

Parameters

out	*AppIdPtr*	Pointer to variable that is to receive the Application's ID (must not be null).
in	*AppName*	Pointer to null terminated character string containing an Application name (must not be null).

Returns

Execution status, see cFE Return Code Defines

Return values

CFE_SUCCESS	Successful execution.
CFE_ES_ERR_NAME_NOT_FOUND	Resource Name Error.
CFE_ES_BAD_ARGUMENT	Bad Argument.

See also

CFE_ES_GetAppID, CFE_ES_GetAppName, CFE_ES_GetAppInfo

10.16.2.3 CFE_ES_GetAppInfo()

```
CFE_Status_t CFE_ES_GetAppInfo (
    CFE_ES_AppInfo_t * AppInfo,
```

```
CFE_ES_AppId_t AppId )
```

Get Application Information given a specified App ID.

Description

This routine retrieves the information about an App associated with a specified App ID. The information includes all of the information ES maintains for an application (documented in the CFE_ES_AppInfo_t type)

Assumptions, External Events, and Notes:

None

Parameters

out	*AppInfo*	Pointer to a structure (must not be null) that will be filled with resource name and memory addresses information.
in	*AppId*	ID of application to obtain information about

Returns

Execution status, see cFE Return Code Defines

Return values

CFE_SUCCESS	Successful execution.
CFE_ES_ERR_RESOURCEID_NOT_VALID	Resource ID is not valid.
CFE_ES_BAD_ARGUMENT	Bad Argument.

See also

CFE_ES_GetAppID, CFE_ES_GetAppIDByName, CFE_ES_GetAppName

10.16.2.4 CFE_ES_GetAppName()

```
CFE_Status_t CFE_ES_GetAppName (
    char * AppName,
    CFE_ES_AppId_t AppId,
    size_t BufferLength )
```

Get an Application name for a specified Application ID.

Description

This routine retrieves the cFE Application name associated with a specified Application ID.

Assumptions, External Events, and Notes:

In the case of a failure (CFE_ES_ERR_RESOURCEID_NOT_VALID), an empty string is returned.

Parameters

out	*AppName*	Pointer to a character array (must not be null) of at least `BufferLength` in size that will be filled with the appropriate Application name.
in	*AppId*	Application ID of Application whose name is being requested.
in	*BufferLength*	The maximum number of characters, including the null terminator, that can be put into the `AppName` buffer. This routine will truncate the name to this length, if necessary.

Returns

Execution status, see cFE Return Code Defines

Return values

CFE_SUCCESS	Successful execution.
CFE_ES_ERR_RESOURCEID_NOT_VALID	Resource ID is not valid.
CFE_ES_BAD_ARGUMENT	Bad Argument.

See also

CFE_ES_GetAppID, CFE_ES_GetAppIDByName, CFE_ES_GetAppInfo

10.16.2.5 CFE_ES_GetLibIDByName()

```
CFE_Status_t CFE_ES_GetLibIDByName (
    CFE_ES_LibId_t * LibIdPtr,
    const char * LibName )
```

Get a Library ID associated with a specified Library name.

Description

This routine retrieves the cFE Library ID associated with a specified Library name.

Assumptions, External Events, and Notes:

None

Parameters

out	*LibIdPtr*	Pointer to variable that is to receive the Library's ID (must not be null).
in	*LibName*	Pointer to null terminated character string containing a Library name (must not be null).

Returns

Execution status, see cFE Return Code Defines

Return values

CFE_SUCCESS	Successful execution.
CFE_ES_ERR_NAME_NOT_FOUND	Resource Name Error.
CFE_ES_BAD_ARGUMENT	Bad Argument.

See also

CFE_ES_GetLibName

10.16.2.6 CFE_ES_GetLibInfo()

```
int32 CFE_ES_GetLibInfo (
    CFE_ES_AppInfo_t * LibInfo,
```

```
CFE_ES_LibId_t LibId )
```

Get Library Information given a specified Resource ID.

Description

This routine retrieves the information about a Library associated with a specified ID. The information includes all of the information ES maintains for this resource type (documented in the CFE_ES_AppInfo_t type).

This shares the same output structure as CFE_ES_GetAppInfo, such that informational commands can be executed against either applications or libraries. When applied to a library, the task information in the structure will be omitted, as libraries do not have tasks associated.

Assumptions, External Events, and Notes:

None

Parameters

out	*LibInfo*	Pointer to a structure (must not be null) that will be filled with resource name and memory addresses information.
in	*LibId*	ID of application to obtain information about

Returns

Execution status, see cFE Return Code Defines

Return values

CFE_SUCCESS	Successful execution.
CFE_ES_ERR_RESOURCEID_NOT_VALID	Resource ID is not valid.
CFE_ES_BAD_ARGUMENT	Bad Argument.

See also

CFE_ES_GetLibIDByName, CFE_ES_GetLibName

10.16.2.7 CFE_ES_GetLibName()

```
CFE_Status_t CFE_ES_GetLibName (
    char * LibName,
    CFE_ES_LibId_t LibId,
    size_t BufferLength )
```

Get a Library name for a specified Library ID.

Description

This routine retrieves the cFE Library name associated with a specified Library ID.

Assumptions, External Events, and Notes:

In the case of a failure (CFE_ES_ERR_RESOURCEID_NOT_VALID), an empty string is returned.

Parameters

out	*LibName*	Pointer to a character array (must not be null) of at least `BufferLength` in size that will be filled with the Library name.
in	*LibId*	Library ID of Library whose name is being requested.
in	*BufferLength*	The maximum number of characters (must not be zero), including the null terminator, that can be put into the `LibName` buffer. This routine will truncate the name to this length, if necessary.

Returns

Execution status, see cFE Return Code Defines

Return values

CFE_SUCCESS	Successful execution.
CFE_ES_ERR_RESOURCEID_NOT_VALID	Resource ID is not valid.
CFE_ES_BAD_ARGUMENT	Bad Argument.

See also

CFE_ES_GetLibIDByName

10.16.2.8 CFE_ES_GetModuleInfo()

```
int32 CFE_ES_GetModuleInfo (
    CFE_ES_AppInfo_t * ModuleInfo,
    CFE_ResourceId_t ResourceId )
```

Get Information given a specified Resource ID.

Description

This routine retrieves the information about an Application or Library associated with a specified ID.

This is a wrapper API that in turn calls either CFE_ES_GetAppInfo or CFE_ES_GetLibInfo if passed an AppId or LibId, respectively.
This allows commands originally targeted to operate on AppIDs to be easily ported to operate on either Libraries or Applications, where relevant.

Assumptions, External Events, and Notes:

None

Parameters

out	*ModuleInfo*	Pointer to a structure (must not be null) that will be filled with resource name and memory addresses information.
in	*ResourceId*	ID of application or library to obtain information about

Returns

Execution status, see cFE Return Code Defines

Return values

CFE_SUCCESS	Successful execution.
CFE_ES_ERR_RESOURCEID_NOT_VALID	Resource ID is not valid.
CFE_ES_BAD_ARGUMENT	Bad Argument.

See also

CFE_ES_GetLibInfo, CFE_ES_GetAppInfo

10.16.2.9 CFE_ES_GetResetType()

```
int32 CFE_ES_GetResetType (
    uint32 * ResetSubtypePtr )
```

Return the most recent Reset Type.

Description

Provides the caller with codes that identifies the type of Reset the processor most recently underwent. The caller can also obtain information on what caused the reset by supplying a pointer to a variable that will be filled with the Reset Sub-Type.

Assumptions, External Events, and Notes:

None

Parameters

`in,out`	*ResetSubtypePtr*	Pointer to `uint32` type variable in which the Reset Sub-Type will be stored. The caller can set this pointer to NULL if the Sub-Type is of no interest. ResetSubtypePtr If the provided pointer was not `NULL`, the Reset Sub-Type is stored at the given address. For a list of possible Sub-Type values, see "Reset Sub-Types" .

Returns

Processor reset type

Return values

CFE_PSP_RST_TYPE_POWERON	
CFE_PSP_RST_TYPE_PROCESSOR	

See also

CFE_ES_GetAppID, CFE_ES_GetAppIDByName, CFE_ES_GetAppName, CFE_ES_GetTaskInfo

10.16.2.10 CFE_ES_GetTaskID()

```
CFE_Status_t CFE_ES_GetTaskID (
    CFE_ES_TaskId_t * TaskIdPtr )
```

Get the task ID of the calling context.

Description

This retrieves the current task context from OSAL

Assumptions, External Events, and Notes:

Applications which desire to call other CFE ES services such as CFE_ES_TaskGetInfo() should use this API rather than getting the ID from OSAL directly via OS_TaskGetId().

Parameters

out	*TaskIdPtr*	Pointer to variable that is to receive the ID (must not be null). Will be set to the ID of the calling task.

Returns

Execution status, see cFE Return Code Defines

Return values

CFE_SUCCESS	Successful execution.
CFE_ES_ERR_RESOURCEID_NOT_VALID	Resource ID is not valid.
CFE_ES_BAD_ARGUMENT	Bad Argument.

10.16.2.11 CFE_ES_GetTaskInfo()

```
CFE_Status_t CFE_ES_GetTaskInfo (
    CFE_ES_TaskInfo_t * TaskInfo,
    CFE_ES_TaskId_t TaskId )
```

Get Task Information given a specified Task ID.

Description

This routine retrieves the information about a Task associated with a specified Task ID. The information includes Task Name, and Parent/Creator Application ID.

Assumptions, External Events, and Notes:

None

Parameters

out	*TaskInfo*	Pointer to a `CFE_ES_TaskInfo_t` structure (must not be null) that holds the specific task information. *TaskInfo is the filled out `CFE_ES_TaskInfo_t` structure containing the Task Name, Parent App Name, Parent App ID among other fields.
in	*TaskId*	Application ID of Application whose name is being requested.

Returns

Execution status, see cFE Return Code Defines

Return values

CFE_SUCCESS	Successful execution.
CFE_ES_ERR_RESOURCEID_NOT_VALID	Resource ID is not valid.
CFE_ES_BAD_ARGUMENT	Bad Argument.

See also

CFE_ES_GetTaskID, CFE_ES_GetTaskIDByName, CFE_ES_GetTaskName

10.17 cFE Child Task APIs

Functions

- CFE_Status_t CFE_ES_CreateChildTask (CFE_ES_TaskId_t ∗TaskIdPtr, const char ∗TaskName, CFE_ES_ChildTaskMainFuncPtr_ FunctionPtr, CFE_ES_StackPointer_t StackPtr, size_t StackSize, CFE_ES_TaskPriority_Atom_t Priority, uint32 Flags)

  Creates a new task under an existing Application.
- CFE_Status_t CFE_ES_GetTaskIDByName (CFE_ES_TaskId_t ∗TaskIdPtr, const char ∗TaskName)

  Get a Task ID associated with a specified Task name.
- CFE_Status_t CFE_ES_GetTaskName (char ∗TaskName, CFE_ES_TaskId_t TaskId, size_t BufferLength)

  Get a Task name for a specified Task ID.
- CFE_Status_t CFE_ES_DeleteChildTask (CFE_ES_TaskId_t TaskId)

  Deletes a task under an existing Application.
- void CFE_ES_ExitChildTask (void)

  Exits a child task.

10.17.1 Detailed Description

10.17.2 Function Documentation

10.17.2.1 CFE_ES_CreateChildTask()

```
CFE_Status_t CFE_ES_CreateChildTask (
    CFE_ES_TaskId_t * TaskIdPtr,
    const char * TaskName,
    CFE_ES_ChildTaskMainFuncPtr_t FunctionPtr,
    CFE_ES_StackPointer_t StackPtr,
    size_t StackSize,
    CFE_ES_TaskPriority_Atom_t Priority,
    uint32 Flags )
```

Creates a new task under an existing Application.

Description

This routine creates a new task (a separate execution thread) owned by the calling Application.

Assumptions, External Events, and Notes:

None

Parameters

out	*TaskIdPtr*	A pointer to a variable that will be filled in with the new task's ID (must not be null). TaskIdPtr is the Task ID of the newly created child task.
in	*TaskName*	A pointer to a string containing the desired name of the new task (must not be null). This can be up to OS_MAX_API_NAME characters, including the trailing null.
in	*FunctionPtr*	A pointer to the function that will be spawned as a new task (must not be null).
in	*StackPtr*	A pointer to the location where the child task's stack pointer should start. NOTE: Not all underlying operating systems support this parameter. The CFE_ES_TASK_STACK_ALLOCATE constant may be passed to indicate that the stack should be dynamically allocated.
in	*StackSize*	The number of bytes to allocate for the new task's stack (must not be zero).

Parameters

in	*Priority*	The priority for the new task. Lower numbers are higher priority, with 0 being the highest priority.
in	*Flags*	Reserved for future expansion.

Returns

Execution status, see cFE Return Code Defines

Return values

CFE_SUCCESS	Successful execution.
CFE_ES_ERR_CHILD_TASK_CREATE	Child Task Create Error.
CFE_ES_BAD_ARGUMENT	Bad Argument.
CFE_ES_ERR_RESOURCEID_NOT_VALID	Resource ID is not valid.

See also

CFE_ES_DeleteChildTask, CFE_ES_ExitChildTask

10.17.2.2 CFE_ES_DeleteChildTask()

```
CFE_Status_t CFE_ES_DeleteChildTask (
    CFE_ES_TaskId_t TaskId )
```

Deletes a task under an existing Application.

Description

This routine deletes a task under an Application specified by the `TaskId` obtained when the child task was created using the CFE_ES_CreateChildTask API.

Assumptions, External Events, and Notes:

None

Parameters

in	*TaskId*	The task ID previously obtained when the Child Task was created with the CFE_ES_CreateChildTask API.

Returns

Execution status, see cFE Return Code Defines

Return values

CFE_SUCCESS	Successful execution.
CFE_ES_ERR_CHILD_TASK_DELETE	(return value only verified in coverage test) Child Task Delete Error.
CFE_ES_ERR_CHILD_TASK_DELETE_MAIN_TASK	Child Task Delete Passed Main Task.
CFE_ES_ERR_RESOURCEID_NOT_VALID	Resource ID is not valid.

See also

CFE_ES_CreateChildTask, CFE_ES_ExitChildTask

10.17.2.3 CFE_ES_ExitChildTask()

```
void CFE_ES_ExitChildTask (
    void )
```

Exits a child task.

Description

This routine allows the current executing child task to exit and be deleted by ES.

Assumptions, External Events, and Notes:

This function cannot be called from an Application's Main Task.

Note

This function does not return a value, but if it does return at all, it is assumed that the Task was either unregistered or this function was called from a cFE Application's main task.

See also

CFE_ES_CreateChildTask, CFE_ES_DeleteChildTask

10.17.2.4 CFE_ES_GetTaskIDByName()

```
CFE_Status_t CFE_ES_GetTaskIDByName (
    CFE_ES_TaskId_t * TaskIdPtr,
    const char * TaskName )
```

Get a Task ID associated with a specified Task name.

Description

This routine retrieves the cFE Task ID associated with a specified Task name.

Assumptions, External Events, and Notes:

None

Parameters

out	*TaskIdPtr*	Pointer to variable that is to receive the Task's ID (must not be null).
in	*TaskName*	Pointer to null terminated character string containing a Task name (must not be null).

Returns

Execution status, see cFE Return Code Defines

Return values

CFE_SUCCESS	Successful execution.
CFE_ES_ERR_NAME_NOT_FOUND	Resource Name Error.

Return values

CFE_ES_BAD_ARGUMENT	Bad Argument.

See also

CFE_ES_GetTaskName

10.17.2.5 CFE_ES_GetTaskName()

```
CFE_Status_t CFE_ES_GetTaskName (
    char * TaskName,
    CFE_ES_TaskId_t TaskId,
    size_t BufferLength )
```

Get a Task name for a specified Task ID.

Description

This routine retrieves the cFE Task name associated with a specified Task ID.

Assumptions, External Events, and Notes:

In the case of a failure (CFE_ES_ERR_RESOURCEID_NOT_VALID), an empty string is returned.

Parameters

`out`	*TaskName*	Pointer to a character array (must not be null) of at least `BufferLength` in size that will be filled with the Task name.
`in`	*TaskId*	Task ID of Task whose name is being requested.
`in`	*BufferLength*	The maximum number of characters, including the null terminator, that can be put into the `TaskName` buffer. This routine will truncate the name to this length, if necessary.

Returns

Execution status, see cFE Return Code Defines

Return values

CFE_SUCCESS	Successful execution.
CFE_ES_ERR_RESOURCEID_NOT_VALID	Resource ID is not valid.
CFE_ES_BAD_ARGUMENT	Bad Argument.

See also

CFE_ES_GetTaskIDByName

10.18 cFE Miscellaneous APIs

Functions

- void CFE_ES_BackgroundWakeup (void)

  Wakes up the CFE background task.
- CFE_Status_t CFE_ES_WriteToSysLog (const char ∗SpecStringPtr,...) OS_PRINTF(1

  Write a string to the cFE System Log.
- CFE_Status_t uint32 CFE_ES_CalculateCRC (const void ∗DataPtr, size_t DataLength, uint32 InputCRC, CFE_ES_CrcType_Enum_t TypeCRC)

  Calculate a CRC on a block of memory.
- void CFE_ES_ProcessAsyncEvent (void)

  Notification that an asynchronous event was detected by the underlying OS/PSP.

10.18.1 Detailed Description

10.18.2 Function Documentation

10.18.2.1 CFE_ES_BackgroundWakeup()

```
void CFE_ES_BackgroundWakeup (
    void )
```

Wakes up the CFE background task.

Description

Normally the ES background task wakes up at a periodic interval. Whenever new background work is added, this can be used to wake the task early, which may reduce the delay between adding the job and the job getting processed.

Assumptions, External Events, and Notes:

Note the amount of work that the background task will perform is pro-rated based on the amount of time elapsed since the last wakeup. Waking the task early will not cause the background task to do more work than it otherwise would - it just reduces the delay before work starts initially.

10.18.2.2 CFE_ES_CalculateCRC()

```
CFE_Status_t uint32 CFE_ES_CalculateCRC (
    const void * DataPtr,
    size_t DataLength,
    uint32 InputCRC,
    CFE_ES_CrcType_Enum_t TypeCRC )
```

Calculate a CRC on a block of memory.

Description

This routine calculates a cyclic redundancy check (CRC) on a block of memory. The CRC algorithm used is determined by the last parameter.

Assumptions, External Events, and Notes:

None

Parameters

in	*DataPtr*	Pointer to the base of the memory block.
in	*DataLength*	The number of bytes in the memory block.
in	*InputCRC*	A starting value for use in the CRC calculation. This parameter allows the user to calculate the CRC of non-contiguous blocks as a single value. Nominally, the user should set this value to zero.
in	*TypeCRC*	One of the following CRC algorithm selections defined in CFE_ES_CrcType_Enum_t

Returns

The result of the CRC calculation on the specified memory block. If the TypeCRC is unimplemented will return 0. If DataPtr is null or DataLength is 0, will return InputCRC

10.18.2.3 CFE_ES_ProcessAsyncEvent()

```
void CFE_ES_ProcessAsyncEvent (
    void )
```

Notification that an asynchronous event was detected by the underlying OS/PSP.

Description

This hook routine is called from the PSP when an exception or other asynchronous system event occurs

Assumptions, External Events, and Notes:

The PSP must guarantee that this function is only invoked from a context which may use OSAL primitives. In general this means that it shouldn't be *directly* invoked from an ISR/signal context.

10.18.2.4 CFE_ES_WriteToSysLog()

```
CFE_Status_t CFE_ES_WriteToSysLog (
    const char * SpecStringPtr,
    ... )
```

Write a string to the cFE System Log.

Description

This routine writes a formatted string to the cFE system log. This can be used to record very low-level errors that can't be reported using the Event Services. This function is used in place of printf for flight software. It should be used for significant startup events, critical errors, and conditionally compiled debug software.

Assumptions, External Events, and Notes:

None

Parameters

in	*SpecStringPtr*	The format string for the log message (must not be null). This is similar to the format string for a printf() call.

Returns

Execution status, see cFE Return Code Defines

Return values

CFE_SUCCESS	Successful execution.
CFE_ES_ERR_SYS_LOG_FULL	System Log Full.
CFE_ES_BAD_ARGUMENT	Bad Argument.

Referenced by CF_Init().

10.19 cFE Critical Data Store APIs

Functions

- CFE_Status_t CFE_ES_RegisterCDS (CFE_ES_CDSHandle_t ∗CDSHandlePtr, size_t BlockSize, const char ∗Name)

  Reserve space (or re-obtain previously reserved space) in the Critical Data Store (CDS)
- CFE_Status_t CFE_ES_GetCDSBlockIDByName (CFE_ES_CDSHandle_t ∗BlockIdPtr, const char ∗BlockName)

  Get a CDS Block ID associated with a specified CDS Block name.
- CFE_Status_t CFE_ES_GetCDSBlockName (char ∗BlockName, CFE_ES_CDSHandle_t BlockId, size_t Buffer↩ Length)

  Get a Block name for a specified Block ID.
- CFE_Status_t CFE_ES_CopyToCDS (CFE_ES_CDSHandle_t Handle, const void ∗DataToCopy)

  Save a block of data in the Critical Data Store (CDS)
- CFE_Status_t CFE_ES_RestoreFromCDS (void ∗RestoreToMemory, CFE_ES_CDSHandle_t Handle)

  Recover a block of data from the Critical Data Store (CDS)

10.19.1 Detailed Description

10.19.2 Function Documentation

10.19.2.1 CFE_ES_CopyToCDS()

```
CFE_Status_t CFE_ES_CopyToCDS (
    CFE_ES_CDSHandle_t Handle,
    const void * DataToCopy )
```

Save a block of data in the Critical Data Store (CDS)

Description

This routine copies a specified block of memory into the Critical Data Store that had been previously registered via CFE_ES_RegisterCDS. The block of memory to be copied must be at least as big as the size specified when registering the CDS.

Assumptions, External Events, and Notes:

None

Parameters

in	*Handle*	The handle of the CDS block that was previously obtained from CFE_ES_RegisterCDS.
in	*DataToCopy*	A Pointer to the block of memory to be copied into the CDS (must not be null).

Returns

Execution status, see cFE Return Code Defines

Return values

CFE_SUCCESS	Successful execution.
CFE_ES_ERR_RESOURCEID_NOT_VALID	Resource ID is not valid.
CFE_ES_BAD_ARGUMENT	Bad Argument.

See also

CFE_ES_RegisterCDS, CFE_ES_RestoreFromCDS

10.19.2.2 CFE_ES_GetCDSBlockIDByName()

```
CFE_Status_t CFE_ES_GetCDSBlockIDByName (
    CFE_ES_CDSHandle_t * BlockIdPtr,
    const char * BlockName )
```

Get a CDS Block ID associated with a specified CDS Block name.

Description

This routine retrieves the CDS Block ID associated with a specified CDS Block name.

Assumptions, External Events, and Notes:

None

Parameters

out	*BlockIdPtr*	Pointer to variable that is to receive the CDS Block ID (must not be null).
in	*BlockName*	Pointer to null terminated character string containing a CDS Block name (must not be null).

Returns

Execution status, see cFE Return Code Defines

Return values

CFE_SUCCESS	Successful execution.
CFE_ES_ERR_NAME_NOT_FOUND	Resource Name Error.
CFE_ES_BAD_ARGUMENT	Bad Argument.
CFE_ES_NOT_IMPLEMENTED	The processor does not support a Critical Data Store.

See also

CFE_ES_GetCDSBlockName

10.19.2.3 CFE_ES_GetCDSBlockName()

```
CFE_Status_t CFE_ES_GetCDSBlockName (
    char * BlockName,
    CFE_ES_CDSHandle_t BlockId,
    size_t BufferLength )
```

Get a Block name for a specified Block ID.

Description

This routine retrieves the cFE Block name associated with a specified Block ID.

Assumptions, External Events, and Notes:

In the case of a failure (CFE_ES_ERR_RESOURCEID_NOT_VALID), an empty string is returned.

Parameters

out	*BlockName*	Pointer to a character array (must not be null) of at least `BufferLength` in size that will be filled with the CDS Block name.
in	*BlockId*	Block ID/Handle of CDS registry entry whose name is being requested.
in	*BufferLength*	The maximum number of characters, including the null terminator, that can be put into the `BlockName` buffer. This routine will truncate the name to this length, if necessary.

Returns

Execution status, see cFE Return Code Defines

Return values

CFE_SUCCESS	Successful execution.
CFE_ES_ERR_RESOURCEID_NOT_VALID	Resource ID is not valid.
CFE_ES_BAD_ARGUMENT	Bad Argument.
CFE_ES_NOT_IMPLEMENTED	The processor does not support a Critical Data Store.

See also

CFE_ES_GetCDSBlockIDByName

10.19.2.4 CFE_ES_RegisterCDS()

```
CFE_Status_t CFE_ES_RegisterCDS (
    CFE_ES_CDSHandle_t * CDSHandlePtr,
    size_t BlockSize,
    const char * Name )
```

Reserve space (or re-obtain previously reserved space) in the Critical Data Store (CDS)

Description

This routine allocates a block of memory in the Critical Data Store and associates it with the calling Application. The memory can survive an Application restart as well as a Processor Reset.

Assumptions, External Events, and Notes:

This function does *not* clear or otherwise initialize/modify the data within the CDS block. If this function returns CFE_ES_CDS_ALREADY_EXISTS the block may already have valid data in it.

If a new CDS block is reserved (either because the name did not exist, or existed as a different size) it is the responsibility of the calling application to fill the CDS block with valid data. This is indicated by a CFE_SUCCESS return code, and in this case the calling application should ensure that it also calls CFE_ES_CopyToCDS() to fill the block with valid data.

Parameters

out	*CDSHandlePtr*	Pointer Application's variable that will contain the CDS Memory Block Handle (must not be null). HandlePtr is the handle of the CDS block that can be used in CFE_ES_CopyToCDS and CFE_ES_RestoreFromCDS.
in	*BlockSize*	The number of bytes needed in the CDS (must not be zero).
in	*Name*	A pointer to a character string (must not be null) containing an application unique name of CFE_MISSION_ES_CDS_MAX_NAME_LENGTH characters or less.

Returns

Execution status, see cFE Return Code Defines

Return values

CFE_SUCCESS	The memory block was successfully created in the CDS.
CFE_ES_NOT_IMPLEMENTED	The processor does not support a Critical Data Store.
CFE_ES_CDS_ALREADY_EXISTS	CDS Already Exists.
CFE_ES_CDS_INVALID_SIZE	CDS Invalid Size.
CFE_ES_CDS_INVALID_NAME	CDS Invalid Name.
CFE_ES_BAD_ARGUMENT	Bad Argument.
CFE_ES_CDS_INVALID	(return value only verified in coverage test) CDS Invalid.

See also

CFE_ES_CopyToCDS, CFE_ES_RestoreFromCDS

10.19.2.5 CFE_ES_RestoreFromCDS()

```
CFE_Status_t CFE_ES_RestoreFromCDS (
    void * RestoreToMemory,
    CFE_ES_CDSHandle_t Handle )
```

Recover a block of data from the Critical Data Store (CDS)

Description

This routine copies data from the Critical Data Store identified with the `Handle` into the area of memory pointed to by the `RestoreToMemory` pointer. The area of memory to be copied into must be at least as big as the size specified when registering the CDS. The recovery will indicate an error if the data integrity check maintained by the CDS indicates the contents of the CDS have changed. However, the contents will still be copied into the specified area of memory.

Assumptions, External Events, and Notes:

None

Parameters

`in`	*Handle*	The handle of the CDS block that was previously obtained from CFE_ES_RegisterCDS.
`out`	*RestoreToMemory*	A Pointer to the block of memory (must not be null) that is to be restored with the contents of the CDS. ∗RestoreToMemory is the contents of the specified CDS.

Returns

Execution status, see cFE Return Code Defines

Return values

CFE_SUCCESS	Successful execution.
CFE_ES_ERR_RESOURCEID_NOT_VALID	Resource ID is not valid.

Return values

CFE_ES_CDS_BLOCK_CRC_ERR	(return value only verified in coverage test) CDS Block CRC Error.
CFE_ES_BAD_ARGUMENT	Bad Argument.

See also

CFE_ES_RegisterCDS, CFE_ES_CopyToCDS

10.20 cFE Memory Manager APIs

Functions

- CFE_Status_t CFE_ES_PoolCreateNoSem (CFE_ES_MemHandle_t ∗PoolID, void ∗MemPtr, size_t Size)

  Initializes a memory pool created by an application without using a semaphore during processing.
- CFE_Status_t CFE_ES_PoolCreate (CFE_ES_MemHandle_t ∗PoolID, void ∗MemPtr, size_t Size)

  Initializes a memory pool created by an application while using a semaphore during processing.
- CFE_Status_t CFE_ES_PoolCreateEx (CFE_ES_MemHandle_t ∗PoolID, void ∗MemPtr, size_t Size, uint16 NumBlockSizes, const size_t ∗BlockSizes, bool UseMutex)

  Initializes a memory pool created by an application with application specified block sizes.
- int32 CFE_ES_PoolDelete (CFE_ES_MemHandle_t PoolID)

  Deletes a memory pool that was previously created.
- int32 CFE_ES_GetPoolBuf (CFE_ES_MemPoolBuf_t ∗BufPtr, CFE_ES_MemHandle_t Handle, size_t Size)

  Gets a buffer from the memory pool created by CFE_ES_PoolCreate or CFE_ES_PoolCreateNoSem.
- CFE_Status_t CFE_ES_GetPoolBufInfo (CFE_ES_MemHandle_t Handle, CFE_ES_MemPoolBuf_t BufPtr)

  Gets info on a buffer previously allocated via CFE_ES_GetPoolBuf.
- int32 CFE_ES_PutPoolBuf (CFE_ES_MemHandle_t Handle, CFE_ES_MemPoolBuf_t BufPtr)

  Releases a buffer from the memory pool that was previously allocated via CFE_ES_GetPoolBuf.
- CFE_Status_t CFE_ES_GetMemPoolStats (CFE_ES_MemPoolStats_t ∗BufPtr, CFE_ES_MemHandle_t Handle)

  Extracts the statistics maintained by the memory pool software.

10.20.1 Detailed Description

10.20.2 Function Documentation

10.20.2.1 CFE_ES_GetMemPoolStats()

```
CFE_Status_t CFE_ES_GetMemPoolStats (
    CFE_ES_MemPoolStats_t * BufPtr,
    CFE_ES_MemHandle_t Handle )
```

Extracts the statistics maintained by the memory pool software.

Description

This routine fills the CFE_ES_MemPoolStats_t data structure with the statistics maintained by the memory pool software. These statistics can then be telemetered by the calling Application.

Assumptions, External Events, and Notes:

None

Parameters

out	*BufPtr*	Pointer to CFE_ES_MemPoolStats_t data structure (must not be null) to be filled with memory statistics. ∗BufPtr is the Memory Pool Statistics stored in given data structure.
in	*Handle*	The handle to the memory pool whose statistics are desired.

Returns

Execution status, see cFE Return Code Defines

Return values

CFE_SUCCESS	Successful execution.
CFE_ES_ERR_RESOURCEID_NOT_VALID	Resource ID is not valid.
CFE_ES_BAD_ARGUMENT	Bad Argument.

See also

CFE_ES_PoolCreate, CFE_ES_PoolCreateNoSem, CFE_ES_PoolCreateEx, CFE_ES_GetPoolBuf, CFE_ES_PutPoolBuf

10.20.2.2 CFE_ES_GetPoolBuf()

```
int32 CFE_ES_GetPoolBuf (
    CFE_ES_MemPoolBuf_t * BufPtr,
    CFE_ES_MemHandle_t Handle,
    size_t Size )
```

Gets a buffer from the memory pool created by CFE_ES_PoolCreate or CFE_ES_PoolCreateNoSem.

Description

This routine obtains a block of memory from the memory pool supplied by the calling application.

Assumptions, External Events, and Notes:

1. The size allocated from the memory pool is, at a minimum, 12 bytes more than requested.

Parameters

out	*BufPtr*	A pointer to the Application's pointer (must not be null) in which will be stored the address of the allocated memory buffer. ∗BufPtr is the address of the requested buffer.
in	*Handle*	The handle to the memory pool as returned by CFE_ES_PoolCreate or CFE_ES_PoolCreateNoSem.
in	*Size*	The size of the buffer requested. NOTE: The size allocated may be larger.

Returns

Bytes Allocated, or error code cFE Return Code Defines

Return values

CFE_ES_ERR_RESOURCEID_NOT_VALID	Resource ID is not valid.
CFE_ES_ERR_MEM_BLOCK_SIZE	Memory Block Size Error.
CFE_ES_BAD_ARGUMENT	Bad Argument.

See also

CFE_ES_PoolCreate, CFE_ES_PoolCreateNoSem, CFE_ES_PoolCreateEx, CFE_ES_PutPoolBuf, CFE_ES_GetMemPoolStats, CFE_ES_GetPoolBufInfo

10.20.2.3 CFE_ES_GetPoolBufInfo()

```
CFE_Status_t CFE_ES_GetPoolBufInfo (
```

```
CFE_ES_MemHandle_t Handle,
CFE_ES_MemPoolBuf_t BufPtr )
```

Gets info on a buffer previously allocated via CFE_ES_GetPoolBuf.

Description

This routine gets info on a buffer in the memory pool.

Assumptions, External Events, and Notes:

None

Parameters

in	*Handle*	The handle to the memory pool as returned by CFE_ES_PoolCreate or CFE_ES_PoolCreateNoSem.
in	*BufPtr*	A pointer to the memory buffer to provide status for (must not be null).

Returns

Size of the buffer if successful, or status code if not successful, see cFE Return Code Defines

Return values

CFE_ES_ERR_RESOURCEID_NOT_VALID	Resource ID is not valid.
CFE_ES_BUFFER_NOT_IN_POOL	Buffer Not In Pool.
CFE_ES_BAD_ARGUMENT	Bad Argument.

See also

CFE_ES_PoolCreate, CFE_ES_PoolCreateNoSem, CFE_ES_PoolCreateEx, CFE_ES_GetPoolBuf, CFE_ES_GetMemPoolStats, CFE_ES_PutPoolBuf

10.20.2.4 CFE_ES_PoolCreate()

```
CFE_Status_t CFE_ES_PoolCreate (
CFE_ES_MemHandle_t * PoolID,
void * MemPtr,
size_t Size )
```

Initializes a memory pool created by an application while using a semaphore during processing.

Description

This routine initializes a pool of memory supplied by the calling application. When a memory pool created by this routine is processed, mutex handling will be performed.

Assumptions, External Events, and Notes:

1. The size of the pool must be an integral number of 32-bit words
2. The start address of the pool must be 32-bit aligned
3. 168 bytes are used for internal bookkeeping, therefore, they will not be available for allocation.

Parameters

out	*PoolID*	A pointer to the variable the caller wishes to have the memory pool handle kept in (must not be null). PoolID is the memory pool handle.
in	*MemPtr*	A Pointer to the pool of memory created by the calling application (must not be null). This address must be aligned suitably for the processor architecture. The CFE_ES_STATIC_POOL_TYPE macro may be used to assist in creating properly aligned memory pools.
in	*Size*	The size of the pool of memory (must not be zero). Note that this must be an integral multiple of the memory alignment of the processor architecture.

Returns

Execution status, see cFE Return Code Defines

Return values

CFE_SUCCESS	Successful execution.
CFE_ES_BAD_ARGUMENT	Bad Argument.

See also

CFE_ES_PoolCreateNoSem, CFE_ES_PoolCreateEx, CFE_ES_GetPoolBuf, CFE_ES_PutPoolBuf, CFE_ES_GetMemPoolStats

10.20.2.5 CFE_ES_PoolCreateEx()

```
CFE_Status_t CFE_ES_PoolCreateEx (
    CFE_ES_MemHandle_t * PoolID,
    void * MemPtr,
    size_t Size,
    uint16 NumBlockSizes,
    const size_t * BlockSizes,
    bool UseMutex )
```

Initializes a memory pool created by an application with application specified block sizes.

Description

This routine initializes a pool of memory supplied by the calling application.

Assumptions, External Events, and Notes:

1. The size of the pool must be an integral number of 32-bit words
2. The start address of the pool must be 32-bit aligned
3. 168 bytes are used for internal bookkeeping, therefore, they will not be available for allocation.

Parameters

out	*PoolID*	A pointer to the variable the caller wishes to have the memory pool handle kept in (must not be null). PoolID is the memory pool handle.
in	*MemPtr*	A Pointer to the pool of memory created by the calling application (must not be null). This address must be aligned suitably for the processor architecture. The CFE_ES_STATIC_POOL_TYPE macro may be used to assist in creating properly aligned memory pools.

Parameters

in	*Size*	The size of the pool of memory (must not be zero). Note that this must be an integral multiple of the memory alignment of the processor architecture.
in	*NumBlockSizes*	The number of different block sizes specified in the `BlockSizes` array. If set larger than CFE_PLATFORM_ES_POOL_MAX_BUCKETS, CFE_ES_BAD_ARGUMENT will be returned. If BlockSizes is null and NumBlockSizes is 0, NubBlockSizes will be set to CFE_PLATFORM_ES_POOL_MAX_BUCKETS.
in	*BlockSizes*	Pointer to an array of sizes to be used instead of the default block sizes specified by CFE_PLATFORM_ES_MEM_BLOCK_SIZE_01 through CFE_PLATFORM_ES_MAX_BLOCK_SIZE. If the pointer is equal to NULL, the default block sizes are used.
in	*UseMutex*	Flag indicating whether the new memory pool will be processing with mutex handling or not. Valid parameter values are CFE_ES_USE_MUTEX and CFE_ES_NO_MUTEX

Returns

Execution status, see cFE Return Code Defines

Return values

CFE_SUCCESS	Successful execution.
CFE_ES_BAD_ARGUMENT	Bad Argument.
CFE_ES_NO_RESOURCE_IDS_AVAILABLE	Resource ID is not available.
CFE_STATUS_EXTERNAL_RESOURCE_FAIL	(return value only verified in coverage test) External failure.

See also

CFE_ES_PoolCreate, CFE_ES_PoolCreateNoSem, CFE_ES_GetPoolBuf, CFE_ES_PutPoolBuf, CFE_ES_GetMemPoolStats

10.20.2.6 CFE_ES_PoolCreateNoSem()

```
CFE_Status_t CFE_ES_PoolCreateNoSem (
    CFE_ES_MemHandle_t * PoolID,
    void * MemPtr,
    size_t Size )
```

Initializes a memory pool created by an application without using a semaphore during processing.

Description

This routine initializes a pool of memory supplied by the calling application. When a memory pool created by this routine is processed, no mutex handling is performed.

Assumptions, External Events, and Notes:

1. The size of the pool must be an integral number of 32-bit words
2. The start address of the pool must be 32-bit aligned
3. 168 bytes are used for internal bookkeeping, therefore, they will not be available for allocation.

Parameters

out	*PoolID*	A pointer to the variable the caller wishes to have the memory pool handle kept in (must not be null). PoolID is the memory pool handle.
in	*MemPtr*	A Pointer to the pool of memory created by the calling application (must not be null). This address must be aligned suitably for the processor architecture. The CFE_ES_STATIC_POOL_TYPE macro may be used to assist in creating properly aligned memory pools.
in	*Size*	The size of the pool of memory (must not be zero). Note that this must be an integral multiple of the memory alignment of the processor architecture.

Returns

Execution status, see cFE Return Code Defines

Return values

CFE_SUCCESS	Successful execution.
CFE_ES_BAD_ARGUMENT	Bad Argument.

See also

CFE_ES_PoolCreate, CFE_ES_PoolCreateEx, CFE_ES_GetPoolBuf, CFE_ES_PutPoolBuf, CFE_ES_GetMemPoolStats

10.20.2.7 CFE_ES_PoolDelete()

```
int32 CFE_ES_PoolDelete (
    CFE_ES_MemHandle_t PoolID )
```

Deletes a memory pool that was previously created.

Description

This routine removes the pool ID and frees the global table entry for future re-use.

Assumptions, External Events, and Notes:

All buffers associated with the pool become invalid after this call. The application should ensure that buffers/references to the pool are returned before deleting the pool.

Parameters

in	*PoolID*	The ID of the pool to delete

Returns

Execution status, see cFE Return Code Defines

Return values

CFE_SUCCESS	Successful execution.
CFE_ES_ERR_RESOURCEID_NOT_VALID	Resource ID is not valid.

See also

CFE_ES_PoolCreate, CFE_ES_PoolCreateNoSem, CFE_ES_GetPoolBuf, CFE_ES_PutPoolBuf, CFE_ES_GetMemPoolStats

10.20.2.8 CFE_ES_PutPoolBuf()

```
int32 CFE_ES_PutPoolBuf (
    CFE_ES_MemHandle_t Handle,
    CFE_ES_MemPoolBuf_t BufPtr )
```

Releases a buffer from the memory pool that was previously allocated via CFE_ES_GetPoolBuf.

Description

This routine releases a buffer back into the memory pool.

Assumptions, External Events, and Notes:

None

Parameters

in	*Handle*	The handle to the memory pool as returned by CFE_ES_PoolCreate or CFE_ES_PoolCreateNoSem.
in	*BufPtr*	A pointer to the memory buffer to be released (must not be null).

Returns

Bytes released, or error code cFE Return Code Defines

Return values

CFE_ES_ERR_RESOURCEID_NOT_VALID	Resource ID is not valid.
CFE_ES_BAD_ARGUMENT	Bad Argument.
CFE_ES_BUFFER_NOT_IN_POOL	Buffer Not In Pool.
CFE_ES_POOL_BLOCK_INVALID	Invalid pool block.

See also

CFE_ES_PoolCreate, CFE_ES_PoolCreateNoSem, CFE_ES_PoolCreateEx, CFE_ES_GetPoolBuf, CFE_ES_GetMemPoolStats, CFE_ES_GetPoolBufInfo

10.21 cFE Performance Monitor APIs

Macros

- #define CFE_ES_PerfLogEntry(id) (CFE_ES_PerfLogAdd(id, 0))

  Entry marker for use with Software Performance Analysis Tool.
- #define CFE_ES_PerfLogExit(id) (CFE_ES_PerfLogAdd(id, 1))

  Exit marker for use with Software Performance Analysis Tool.

Functions

- void CFE_ES_PerfLogAdd (uint32 Marker, uint32 EntryExit)

  Adds a new entry to the data buffer.

10.21.1 Detailed Description

10.21.2 Macro Definition Documentation

10.21.2.1 CFE_ES_PerfLogEntry `#define CFE_ES_PerfLogEntry( id ) (CFE_ES_PerfLogAdd(id, 0))`

Entry marker for use with Software Performance Analysis Tool.

Description

This macro logs the entry or start event/marker for the specified entry `id`. This macro, in conjunction with the CFE_ES_PerfLogExit, is used by the Software Performance Analysis tool.

Assumptions, External Events, and Notes:

None

Parameters

in	*id*	Identifier of the specific event or marker.

See also

CFE_ES_PerfLogExit, CFE_ES_PerfLogAdd

Definition at line 1464 of file cfe_es.h.

10.21.2.2 CFE_ES_PerfLogExit `#define CFE_ES_PerfLogExit( id ) (CFE_ES_PerfLogAdd(id, 1))`

Exit marker for use with Software Performance Analysis Tool.

Description

This macro logs the exit or end event/marker for the specified entry `id`. This macro, in conjunction with the CFE_ES_PerfLogEntry, is used by the Software Performance Analysis tool.

Assumptions, External Events, and Notes:

None

Parameters

in	*id*	Identifier of the specific event or marker.

See also

CFE_ES_PerfLogEntry, CFE_ES_PerfLogAdd

Definition at line 1483 of file cfe_es.h.

10.21.3 Function Documentation

10.21.3.1 CFE_ES_PerfLogAdd()

```
void CFE_ES_PerfLogAdd (
    uint32 Marker,
    uint32 EntryExit )
```

Adds a new entry to the data buffer.
Function called by CFE_ES_PerfLogEntry and CFE_ES_PerfLogExit macros

Description

This function logs the entry and exit marker for the specified `id`. This function is used by the Software Performance Analysis tool.

Assumptions, External Events, and Notes:

`Marker` limited to the range of 0 to CFE_MISSION_ES_PERF_MAX_IDS - 1. Any performance ids outside of this range will be ignored and will be flagged as an error.
This function implements a circular buffer using an array. DataStart points to first stored entry DataEnd points to next available entry if DataStart == DataEnd then the buffer is either empty or full depending on the value of the DataCount
Time is stored as 2 32 bit integers, (TimerLower32, TimerUpper32): TimerLower32 is the current value of the hardware timer register. TimerUpper32 is the number of times the timer has rolled over.

Parameters

in	*Marker*	Identifier of the specific event or marker.
in	*EntryExit*	Used to specify Entry(0) or Exit(1)

See also

CFE_ES_PerfLogEntry, CFE_ES_PerfLogExit

10.22 cFE Generic Counter APIs

Functions

- CFE_Status_t CFE_ES_RegisterGenCounter (CFE_ES_CounterId_t ∗CounterIdPtr, const char ∗CounterName)

  Register a generic counter.
- CFE_Status_t CFE_ES_DeleteGenCounter (CFE_ES_CounterId_t CounterId)

  Delete a generic counter.
- CFE_Status_t CFE_ES_IncrementGenCounter (CFE_ES_CounterId_t CounterId)

  Increments the specified generic counter.
- CFE_Status_t CFE_ES_SetGenCount (CFE_ES_CounterId_t CounterId, uint32 Count)

  Set the specified generic counter.
- CFE_Status_t CFE_ES_GetGenCount (CFE_ES_CounterId_t CounterId, uint32 ∗Count)

  Get the specified generic counter count.
- CFE_Status_t CFE_ES_GetGenCounterIDByName (CFE_ES_CounterId_t ∗CounterIdPtr, const char ∗CounterName)

  Get the Id associated with a generic counter name.
- CFE_Status_t CFE_ES_GetGenCounterName (char ∗CounterName, CFE_ES_CounterId_t CounterId, size_↩t BufferLength)

  Get a Counter name for a specified Counter ID.

10.22.1 Detailed Description

10.22.2 Function Documentation

10.22.2.1 CFE_ES_DeleteGenCounter() `CFE_Status_t CFE_ES_DeleteGenCounter ( CFE_ES_CounterId_t CounterId )`

Delete a generic counter.

Description

This routine deletes a previously registered generic counter.

Assumptions, External Events, and Notes:

None.

Parameters

in	*Counter↩Id*	The Counter Id of the newly created counter.

Returns

Execution status, see cFE Return Code Defines

Return values

CFE_SUCCESS	Successful execution.
CFE_ES_BAD_ARGUMENT	Bad Argument.

See also

CFE_ES_IncrementGenCounter, CFE_ES_RegisterGenCounter, CFE_ES_SetGenCount, CFE_ES_GetGenCount, CFE_ES_GetGenCounterIDByName

10.22.2.2 CFE_ES_GetGenCount()

```
CFE_Status_t CFE_ES_GetGenCount (
    CFE_ES_CounterId_t CounterId,
    uint32 * Count )
```

Get the specified generic counter count.

Description

This routine gets the value of a generic counter.

Assumptions, External Events, and Notes:

None.

Parameters

in	*CounterId*	The Counter to get the value from.
out	*Count*	Buffer to store value of the Counter (must not be null).

Returns

Execution status, see cFE Return Code Defines

Return values

CFE_SUCCESS	Successful execution.
CFE_ES_BAD_ARGUMENT	Bad Argument.

See also

CFE_ES_RegisterGenCounter, CFE_ES_DeleteGenCounter, CFE_ES_SetGenCount, CFE_ES_IncrementGenCounter, CFE_ES_GetGenCounterIDByName

10.22.2.3 CFE_ES_GetGenCounterIDByName()

```
CFE_Status_t CFE_ES_GetGenCounterIDByName (
    CFE_ES_CounterId_t * CounterIdPtr,
    const char * CounterName )
```

Get the Id associated with a generic counter name.

Description

This routine gets the Counter Id for a generic counter specified by name.

Assumptions, External Events, and Notes:

None.

Parameters

out	*CounterIdPtr*	Pointer to variable that is to receive the Counter's ID (must not be null).
in	*CounterName*	Pointer to null terminated character string containing a Counter name (must not be null).

Returns

Execution status, see cFE Return Code Defines

Return values

CFE_SUCCESS	Successful execution.
CFE_ES_ERR_NAME_NOT_FOUND	Resource Name Error.
CFE_ES_BAD_ARGUMENT	Bad Argument.

See also

CFE_ES_GetGenCounterName

10.22.2.4 CFE_ES_GetGenCounterName()

```
CFE_Status_t CFE_ES_GetGenCounterName (
    char * CounterName,
    CFE_ES_CounterId_t CounterId,
    size_t BufferLength )
```

Get a Counter name for a specified Counter ID.

Description

This routine retrieves the cFE Counter name associated with a specified Counter ID.

Assumptions, External Events, and Notes:

In the case of a failure (CFE_ES_ERR_RESOURCEID_NOT_VALID), an empty string is returned.

Parameters

out	*CounterName*	Pointer to a character array (must not be null) of at least `BufferLength` in size that will be filled with the Counter name.
in	*CounterId*	ID of Counter whose name is being requested.
in	*BufferLength*	The maximum number of characters, including the null terminator (must not be zero), that can be put into the `CounterName` buffer. This routine will truncate the name to this length, if necessary.

Returns

Execution status, see cFE Return Code Defines

Return values

CFE_SUCCESS	Successful execution.

Return values

CFE_ES_ERR_RESOURCEID_NOT_VALID	Resource ID is not valid.
CFE_ES_BAD_ARGUMENT	Bad Argument.

See also

CFE_ES_GetGenCounterIDByName

10.22.2.5 CFE_ES_IncrementGenCounter()

```
CFE_Status_t CFE_ES_IncrementGenCounter (
    CFE_ES_CounterId_t CounterId )
```

Increments the specified generic counter.

Description

This routine increments the specified generic counter.

Assumptions, External Events, and Notes:

None.

Parameters

in	*CounterId*	The Counter to be incremented.

Returns

Execution status, see cFE Return Code Defines

Return values

CFE_SUCCESS	Successful execution.
CFE_ES_BAD_ARGUMENT	Bad Argument.

See also

CFE_ES_RegisterGenCounter, CFE_ES_DeleteGenCounter, CFE_ES_SetGenCount, CFE_ES_GetGenCount, CFE_ES_GetGenCounterIDByName

10.22.2.6 CFE_ES_RegisterGenCounter()

```
CFE_Status_t CFE_ES_RegisterGenCounter (
    CFE_ES_CounterId_t * CounterIdPtr,
    const char * CounterName )
```

Register a generic counter.

Description

This routine registers a generic thread-safe counter which can be used for inter-task management.

Assumptions, External Events, and Notes:

The initial value of all newly registered counters is 0.

Parameters

out	*CounterIdPtr*	Buffer to store the Counter Id of the newly created counter (must not be null).
in	*CounterName*	The Name of the generic counter (must not be null).

Returns

Execution status, see cFE Return Code Defines

Return values

CFE_SUCCESS	Successful execution.
CFE_ES_BAD_ARGUMENT	Bad Argument.
CFE_ES_ERR_DUPLICATE_NAME	Duplicate Name Error.
CFE_ES_NO_RESOURCE_IDS_AVAILABLE	Resource ID is not available.

See also

CFE_ES_IncrementGenCounter, CFE_ES_DeleteGenCounter, CFE_ES_SetGenCount, CFE_ES_GetGenCount, CFE_ES_GetGenCounterIDByName

10.22.2.7 CFE_ES_SetGenCount()

```
CFE_Status_t CFE_ES_SetGenCount (
    CFE_ES_CounterId_t CounterId,
    uint32 Count )
```

Set the specified generic counter.

Description

This routine sets the specified generic counter to the specified value.

Assumptions, External Events, and Notes:

None.

Parameters

in	*CounterId*	The Counter to be set.
in	*Count*	The new value of the Counter.

Returns

Execution status, see cFE Return Code Defines

Return values

CFE_SUCCESS	Successful execution.
CFE_ES_BAD_ARGUMENT	Bad Argument.

See also

CFE_ES_RegisterGenCounter, CFE_ES_DeleteGenCounter, CFE_ES_IncrementGenCounter, CFE_ES_GetGenCount, CFE_ES_GetGenCounterIDByName

10.23 cFE Registration APIs

Functions

- CFE_Status_t CFE_EVS_Register (const void ∗Filters, uint16 NumEventFilters, uint16 FilterScheme)

  Register an application for receiving event services.

10.23.1 Detailed Description

10.23.2 Function Documentation

10.23.2.1 CFE_EVS_Register()

```
CFE_Status_t CFE_EVS_Register (
    const void * Filters,
    uint16 NumEventFilters,
    uint16 FilterScheme )
```

Register an application for receiving event services.

Description

This routine registers an application with event services and allocates/initializes the internal data structures used to support this application's events. An application may not send events unless it has called this routine. The routine also accepts a filter array structure for applications requiring event filtering. In the current implementation of the EVS, only the binary filtering scheme is supported. See section TBD of the cFE Application Programmer's Guide for a description of the behavior of binary filters. Applications may call CFE_EVS_Register more than once, but each call will wipe out all filters registered by previous calls (filter registration is NOT cumulative).

Assumptions, External Events, and Notes:

Note: Event filters can be added, deleted or modified by ground commands. All filtering schemes include a default setting that results in no filtering (such as CFE_EVS_NO_FILTER for binary filters).

Filter Scheme: Binary
Code: CFE_EVS_EventFilter_BINARY
Filter Structure:

```
typedef struct CFE_EVS_BinFilter {
      uint16  EventID,
      uint16  Mask ;
} CFE_EVS_BinFilter_t;
```

Parameters

in	*Filters*	Pointer to an array of event message filters, or NULL if no filtering is desired. The structure of an event message filter depends on the FilterScheme selected. (see Filter Schemes mentioned above)
in	*NumEventFilters*	The number of event message filters included in this call. This must be less than or equal to the maximum number of events allowed per application (CFE_PLATFORM_EVS_MAX_EVENT_FILTERS).
in	*FilterScheme*	The event filtering scheme that this application will use. For the first implementation of the event services, only filter type CFE_EVS_EventFilter_BINARY will be supported.

Returns

Execution status below or from CFE_ES_GetAppID, see cFE Return Code Defines

Return values

CFE_SUCCESS	Successful execution.
CFE_EVS_APP_FILTER_OVERLOAD	Application Filter Overload.
CFE_EVS_UNKNOWN_FILTER	Unknown Filter.
CFE_EVS_APP_ILLEGAL_APP_ID	Illegal Application ID.
CFE_ES_BAD_ARGUMENT	Bad Argument.

Referenced by CF_Init().

10.24 cFE Send Event APIs

Functions

- CFE_Status_t CFE_EVS_SendEvent (uint16 EventID, uint16 EventType, const char ∗Spec,...) OS_PRINTF(3

  Generate a software event.
- CFE_Status_t CFE_Status_t CFE_EVS_SendEventWithAppID (uint16 EventID, uint16 EventType, CFE_ES_AppId_t AppID, const char ∗Spec,...) OS_PRINTF(4

  Generate a software event given the specified Application ID.
- CFE_Status_t CFE_Status_t CFE_Status_t CFE_EVS_SendTimedEvent (CFE_TIME_SysTime_t Time, uint16 EventID, uint16 EventType, const char ∗Spec,...) OS_PRINTF(4

  Generate a software event with a specific time tag.

10.24.1 Detailed Description

10.24.2 Function Documentation

10.24.2.1 CFE_EVS_SendEvent()

```
CFE_Status_t CFE_EVS_SendEvent (
    uint16 EventID,
    uint16 EventType,
    const char * Spec,
    ... )
```

Generate a software event.

Description

This routine generates a software event message. If the EventID is not filtered, the event will be sent as a software bus message, optionally logged in the local event log, and optionally sent as an ASCII text string out the enabled output port(s).

Assumptions, External Events, and Notes:

This API only works within the context of a registered application or core service. For messages outside the context of a registered application (for example early in app initialization or if registration fails) CFE_ES_WriteToSysLog can be used for reporting.

Parameters

in	*EventID*	A numeric literal used to uniquely identify an application event. The `EventID` is defined and supplied by the application sending the event.
in	*EventType*	A numeric literal used to classify an event, one of: • CFE_EVS_EventType_DEBUG • CFE_EVS_EventType_INFORMATION • CFE_EVS_EventType_ERROR • CFE_EVS_EventType_CRITICAL

Parameters

in	*Spec*	A pointer to a null terminated text string (must not be null) describing the output format for the event. This is the same type of format string used for the ANSI `printf` function. Nominally the post-conversion string is limited to 80 characters, but this limit is configurable through the parameter CFE_MISSION_EVS_MAX_MESSAGE_LENGTH. Characters beyond the limit will be truncated. Do not use floating point conversions (f, e, E, g, and G) in the format string unless your application will be running in a system that supports floating point arithmetic. Do not use non-printable characters (\t, \n, etc.) in the format string; they will mess up the formatting when the events are displayed on the ground system.

Returns

Execution status, see cFE Return Code Defines

Return values

CFE_SUCCESS	Successful execution.
CFE_EVS_APP_NOT_REGISTERED	Application Not Registered.
CFE_EVS_APP_ILLEGAL_APP_ID	Illegal Application ID.
CFE_EVS_INVALID_PARAMETER	Invalid Pointer.

See also

CFE_EVS_SendEventWithAppID, CFE_EVS_SendTimedEvent

Referenced by CF_AbandonCmd(), CF_AppMain(), CF_AppPipe(), CF_CancelCmd(), CF_CFDP_InitEngine(), CF_CFDP_MsgOutGet(), CF_CFDP_PlaybackDir(), CF_CFDP_PlaybackDir_Initiate(), CF_CFDP_R2_CalcCrcChunk(), CF_CFDP_R2_Complete(), CF_CFDP_R2_Recv_fin_ack(), CF_CFDP_R2_RecvMd(), CF_CFDP_R_CheckCrc(), CF_CFDP_R_DispatchRecv(), CF_CFDP_R_Init(), CF_CFDP_R_ProcessFd(), CF_CFDP_R_SendInactivityEvent(), CF_CFDP_R_SubstateRecvEof(), CF_CFDP_R_SubstateSendNak(), CF_CFDP_R_Tick(), CF_CFDP_ReceiveMessage(), CF_CFDP_RecvAck(), CF_CFDP_RecvEof(), CF_CFDP_RecvFd(), CF_CFDP_RecvFin(), CF_CFDP_RecvIdle(), CF_CFDP_RecvMd(), CF_CFDP_RecvNak(), CF_CFDP_RecvPh(), CF_CFDP_ResetTransaction(), CF_CFDP_S2_EarlyFin(), CF_CFDP_S2_Nak(), CF_CFDP_S2_WaitForEofAck(), CF_CFDP_S_DispatchRecv(), CF_CFDP_S_SendFileData(), CF_CFDP_S_SubstateSendMetadata(), CF_CFDP_S_Tick(), CF_CFDP_TxFile(), CF_CFDP_TxFile_Initiate(), CF_CheckTables(), CF_DisableDequeueCmd(), CF_DisableDirPollingCmd(), CF_DisableEngineCmd(), CF_DoChanAction(), CF_DoEnableDisablePolldir(), CF_DoPurgeQueue(), CF_DoSuspRes(), CF_EnableDequeueCmd(), CF_EnableDirPollingCmd(), CF_EnableEngineCmd(), CF_FreezeCmd(), CF_GetSetParamCmd(), CF_Init(), CF_NoopCmd(), CF_PlaybackDirCmd(), CF_ProcessGroundCommand(), CF_PurgeQueueCmd(), CF_ResetCmd(), CF_TableInit(), CF_ThawCmd(), CF_TsnChanAction(), CF_TxFileCmd(), CF_ValidateConfigTable(), CF_WrappedClose(), CF_WriteHistoryEntryToFile(), and CF_WriteQueueCmd().

10.24.2.2 CFE_EVS_SendEventWithAppID()

```
CFE_Status_t CFE_Status_t CFE_EVS_SendEventWithAppID (
    uint16 EventID,
    uint16 EventType,
    CFE_ES_AppId_t AppID,
    const char * Spec,
    ... )
```

Generate a software event given the specified Application ID.

Description

This routine generates a software event message. If the EventID is not filtered, the event will be sent as a software bus message, optionally logged in the local event log, and optionally sent as an ASCII text string out the enabled output port(s). Note that this function should really only be used from within an API in order to preserve the context of an Application's event. In general, CFE_EVS_SendEvent should be used.

Assumptions, External Events, and Notes:

The Application ID must correspond to a registered application or core service. For messages outside the context of a registered application (for example early in app initialization or if registration fails) CFE_ES_WriteToSysLog can be used for reporting.

Parameters

in	*EventID*	A numeric literal used to uniquely identify an application event. The `EventID` is defined and supplied by the application sending the event.
in	*EventType*	A numeric literal used to classify an event, one of: • CFE_EVS_EventType_DEBUG • CFE_EVS_EventType_INFORMATION • CFE_EVS_EventType_ERROR • CFE_EVS_EventType_CRITICAL
in	*AppID*	The Application ID from which the event message should appear.
in	*Spec*	A pointer to a null terminated text string (must not be null) describing the output format for the event. This is the same type of format string used for the ANSI `printf` function. Nominally the post-conversion string is limited to 80 characters, but this limit is configurable through the parameter CFE_MISSION_EVS_MAX_MESSAGE_LENGTH. Characters beyond the limit will be truncated. Do not use floating point conversions (f, e, E, g, and G) in the format string unless your application will be running in a system that supports floating point arithmetic. Do not use non-printable characters (\t, \n, etc.) in the format string; they will mess up the formatting when the events are displayed on the ground system.

Returns

Execution status, see cFE Return Code Defines

Return values

CFE_SUCCESS	Successful execution.
CFE_EVS_APP_NOT_REGISTERED	Application Not Registered.
CFE_EVS_APP_ILLEGAL_APP_ID	Illegal Application ID.
CFE_EVS_INVALID_PARAMETER	Invalid Pointer.

See also

CFE_EVS_SendEvent, CFE_EVS_SendTimedEvent

10.24.2.3 CFE_EVS_SendTimedEvent()

```
CFE_Status_t CFE_Status_t CFE_Status_t CFE_EVS_SendTimed↩
Event (
            CFE_TIME_SysTime_t Time,
            uint16 EventID,
            uint16 EventType,
            const char * Spec,
             ...  )
```

Generate a software event with a specific time tag.

Description

This routine is the same as CFE_EVS_SendEvent except that the caller specifies the event time instead of having the EVS use the current spacecraft time. This routine should be used in situations where an error condition is detected at one time, but the event message is reported at a later time.

Assumptions, External Events, and Notes:

This API only works within the context of a registered application or core service. For messages outside the context of a registered application (for example early in app initialization or if registration fails) CFE_ES_WriteToSysLog can be used for reporting.

Parameters

in	*Time*	The time to include in the event. This will usually be a time returned by the function CFE_TIME_GetTime.
in	*EventID*	A numeric literal used to uniquely identify an application event. The `EventID` is defined and supplied by the application sending the event.
in	*EventType*	A numeric literal used to classify an event, one of: • CFE_EVS_EventType_DEBUG • CFE_EVS_EventType_INFORMATION • CFE_EVS_EventType_ERROR • CFE_EVS_EventType_CRITICAL
in	*Spec*	A pointer to a null terminated text string (must not be null) describing the output format for the event. This is the same type of format string used for the ANSI `printf` function. Nominally the post-conversion string is limited to 80 characters, but this limit is configurable through the parameter CFE_MISSION_EVS_MAX_MESSAGE_LENGTH. Characters beyond the limit will be truncated. Do not use floating point conversions (f, e, E, g, and G) in the format string unless your application will be running in a system that supports floating point arithmetic. Do not use non-printable characters (\t, \n, etc.) in the format string; they will mess up the formatting when the events are displayed on the ground system.

Returns

Execution status, see cFE Return Code Defines

Return values

CFE_SUCCESS	Successful execution.
CFE_EVS_APP_NOT_REGISTERED	Application Not Registered.

Return values

CFE_EVS_APP_ILLEGAL_APP_ID	Illegal Application ID.
CFE_EVS_INVALID_PARAMETER	Invalid Pointer.

See also

CFE_EVS_SendEvent, CFE_EVS_SendEventWithAppID

10.25 cFE Reset Event Filter APIs

Functions

- CFE_Status_t CFE_EVS_ResetFilter (uint16 EventID)

  Resets the calling application's event filter for a single event ID.
- CFE_Status_t CFE_EVS_ResetAllFilters (void)

  Resets all of the calling application's event filters.

10.25.1 Detailed Description

10.25.2 Function Documentation

10.25.2.1 CFE_EVS_ResetAllFilters()

```
CFE_Status_t CFE_EVS_ResetAllFilters (
    void )
```

Resets all of the calling application's event filters.

Description

This routine resets all the calling application's event filter counters to zero, providing a quick and convenient method for resetting event filters.

Assumptions, External Events, and Notes:

None

Returns

Execution status below or from CFE_ES_GetAppID, see cFE Return Code Defines

Return values

CFE_SUCCESS	Successful execution.
CFE_EVS_APP_NOT_REGISTERED	Application Not Registered.
CFE_EVS_APP_ILLEGAL_APP_ID	Illegal Application ID.

See also

CFE_EVS_ResetFilter

10.25.2.2 CFE_EVS_ResetFilter()

```
CFE_Status_t CFE_EVS_ResetFilter (
    uint16 EventID )
```

Resets the calling application's event filter for a single event ID.

Description

Resets the filter such that the next event is treated like the first. For example, if the filter was set to only send the first event, the next event following the reset would be sent.

Assumptions, External Events, and Notes:

None

Parameters

in	*EventID*	A numeric literal used to uniquely identify an application event. The `EventID` is defined and supplied by the application sending the event.

Returns

Execution status below or from CFE_ES_GetAppID, see cFE Return Code Defines

Return values

CFE_SUCCESS	Successful execution.
CFE_EVS_APP_NOT_REGISTERED	Application Not Registered.
CFE_EVS_APP_ILLEGAL_APP_ID	Illegal Application ID.
CFE_EVS_EVT_NOT_REGISTERED	Event Not Registered.

See also

CFE_EVS_ResetAllFilters

10.26 cFE File Header Management APIs

Functions

- CFE_Status_t CFE_FS_ReadHeader (CFE_FS_Header_t ∗Hdr, osal_id_t FileDes)

  Read the contents of the Standard cFE File Header.
- void CFE_FS_InitHeader (CFE_FS_Header_t ∗Hdr, const char ∗Description, uint32 SubType)

  Initializes the contents of the Standard cFE File Header.
- CFE_Status_t CFE_FS_WriteHeader (osal_id_t FileDes, CFE_FS_Header_t ∗Hdr)

  Write the specified Standard cFE File Header to the specified file.
- CFE_Status_t CFE_FS_SetTimestamp (osal_id_t FileDes, CFE_TIME_SysTime_t NewTimestamp)

  Modifies the Time Stamp field in the Standard cFE File Header for the specified file.

10.26.1 Detailed Description

10.26.2 Function Documentation

10.26.2.1 CFE_FS_InitHeader()

```
void CFE_FS_InitHeader (
    CFE_FS_Header_t * Hdr,
    const char * Description,
    uint32 SubType )
```

Initializes the contents of the Standard cFE File Header.

Description

This API will clear the specified CFE_FS_Header_t variable and initialize the description field with the specified value

Parameters

in	*Hdr*	Pointer to a variable of type CFE_FS_Header_t that will be cleared and initialized
in	*Description*	Initializes Header's Description (must not be null)
in	*SubType*	Initializes Header's SubType

See also

CFE_FS_WriteHeader

10.26.2.2 CFE_FS_ReadHeader()

```
CFE_Status_t CFE_FS_ReadHeader (
    CFE_FS_Header_t * Hdr,
    osal_id_t FileDes )
```

Read the contents of the Standard cFE File Header.

Description

This API will fill the specified CFE_FS_Header_t variable with the contents of the Standard cFE File Header of the file identified by the given File Descriptor.

Assumptions, External Events, and Notes:

1. The File has already been successfully opened using OS_OpenCreate and the caller has a legitimate File Descriptor.
2. File offset behavior: Agnostic on entry since it will move the offset to the start of the file, on success the offset will be at the end of the header, undefined offset behavior for error cases.

Parameters

`out`	*Hdr*	Pointer to a variable of type CFE_FS_Header_t (must not be null) that will be filled with the contents of the Standard cFE File Header. ∗Hdr is the contents of the Standard cFE File Header for the specified file.
`in`	*FileDes*	File Descriptor obtained from a previous call to OS_OpenCreate that is associated with the file whose header is to be read.

Returns

Bytes read or error status from OSAL

Return values

CFE_FS_BAD_ARGUMENT	Bad Argument.

Note

This function invokes OSAL API routines and the current implementation may return OSAL error codes to the caller if failure occurs. In a future version of CFE, the status codes will be converted to a value in cFE Return Code Defines.

See also

CFE_FS_WriteHeader

10.26.2.3 CFE_FS_SetTimestamp()

```
CFE_Status_t CFE_FS_SetTimestamp (
    osal_id_t FileDes,
    CFE_TIME_SysTime_t NewTimestamp )
```

Modifies the Time Stamp field in the Standard cFE File Header for the specified file.

Description

This API will modify the timestamp found in the Standard cFE File Header of the specified file. The timestamp will be replaced with the time specified by the caller.

Assumptions, External Events, and Notes:

1. The File has already been successfully opened using OS_OpenCreate and the caller has a legitimate File Descriptor.
2. The `NewTimestamp` field has been filled appropriately by the Application.
3. File offset behavior: Agnostic on entry since it will move the offset, on success the offset will be at the end of the time stamp, undefined offset behavior for error cases.

Parameters

in	*FileDes*	File Descriptor obtained from a previous call to OS_OpenCreate that is associated with the file whose header is to be read.
in	*NewTimestamp*	A CFE_TIME_SysTime_t data structure containing the desired time to be put into the file's Standard cFE File Header.

Returns

Execution status, see cFE Return Code Defines, or OSAL status

Return values

CFE_STATUS_EXTERNAL_RESOURCE_FAIL	(return value only verified in coverage test) External failure.
CFE_SUCCESS	Successful execution.

Note

This function invokes OSAL API routines and the current implementation may return OSAL error codes to the caller if failure occurs. In a future version of CFE, the status codes will be converted to a value in cFE Return Code Defines.

10.26.2.4 CFE_FS_WriteHeader()

```
CFE_Status_t CFE_FS_WriteHeader (
    osal_id_t FileDes,
    CFE_FS_Header_t * Hdr )
```

Write the specified Standard cFE File Header to the specified file.

Description

This API will output the specified CFE_FS_Header_t variable, with some fields automatically updated, to the specified file as the Standard cFE File Header. This API will automatically populate the following fields in the specified CFE_FS_Header_t:

1. `ContentType` - Filled with 0x63464531 ('cFE1')
2. `Length` - Filled with the sizeof(CFE_FS_Header_t)
3. `SpacecraftID` - Filled with the Spacecraft ID
4. `ProcessorID` - Filled with the Processor ID
5. `ApplicationID` - Filled with the Application ID
6. `TimeSeconds` - Filled with the Time, in seconds, as obtained by CFE_TIME_GetTime
7. `TimeSubSeconds` - Filled with the Time, subseconds, as obtained by CFE_TIME_GetTime

Assumptions, External Events, and Notes:

1. The File has already been successfully opened using OS_OpenCreate and the caller has a legitimate File Descriptor.
2. The `SubType` field has been filled appropriately by the Application.
3. The `Description` field has been filled appropriately by the Application.
4. File offset behavior: Agnostic on entry since it will move the offset to the start of the file, on success the offset will be at the end of the header, undefined offset behavior for error cases.

Parameters

in	*FileDes*	File Descriptor obtained from a previous call to OS_OpenCreate that is associated with the file whose header is to be read.
out	*Hdr*	Pointer to a variable of type CFE_FS_Header_t (must not be null) that will be filled with the contents of the Standard cFE File Header. ∗Hdr is the contents of the Standard cFE File Header for the specified file.

Returns

Bytes read or error status from OSAL

Return values

CFE_FS_BAD_ARGUMENT	Bad Argument.

Note

This function invokes OSAL API routines and the current implementation may return OSAL error codes to the caller if failure occurs. In a future version of CFE, the status codes will be converted to a value in cFE Return Code Defines.

See also

CFE_FS_ReadHeader

10.27 cFE File Utility APIs

Functions

- const char ∗ CFE_FS_GetDefaultMountPoint (CFE_FS_FileCategory_t FileCategory)

  Get the default virtual mount point for a file category.
- const char ∗ CFE_FS_GetDefaultExtension (CFE_FS_FileCategory_t FileCategory)

  Get the default filename extension for a file category.
- int32 CFE_FS_ParseInputFileNameEx (char ∗OutputBuffer, const char ∗InputBuffer, size_t OutputBufSize, size↩_t InputBufSize, const char ∗DefaultInput, const char ∗DefaultPath, const char ∗DefaultExtension)

  Parse a filename input from an input buffer into a local buffer.
- int32 CFE_FS_ParseInputFileName (char ∗OutputBuffer, const char ∗InputName, size_t OutputBufSize, CFE_FS_FileCategory_t FileCategory)

  Parse a filename string from the user into a local buffer.
- CFE_Status_t CFE_FS_ExtractFilenameFromPath (const char ∗OriginalPath, char ∗FileNameOnly)

  Extracts the filename from a unix style path and filename string.
- int32 CFE_FS_BackgroundFileDumpRequest (CFE_FS_FileWriteMetaData_t ∗Meta)

  Register a background file dump request.
- bool CFE_FS_BackgroundFileDumpIsPending (const CFE_FS_FileWriteMetaData_t ∗Meta)

  Query if a background file write request is currently pending.

10.27.1 Detailed Description

10.27.2 Function Documentation

10.27.2.1 CFE_FS_BackgroundFileDumpIsPending()

```
bool CFE_FS_BackgroundFileDumpIsPending (
    const CFE_FS_FileWriteMetaData_t * Meta )
```

Query if a background file write request is currently pending.

Description

This returns "true" while the request is on the background work queue This returns "false" once the request is complete and removed from the queue.

Assumptions, External Events, and Notes:

None

Parameters

in,out	*Meta*	The background file write persistent state object (must not be null)

Returns

boolean value indicating if request is already pending

Return values

true	if request is pending
false	if request is not pending

10.27.2.2 CFE_FS_BackgroundFileDumpRequest()

```
int32 CFE_FS_BackgroundFileDumpRequest (
    CFE_FS_FileWriteMetaData_t * Meta )
```

Register a background file dump request.

Description

Puts the previously-initialized metadata into the pending request queue

Assumptions, External Events, and Notes:

Metadata structure should be stored in a persistent memory area (not on stack) as it must remain accessible by the file writer task throughout the asynchronous job operation.

Parameters

in,out	*Meta*	The background file write persistent state object (must not be null)

Returns

Execution status, see cFE Return Code Defines

Return values

CFE_FS_BAD_ARGUMENT	Bad Argument.
CFE_FS_INVALID_PATH	Invalid Path.
CFE_STATUS_REQUEST_ALREADY_PENDING	Request already pending.
CFE_SUCCESS	Successful execution.

10.27.2.3 CFE_FS_ExtractFilenameFromPath()

```
CFE_Status_t CFE_FS_ExtractFilenameFromPath (
    const char * OriginalPath,
    char * FileNameOnly )
```

Extracts the filename from a unix style path and filename string.

Description

This API will take the original unix path/filename combination and extract the base filename. Example: Given the path/filename : "/cf/apps/myapp.o.gz" this function will return the filename: "myapp.o.gz".

Assumptions, External Events, and Notes:

1. The paths and filenames used here are the standard unix style filenames separated by "/" characters.
2. The extracted filename (including terminator) is no longer than OS_MAX_PATH_LEN

Parameters

in	*OriginalPath*	The original path (must not be null)
out	*FileNameOnly*	The filename that is extracted from the path (must not be null)

Returns

Execution status, see cFE Return Code Defines

Return values

CFE_FS_BAD_ARGUMENT	Bad Argument.
CFE_FS_FNAME_TOO_LONG	Filename Too Long.
CFE_FS_INVALID_PATH	Invalid Path.
CFE_SUCCESS	Successful execution.

10.27.2.4 CFE_FS_GetDefaultExtension()

```
const char* CFE_FS_GetDefaultExtension (
    CFE_FS_FileCategory_t FileCategory )
```

Get the default filename extension for a file category.

Certain file types may have an extension that varies from system to system. This is primarily an issue for application modules which are ".so" on Linux systems, ".dll" on Windows, ".o" on VxWorks, ".obj" on RTEMS, and so on.

This uses a combination of compile-time configuration and hints from the build environment to get the default/expected extension for a given file category.

Returns

String containing the extension

Return values

NULL	if no default extension is known for the given file category

10.27.2.5 CFE_FS_GetDefaultMountPoint()

```
const char* CFE_FS_GetDefaultMountPoint (
    CFE_FS_FileCategory_t FileCategory )
```

Get the default virtual mount point for a file category.

Certain classes of files generally reside in a common directory, mainly either the persistent storage (/cf typically) or ram disk (/ram typically).

Ephemeral status files are generally in the ram disk while application modules and scripts are generally in the persistent storage.

This returns the expected directory for a given class of files in the form of a virtual OSAL mount point string.

Returns

String containing the mount point

Return values

NULL	if no mount point is known for the given file category

10.27.2.6 CFE_FS_ParseInputFileName()

```
int32 CFE_FS_ParseInputFileName (
    char * OutputBuffer,
```

```
const char * InputName,
size_t OutputBufSize,
CFE_FS_FileCategory_t FileCategory )
```

Parse a filename string from the user into a local buffer.

Description

Simplified API for CFE_FS_ParseInputFileNameEx() where input is always known to be a non-empty, null terminated string and the fixed-length input buffer not needed. For instance this may be used where the input is a fixed string from cfe_platform_cfg.h or similar.

Assumptions, External Events, and Notes:

The parameters are organized such that this is basically like strncpy() with an extra argument, and existing file name accesses which use a direct copy can easily change to use this instead.

See also

CFE_FS_ParseInputFileNameEx()

Parameters

out	*OutputBuffer*	Buffer to store result (must not be null).
in	*InputName*	A null terminated input string (must not be null).
in	*OutputBufSize*	Maximum Size of output buffer (must not be zero).
in	*FileCategory*	The generalized category of file (implies default path/extension)

Returns

Execution status, see cFE Return Code Defines

10.27.2.7 CFE_FS_ParseInputFileNameEx()

```
int32 CFE_FS_ParseInputFileNameEx (
char * OutputBuffer,
const char * InputBuffer,
size_t OutputBufSize,
size_t InputBufSize,
const char * DefaultInput,
const char * DefaultPath,
const char * DefaultExtension )
```

Parse a filename input from an input buffer into a local buffer.

Description

This provides a more user friendly way to specify file names, using default values for the path and extension, which can vary from system to system.

If InputBuffer is null or its length is zero, then DefaultInput is used as if it was the content of the input buffer.
If either the pathname or extension is missing from the input, it will be added from defaults, with the complete fully-qualified filename stored in the output buffer.

Assumptions, External Events, and Notes:

1. The paths and filenames used here are the standard unix style filenames separated by "/" (path) and "." (extension) characters.
2. Input Buffer has a fixed max length. Parsing will not exceed InputBufSize, and does not need to be null terminated. However parsing will stop at the first null char, when the input is shorter than the maximum.

Parameters

out	*OutputBuffer*	Buffer to store result (must not be null).
in	*InputBuffer*	A input buffer that may contain a file name (e.g. from command) (must not be null).
in	*OutputBufSize*	Maximum Size of output buffer (must not be zero).
in	*InputBufSize*	Maximum Size of input buffer.
in	*DefaultInput*	Default value to use for input if InputBffer is empty
in	*DefaultPath*	Default value to use for pathname if omitted from input
in	*DefaultExtension*	Default value to use for extension if omitted from input

Returns

Execution status, see cFE Return Code Defines

Return values

CFE_FS_BAD_ARGUMENT	Bad Argument.
CFE_FS_FNAME_TOO_LONG	Filename Too Long.
CFE_FS_INVALID_PATH	Invalid Path.
CFE_SUCCESS	Successful execution.

10.28 cFE Generic Message APIs

Functions

- CFE_Status_t CFE_MSG_Init (CFE_MSG_Message_t *MsgPtr, CFE_SB_MsgId_t MsgId, CFE_MSG_Size_t Size)

  Initialize a message.

10.28.1 Detailed Description

10.28.2 Function Documentation

10.28.2.1 CFE_MSG_Init()

```
CFE_Status_t CFE_MSG_Init (
    CFE_MSG_Message_t * MsgPtr,
    CFE_SB_MsgId_t MsgId,
    CFE_MSG_Size_t Size )
```

Initialize a message.

Description

This routine initialize a message. The entire message is set to zero (based on size), defaults are set, then the size and bits from MsgId are set.

Parameters

out	*MsgPtr*	A pointer to the buffer that contains the message (must not be null).
in	*MsgId*	MsgId that corresponds to message
in	*Size*	Total size of the message (used to set length field)

Returns

Execution status, see cFE Return Code Defines

Return values

CFE_SUCCESS	Successful execution.
CFE_MSG_BAD_ARGUMENT	Error - bad argument.

Referenced by CF_CFDP_MsgOutGet(), CF_CFDP_SendEotPkt(), and CF_Init().

10.29 cFE Message Primary Header APIs

Functions

- CFE_Status_t CFE_MSG_GetSize (const CFE_MSG_Message_t *MsgPtr, CFE_MSG_Size_t *Size)

  Gets the total size of a message.
- CFE_Status_t CFE_MSG_SetSize (CFE_MSG_Message_t *MsgPtr, CFE_MSG_Size_t Size)

  Sets the total size of a message.
- CFE_Status_t CFE_MSG_GetType (const CFE_MSG_Message_t *MsgPtr, CFE_MSG_Type_t *Type)

  Gets the message type.
- CFE_Status_t CFE_MSG_SetType (CFE_MSG_Message_t *MsgPtr, CFE_MSG_Type_t Type)

  Sets the message type.
- CFE_Status_t CFE_MSG_GetHeaderVersion (const CFE_MSG_Message_t *MsgPtr, CFE_MSG_HeaderVersion_t *Version)

  Gets the message header version.
- CFE_Status_t CFE_MSG_SetHeaderVersion (CFE_MSG_Message_t *MsgPtr, CFE_MSG_HeaderVersion_t Version)

  Sets the message header version.
- CFE_Status_t CFE_MSG_GetHasSecondaryHeader (const CFE_MSG_Message_t *MsgPtr, bool *Has↩Secondary)

  Gets the message secondary header boolean.
- CFE_Status_t CFE_MSG_SetHasSecondaryHeader (CFE_MSG_Message_t *MsgPtr, bool HasSecondary)

  Sets the message secondary header boolean.
- CFE_Status_t CFE_MSG_GetApId (const CFE_MSG_Message_t *MsgPtr, CFE_MSG_ApId_t *ApId)

  Gets the message application ID.
- CFE_Status_t CFE_MSG_SetApId (CFE_MSG_Message_t *MsgPtr, CFE_MSG_ApId_t ApId)

  Sets the message application ID.
- CFE_Status_t CFE_MSG_GetSegmentationFlag (const CFE_MSG_Message_t *MsgPtr, CFE_MSG_SegmentationFlag_t *SegFlag)

  Gets the message segmentation flag.
- CFE_Status_t CFE_MSG_SetSegmentationFlag (CFE_MSG_Message_t *MsgPtr, CFE_MSG_SegmentationFlag_t SegFlag)

  Sets the message segmentation flag.
- CFE_Status_t CFE_MSG_GetSequenceCount (const CFE_MSG_Message_t *MsgPtr, CFE_MSG_SequenceCount_t *SeqCnt)

  Gets the message sequence count.
- CFE_Status_t CFE_MSG_SetSequenceCount (CFE_MSG_Message_t *MsgPtr, CFE_MSG_SequenceCount_t SeqCnt)

  Sets the message sequence count.
- CFE_MSG_SequenceCount_t CFE_MSG_GetNextSequenceCount (CFE_MSG_SequenceCount_t SeqCnt)

  Gets the next sequence count value (rolls over if appropriate)

10.29.1 Detailed Description

10.29.2 Function Documentation

10.29.2.1 CFE_MSG_GetApId()

```
CFE_Status_t CFE_MSG_GetApId (
    const CFE_MSG_Message_t * MsgPtr,
    CFE_MSG_ApId_t * ApId )
```

Gets the message application ID.

Description

This routine gets the message application ID.

Parameters

in	*MsgPtr*	A pointer to the buffer that contains the message (must not be null).
out	*ApId*	Application ID (must not be null)

Returns

Execution status, see cFE Return Code Defines

Return values

CFE_SUCCESS	Successful execution.
CFE_MSG_BAD_ARGUMENT	Error - bad argument.

10.29.2.2 CFE_MSG_GetHasSecondaryHeader()

```
CFE_Status_t CFE_MSG_GetHasSecondaryHeader (
    const CFE_MSG_Message_t * MsgPtr,
    bool * HasSecondary )
```

Gets the message secondary header boolean.

Description

This routine gets the message secondary header boolean.

Parameters

in	*MsgPtr*	A pointer to the buffer that contains the message (must not be null).
out	*HasSecondary*	Has secondary header flag (must not be null)

Returns

Execution status, see cFE Return Code Defines

Return values

CFE_SUCCESS	Successful execution.
CFE_MSG_BAD_ARGUMENT	Error - bad argument.

10.29.2.3 CFE_MSG_GetHeaderVersion()

```
CFE_Status_t CFE_MSG_GetHeaderVersion (
    const CFE_MSG_Message_t * MsgPtr,
    CFE_MSG_HeaderVersion_t * Version )
```

Gets the message header version.

Description

This routine gets the message header version.

Parameters

in	*MsgPtr*	A pointer to the buffer that contains the message (must not be null).
out	*Version*	Header version (must not be null)

Returns

Execution status, see cFE Return Code Defines

Return values

CFE_SUCCESS	Successful execution.
CFE_MSG_BAD_ARGUMENT	Error - bad argument.

10.29.2.4 CFE_MSG_GetNextSequenceCount()

```
CFE_MSG_SequenceCount_t CFE_MSG_GetNextSequenceCount (
    CFE_MSG_SequenceCount_t SeqCnt )
```

Gets the next sequence count value (rolls over if appropriate)

Description

Abstract method to get the next valid sequence count value. Will roll over to zero for any input value greater than or equal to the maximum possible sequence count value given the field in the header.

Parameters

in	*SeqCnt*	Sequence count

Returns

The next valid sequence count value

10.29.2.5 CFE_MSG_GetSegmentationFlag()

```
CFE_Status_t CFE_MSG_GetSegmentationFlag (
    const CFE_MSG_Message_t * MsgPtr,
    CFE_MSG_SegmentationFlag_t * SegFlag )
```

Gets the message segmentation flag.

Description

This routine gets the message segmentation flag

Parameters

in	*MsgPtr*	A pointer to the buffer that contains the message (must not be null).
out	*SegFlag*	Segmentation flag (must not be null)

Returns

Execution status, see cFE Return Code Defines

Return values

CFE_SUCCESS	Successful execution.
CFE_MSG_BAD_ARGUMENT	Error - bad argument.

10.29.2.6 CFE_MSG_GetSequenceCount()

```
CFE_Status_t CFE_MSG_GetSequenceCount (
    const CFE_MSG_Message_t * MsgPtr,
    CFE_MSG_SequenceCount_t * SeqCnt )
```

Gets the message sequence count.

Description

This routine gets the message sequence count.

Parameters

in	*MsgPtr*	A pointer to the buffer that contains the message (must not be null).
out	*SeqCnt*	Sequence count (must not be null)

Returns

Execution status, see cFE Return Code Defines

Return values

CFE_SUCCESS	Successful execution.
CFE_MSG_BAD_ARGUMENT	Error - bad argument.

10.29.2.7 CFE_MSG_GetSize()

```
CFE_Status_t CFE_MSG_GetSize (
    const CFE_MSG_Message_t * MsgPtr,
    CFE_MSG_Size_t * Size )
```

Gets the total size of a message.

Description

This routine gets the total size of the message.

Parameters

in	*MsgPtr*	A pointer to the buffer that contains the message (must not be null).
out	*Size*	Total message size (must not be null)

Returns

Execution status, see cFE Return Code Defines

Return values

CFE_SUCCESS	Successful execution.
CFE_MSG_BAD_ARGUMENT	Error - bad argument.

Referenced by CF_AppPipe(), CF_CFDP_ReceiveMessage(), and CF_ProcessGroundCommand().

10.29.2.8 CFE_MSG_GetType()

```
CFE_Status_t CFE_MSG_GetType (
    const CFE_MSG_Message_t * MsgPtr,
    CFE_MSG_Type_t * Type )
```

Gets the message type.

Description

This routine gets the message type.

Parameters

in	*MsgPtr*	A pointer to the buffer that contains the message (must not be null).
out	*Type*	Message type (must not be null)

Returns

Execution status, see cFE Return Code Defines

Return values

CFE_SUCCESS	Successful execution.
CFE_MSG_BAD_ARGUMENT	Error - bad argument.

Referenced by CF_CFDP_ReceiveMessage().

10.29.2.9 CFE_MSG_SetApId()

```
CFE_Status_t CFE_MSG_SetApId (
    CFE_MSG_Message_t * MsgPtr,
    CFE_MSG_ApId_t ApId )
```

Sets the message application ID.

Description

This routine sets the message application ID. Typically set at initialization using the MsgId, but API available to set bits that may not be included in MsgId.

Parameters

in,out	*MsgPtr*	A pointer to the buffer that contains the message (must not be null).
in	*ApId*	Application ID

Returns

Execution status, see cFE Return Code Defines

Return values

CFE_SUCCESS	Successful execution.
CFE_MSG_BAD_ARGUMENT	Error - bad argument.

10.29.2.10 CFE_MSG_SetHasSecondaryHeader()

```
CFE_Status_t CFE_MSG_SetHasSecondaryHeader (
    CFE_MSG_Message_t * MsgPtr,
    bool HasSecondary )
```

Sets the message secondary header boolean.

Description

This routine sets the message secondary header boolean. Typically only set within message initialization and not used by APPs.

Parameters

in,out	*MsgPtr*	A pointer to the buffer that contains the message (must not be null).
in	*HasSecondary*	Has secondary header flag

Returns

Execution status, see cFE Return Code Defines

Return values

CFE_SUCCESS	Successful execution.
CFE_MSG_BAD_ARGUMENT	Error - bad argument.

10.29.2.11 CFE_MSG_SetHeaderVersion()

```
CFE_Status_t CFE_MSG_SetHeaderVersion (
    CFE_MSG_Message_t * MsgPtr,
    CFE_MSG_HeaderVersion_t Version )
```

Sets the message header version.

Description

This routine sets the message header version. Typically only set within message initialization and not used by APPs.

Parameters

in,out	*MsgPtr*	A pointer to the buffer that contains the message.
in	*Version*	Header version

Returns

Execution status, see cFE Return Code Defines

Return values

CFE_SUCCESS	Successful execution.
CFE_MSG_BAD_ARGUMENT	Error - bad argument.

10.29.2.12 CFE_MSG_SetSegmentationFlag()

```
CFE_Status_t CFE_MSG_SetSegmentationFlag (
    CFE_MSG_Message_t * MsgPtr,
    CFE_MSG_SegmentationFlag_t SegFlag )
```

Sets the message segmentation flag.

Description

This routine sets the message segmentation flag.

Parameters

in,out	*MsgPtr*	A pointer to the buffer that contains the message (must not be null).
in	*SegFlag*	Segmentation flag

Returns

Execution status, see cFE Return Code Defines

Return values

CFE_SUCCESS	Successful execution.
CFE_MSG_BAD_ARGUMENT	Error - bad argument.

10.29.2.13 CFE_MSG_SetSequenceCount()

```
CFE_Status_t CFE_MSG_SetSequenceCount (
    CFE_MSG_Message_t * MsgPtr,
```

```
CFE_MSG_SequenceCount_t SeqCnt )
```

Sets the message sequence count.

Description

This routine sets the message sequence count.

Parameters

in,out	*MsgPtr*	A pointer to the buffer that contains the message (must not be null).
in	*SeqCnt*	Sequence count

Returns

Execution status, see cFE Return Code Defines

Return values

CFE_SUCCESS	Successful execution.
CFE_MSG_BAD_ARGUMENT	Error - bad argument.

10.29.2.14 CFE_MSG_SetSize()

```
CFE_Status_t CFE_MSG_SetSize (
    CFE_MSG_Message_t * MsgPtr,
    CFE_MSG_Size_t Size )
```

Sets the total size of a message.

Description

This routine sets the total size of the message.

Parameters

in,out	*MsgPtr*	A pointer to the buffer that contains the message (must not be null).
in	*Size*	Total message size

Returns

Execution status, see cFE Return Code Defines

Return values

CFE_SUCCESS	Successful execution.
CFE_MSG_BAD_ARGUMENT	Error - bad argument.

Referenced by CF_CFDP_Send().

10.29.2.15 CFE_MSG_SetType()

```
CFE_Status_t CFE_MSG_SetType (
```

```
CFE_MSG_Message_t * MsgPtr,
CFE_MSG_Type_t Type )
```

Sets the message type.

Description

This routine sets the message type.

Parameters

in,out	*MsgPtr*	A pointer to the buffer that contains the message (must not be null).
in	*Type*	Message type

Returns

Execution status, see cFE Return Code Defines

Return values

CFE_SUCCESS	Successful execution.
CFE_MSG_BAD_ARGUMENT	Error - bad argument.

10.30 cFE Message Extended Header APIs

Functions

- CFE_Status_t CFE_MSG_GetEDSVersion (const CFE_MSG_Message_t *MsgPtr, CFE_MSG_EDSVersion_t *Version)

  Gets the message EDS version.
- CFE_Status_t CFE_MSG_SetEDSVersion (CFE_MSG_Message_t *MsgPtr, CFE_MSG_EDSVersion_t Version)

  Sets the message EDS version.
- CFE_Status_t CFE_MSG_GetEndian (const CFE_MSG_Message_t *MsgPtr, CFE_MSG_Endian_t *Endian)

  Gets the message endian.
- CFE_Status_t CFE_MSG_SetEndian (CFE_MSG_Message_t *MsgPtr, CFE_MSG_Endian_t Endian)

  Sets the message endian.
- CFE_Status_t CFE_MSG_GetPlaybackFlag (const CFE_MSG_Message_t *MsgPtr, CFE_MSG_PlaybackFlag_t *PlayFlag)

  Gets the message playback flag.
- CFE_Status_t CFE_MSG_SetPlaybackFlag (CFE_MSG_Message_t *MsgPtr, CFE_MSG_PlaybackFlag_t PlayFlag)

  Sets the message playback flag.
- CFE_Status_t CFE_MSG_GetSubsystem (const CFE_MSG_Message_t *MsgPtr, CFE_MSG_Subsystem_t *Subsystem)

  Gets the message subsystem.
- CFE_Status_t CFE_MSG_SetSubsystem (CFE_MSG_Message_t *MsgPtr, CFE_MSG_Subsystem_t Subsystem)

  Sets the message subsystem.
- CFE_Status_t CFE_MSG_GetSystem (const CFE_MSG_Message_t *MsgPtr, CFE_MSG_System_t *System)

  Gets the message system.
- CFE_Status_t CFE_MSG_SetSystem (CFE_MSG_Message_t *MsgPtr, CFE_MSG_System_t System)

  Sets the message system.

10.30.1 Detailed Description

10.30.2 Function Documentation

10.30.2.1 CFE_MSG_GetEDSVersion()

```
CFE_Status_t CFE_MSG_GetEDSVersion (
    const CFE_MSG_Message_t * MsgPtr,
    CFE_MSG_EDSVersion_t * Version )
```

Gets the message EDS version.

Description

This routine gets the message EDS version.

Parameters

in	*MsgPtr*	A pointer to the buffer that contains the message (must not be null).
out	*Version*	EDS Version (must not be null)

Returns

Execution status, see cFE Return Code Defines

Return values

CFE_SUCCESS	Successful execution.
CFE_MSG_BAD_ARGUMENT	Error - bad argument.

10.30.2.2 CFE_MSG_GetEndian()

```
CFE_Status_t CFE_MSG_GetEndian (
    const CFE_MSG_Message_t * MsgPtr,
    CFE_MSG_Endian_t * Endian )
```

Gets the message endian.

Description

This routine gets the message endian.

Parameters

in	*MsgPtr*	A pointer to the buffer that contains the message (must not be null).
out	*Endian*	Endian (must not be null)

Returns

Execution status, see cFE Return Code Defines

Return values

CFE_SUCCESS	Successful execution.
CFE_MSG_BAD_ARGUMENT	Error - bad argument.

10.30.2.3 CFE_MSG_GetPlaybackFlag()

```
CFE_Status_t CFE_MSG_GetPlaybackFlag (
    const CFE_MSG_Message_t * MsgPtr,
    CFE_MSG_PlaybackFlag_t * PlayFlag )
```

Gets the message playback flag.

Description

This routine gets the message playback flag.

Parameters

in	*MsgPtr*	A pointer to the buffer that contains the message (must not be null).
out	*PlayFlag*	Playback Flag (must not be null)

Returns

Execution status, see cFE Return Code Defines

Return values

CFE_SUCCESS	Successful execution.
CFE_MSG_BAD_ARGUMENT	Error - bad argument.

10.30.2.4 CFE_MSG_GetSubsystem()

```
CFE_Status_t CFE_MSG_GetSubsystem (
    const CFE_MSG_Message_t * MsgPtr,
    CFE_MSG_Subsystem_t * Subsystem )
```

Gets the message subsystem.

Description

This routine gets the message subsystem

Parameters

in	*MsgPtr*	A pointer to the buffer that contains the message (must not be null).
out	*Subsystem*	Subsystem (must not be null)

Returns

Execution status, see cFE Return Code Defines

Return values

CFE_SUCCESS	Successful execution.
CFE_MSG_BAD_ARGUMENT	Error - bad argument.

10.30.2.5 CFE_MSG_GetSystem()

```
CFE_Status_t CFE_MSG_GetSystem (
    const CFE_MSG_Message_t * MsgPtr,
    CFE_MSG_System_t * System )
```

Gets the message system.

Description

This routine gets the message system id

Parameters

in	*MsgPtr*	A pointer to the buffer that contains the message (must not be null).
out	*System*	System (must not be null)

Returns

Execution status, see cFE Return Code Defines

Return values

CFE_SUCCESS	Successful execution.
CFE_MSG_BAD_ARGUMENT	Error - bad argument.

10.30.2.6 CFE_MSG_SetEDSVersion()

```
CFE_Status_t CFE_MSG_SetEDSVersion (
    CFE_MSG_Message_t * MsgPtr,
    CFE_MSG_EDSVersion_t Version )
```

Sets the message EDS version.

Description

This routine sets the message EDS version.

Parameters

in,out	*MsgPtr*	A pointer to the buffer that contains the message (must not be null).
in	*Version*	EDS Version

Returns

Execution status, see cFE Return Code Defines

Return values

CFE_SUCCESS	Successful execution.
CFE_MSG_BAD_ARGUMENT	Error - bad argument.

10.30.2.7 CFE_MSG_SetEndian()

```
CFE_Status_t CFE_MSG_SetEndian (
    CFE_MSG_Message_t * MsgPtr,
    CFE_MSG_Endian_t Endian )
```

Sets the message endian.

Description

This routine sets the message endian. Invalid endian selection will set big endian.

Parameters

in,out	*MsgPtr*	A pointer to the buffer that contains the message (must not be null).
in	*Endian*	Endian

Returns

Execution status, see cFE Return Code Defines

Return values

CFE_SUCCESS	Successful execution.
CFE_MSG_BAD_ARGUMENT	Error - bad argument.

10.30.2.8 CFE_MSG_SetPlaybackFlag()

```
CFE_Status_t CFE_MSG_SetPlaybackFlag (
    CFE_MSG_Message_t * MsgPtr,
    CFE_MSG_PlaybackFlag_t PlayFlag )
```

Sets the message playback flag.

Description

This routine sets the message playback flag.

Parameters

in,out	*MsgPtr*	A pointer to the buffer that contains the message (must not be null).
in	*PlayFlag*	Playback Flag

Returns

Execution status, see cFE Return Code Defines

Return values

CFE_SUCCESS	Successful execution.
CFE_MSG_BAD_ARGUMENT	Error - bad argument.

10.30.2.9 CFE_MSG_SetSubsystem()

```
CFE_Status_t CFE_MSG_SetSubsystem (
    CFE_MSG_Message_t * MsgPtr,
    CFE_MSG_Subsystem_t Subsystem )
```

Sets the message subsystem.

Description

This routine sets the message subsystem. Some bits may be set at initialization using the MsgId, but API available to set bits that may not be included in MsgId.

Parameters

in,out	*MsgPtr*	A pointer to the buffer that contains the message (must not be null).
in	*Subsystem*	Subsystem

Returns

Execution status, see cFE Return Code Defines

Return values

CFE_SUCCESS	Successful execution.
CFE_MSG_BAD_ARGUMENT	Error - bad argument.

10.30.2.10 CFE_MSG_SetSystem()

```
CFE_Status_t CFE_MSG_SetSystem (
    CFE_MSG_Message_t * MsgPtr,
    CFE_MSG_System_t System )
```

Sets the message system.

Description

This routine sets the message system id. Some bits may be set at initialization using the MsgId, but API available to set bits that may not be included in MsgId.

Parameters

in,out	*MsgPtr*	A pointer to the buffer that contains the message (must not be null).
in	*System*	System

Returns

Execution status, see cFE Return Code Defines

Return values

CFE_SUCCESS	Successful execution.
CFE_MSG_BAD_ARGUMENT	Error - bad argument.

10.31 cFE Message Secondary Header APIs

Functions

- CFE_Status_t CFE_MSG_GenerateChecksum (CFE_MSG_Message_t ∗MsgPtr)

  Calculates and sets the checksum of a message.
- CFE_Status_t CFE_MSG_ValidateChecksum (const CFE_MSG_Message_t ∗MsgPtr, bool ∗IsValid)

  Validates the checksum of a message.
- CFE_Status_t CFE_MSG_SetFcnCode (CFE_MSG_Message_t ∗MsgPtr, CFE_MSG_FcnCode_t FcnCode)

  Sets the function code field in a message.
- CFE_Status_t CFE_MSG_GetFcnCode (const CFE_MSG_Message_t ∗MsgPtr, CFE_MSG_FcnCode_t ∗Fcn↩ Code)

  Gets the function code field from a message.
- CFE_Status_t CFE_MSG_GetMsgTime (const CFE_MSG_Message_t ∗MsgPtr, CFE_TIME_SysTime_t ∗Time)

  Gets the time field from a message.
- CFE_Status_t CFE_MSG_SetMsgTime (CFE_MSG_Message_t ∗MsgPtr, CFE_TIME_SysTime_t NewTime)

  Sets the time field in a message.

10.31.1 Detailed Description

10.31.2 Function Documentation

10.31.2.1 CFE_MSG_GenerateChecksum()

```
CFE_Status_t CFE_MSG_GenerateChecksum (
    CFE_MSG_Message_t * MsgPtr )
```

Calculates and sets the checksum of a message.

Description

This routine calculates the checksum of a message according to an implementation-defined algorithm. Then, it sets the checksum field in the message with the calculated value. The contents and location of this field will depend on the underlying implementation of messages. It may be a checksum, a CRC, or some other algorithm.

Assumptions, External Events, and Notes:

- If the underlying implementation of messages does not include a checksum field, then this routine will return CFE_MSG_WRONG_MSG_TYPE

Parameters

in,out	*MsgPtr*	A pointer to the buffer that contains the message (must not be null).

Returns

Execution status, see cFE Return Code Defines

Return values

CFE_SUCCESS	Successful execution.
CFE_MSG_BAD_ARGUMENT	Error - bad argument.
CFE_MSG_WRONG_MSG_TYPE	Error - wrong type.

10.31.2.2 CFE_MSG_GetFcnCode()

```
CFE_Status_t CFE_MSG_GetFcnCode (
    const CFE_MSG_Message_t * MsgPtr,
    CFE_MSG_FcnCode_t * FcnCode )
```

Gets the function code field from a message.

Description

This routine gets the function code from a message.

Assumptions, External Events, and Notes:

- If the underlying implementation of messages does not include a function code field, then this routine will set FcnCode to zero and return CFE_MSG_WRONG_MSG_TYPE

Parameters

in	*MsgPtr*	A pointer to the buffer that contains the message (must not be null).
out	*FcnCode*	The function code from the message (must not be null)

Returns

Execution status, see cFE Return Code Defines

Return values

CFE_SUCCESS	Successful execution.
CFE_MSG_BAD_ARGUMENT	Error - bad argument.
CFE_MSG_WRONG_MSG_TYPE	Error - wrong type.

Referenced by CF_AppPipe(), and CF_ProcessGroundCommand().

10.31.2.3 CFE_MSG_GetMsgTime()

```
CFE_Status_t CFE_MSG_GetMsgTime (
    const CFE_MSG_Message_t * MsgPtr,
    CFE_TIME_SysTime_t * Time )
```

Gets the time field from a message.

Description

This routine gets the time from a message.

Assumptions, External Events, and Notes:

- If the underlying implementation of messages does not include a time field, then this routine will set Time to zero and return CFE_MSG_WRONG_MSG_TYPE
- Note default implementation of command messages do not have a time field.

Parameters

in	*MsgPtr*	A pointer to the buffer that contains the message (must not be null).
out	*Time*	Time from the message (must not be null)

Returns

Execution status, see cFE Return Code Defines

Return values

CFE_SUCCESS	Successful execution.
CFE_MSG_BAD_ARGUMENT	Error - bad argument.
CFE_MSG_WRONG_MSG_TYPE	Error - wrong type.

10.31.2.4 CFE_MSG_SetFcnCode()

```
CFE_Status_t CFE_MSG_SetFcnCode (
    CFE_MSG_Message_t * MsgPtr,
    CFE_MSG_FcnCode_t FcnCode )
```

Sets the function code field in a message.

Description

This routine sets the function code of a message.

Assumptions, External Events, and Notes:

- If the underlying implementation of messages does not include a function code field, then this routine will do nothing to the message contents and will return CFE_MSG_WRONG_MSG_TYPE.

Parameters

in,out	*MsgPtr*	A pointer to the buffer that contains the message (must not be null).
in	*FcnCode*	The function code to include in the message.

Returns

Execution status, see cFE Return Code Defines

Return values

CFE_SUCCESS	Successful execution.
CFE_MSG_BAD_ARGUMENT	Error - bad argument.
CFE_MSG_WRONG_MSG_TYPE	Error - wrong type.

10.31.2.5 CFE_MSG_SetMsgTime()

```
CFE_Status_t CFE_MSG_SetMsgTime (
```

```
CFE_MSG_Message_t * MsgPtr,
CFE_TIME_SysTime_t NewTime )
```

Sets the time field in a message.

Description

This routine sets the time of a message. Most applications will want to use CFE_SB_TimeStampMsg instead of this function. But, when needed, this API can be used to set multiple messages with identical time stamps.

Assumptions, External Events, and Notes:

- If the underlying implementation of messages does not include a time field, then this routine will do nothing to the message contents and will return CFE_MSG_WRONG_MSG_TYPE.
- Note default implementation of command messages do not have a time field.

Parameters

in,out	*MsgPtr*	A pointer to the message (must not be null).
in	*NewTime*	The time to include in the message. This will usually be a time from CFE_TIME_GetTime.

Returns

Execution status, see cFE Return Code Defines

Return values

CFE_SUCCESS	Successful execution.
CFE_MSG_BAD_ARGUMENT	Error - bad argument.
CFE_MSG_WRONG_MSG_TYPE	Error - wrong type.

Referenced by CF_CFDP_Send(), and CF_SendHkCmd().

10.31.2.6 CFE_MSG_ValidateChecksum()

```
CFE_Status_t CFE_MSG_ValidateChecksum (
const CFE_MSG_Message_t * MsgPtr,
bool * IsValid )
```

Validates the checksum of a message.

Description

This routine validates the checksum of a message according to an implementation-defined algorithm.

Assumptions, External Events, and Notes:

- If the underlying implementation of messages does not include a checksum field, then this routine will return CFE_MSG_WRONG_MSG_TYPE and set the IsValid parameter false.

Parameters

in	*MsgPtr*	A pointer to the buffer that contains the message (must not be null). This must point to the first byte of the message header.

Parameters

`out`	*IsValid*	Checksum validation result (must not be null) • true - valid • false - invalid or not supported/implemented

Returns

Execution status, see cFE Return Code Defines

Return values

CFE_SUCCESS	Successful execution.
CFE_MSG_BAD_ARGUMENT	Error - bad argument.
CFE_MSG_WRONG_MSG_TYPE	Error - wrong type.

10.32 cFE Message Id APIs

Functions

- CFE_Status_t CFE_MSG_GetMsgId (const CFE_MSG_Message_t ∗MsgPtr, CFE_SB_MsgId_t ∗MsgId)

  Gets the message id from a message.
- CFE_Status_t CFE_MSG_SetMsgId (CFE_MSG_Message_t ∗MsgPtr, CFE_SB_MsgId_t MsgId)

  Sets the message id bits in a message.
- CFE_Status_t CFE_MSG_GetTypeFromMsgId (CFE_SB_MsgId_t MsgId, CFE_MSG_Type_t ∗Type)

  Gets message type using message ID.

10.32.1 Detailed Description

10.32.2 Function Documentation

10.32.2.1 CFE_MSG_GetMsgId()

```
CFE_Status_t CFE_MSG_GetMsgId (
    const CFE_MSG_Message_t * MsgPtr,
    CFE_SB_MsgId_t * MsgId )
```

Gets the message id from a message.

Description

This routine gets the message id from a message. The message id is a hash of bits in the message header, used by the software bus for routing. Message id needs to be unique for each endpoint in the system.

Parameters

in	*MsgPtr*	A pointer to the buffer that contains the message (must not be null).
out	*MsgId*	Message id (must not be null)

Returns

Execution status, see cFE Return Code Defines

Return values

CFE_SUCCESS	Successful execution.
CFE_MSG_BAD_ARGUMENT	Error - bad argument.

Referenced by CF_AppPipe().

10.32.2.2 CFE_MSG_GetTypeFromMsgId()

```
CFE_Status_t CFE_MSG_GetTypeFromMsgId (
    CFE_SB_MsgId_t MsgId,
    CFE_MSG_Type_t * Type )
```

Gets message type using message ID.

Description

This routine gets the message type using the message ID

Parameters

in	*MsgId*	Message id
out	*Type*	Message type (must not be null)

Returns

Execution status, see cFE Return Code Defines

Return values

CFE_SUCCESS	Successful execution.
CFE_MSG_BAD_ARGUMENT	Error - bad argument.

10.32.2.3 CFE_MSG_SetMsgId()

```
CFE_Status_t CFE_MSG_SetMsgId (
    CFE_MSG_Message_t * MsgPtr,
    CFE_SB_MsgId_t MsgId )
```

Sets the message id bits in a message.

Description

This routine sets the message id bits in a message. The message id is a hash of bits in the message header, used by the software bus for routing. Message id needs to be unique for each endpoint in the system.

Note

This API only sets the bits in the header that make up the message ID. No other values in the header are modified.

The user should ensure that this function is only called with a valid MsgId parameter value. If called with an invalid value, the results are implementation-defined. The implementation may or may not return the error code CFE_MSG_BAD_ARGUMENT in this case.

Parameters

in,out	*MsgPtr*	A pointer to the buffer that contains the message (must not be null).
in	*MsgId*	Message id

Returns

Execution status, see cFE Return Code Defines

Return values

CFE_SUCCESS	Successful execution.
CFE_MSG_BAD_ARGUMENT	Error - bad argument.

10.33 cFE Message Integrity APIs

Functions

- CFE_Status_t CFE_MSG_OriginationAction (CFE_MSG_Message_t *MsgPtr, size_t BufferSize, bool *Is↩ Acceptable)

  Perform any necessary actions on a newly-created message, prior to sending.
- CFE_Status_t CFE_MSG_VerificationAction (const CFE_MSG_Message_t *MsgPtr, size_t BufferSize, bool *Is↩ Acceptable)

  Checks message integrity/acceptability.

10.33.1 Detailed Description

10.33.2 Function Documentation

10.33.2.1 CFE_MSG_OriginationAction()

```
CFE_Status_t CFE_MSG_OriginationAction (
    CFE_MSG_Message_t * MsgPtr,
    size_t BufferSize,
    bool * IsAcceptable )
```

Perform any necessary actions on a newly-created message, prior to sending.

Description

This routine updates and/or appends any necessary fields on a message, is invoked via SB just prior to broadcasting the message. The actions include updating any values that should be computed/updated per message, including:

- setting the sequence number
- updating the timestamp, if present
- computing any error control or checksum fields, if present

The MSG module implementation determines which header fields meet this criteria and how they should be computed. The BufferSize parameter indicates the allocation size message of the buffer that holds the message (i.e. the message envelope size). In some implementations, the allocated buffer may include extra space in order to append a CRC or digital signature.

See also

CFE_MSG_VerificationAction

Parameters

in,out	*MsgPtr*	A pointer to the buffer that contains the message (must not be null).
in	*BufferSize*	The size of the buffer encapsulating the message
out	*IsAcceptable*	Output variable to be set, indicates message acceptability (must not be null)

Returns

Execution status, see cFE Return Code Defines

Return values

CFE_SUCCESS	Successful execution.

Return values

CFE_MSG_BAD_ARGUMENT	Error - bad argument.

10.33.2.2 CFE_MSG_VerificationAction()

```
CFE_Status_t CFE_MSG_VerificationAction (
    const CFE_MSG_Message_t * MsgPtr,
    size_t BufferSize,
    bool * IsAcceptable )
```

Checks message integrity/acceptability.

Description

This routine validates that any error-control field(s) in the message header matches the expected value.

The specific function of this API is entirely dependent on the header fields and may be a no-op if no error checking is implemented. In that case, it will always output "true".

Note

Due to the fact that software bus uses a multicast architecture, this function must not modify the message, as the buffer may be shared among multiple receivers. This should generally be the inverse of CFE_MSG_OriginationAction(), but on the origination side it may update header fields and/or modify the message, on the verification/receive side it must only check those fields, not modify them.

See also

CFE_MSG_OriginationAction

Parameters

in	*MsgPtr*	Message Pointer (must not be null)
in	*BufferSize*	The size of the buffer encapsulating the message
out	*IsAcceptable*	Output variable to be set, indicates message acceptability (must not be null)

Returns

Execution status, see cFE Return Code Defines

Return values

CFE_SUCCESS	Successful execution.
CFE_MSG_BAD_ARGUMENT	Error - bad argument.

10.34 cFE Pipe Management APIs

Functions

- CFE_Status_t CFE_SB_CreatePipe (CFE_SB_PipeId_t ∗PipeIdPtr, uint16 Depth, const char ∗PipeName)

  Creates a new software bus pipe.
- CFE_Status_t CFE_SB_DeletePipe (CFE_SB_PipeId_t PipeId)

  Delete a software bus pipe.
- CFE_Status_t CFE_SB_PipeId_ToIndex (CFE_SB_PipeId_t PipeID, uint32 ∗Idx)

  Obtain an index value correlating to an SB Pipe ID.
- CFE_Status_t CFE_SB_SetPipeOpts (CFE_SB_PipeId_t PipeId, uint8 Opts)

  Set options on a pipe.
- CFE_Status_t CFE_SB_GetPipeOpts (CFE_SB_PipeId_t PipeId, uint8 ∗OptsPtr)

  Get options on a pipe.
- CFE_Status_t CFE_SB_GetPipeName (char ∗PipeNameBuf, size_t PipeNameSize, CFE_SB_PipeId_t PipeId)

  Get the pipe name for a given id.
- CFE_Status_t CFE_SB_GetPipeIdByName (CFE_SB_PipeId_t ∗PipeIdPtr, const char ∗PipeName)

  Get pipe id by pipe name.

10.34.1 Detailed Description

10.34.2 Function Documentation

10.34.2.1 CFE_SB_CreatePipe()

```
CFE_Status_t CFE_SB_CreatePipe (
    CFE_SB_PipeId_t * PipeIdPtr,
    uint16 Depth,
    const char * PipeName )
```

Creates a new software bus pipe.

Description

This routine creates and initializes an input pipe that the calling application can use to receive software bus messages. By default, no messages are routed to the new pipe. So, the application must use CFE_SB_Subscribe to specify which messages it wants to receive on this pipe.

Assumptions, External Events, and Notes:

None

Parameters

out	*PipeIdPtr*	A pointer to a variable of type CFE_SB_PipeId_t (must not be null), which will be filled in with the pipe ID information by the CFE_SB_CreatePipe routine. ∗PipeIdPtr is the identifier for the created pipe.
in	*Depth*	The maximum number of messages that will be allowed on this pipe at one time.
in	*PipeName*	A string (must not be null) to be used to identify this pipe in error messages and routing information telemetry. The string must be no longer than OS_MAX_API_NAME (including terminator). Longer strings will be truncated.

Returns

Execution status, see cFE Return Code Defines

Return values

CFE_SUCCESS	Successful execution.
CFE_SB_BAD_ARGUMENT	Bad Argument.
CFE_SB_MAX_PIPES_MET	Max Pipes Met.
CFE_SB_PIPE_CR_ERR	Pipe Create Error.

See also

CFE_SB_DeletePipe CFE_SB_GetPipeOpts CFE_SB_SetPipeOpts CFE_SB_GetPipeIdByName

Referenced by CF_CFDP_InitEngine(), and CF_Init().

10.34.2.2 CFE_SB_DeletePipe()

```
CFE_Status_t CFE_SB_DeletePipe (
    CFE_SB_PipeId_t PipeId )
```

Delete a software bus pipe.

Description

This routine deletes an input pipe and cleans up all data structures associated with the pipe. All subscriptions made for this pipe by calls to CFE_SB_Subscribe will be automatically removed from the SB routing tables. Any messages in the pipe will be discarded.

Applications should not call this routine for all of their SB pipes as part of their orderly shutdown process, as the pipe will be deleted by the support framework at the appropriate time.

Assumptions, External Events, and Notes:

None

Parameters

in	*PipeId*	The pipe ID (obtained previously from CFE_SB_CreatePipe) of the pipe to be deleted.

Returns

Execution status, see cFE Return Code Defines

Return values

CFE_SUCCESS	Successful execution.
CFE_SB_BAD_ARGUMENT	Bad Argument.

See also

CFE_SB_CreatePipe CFE_SB_GetPipeOpts CFE_SB_SetPipeOpts CFE_SB_GetPipeIdByName

Referenced by CF_CFDP_DisableEngine().

10.34.2.3 CFE_SB_GetPipeIdByName()

```
CFE_Status_t CFE_SB_GetPipeIdByName (
    CFE_SB_PipeId_t * PipeIdPtr,
    const char * PipeName )
```

Get pipe id by pipe name.

Description

This routine finds the pipe id for a pipe name.

Parameters

in	*PipeName*	The name of the pipe (must not be null).
out	*PipeIdPtr*	The PipeId for that name (must not be null).

Returns

Execution status, see cFE Return Code Defines

Return values

CFE_SUCCESS	Successful execution.
CFE_SB_BAD_ARGUMENT	Bad Argument.

See also

CFE_SB_CreatePipe CFE_SB_DeletePipe CFE_SB_SetPipeOpts CFE_SB_PIPEOPTS_IGNOREMINE

10.34.2.4 CFE_SB_GetPipeName()

```
CFE_Status_t CFE_SB_GetPipeName (
    char * PipeNameBuf,
    size_t PipeNameSize,
    CFE_SB_PipeId_t PipeId )
```

Get the pipe name for a given id.

Description

This routine finds the pipe name for a pipe id.

Parameters

out	*PipeNameBuf*	The buffer to receive the pipe name (must not be null).
in	*PipeNameSize*	The size (in chars) of the PipeName buffer (must not be zero).
in	*PipeId*	The PipeId for that name.

Returns

Execution status, see cFE Return Code Defines

Return values

CFE_SUCCESS	Successful execution.
CFE_SB_BAD_ARGUMENT	Bad Argument.

See also

CFE_SB_CreatePipe CFE_SB_DeletePipe CFE_SB_SetPipeOpts CFE_SB_GetPipeIdByName

10.34.2.5 CFE_SB_GetPipeOpts()

```
CFE_Status_t CFE_SB_GetPipeOpts (
    CFE_SB_PipeId_t PipeId,
    uint8 * OptsPtr )
```

Get options on a pipe.

Description

This routine gets the current options on a pipe.

Parameters

in	*PipeId*	The pipe ID of the pipe to get options from.
out	*OptsPtr*	A bit field of options: cFE SB Pipe options (must not be null)

Returns

Execution status, see cFE Return Code Defines

Return values

CFE_SUCCESS	Successful execution.
CFE_SB_BAD_ARGUMENT	Bad Argument.

See also

CFE_SB_CreatePipe CFE_SB_DeletePipe CFE_SB_SetPipeOpts CFE_SB_GetPipeIdByName CFE_SB_PIPEOPTS_IGNOREMIN

10.34.2.6 CFE_SB_PipeId_ToIndex()

```
CFE_Status_t CFE_SB_PipeId_ToIndex (
    CFE_SB_PipeId_t PipeID,
    uint32 * Idx )
```

Obtain an index value correlating to an SB Pipe ID.

This calculates a zero based integer value that may be used for indexing into a local resource table/array.

Index values are only guaranteed to be unique for resources of the same type. For instance, the indices corresponding to two [valid] application IDs will never overlap, but the index of a pipe ID and an app ID may be the same. Furthermore, indices may be reused if a resource is deleted and re-created.

Note

There is no inverse of this function - indices cannot be converted back to the original PipeID value. The caller should retain the original ID for future use.

Parameters

in	*PipeID*	Pipe ID to convert
out	*Idx*	Buffer where the calculated index will be stored (must not be null)

Returns

Execution status, see cFE Return Code Defines

Return values

CFE_SUCCESS	Successful execution.
CFE_ES_ERR_RESOURCEID_NOT_VALID	Resource ID is not valid.

10.34.2.7 CFE_SB_SetPipeOpts()

```
CFE_Status_t CFE_SB_SetPipeOpts (
    CFE_SB_PipeId_t PipeId,
    uint8 Opts )
```

Set options on a pipe.

Description

This routine sets (or clears) options to alter the pipe's behavior. Options are (re)set every call to this routine.

Parameters

in	*PipeId*	The pipe ID of the pipe to set options on.
in	*Opts*	A bit field of options: cFE SB Pipe options

Returns

Execution status, see cFE Return Code Defines

Return values

CFE_SUCCESS	Successful execution.
CFE_SB_BAD_ARGUMENT	Bad Argument.

See also

CFE_SB_CreatePipe CFE_SB_DeletePipe CFE_SB_GetPipeOpts CFE_SB_GetPipeIdByName CFE_SB_PIPEOPTS_IGNOREMIN

10.35 cFE Message Subscription Control APIs

Functions

- CFE_Status_t CFE_SB_SubscribeEx (CFE_SB_MsgId_t MsgId, CFE_SB_PipeId_t PipeId, CFE_SB_Qos_t Quality, uint16 MsgLim)

  Subscribe to a message on the software bus.
- CFE_Status_t CFE_SB_Subscribe (CFE_SB_MsgId_t MsgId, CFE_SB_PipeId_t PipeId)

  Subscribe to a message on the software bus with default parameters.
- CFE_Status_t CFE_SB_SubscribeLocal (CFE_SB_MsgId_t MsgId, CFE_SB_PipeId_t PipeId, uint16 MsgLim)

  Subscribe to a message while keeping the request local to a cpu.
- CFE_Status_t CFE_SB_Unsubscribe (CFE_SB_MsgId_t MsgId, CFE_SB_PipeId_t PipeId)

  Remove a subscription to a message on the software bus.
- CFE_Status_t CFE_SB_UnsubscribeLocal (CFE_SB_MsgId_t MsgId, CFE_SB_PipeId_t PipeId)

  Remove a subscription to a message on the software bus on the current CPU.

10.35.1 Detailed Description

10.35.2 Function Documentation

10.35.2.1 CFE_SB_Subscribe()

```
CFE_Status_t CFE_SB_Subscribe (
    CFE_SB_MsgId_t MsgId,
    CFE_SB_PipeId_t PipeId )
```

Subscribe to a message on the software bus with default parameters.

Description

This routine adds the specified pipe to the destination list for the specified message ID. This is the same as CFE_SB_SubscribeEx with the Quality field set to CFE_SB_DEFAULT_QOS and MsgLim set to CFE_PLATFORM_SB_DEFAULT_MSG_LIMIT (4).

Assumptions, External Events, and Notes:

Note: As subscriptions are received, the destinations are added to the head of a linked list. During the sending of a message, the list is traversed beginning at the head of the list. Therefore the message will first be sent to the last subscriber. If an application has timing constraints and needs to receive a message in the shortest possible time, the developer may consider holding off its subscription until other applications have subscribed to the message.

Parameters

in	*MsgId*	The message ID of the message to be subscribed to.
in	*PipeId*	The pipe ID of the pipe the subscribed message should be sent to.

Returns

Execution status, see cFE Return Code Defines

Return values

CFE_SUCCESS	Successful execution.
CFE_SB_MAX_MSGS_MET	(return value only verified in coverage test) Max Messages Met.
CFE_SB_MAX_DESTS_MET	Max Destinations Met.
CFE_SB_BAD_ARGUMENT	Bad Argument.
CFE_SB_BUF_ALOC_ERR	(return value only verified in coverage test) Buffer Allocation Error.

See also

CFE_SB_SubscribeEx, CFE_SB_SubscribeLocal, CFE_SB_Unsubscribe, CFE_SB_UnsubscribeLocal

Referenced by CF_Init().

10.35.2.2 CFE_SB_SubscribeEx()

```
CFE_Status_t CFE_SB_SubscribeEx (
    CFE_SB_MsgId_t MsgId,
    CFE_SB_PipeId_t PipeId,
    CFE_SB_Qos_t Quality,
    uint16 MsgLim )
```

Subscribe to a message on the software bus.

Description

This routine adds the specified pipe to the destination list associated with the specified message ID.

Assumptions, External Events, and Notes:

Note: As subscriptions are received, the destinations are added to the head of a linked list. During the sending of a message, the list is traversed beginning at the head of the list. Therefore the message will first be sent to the last subscriber. If an application has timing constraints and needs to receive a message in the shortest possible time, the developer may consider holding off its subscription until other applications have subscribed to the message.

Parameters

in	*MsgId*	The message ID of the message to be subscribed to.
in	*PipeId*	The pipe ID of the pipe the subscribed message should be sent to.
in	*Quality*	The requested Quality of Service (QoS) required of the messages. Most callers will use CFE_SB_DEFAULT_QOS for this parameter.
in	*MsgLim*	The maximum number of messages with this Message ID to allow in this pipe at the same time.

Returns

Execution status, see cFE Return Code Defines

Return values

CFE_SUCCESS	Successful execution.
CFE_SB_MAX_MSGS_MET	(return value only verified in coverage test) Max Messages Met.
CFE_SB_MAX_DESTS_MET	Max Destinations Met.
CFE_SB_BAD_ARGUMENT	Bad Argument.
CFE_SB_BUF_ALOC_ERR	(return value only verified in coverage test) Buffer Allocation Error.

See also

CFE_SB_Subscribe, CFE_SB_SubscribeLocal, CFE_SB_Unsubscribe, CFE_SB_UnsubscribeLocal

10.35.2.3 CFE_SB_SubscribeLocal()

```
CFE_Status_t CFE_SB_SubscribeLocal (
    CFE_SB_MsgId_t MsgId,
    CFE_SB_PipeId_t PipeId,
    uint16 MsgLim )
```

Subscribe to a message while keeping the request local to a cpu.

Description

This routine adds the specified pipe to the destination list for the specified message ID. This is similar to CFE_SB_SubscribeEx with the Quality field set to CFE_SB_DEFAULT_QOS and MsgLim set to CFE_PLATFORM_SB_DEFAULT_MSG_LIMIT, but will not report the subscription.

Software Bus Network (SBN) application is an example use case, where local subscriptions should not be reported to peers.

Assumptions, External Events, and Notes:

- This API is typically only used by Software Bus Network (SBN) Application

Parameters

in	*MsgId*	The message ID of the message to be subscribed to.
in	*PipeId*	The pipe ID of the pipe the subscribed message should be sent to.
in	*MsgLim*	The maximum number of messages with this Message ID to allow in this pipe at the same time.

Returns

Execution status, see cFE Return Code Defines

Return values

CFE_SUCCESS	Successful execution.
CFE_SB_MAX_MSGS_MET	(return value only verified in coverage test) Max Messages Met.
CFE_SB_MAX_DESTS_MET	Max Destinations Met.
CFE_SB_BAD_ARGUMENT	Bad Argument.
CFE_SB_BUF_ALOC_ERR	(return value only verified in coverage test) Buffer Allocation Error.

See also

CFE_SB_Subscribe, CFE_SB_SubscribeEx, CFE_SB_Unsubscribe, CFE_SB_UnsubscribeLocal

Referenced by CF_CFDP_InitEngine().

10.35.2.4 CFE_SB_Unsubscribe()

```
CFE_Status_t CFE_SB_Unsubscribe (
    CFE_SB_MsgId_t MsgId,
    CFE_SB_PipeId_t PipeId )
```

Remove a subscription to a message on the software bus.

Description

This routine removes the specified pipe from the destination list for the specified message ID.

Assumptions, External Events, and Notes:

If the Pipe is not subscribed to MsgId, the CFE_SB_UNSUB_NO_SUBS_EID event will be generated and CFE_SUCCESS will be returned

Parameters

in	*Msg↩ Id*	The message ID of the message to be unsubscribed.
in	*Pipe↩ Id*	The pipe ID of the pipe the subscribed message should no longer be sent to.

Returns

Execution status, see cFE Return Code Defines

Return values

CFE_SUCCESS	Successful execution.
CFE_SB_BAD_ARGUMENT	Bad Argument.

See also

CFE_SB_Subscribe, CFE_SB_SubscribeEx, CFE_SB_SubscribeLocal, CFE_SB_UnsubscribeLocal

10.35.2.5 CFE_SB_UnsubscribeLocal()

```
CFE_Status_t CFE_SB_UnsubscribeLocal (
    CFE_SB_MsgId_t MsgId,
    CFE_SB_PipeId_t PipeId )
```

Remove a subscription to a message on the software bus on the current CPU.

Description

This routine removes the specified pipe from the destination list for the specified message ID on the current CPU.

Assumptions, External Events, and Notes:

This API is typically only used by Software Bus Network (SBN) Application. If the Pipe is not subscribed to MsgId, the CFE_SB_UNSUB_NO_SUBS_EID event will be generated and CFE_SUCCESS will be returned

Parameters

in	*Msg↩ Id*	The message ID of the message to be unsubscribed.
in	*Pipe↩ Id*	The pipe ID of the pipe the subscribed message should no longer be sent to.

Returns

Execution status, see cFE Return Code Defines

Return values

CFE_SUCCESS	Successful execution.
CFE_SB_BAD_ARGUMENT	Bad Argument.

See also

CFE_SB_Subscribe, CFE_SB_SubscribeEx, CFE_SB_SubscribeLocal, CFE_SB_Unsubscribe

10.36 cFE Send/Receive Message APIs

Functions

- CFE_Status_t CFE_SB_TransmitMsg (const CFE_MSG_Message_t ∗MsgPtr, bool IsOrigination)

  Transmit a message.
- CFE_Status_t CFE_SB_ReceiveBuffer (CFE_SB_Buffer_t ∗∗BufPtr, CFE_SB_PipeId_t PipeId, int32 TimeOut)

  Receive a message from a software bus pipe.

10.36.1 Detailed Description

10.36.2 Function Documentation

10.36.2.1 CFE_SB_ReceiveBuffer()

```
CFE_Status_t CFE_SB_ReceiveBuffer (
    CFE_SB_Buffer_t ** BufPtr,
    CFE_SB_PipeId_t PipeId,
    int32 TimeOut )
```

Receive a message from a software bus pipe.

Description

This routine retrieves the next message from the specified pipe. If the pipe is empty, this routine will block until either a new message comes in or the timeout value is reached.

Assumptions, External Events, and Notes:

Note - If an error occurs in this API, the ∗BufPtr value may be NULL or random. Therefore, it is recommended that the return code be tested for CFE_SUCCESS before processing the message.

Parameters

in,out	*BufPtr*	A pointer to the software bus buffer to receive to (must not be null). Typically a caller declares a ptr of type CFE_SB_Buffer_t (i.e. CFE_SB_Buffer_t ∗Ptr) then gives the address of that pointer (&Ptr) as this parameter. After a successful receipt of a message, ∗BufPtr will point to the first byte of the software bus buffer. This should be used as a read-only pointer (in systems with an MMU, writes to this pointer may cause a memory protection fault). The ∗BufPtr is valid only until the next call to CFE_SB_ReceiveBuffer for the same pipe.
in	*PipeId*	The pipe ID of the pipe containing the message to be obtained.
in	*TimeOut*	The number of milliseconds to wait for a new message if the pipe is empty at the time of the call. This can also be set to CFE_SB_POLL for a non-blocking receive or CFE_SB_PEND_FOREVER to wait forever for a message to arrive.

Returns

Execution status, see cFE Return Code Defines

Return values

CFE_SUCCESS	Successful execution.
CFE_SB_BAD_ARGUMENT	Bad Argument.

Return values

CFE_SB_TIME_OUT	Time Out.
CFE_SB_PIPE_RD_ERR	(return value only verified in coverage test) Pipe Read Error.
CFE_SB_NO_MESSAGE	No Message.

Referenced by CF_AppMain(), and CF_CFDP_ReceiveMessage().

10.36.2.2 CFE_SB_TransmitMsg()

```
CFE_Status_t CFE_SB_TransmitMsg (
    const CFE_MSG_Message_t * MsgPtr,
    bool IsOrigination )
```

Transmit a message.

Description

This routine copies the specified message into a software bus buffer which is then transmitted to all subscribers. The software bus will read the message ID from the message header to determine which pipes should receive the message.

The IsOrigination parameter should be passed as "true" if the message was newly constructed by the sender and is being sent for the first time. This enables the message origination actions as determined by the CFE MSG module, which may include (but not limited to):

- Updating sequence number
- Updating timestamp
- Calcualating a CRC, checksum, or other message error control field

Conversely, when forwarding a message that originated from an external entity (e.g. messages passing through CI or SBN), the parameter should be passed as "false" to not overwrite existing data.

Assumptions, External Events, and Notes:

- This routine will not normally wait for the receiver tasks to process the message before returning control to the caller's task.
- However, if a higher priority task is pending and subscribed to this message, that task may get to run before returning control to the caller.
- In previous versions of CFE, the boolean parameter referred to the sequence number header of telemetry messages only. This has been extended to apply more generically to any headers, as determined by the CFE MSG implementation.

Parameters

in	*MsgPtr*	A pointer to the message to be sent (must not be null). This must point to the first byte of the message header.
in	*IsOrigination*	Update the headers of the message

Returns

Execution status, see cFE Return Code Defines

Return values

CFE_SUCCESS	Successful execution.
CFE_SB_BAD_ARGUMENT	Bad Argument.
CFE_SB_MSG_TOO_BIG	Message Too Big.
CFE_SB_BUF_ALOC_ERR	(return value only verified in coverage test) Buffer Allocation Error.

Referenced by CF_SendHkCmd().

10.37 cFE Zero Copy APIs

Functions

- CFE_SB_Buffer_t * CFE_SB_AllocateMessageBuffer (size_t MsgSize)

  Get a buffer pointer to use for "zero copy" SB sends.
- CFE_Status_t CFE_SB_ReleaseMessageBuffer (CFE_SB_Buffer_t *BufPtr)

  Release an unused "zero copy" buffer pointer.
- CFE_Status_t CFE_SB_TransmitBuffer (CFE_SB_Buffer_t *BufPtr, bool IsOrigination)

  Transmit a buffer.

10.37.1 Detailed Description

10.37.2 Function Documentation

10.37.2.1 CFE_SB_AllocateMessageBuffer()

```
CFE_SB_Buffer_t* CFE_SB_AllocateMessageBuffer (
    size_t MsgSize )
```

Get a buffer pointer to use for "zero copy" SB sends.

Description

This routine can be used to get a pointer to one of the software bus' internal memory buffers that are used for sending messages. The caller can use this memory buffer to build an SB message, then send it using the CFE_SB_TransmitBuffer() function. This interface avoids an extra copy of the message from the user's memory buffer to the software bus internal buffer.

Assumptions, External Events, and Notes:

1. The pointer returned by CFE_SB_AllocateMessageBuffer() is only good for one call to CFE_SB_TransmitBuffer().
2. Once a buffer has been successfully transmitted (as indicated by a successful return from CFE_SB_TransmitBuffer()) the buffer becomes owned by the SB application. It will automatically be freed by SB once all recipients have finished reading it.
3. Applications must not de-reference the message pointer (for reading or writing) after the call to CFE_SB_TransmitBuffer().
4. If CFE_SB_ReleaseMessageBuffer should be used only if a message is not transmitted

Parameters

in	*MsgSize*	The size of the SB message buffer the caller wants (including the SB message header).

Returns

A pointer to a memory buffer that message data can be written to for use with CFE_SB_TransmitBuffer().

Referenced by CF_CFDP_MsgOutGet(), and CF_CFDP_SendEotPkt().

10.37.2.2 CFE_SB_ReleaseMessageBuffer()

```
CFE_Status_t CFE_SB_ReleaseMessageBuffer (
    CFE_SB_Buffer_t * BufPtr )
```

Release an unused "zero copy" buffer pointer.

Description

This routine can be used to release a pointer to one of the software bus' internal memory buffers.

Assumptions, External Events, and Notes:

1. This function is not needed for normal "zero copy" transfers. It is needed only for cleanup when an application gets a pointer using CFE_SB_AllocateMessageBuffer(), but (due to some error condition) never uses that pointer in a call to CFE_SB_TransmitBuffer().

Parameters

in	*BufPtr*	A pointer to the SB internal buffer (must not be null). This must be a pointer returned by a call to CFE_SB_AllocateMessageBuffer(), but never used in a call to CFE_SB_TransmitBuffer().

Returns

Execution status, see cFE Return Code Defines

Return values

CFE_SUCCESS	Successful execution.
CFE_SB_BUFFER_INVALID	Buffer Invalid.

Referenced by CF_CFDP_MsgOutGet().

10.37.2.3 CFE_SB_TransmitBuffer()

```
CFE_Status_t CFE_SB_TransmitBuffer (
    CFE_SB_Buffer_t * BufPtr,
    bool IsOrigination )
```

Transmit a buffer.

Description

This routine sends a message that has been created directly in an internal SB message buffer by an application (after a call to CFE_SB_AllocateMessageBuffer). This interface is more complicated than the normal CFE_SB_TransmitMsg interface, but it avoids an extra copy of the message from the user's memory buffer to the software bus internal buffer. The "zero copy" interface can be used to improve performance in high-rate, high-volume software bus traffic.

The IsOrigination parameter should be passed as "true" if the message was newly constructed by the sender and is being sent for the first time. This enables the message origination actions as determined by the CFE MSG module, which may include (but not limited to):

- Updating sequence number
- Updating timestamp
- Calcualating a CRC, checksum, or other message error control field

Conversely, when forwarding a message that originated from an external entity (e.g. messages passing through CI or SBN), the parameter should be passed as "false" to not overwrite existing data.

Assumptions, External Events, and Notes:

1. A handle returned by CFE_SB_AllocateMessageBuffer is "consumed" by a *successful* call to CFE_SB_TransmitBuffer.
2. If this function returns CFE_SUCCESS, this indicates the zero copy handle is now owned by software bus, and is no longer owned by the calling application, and should not be re-used.
3. However if this function fails (returns any error status) it does not change the state of the buffer at all, meaning the calling application still owns it. (a failure means the buffer is left in the same state it was before the call).
4. Applications should be written as if CFE_SB_AllocateMessageBuffer is equivalent to a `malloc()` and a successful call to CFE_SB_TransmitBuffer is equivalent to a `free()`.
5. Applications must not de-reference the message pointer (for reading or writing) after a successful call to CFE_SB_TransmitBuffer.
6. This function will increment and apply the internally tracked sequence counter if set to do so.

Parameters

in	*BufPtr*	A pointer to the buffer to be sent (must not be null).
in	*IsOrigination*	Update applicable header field(s) of a newly constructed message

Returns

Execution status, see cFE Return Code Defines

Return values

CFE_SUCCESS	Successful execution.
CFE_SB_BAD_ARGUMENT	Bad Argument.
CFE_SB_MSG_TOO_BIG	Message Too Big.

Referenced by CF_CFDP_Send(), and CF_CFDP_SendEotPkt().

10.38 cFE Message Characteristics APIs

Functions

- void CFE_SB_SetUserDataLength (CFE_MSG_Message_t *MsgPtr, size_t DataLength)

  Sets the length of user data in a software bus message.
- void CFE_SB_TimeStampMsg (CFE_MSG_Message_t *MsgPtr)

  Sets the time field in a software bus message with the current spacecraft time.
- int32 CFE_SB_MessageStringSet (char *DestStringPtr, const char *SourceStringPtr, size_t DestMaxSize, size_t SourceMaxSize)

  Copies a string into a software bus message.
- void * CFE_SB_GetUserData (CFE_MSG_Message_t *MsgPtr)

  Get a pointer to the user data portion of a software bus message.
- size_t CFE_SB_GetUserDataLength (const CFE_MSG_Message_t *MsgPtr)

  Gets the length of user data in a software bus message.
- int32 CFE_SB_MessageStringGet (char *DestStringPtr, const char *SourceStringPtr, const char *DefaultString, size_t DestMaxSize, size_t SourceMaxSize)

  Copies a string out of a software bus message.

10.38.1 Detailed Description

10.38.2 Function Documentation

10.38.2.1 CFE_SB_GetUserData() `void* CFE_SB_GetUserData ( CFE_MSG_Message_t * MsgPtr )`

Get a pointer to the user data portion of a software bus message.

Description

This routine returns a pointer to the user data portion of a software bus message. SB message header formats can be different for each deployment of the cFE. So, applications should use this function and avoid hard coding offsets into their SB message buffers.

Assumptions, External Events, and Notes:

None

Parameters

in	*MsgPtr*	A pointer to the buffer that contains the software bus message (must not be null).

Returns

A pointer to the first byte of user data within the software bus message.

10.38.2.2 CFE_SB_GetUserDataLength() `size_t CFE_SB_GetUserDataLength ( const CFE_MSG_Message_t * MsgPtr )`

Gets the length of user data in a software bus message.

Description

This routine returns the size of the user data in a software bus message.

Assumptions, External Events, and Notes:

None

Parameters

in	*MsgPtr*	A pointer to the buffer that contains the software bus message (must not be null). This must point to the first byte of the message header.

Returns

The size (in bytes) of the user data in the software bus message.

Return values

0	if an error occurs, such as if the MsgPtr argument is not valid.

10.38.2.3 CFE_SB_MessageStringGet()

```
int32 CFE_SB_MessageStringGet (
    char * DestStringPtr,
    const char * SourceStringPtr,
    const char * DefaultString,
    size_t DestMaxSize,
    size_t SourceMaxSize )
```

Copies a string out of a software bus message.

Description

Strings within software bus messages have a defined/fixed maximum length, and may not necessarily be null terminated within the message. This presents a possible issue when using the C library functions to copy strings out of a message.

This function should replace use of C library functions such as strcpy/strncpy when copying strings out of software bus messages to local storage buffers.
Up to [SourceMaxSize] or [DestMaxSize-1] (whichever is smaller) characters will be copied from the source buffer to the destination buffer, and a NUL termination character will be written to the destination buffer as the last character.
If the DefaultString pointer is non-NULL, it will be used in place of the source string if the source is an empty string. This is typically a string constant that comes from the platform configuration, allowing default values to be assumed for fields that are unspecified.
IMPORTANT - the default string, if specified, must be null terminated. This will be the case if a string literal is passed in (the typical/expected use case).
If the default is NULL, then only the source string will be copied, and the result will be an empty string if the source was empty.
If the destination buffer is too small to store the entire string, it will be truncated, but it will still be null terminated.

Parameters

out	*DestStringPtr*	Pointer to destination buffer (must not be null)

Parameters

in	*SourceStringPtr*	Pointer to source buffer (component of SB message definition)
in	*DefaultString*	Default string to use if source is empty
in	*DestMaxSize*	Size of destination storage buffer (must not be zero)
in	*SourceMaxSize*	Size of source buffer as defined by the message definition

Returns

Number of characters copied or error code, see cFE Return Code Defines

Return values

CFE_SB_BAD_ARGUMENT	Bad Argument.

10.38.2.4 CFE_SB_MessageStringSet()

```
int32 CFE_SB_MessageStringSet (
    char * DestStringPtr,
    const char * SourceStringPtr,
    size_t DestMaxSize,
    size_t SourceMaxSize )
```

Copies a string into a software bus message.

Description

Strings within software bus messages have a defined/fixed maximum length, and may not necessarily be null terminated within the message. This presents a possible issue when using the C library functions to copy strings out of a message.

This performs a very similar function to "strncpy()" except that the sizes of *both* buffers are passed in. Neither buffer is required to be null-terminated, but copying will stop after the first termination character is encountered.
If the destination buffer is not completely filled by the source data (such as if the supplied string was shorter than the allotted length) the destination buffer will be padded with NUL characters up to the size of the buffer, similar to what strncpy() does. This ensures that the entire destination buffer is set.

Note

If the source string buffer is already guaranteed to be null terminated, then there is no difference between the C library "strncpy()" function and this implementation. It is only necessary to use this when termination of the source buffer is not guaranteed.

Parameters

out	*DestStringPtr*	Pointer to destination buffer (component of SB message definition) (must not be null)
in	*SourceStringPtr*	Pointer to source buffer (must not be null)
in	*DestMaxSize*	Size of destination buffer as defined by the message definition
in	*SourceMaxSize*	Size of source buffer

Returns

Number of characters copied or error code, see cFE Return Code Defines

Return values

CFE_SB_BAD_ARGUMENT	Bad Argument.

10.38.2.5 CFE_SB_SetUserDataLength()

```
void CFE_SB_SetUserDataLength (
    CFE_MSG_Message_t * MsgPtr,
    size_t DataLength )
```

Sets the length of user data in a software bus message.

Description

This routine sets the field in the SB message header that determines the size of the user data in a software bus message. SB message header formats can be different for each deployment of the cFE. So, applications should use this function rather than trying to poke a length value directly into their SB message buffers.

Assumptions, External Events, and Notes:

- You must set a valid message ID in the SB message header before calling this function.

Parameters

in	*MsgPtr*	A pointer to the buffer that contains the software bus message (must not be null). This must point to the first byte of the message header.
in	*DataLength*	The length to set (size of the user data, in bytes).

10.38.2.6 CFE_SB_TimeStampMsg()

```
void CFE_SB_TimeStampMsg (
    CFE_MSG_Message_t * MsgPtr )
```

Sets the time field in a software bus message with the current spacecraft time.

Description

This routine sets the time of a software bus message with the current spacecraft time. This will be the same time that is returned by the function CFE_TIME_GetTime.

Assumptions, External Events, and Notes:

- If the underlying implementation of software bus messages does not include a time field, then this routine will do nothing.

Parameters

in	*MsgPtr*	A pointer to the buffer that contains the software bus message (must not be null). This must point to the first byte of the message header.

Referenced by CF_CFDP_SendEotPkt().

10.39 cFE Message ID APIs

Functions

- bool CFE_SB_IsValidMsgId (CFE_SB_MsgId_t MsgId)

  Identifies whether a given CFE_SB_MsgId_t is valid.
- static bool CFE_SB_MsgId_Equal (CFE_SB_MsgId_t MsgId1, CFE_SB_MsgId_t MsgId2)

  Identifies whether two CFE_SB_MsgId_t values are equal.
- static CFE_SB_MsgId_Atom_t CFE_SB_MsgIdToValue (CFE_SB_MsgId_t MsgId)

  Converts a CFE_SB_MsgId_t to a normal integer.
- static CFE_SB_MsgId_t CFE_SB_ValueToMsgId (CFE_SB_MsgId_Atom_t MsgIdValue)

  Converts a normal integer into a CFE_SB_MsgId_t.
- CFE_SB_MsgId_Atom_t CFE_SB_CmdTopicIdToMsgId (uint16 TopicId, uint16 InstanceNum)

  Converts a topic ID and instance number combination into a MsgID value integer.
- CFE_SB_MsgId_Atom_t CFE_SB_TlmTopicIdToMsgId (uint16 TopicId, uint16 InstanceNum)

  Converts a topic ID and instance number combination into a MsgID value integer.
- CFE_SB_MsgId_Atom_t CFE_SB_GlobalCmdTopicIdToMsgId (uint16 TopicId)

  Converts a topic ID to a MsgID value integer for Global commands.
- CFE_SB_MsgId_Atom_t CFE_SB_GlobalTlmTopicIdToMsgId (uint16 TopicId)

  Converts a topic ID to a MsgID value integer for Global telemetry.
- CFE_SB_MsgId_Atom_t CFE_SB_LocalCmdTopicIdToMsgId (uint16 TopicId)

  Converts a topic ID to a MsgID value integer for local commands.
- CFE_SB_MsgId_Atom_t CFE_SB_LocalTlmTopicIdToMsgId (uint16 TopicId)

  Converts a topic ID to a MsgID value integer for local telemetry.

10.39.1 Detailed Description

10.39.2 Function Documentation

10.39.2.1 CFE_SB_CmdTopicIdToMsgId()

```
CFE_SB_MsgId_Atom_t CFE_SB_CmdTopicIdToMsgId (
    uint16 TopicId,
    uint16 InstanceNum )
```

Converts a topic ID and instance number combination into a MsgID value integer.

Description

This function accepts a data pair of topic ID + instance number and returns the corresponding MsgID Value (integer) for commands.

Assumptions and Notes:

A topic ID identifies a certain data stream from an application, for example the CFE Software bus ground commands (CFE_MISSION_SB_CMD_TOPICID). In contrast to MsgID, the topic ID is consistent across all CPUs in a system, whereas each CPU instance will have a unique MsgID.

CPU instance numbers are 1-based. The instance number of 0 is reserved for "global" MsgID values that are the same on all CPUs. The PSP function may be used to obtain the current CPU number for the host processor.

See also

CFE_SB_TlmTopicIdToMsgId(), CFE_PSP_GetProcessorId()

Returns

Integer representation of the CFE_SB_MsgId_t

10.39.2.2 CFE_SB_GlobalCmdTopicIdToMsgId() `CFE_SB_MsgId_Atom_t CFE_SB_GlobalCmdTopicIdToMsgId ( uint16 TopicId )`

Converts a topic ID to a MsgID value integer for Global commands.

Description

This is a wrapper around CFE_SB_CmdTopicIdToMsgId() for topic IDs which are the same on all CPUs within a system (i.e. not specific to a certain processor)

Assumptions and Notes:

Global MsgIDs may be used when only a single instance of a service exists within the system. The CFE framework does not use this feature for commands, but is defined for future use.

See also

CFE_SB_CmdTopicIdToMsgId(), CFE_SB_LocalCmdTopicIdToMsgId()

Returns

Integer representation of the CFE_SB_MsgId_t

10.39.2.3 CFE_SB_GlobalTlmTopicIdToMsgId() `CFE_SB_MsgId_Atom_t CFE_SB_GlobalTlmTopicIdToMsgId ( uint16 TopicId )`

Converts a topic ID to a MsgID value integer for Global telemetry.

Description

This is a wrapper around CFE_SB_TlmTopicIdToMsgId() for topic IDs which are the same on all CPUs within a system (i.e. not specific to a certain processor)

Assumptions and Notes:

Global MsgIDs may be used when only a single instance of a service exists within the system. An example for such telemetry is the time synchronization service published by CFE_TIME.

See also

CFE_SB_TlmTopicIdToMsgId(), CFE_SB_LocalTlmTopicIdToMsgId()

Returns

Integer representation of the CFE_SB_MsgId_t

10.39.2.4 CFE_SB_IsValidMsgId() `bool CFE_SB_IsValidMsgId ( CFE_SB_MsgId_t MsgId )`

Identifies whether a given CFE_SB_MsgId_t is valid.

Description

Implements a basic sanity check on the value provided

Returns

Boolean message ID validity indicator

Return values

true	Message ID is within the valid range
false	Message ID is not within the valid range

10.39.2.5 CFE_SB_LocalCmdTopicIdToMsgId()

```
CFE_SB_MsgId_Atom_t CFE_SB_LocalCmdTopicIdToMsgId ( uint16 TopicId )
```

Converts a topic ID to a MsgID value integer for local commands.

Description

This is a wrapper around CFE_SB_CmdTopicIdToMsgId() for topic IDs which are unique on all CPUs within a system (i.e. specific to a certain processor)

Assumptions and Notes:

This assumes the caller is referring to a service running on the same processor instance as itself.

See also

CFE_SB_CmdTopicIdToMsgId(), CFE_SB_LocalTlmTopicIdToMsgId()

Returns

Integer representation of the CFE_SB_MsgId_t

10.39.2.6 CFE_SB_LocalTlmTopicIdToMsgId()

```
CFE_SB_MsgId_Atom_t CFE_SB_LocalTlmTopicIdToMsgId ( uint16 TopicId )
```

Converts a topic ID to a MsgID value integer for local telemetry.

Description

This is a wrapper around CFE_SB_TlmTopicIdToMsgId() for topic IDs which are unique on all CPUs within a system (i.e. specific to a certain processor)

Assumptions and Notes:

This assumes the caller is referring to a service running on the same processor instance as itself.

See also

CFE_SB_TlmTopicIdToMsgId(), CFE_SB_LocalCmdTopicIdToMsgId()

Returns

Integer representation of the CFE_SB_MsgId_t

10.39.2.7 CFE_SB_MsgId_Equal()

```
static bool CFE_SB_MsgId_Equal (
    CFE_SB_MsgId_t MsgId1,
    CFE_SB_MsgId_t MsgId2 ) [inline], [static]
```

Identifies whether two CFE_SB_MsgId_t values are equal.

Description

In cases where the CFE_SB_MsgId_t type is not a simple integer type, it may not be possible to do a direct equality check. This inline function provides an abstraction for the equality check between two CFE_SB_MsgId_t values.

Applications should transition to using this function to compare MsgId values for equality to remain compatible with future versions of cFE.

Returns

Boolean message ID equality indicator

Return values

true	Message IDs are Equal
false	Message IDs are not Equal

Definition at line 791 of file cfe_sb.h.
References CFE_SB_MSGID_UNWRAP_VALUE.

10.39.2.8 CFE_SB_MsgIdToValue()

```
static CFE_SB_MsgId_Atom_t CFE_SB_MsgIdToValue (
    CFE_SB_MsgId_t MsgId ) [inline], [static]
```

Converts a CFE_SB_MsgId_t to a normal integer.

Description

In cases where the CFE_SB_MsgId_t type is not a simple integer type, it is not possible to directly display the value in a printf-style statement, use it in a switch() statement, or other similar use cases.

This inline function provides the ability to map a CFE_SB_MsgId_t type back into a simple integer value.
Applications should transition to using this function wherever a CFE_SB_MsgId_t type needs to be used as an integer.

Assumptions and Notes:

This negates the type safety that was gained by using a non- integer type for the CFE_SB_MsgId_t value. This should only be used in specific cases such as UI display (printf, events, etc) where the value is being sent externally. Any internal API calls should be updated to use the CFE_SB_MsgId_t type directly, rather than an integer type.

Returns

Integer representation of the CFE_SB_MsgId_t

Definition at line 822 of file cfe_sb.h.
References CFE_SB_MSGID_UNWRAP_VALUE.
Referenced by CF_AppPipe().

10.39.2.9 CFE_SB_TlmTopicIdToMsgId()

```
CFE_SB_MsgId_Atom_t CFE_SB_TlmTopicIdToMsgId (
    uint16 TopicId,
    uint16 InstanceNum )
```

Converts a topic ID and instance number combination into a MsgID value integer.

Description

This function accepts a data pair of topic ID + instance number and returns the corresponding MsgID Value (integer) for telemetry.

Assumptions and Notes:

A topic ID identifies a certain data stream from an application, for example the CFE Software bus housekeeping telemetry (CFE_MISSION_SB_HK_TLM_TOPICID). In contrast to MsgID, the topic ID is consistent across all CPUs in a system, whereas each CPU instance will have a unique MsgID.

CPU instance numbers are 1-based. The instance number of 0 is reserved for "global" MsgID values that are the same on all CPUs. The PSP function may be used to obtain the current CPU number for the host processor.

See also

CFE_SB_CmdTopicIdToMsgId(), CFE_PSP_GetProcessorId()

Returns

Integer representation of the CFE_SB_MsgId_t

10.39.2.10 CFE_SB_ValueToMsgId()

```
static CFE_SB_MsgId_t CFE_SB_ValueToMsgId (
    CFE_SB_MsgId_Atom_t MsgIdValue ) [inline], [static]
```

Converts a normal integer into a CFE_SB_MsgId_t.

Description

In cases where the CFE_SB_MsgId_t type is not a simple integer type, it is not possible to directly use an integer value supplied via a define or similar method.

This inline function provides the ability to map an integer value into a corresponding CFE_SB_MsgId_t value. Applications should transition to using this function wherever an integer needs to be used for a CFE_SB_MsgId_t.

Assumptions and Notes:

This negates the type safety that was gained by using a non- integer type for the CFE_SB_MsgId_t value. This should only be used in specific cases where the value is coming from an external source. Any internal API calls should be updated to return the CFE_SB_MsgId_t type directly, rather than an integer type.

Returns

CFE_SB_MsgId_t representation of the integer

Definition at line 851 of file cfe_sb.h.
References CFE_SB_MSGID_C.
Referenced by CF_CFDP_InitEngine(), CF_CFDP_MsgOutGet(), CF_CFDP_SendEotPkt(), and CF_Init().

10.40 cFE SB Pipe options

Macros

- #define CFE_SB_PIPEOPTS_IGNOREMINE 0x00000001

  Messages sent by the app that owns this pipe will not be sent to this pipe.

10.40.1 Detailed Description

10.40.2 Macro Definition Documentation

10.40.2.1 CFE_SB_PIPEOPTS_IGNOREMINE `#define CFE_SB_PIPEOPTS_IGNOREMINE 0x00000001`

Messages sent by the app that owns this pipe will not be sent to this pipe.
Definition at line 131 of file cfe_sb_api_typedefs.h.

10.41 cFE Registration APIs

Functions

- CFE_Status_t CFE_TBL_Register (CFE_TBL_Handle_t ∗TblHandlePtr, const char ∗Name, size_t Size, uint16 TblOptionFlags, CFE_TBL_CallbackFuncPtr_t TblValidationFuncPtr)

  Register a table with cFE to obtain Table Management Services.
- CFE_Status_t CFE_TBL_Share (CFE_TBL_Handle_t ∗TblHandlePtr, const char ∗TblName)

  Obtain handle of table registered by another application.
- CFE_Status_t CFE_TBL_Unregister (CFE_TBL_Handle_t TblHandle)

  Unregister a table.

10.41.1 Detailed Description

10.41.2 Function Documentation

10.41.2.1 CFE_TBL_Register()

```
CFE_Status_t CFE_TBL_Register (
    CFE_TBL_Handle_t * TblHandlePtr,
    const char * Name,
    size_t Size,
    uint16 TblOptionFlags,
    CFE_TBL_CallbackFuncPtr_t TblValidationFuncPtr )
```

Register a table with cFE to obtain Table Management Services.

Description

When an application is created and initialized, it is responsible for creating its table images via the TBL API. The application must inform the Table Service of the table name, table size and selection of optional table features.

Assumptions, External Events, and Notes:

Note: This function call can block. Therefore, interrupt service routines should NOT create their own tables. An application should create any table(s) and provide the handle(s) to the interrupt service routine.

Parameters

out	*TblHandlePtr*	a pointer to a CFE_TBL_Handle_t type variable (must not be null) that will be assigned the table's handle. The table handle is required for other API calls when accessing the data contained in the table. ∗TblHandlePtr is the handle used to identify table to cFE when performing Table operations. This value is returned at address specified by TblHandlePtr.
in	*Name*	The raw table name. This name will be combined with the name of the application to produce a name of the form "AppName.RawTableName". This application specific name will be used in commands for modifying or viewing the contents of the table.
in	*Size*	The size, in bytes, of the table to be created (must not be zero). This is the size that will be allocated as a shared memory resource between the Table Management Service and the calling application.

Parameters

in	*TblOptionFlags*	Flag bits indicating selected options for table. A bitwise OR of the following option flags: • CFE_TBL_OPT_DEFAULT - The default setting for table options is a combination of CFE_TBL_OPT_SNGL_BUFFER and CFE_TBL_OPT_LOAD_DUMP. See below for a description of these two options. This option is mutually exclusive with the CFE_TBL_OPT_DBL_BUFFER, CFE_TBL_OPT_DUMP_ONLY and CFE_TBL_OPT_USR_DEF_ADDR options. • CFE_TBL_OPT_SNGL_BUFFER - When this option is selected, the table will use a shared session table for performing table modifications and a memory copy from the session table to the "active" table buffer will occur when the table is updated. This is the preferred option since it will minimize memory usage. This option is mutually exclusive with the CFE_TBL_OPT_DBL_BUFFER option • CFE_TBL_OPT_DBL_BUFFER - When this option is selected, two instances of the table are created. One is considered the "active" table and the other the "inactive" table. Whenever table modifications occur, they do not require the use of a common session table. Modifications occur in the "inactive" buffer. Then, when it is time to update the table, the pointer to the "active" table is changed to point to the "inactive" buffer thus making it the new "active" buffer. This feature is most useful for time critical applications (ie - interrupt service routines, etc). This option is mutually exclusive with the CFE_TBL_OPT_SNGL_BUFFER and CFE_TBL_OPT_DEFAULT option. • CFE_TBL_OPT_LOAD_DUMP - When this option is selected, the Table Service is allowed to perform all operations on the specified table. This option is mutually exclusive with the CFE_TBL_OPT_DUMP_ONLY option. • CFE_TBL_OPT_DUMP_ONLY - When this option is selected, the Table Service will not perform table loads to this table. This does not prevent, however, a task from writing to the table via an address obtained with the CFE_TBL_GetAddress API function. This option is mutually exclusive with the CFE_TBL_OPT_LOAD_DUMP and CFE_TBL_OPT_DEFAULT options. If the Application wishes to specify their own block of memory as the Dump Only table, they need to also include the CFE_TBL_OPT_USR_DEF_ADDR option explained below. • CFE_TBL_OPT_NOT_USR_DEF - When this option is selected, Table Services allocates memory for the table and, in the case of a double buffered table, it allocates the same amount of memory again for the second buffer. This option is mutually exclusive with the CFE_TBL_OPT_USR_DEF_ADDR option. • CFE_TBL_OPT_USR_DEF_ADDR- When this option is selected, the Table Service will not allocate memory for the table. Table Services will require the Application to identify the location of the active table buffer via the CFE_TBL_Load function. This option implies the CFE_TBL_OPT_DUMP_ONLY and the CFE_TBL_OPT_SNGL_BUFFER options and is mutually exclusive of the CFE_TBL_OPT_DBL_BUFFER option. • CFE_TBL_OPT_CRITICAL- When this option is selected, the Table Service will automatically allocate space in the Critical Data Store (CDS) for the table and ensure that the contents in the CDS are the same as the contents
		of the currently active buffer for the table. This option is mutually exclusive of the CFE_TBL_OPT_USR_DEF_ADDR and CFE_TBL_OPT_DUMP_ONLY options. It should also be noted that the use of this option with double buffered tables will prevent the update of the double buffered table from being quick and it could be blocked. Therefore, critical tables should not be

Parameters

in	*TblValidationFuncPtr*	is a pointer to a function that will be executed in the context of the Table Management Service when the contents of a table need to be validated. If set to NULL, then the Table Management Service will assume any data is valid. If the value is not NULL, it must be a pointer to a function with the following prototype: **int32 CallbackFunc(void ∗TblPtr);** where **TblPtr** will be a pointer to the table data that is to be verified. When the function returns CFE_SUCCESS, the data is considered valid and ready for a commit. When the function returns a negative value, the data is considered invalid and an Event Message will be issued containing the returned value. If the function should return a positive number, the table is considered invalid and the return code is considered invalid. Validation functions **must** return either CFE_SUCCESS or a negative number (whose value is at the developer's discretion). The validation function will be executed in the Application's context so that Event Messages describing the validation failure are possible from within the function.

Returns

Execution status, see cFE Return Code Defines

Return values

CFE_SUCCESS	Successful execution.
CFE_TBL_INFO_RECOVERED_TBL	Recovered Table.
CFE_TBL_ERR_DUPLICATE_DIFF_SIZE	Duplicate Table With Different Size.
CFE_TBL_ERR_DUPLICATE_NOT_OWNED	Duplicate Table And Not Owned.
CFE_TBL_ERR_REGISTRY_FULL	Registry Full.
CFE_TBL_ERR_HANDLES_FULL	Handles Full.
CFE_TBL_ERR_INVALID_SIZE	Invalid Size.
CFE_TBL_ERR_INVALID_NAME	Invalid Name.
CFE_ES_ERR_RESOURCEID_NOT_VALID	Resource ID is not valid.
CFE_TBL_BAD_ARGUMENT	Bad Argument.
CFE_TBL_ERR_INVALID_OPTIONS	Invalid Options.
CFE_TBL_WARN_DUPLICATE	Duplicate Warning.
CFE_TBL_WARN_NOT_CRITICAL	Not Critical Warning.

See also

CFE_TBL_Unregister, CFE_TBL_Share

Referenced by CF_TableInit().

10.41.2.2 CFE_TBL_Share()

```
CFE_Status_t CFE_TBL_Share (
    CFE_TBL_Handle_t * TblHandlePtr,
    const char * TblName )
```

Obtain handle of table registered by another application.

Description

After a table has been created, other applications can gain access to that table via the table handle. In order for two or more applications to share a table, the applications that do not create the table must obtain the handle using this function.

Assumptions, External Events, and Notes:

None

Parameters

out	*TblHandlePtr*	A pointer to a CFE_TBL_Handle_t type variable (must not be null) that will be assigned the table's handle. The table handle is required for other API calls when accessing the data contained in the table. ∗TblHandlePtr is the handle used to identify table to cFE when performing Table operations. This value is returned at the address specified by TblHandlePtr.
in	*TblName*	The application specific name of the table of the form "AppName.RawTableName", where RawTableName is the name specified in the CFE_TBL_Register API call. Example: "ACS.TamParams" for a table called "TamParams" that was registered by the application called "ACS".

Returns

Execution status, see cFE Return Code Defines

Return values

CFE_SUCCESS	Successful execution.
CFE_TBL_ERR_HANDLES_FULL	Handles Full.
CFE_TBL_ERR_INVALID_NAME	Invalid Name.
CFE_ES_ERR_RESOURCEID_NOT_VALID	Resource ID is not valid.
CFE_TBL_BAD_ARGUMENT	Bad Argument.

See also

CFE_TBL_Unregister, CFE_TBL_Register

10.41.2.3 CFE_TBL_Unregister()

```
CFE_Status_t CFE_TBL_Unregister (
    CFE_TBL_Handle_t TblHandle )
```

Unregister a table.

Description

When an application is being removed from the system, ES will clean up/free all the application related resources including tables so apps are not required to call this function.

A valid use-case for this API is to unregister a shared table if access is no longer needed or the owning application was removed from the system (CS app is an example).
Typically apps should only register tables during initialization and registration/unregistration by the owning application during operation should be avoided. If unavoidable, special care needs to be taken (especially for shared tables) to avoid race conditions due to competing requests from multiple tasks.

Note the table will not be removed from memory until all table access links have been removed (registration and all shared access).

Assumptions, External Events, and Notes:

None

Parameters

in	*TblHandle*	Handle, previously obtained from CFE_TBL_Register or CFE_TBL_Share, that identifies the Table to be unregistered.

Returns

Execution status, see cFE Return Code Defines

Return values

CFE_SUCCESS	Successful execution.
CFE_ES_ERR_RESOURCEID_NOT_VALID	Resource ID is not valid.
CFE_TBL_ERR_NO_ACCESS	No Access.
CFE_TBL_ERR_INVALID_HANDLE	Invalid Handle.

See also

CFE_TBL_Share, CFE_TBL_Register

10.42 cFE Manage Table Content APIs

Functions

- CFE_Status_t CFE_TBL_Load (CFE_TBL_Handle_t TblHandle, CFE_TBL_SrcEnum_t SrcType, const void *SrcDataPtr)

  Load a specified table with data from specified source.
- CFE_Status_t CFE_TBL_Update (CFE_TBL_Handle_t TblHandle)

  Update contents of a specified table, if an update is pending.
- CFE_Status_t CFE_TBL_Validate (CFE_TBL_Handle_t TblHandle)

  Perform steps to validate the contents of a table image.
- CFE_Status_t CFE_TBL_Manage (CFE_TBL_Handle_t TblHandle)

  Perform standard operations to maintain a table.
- CFE_Status_t CFE_TBL_DumpToBuffer (CFE_TBL_Handle_t TblHandle)

  Copies the contents of a Dump Only Table to a shared buffer.
- CFE_Status_t CFE_TBL_Modified (CFE_TBL_Handle_t TblHandle)

  Notify cFE Table Services that table contents have been modified by the Application.

10.42.1 Detailed Description

10.42.2 Function Documentation

10.42.2.1 CFE_TBL_DumpToBuffer() `CFE_Status_t CFE_TBL_DumpToBuffer ( CFE_TBL_Handle_t TblHandle )`

Copies the contents of a Dump Only Table to a shared buffer.

Description

Typically, apps should just call CFE_TBL_Manage as part of routine processing which will perform validation, update, or dump if pending. This API is provided for the case where just a dump should be performed.

Assumptions, External Events, and Notes:

If the table does not have a dump pending status, nothing will occur (no error, no dump)

Parameters

in	*TblHandle*	Handle of Table to be dumped.

Returns

Execution status, see cFE Return Code Defines

Return values

CFE_SUCCESS	Successful execution.
CFE_ES_ERR_RESOURCEID_NOT_VALID	Resource ID is not valid.
CFE_TBL_ERR_NO_ACCESS	No Access.
CFE_TBL_ERR_INVALID_HANDLE	Invalid Handle.
CFE_TBL_INFO_DUMP_PENDING	Dump Pending.

See also

CFE_TBL_Manage

10.42.2.2 CFE_TBL_Load()

```
CFE_Status_t CFE_TBL_Load (
    CFE_TBL_Handle_t TblHandle,
    CFE_TBL_SrcEnum_t SrcType,
    const void * SrcDataPtr )
```

Load a specified table with data from specified source.

Description

Once an application has created a table (CFE_TBL_Register), it must provide the values that initialize the contents of that table. The application accomplishes this with one of two different TBL API calls. This function call initializes the table with values that are held in a data structure.

Assumptions, External Events, and Notes:

This function call can block. Therefore, interrupt service routines should NOT initialize their own tables. An application should initialize any table(s) prior to providing the handle(s) to the interrupt service routine.

Parameters

in	*TblHandle*	Handle, previously obtained from CFE_TBL_Register or CFE_TBL_Share, that identifies the Table to be loaded.
in	*SrcType*	Flag indicating the nature of the given `SrcDataPtr` below. This value can be any one of the following: • CFE_TBL_SRC_FILE - File source When this option is selected, the `SrcDataPtr` will be interpreted as a pointer to a null terminated character string. The string should specify the full path and filename of the file containing the initial data contents of the table. • CFE_TBL_SRC_ADDRESS - Address source When this option is selected, the `SrcDataPtr` will be interpreted as a pointer to a memory location that is the beginning of the initialization data for loading the table OR, in the case of a "user defined" dump only table, the address of the active table itself. The block of memory is assumed to be of the same size specified in the CFE_TBL_Register function Size parameter.
in	*SrcDataPtr*	Pointer (must not be null) to either a character string specifying a filename or a memory address of a block of binary data to be loaded into a table or, if the table was registered with the CFE_TBL_OPT_USR_DEF_ADDR option, the address of the active table buffer.

Returns

Execution status, see cFE Return Code Defines

Return values

CFE_SUCCESS	Successful execution.
CFE_ES_ERR_RESOURCEID_NOT_VALID	Resource ID is not valid.
CFE_TBL_ERR_NO_ACCESS	No Access.

Return values

CFE_TBL_ERR_INVALID_HANDLE	Invalid Handle.
CFE_TBL_ERR_DUMP_ONLY	Dump Only Error.
CFE_TBL_ERR_ILLEGAL_SRC_TYPE	Illegal Source Type.
CFE_TBL_ERR_LOAD_IN_PROGRESS	Load In Progress.
CFE_TBL_ERR_LOAD_INCOMPLETE	Load Incomplete.
CFE_TBL_ERR_NO_BUFFER_AVAIL	No Buffer Available.
CFE_TBL_ERR_ACCESS	
CFE_TBL_ERR_FILE_TOO_LARGE	File Too Large.
CFE_TBL_ERR_BAD_CONTENT_ID	Bad Content ID.
CFE_TBL_ERR_BAD_SUBTYPE_ID	Bad Subtype ID.
CFE_TBL_ERR_NO_STD_HEADER	No Standard Header.
CFE_TBL_ERR_NO_TBL_HEADER	No Table Header.
CFE_TBL_ERR_PARTIAL_LOAD	Partial Load Error.
CFE_TBL_BAD_ARGUMENT	Bad Argument.

See also

CFE_TBL_Update, CFE_TBL_Validate, CFE_TBL_Manage

Referenced by CF_TableInit().

10.42.2.3 CFE_TBL_Manage() `CFE_Status_t CFE_TBL_Manage ( CFE_TBL_Handle_t TblHandle )`

Perform standard operations to maintain a table.

Description

Applications should call this API periodically to process pending requests for update, validation, or dump to buffer. Typically, the application that created the table would call this function at the start or conclusion of any routine processing cycle.

Assumptions, External Events, and Notes:

None

Parameters

in	*TblHandle*	Handle, previously obtained from CFE_TBL_Register or CFE_TBL_Share, that identifies the Table to be managed.

Returns

Execution status, see cFE Return Code Defines

Return values

CFE_SUCCESS	Successful execution.
CFE_TBL_INFO_UPDATED	Updated.

Return values

CFE_ES_ERR_RESOURCEID_NOT_VALID	Resource ID is not valid.
CFE_TBL_ERR_NO_ACCESS	No Access.
CFE_TBL_ERR_INVALID_HANDLE	Invalid Handle.
CFE_TBL_INFO_DUMP_PENDING	Dump Pending.
CFE_TBL_INFO_UPDATE_PENDING	Update Pending.
CFE_TBL_INFO_VALIDATION_PENDING	

See also

CFE_TBL_Update, CFE_TBL_Validate, CFE_TBL_Load, CFE_TBL_DumpToBuffer

Referenced by CF_CheckTables(), and CF_TableInit().

10.42.2.4 CFE_TBL_Modified()

```
CFE_Status_t CFE_TBL_Modified (
    CFE_TBL_Handle_t TblHandle )
```

Notify cFE Table Services that table contents have been modified by the Application.

Description

This API notifies Table Services that the contents of the specified table has been modified by the Application. This notification is important when a table has been registered as "Critical" because Table Services can then update the contents of the table kept in the Critical Data Store.

Assumptions, External Events, and Notes:

None

Parameters

in	*TblHandle*	Handle of Table that was modified.

Returns

Execution status, see cFE Return Code Defines

Return values

CFE_SUCCESS	Successful execution.
CFE_ES_ERR_RESOURCEID_NOT_VALID	Resource ID is not valid.
CFE_TBL_ERR_NO_ACCESS	No Access.
CFE_TBL_ERR_INVALID_HANDLE	Invalid Handle.

See also

CFE_TBL_Manage

10.42.2.5 CFE_TBL_Update() `CFE_Status_t CFE_TBL_Update ( CFE_TBL_Handle_t TblHandle )`

Update contents of a specified table, if an update is pending.

Description

Typically, apps should just call CFE_TBL_Manage as part of routine processing which will perform validation, update, or dump if pending. This API is provided for the case where just an update should be performed.

Assumptions, External Events, and Notes:

None

Parameters

in	*TblHandle*	Handle, previously obtained from CFE_TBL_Register or CFE_TBL_Share, that identifies the Table to be updated.

Returns

Execution status, see cFE Return Code Defines

Return values

CFE_SUCCESS	Successful execution.
CFE_TBL_INFO_NO_UPDATE_PENDING	No Update Pending.
CFE_ES_ERR_RESOURCEID_NOT_VALID	Resource ID is not valid.
CFE_TBL_ERR_NO_ACCESS	No Access.
CFE_TBL_ERR_INVALID_HANDLE	Invalid Handle.

See also

CFE_TBL_Load, CFE_TBL_Validate, CFE_TBL_Manage

10.42.2.6 CFE_TBL_Validate() `CFE_Status_t CFE_TBL_Validate ( CFE_TBL_Handle_t TblHandle )`

Perform steps to validate the contents of a table image.

Description

Typically, apps should just call CFE_TBL_Manage as part of routine processing which will perform validation, update, or dump if pending. This API is provided for the case where just a validation should be performed.

Assumptions, External Events, and Notes:

None

Parameters

in	*TblHandle*	Handle, previously obtained from CFE_TBL_Register or CFE_TBL_Share, that identifies the Table to be managed.

Returns

Execution status, see cFE Return Code Defines

Return values

CFE_SUCCESS	Successful execution.
CFE_TBL_INFO_NO_VALIDATION_PENDING	
CFE_ES_ERR_RESOURCEID_NOT_VALID	Resource ID is not valid.
CFE_TBL_ERR_NO_ACCESS	No Access.
CFE_TBL_ERR_INVALID_HANDLE	Invalid Handle.

See also

CFE_TBL_Update, CFE_TBL_Manage, CFE_TBL_Load

10.43 cFE Access Table Content APIs

Functions

- CFE_Status_t CFE_TBL_GetAddress (void **TblPtr, CFE_TBL_Handle_t TblHandle)

  Obtain the current address of the contents of the specified table.
- CFE_Status_t CFE_TBL_ReleaseAddress (CFE_TBL_Handle_t TblHandle)

  Release previously obtained pointer to the contents of the specified table.
- CFE_Status_t CFE_TBL_GetAddresses (void **TblPtrs[], uint16 NumTables, const CFE_TBL_Handle_t Tbl↩ Handles[])

  Obtain the current addresses of an array of specified tables.
- CFE_Status_t CFE_TBL_ReleaseAddresses (uint16 NumTables, const CFE_TBL_Handle_t TblHandles[])

  Release the addresses of an array of specified tables.

10.43.1 Detailed Description

10.43.2 Function Documentation

10.43.2.1 CFE_TBL_GetAddress()

```
CFE_Status_t CFE_TBL_GetAddress (
    void ** TblPtr,
    CFE_TBL_Handle_t TblHandle )
```

Obtain the current address of the contents of the specified table.

Description

When a table has been created and initialized, it is available to any application that can identify it with its unique handle. In order to view the data contained in the table, an application must call this function or CFE_TBL_GetAddresses.

Assumptions, External Events, and Notes:

1. This call can be a blocking call when the table is not double buffered and is shared with another application of lower priority that just happens to be in the middle of a table update of the specific table. If this occurs, the application performing the table update will automatically have its priority elevated in order to release the resource as soon as possible.
2. An application must always release the returned table address using the CFE_TBL_ReleaseAddress or CFE_TBL_ReleaseAddresses function prior to either a CFE_TBL_Update call or any blocking call (e.g. - pending on software bus message, etc). Table updates cannot occur while table addresses have not been released.
3. CFE_TBL_ERR_NEVER_LOADED will be returned if the table has never been loaded (either from file or from a block of memory), but the function will still return a valid table pointer to a table with all zero content. This pointer must be released with the CFE_TBL_ReleaseAddress API before the table can be loaded with data.

Parameters

out	*TblPtr*	The address of a pointer (must not be null) that will be loaded with the address of the first byte of the table. This pointer can then be typecast by the calling application to the appropriate table data structure. *TblPtr is the address of the first byte of data associated with the specified table.
in	*TblHandle*	Handle, previously obtained from CFE_TBL_Register or CFE_TBL_Share, that identifies the Table whose address is to be returned.

Returns

Execution status, see cFE Return Code Defines

Return values

CFE_SUCCESS	Successful execution.
CFE_TBL_INFO_UPDATED	Updated.
CFE_ES_ERR_RESOURCEID_NOT_VALID	Resource ID is not valid.
CFE_TBL_ERR_NO_ACCESS	No Access.
CFE_TBL_ERR_INVALID_HANDLE	Invalid Handle.
CFE_TBL_ERR_UNREGISTERED	Unregistered.
CFE_TBL_ERR_NEVER_LOADED	Never Loaded.
CFE_TBL_BAD_ARGUMENT	Bad Argument.

See also

CFE_TBL_ReleaseAddress, CFE_TBL_GetAddresses, CFE_TBL_ReleaseAddresses

Referenced by CF_CheckTables(), and CF_TableInit().

10.43.2.2 CFE_TBL_GetAddresses()

```
CFE_Status_t CFE_TBL_GetAddresses (
    void ** TblPtrs[],
    uint16 NumTables,
    const CFE_TBL_Handle_t TblHandles[] )
```

Obtain the current addresses of an array of specified tables.

Description

When a table has been created and initialized, it is available to any application that can identify it with its unique handle. In order to view the data contained in the table, an application must call this function or CFE_TBL_GetAddress.

Assumptions, External Events, and Notes:

1. This call can be a blocking call when the table is not double buffered and is shared with another application of lower priority that just happens to be in the middle of a table update of the specific table. If this occurs, the application performing the table update will automatically have its priority elevated in order to release the resource as soon as possible.
2. An application must always release the returned table address using the CFE_TBL_ReleaseAddress or CFE_TBL_ReleaseAddresses function prior to either a CFE_TBL_Update call or any blocking call (e.g. - pending on software bus message, etc). Table updates cannot occur while table addresses have not been released.
3. CFE_TBL_ERR_NEVER_LOADED will be returned if the table has never been loaded (either from file or from a block of memory), but the function will still return a valid table pointer to a table with all zero content. This pointer must be released with the CFE_TBL_ReleaseAddress API before the table can be loaded with data.

Parameters

out	*TblPtrs*	Array of Pointers (must not be null) to variables that calling Application wishes to hold the start addresses of the Tables. ∗TblPtrs is an array of addresses of the first byte of data associated with the specified tables.
in	*NumTables*	Size of TblPtrs and TblHandles arrays.
in	*TblHandles*	Array of Table Handles, previously obtained from CFE_TBL_Register or CFE_TBL_Share, of those tables whose start addresses are to be obtained.

Returns

Execution status, see cFE Return Code Defines

Return values

CFE_SUCCESS	Successful execution.
CFE_TBL_INFO_UPDATED	Updated.
CFE_ES_ERR_RESOURCEID_NOT_VALID	Resource ID is not valid.
CFE_TBL_ERR_NO_ACCESS	No Access.
CFE_TBL_ERR_INVALID_HANDLE	Invalid Handle.
CFE_TBL_ERR_UNREGISTERED	Unregistered.
CFE_TBL_ERR_NEVER_LOADED	Never Loaded.
CFE_TBL_BAD_ARGUMENT	Bad Argument.

See also

CFE_TBL_GetAddress, CFE_TBL_ReleaseAddress, CFE_TBL_ReleaseAddresses

10.43.2.3 CFE_TBL_ReleaseAddress() `CFE_Status_t CFE_TBL_ReleaseAddress ( CFE_TBL_Handle_t TblHandle )`

Release previously obtained pointer to the contents of the specified table.

Description

Each application is **required** to release a table address obtained through the CFE_TBL_GetAddress function.

Assumptions, External Events, and Notes:

An application must always release the returned table address using the CFE_TBL_ReleaseAddress function prior to either a CFE_TBL_Update call or any blocking call (e.g. - pending on software bus message, etc). Table updates cannot occur while table addresses have not been released.

Parameters

in	*TblHandle*	Handle, previously obtained from CFE_TBL_Register or CFE_TBL_Share, that identifies the Table whose address is to be released.

Returns

Execution status, see cFE Return Code Defines

Return values

CFE_SUCCESS	Successful execution.
CFE_TBL_INFO_UPDATED	Updated.
CFE_ES_ERR_RESOURCEID_NOT_VALID	Resource ID is not valid.
CFE_TBL_ERR_NO_ACCESS	No Access.
CFE_TBL_ERR_INVALID_HANDLE	Invalid Handle.
CFE_TBL_ERR_NEVER_LOADED	Never Loaded.

See also

CFE_TBL_GetAddress, CFE_TBL_GetAddresses, CFE_TBL_ReleaseAddresses

Referenced by CF_CheckTables().

10.43.2.4 CFE_TBL_ReleaseAddresses()

```
CFE_Status_t CFE_TBL_ReleaseAddresses (
    uint16 NumTables,
    const CFE_TBL_Handle_t TblHandles[] )
```

Release the addresses of an array of specified tables.

Description

Each application is **required** to release a table address obtained through the CFE_TBL_GetAddress function.

Assumptions, External Events, and Notes:

An application must always release the returned table address using the CFE_TBL_ReleaseAddress function prior to either a CFE_TBL_Update call or any blocking call (e.g. - pending on software bus message, etc). Table updates cannot occur while table addresses have not been released.

Parameters

in	*NumTables*	Size of TblHandles array.
in	*TblHandles*	Array of Table Handles (must not be null), previously obtained from CFE_TBL_Register or CFE_TBL_Share, of those tables whose start addresses are to be released.

Returns

Execution status, see cFE Return Code Defines

Return values

CFE_SUCCESS	Successful execution.
CFE_TBL_INFO_UPDATED	Updated.
CFE_ES_ERR_RESOURCEID_NOT_VALID	Resource ID is not valid.
CFE_TBL_ERR_NO_ACCESS	No Access.
CFE_TBL_ERR_INVALID_HANDLE	Invalid Handle.

Return values

CFE_TBL_ERR_NEVER_LOADED	Never Loaded.
CFE_TBL_BAD_ARGUMENT	Bad Argument.

See also

CFE_TBL_GetAddress, CFE_TBL_ReleaseAddress, CFE_TBL_GetAddresses

10.44 cFE Get Table Information APIs

Functions

- CFE_Status_t CFE_TBL_GetStatus (CFE_TBL_Handle_t TblHandle)

  Obtain current status of pending actions for a table.
- CFE_Status_t CFE_TBL_GetInfo (CFE_TBL_Info_t ∗TblInfoPtr, const char ∗TblName)

  Obtain characteristics/information of/about a specified table.
- CFE_Status_t CFE_TBL_NotifyByMessage (CFE_TBL_Handle_t TblHandle, CFE_SB_MsgId_t MsgId, CFE_MSG_FcnCode_t CommandCode, uint32 Parameter)

  Instruct cFE Table Services to notify Application via message when table requires management.

10.44.1 Detailed Description

10.44.2 Function Documentation

10.44.2.1 CFE_TBL_GetInfo()

```
CFE_Status_t CFE_TBL_GetInfo (
    CFE_TBL_Info_t * TblInfoPtr,
    const char * TblName )
```

Obtain characteristics/information of/about a specified table.

Description

This API provides the registry information associated with the specified table. The function fills the given data structure with the data found in the Table Registry.

Assumptions, External Events, and Notes:

None

Parameters

out	*TblInfoPtr*	A pointer to a CFE_TBL_Info_t data structure (must not be null) that is to be populated with table characteristics and information. ∗TblInfoPtr is the description of the tables characteristics and registry information stored in the CFE_TBL_Info_t data structure format.
in	*TblName*	The application specific name (must not be null) of the table of the form "AppName.RawTableName", where RawTableName is the name specified in the CFE_TBL_Register API call. Example: "ACS.TamParams" for a table called "TamParams" that was registered by the application called "ACS".

Returns

Execution status, see cFE Return Code Defines

Return values

CFE_SUCCESS	Successful execution.
CFE_TBL_ERR_INVALID_NAME	Invalid Name.
CFE_TBL_BAD_ARGUMENT	Bad Argument.

See also

CFE_TBL_GetStatus

10.44.2.2 CFE_TBL_GetStatus()

```
CFE_Status_t CFE_TBL_GetStatus (
    CFE_TBL_Handle_t TblHandle )
```

Obtain current status of pending actions for a table.

Description

An application is **required** to perform a periodic check for an update or a validation request for all the tables that it creates. Typically, the application that created the table would call this function at the start or conclusion of any routine processing cycle. If a table update or validation request is pending, the Application should follow up with a call to CFE_TBL_Update or CFE_TBL_Validate respectively.

Assumptions, External Events, and Notes:

None

Parameters

in	*TblHandle*	Handle, previously obtained from CFE_TBL_Register or CFE_TBL_Share, that identifies the Table to be managed.

Returns

Execution status, see cFE Return Code Defines

Return values

CFE_SUCCESS	Successful execution.
CFE_TBL_INFO_UPDATE_PENDING	Update Pending.
CFE_TBL_INFO_VALIDATION_PENDING	
CFE_TBL_INFO_DUMP_PENDING	Dump Pending.
CFE_ES_ERR_RESOURCEID_NOT_VALID	Resource ID is not valid.
CFE_TBL_ERR_NO_ACCESS	No Access.
CFE_TBL_ERR_INVALID_HANDLE	Invalid Handle.

Note

Some status return codes are "success" while being non-zero. This behavior will change in the future.

See also

CFE_TBL_Manage, CFE_TBL_Update, CFE_TBL_Validate, CFE_TBL_GetInfo

10.44.2.3 CFE_TBL_NotifyByMessage()

```
CFE_Status_t CFE_TBL_NotifyByMessage (
    CFE_TBL_Handle_t TblHandle,
    CFE_SB_MsgId_t MsgId,
```

```
CFE_MSG_FcnCode_t CommandCode,
uint32 Parameter )
```

Instruct cFE Table Services to notify Application via message when table requires management.

Description

This API instructs Table Services to send a message to the calling Application whenever the specified table requires management by the application. This feature allows applications to avoid polling table services via the CFE_TBL_Manage call to determine whether a table requires updates, validation, etc. This API should be called following the CFE_TBL_Register API whenever the owning application requires this feature.

Assumptions, External Events, and Notes:

- Only the application that owns the table is allowed to register a notification message
- Recommend **NOT** using the ground command MID which typically impacts command counters. The typical approach is to use a unique MID for inter-task communications similar to how schedulers typically trigger application housekeeping messages.

Parameters

in	*TblHandle*	Handle of Table with which the message should be associated.
in	*MsgId*	Message ID to be used in notification message sent by Table Services.
in	*CommandCode*	Command Code value to be placed in secondary header of message sent by Table Services.
in	*Parameter*	Application defined value to be passed as a parameter in the message sent by Table Services. Suggested use includes an application's table index that allows the same MsgId and Command Code to be used for all table management notifications.

Returns

Execution status, see cFE Return Code Defines

Return values

CFE_SUCCESS	Successful execution.
CFE_ES_ERR_RESOURCEID_NOT_VALID	Resource ID is not valid.
CFE_TBL_ERR_NO_ACCESS	No Access.
CFE_TBL_ERR_INVALID_HANDLE	Invalid Handle.

See also

CFE_TBL_Register

10.45 cFE Table Type Defines

Macros

- #define CFE_TBL_OPT_BUFFER_MSK (0x0001)

  Table buffer mask.
- #define CFE_TBL_OPT_SNGL_BUFFER (0x0000)

  Single buffer table.
- #define CFE_TBL_OPT_DBL_BUFFER (0x0001)

  Double buffer table.
- #define CFE_TBL_OPT_LD_DMP_MSK (0x0002)

  Table load/dump mask.
- #define CFE_TBL_OPT_LOAD_DUMP (0x0000)

  Load/Dump table.
- #define CFE_TBL_OPT_DUMP_ONLY (0x0002)

  Dump only table.
- #define CFE_TBL_OPT_USR_DEF_MSK (0x0004)

  Table user defined mask.
- #define CFE_TBL_OPT_NOT_USR_DEF (0x0000)

  Not user defined table.
- #define CFE_TBL_OPT_USR_DEF_ADDR (0x0006)

  User Defined table,.
- #define CFE_TBL_OPT_CRITICAL_MSK (0x0008)

  Table critical mask.
- #define CFE_TBL_OPT_NOT_CRITICAL (0x0000)

  Not critical table.
- #define CFE_TBL_OPT_CRITICAL (0x0008)

  Critical table.
- #define CFE_TBL_OPT_DEFAULT (CFE_TBL_OPT_SNGL_BUFFER | CFE_TBL_OPT_LOAD_DUMP)

  Default table options.

10.45.1 Detailed Description

10.45.2 Macro Definition Documentation

10.45.2.1 CFE_TBL_OPT_BUFFER_MSK `#define CFE_TBL_OPT_BUFFER_MSK (0x0001)`

Table buffer mask.

Definition at line 48 of file cfe_tbl_api_typedefs.h.

10.45.2.2 CFE_TBL_OPT_CRITICAL `#define CFE_TBL_OPT_CRITICAL (0x0008)`

Critical table.

Definition at line 63 of file cfe_tbl_api_typedefs.h.

10.45.2.3 CFE_TBL_OPT_CRITICAL_MSK `#define CFE_TBL_OPT_CRITICAL_MSK (0x0008)`

Table critical mask.

Definition at line 61 of file cfe_tbl_api_typedefs.h.

10.45.2.4 CFE_TBL_OPT_DBL_BUFFER `#define CFE_TBL_OPT_DBL_BUFFER (0x0001)`

Double buffer table.
Definition at line 50 of file cfe_tbl_api_typedefs.h.

10.45.2.5 CFE_TBL_OPT_DEFAULT `#define CFE_TBL_OPT_DEFAULT (CFE_TBL_OPT_SNGL_BUFFER | CFE_TBL_OPT_LOAD_DUMP)`

Default table options.
Definition at line 66 of file cfe_tbl_api_typedefs.h.

10.45.2.6 CFE_TBL_OPT_DUMP_ONLY `#define CFE_TBL_OPT_DUMP_ONLY (0x0002)`

Dump only table.
Definition at line 54 of file cfe_tbl_api_typedefs.h.

10.45.2.7 CFE_TBL_OPT_LD_DMP_MSK `#define CFE_TBL_OPT_LD_DMP_MSK (0x0002)`

Table load/dump mask.
Definition at line 52 of file cfe_tbl_api_typedefs.h.

10.45.2.8 CFE_TBL_OPT_LOAD_DUMP `#define CFE_TBL_OPT_LOAD_DUMP (0x0000)`

Load/Dump table.
Definition at line 53 of file cfe_tbl_api_typedefs.h.

10.45.2.9 CFE_TBL_OPT_NOT_CRITICAL `#define CFE_TBL_OPT_NOT_CRITICAL (0x0000)`

Not critical table.
Definition at line 62 of file cfe_tbl_api_typedefs.h.

10.45.2.10 CFE_TBL_OPT_NOT_USR_DEF `#define CFE_TBL_OPT_NOT_USR_DEF (0x0000)`

Not user defined table.
Definition at line 57 of file cfe_tbl_api_typedefs.h.

10.45.2.11 CFE_TBL_OPT_SNGL_BUFFER `#define CFE_TBL_OPT_SNGL_BUFFER (0x0000)`

Single buffer table.
Definition at line 49 of file cfe_tbl_api_typedefs.h.

10.45.2.12 CFE_TBL_OPT_USR_DEF_ADDR `#define CFE_TBL_OPT_USR_DEF_ADDR (0x0006)`

User Defined table,.

Note

Automatically includes CFE_TBL_OPT_DUMP_ONLY option

Definition at line 58 of file cfe_tbl_api_typedefs.h.

10.45.2.13 CFE_TBL_OPT_USR_DEF_MSK `#define CFE_TBL_OPT_USR_DEF_MSK (0x0004)`

Table user defined mask.
Definition at line 56 of file cfe_tbl_api_typedefs.h.

10.46 cFE Get Current Time APIs

Functions

- CFE_TIME_SysTime_t CFE_TIME_GetTime (void)

  Get the current spacecraft time.
- CFE_TIME_SysTime_t CFE_TIME_GetTAI (void)

  Get the current TAI (MET + SCTF) time.
- CFE_TIME_SysTime_t CFE_TIME_GetUTC (void)

  Get the current UTC (MET + SCTF - Leap Seconds) time.
- CFE_TIME_SysTime_t CFE_TIME_GetMET (void)

  Get the current value of the Mission Elapsed Time (MET).
- uint32 CFE_TIME_GetMETseconds (void)

  Get the current seconds count of the mission-elapsed time.
- uint32 CFE_TIME_GetMETsubsecs (void)

  Get the current sub-seconds count of the mission-elapsed time.

10.46.1 Detailed Description

10.46.2 Function Documentation

10.46.2.1 CFE_TIME_GetMET() `CFE_TIME_SysTime_t CFE_TIME_GetMET ( void )`

Get the current value of the Mission Elapsed Time (MET).

Description

This routine returns the current mission-elapsed time (MET). MET is usually derived from a hardware-based clock that is not adjusted during normal operations. Callers of this routine should not assume that the MET return value has any specific relationship to any ground-based time standard.

Assumptions, External Events, and Notes:

None

Returns

The current MET

See also

CFE_TIME_GetTime, CFE_TIME_GetTAI, CFE_TIME_GetUTC, CFE_TIME_GetMETseconds, CFE_TIME_GetMETsubsecs, CFE_TIME_MET2SCTime

10.46.2.2 CFE_TIME_GetMETseconds() `uint32 CFE_TIME_GetMETseconds ( void )`

Get the current seconds count of the mission-elapsed time.

Description

This routine is the same as CFE_TIME_GetMET, except that it returns only the integer seconds portion of the MET time.

Assumptions, External Events, and Notes:

None

Returns

The current MET seconds

See also

CFE_TIME_GetTime, CFE_TIME_GetTAI, CFE_TIME_GetUTC, CFE_TIME_GetMET, CFE_TIME_GetMETsubsecs, CFE_TIME_MET2SCTime

10.46.2.3 CFE_TIME_GetMETsubsecs()

```
uint32 CFE_TIME_GetMETsubsecs (
    void )
```

Get the current sub-seconds count of the mission-elapsed time.

Description

This routine is the same as CFE_TIME_GetMET, except that it returns only the integer sub-seconds portion of the MET time. Each count is equal to 2^(-32) seconds.

Assumptions, External Events, and Notes:

None

Returns

The current MET sub-seconds

See also

CFE_TIME_GetTime, CFE_TIME_GetTAI, CFE_TIME_GetUTC, CFE_TIME_GetMET, CFE_TIME_GetMETseconds, CFE_TIME_MET2SCTime

10.46.2.4 CFE_TIME_GetTAI()

```
CFE_TIME_SysTime_t CFE_TIME_GetTAI (
    void )
```

Get the current TAI (MET + SCTF) time.

Description

This routine returns the current TAI time to the caller. TAI is an international time standard that does not include leap seconds. This routine should only be used in situations where TAI is absolutely required. Applications that call CFE_TIME_GetTAI may not be portable to all missions. Maintenance of correct TAI in flight is not guaranteed under all mission operations scenarios. To maintain re-usability across missions, most applications should be using CFE_TIME_GetTime, rather than the specific routines for getting UTC/TAI directly.

Assumptions, External Events, and Notes:

1. The "TAI" time returned is referenced to the mission-defined time epoch, which may or may not be the same as the standard TAI epoch.
2. Even though TAI does not include leap seconds, the time returned by this function can still jump forward or backward without warning when the spacecraft clock is set or adjusted by operators. Applications using this function must be able to handle these time discontinuities gracefully.

Returns

The current spacecraft time in TAI

See also

CFE_TIME_GetTime, CFE_TIME_GetUTC, CFE_TIME_GetMET, CFE_TIME_GetMETseconds, CFE_TIME_GetMETsubsecs

10.46.2.5 CFE_TIME_GetTime()

```
CFE_TIME_SysTime_t CFE_TIME_GetTime (
    void )
```

Get the current spacecraft time.

Description

This routine returns the current spacecraft time, which is the amount of time elapsed since the epoch as set in mission configuration. The time returned is either TAI (no leap seconds) or UTC (including leap seconds). This choice is made in the mission configuration file by defining either CFE_MISSION_TIME_CFG_DEFAULT_TAI or CFE_MISSION_TIME_CFG_DEFAULT_UTC as true at compile time. To maintain re-usability across missions, most applications should be using this function rather than the specific routines for getting UTC/TAI directly.

Assumptions, External Events, and Notes:

None

Returns

The current spacecraft time in default format

See also

CFE_TIME_GetTAI, CFE_TIME_GetUTC, CFE_TIME_GetMET, CFE_TIME_GetMETseconds, CFE_TIME_GetMETsubsecs

Referenced by CF_CFDP_Send(), and CF_SendHkCmd().

10.46.2.6 CFE_TIME_GetUTC()

```
CFE_TIME_SysTime_t CFE_TIME_GetUTC (
    void )
```

Get the current UTC (MET + SCTF - Leap Seconds) time.

Description

This routine returns the current UTC time to the caller. This routine should only be used in situations where UTC is absolutely required. Applications that call CFE_TIME_GetUTC may not be portable to all missions. Maintenance of correct UTC in flight is not guaranteed under all mission operations scenarios. If UTC is maintained in flight, it will jump backwards occasionally due to leap second adjustments. To maintain re-usability across missions, most applications should be using CFE_TIME_GetTime, rather than the specific routines for getting UTC/TAI directly.

Assumptions, External Events, and Notes:

Note: The "UTC" time returned is referenced to the mission-defined time epoch, which may or may not be the same as the standard UTC epoch.

Returns

The current spacecraft time in UTC

See also

CFE_TIME_GetTime, CFE_TIME_GetTAI, CFE_TIME_GetMET, CFE_TIME_GetMETseconds, CFE_TIME_GetMETsubsecs

10.47 cFE Get Time Information APIs

Functions

- CFE_TIME_SysTime_t CFE_TIME_GetSTCF (void)

  Get the current value of the spacecraft time correction factor (STCF).
- int16 CFE_TIME_GetLeapSeconds (void)

  Get the current value of the leap seconds counter.
- CFE_TIME_ClockState_Enum_t CFE_TIME_GetClockState (void)

  Get the current state of the spacecraft clock.
- uint16 CFE_TIME_GetClockInfo (void)

  Provides information about the spacecraft clock.

10.47.1 Detailed Description

10.47.2 Function Documentation

10.47.2.1 CFE_TIME_GetClockInfo() `uint16 CFE_TIME_GetClockInfo ( void )`

Provides information about the spacecraft clock.

Description

This routine returns information on the spacecraft clock in a bit mask.

Assumptions, External Events, and Notes:

None

Returns

Spacecraft clock information, cFE Clock State Flag Defines. To extract the information from the returned value, the flags can be used as in the following:
`if ((ReturnValue & CFE_TIME_FLAG_xxxxxx) == CFE_TIME_FLAG_xxxxxx)` then the following definition of the `CFE_TIME_FLAG_xxxxxx` is true.

See also

CFE_TIME_GetSTCF, CFE_TIME_GetLeapSeconds, CFE_TIME_GetClockState

10.47.2.2 CFE_TIME_GetClockState() `CFE_TIME_ClockState_Enum_t CFE_TIME_GetClockState ( void )`

Get the current state of the spacecraft clock.

Description

This routine returns the spacecraft clock state. Applications that are highly dependent on valid time may want to call this routine before taking actions based on the times returned by the various clock routines

Assumptions, External Events, and Notes:

None

Returns

The current spacecraft clock state

See also

CFE_TIME_GetSTCF, CFE_TIME_GetLeapSeconds, CFE_TIME_GetClockInfo

10.47.2.3 CFE_TIME_GetLeapSeconds()

```
int16 CFE_TIME_GetLeapSeconds (
    void )
```

Get the current value of the leap seconds counter.

Description

This routine returns the current value of the leap seconds counter. This is the delta seconds between international atomic time (TAI) and universal coordinated time (UTC). There is no API provided to set or adjust leap seconds or SCTF, those actions should be done by command only. This API is provided for applications to be able to include leap seconds in their data products to aid in time correlation during downstream science data processing. Note that some mission operations teams do not maintain the leap seconds count, preferring to adjust the STCF instead. Users of this function should check with their mission ops team to see how they are planning to handle leap seconds.

Assumptions, External Events, and Notes:

None

Returns

The current spacecraft leap seconds.

See also

CFE_TIME_GetSTCF, CFE_TIME_GetClockState, CFE_TIME_GetClockInfo

10.47.2.4 CFE_TIME_GetSTCF()

```
CFE_TIME_SysTime_t CFE_TIME_GetSTCF (
    void )
```

Get the current value of the spacecraft time correction factor (STCF).

Description

This routine returns the current value of the spacecraft time correction factor. This is the delta time between the MET and the TAI time. There is no API provided to set or adjust leap seconds or SCTF, those actions should be done by command only. This API is provided for applications to be able to include STCF in their data products to aid in time correlation during downstream science data processing.

Assumptions, External Events, and Notes:

Does not include leap seconds

Returns

The current SCTF

See also

CFE_TIME_GetLeapSeconds, CFE_TIME_GetClockState, CFE_TIME_GetClockInfo

10.48 cFE Time Arithmetic APIs

Functions

- CFE_TIME_SysTime_t CFE_TIME_Add (CFE_TIME_SysTime_t Time1, CFE_TIME_SysTime_t Time2)

  Adds two time values.
- CFE_TIME_SysTime_t CFE_TIME_Subtract (CFE_TIME_SysTime_t Time1, CFE_TIME_SysTime_t Time2)

  Subtracts two time values.
- CFE_TIME_Compare_t CFE_TIME_Compare (CFE_TIME_SysTime_t TimeA, CFE_TIME_SysTime_t TimeB)

  Compares two time values.

10.48.1 Detailed Description

10.48.2 Function Documentation

10.48.2.1 CFE_TIME_Add()

```
CFE_TIME_SysTime_t CFE_TIME_Add (
    CFE_TIME_SysTime_t Time1,
    CFE_TIME_SysTime_t Time2 )
```

Adds two time values.

Description

This routine adds the two specified times and returns the result. Normally, at least one of the input times should be a value representing a delta time. Adding two absolute times together will not cause an error, but the result will probably be meaningless.

Assumptions, External Events, and Notes:

None

Parameters

in	*Time1*	The first time to be added.
in	*Time2*	The second time to be added.

Returns

The sum of the two times. If the sum is greater than the maximum value that can be stored in a CFE_TIME_SysTime_t, the result will roll over (this is not considered an error).

See also

CFE_TIME_Subtract, CFE_TIME_Compare

10.48.2.2 CFE_TIME_Compare()

```
CFE_TIME_Compare_t CFE_TIME_Compare (
    CFE_TIME_SysTime_t TimeA,
    CFE_TIME_SysTime_t TimeB )
```

Compares two time values.

Description

This routine compares two time values to see which is "greater". It is important that applications use this function rather than trying to directly compare the component pieces of times. This function will handle roll-over cases seamlessly, which may not be intuitively obvious. The cFE's internal representation of time "rolls over" when the 32 bit seconds count reaches 0xFFFFFFFF. Also, subtracting a delta time from an absolute time close to the epoch could result in "roll under". The strange cases that result from these situations can be handled by defining the comparison function for times as follows: Plot the two times on the circumference of a circle where 0 is at the top and 0x80000000 is at the bottom. If the shortest arc from time A to time B runs clockwise around the circle, then time A is less than time B. If the shortest arc from A to B runs counter-clockwise, then time A is greater than time B.

Assumptions, External Events, and Notes:

None

Parameters

in	*TimeA*	The first time to compare.
in	*TimeB*	The second time to compare.

Returns

The result of comparing the two times.

Return values

CFE_TIME_EQUAL	The two specified times are considered to be equal.
CFE_TIME_A_GT_B	The first specified time is considered to be after the second specified time.
CFE_TIME_A_LT_B	The first specified time is considered to be before the second specified time.

See also

CFE_TIME_Add, CFE_TIME_Subtract

10.48.2.3 CFE_TIME_Subtract()

```
CFE_TIME_SysTime_t CFE_TIME_Subtract (
    CFE_TIME_SysTime_t Time1,
    CFE_TIME_SysTime_t Time2 )
```

Subtracts two time values.

Description

This routine subtracts time2 from time1 and returns the result. The time values can represent either absolute or delta times, but not all combinations make sense.

- AbsTime - AbsTime = DeltaTime
- AbsTime - DeltaTime = AbsTime
- DeltaTime - DeltaTime = DeltaTime
- DeltaTime - AbsTime = garbage

Assumptions, External Events, and Notes:

None

Parameters

in	*Time1*	The base time.
in	*Time2*	The time to be subtracted from the base time.

Returns

The result of subtracting the two times. If the subtraction results in an underflow, the result will roll over (this is not considered an error).

See also

CFE_TIME_Add, CFE_TIME_Compare

10.49 cFE Time Conversion APIs

Functions

- CFE_TIME_SysTime_t CFE_TIME_MET2SCTime (CFE_TIME_SysTime_t METTime)

  Convert specified MET into Spacecraft Time.
- uint32 CFE_TIME_Sub2MicroSecs (uint32 SubSeconds)

  Converts a sub-seconds count to an equivalent number of microseconds.
- uint32 CFE_TIME_Micro2SubSecs (uint32 MicroSeconds)

  Converts a number of microseconds to an equivalent sub-seconds count.

10.49.1 Detailed Description

10.49.2 Function Documentation

10.49.2.1 CFE_TIME_MET2SCTime() `CFE_TIME_SysTime_t CFE_TIME_MET2SCTime ( CFE_TIME_SysTime_t METTime )`

Convert specified MET into Spacecraft Time.

Description

This function returns Spacecraft Time given MET. Note that Spacecraft Time is returned as either UTC or TAI depending on whether the mission configuration parameter CFE_MISSION_TIME_CFG_DEFAULT_UTC or CFE_MISSION_TIME_CFG_DEFAULT_TAI was set to true at compile time.

Assumptions, External Events, and Notes:

None

Parameters

in	*METTime*	The MET to be converted.

Returns

Spacecraft Time (UTC or TAI) corresponding to the specified MET

See also

CFE_TIME_GetMET, CFE_TIME_GetMETseconds, CFE_TIME_GetMETsubsecs, CFE_TIME_Sub2MicroSecs, CFE_TIME_Micro2SubSecs

10.49.2.2 CFE_TIME_Micro2SubSecs() `uint32 CFE_TIME_Micro2SubSecs ( uint32 MicroSeconds )`

Converts a number of microseconds to an equivalent sub-seconds count.

Description

This routine converts from microseconds (each tick is 1e-06 seconds) to a subseconds count (each tick is 1 / 2^32 seconds).

Assumptions, External Events, and Notes:

None

Parameters

in	*MicroSeconds*	The sub-seconds count to convert.

Returns

The equivalent number of subseconds. If the number of microseconds passed in is greater than one second, (i.e. > 999,999), the return value is equal to `0xffffffff`.

See also

CFE_TIME_MET2SCTime, CFE_TIME_Sub2MicroSecs,

10.49.2.3 CFE_TIME_Sub2MicroSecs()

```
uint32 CFE_TIME_Sub2MicroSecs (
    uint32 SubSeconds )
```

Converts a sub-seconds count to an equivalent number of microseconds.

Description

This routine converts from a sub-seconds count (each tick is 1 / 2^32 seconds) to microseconds (each tick is 1e-06 seconds).

Assumptions, External Events, and Notes:

None

Parameters

in	*SubSeconds*	The sub-seconds count to convert.

Returns

The equivalent number of microseconds.

See also

CFE_TIME_MET2SCTime, CFE_TIME_Micro2SubSecs,

10.50 cFE External Time Source APIs

Functions

- void CFE_TIME_ExternalTone (void)

  Provides the 1 Hz signal from an external source.
- void CFE_TIME_ExternalMET (CFE_TIME_SysTime_t NewMET)

  Provides the Mission Elapsed Time from an external source.
- void CFE_TIME_ExternalGPS (CFE_TIME_SysTime_t NewTime, int16 NewLeaps)

  Provide the time from an external source that has data common to GPS receivers.
- void CFE_TIME_ExternalTime (CFE_TIME_SysTime_t NewTime)

  Provide the time from an external source that measures time relative to a known epoch.
- CFE_Status_t CFE_TIME_RegisterSynchCallback (CFE_TIME_SynchCallbackPtr_t CallbackFuncPtr)

  Registers a callback function that is called whenever time synchronization occurs.
- CFE_Status_t CFE_TIME_UnregisterSynchCallback (CFE_TIME_SynchCallbackPtr_t CallbackFuncPtr)

  Unregisters a callback function that is called whenever time synchronization occurs.

10.50.1 Detailed Description

10.50.2 Function Documentation

10.50.2.1 CFE_TIME_ExternalGPS()

```
void CFE_TIME_ExternalGPS (
    CFE_TIME_SysTime_t NewTime,
    int16 NewLeaps )
```

Provide the time from an external source that has data common to GPS receivers.

Description

This routine provides a method to provide cFE TIME with current time data acquired from an external source. There is a presumption that this function will be called at the appropriate time (relative to the tone) such that this call may be used by cFE TIME as the signal to generate the "time at the tone" data command. The "time at the tone" data command must arrive within the configuration parameter specified window for tone signal and data packet verification.

Internally, cFE TIME will calculate a new STCF as the difference between this new time value and the spacecraft MET value at the tone. This allows cFE TIME to always calculate time as the sum of MET and STCF. The value of STCF will change only as much as the drift factor between spacecraft MET and the external time source.

Assumptions, External Events, and Notes:

- This routine is included in the API only when 3 specific configuration parameters are set to true. The first is CFE_PLATFORM_TIME_CFG_SERVER which defines this instantiation of cFE TIME as a time server (not a client). The second required configuration parameter is CFE_PLATFORM_TIME_CFG_SOURCE which enables time source selection commands to the cFE TIME task, and further enables configuration definitions for the selected type of external time data. The third configuration parameter required for this routine is CFE_PLATFORM_TIME_CFG_SRC_GPS, which indicates that the external time data consists of a time value relative to a known epoch, plus a leap seconds value.

Parameters

in	*NewTime*	The MET value at the next (or previous) 1 Hz tone signal.
in	*NewLeaps*	The Leap Seconds value used to calculate time as UTC.

See also

CFE_TIME_ExternalTone, CFE_TIME_ExternalMET, CFE_TIME_ExternalTime

10.50.2.2 CFE_TIME_ExternalMET() `void CFE_TIME_ExternalMET ( CFE_TIME_SysTime_t NewMET )`

Provides the Mission Elapsed Time from an external source.

Description

This routine provides a method to provide cFE TIME with MET acquired from an external source. There is a presumption that this function will be called at the appropriate time (relative to the tone) such that this call may be used by cFE TIME as the signal to generate the "time at the tone" data command. The "time at the tone" data command must arrive within the configuration parameter specified window for tone signal and data packet verification.

The MET value at the tone "should" have zero subseconds. Although the interface accepts non-zero values for sub-seconds, it may be harmful to other applications that expect zero subseconds at the moment of the tone. Any decision to use non-zero subseconds should be carefully considered.

Assumptions, External Events, and Notes:

- This routine is included in the API only when 3 specific configuration parameters are set to true. The first is CFE_PLATFORM_TIME_CFG_SERVER which defines this instantiation of cFE TIME as a time server (not a client). The second required configuration parameter is CFE_PLATFORM_TIME_CFG_SOURCE which enables time source selection commands to the cFE TIME task, and further enables configuration definitions for the selected type of external time data. The third configuration parameter required for this routine is CFE_PLATFORM_TIME_CFG_SRC_MET, which indicates that the external time data consists of MET.

Parameters

in	*NewMET*	The MET value at the next (or previous) 1 Hz tone signal.

See also

CFE_TIME_ExternalTone, CFE_TIME_ExternalGPS, CFE_TIME_ExternalTime

10.50.2.3 CFE_TIME_ExternalTime() `void CFE_TIME_ExternalTime ( CFE_TIME_SysTime_t NewTime )`

Provide the time from an external source that measures time relative to a known epoch.

Description

This routine provides a method to provide cFE TIME with current time data acquired from an external source. There is a presumption that this function will be called at the appropriate time (relative to the tone) such that this call may be used by cFE TIME as the signal to generate the "time at the tone" data command. The "time at the tone" data command must arrive within the configuration specified window for tone signal and data packet verification.

Internally, cFE TIME will calculate a new STCF as the difference between this new time value and the spacecraft MET value at the tone. This allows cFE TIME to always calculate time as the sum of MET and STCF. The value of STCF will change only as much as the drift factor between spacecraft MET and the external time source.

Assumptions, External Events, and Notes:

- This routine is included in the API only when 3 specific configuration parameters are set to true. The first is CFE_PLATFORM_TIME_CFG_SERVER which defines this instantiation of cFE TIME as a time server (not a client). The second required configuration parameter is CFE_PLATFORM_TIME_CFG_SOURCE which enables time source selection commands to the cFE TIME task, and further enables configuration definitions for the selected type of external time data. The third configuration parameter required for this routine is CFE_PLATFORM_TIME_CFG_SRC_TIME, which indicates that the external time data consists of a time value relative to a known epoch.

Parameters

in	*NewTime*	The MET value at the next (or previous) 1 Hz tone signal.

See also

CFE_TIME_ExternalTone, CFE_TIME_ExternalMET, CFE_TIME_ExternalGPS

10.50.2.4 CFE_TIME_ExternalTone()

```
void CFE_TIME_ExternalTone (
    void )
```

Provides the 1 Hz signal from an external source.

Description

This routine provides a method for cFE TIME software to be notified of the occurrence of the 1Hz tone signal without knowledge of the specific hardware design. Regardless of the source of the tone, this routine should be called as soon as possible after detection to allow cFE TIME software the opportunity to latch the local clock as close as possible to the instant of the tone.

Assumptions, External Events, and Notes:

- This routine may be called directly from within the context of an interrupt handler.

See also

CFE_TIME_ExternalMET, CFE_TIME_ExternalGPS, CFE_TIME_ExternalTime

10.50.2.5 CFE_TIME_RegisterSynchCallback()

```
CFE_Status_t CFE_TIME_RegisterSynchCallback (
    CFE_TIME_SynchCallbackPtr_t CallbackFuncPtr )
```

Registers a callback function that is called whenever time synchronization occurs.

Description

This routine passes a callback function pointer for an Application that wishes to be notified whenever a legitimate time synchronization signal (typically a 1 Hz) is received.

Assumptions, External Events, and Notes:

Only a single callback per application is supported, and this function should only be called from a single thread within each application (typically the apps main thread). If an application requires triggering multiple child tasks at 1Hz, it should distribute the timing signal internally, rather than registering for multiple callbacks.

Parameters

in	*CallbackFuncPtr*	Function to call at synchronization interval (must not be null)

Returns

Execution status, see cFE Return Code Defines

Return values

CFE_SUCCESS	Successful execution.
CFE_TIME_TOO_MANY_SYNCH_CALLBACKS	Too Many Sync Callbacks.
CFE_TIME_BAD_ARGUMENT	Bad Argument.

See also

CFE_TIME_UnregisterSynchCallback

10.50.2.6 CFE_TIME_UnregisterSynchCallback()

```
CFE_Status_t CFE_TIME_UnregisterSynchCallback (
    CFE_TIME_SynchCallbackPtr_t CallbackFuncPtr )
```

Unregisters a callback function that is called whenever time synchronization occurs.

Description

This routine removes the specified callback function pointer from the list of Callback functions that are called whenever a time synchronization (typically the 1Hz signal) is received.

Assumptions, External Events, and Notes:

Only a single callback per application is supported, and this function should only be called from a single thread within each application (typically the apps main thread).

Parameters

in	*CallbackFuncPtr*	Function to remove from synchronization call list (must not be null)

Returns

Execution status, see cFE Return Code Defines

Return values

CFE_SUCCESS	Successful execution.
CFE_TIME_CALLBACK_NOT_REGISTERED	Callback Not Registered.
CFE_TIME_BAD_ARGUMENT	Bad Argument.

See also

CFE_TIME_RegisterSynchCallback

10.51 cFE Miscellaneous Time APIs

Functions

- void CFE_TIME_Print (char *PrintBuffer, CFE_TIME_SysTime_t TimeToPrint)

  Print a time value as a string.
- void CFE_TIME_Local1HzISR (void)

  This function is called via a timer callback set up at initialization of the TIME service.

10.51.1 Detailed Description

10.51.2 Function Documentation

10.51.2.1 CFE_TIME_Local1HzISR() `void CFE_TIME_Local1HzISR ( void )`

This function is called via a timer callback set up at initialization of the TIME service.

Description

Drives the time processing logic from the system PSP layer. This must be called once per second based on a hardware interrupt or OS kernel signal.

Assumptions, External Events, and Notes:

This will update the global data structures accordingly, incrementing each by the 1Hz amount.

10.51.2.2 CFE_TIME_Print() `void CFE_TIME_Print ( char * PrintBuffer, CFE_TIME_SysTime_t TimeToPrint )`

Print a time value as a string.

Description

This routine prints the specified time to the specified string buffer in the following format:

`yyyy-ddd-hh`:mm:ss.xxxxx\0

where:

- `yyyy` = year
- `ddd` = Julian day of the year
- `hh` = hour of the day (0 to 23)
- `mm` = minute (0 to 59)
- `ss` = second (0 to 59)
- `xxxxx` = subsecond formatted as a decimal fraction (1/4 second = 0.25000)
- `\0` = trailing null

Assumptions, External Events, and Notes:

- The value of the time argument is simply added to the configuration definitions for the ground epoch and converted into a fixed length string in the buffer provided by the caller.
- A loss of data during the string conversion will occur if the computed year exceeds 9999. However, a year that large would require an unrealistic definition for the ground epoch since the maximum amount of time represented by a CFE_TIME_SysTime structure is approximately 136 years.

Parameters

out	*PrintBuffer*	Pointer to a character array (must not be null) of at least CFE_TIME_PRINTED_STRING_SIZE characters in length. ∗PrintBuffer is the time as a character string as described above.
in	*TimeToPrint*	The time to print into the character array.

10.52 cFE Resource ID base values

Enumerations

- enum {
  CFE_RESOURCEID_ES_TASKID_BASE_OFFSET = OS_OBJECT_TYPE_OS_TASK, CFE_RESOURCEID_ES_APPID_BASE_O
  = OS_OBJECT_TYPE_USER + 1, CFE_RESOURCEID_ES_LIBID_BASE_OFFSET = OS_OBJECT_TYPE_↩
  USER + 2, CFE_RESOURCEID_ES_COUNTID_BASE_OFFSET = OS_OBJECT_TYPE_USER + 3,
  CFE_RESOURCEID_ES_POOLID_BASE_OFFSET = OS_OBJECT_TYPE_USER + 4, CFE_RESOURCEID_ES_CDSBLOCKID_
  = OS_OBJECT_TYPE_USER + 5, CFE_RESOURCEID_SB_PIPEID_RESOURCE_BASE_OFFSET = OS_O↩
  BJECT_TYPE_USER + 6, CFE_RESOURCEID_CONFIGID_BASE_OFFSET = OS_OBJECT_TYPE_USER +
  7,
  CFE_RESOURCEID_TBL_VALRESULTID_BASE_OFFSET = OS_OBJECT_TYPE_USER + 8, CFE_RESOURCEID_TBL_DUMPC
  = OS_OBJECT_TYPE_USER + 9 }
- enum {
  CFE_ES_TASKID_BASE = CFE_RESOURCEID_MAKE_BASE(CFE_RESOURCEID_ES_TASKID_BASE_O↩
  FFSET), CFE_ES_APPID_BASE = CFE_RESOURCEID_MAKE_BASE(CFE_RESOURCEID_ES_APPID_BA↩
  SE_OFFSET), CFE_ES_LIBID_BASE = CFE_RESOURCEID_MAKE_BASE(CFE_RESOURCEID_ES_LIBID↩
  _BASE_OFFSET), CFE_ES_COUNTID_BASE = CFE_RESOURCEID_MAKE_BASE(CFE_RESOURCEID_E↩
  S_COUNTID_BASE_OFFSET),
  CFE_ES_POOLID_BASE = CFE_RESOURCEID_MAKE_BASE(CFE_RESOURCEID_ES_POOLID_BASE_O↩
  FFSET), CFE_ES_CDSBLOCKID_BASE = CFE_RESOURCEID_MAKE_BASE(CFE_RESOURCEID_ES_CD↩
  SBLOCKID_BASE_OFFSET), CFE_SB_PIPEID_BASE = CFE_RESOURCEID_MAKE_BASE(CFE_RESOUR↩
  CEID_SB_PIPEID_RESOURCE_BASE_OFFSET), CFE_CONFIGID_BASE = CFE_RESOURCEID_MAKE_B↩
  ASE(CFE_RESOURCEID_CONFIGID_BASE_OFFSET),
  CFE_TBL_VALRESULTID_BASE = CFE_RESOURCEID_MAKE_BASE(CFE_RESOURCEID_TBL_VALRES↩
  ULTID_BASE_OFFSET), CFE_TBL_DUMPCTRLID_BASE = CFE_RESOURCEID_MAKE_BASE(CFE_RES↩
  OURCEID_TBL_DUMPCTRLID_BASE_OFFSET) }

10.52.1 Detailed Description

10.52.2 Enumeration Type Documentation

10.52.2.1 anonymous enum `anonymous enum`

Enumerator

CFE_RESOURCEID_ES_TASKID_BASE_OFFSET	
CFE_RESOURCEID_ES_APPID_BASE_OFFSET	
CFE_RESOURCEID_ES_LIBID_BASE_OFFSET	
CFE_RESOURCEID_ES_COUNTID_BASE_OFFSET	
CFE_RESOURCEID_ES_POOLID_BASE_OFFSET	
CFE_RESOURCEID_ES_CDSBLOCKID_BASE_OFFSET	
CFE_RESOURCEID_SB_PIPEID_RESOURCE_BASE_OFFSET	
CFE_RESOURCEID_CONFIGID_BASE_OFFSET	
CFE_RESOURCEID_TBL_VALRESULTID_BASE_OFFSET	
CFE_RESOURCEID_TBL_DUMPCTRLID_BASE_OFFSET	

Definition at line 48 of file cfe_core_resourceid_basevalues.h.

10.52.2.2 anonymous enum `anonymous enum`

Enumerator

CFE_ES_TASKID_BASE	
CFE_ES_APPID_BASE	
CFE_ES_LIBID_BASE	
CFE_ES_COUNTID_BASE	
CFE_ES_POOLID_BASE	
CFE_ES_CDSBLOCKID_BASE	
CFE_SB_PIPEID_BASE	
CFE_CONFIGID_BASE	
CFE_TBL_VALRESULTID_BASE	
CFE_TBL_DUMPCTRLID_BASE	

Definition at line 85 of file cfe_core_resourceid_basevalues.h.

10.53 cFE Clock State Flag Defines

Macros

- #define CFE_TIME_FLAG_CLKSET 0x8000

  The spacecraft time has been set.
- #define CFE_TIME_FLAG_FLYING 0x4000

  This instance of Time Services is flywheeling.
- #define CFE_TIME_FLAG_SRCINT 0x2000

  The clock source is set to "internal".
- #define CFE_TIME_FLAG_SIGPRI 0x1000

  The clock signal is set to "primary".
- #define CFE_TIME_FLAG_SRVFLY 0x0800

  The Time Server is in flywheel mode.
- #define CFE_TIME_FLAG_CMDFLY 0x0400

  This instance of Time Services was commanded into flywheel mode.
- #define CFE_TIME_FLAG_ADDADJ 0x0200

  One time STCF Adjustment is to be done in positive direction.
- #define CFE_TIME_FLAG_ADD1HZ 0x0100

  1 Hz STCF Adjustment is to be done in a positive direction
- #define CFE_TIME_FLAG_ADDTCL 0x0080

  Time Client Latency is applied in a positive direction.
- #define CFE_TIME_FLAG_SERVER 0x0040

  This instance of Time Services is a Time Server.
- #define CFE_TIME_FLAG_GDTONE 0x0020

  The tone received is good compared to the last tone received.
- #define CFE_TIME_FLAG_REFERR 0x0010

  GetReference read error, will be set if unable to get a consistent ref value.
- #define CFE_TIME_FLAG_UNUSED 0x000F

  Reserved flags - should be zero.

10.53.1 Detailed Description

10.53.2 Macro Definition Documentation

10.53.2.1 CFE_TIME_FLAG_ADD1HZ `#define CFE_TIME_FLAG_ADD1HZ 0x0100`

1 Hz STCF Adjustment is to be done in a positive direction
Definition at line 44 of file default_cfe_time_msgdefs.h.

10.53.2.2 CFE_TIME_FLAG_ADDADJ `#define CFE_TIME_FLAG_ADDADJ 0x0200`

One time STCF Adjustment is to be done in positive direction.
Definition at line 43 of file default_cfe_time_msgdefs.h.

10.53.2.3 CFE_TIME_FLAG_ADDTCL `#define CFE_TIME_FLAG_ADDTCL 0x0080`

Time Client Latency is applied in a positive direction.
Definition at line 45 of file default_cfe_time_msgdefs.h.

10.53.2.4 CFE_TIME_FLAG_CLKSET `#define CFE_TIME_FLAG_CLKSET 0x8000`

The spacecraft time has been set.
Definition at line 37 of file default_cfe_time_msgdefs.h.

10.53.2.5 CFE_TIME_FLAG_CMDFLY `#define CFE_TIME_FLAG_CMDFLY 0x0400`

This instance of Time Services was commanded into flywheel mode.
Definition at line 42 of file default_cfe_time_msgdefs.h.

10.53.2.6 CFE_TIME_FLAG_FLYING `#define CFE_TIME_FLAG_FLYING 0x4000`

This instance of Time Services is flywheeling.
Definition at line 38 of file default_cfe_time_msgdefs.h.

10.53.2.7 CFE_TIME_FLAG_GDTONE `#define CFE_TIME_FLAG_GDTONE 0x0020`

The tone received is good compared to the last tone received.
Definition at line 47 of file default_cfe_time_msgdefs.h.

10.53.2.8 CFE_TIME_FLAG_REFERR `#define CFE_TIME_FLAG_REFERR 0x0010`

GetReference read error, will be set if unable to get a consistent ref value.
Definition at line 48 of file default_cfe_time_msgdefs.h.

10.53.2.9 CFE_TIME_FLAG_SERVER `#define CFE_TIME_FLAG_SERVER 0x0040`

This instance of Time Services is a Time Server.
Definition at line 46 of file default_cfe_time_msgdefs.h.

10.53.2.10 CFE_TIME_FLAG_SIGPRI `#define CFE_TIME_FLAG_SIGPRI 0x1000`

The clock signal is set to "primary".
Definition at line 40 of file default_cfe_time_msgdefs.h.

10.53.2.11 CFE_TIME_FLAG_SRCINT `#define CFE_TIME_FLAG_SRCINT 0x2000`

The clock source is set to "internal".
Definition at line 39 of file default_cfe_time_msgdefs.h.

10.53.2.12 CFE_TIME_FLAG_SRVFLY `#define CFE_TIME_FLAG_SRVFLY 0x0800`

The Time Server is in flywheel mode.
Definition at line 41 of file default_cfe_time_msgdefs.h.

10.53.2.13 CFE_TIME_FLAG_UNUSED `#define CFE_TIME_FLAG_UNUSED 0x000F`

Reserved flags - should be zero.
Definition at line 50 of file default_cfe_time_msgdefs.h.

10.54 OSAL Semaphore State Defines

Macros

- #define OS_SEM_FULL 1

  Semaphore full state.
- #define OS_SEM_EMPTY 0

  Semaphore empty state.

10.54.1 Detailed Description

10.54.2 Macro Definition Documentation

10.54.2.1 OS_SEM_EMPTY `#define OS_SEM_EMPTY 0`

Semaphore empty state.
Definition at line 35 of file osapi-binsem.h.

10.54.2.2 OS_SEM_FULL `#define OS_SEM_FULL 1`

Semaphore full state.
Definition at line 34 of file osapi-binsem.h.

10.55 OSAL Binary Semaphore APIs

Functions

- int32 OS_BinSemCreate (osal_id_t *sem_id, const char *sem_name, uint32 sem_initial_value, uint32 options)

  Creates a binary semaphore.
- int32 OS_BinSemFlush (osal_id_t sem_id)

  Unblock all tasks pending on the specified semaphore.
- int32 OS_BinSemGive (osal_id_t sem_id)

  Increment the semaphore value.
- int32 OS_BinSemTake (osal_id_t sem_id)

  Decrement the semaphore value.
- int32 OS_BinSemTimedWait (osal_id_t sem_id, uint32 msecs)

  Decrement the semaphore value with a timeout.
- int32 OS_BinSemDelete (osal_id_t sem_id)

  Deletes the specified Binary Semaphore.
- int32 OS_BinSemGetIdByName (osal_id_t *sem_id, const char *sem_name)

  Find an existing semaphore ID by name.
- int32 OS_BinSemGetInfo (osal_id_t sem_id, OS_bin_sem_prop_t *bin_prop)

  Fill a property object buffer with details regarding the resource.

10.55.1 Detailed Description

10.55.2 Function Documentation

10.55.2.1 OS_BinSemCreate()

```
int32 OS_BinSemCreate (
    osal_id_t * sem_id,
    const char * sem_name,
    uint32 sem_initial_value,
    uint32 options )
```

Creates a binary semaphore.

Creates a binary semaphore with initial value specified by sem_initial_value and name specified by sem_name. sem_id will be returned to the caller

Parameters

out	*sem_id*	will be set to the non-zero ID of the newly-created resource (must not be null)
in	*sem_name*	the name of the new resource to create (must not be null)
in	*sem_initial_value*	the initial value of the binary semaphore
in	*options*	Reserved for future use, should be passed as 0.

Returns

Execution status, see OSAL Return Code Defines

Return values

OS_SUCCESS	Successful execution.
OS_INVALID_POINTER	if sen name or sem_id are NULL

Return values

OS_ERR_NAME_TOO_LONG	name length including null terminator greater than OS_MAX_API_NAME
OS_ERR_NO_FREE_IDS	if all of the semaphore ids are taken
OS_ERR_NAME_TAKEN	if this is already the name of a binary semaphore
OS_SEM_FAILURE	if the OS call failed (return value only verified in coverage test)

10.55.2.2 OS_BinSemDelete()

```
int32 OS_BinSemDelete (
    osal_id_t sem_id )
```

Deletes the specified Binary Semaphore.
This is the function used to delete a binary semaphore in the operating system. This also frees the respective sem_id to be used again when another semaphore is created.

Parameters

in	*sem↩ _id*	The object ID to delete

Returns

Execution status, see OSAL Return Code Defines

Return values

OS_SUCCESS	Successful execution.
OS_ERR_INVALID_ID	if the id passed in is not a valid binary semaphore
OS_SEM_FAILURE	if an unspecified failure occurs (return value only verified in coverage test)

10.55.2.3 OS_BinSemFlush()

```
int32 OS_BinSemFlush (
    osal_id_t sem_id )
```

Unblock all tasks pending on the specified semaphore.
The function unblocks all tasks pending on the specified semaphore. However, this function does not change the state of the semaphore.

Parameters

in	*sem↩ _id*	The object ID to operate on

Returns

Execution status, see OSAL Return Code Defines

Return values

OS_SUCCESS	Successful execution.

Return values

OS_ERR_INVALID_ID	if the id passed in is not a binary semaphore
OS_SEM_FAILURE	if an unspecified failure occurs (return value only verified in coverage test)

10.55.2.4 OS_BinSemGetIdByName()

```
int32 OS_BinSemGetIdByName (
    osal_id_t * sem_id,
    const char * sem_name )
```

Find an existing semaphore ID by name.

This function tries to find a binary sem Id given the name of a bin_sem The id is returned through sem_id

Parameters

out	*sem_id*	will be set to the ID of the existing resource
in	*sem_name*	the name of the existing resource to find (must not be null)

Returns

Execution status, see OSAL Return Code Defines

Return values

OS_SUCCESS	Successful execution.
OS_INVALID_POINTER	is semid or sem_name are NULL pointers
OS_ERR_NAME_TOO_LONG	name length including null terminator greater than OS_MAX_API_NAME
OS_ERR_NAME_NOT_FOUND	if the name was not found in the table

10.55.2.5 OS_BinSemGetInfo()

```
int32 OS_BinSemGetInfo (
    osal_id_t sem_id,
    OS_bin_sem_prop_t * bin_prop )
```

Fill a property object buffer with details regarding the resource.

This function will pass back a pointer to structure that contains all of the relevant info(name and creator) about the specified binary semaphore.

Parameters

in	*sem_id*	The object ID to operate on
out	*bin_prop*	The property object buffer to fill (must not be null)

Returns

Execution status, see OSAL Return Code Defines

Return values

OS_SUCCESS	Successful execution.

Return values

OS_ERR_INVALID_ID	if the id passed in is not a valid semaphore
OS_INVALID_POINTER	if the bin_prop pointer is null
OS_ERR_NOT_IMPLEMENTED	Not implemented.

10.55.2.6 OS_BinSemGive()

```
int32 OS_BinSemGive (
    osal_id_t sem_id )
```

Increment the semaphore value.

The function unlocks the semaphore referenced by sem_id by performing a semaphore unlock operation on that semaphore. If the semaphore value resulting from this operation is positive, then no threads were blocked waiting for the semaphore to become unlocked; the semaphore value is simply incremented for this semaphore.

Parameters

in	*sem↩ _id*	The object ID to operate on

Returns

Execution status, see OSAL Return Code Defines

Return values

OS_SUCCESS	Successful execution.
OS_ERR_INVALID_ID	if the id passed in is not a binary semaphore
OS_SEM_FAILURE	if an unspecified failure occurs (return value only verified in coverage test)

10.55.2.7 OS_BinSemTake()

```
int32 OS_BinSemTake (
    osal_id_t sem_id )
```

Decrement the semaphore value.

The locks the semaphore referenced by sem_id by performing a semaphore lock operation on that semaphore. If the semaphore value is currently zero, then the calling thread shall not return from the call until it either locks the semaphore or the call is interrupted.

Parameters

in	*sem↩ _id*	The object ID to operate on

Returns

Execution status, see OSAL Return Code Defines

Return values

OS_SUCCESS	Successful execution.

Return values

OS_ERR_INVALID_ID	the Id passed in is not a valid binary semaphore
OS_SEM_FAILURE	if an unspecified failure occurs (return value only verified in coverage test)

10.55.2.8 OS_BinSemTimedWait()

```
int32 OS_BinSemTimedWait (
    osal_id_t sem_id,
    uint32 msecs )
```

Decrement the semaphore value with a timeout.

The function locks the semaphore referenced by sem_id. However, if the semaphore cannot be locked without waiting for another process or thread to unlock the semaphore, this wait shall be terminated when the specified timeout, msecs, expires.

Parameters

in	*sem↩ _id*	The object ID to operate on
in	*msecs*	The maximum amount of time to block, in milliseconds

Returns

Execution status, see OSAL Return Code Defines

Return values

OS_SUCCESS	Successful execution.
OS_SEM_TIMEOUT	if semaphore was not relinquished in time
OS_ERR_INVALID_ID	if the ID passed in is not a valid semaphore ID
OS_SEM_FAILURE	if an unspecified failure occurs (return value only verified in coverage test)

10.56 OSAL BSP low level access APIs

These are for OSAL internal BSP information access to pass any BSP-specific boot/command line/startup arguments through to the application, and return a status code back to the OS after exit.

Functions

- void OS_BSP_SetResourceTypeConfig (uint32 ResourceType, uint32 ConfigOptionValue)
- uint32 OS_BSP_GetResourceTypeConfig (uint32 ResourceType)
- uint32 OS_BSP_GetArgC (void)
- char ∗const ∗ OS_BSP_GetArgV (void)
- void OS_BSP_SetExitCode (int32 code)

10.56.1 Detailed Description

These are for OSAL internal BSP information access to pass any BSP-specific boot/command line/startup arguments through to the application, and return a status code back to the OS after exit.
Not intended for user application use

10.56.2 Function Documentation

10.56.2.1 OS_BSP_GetArgC()

```
uint32 OS_BSP_GetArgC (
    void )
```

10.56.2.2 OS_BSP_GetArgV()

```
char* const * OS_BSP_GetArgV (
    void )
```

10.56.2.3 OS_BSP_GetResourceTypeConfig()

```
uint32 OS_BSP_GetResourceTypeConfig (
    uint32 ResourceType )
```

10.56.2.4 OS_BSP_SetExitCode()

```
void OS_BSP_SetExitCode (
    int32 code )
```

10.56.2.5 OS_BSP_SetResourceTypeConfig()

```
void OS_BSP_SetResourceTypeConfig (
    uint32 ResourceType,
    uint32 ConfigOptionValue )
```

10.57 OSAL Real Time Clock APIs

Functions

- int32 OS_GetLocalTime (OS_time_t *time_struct)

  Get the local time.
- int32 OS_SetLocalTime (const OS_time_t *time_struct)

  Set the local time.
- OS_time_t OS_TimeFromRelativeMilliseconds (int32 relative_msec)

  Gets an absolute time value relative to the current time.
- int32 OS_TimeToRelativeMilliseconds (OS_time_t time)

  Gets a relative time value from an absolute time.
- static int64 OS_TimeGetTotalSeconds (OS_time_t tm)

  Get interval from an OS_time_t object normalized to whole number of seconds.
- static OS_time_t OS_TimeFromTotalSeconds (int64 tm)

  Get an OS_time_t interval object from an integer number of seconds.
- static int64 OS_TimeGetTotalMilliseconds (OS_time_t tm)

  Get interval from an OS_time_t object normalized to millisecond units.
- static OS_time_t OS_TimeFromTotalMilliseconds (int64 tm)

  Get an OS_time_t interval object from a integer number of milliseconds.
- static int64 OS_TimeGetTotalMicroseconds (OS_time_t tm)

  Get interval from an OS_time_t object normalized to microsecond units.
- static OS_time_t OS_TimeFromTotalMicroseconds (int64 tm)

  Get an OS_time_t interval object from a integer number of microseconds.
- static int64 OS_TimeGetTotalNanoseconds (OS_time_t tm)

  Get interval from an OS_time_t object normalized to nanosecond units.
- static OS_time_t OS_TimeFromTotalNanoseconds (int64 tm)

  Get an OS_time_t interval object from a integer number of nanoseconds.
- static int64 OS_TimeGetFractionalPart (OS_time_t tm)

  Get subseconds portion (fractional part only) from an OS_time_t object.
- static uint32 OS_TimeGetSubsecondsPart (OS_time_t tm)

  Get 32-bit normalized subseconds (fractional part only) from an OS_time_t object.
- static uint32 OS_TimeGetMillisecondsPart (OS_time_t tm)

  Get milliseconds portion (fractional part only) from an OS_time_t object.
- static uint32 OS_TimeGetMicrosecondsPart (OS_time_t tm)

  Get microseconds portion (fractional part only) from an OS_time_t object.
- static uint32 OS_TimeGetNanosecondsPart (OS_time_t tm)

  Get nanoseconds portion (fractional part only) from an OS_time_t object.
- static OS_time_t OS_TimeAssembleFromNanoseconds (int64 seconds, uint32 nanoseconds)

  Assemble/Convert a number of seconds + nanoseconds into an OS_time_t interval.
- static OS_time_t OS_TimeAssembleFromMicroseconds (int64 seconds, uint32 microseconds)

  Assemble/Convert a number of seconds + microseconds into an OS_time_t interval.
- static OS_time_t OS_TimeAssembleFromMilliseconds (int64 seconds, uint32 milliseconds)

  Assemble/Convert a number of seconds + milliseconds into an OS_time_t interval.
- static OS_time_t OS_TimeAssembleFromSubseconds (int64 seconds, uint32 subseconds)

  Assemble/Convert a number of seconds + subseconds into an OS_time_t interval.
- static OS_time_t OS_TimeAdd (OS_time_t time1, OS_time_t time2)

  Computes the sum of two time intervals.

- static OS_time_t OS_TimeSubtract (OS_time_t time1, OS_time_t time2)

  Computes the difference between two time intervals.
- static bool OS_TimeEqual (OS_time_t time1, OS_time_t time2)

  Checks if two time values are equal.
- static int8_t OS_TimeGetSign (OS_time_t time)

  Checks the sign of the time value.
- static int8_t OS_TimeCompare (OS_time_t time1, OS_time_t time2)

  Compares two time values.

10.57.1 Detailed Description

10.57.2 Function Documentation

10.57.2.1 OS_GetLocalTime()

```
int32 OS_GetLocalTime (
    OS_time_t * time_struct )
```

Get the local time.
This function gets the local time from the underlying OS.

Note

Mission time management typically uses the cFE Time Service

Parameters

out	*time_struct*	An OS_time_t that will be set to the current time (must not be null)

Returns

Get local time status, see OSAL Return Code Defines

Return values

OS_SUCCESS	Successful execution.
OS_INVALID_POINTER	if time_struct is null

10.57.2.2 OS_SetLocalTime()

```
int32 OS_SetLocalTime (
    const OS_time_t * time_struct )
```

Set the local time.
This function sets the local time on the underlying OS.

Note

Mission time management typically uses the cFE Time Services

Parameters

in	*time_struct*	An OS_time_t containing the current time (must not be null)

Returns

Set local time status, see OSAL Return Code Defines

Return values

OS_SUCCESS	Successful execution.
OS_INVALID_POINTER	if time_struct is null

10.57.2.3 OS_TimeAdd()

```
static OS_time_t OS_TimeAdd (
    OS_time_t time1,
    OS_time_t time2 ) [inline], [static]
```

Computes the sum of two time intervals.

Parameters

in	*time1*	The first interval
in	*time2*	The second interval

Returns

The sum of the two intervals (time1 + time2)

Definition at line 530 of file osapi-clock.h.
References OS_time_t::ticks.

10.57.2.4 OS_TimeAssembleFromMicroseconds()

```
static OS_time_t OS_TimeAssembleFromMicroseconds (
    int64 seconds,
    uint32 microseconds ) [inline], [static]
```

Assemble/Convert a number of seconds + microseconds into an OS_time_t interval.
This creates an OS_time_t value using a whole number of seconds and a fractional part in units of microseconds. This is the inverse of OS_TimeGetTotalSeconds() and OS_TimeGetMicrosecondsPart(), and should recreate the original OS_time_t value from these separate values (aside from any potential conversion losses due to limited resolution of the data types/units).

See also

OS_TimeGetTotalSeconds(), OS_TimeGetMicrosecondsPart()

Parameters

in	*seconds*	Whole number of seconds
in	*microseconds*	Number of microseconds (fractional part only)

Returns

The input arguments represented as an OS_time_t interval

Definition at line 465 of file osapi-clock.h.
References OS_TIME_TICKS_PER_SECOND, OS_TIME_TICKS_PER_USEC, and OS_time_t::ticks.

10.57.2.5 OS_TimeAssembleFromMilliseconds()

```
static OS_time_t OS_TimeAssembleFromMilliseconds (
    int64 seconds,
    uint32 milliseconds ) [inline], [static]
```

Assemble/Convert a number of seconds + milliseconds into an OS_time_t interval.

This creates an OS_time_t value using a whole number of seconds and a fractional part in units of milliseconds. This is the inverse of OS_TimeGetTotalSeconds() and OS_TimeGetMillisecondsPart(), and should recreate the original OS_time_t value from these separate values (aside from any potential conversion losses due to limited resolution of the data types/units).

See also

OS_TimeGetTotalSeconds(), OS_TimeGetMillisecondsPart()

Parameters

in	*seconds*	Whole number of seconds
in	*milliseconds*	Number of milliseconds (fractional part only)

Returns

The input arguments represented as an OS_time_t interval

Definition at line 489 of file osapi-clock.h.

References OS_TIME_TICKS_PER_MSEC, OS_TIME_TICKS_PER_SECOND, and OS_time_t::ticks.

10.57.2.6 OS_TimeAssembleFromNanoseconds()

```
static OS_time_t OS_TimeAssembleFromNanoseconds (
    int64 seconds,
    uint32 nanoseconds ) [inline], [static]
```

Assemble/Convert a number of seconds + nanoseconds into an OS_time_t interval.

This creates an OS_time_t value using a whole number of seconds and a fractional part in units of nanoseconds. This is the inverse of OS_TimeGetTotalSeconds() and OS_TimeGetNanosecondsPart(), and should recreate the original OS_time_t value from these separate values (aside from any potential conversion losses due to limited resolution of the data types/units).

See also

OS_TimeGetTotalSeconds(), OS_TimeGetNanosecondsPart()

Parameters

in	*seconds*	Whole number of seconds
in	*nanoseconds*	Number of nanoseconds (fractional part only)

Returns

The input arguments represented as an OS_time_t interval

Definition at line 441 of file osapi-clock.h.

References OS_TIME_TICK_RESOLUTION_NS, OS_TIME_TICKS_PER_SECOND, and OS_time_t::ticks.

10.57.2.7 OS_TimeAssembleFromSubseconds()

```
static OS_time_t OS_TimeAssembleFromSubseconds (
    int64 seconds,
```

```
uint32 subseconds ) [inline], [static]
```

Assemble/Convert a number of seconds + subseconds into an OS_time_t interval.
This creates an OS_time_t value using a whole number of seconds and a fractional part in units of sub-seconds (1/2^32). This is the inverse of OS_TimeGetTotalSeconds() and OS_TimeGetSubsecondsPart(), and should recreate the original OS_time_t value from these separate values (aside from any potential conversion losses due to limited resolution of the data types/units).

See also

OS_TimeGetTotalSeconds(), OS_TimeGetNanosecondsPart()

Parameters

in	*seconds*	Whole number of seconds
in	*subseconds*	Number of subseconds (32 bit fixed point fractional part)

Returns

The input arguments represented as an OS_time_t interval

Definition at line 512 of file osapi-clock.h.
References OS_TIME_TICKS_PER_SECOND, and OS_time_t::ticks.

10.57.2.8 OS_TimeCompare()

```
static int8_t OS_TimeCompare (
    OS_time_t time1,
    OS_time_t time2 ) [inline], [static]
```

Compares two time values.

Parameters

in	*time1*	The first time
in	*time2*	The second time

Return values

-1	if the time1 < time2
0	if the times are equal
1	if the time1 > time2

Definition at line 592 of file osapi-clock.h.
References OS_TimeGetSign(), and OS_TimeSubtract().

Here is the call graph for this function:

10.57.2.9 OS_TimeEqual()

```
static bool OS_TimeEqual (
    OS_time_t time1,
    OS_time_t time2 ) [inline], [static]
```

Checks if two time values are equal.

Parameters

in	*time1*	The first time value
in	*time2*	The second time value

Return values

true	if the two values are equal
false	if the two values are not equal

Definition at line 561 of file osapi-clock.h.
References OS_time_t::ticks.

10.57.2.10 OS_TimeFromRelativeMilliseconds()

```
OS_time_t OS_TimeFromRelativeMilliseconds (
    int32 relative_msec )
```

Gets an absolute time value relative to the current time.
This function adds the given interval, expressed in milliseconds, to the current clock and returns the result.

Note

This is intended to ease transitioning from a relative timeout value to and absolute timeout value. The result can be passed to any function that accepts an absolute timeout, to mimic the behavior of a relative timeout.

Parameters

in	*relative_msec*	A relative time interval, in milliseconds

Returns

Absolute time value after adding interval

10.57.2.11 OS_TimeFromTotalMicroseconds()

`static OS_time_t OS_TimeFromTotalMicroseconds ( int64 tm ) [inline], [static]`

Get an OS_time_t interval object from a integer number of microseconds.
This is the inverse operation of OS_TimeGetTotalMicroseconds(), converting the total number of microseconds into an OS_time_t value.

See also

OS_TimeGetTotalMicroseconds()

Parameters

in	*tm*	Time interval value, in microseconds

Returns

OS_time_t value representing the interval

Definition at line 278 of file osapi-clock.h.
References OS_TIME_TICKS_PER_USEC.

10.57.2.12 OS_TimeFromTotalMilliseconds()

`static OS_time_t OS_TimeFromTotalMilliseconds ( int64 tm ) [inline], [static]`

Get an OS_time_t interval object from a integer number of milliseconds.
This is the inverse operation of OS_TimeGetTotalMilliseconds(), converting the total number of milliseconds into an OS_time_t value.

See also

OS_TimeGetTotalMilliseconds()

Parameters

in	*tm*	Time interval value, in milliseconds

Returns

OS_time_t value representing the interval

Definition at line 244 of file osapi-clock.h.
References OS_TIME_TICKS_PER_MSEC.

10.57.2.13 OS_TimeFromTotalNanoseconds()

`static OS_time_t OS_TimeFromTotalNanoseconds ( int64 tm ) [inline], [static]`

Get an OS_time_t interval object from a integer number of nanoseconds.
This is the inverse operation of OS_TimeGetTotalNanoseconds(), converting the total number of nanoseconds into an OS_time_t value.

See also

OS_TimeGetTotalNanoseconds()

Parameters

in	*tm*	Time interval value, in nanoseconds

Returns

OS_time_t value representing the interval

Definition at line 317 of file osapi-clock.h.
References OS_TIME_TICK_RESOLUTION_NS.

10.57.2.14 OS_TimeFromTotalSeconds()

```
static OS_time_t OS_TimeFromTotalSeconds ( int64 tm ) [inline], [static]
```

Get an OS_time_t interval object from an integer number of seconds.
This is the inverse operation of OS_TimeGetTotalSeconds(), converting the total number of seconds into an OS_time_t value.

See also

OS_TimeGetTotalSeconds()

Parameters

in	*tm*	Time interval value, in seconds

Returns

OS_time_t value representing the interval

Definition at line 210 of file osapi-clock.h.
References OS_TIME_TICKS_PER_SECOND.

10.57.2.15 OS_TimeGetFractionalPart()

```
static int64 OS_TimeGetFractionalPart ( OS_time_t tm ) [inline], [static]
```

Get subseconds portion (fractional part only) from an OS_time_t object.
Extracts the fractional part from a given OS_time_t object. Units returned are in ticks, not normalized to any standard time unit.

Parameters

in	*tm*	Time interval value

Returns

Fractional/subsecond portion of time interval in ticks

Definition at line 333 of file osapi-clock.h.
References OS_TIME_TICKS_PER_SECOND, and OS_time_t::ticks.

Referenced by OS_TimeGetMicrosecondsPart(), OS_TimeGetMillisecondsPart(), OS_TimeGetNanosecondsPart(), and OS_TimeGetSubsecondsPart().

10.57.2.16 OS_TimeGetMicrosecondsPart()

```
static uint32 OS_TimeGetMicrosecondsPart ( OS_time_t tm ) [inline], [static]
```

Get microseconds portion (fractional part only) from an OS_time_t object.
Extracts the fractional part from a given OS_time_t object normalized to units of microseconds.
This function may be used to adapt applications initially implemented using an older OSAL version where OS_time_t was a structure containing a "seconds" and "microsecs" field.
This function will obtain a value that is compatible with the "microsecs" field of OS_time_t as it was defined in previous versions of OSAL, as well as the "tv_usec" field of POSIX-style "struct timeval" values.

See also

OS_TimeGetTotalSeconds()

Parameters

in	*tm*	Time interval value

Returns

Number of microseconds in time interval

Definition at line 401 of file osapi-clock.h.
References OS_TIME_TICKS_PER_USEC, and OS_TimeGetFractionalPart().
Here is the call graph for this function:

10.57.2.17 OS_TimeGetMillisecondsPart()

```
static uint32 OS_TimeGetMillisecondsPart ( OS_time_t tm ) [inline], [static]
```

Get milliseconds portion (fractional part only) from an OS_time_t object.
Extracts the fractional part from a given OS_time_t object normalized to units of milliseconds.

See also

OS_TimeGetTotalSeconds()

Parameters

in	*tm*	Time interval value

Returns

Number of milliseconds in time interval

Definition at line 376 of file osapi-clock.h.
References OS_TIME_TICKS_PER_MSEC, and OS_TimeGetFractionalPart().
Here is the call graph for this function:

10.57.2.18 OS_TimeGetNanosecondsPart()

```
static uint32 OS_TimeGetNanosecondsPart ( OS_time_t tm ) [inline], [static]
```

Get nanoseconds portion (fractional part only) from an OS_time_t object.
Extracts the only number of nanoseconds from a given OS_time_t object.
This function will obtain a value that is compatible with the "tv_nsec" field of POSIX-style "struct timespec" values.

See also

OS_TimeGetTotalSeconds()

Parameters

in	*tm*	Time interval value

Returns

Number of nanoseconds in time interval

Definition at line 420 of file osapi-clock.h.
References OS_TIME_TICK_RESOLUTION_NS, and OS_TimeGetFractionalPart().
Here is the call graph for this function:

10.57.2.19 OS_TimeGetSign()

```
static int8_t OS_TimeGetSign ( OS_time_t time ) [inline], [static]
```

Checks the sign of the time value.

Parameters

in	*time*	The time to check

Return values

-1	if the time value is negative / below 0
0	if the time value is 0
1	if the time value is positive / above 0

Definition at line 576 of file osapi-clock.h.
References OS_time_t::ticks.
Referenced by OS_TimeCompare().

10.57.2.20 OS_TimeGetSubsecondsPart()

`static uint32 OS_TimeGetSubsecondsPart ( OS_time_t tm ) [inline], [static]`

Get 32-bit normalized subseconds (fractional part only) from an OS_time_t object.
Extracts the fractional part from a given OS_time_t object in maximum precision, with units of 2^(-32) sec. This is a base-2 fixed-point fractional value with the point left-justified in the 32-bit value (i.e. left of MSB).
This is (mostly) compatible with the CFE "subseconds" value, where 0x80000000 represents exactly one half second, and 0 represents a full second.

Parameters

in	*tm*	Time interval value

Returns

Fractional/subsecond portion of time interval as 32-bit fixed point value

Definition at line 352 of file osapi-clock.h.
References OS_TIME_TICKS_PER_SECOND, and OS_TimeGetFractionalPart().
Here is the call graph for this function:

10.57.2.21 OS_TimeGetTotalMicroseconds()

`static int64 OS_TimeGetTotalMicroseconds ( OS_time_t tm ) [inline], [static]`

Get interval from an OS_time_t object normalized to microsecond units.
Note this refers to the complete interval, not just the fractional part.

See also

OS_TimeFromTotalMicroseconds()

Parameters

in	*tm*	Time interval value

Returns

Whole number of microseconds in time interval

Definition at line 261 of file osapi-clock.h.
References OS_TIME_TICKS_PER_USEC, and OS_time_t::ticks.

10.57.2.22 OS_TimeGetTotalMilliseconds()

```
static int64 OS_TimeGetTotalMilliseconds ( OS_time_t tm ) [inline], [static]
```

Get interval from an OS_time_t object normalized to millisecond units.
Note this refers to the complete interval, not just the fractional part.

See also

OS_TimeFromTotalMilliseconds()

Parameters

in	*tm*	Time interval value

Returns

Whole number of milliseconds in time interval

Definition at line 227 of file osapi-clock.h.
References OS_TIME_TICKS_PER_MSEC, and OS_time_t::ticks.

10.57.2.23 OS_TimeGetTotalNanoseconds()

```
static int64 OS_TimeGetTotalNanoseconds ( OS_time_t tm ) [inline], [static]
```

Get interval from an OS_time_t object normalized to nanosecond units.
Note this refers to the complete interval, not just the fractional part.

Note

There is no protection against overflow of the 64-bit return value. Applications must use caution to ensure that the interval does not exceed the representable range of a signed 64 bit integer - approximately 140 years.

See also

OS_TimeFromTotalNanoseconds

Parameters

in	*tm*	Time interval value

Returns

Whole number of microseconds in time interval

Definition at line 300 of file osapi-clock.h.
References OS_TIME_TICK_RESOLUTION_NS, and OS_time_t::ticks.

10.57.2.24 OS_TimeGetTotalSeconds()

```
static int64 OS_TimeGetTotalSeconds ( OS_time_t tm ) [inline], [static]
```

Get interval from an OS_time_t object normalized to whole number of seconds.
Extracts the number of whole seconds from a given OS_time_t object, discarding any fractional component.
This may also replace a direct read of the "seconds" field from the OS_time_t object from previous versions of OSAL, where the structure was defined with separate seconds/microseconds fields.

See also

OS_TimeGetMicrosecondsPart()

OS_TimeFromTotalSeconds()

Parameters

in	*tm*	Time interval value

Returns

Whole number of seconds in time interval

Definition at line 193 of file osapi-clock.h.
References OS_TIME_TICKS_PER_SECOND, and OS_time_t::ticks.

10.57.2.25 OS_TimeSubtract()

```
static OS_time_t OS_TimeSubtract ( OS_time_t time1, OS_time_t time2 ) [inline], [static]
```

Computes the difference between two time intervals.

Parameters

in	*time1*	The first interval
in	*time2*	The second interval

Returns

The difference of the two intervals (time1 - time2)

Definition at line 545 of file osapi-clock.h.
References OS_time_t::ticks.
Referenced by OS_TimeCompare().

10.57.2.26 OS_TimeToRelativeMilliseconds()

```
int32 OS_TimeToRelativeMilliseconds ( OS_time_t time )
```

Gets a relative time value from an absolute time.
This function computes the number of milliseconds until the given absolute time value is reached in the system clock.

Note

This is intended to ease transitioning from a relative timeout value to and absolute timeout value. The result can be passed to any function that accepts a relative timeout, to mimic the behavior of an absolute timeout.

The return value of this function is intended to be compatible with the relative timeout parameter of various OSAL APIs e.g. OS_TimedRead() / OS_TimedWrite()

Parameters

in	*time*	An absolute time value

Returns

Milliseconds until time value will be reached

Return values

OS_CHECK	(0) if time is the current time or is in the past
OS_PEND	(-1) if time is far in the future (not expressable as an int32)

10.58 OSAL Core Operation APIs

These are for OSAL core operations for startup/initialization, running, and shutdown. Typically only used in bsps, unit tests, psps, etc.

Functions

- void OS_Application_Startup (void)

  Application startup.
- void OS_Application_Run (void)

  Application run.
- int32 OS_API_Init (void)

  Initialization of API.
- void OS_API_Teardown (void)

  Teardown/de-initialization of OSAL API.
- void OS_IdleLoop (void)

  Background thread implementation - waits forever for events to occur.
- void OS_DeleteAllObjects (void)

  delete all resources created in OSAL.
- void OS_ApplicationShutdown (uint8 flag)

  Initiate orderly shutdown.
- void OS_ApplicationExit (int32 Status)

  Exit/Abort the application.
- int32 OS_RegisterEventHandler (OS_EventHandler_t handler)

  Callback routine registration.
- size_t OS_strnlen (const char *s, size_t maxlen)

  get string length

10.58.1 Detailed Description

These are for OSAL core operations for startup/initialization, running, and shutdown. Typically only used in bsps, unit tests, psps, etc.
Not intended for user application use

10.58.2 Function Documentation

10.58.2.1 OS_API_Init() `int32 OS_API_Init ( void )`

Initialization of API.
This function returns initializes the internal data structures of the OS Abstraction Layer. It must be called in the application startup code before calling any other OS routines.

Returns

Execution status, see OSAL Return Code Defines. Any error code (negative) means the OSAL can not be initialized. Typical platform specific response is to abort since additional OSAL calls will have undefined behavior.

Return values

OS_SUCCESS	Successful execution.
OS_ERROR	Failed execution. (return value only verified in coverage test)

10.58.2.2 OS_API_Teardown()

```
void OS_API_Teardown (
    void )
```

Teardown/de-initialization of OSAL API.
This is the inverse of OS_API_Init(). It will release all OS resources and return the system to a state similar to what it was prior to invoking OS_API_Init() initially.
Normally for embedded applications, the OSAL is initialized after boot and will remain initialized in memory until the processor is rebooted. However for testing and development purposes, it is potentially useful to reset back to initial conditions.
For testing purposes, this API is designed/intended to be compatible with the UtTest_AddTeardown() routine provided by the UT-Assert subsystem.

Note

This is a "best-effort" routine and it may not always be possible/guaranteed to recover all resources, particularly in the case of off-nominal conditions, or if a resource is used outside of OSAL.

For example, while this will attempt to unload all dynamically-loaded modules, doing so may not be possible and/or may induce undefined behavior if resources are in use by tasks/functions outside of OSAL.

10.58.2.3 OS_Application_Run()

```
void OS_Application_Run (
    void )
```

Application run.
Run abstraction such that the same BSP can be used for operations and testing.

10.58.2.4 OS_Application_Startup()

```
void OS_Application_Startup (
    void )
```

Application startup.
Startup abstraction such that the same BSP can be used for operations and testing.

10.58.2.5 OS_ApplicationExit()

```
void OS_ApplicationExit (
    int32 Status )
```

Exit/Abort the application.
Indicates that the OSAL application should exit and return control to the OS This is intended for e.g. scripted unit testing where the test needs to end without user intervention.
This function does not return. Production code typically should not ever call this.

Note

This exits the entire process including tasks that have been created.

10.58.2.6 OS_ApplicationShutdown()

```
void OS_ApplicationShutdown (
    uint8 flag )
```

Initiate orderly shutdown.
Indicates that the OSAL application should perform an orderly shutdown of ALL tasks, clean up all resources, and exit the application.
This allows the task currently blocked in OS_IdleLoop() to wake up, and for that function to return to its caller.
This is preferred over e.g. OS_ApplicationExit() which exits immediately and does not provide for any means to clean up first.

Parameters

in	*flag*	set to true to initiate shutdown, false to cancel

10.58.2.7 OS_DeleteAllObjects()

```
void OS_DeleteAllObjects (
    void )
```

delete all resources created in OSAL.
provides a means to clean up all resources allocated by this instance of OSAL. It would typically be used during an orderly shutdown but may also be helpful for testing purposes.

10.58.2.8 OS_IdleLoop()

```
void OS_IdleLoop (
    void )
```

Background thread implementation - waits forever for events to occur.
This should be called from the BSP main routine or initial thread after all other board and application initialization has taken place and all other tasks are running.
Typically just waits forever until "OS_shutdown" flag becomes true.

10.58.2.9 OS_RegisterEventHandler()

```
int32 OS_RegisterEventHandler (
    OS_EventHandler_t handler )
```

Callback routine registration.
This hook enables the application code to perform extra platform-specific operations on various system events such as resource creation/deletion.

Note

Some events are invoked while the resource is "locked" and therefore application-defined handlers for these events should not block or attempt to access other OSAL resources.

Parameters

in	*handler*	The application-provided event handler (must not be null)

Returns

Execution status, see OSAL Return Code Defines.

Return values

OS_SUCCESS	Successful execution.
OS_INVALID_POINTER	if handler is NULL

10.58.2.10 OS_strnlen()

```
size_t OS_strnlen (
    const char * s,
    size_t maxlen )
```

get string length
Provides an OSAL routine to get the functionality of the (non-C99) "strnlen()" function, via the C89/C99 standard "memchr()" function instead.

Parameters

in	*s*	The input string
in	*maxlen*	Maximum length to check

Return values

Length	of the string or maxlen, whichever is smaller.

Referenced by CF_CFDP_SendMd(), and CF_WriteHistoryEntryToFile().

10.59 OSAL Condition Variable APIs

Functions

- int32 OS_CondVarCreate (osal_id_t *var_id, const char *var_name, uint32 options)

  Creates a condition variable resource.
- int32 OS_CondVarLock (osal_id_t var_id)

  Locks/Acquires the underlying mutex associated with a condition variable.
- int32 OS_CondVarUnlock (osal_id_t var_id)

  Unlocks/Releases the underlying mutex associated with a condition variable.
- int32 OS_CondVarSignal (osal_id_t var_id)

  Signals the condition variable resource referenced by var_id.
- int32 OS_CondVarBroadcast (osal_id_t var_id)

  Broadcasts the condition variable resource referenced by var_id.
- int32 OS_CondVarWait (osal_id_t var_id)

  Waits on the condition variable object referenced by var_id.
- int32 OS_CondVarTimedWait (osal_id_t var_id, const OS_time_t *abs_wakeup_time)

  Time-limited wait on the condition variable object referenced by var_id.
- int32 OS_CondVarDelete (osal_id_t var_id)

  Deletes the specified condition variable.
- int32 OS_CondVarGetIdByName (osal_id_t *var_id, const char *var_name)

  Find an existing condition variable ID by name.
- int32 OS_CondVarGetInfo (osal_id_t var_id, OS_condvar_prop_t *condvar_prop)

  Fill a property object buffer with details regarding the resource.

10.59.1 Detailed Description

10.59.2 Function Documentation

10.59.2.1 OS_CondVarBroadcast() `int32 OS_CondVarBroadcast ( osal_id_t var_id )`

Broadcasts the condition variable resource referenced by var_id.
This function may be used to indicate when the state of a data object has been changed.
If there are threads blocked on the condition variable object referenced by var_id when this function is called, all threads will be unblocked.
Note that although all threads are unblocked, because the mutex is re-acquired before the wait function returns, only a single task will be testing the condition at a given time. The order with which each blocked task runs is determined by the scheduling policy.

Parameters

in	*var_id*	The object ID to operate on

Returns

Execution status, see OSAL Return Code Defines

Return values

OS_SUCCESS	Successful execution.
OS_ERR_INVALID_ID	if the id passed in is not a valid condition variable

10.59.2.2 OS_CondVarCreate()

```
int32 OS_CondVarCreate (
    osal_id_t * var_id,
    const char * var_name,
    uint32 options )
```

Creates a condition variable resource.

A condition variable adds a more sophisticated synchronization option for mutexes, such that it can operate on arbitrary user-defined conditions rather than simply a counter or boolean (as in the case of simple semaphores).

Creating a condition variable resource in OSAL will in turn create both a basic mutex as well as a synchronization overlay. The underlying mutex is similar to the mutex functionality provided by the OSAL mutex subsystem, and can be locked and unlocked normally.

This mutex is intended to protect access to any arbitrary user-defined data object that serves as the condition being tested.

A task that needs a particular state of the object should follow this general flow:

- Lock the underlying mutex
- Test for the condition being waited for (a user-defined check on user-defined data)
- If condition IS NOT met, then call OS_CondVarWait() to wait, then repeat test
- If condition IS met, then unlock the underlying mutex and continue

A task that changes the state of the object should follow this general flow:

- Lock the underlying mutex
- Change the state as necessary
- Call either OS_CondVarSignal() or OS_CondVarBroadcast()
- Unlock the underlying mutex

Parameters

out	*var_id*	will be set to the non-zero ID of the newly-created resource (must not be null)
in	*var_name*	the name of the new resource to create (must not be null)
in	*options*	reserved for future use. Should be passed as 0.

Returns

Execution status, see OSAL Return Code Defines

Return values

OS_SUCCESS	Successful execution.
OS_INVALID_POINTER	if var_id or var_name are NULL
OS_ERR_NAME_TOO_LONG	name length including null terminator greater than OS_MAX_API_NAME

Return values

OS_ERR_NO_FREE_IDS	if there are no more free condition variable Ids
OS_ERR_NAME_TAKEN	if there is already a condition variable with the same name

10.59.2.3 OS_CondVarDelete()

```
int32 OS_CondVarDelete (
    osal_id_t var_id )
```

Deletes the specified condition variable.
Delete the condition variable and releases any related system resources.

Parameters

in	*var↩ _id*	The object ID to delete

Returns

Execution status, see OSAL Return Code Defines

Return values

OS_SUCCESS	Successful execution.
OS_ERR_INVALID_ID	if the id passed in is not a valid condvar

10.59.2.4 OS_CondVarGetIdByName()

```
int32 OS_CondVarGetIdByName (
    osal_id_t * var_id,
    const char * var_name )
```

Find an existing condition variable ID by name.
This function tries to find an existing condition variable ID given the name. The id is returned through var_id.

Parameters

out	*var_id*	will be set to the ID of the existing resource
in	*var_name*	the name of the existing resource to find (must not be null)

Returns

Execution status, see OSAL Return Code Defines

Return values

OS_SUCCESS	Successful execution.
OS_INVALID_POINTER	is var_id or var_name are NULL pointers
OS_ERR_NAME_TOO_LONG	name length including null terminator greater than OS_MAX_API_NAME
OS_ERR_NAME_NOT_FOUND	if the name was not found in the table

10.59.2.5 OS_CondVarGetInfo()

```
int32 OS_CondVarGetInfo (
    osal_id_t var_id,
    OS_condvar_prop_t * condvar_prop )
```

Fill a property object buffer with details regarding the resource.
This function will fill a structure to contain the information (name and creator) about the specified condition variable.

Parameters

in	*var_id*	The object ID to operate on
out	*condvar_prop*	The property object buffer to fill (must not be null)

Returns

Execution status, see OSAL Return Code Defines

Return values

OS_SUCCESS	Successful execution.
OS_ERR_INVALID_ID	if the id passed in is not a valid semaphore
OS_INVALID_POINTER	if the mut_prop pointer is null

10.59.2.6 OS_CondVarLock()

```
int32 OS_CondVarLock (
    osal_id_t var_id )
```

Locks/Acquires the underlying mutex associated with a condition variable.
The mutex should always be locked by a task before reading or modifying the data object associated with a condition variable.

Note

This lock must be acquired by a task before invoking OS_CondVarWait() or OS_CondVarTimedWait() on the same condition variable.

Parameters

in	*var↩ _id*	The object ID to operate on

Returns

Execution status, see OSAL Return Code Defines

Return values

OS_SUCCESS	Successful execution.
OS_ERR_INVALID_ID	if the id passed in is not a valid condition variable

10.59.2.7 OS_CondVarSignal() `int32 OS_CondVarSignal ( osal_id_t var_id )`

Signals the condition variable resource referenced by var_id.
This function may be used to indicate when the state of a data object has been changed.
If there are threads blocked on the condition variable object referenced by var_id when this function is called, one of those threads will be unblocked, as determined by the scheduling policy.

Parameters

in	*var_id*	The object ID to operate on

Returns

Execution status, see OSAL Return Code Defines

Return values

OS_SUCCESS	Successful execution.
OS_ERR_INVALID_ID	if the id passed in is not a valid condition variable

10.59.2.8 OS_CondVarTimedWait() `int32 OS_CondVarTimedWait ( osal_id_t var_id, const OS_time_t * abs_wakeup_time )`

Time-limited wait on the condition variable object referenced by var_id.
Identical in operation to OS_CondVarWait(), except that the maximum amount of time that the task will be blocked is limited.
The abs_wakeup_time refers to the absolute time of the system clock at which the task should be unblocked to run, regardless of the state of the condition variable. This refers to the same system clock that is the subject of the OS_GetLocalTime() API.

Parameters

in	*var_id*	The object ID to operate on
in	*abs_wakeup_time*	The system time at which the task should be unblocked (must not be null)

Returns

Execution status, see OSAL Return Code Defines

Return values

OS_SUCCESS	Successful execution.
OS_ERR_INVALID_ID	the id passed in is not a valid condvar

10.59.2.9 OS_CondVarUnlock() `int32 OS_CondVarUnlock ( osal_id_t var_id )`

Unlocks/Releases the underlying mutex associated with a condition variable.
The mutex should be unlocked by a task once reading or modifying the data object associated with a condition variable is complete.

Parameters

in	*var↩ _id*	The object ID to operate on

Returns

Execution status, see OSAL Return Code Defines

Return values

OS_SUCCESS	Successful execution.
OS_ERR_INVALID_ID	if the id passed in is not a valid condition variable

10.59.2.10 OS_CondVarWait()

```
int32 OS_CondVarWait (
    osal_id_t var_id )
```

Waits on the condition variable object referenced by var_id.
The calling task will be blocked until another task calls the function OS_CondVarSignal() or OS_CondVarBroadcast() on the same condition variable.
The underlying mutex associated with the condition variable must be locked and owned by the calling task at the time this function is invoked. As part of this call, the mutex will be unlocked as the task blocks. This is done in such a way that there is no possibility that another task could aquire the mutex before the calling task has actually blocked.
This atomicity with respect to blocking the task and unlocking the mutex is a critical difference between condition variables and other synchronization primitives. It avoids a window of opportunity where inherent in the simpler synchronization resource types where the state of the data could change between the time that the calling task tested the state and the time that the task actually blocks on the sync resource.

Parameters

in	*var↩ _id*	The object ID to operate on

Returns

Execution status, see OSAL Return Code Defines

Return values

OS_SUCCESS	Successful execution.
OS_ERR_INVALID_ID	the id passed in is not a valid condvar

10.60 OSAL Counting Semaphore APIs

Functions

- int32 OS_CountSemCreate (osal_id_t *sem_id, const char *sem_name, uint32 sem_initial_value, uint32 options)

  Creates a counting semaphore.
- int32 OS_CountSemGive (osal_id_t sem_id)

  Increment the semaphore value.
- int32 OS_CountSemTake (osal_id_t sem_id)

  Decrement the semaphore value.
- int32 OS_CountSemTimedWait (osal_id_t sem_id, uint32 msecs)

  Decrement the semaphore value with timeout.
- int32 OS_CountSemDelete (osal_id_t sem_id)

  Deletes the specified counting Semaphore.
- int32 OS_CountSemGetIdByName (osal_id_t *sem_id, const char *sem_name)

  Find an existing semaphore ID by name.
- int32 OS_CountSemGetInfo (osal_id_t sem_id, OS_count_sem_prop_t *count_prop)

  Fill a property object buffer with details regarding the resource.

10.60.1 Detailed Description

10.60.2 Function Documentation

10.60.2.1 OS_CountSemCreate()

```
int32 OS_CountSemCreate (
    osal_id_t * sem_id,
    const char * sem_name,
    uint32 sem_initial_value,
    uint32 options )
```

Creates a counting semaphore.

Creates a counting semaphore with initial value specified by sem_initial_value and name specified by sem_name. sem_id will be returned to the caller.

Note

Underlying RTOS implementations may or may not impose a specific upper limit to the value of a counting semaphore. If the OS has a specific limit and the sem_initial_value exceeds this limit, then OS_INVALID_SEM_VALUE is returned. On other implementations, any 32-bit integer value may be acceptable. For maximum portability, it is recommended to keep counting semaphore values within the range of a "short int" (i.e. between 0 and 32767). Many platforms do accept larger values, but may not be guaranteed.

Parameters

out	*sem_id*	will be set to the non-zero ID of the newly-created resource (must not be null)
in	*sem_name*	the name of the new resource to create (must not be null)
in	*sem_initial_value*	the initial value of the counting semaphore
in	*options*	Reserved for future use, should be passed as 0.

Returns

Execution status, see OSAL Return Code Defines

Return values

OS_SUCCESS	Successful execution.
OS_INVALID_POINTER	if sen name or sem_id are NULL
OS_ERR_NAME_TOO_LONG	name length including null terminator greater than OS_MAX_API_NAME
OS_ERR_NO_FREE_IDS	if all of the semaphore ids are taken
OS_ERR_NAME_TAKEN	if this is already the name of a counting semaphore
OS_INVALID_SEM_VALUE	if the semaphore value is too high (return value only verified in coverage test)
OS_SEM_FAILURE	if an unspecified implementation error occurs (return value only verified in coverage test)

10.60.2.2 OS_CountSemDelete()

```
int32 OS_CountSemDelete (
    osal_id_t sem_id )
```

Deletes the specified counting Semaphore.

Parameters

in	*sem↩ _id*	The object ID to delete

Returns

Execution status, see OSAL Return Code Defines

Return values

OS_SUCCESS	Successful execution.
OS_ERR_INVALID_ID	if the id passed in is not a valid counting semaphore
OS_SEM_FAILURE	if an unspecified implementation error occurs (return value only verified in coverage test)

10.60.2.3 OS_CountSemGetIdByName()

```
int32 OS_CountSemGetIdByName (
    osal_id_t * sem_id,
    const char * sem_name )
```

Find an existing semaphore ID by name.
This function tries to find a counting sem Id given the name of a count_sem The id is returned through sem_id

Parameters

out	*sem_id*	will be set to the ID of the existing resource
in	*sem_name*	the name of the existing resource to find (must not be null)

Returns

Execution status, see OSAL Return Code Defines

Return values

OS_SUCCESS	Successful execution.
OS_INVALID_POINTER	is semid or sem_name are NULL pointers
OS_ERR_NAME_TOO_LONG	name length including null terminator greater than OS_MAX_API_NAME
OS_ERR_NAME_NOT_FOUND	if the name was not found in the table

Referenced by CF_CFDP_InitEngine().

10.60.2.4 OS_CountSemGetInfo()

```
int32 OS_CountSemGetInfo (
    osal_id_t sem_id,
    OS_count_sem_prop_t * count_prop )
```

Fill a property object buffer with details regarding the resource.
This function will pass back a pointer to structure that contains all of the relevant info(name and creator) about the specified counting semaphore.

Parameters

in	*sem_id*	The object ID to operate on
out	*count_prop*	The property object buffer to fill (must not be null)

Returns

Execution status, see OSAL Return Code Defines

Return values

OS_SUCCESS	Successful execution.
OS_ERR_INVALID_ID	if the id passed in is not a valid semaphore
OS_INVALID_POINTER	if the count_prop pointer is null
OS_ERR_NOT_IMPLEMENTED	Not implemented.

10.60.2.5 OS_CountSemGive()

```
int32 OS_CountSemGive (
    osal_id_t sem_id )
```

Increment the semaphore value.
The function unlocks the semaphore referenced by sem_id by performing a semaphore unlock operation on that semaphore. If the semaphore value resulting from this operation is positive, then no threads were blocked waiting for the semaphore to become unlocked; the semaphore value is simply incremented for this semaphore.

Parameters

in	*sem↩ _id*	The object ID to operate on

Returns

Execution status, see OSAL Return Code Defines

Return values

OS_SUCCESS	Successful execution.
OS_ERR_INVALID_ID	if the id passed in is not a counting semaphore
OS_SEM_FAILURE	if an unspecified implementation error occurs (return value only verified in coverage test)

10.60.2.6 OS_CountSemTake()

```
int32 OS_CountSemTake (
    osal_id_t sem_id )
```

Decrement the semaphore value.

The locks the semaphore referenced by sem_id by performing a semaphore lock operation on that semaphore. If the semaphore value is currently zero, then the calling thread shall not return from the call until it either locks the semaphore or the call is interrupted.

Parameters

in	*sem_id*	The object ID to operate on

Returns

Execution status, see OSAL Return Code Defines

Return values

OS_SUCCESS	Successful execution.
OS_ERR_INVALID_ID	the Id passed in is not a valid counting semaphore
OS_SEM_FAILURE	if an unspecified implementation error occurs (return value only verified in coverage test)

10.60.2.7 OS_CountSemTimedWait()

```
int32 OS_CountSemTimedWait (
    osal_id_t sem_id,
    uint32 msecs )
```

Decrement the semaphore value with timeout.

The function locks the semaphore referenced by sem_id. However, if the semaphore cannot be locked without waiting for another process or thread to unlock the semaphore, this wait shall be terminated when the specified timeout, msecs, expires.

Parameters

in	*sem_id*	The object ID to operate on
in	*msecs*	The maximum amount of time to block, in milliseconds

Returns

Execution status, see OSAL Return Code Defines

Return values

OS_SUCCESS	Successful execution.
OS_SEM_TIMEOUT	if semaphore was not relinquished in time
OS_ERR_INVALID_ID	if the ID passed in is not a valid semaphore ID
OS_SEM_FAILURE	if an unspecified implementation error occurs (return value only verified in coverage test)

Referenced by CF_CFDP_MsgOutGet().

10.61 OSAL Directory APIs

Functions

- int32 OS_DirectoryOpen (osal_id_t *dir_id, const char *path)

  Opens a directory.
- int32 OS_DirectoryClose (osal_id_t dir_id)

  Closes an open directory.
- int32 OS_DirectoryRewind (osal_id_t dir_id)

  Rewinds an open directory.
- int32 OS_DirectoryRead (osal_id_t dir_id, os_dirent_t *dirent)

  Reads the next name in the directory.
- int32 OS_mkdir (const char *path, uint32 access)

  Makes a new directory.
- int32 OS_rmdir (const char *path)

  Removes a directory from the file system.

10.61.1 Detailed Description

10.61.2 Function Documentation

10.61.2.1 OS_DirectoryClose()

```
int32 OS_DirectoryClose (
    osal_id_t dir_id )
```

Closes an open directory.
The directory referred to by dir_id will be closed

Parameters

in	*dir_id*	The handle ID of the directory

Returns

Execution status, see OSAL Return Code Defines

Return values

OS_SUCCESS	Successful execution.
OS_ERR_INVALID_ID	if the directory handle is invalid

Referenced by CF_CFDP_DisableEngine(), and CF_CFDP_ProcessPlaybackDirectory().

10.61.2.2 OS_DirectoryOpen()

```
int32 OS_DirectoryOpen (
    osal_id_t * dir_id,
    const char * path )
```

Opens a directory.
Prepares for reading the files within a directory

Parameters

out	*dir↩ _id*	Location to store handle ID of the directory (must not be null)
in	*path*	The directory to open (must not be null)

Returns

Execution status, see OSAL Return Code Defines

Return values

OS_SUCCESS	Successful execution.
OS_INVALID_POINTER	if dir_id or path is NULL
OS_FS_ERR_PATH_TOO_LONG	if the path argument exceeds the maximum length
OS_FS_ERR_PATH_INVALID	if the path argument is not valid
OS_ERROR	if the directory could not be opened

Referenced by CF_CFDP_PlaybackDir_Initiate().

10.61.2.3 OS_DirectoryRead()

```
int32 OS_DirectoryRead (
    osal_id_t dir_id,
    os_dirent_t * dirent )
```

Reads the next name in the directory.
Obtains directory entry data for the next file from an open directory

Parameters

in	*dir↩ _id*	The handle ID of the directory
out	*dirent*	Buffer to store directory entry information (must not be null)

Returns

Execution status, see OSAL Return Code Defines

Return values

OS_SUCCESS	Successful execution.
OS_INVALID_POINTER	if dirent argument is NULL
OS_ERR_INVALID_ID	if the directory handle is invalid
OS_ERROR	at the end of the directory or if the OS call otherwise fails

Referenced by CF_CFDP_ProcessPlaybackDirectory().

10.61.2.4 OS_DirectoryRewind()

```
int32 OS_DirectoryRewind (
    osal_id_t dir_id )
```

Rewinds an open directory.
Resets a directory read handle back to the first file.

Parameters

in	*dir↩ _id*	The handle ID of the directory

Returns

Execution status, see OSAL Return Code Defines

Return values

OS_SUCCESS	Successful execution.
OS_ERR_INVALID_ID	if the directory handle is invalid

10.61.2.5 OS_mkdir()

```
int32 OS_mkdir (
    const char * path,
    uint32 access )
```

Makes a new directory.
Makes a directory specified by path.

Parameters

in	*path*	The new directory name (must not be null)
in	*access*	The permissions for the directory (reserved for future use)

Note

Current implementations do not utilize the "access" parameter. Applications should still pass the intended value (OS_READ_WRITE or OS_READ_ONLY) to be compatible with future implementations.

Returns

Execution status, see OSAL Return Code Defines

Return values

OS_SUCCESS	Successful execution.
OS_INVALID_POINTER	if path is NULL
OS_FS_ERR_PATH_TOO_LONG	if the path is too long to be stored locally
OS_FS_ERR_PATH_INVALID	if path cannot be parsed
OS_ERROR	if the OS call fails (return value only verified in coverage test)

10.61.2.6 OS_rmdir()

```
int32 OS_rmdir (
```

```
const char * path )
```

Removes a directory from the file system.

Removes a directory from the structure. The directory must be empty prior to this operation.

Parameters

in	*path*	The directory to remove

Returns

Execution status, see OSAL Return Code Defines

Return values

OS_SUCCESS	Successful execution.
OS_INVALID_POINTER	if path is NULL
OS_FS_ERR_PATH_INVALID	if path cannot be parsed
OS_FS_ERR_PATH_TOO_LONG	
OS_ERROR	if the directory remove operation failed (return value only verified in coverage test)

10.62 OSAL Return Code Defines

The specific status/return code definitions listed in this section may be extended or refined in future versions of OSAL.

Macros

- #define OS_SUCCESS (0)

  Successful execution.
- #define OS_ERROR (-1)

  Failed execution.
- #define OS_INVALID_POINTER (-2)

  Invalid pointer.
- #define OS_ERROR_ADDRESS_MISALIGNED (-3)

  Address misalignment.
- #define OS_ERROR_TIMEOUT (-4)

  Error timeout.
- #define OS_INVALID_INT_NUM (-5)

  Invalid Interrupt number.
- #define OS_SEM_FAILURE (-6)

  Semaphore failure.
- #define OS_SEM_TIMEOUT (-7)

  Semaphore timeout.
- #define OS_QUEUE_EMPTY (-8)

  Queue empty.
- #define OS_QUEUE_FULL (-9)

  Queue full.
- #define OS_QUEUE_TIMEOUT (-10)

  Queue timeout.
- #define OS_QUEUE_INVALID_SIZE (-11)

  Queue invalid size.
- #define OS_QUEUE_ID_ERROR (-12)

  Queue ID error.
- #define OS_ERR_NAME_TOO_LONG (-13)

  name length including null terminator greater than OS_MAX_API_NAME
- #define OS_ERR_NO_FREE_IDS (-14)

  No free IDs.
- #define OS_ERR_NAME_TAKEN (-15)

  Name taken.
- #define OS_ERR_INVALID_ID (-16)

  Invalid ID.
- #define OS_ERR_NAME_NOT_FOUND (-17)

  Name not found.
- #define OS_ERR_SEM_NOT_FULL (-18)

  Semaphore not full.
- #define OS_ERR_INVALID_PRIORITY (-19)

  Invalid priority.
- #define OS_INVALID_SEM_VALUE (-20)

  Invalid semaphore value.

- #define OS_ERR_FILE (-27)

  File error.
- #define OS_ERR_NOT_IMPLEMENTED (-28)

  Not implemented.
- #define OS_TIMER_ERR_INVALID_ARGS (-29)

  Timer invalid arguments.
- #define OS_TIMER_ERR_TIMER_ID (-30)

  Timer ID error.
- #define OS_TIMER_ERR_UNAVAILABLE (-31)

  Timer unavailable.
- #define OS_TIMER_ERR_INTERNAL (-32)

  Timer internal error.
- #define OS_ERR_OBJECT_IN_USE (-33)

  Object in use.
- #define OS_ERR_BAD_ADDRESS (-34)

  Bad address.
- #define OS_ERR_INCORRECT_OBJ_STATE (-35)

  Incorrect object state.
- #define OS_ERR_INCORRECT_OBJ_TYPE (-36)

  Incorrect object type.
- #define OS_ERR_STREAM_DISCONNECTED (-37)

  Stream disconnected.
- #define OS_ERR_OPERATION_NOT_SUPPORTED (-38)

  Requested operation not support on supplied object(s)
- #define OS_ERR_INVALID_SIZE (-40)

  Invalid Size.
- #define OS_ERR_OUTPUT_TOO_LARGE (-41)

  Size of output exceeds limit
- #define OS_ERR_INVALID_ARGUMENT (-42)

  Invalid argument value (other than ID or size)
- #define OS_FS_ERR_PATH_TOO_LONG (-103)

  FS path too long.
- #define OS_FS_ERR_NAME_TOO_LONG (-104)

  FS name too long.
- #define OS_FS_ERR_DRIVE_NOT_CREATED (-106)

  FS drive not created.
- #define OS_FS_ERR_DEVICE_NOT_FREE (-107)

  FS device not free.
- #define OS_FS_ERR_PATH_INVALID (-108)

  FS path invalid.

10.62.1 Detailed Description

The specific status/return code definitions listed in this section may be extended or refined in future versions of OSAL.

Note

> Application developers should assume that any OSAL API may return any status value listed here. While the documentation of each OSAL API function indicates the return/status values that function may directly generate, functions may also pass through other status codes from related functions, so that list should not be considered absolute/exhaustive.

The `int32` data type should be used to store an OSAL status code. Negative values will always represent errors, while non-negative values indicate success. Most APIs specifically return OS_SUCCESS (0) upon successful execution, but some return a nonzero value, such as data size.
Ideally, in order to more easily adapt to future OSAL versions and status code extensions/refinements, applications should typically check for errors as follows:

```
int32 status;
status = OS_TaskCreate(...);  (or any other API)
if (status < OS_SUCCESS)
{
    handle or report error....
    may also check for specific codes here.
}
else
{
    handle normal/successful status...
}
```

10.62.2 Macro Definition Documentation

10.62.2.1 OS_ERR_BAD_ADDRESS `#define OS_ERR_BAD_ADDRESS (-34)`

Bad address.
Definition at line 124 of file osapi-error.h.

10.62.2.2 OS_ERR_FILE `#define OS_ERR_FILE (-27)`

File error.
Definition at line 117 of file osapi-error.h.

10.62.2.3 OS_ERR_INCORRECT_OBJ_STATE `#define OS_ERR_INCORRECT_OBJ_STATE (-35)`

Incorrect object state.
Definition at line 125 of file osapi-error.h.

10.62.2.4 OS_ERR_INCORRECT_OBJ_TYPE `#define OS_ERR_INCORRECT_OBJ_TYPE (-36)`

Incorrect object type.
Definition at line 126 of file osapi-error.h.

10.62.2.5 OS_ERR_INVALID_ARGUMENT `#define OS_ERR_INVALID_ARGUMENT (-42)`

Invalid argument value (other than ID or size)
Definition at line 131 of file osapi-error.h.

10.62.2.6 OS_ERR_INVALID_ID `#define OS_ERR_INVALID_ID (-16)`

Invalid ID.
Definition at line 112 of file osapi-error.h.

10.62.2.7 OS_ERR_INVALID_PRIORITY `#define OS_ERR_INVALID_PRIORITY (-19)`

Invalid priority.
Definition at line 115 of file osapi-error.h.

10.62.2.8 OS_ERR_INVALID_SIZE `#define OS_ERR_INVALID_SIZE (-40)`

Invalid Size.
Definition at line 129 of file osapi-error.h.

10.62.2.9 OS_ERR_NAME_NOT_FOUND `#define OS_ERR_NAME_NOT_FOUND (-17)`

Name not found.
Definition at line 113 of file osapi-error.h.

10.62.2.10 OS_ERR_NAME_TAKEN `#define OS_ERR_NAME_TAKEN (-15)`

Name taken.
Definition at line 111 of file osapi-error.h.

10.62.2.11 OS_ERR_NAME_TOO_LONG `#define OS_ERR_NAME_TOO_LONG (-13)`

name length including null terminator greater than OS_MAX_API_NAME
Definition at line 109 of file osapi-error.h.

10.62.2.12 OS_ERR_NO_FREE_IDS `#define OS_ERR_NO_FREE_IDS (-14)`

No free IDs.
Definition at line 110 of file osapi-error.h.

10.62.2.13 OS_ERR_NOT_IMPLEMENTED `#define OS_ERR_NOT_IMPLEMENTED (-28)`

Not implemented.
Definition at line 118 of file osapi-error.h.

10.62.2.14 OS_ERR_OBJECT_IN_USE `#define OS_ERR_OBJECT_IN_USE (-33)`

Object in use.
Definition at line 123 of file osapi-error.h.

10.62.2.15 OS_ERR_OPERATION_NOT_SUPPORTED `#define OS_ERR_OPERATION_NOT_SUPPORTED (-38)`

Requested operation not support on supplied object(s)
Definition at line 128 of file osapi-error.h.

10.62.2.16 OS_ERR_OUTPUT_TOO_LARGE `#define OS_ERR_OUTPUT_TOO_LARGE (-41)`

Size of output exceeds limit

Definition at line 130 of file osapi-error.h.

10.62.2.17 OS_ERR_SEM_NOT_FULL `#define OS_ERR_SEM_NOT_FULL (-18)`

Semaphore not full.
Definition at line 114 of file osapi-error.h.

10.62.2.18 OS_ERR_STREAM_DISCONNECTED `#define OS_ERR_STREAM_DISCONNECTED (-37)`

Stream disconnected.
Definition at line 127 of file osapi-error.h.

10.62.2.19 OS_ERROR `#define OS_ERROR (-1)`

Failed execution.
Definition at line 97 of file osapi-error.h.

10.62.2.20 OS_ERROR_ADDRESS_MISALIGNED `#define OS_ERROR_ADDRESS_MISALIGNED (-3)`

Address misalignment.
Definition at line 99 of file osapi-error.h.

10.62.2.21 OS_ERROR_TIMEOUT `#define OS_ERROR_TIMEOUT (-4)`

Error timeout.
Definition at line 100 of file osapi-error.h.

10.62.2.22 OS_FS_ERR_DEVICE_NOT_FREE `#define OS_FS_ERR_DEVICE_NOT_FREE (-107)`

FS device not free.
Definition at line 144 of file osapi-error.h.

10.62.2.23 OS_FS_ERR_DRIVE_NOT_CREATED `#define OS_FS_ERR_DRIVE_NOT_CREATED (-106)`

FS drive not created.
Definition at line 143 of file osapi-error.h.

10.62.2.24 OS_FS_ERR_NAME_TOO_LONG `#define OS_FS_ERR_NAME_TOO_LONG (-104)`

FS name too long.
Definition at line 142 of file osapi-error.h.

10.62.2.25 OS_FS_ERR_PATH_INVALID `#define OS_FS_ERR_PATH_INVALID (-108)`

FS path invalid.
Definition at line 145 of file osapi-error.h.

10.62.2.26 OS_FS_ERR_PATH_TOO_LONG `#define OS_FS_ERR_PATH_TOO_LONG (-103)`

FS path too long.
Definition at line 141 of file osapi-error.h.

10.62.2.27 OS_INVALID_INT_NUM `#define OS_INVALID_INT_NUM (-5)`

Invalid Interrupt number.
Definition at line 101 of file osapi-error.h.

10.62.2.28 OS_INVALID_POINTER `#define OS_INVALID_POINTER (-2)`

Invalid pointer.
Definition at line 98 of file osapi-error.h.

10.62.2.29 OS_INVALID_SEM_VALUE `#define OS_INVALID_SEM_VALUE (-20)`

Invalid semaphore value.
Definition at line 116 of file osapi-error.h.

10.62.2.30 OS_QUEUE_EMPTY `#define OS_QUEUE_EMPTY (-8)`

Queue empty.
Definition at line 104 of file osapi-error.h.

10.62.2.31 OS_QUEUE_FULL `#define OS_QUEUE_FULL (-9)`

Queue full.
Definition at line 105 of file osapi-error.h.

10.62.2.32 OS_QUEUE_ID_ERROR `#define OS_QUEUE_ID_ERROR (-12)`

Queue ID error.
Definition at line 108 of file osapi-error.h.

10.62.2.33 OS_QUEUE_INVALID_SIZE `#define OS_QUEUE_INVALID_SIZE (-11)`

Queue invalid size.
Definition at line 107 of file osapi-error.h.

10.62.2.34 OS_QUEUE_TIMEOUT `#define OS_QUEUE_TIMEOUT (-10)`

Queue timeout.
Definition at line 106 of file osapi-error.h.

10.62.2.35 OS_SEM_FAILURE `#define OS_SEM_FAILURE (-6)`

Semaphore failure.
Definition at line 102 of file osapi-error.h.

10.62.2.36 OS_SEM_TIMEOUT `#define OS_SEM_TIMEOUT (-7)`

Semaphore timeout.
Definition at line 103 of file osapi-error.h.

10.62.2.37 OS_SUCCESS `#define OS_SUCCESS (0)`

Successful execution.
Definition at line 96 of file osapi-error.h.

10.62.2.38 OS_TIMER_ERR_INTERNAL `#define OS_TIMER_ERR_INTERNAL (-32)`

Timer internal error.
Definition at line 122 of file osapi-error.h.

10.62.2.39 OS_TIMER_ERR_INVALID_ARGS `#define OS_TIMER_ERR_INVALID_ARGS (-29)`

Timer invalid arguments.
Definition at line 119 of file osapi-error.h.

10.62.2.40 OS_TIMER_ERR_TIMER_ID `#define OS_TIMER_ERR_TIMER_ID (-30)`

Timer ID error.
Definition at line 120 of file osapi-error.h.

10.62.2.41 OS_TIMER_ERR_UNAVAILABLE `#define OS_TIMER_ERR_UNAVAILABLE (-31)`

Timer unavailable.
Definition at line 121 of file osapi-error.h.

10.63 OSAL Error Info APIs

Functions

- static long OS_StatusToInteger (osal_status_t Status)

  Convert a status code to a native "long" type.
- int32 OS_GetErrorName (int32 error_num, os_err_name_t *err_name)

  Convert an error number to a string.
- char * OS_StatusToString (osal_status_t status, os_status_string_t *status_string)

  Convert status to a string.

10.63.1 Detailed Description

10.63.2 Function Documentation

10.63.2.1 OS_GetErrorName()

```
int32 OS_GetErrorName (
    int32 error_num,
    os_err_name_t * err_name )
```

Convert an error number to a string.

Parameters

in	*error_num*	Error number to convert
out	*err_name*	Buffer to store error string

Returns

Execution status, see OSAL Return Code Defines

Return values

OS_SUCCESS	if successfully converted to a string
OS_INVALID_POINTER	if err_name is NULL
OS_ERROR	if error could not be converted

10.63.2.2 OS_StatusToInteger()

```
static long OS_StatusToInteger (
    osal_status_t Status ) [inline], [static]
```

Convert a status code to a native "long" type.

For printing or logging purposes, this converts the given status code to a "long" (signed integer) value. It should be used in conjunction with the "%ld" conversion specifier in printf-style statements.

Parameters

in	*Status*	Execution status, see OSAL Return Code Defines

Returns

Same status value converted to the "long" data type

Definition at line 164 of file osapi-error.h.

10.63.2.3 OS_StatusToString()

```
char* OS_StatusToString (
    osal_status_t status,
    os_status_string_t * status_string )
```

Convert status to a string.

Parameters

in	*status*	Status value to convert
out	*status_string*	Buffer to store status converted to string

Returns

Passed in string pointer

10.64 OSAL File Access Option Defines

Macros

- #define OS_READ_ONLY 0
- #define OS_WRITE_ONLY 1
- #define OS_READ_WRITE 2

10.64.1 Detailed Description

10.64.2 Macro Definition Documentation

10.64.2.1 OS_READ_ONLY `#define OS_READ_ONLY 0`

Read only file access

Definition at line 35 of file osapi-file.h.

10.64.2.2 OS_READ_WRITE `#define OS_READ_WRITE 2`

Read write file access

Definition at line 37 of file osapi-file.h.

10.64.2.3 OS_WRITE_ONLY `#define OS_WRITE_ONLY 1`

Write only file access

Definition at line 36 of file osapi-file.h.

10.65 OSAL Reference Point For Seek Offset Defines

Macros

- #define OS_SEEK_SET 0
- #define OS_SEEK_CUR 1
- #define OS_SEEK_END 2

10.65.1 Detailed Description

10.65.2 Macro Definition Documentation

10.65.2.1 OS_SEEK_CUR `#define OS_SEEK_CUR 1`

Seek offset current

Definition at line 44 of file osapi-file.h.

10.65.2.2 OS_SEEK_END `#define OS_SEEK_END 2`

Seek offset end

Definition at line 45 of file osapi-file.h.

10.65.2.3 OS_SEEK_SET `#define OS_SEEK_SET 0`

Seek offset set

Definition at line 43 of file osapi-file.h.

10.66 OSAL Standard File APIs

Functions

- int32 OS_OpenCreate (osal_id_t *filedes, const char *path, int32 flags, int32 access_mode)

  Open or create a file.
- int32 OS_close (osal_id_t filedes)

  Closes an open file handle.
- int32 OS_read (osal_id_t filedes, void *buffer, size_t nbytes)

  Read from a file handle.
- int32 OS_write (osal_id_t filedes, const void *buffer, size_t nbytes)

  Write to a file handle.
- int32 OS_TimedReadAbs (osal_id_t filedes, void *buffer, size_t nbytes, OS_time_t abstime)

  File/Stream input read with a timeout.
- int32 OS_TimedRead (osal_id_t filedes, void *buffer, size_t nbytes, int32 timeout)

  File/Stream input read with a timeout.
- int32 OS_TimedWriteAbs (osal_id_t filedes, const void *buffer, size_t nbytes, OS_time_t abstime)

  File/Stream output write with a timeout.
- int32 OS_TimedWrite (osal_id_t filedes, const void *buffer, size_t nbytes, int32 timeout)

  File/Stream output write with a timeout.
- int32 OS_chmod (const char *path, uint32 access_mode)

  Changes the permissions of a file.
- int32 OS_stat (const char *path, os_fstat_t *filestats)

  Obtain information about a file or directory.
- int32 OS_lseek (osal_id_t filedes, int32 offset, uint32 whence)

  Seeks to the specified position of an open file.
- int32 OS_remove (const char *path)

  Removes a file from the file system.
- int32 OS_rename (const char *old_filename, const char *new_filename)

  Renames a file.
- int32 OS_cp (const char *src, const char *dest)

  Copies a single file from src to dest.
- int32 OS_mv (const char *src, const char *dest)

  Move a single file from src to dest.
- int32 OS_FDGetInfo (osal_id_t filedes, OS_file_prop_t *fd_prop)

  Obtain information about an open file.
- int32 OS_FileOpenCheck (const char *Filename)

  Checks to see if a file is open.
- int32 OS_CloseAllFiles (void)

  Close all open files.
- int32 OS_CloseFileByName (const char *Filename)

  Close a file by filename.

10.66.1 Detailed Description

10.66.2 Function Documentation

10.66.2.1 OS_chmod()

```
int32 OS_chmod (
    const char * path,
    uint32 access_mode )
```

Changes the permissions of a file.

Parameters

in	*path*	File to change (must not be null)
in	*access_mode*	Desired access mode - see OSAL File Access Option Defines

Note

Some file systems do not implement permissions. If the underlying OS does not support this operation, then OS_ERR_NOT_IMPLEMENTED is returned.

Returns

Execution status, see OSAL Return Code Defines

Return values

OS_SUCCESS	Successful execution. (return value only verified in coverage test)
OS_ERR_NOT_IMPLEMENTED	if the filesystem does not support this call
OS_INVALID_POINTER	if the path argument is NULL

10.66.2.2 OS_close()

```
int32 OS_close (
    osal_id_t filedes )
```

Closes an open file handle.
This closes regular file handles and any other file-like resource, such as network streams or pipes.

Parameters

in	*filedes*	The handle ID to operate on

Returns

Execution status, see OSAL Return Code Defines

Return values

OS_SUCCESS	Successful execution.
OS_ERR_INVALID_ID	if the file descriptor passed in is invalid
OS_ERROR	if an unexpected/unhandled error occurs (return value only verified in coverage test)

Referenced by CF_WrappedClose().

10.66.2.3 OS_CloseAllFiles()

```
int32 OS_CloseAllFiles (
```

```
void )
```

Close all open files.
Closes All open files that were opened through the OSAL

Returns

Execution status, see OSAL Return Code Defines

Return values

OS_SUCCESS	Successful execution.
OS_ERROR	if one or more file close returned an error (return value only verified in coverage test)

10.66.2.4 OS_CloseFileByName()

```
int32 OS_CloseFileByName (
    const char * Filename )
```

Close a file by filename.
Allows a file to be closed by name. This will only work if the name passed in is the same name used to open the file.

Parameters

in	*Filename*	The file to close (must not be null)

Returns

Execution status, see OSAL Return Code Defines

Return values

OS_SUCCESS	Successful execution.
OS_FS_ERR_PATH_INVALID	if the file is not found
OS_ERROR	if the file close returned an error (return value only verified in coverage test)
OS_INVALID_POINTER	if the filename argument is NULL

10.66.2.5 OS_cp()

```
int32 OS_cp (
    const char * src,
    const char * dest )
```

Copies a single file from src to dest.

Note

The behavior of this API on an open file is not defined at the OSAL level due to dependencies on the underlying OS which may or may not allow the related operation based on a variety of potential configurations. For portability, it is recommended that applications ensure the file is closed prior to removal.

Parameters

in	*src*	The source file to operate on (must not be null)
in	*dest*	The destination file (must not be null)

Returns

Execution status, see OSAL Return Code Defines

Return values

OS_SUCCESS	Successful execution.
OS_ERROR	if the file could not be accessed
OS_INVALID_POINTER	if src or dest are NULL
OS_FS_ERR_PATH_INVALID	if path cannot be parsed
OS_FS_ERR_PATH_TOO_LONG	if the paths given are too long to be stored locally
OS_FS_ERR_NAME_TOO_LONG	if the dest name is too long to be stored locally

10.66.2.6 OS_FDGetInfo()

```
int32 OS_FDGetInfo (
    osal_id_t filedes,
    OS_file_prop_t * fd_prop )
```

Obtain information about an open file.
Copies the information of the given file descriptor into a structure passed in

Parameters

in	*filedes*	The handle ID to operate on
out	*fd_prop*	Storage buffer for file information (must not be null)

Returns

Execution status, see OSAL Return Code Defines

Return values

OS_SUCCESS	Successful execution.
OS_ERR_INVALID_ID	if the file descriptor passed in is invalid
OS_INVALID_POINTER	if the fd_prop argument is NULL

10.66.2.7 OS_FileOpenCheck()

```
int32 OS_FileOpenCheck (
    const char * Filename )
```

Checks to see if a file is open.
This function takes a filename and determines if the file is open. The function will return success if the file is open.

Parameters

in	*Filename*	The file to operate on (must not be null)

Returns

Execution status, see OSAL Return Code Defines

Return values

OS_SUCCESS	if the file is open
OS_ERROR	if the file is not open
OS_INVALID_POINTER	if the filename argument is NULL

Referenced by CF_CFDP_S_SubstateSendMetadata().

10.66.2.8 OS_lseek()

```
int32 OS_lseek (
    osal_id_t filedes,
    int32 offset,
    uint32 whence )
```

Seeks to the specified position of an open file.
Sets the read/write pointer to a specific offset in a specific file.

Parameters

in	*filedes*	The handle ID to operate on
in	*offset*	The file offset to seek to
in	*whence*	The reference point for offset, see OSAL Reference Point For Seek Offset Defines

Returns

Byte offset from the beginning of the file or appropriate error code, see OSAL Return Code Defines

Return values

OS_ERR_INVALID_ID	if the file descriptor passed in is invalid
OS_ERROR	if OS call failed (return value only verified in coverage test)

Referenced by CF_WrappedLseek().

10.66.2.9 OS_mv()

```
int32 OS_mv (
    const char * src,
    const char * dest )
```

Move a single file from src to dest.
This first attempts to rename the file, which is faster if the source and destination reside on the same file system.
If this fails, it falls back to copying the file and removing the original.

Note

The behavior of this API on an open file is not defined at the OSAL level due to dependencies on the underlying OS which may or may not allow the related operation based on a variety of potential configurations. For portability, it is recommended that applications ensure the file is closed prior to removal.

Parameters

in	*src*	The source file to operate on (must not be null)
in	*dest*	The destination file (must not be null)

Returns

Execution status, see OSAL Return Code Defines

Return values

OS_SUCCESS	Successful execution.
OS_ERROR	if the file could not be renamed.
OS_INVALID_POINTER	if src or dest are NULL
OS_FS_ERR_PATH_INVALID	if path cannot be parsed
OS_FS_ERR_PATH_TOO_LONG	if the paths given are too long to be stored locally
OS_FS_ERR_NAME_TOO_LONG	if the dest name is too long to be stored locally

Referenced by CF_CFDP_MoveFile(), and CF_CFDP_R2_RecvMd().

10.66.2.10 OS_OpenCreate()

```
int32 OS_OpenCreate (
    osal_id_t * filedes,
    const char * path,
    int32 flags,
    int32 access_mode )
```

Open or create a file.
Implements the same as OS_open/OS_creat but follows the OSAL paradigm of outputting the ID/descriptor separately from the return value, rather than relying on the user to convert it back.

Parameters

out	*filedes*	The handle ID (OS_OBJECT_ID_UNDEFINED on failure) (must not be null)
in	*path*	File name to create or open (must not be null)
in	*flags*	The file permissions - see OS_file_flag_t
in	*access_mode*	Intended access mode - see OSAL File Access Option Defines

Returns

Execution status, see OSAL Return Code Defines

Return values

OS_SUCCESS	Successful execution.
OS_ERROR	if the command was not executed properly
OS_INVALID_POINTER	if pointer argument was NULL
OS_ERR_NO_FREE_IDS	if all available file handles are in use
OS_FS_ERR_NAME_TOO_LONG	if the filename portion of the path exceeds OS_MAX_FILE_NAME
OS_FS_ERR_PATH_INVALID	if the path argument is not valid
OS_FS_ERR_PATH_TOO_LONG	if the path argument exceeds OS_MAX_PATH_LEN

Referenced by CF_WrappedOpenCreate().

10.66.2.11 OS_read()

```
int32 OS_read (
    osal_id_t filedes,
    void * buffer,
    size_t nbytes )
```

Read from a file handle.
Reads up to nbytes from a file, and puts them into buffer.
If the file position is at the end of file (or beyond, if the OS allows) then this function will return 0.

Parameters

in	*filedes*	The handle ID to operate on
out	*buffer*	Storage location for file data (must not be null)
in	*nbytes*	Maximum number of bytes to read (must not be zero)

Note

All OSAL error codes are negative int32 values. Failure of this call can be checked by testing if the result is less than 0.

Returns

A non-negative byte count or appropriate error code, see OSAL Return Code Defines

Return values

OS_INVALID_POINTER	if buffer is a null pointer
OS_ERR_INVALID_SIZE	if the passed-in size is not valid
OS_ERROR	if OS call failed (return value only verified in coverage test)
OS_ERR_INVALID_ID	if the file descriptor passed in is invalid
0	if at end of file/stream data

Referenced by CF_WrappedRead().

10.66.2.12 OS_remove()

```
int32 OS_remove (
    const char * path )
```

Removes a file from the file system.
Removes a given filename from the drive

Note

The behavior of this API on an open file is not defined at the OSAL level due to dependencies on the underlying OS which may or may not allow the related operation based on a variety of potential configurations. For portability, it is recommended that applications ensure the file is closed prior to removal.

Parameters

in	*path*	The file to operate on (must not be null)

Returns

Execution status, see OSAL Return Code Defines

Return values

OS_SUCCESS	Successful execution.
OS_ERROR	if there is no device or the driver returns error
OS_INVALID_POINTER	if path is NULL
OS_FS_ERR_PATH_TOO_LONG	if path is too long to be stored locally
OS_FS_ERR_PATH_INVALID	if path cannot be parsed
OS_FS_ERR_NAME_TOO_LONG	if the name of the file to remove is too long

Referenced by CF_CFDP_HandleNotKeepFile(), and CF_CFDP_MoveFile().

10.66.2.13 OS_rename()

```
int32 OS_rename (
    const char * old_filename,
    const char * new_filename )
```

Renames a file.
Changes the name of a file, where the source and destination reside on the same file system.

Note

The behavior of this API on an open file is not defined at the OSAL level due to dependencies on the underlying OS which may or may not allow the related operation based on a variety of potential configurations. For portability, it is recommended that applications ensure the file is closed prior to removal.

Parameters

in	*old_filename*	The original filename (must not be null)
in	*new_filename*	The desired filename (must not be null)

Returns

Execution status, see OSAL Return Code Defines

Return values

OS_SUCCESS	Successful execution.
OS_ERROR	if the file could not be opened or renamed.
OS_INVALID_POINTER	if old_filename or new_filename are NULL
OS_FS_ERR_PATH_INVALID	if path cannot be parsed
OS_FS_ERR_PATH_TOO_LONG	if the paths given are too long to be stored locally
OS_FS_ERR_NAME_TOO_LONG	if the new name is too long to be stored locally

10.66.2.14 OS_stat()

```
int32 OS_stat (
    const char * path,
```

```
os_fstat_t * filestats )
```

Obtain information about a file or directory.
Returns information about a file or directory in an os_fstat_t structure

Parameters

in	*path*	The file to operate on (must not be null)
out	*filestats*	Buffer to store file information (must not be null)

Returns

Execution status, see OSAL Return Code Defines

Return values

OS_SUCCESS	Successful execution.
OS_INVALID_POINTER	if path or filestats is NULL
OS_FS_ERR_PATH_TOO_LONG	if the path is too long to be stored locally
OS_FS_ERR_NAME_TOO_LONG	if the name of the file is too long to be stored
OS_FS_ERR_PATH_INVALID	if path cannot be parsed
OS_ERROR	if the OS call failed

10.66.2.15 OS_TimedRead()

```
int32 OS_TimedRead (
    osal_id_t filedes,
    void * buffer,
    size_t nbytes,
    int32 timeout )
```

File/Stream input read with a timeout.
This implements a time-limited read and is primarily intended for use with sockets but may also work with any other stream-like resource that the underlying OS supports, such as pipes or special devices.
If data is immediately available on the file/socket, this will return that data along with the actual number of bytes that were immediately available. It will not block.
If the file position is at the end of file or end of stream data (e.g. if the remote end has closed the connection), then this function will immediately return 0 without blocking for the timeout period.
If no data is immediately available, but the underlying resource/stream is still connected to a peer, this will wait up to the given timeout for additional data to appear. If no data appears within the timeout period, then this returns the OS_ERROR_TIMEOUT status code. This allows the caller to differentiate an open (but idle) socket connection from a connection which has been closed by the remote peer.
In all cases this will return successfully as soon as at least 1 byte of actual data is available. It will not attempt to read the entire input buffer.
If an EOF condition occurs prior to timeout, this function returns zero.

Parameters

in	*filedes*	The handle ID to operate on
out	*buffer*	Storage location for file data (must not be null)
in	*nbytes*	Maximum number of bytes to read (must not be zero)
in	*timeout*	Maximum time to wait, in milliseconds, relative to current time (OS_PEND = forever)

Returns

Byte count on success or appropriate error code, see OSAL Return Code Defines

Return values

OS_ERROR_TIMEOUT	if no data became available during timeout period
OS_ERR_INVALID_ID	if the file descriptor passed in is invalid
OS_ERR_INVALID_SIZE	if the passed-in size is not valid
OS_INVALID_POINTER	if the passed-in buffer is not valid
0	if at end of file/stream data

10.66.2.16 OS_TimedReadAbs()

```
int32 OS_TimedReadAbs (
    osal_id_t filedes,
    void * buffer,
    size_t nbytes,
    OS_time_t abstime )
```

File/Stream input read with a timeout.

This implements a time-limited read and is primarily intended for use with sockets but may also work with any other stream-like resource that the underlying OS supports, such as pipes or special devices.

If data is immediately available on the file/socket, this will return that data along with the actual number of bytes that were immediately available. It will not block.

If the file position is at the end of file or end of stream data (e.g. if the remote end has closed the connection), then this function will immediately return 0 without blocking for the timeout period.

If no data is immediately available, but the underlying resource/stream is still connected to a peer, this will wait up to the given timeout for additional data to appear. If no data appears within the timeout period, then this returns the OS_ERROR_TIMEOUT status code. This allows the caller to differentiate an open (but idle) socket connection from a connection which has been closed by the remote peer.

In all cases this will return successfully as soon as at least 1 byte of actual data is available. It will not attempt to read the entire input buffer.

If an EOF condition occurs prior to timeout, this function returns zero.

Parameters

in	*filedes*	The handle ID to operate on
out	*buffer*	Storage location for file data (must not be null)
in	*nbytes*	Maximum number of bytes to read (must not be zero)
in	*abstime*	Absolute time at which this function should return, if no data is readable

Returns

Byte count on success or appropriate error code, see OSAL Return Code Defines

Return values

OS_ERROR_TIMEOUT	if no data became available during timeout period
OS_ERR_INVALID_ID	if the file descriptor passed in is invalid
OS_ERR_INVALID_SIZE	if the passed-in size is not valid
OS_INVALID_POINTER	if the passed-in buffer is not valid
0	if at end of file/stream data

10.66.2.17 OS_TimedWrite()

```
int32 OS_TimedWrite (
    osal_id_t filedes,
    const void * buffer,
    size_t nbytes,
    int32 timeout )
```

File/Stream output write with a timeout.

This implements a time-limited write and is primarily intended for use with sockets but may also work with any other stream-like resource that the underlying OS supports.

If output buffer space is immediately available on the file/socket, this will place data into the buffer and return the actual number of bytes that were queued for output. It will not block.

If no output buffer space is immediately available, this will wait up to the given timeout for space to become available. If no space becomes available within the timeout period, then this returns an error code (not zero).

In all cases this will return successfully as soon as at least 1 byte of actual data is output. It will *not* attempt to write the entire output buffer.

If an EOF condition occurs prior to timeout, this function returns zero.

Parameters

in	*filedes*	The handle ID to operate on
in	*buffer*	Source location for file data (must not be null)
in	*nbytes*	Maximum number of bytes to read (must not be zero)
in	*timeout*	Maximum time to wait, in milliseconds, relative to current time (OS_PEND = forever)

Returns

A non-negative byte count or appropriate error code, see OSAL Return Code Defines

Return values

OS_ERROR_TIMEOUT	if no data became available during timeout period
OS_ERR_INVALID_ID	if the file descriptor passed in is invalid
OS_ERR_INVALID_SIZE	if the passed-in size is not valid
OS_INVALID_POINTER	if the passed-in buffer is not valid
0	if file/stream cannot accept any more data

10.66.2.18 OS_TimedWriteAbs()

```
int32 OS_TimedWriteAbs (
    osal_id_t filedes,
    const void * buffer,
    size_t nbytes,
    OS_time_t abstime )
```

File/Stream output write with a timeout.

This implements a time-limited write and is primarily intended for use with sockets but may also work with any other stream-like resource that the underlying OS supports.

If output buffer space is immediately available on the file/socket, this will place data into the buffer and return the actual number of bytes that were queued for output. It will not block.

If no output buffer space is immediately available, this will wait up to the given timeout for space to become available. If no space becomes available within the timeout period, then this returns an error code (not zero).

In all cases this will return successfully as soon as at least 1 byte of actual data is output. It will *not* attempt to write the entire output buffer.
If an EOF condition occurs prior to timeout, this function returns zero.

Parameters

in	*filedes*	The handle ID to operate on
in	*buffer*	Source location for file data (must not be null)
in	*nbytes*	Maximum number of bytes to read (must not be zero)
in	*abstime*	Absolute time at which this function should return, if no data is readable

Returns

A non-negative byte count or appropriate error code, see OSAL Return Code Defines

Return values

OS_ERROR_TIMEOUT	if no data became available during timeout period
OS_ERR_INVALID_ID	if the file descriptor passed in is invalid
OS_ERR_INVALID_SIZE	if the passed-in size is not valid
OS_INVALID_POINTER	if the passed-in buffer is not valid
0	if file/stream cannot accept any more data

10.66.2.19 OS_write()

```
int32 OS_write (
    osal_id_t filedes,
    const void * buffer,
    size_t nbytes )
```

Write to a file handle.
Writes to a file. copies up to a maximum of nbytes of buffer to the file described in filedes

Parameters

in	*filedes*	The handle ID to operate on
in	*buffer*	Source location for file data (must not be null)
in	*nbytes*	Maximum number of bytes to read (must not be zero)

Note

All OSAL error codes are negative int32 values. Failure of this call can be checked by testing if the result is less than 0.

Returns

A non-negative byte count or appropriate error code, see OSAL Return Code Defines

Return values

OS_INVALID_POINTER	if buffer is NULL

Return values

OS_ERR_INVALID_SIZE	if the passed-in size is not valid
OS_ERROR	if OS call failed (return value only verified in coverage test)
OS_ERR_INVALID_ID	if the file descriptor passed in is invalid
0	if file/stream cannot accept any more data

Referenced by CF_WrappedWrite().

10.67 OSAL File System Level APIs

Functions

- int32 OS_FileSysAddFixedMap (osal_id_t ∗filesys_id, const char ∗phys_path, const char ∗virt_path)

  Create a fixed mapping between an existing directory and a virtual OSAL mount point.
- int32 OS_mkfs (char ∗address, const char ∗devname, const char ∗volname, size_t blocksize, osal_blockcount_t numblocks)

  Makes a file system on the target.
- int32 OS_mount (const char ∗devname, const char ∗mountpoint)

  Mounts a file system.
- int32 OS_initfs (char ∗address, const char ∗devname, const char ∗volname, size_t blocksize, osal_blockcount_t numblocks)

  Initializes an existing file system.
- int32 OS_rmfs (const char ∗devname)

  Removes a file system.
- int32 OS_unmount (const char ∗mountpoint)

  Unmounts a mounted file system.
- int32 OS_FileSysStatVolume (const char ∗name, OS_statvfs_t ∗statbuf)

  Obtains information about size and free space in a volume.
- int32 OS_chkfs (const char ∗name, bool repair)

  Checks the health of a file system and repairs it if necessary.
- int32 OS_FS_GetPhysDriveName (char ∗PhysDriveName, const char ∗MountPoint)

  Obtains the physical drive name associated with a mount point.
- int32 OS_TranslatePath (const char ∗VirtualPath, char ∗LocalPath)

  Translates an OSAL Virtual file system path to a host Local path.
- int32 OS_GetFsInfo (os_fsinfo_t ∗filesys_info)

  Returns information about the file system.

10.67.1 Detailed Description

10.67.2 Function Documentation

10.67.2.1 OS_chkfs()

```
int32 OS_chkfs (
    const char * name,
    bool repair )
```

Checks the health of a file system and repairs it if necessary.
Checks the drives for inconsistencies and optionally also repairs it

Note

not all operating systems implement this function. If the underlying OS does not provide a facility to check the volume, then OS_ERR_NOT_IMPLEMENTED will be returned.

Parameters

in	*name*	The device/path to operate on (must not be null)
in	*repair*	Whether to also repair inconsistencies

Returns

Execution status, see OSAL Return Code Defines

Return values

OS_SUCCESS	Successful execution. (return value only verified in coverage test)
OS_INVALID_POINTER	Name is NULL
OS_ERR_NOT_IMPLEMENTED	Not implemented.
OS_FS_ERR_PATH_TOO_LONG	if the name is too long
OS_ERROR	Failed execution. (return value only verified in coverage test)

10.67.2.2 OS_FileSysAddFixedMap()

```
int32 OS_FileSysAddFixedMap (
    osal_id_t * filesys_id,
    const char * phys_path,
    const char * virt_path )
```

Create a fixed mapping between an existing directory and a virtual OSAL mount point.

This mimics the behavior of a "FS_BASED" entry in the VolumeTable but is registered at runtime. It is intended to be called by the PSP/BSP prior to starting the application.

Note

OSAL virtual mount points are required to be a single, non-empty top-level directory name. Virtual path names always follow the form /<virt_mount_point>/<relative_path>/<file>. Only the relative path may be omitted/empty (i.e. /<virt_mount_point>/<file>) but the virtual mount point must be present and not an empty string. In particular this means it is not possible to directly refer to files in the "root" of the native file system from OSAL. However it is possible to create a virtual map to the root, such as by calling:

```
OS_FileSysAddFixedMap(&fs_id, "/", "/root");
```

Parameters

out	*filesys_id*	A buffer to store the ID of the file system mapping (must not be null)
in	*phys_path*	The native system directory (an existing mount point) (must not be null)
in	*virt_path*	The virtual mount point of this filesystem (must not be null)

Returns

Execution status, see OSAL Return Code Defines

Return values

OS_SUCCESS	Successful execution.
OS_FS_ERR_PATH_TOO_LONG	if the overall phys_path is too long
OS_ERR_NAME_TOO_LONG	if the phys_path basename (filesystem name) is too long
OS_INVALID_POINTER	if any argument is NULL

10.67.2.3 OS_FileSysStatVolume()

```
int32 OS_FileSysStatVolume (
    const char * name,
    OS_statvfs_t * statbuf )
```

Obtains information about size and free space in a volume.
Populates the supplied OS_statvfs_t structure, which includes the block size and total/free blocks in a file system volume.
This replaces two older OSAL calls:
OS_fsBlocksFree() is determined by reading the blocks_free output struct member OS_fsBytesFree() is determined by multiplying blocks_free by the block_size member

Parameters

in	*name*	The device/path to operate on (must not be null)
out	*statbuf*	Output structure to populate (must not be null)

Returns

Execution status, see OSAL Return Code Defines

Return values

OS_SUCCESS	Successful execution.
OS_INVALID_POINTER	if name or statbuf is NULL
OS_FS_ERR_PATH_TOO_LONG	if the name is too long
OS_ERROR	if an unexpected/unhandled OS error occurs (return value only verified in coverage test)

10.67.2.4 OS_FS_GetPhysDriveName()

```
int32 OS_FS_GetPhysDriveName (
    char * PhysDriveName,
    const char * MountPoint )
```

Obtains the physical drive name associated with a mount point.
Returns the name of the physical volume associated with the drive, when given the OSAL mount point of the drive

Parameters

out	*PhysDriveName*	Buffer to store physical drive name (must not be null)
in	*MountPoint*	OSAL mount point (must not be null)

Returns

Execution status, see OSAL Return Code Defines

Return values

OS_SUCCESS	Successful execution.
OS_INVALID_POINTER	if either parameter is NULL
OS_ERR_NAME_NOT_FOUND	if the MountPoint is not mounted in OSAL
OS_FS_ERR_PATH_TOO_LONG	if the MountPoint is too long

10.67.2.5 OS_GetFsInfo()

```
int32 OS_GetFsInfo (
    os_fsinfo_t * filesys_info )
```

Returns information about the file system.

Returns information about the file system in an os_fsinfo_t. This includes the number of open files and file systems

Parameters

out	*filesys_info*	Buffer to store filesystem information (must not be null)

Returns

Execution status, see OSAL Return Code Defines

Return values

OS_SUCCESS	Successful execution.
OS_INVALID_POINTER	if filesys_info is NULL

10.67.2.6 OS_initfs()

```
int32 OS_initfs (
    char * address,
    const char * devname,
    const char * volname,
    size_t blocksize,
    osal_blockcount_t numblocks )
```

Initializes an existing file system.

Initializes a file system on the target.

Note

The "volname" parameter of RAM disks should always begin with the string "RAM", e.g. "RAMDISK" or "RA↩M0","RAM1", etc if multiple devices are created. The underlying implementation uses this to select the correct filesystem type/format, and this may also be used to differentiate between RAM disks and real physical disks.

Parameters

in	*address*	The address at which to start the new disk. If address == 0, then space will be allocated by the OS
in	*devname*	The underlying kernel device to use, if applicable. (must not be null)
in	*volname*	The name of the volume (see note) (must not be null)
in	*blocksize*	The size of a single block on the drive
in	*numblocks*	The number of blocks to allocate for the drive

Returns

Execution status, see OSAL Return Code Defines

Return values

OS_SUCCESS	Successful execution.
OS_INVALID_POINTER	if devname or volname are NULL
OS_FS_ERR_PATH_TOO_LONG	if the name is too long
OS_FS_ERR_DEVICE_NOT_FREE	if the volume table is full
OS_FS_ERR_DRIVE_NOT_CREATED	if an unexpected/unhandled OS error occurs (return value only verified in coverage test)

10.67.2.7 OS_mkfs()

```
int32 OS_mkfs (
    char * address,
    const char * devname,
    const char * volname,
    size_t blocksize,
    osal_blockcount_t numblocks )
```

Makes a file system on the target.

Makes a file system on the target. Highly dependent on underlying OS and dependent on OS volume table definition.

Note

The "volname" parameter of RAM disks should always begin with the string "RAM", e.g. "RAMDISK" or "RA↩M0","RAM1", etc if multiple devices are created. The underlying implementation uses this to select the correct filesystem type/format, and this may also be used to differentiate between RAM disks and real physical disks.

Parameters

in	*address*	The address at which to start the new disk. If address == 0 space will be allocated by the OS.
in	*devname*	The underlying kernel device to use, if applicable. (must not be null)
in	*volname*	The name of the volume (see note) (must not be null)
in	*blocksize*	The size of a single block on the drive
in	*numblocks*	The number of blocks to allocate for the drive

Returns

Execution status, see OSAL Return Code Defines

Return values

OS_SUCCESS	Successful execution.
OS_INVALID_POINTER	if devname or volname is NULL
OS_FS_ERR_PATH_TOO_LONG	if the overall devname or volname is too long
OS_FS_ERR_DEVICE_NOT_FREE	if the volume table is full
OS_FS_ERR_DRIVE_NOT_CREATED	if an unexpected/unhandled OS error occurs (return value only verified in coverage test)

10.67.2.8 OS_mount()

```
int32 OS_mount (
```

```
const char * devname,
const char * mountpoint )
```

Mounts a file system.

Mounts a file system / block device at the given mount point.

Parameters

in	*devname*	The name of the drive to mount. devname is the same from OS_mkfs (must not be null)
in	*mountpoint*	The name to call this disk from now on (must not be null)

Returns

Execution status, see OSAL Return Code Defines

Return values

OS_SUCCESS	Successful execution.
OS_ERR_NAME_NOT_FOUND	if the device name does not exist in OSAL
OS_FS_ERR_PATH_TOO_LONG	if the mount point string is too long
OS_INVALID_POINTER	if any argument is NULL
OS_ERROR	if an unexpected/unhandled OS error occurs (return value only verified in coverage test)

10.67.2.9 OS_rmfs()

```
int32 OS_rmfs (
    const char * devname )
```

Removes a file system.

This function will remove or un-map the target file system. Note that this is not the same as un-mounting the file system.

Parameters

in	*devname*	The name of the "generic" drive (must not be null)

Returns

Execution status, see OSAL Return Code Defines

Return values

OS_SUCCESS	Successful execution.
OS_INVALID_POINTER	if devname is NULL
OS_FS_ERR_PATH_TOO_LONG	if the devname is too long
OS_ERR_NAME_NOT_FOUND	if the devname does not exist in OSAL
OS_ERROR	if an unexpected/unhandled OS error occurs (return value only verified in coverage test)

10.67.2.10 OS_TranslatePath()

```
int32 OS_TranslatePath (
    const char * VirtualPath,
    char * LocalPath )
```

Translates an OSAL Virtual file system path to a host Local path.
Translates a virtual path to an actual system path name

Note

The buffer provided in the LocalPath argument is required to be at least OS_MAX_PATH_LEN characters in length.

Parameters

in	*VirtualPath*	OSAL virtual path name (must not be null)
out	*LocalPath*	Buffer to store native/translated path name (must not be null)

Returns

Execution status, see OSAL Return Code Defines

Return values

OS_SUCCESS	Successful execution.
OS_INVALID_POINTER	if either parameter is NULL
OS_FS_ERR_NAME_TOO_LONG	if the filename component is too long
OS_FS_ERR_PATH_INVALID	if either parameter cannot be interpreted as a path
OS_FS_ERR_PATH_TOO_LONG	if either input or output pathnames are too long

10.67.2.11 OS_unmount()

```
int32 OS_unmount (
    const char * mountpoint )
```

Unmounts a mounted file system.
This function will unmount a drive from the file system and make all open file descriptors useless.

Note

Any open file descriptors referencing this file system should be closed prior to unmounting a drive

Parameters

in	*mountpoint*	The mount point to remove from OS_mount (must not be null)

Returns

Execution status, see OSAL Return Code Defines

Return values

OS_SUCCESS	Successful execution.
OS_INVALID_POINTER	if name is NULL
OS_FS_ERR_PATH_TOO_LONG	if the absolute path given is too long

Return values

OS_ERR_NAME_NOT_FOUND	if the mountpoint is not mounted in OSAL
OS_ERROR	if an unexpected/unhandled OS error occurs (return value only verified in coverage test)

10.68 OSAL Heap APIs

Functions

- int32 OS_HeapGetInfo (OS_heap_prop_t *heap_prop)

  Return current info on the heap.

10.68.1 Detailed Description

10.68.2 Function Documentation

10.68.2.1 OS_HeapGetInfo()

```
int32 OS_HeapGetInfo (
    OS_heap_prop_t * heap_prop )
```

Return current info on the heap.

Parameters

out	*heap_prop*	Storage buffer for heap info

Returns

Execution status, see OSAL Return Code Defines

Return values

OS_SUCCESS	Successful execution.
OS_INVALID_POINTER	if the heap_prop argument is NULL

10.69 OSAL Object Type Defines

Macros

- #define OS_OBJECT_TYPE_UNDEFINED 0x00

  Object type undefined.
- #define OS_OBJECT_TYPE_OS_TASK 0x01

  Object task type.
- #define OS_OBJECT_TYPE_OS_QUEUE 0x02

  Object queue type.
- #define OS_OBJECT_TYPE_OS_COUNTSEM 0x03

  Object counting semaphore type.
- #define OS_OBJECT_TYPE_OS_BINSEM 0x04

  Object binary semaphore type.
- #define OS_OBJECT_TYPE_OS_MUTEX 0x05

  Object mutex type.
- #define OS_OBJECT_TYPE_OS_STREAM 0x06

  Object stream type.
- #define OS_OBJECT_TYPE_OS_DIR 0x07

  Object directory type.
- #define OS_OBJECT_TYPE_OS_TIMEBASE 0x08

  Object timebase type.
- #define OS_OBJECT_TYPE_OS_TIMECB 0x09

  Object timer callback type.
- #define OS_OBJECT_TYPE_OS_MODULE 0x0A

  Object module type.
- #define OS_OBJECT_TYPE_OS_FILESYS 0x0B

  Object file system type.
- #define OS_OBJECT_TYPE_OS_CONSOLE 0x0C

  Object console type.
- #define OS_OBJECT_TYPE_OS_CONDVAR 0x0D

  Object condition variable type.
- #define OS_OBJECT_TYPE_USER 0x10

  Object user type.

10.69.1 Detailed Description

10.69.2 Macro Definition Documentation

10.69.2.1 OS_OBJECT_TYPE_OS_BINSEM `#define OS_OBJECT_TYPE_OS_BINSEM 0x04`

Object binary semaphore type.
Definition at line 42 of file osapi-idmap.h.

10.69.2.2 OS_OBJECT_TYPE_OS_CONDVAR `#define OS_OBJECT_TYPE_OS_CONDVAR 0x0D`

Object condition variable type.
Definition at line 51 of file osapi-idmap.h.

10.69.2.3 OS_OBJECT_TYPE_OS_CONSOLE `#define OS_OBJECT_TYPE_OS_CONSOLE 0x0C`

Object console type.
Definition at line 50 of file osapi-idmap.h.

10.69.2.4 OS_OBJECT_TYPE_OS_COUNTSEM `#define OS_OBJECT_TYPE_OS_COUNTSEM 0x03`

Object counting semaphore type.
Definition at line 41 of file osapi-idmap.h.

10.69.2.5 OS_OBJECT_TYPE_OS_DIR `#define OS_OBJECT_TYPE_OS_DIR 0x07`

Object directory type.
Definition at line 45 of file osapi-idmap.h.

10.69.2.6 OS_OBJECT_TYPE_OS_FILESYS `#define OS_OBJECT_TYPE_OS_FILESYS 0x0B`

Object file system type.
Definition at line 49 of file osapi-idmap.h.

10.69.2.7 OS_OBJECT_TYPE_OS_MODULE `#define OS_OBJECT_TYPE_OS_MODULE 0x0A`

Object module type.
Definition at line 48 of file osapi-idmap.h.

10.69.2.8 OS_OBJECT_TYPE_OS_MUTEX `#define OS_OBJECT_TYPE_OS_MUTEX 0x05`

Object mutex type.
Definition at line 43 of file osapi-idmap.h.

10.69.2.9 OS_OBJECT_TYPE_OS_QUEUE `#define OS_OBJECT_TYPE_OS_QUEUE 0x02`

Object queue type.
Definition at line 40 of file osapi-idmap.h.

10.69.2.10 OS_OBJECT_TYPE_OS_STREAM `#define OS_OBJECT_TYPE_OS_STREAM 0x06`

Object stream type.
Definition at line 44 of file osapi-idmap.h.

10.69.2.11 OS_OBJECT_TYPE_OS_TASK `#define OS_OBJECT_TYPE_OS_TASK 0x01`

Object task type.
Definition at line 39 of file osapi-idmap.h.

10.69.2.12 OS_OBJECT_TYPE_OS_TIMEBASE `#define OS_OBJECT_TYPE_OS_TIMEBASE 0x08`

Object timebase type.
Definition at line 46 of file osapi-idmap.h.

10.69.2.13 OS_OBJECT_TYPE_OS_TIMECB `#define OS_OBJECT_TYPE_OS_TIMECB 0x09`

Object timer callback type.
Definition at line 47 of file osapi-idmap.h.

10.69.2.14 OS_OBJECT_TYPE_UNDEFINED `#define OS_OBJECT_TYPE_UNDEFINED 0x00`

Object type undefined.
Definition at line 38 of file osapi-idmap.h.

10.69.2.15 OS_OBJECT_TYPE_USER `#define OS_OBJECT_TYPE_USER 0x10`

Object user type.
Definition at line 52 of file osapi-idmap.h.

10.70 OSAL Object ID Utility APIs

Functions

- static unsigned long OS_ObjectIdToInteger (osal_id_t object_id)

  Obtain an integer value corresponding to an object ID.
- static osal_id_t OS_ObjectIdFromInteger (unsigned long value)

  Obtain an osal ID corresponding to an integer value.
- static bool OS_ObjectIdEqual (osal_id_t object_id1, osal_id_t object_id2)

  Check two OSAL object ID values for equality.
- static bool OS_ObjectIdDefined (osal_id_t object_id)

  Check if an object ID is defined.
- int32 OS_GetResourceName (osal_id_t object_id, char ∗buffer, size_t buffer_size)

  Obtain the name of an object given an arbitrary object ID.
- osal_objtype_t OS_IdentifyObject (osal_id_t object_id)

  Obtain the type of an object given an arbitrary object ID.
- int32 OS_ConvertToArrayIndex (osal_id_t object_id, osal_index_t ∗ArrayIndex)

  Converts an abstract ID into a number suitable for use as an array index.
- int32 OS_ObjectIdToArrayIndex (osal_objtype_t idtype, osal_id_t object_id, osal_index_t ∗ArrayIndex)

  Converts an abstract ID into a number suitable for use as an array index.
- void OS_ForEachObject (osal_id_t creator_id, OS_ArgCallback_t callback_ptr, void ∗callback_arg)

  call the supplied callback function for all valid object IDs
- void OS_ForEachObjectOfType (osal_objtype_t objtype, osal_id_t creator_id, OS_ArgCallback_t callback_ptr, void ∗callback_arg)

  call the supplied callback function for valid object IDs of a specific type

10.70.1 Detailed Description

10.70.2 Function Documentation

10.70.2.1 OS_ConvertToArrayIndex()

```
int32 OS_ConvertToArrayIndex (
    osal_id_t object_id,
    osal_index_t * ArrayIndex )
```

Converts an abstract ID into a number suitable for use as an array index.
This will return a unique zero-based integer number in the range of [0,MAX) for any valid object ID. This may be used by application code as an array index for indexing into local tables.

Note

This does NOT verify the validity of the ID, that is left to the caller. This is only the conversion logic.

This routine accepts any object type, and returns a value based on the maximum number of objects for that type. This is equivalent to invoking OS_ObjectIdToArrayIndex() with the idtype set to OS_OBJECT_TYPE_UNDEFINED.

See also

OS_ObjectIdToArrayIndex

Parameters

in	*object_id*	The object ID to operate on
out	∗*ArrayIndex*	The Index to return (must not be null)

Returns

Execution status, see OSAL Return Code Defines

Return values

OS_SUCCESS	Successful execution.
OS_ERR_INVALID_ID	if the object_id argument is not valid
OS_INVALID_POINTER	if the ArrayIndex is NULL

10.70.2.2 OS_ForEachObject()

```
void OS_ForEachObject (
    osal_id_t creator_id,
    OS_ArgCallback_t callback_ptr,
    void * callback_arg )
```

call the supplied callback function for all valid object IDs
Loops through all defined OSAL objects of all types and calls callback_ptr on each one If creator_id is nonzero then only objects with matching creator id are processed.

Parameters

in	*creator_id*	Filter objects to those created by a specific task This may be passed as OS_OBJECT_CREATOR_ANY to return all objects
in	*callback_ptr*	Function to invoke for each matching object ID
in	*callback_arg*	Opaque Argument to pass to callback function (may be NULL)

10.70.2.3 OS_ForEachObjectOfType()

```
void OS_ForEachObjectOfType (
    osal_objtype_t objtype,
    osal_id_t creator_id,
    OS_ArgCallback_t callback_ptr,
    void * callback_arg )
```

call the supplied callback function for valid object IDs of a specific type
Loops through all defined OSAL objects of a specific type and calls callback_ptr on each one If creator_id is nonzero then only objects with matching creator id are processed.

Parameters

in	*objtype*	The type of objects to iterate
in	*creator_id*	Filter objects to those created by a specific task This may be passed as OS_OBJECT_CREATOR_ANY to return all objects
in	*callback_ptr*	Function to invoke for each matching object ID
in	*callback_arg*	Opaque Argument to pass to callback function (may be NULL)

10.70.2.4 OS_GetResourceName()

```
int32 OS_GetResourceName (
    osal_id_t object_id,
    char * buffer,
```

```
size_t buffer_size )
```

Obtain the name of an object given an arbitrary object ID.
All OSAL resources generally have a name associated with them. This allows application code to retrieve the name of any valid OSAL object ID.

Parameters

in	*object_id*	The object ID to operate on
out	*buffer*	Buffer in which to store the name (must not be null)
in	*buffer_size*	Size of the output storage buffer (must not be zero)

Returns

Execution status, see OSAL Return Code Defines

Return values

OS_SUCCESS	Successful execution.
OS_ERR_INVALID_ID	if the passed-in ID is not a valid OSAL ID
OS_INVALID_POINTER	if the passed-in buffer is invalid
OS_ERR_NAME_TOO_LONG	if the name will not fit in the buffer provided

10.70.2.5 OS_IdentifyObject()

```
osal_objtype_t OS_IdentifyObject (
    osal_id_t object_id )
```

Obtain the type of an object given an arbitrary object ID.
Given an arbitrary object ID, get the type of the object

Parameters

in	*object↩ _id*	The object ID to operate on

Returns

The object type portion of the object_id, see OSAL Object Type Defines for expected values

10.70.2.6 OS_ObjectIdDefined()

```
static bool OS_ObjectIdDefined (
    osal_id_t object_id )  [inline], [static]
```

Check if an object ID is defined.
The OSAL ID values should be treated as abstract values by applications, and not directly manipulated using standard C operators.
This returns false if the ID is NOT a defined resource (i.e. free/empty/invalid).

Note

OS_ObjectIdDefined(OS_OBJECT_ID_UNDEFINED) is always guaranteed to be false.

Parameters

in	*object↩ _id*	The first object ID

Definition at line 150 of file osapi-idmap.h.
References OS_ObjectIdToInteger().
Referenced by CF_CFDP_CloseFiles(), CF_CFDP_MsgOutGet(), CF_CFDP_ResetTransaction(), and CF_CFDP_S↩ _SubstateSendMetadata().

10.70.2.7 OS_ObjectIdEqual()

```
static bool OS_ObjectIdEqual (
    osal_id_t object_id1,
    osal_id_t object_id2 ) [inline], [static]
```

Check two OSAL object ID values for equality.
The OSAL ID values should be treated as abstract values by applications, and not directly manipulated using standard C operators.
This checks two values for equality, replacing the "==" operator.

Parameters

in	*object_id1*	The first object ID
in	*object_id2*	The second object ID

Returns

true if the object IDs are equal

Definition at line 129 of file osapi-idmap.h.
References OS_ObjectIdToInteger().

10.70.2.8 OS_ObjectIdFromInteger()

```
static osal_id_t OS_ObjectIdFromInteger (
    unsigned long value ) [inline], [static]
```

Obtain an osal ID corresponding to an integer value.
Provides the inverse of OS_ObjectIdToInteger(). Reconstitutes the original osal_id_t type from an integer representation.

Parameters

in	*value*	The integer representation of an OSAL ID

Returns

The ID value converted to an osal_id_t

Definition at line 102 of file osapi-idmap.h.

10.70.2.9 OS_ObjectIdToArrayIndex()

```
int32 OS_ObjectIdToArrayIndex (
    osal_objtype_t idtype,
    osal_id_t object_id,
    osal_index_t * ArrayIndex )
```

Converts an abstract ID into a number suitable for use as an array index.

This will return a unique zero-based integer number in the range of [0,MAX) for any valid object ID. This may be used by application code as an array index for indexing into local tables.
This routine operates on a specific object type, and returns a value based on the maximum number of objects for that type.
If the idtype is passed as OS_OBJECT_TYPE_UNDEFINED, then object type verification is skipped and any object ID will be accepted and converted to an index. In this mode, the range of the output depends on the actual passed-in object type.
If the idtype is passed as any other value, the passed-in ID value is first confirmed to be the correct type. This check will guarantee that the output is within an expected range; for instance, if the type is passed as OS_OBJECT_TYPE_OS_TASK, then the output index is guaranteed to be between 0 and OS_MAX_TASKS-1 after successful conversion.

Parameters

in	*idtype*	The object type to convert
in	*object_id*	The object ID to operate on
out	∗*ArrayIndex*	The Index to return (must not be null)

Returns

Execution status, see OSAL Return Code Defines

Return values

OS_SUCCESS	Successful execution.
OS_ERR_INVALID_ID	if the object_id argument is not valid
OS_INVALID_POINTER	if the ArrayIndex is NULL

10.70.2.10 OS_ObjectIdToInteger()

```
static unsigned long OS_ObjectIdToInteger (
    osal_id_t object_id ) [inline], [static]
```

Obtain an integer value corresponding to an object ID.
Obtains an integer representation of an object id, generally for the purpose of printing to the console or system logs.
The returned value is of the type "unsigned long" for direct use with printf-style functions. It is recommended to use the "%lx" conversion specifier as the hexadecimal encoding clearly delineates the internal fields.

Note

This provides the raw integer value and is *not* suitable for use as an array index, as the result is not zero-based. See the OS_ConvertToArrayIndex() to obtain a zero-based index value.

Parameters

in	*object↩ _id*	The object ID

Returns

integer value representation of object ID

Definition at line 80 of file osapi-idmap.h.
Referenced by CF_WrappedClose(), OS_ObjectIdDefined(), and OS_ObjectIdEqual().

10.71 OSAL Dynamic Loader and Symbol APIs

Functions

- int32 OS_SymbolLookup (cpuaddr *symbol_address, const char *symbol_name)

  Find the Address of a Symbol.
- int32 OS_ModuleSymbolLookup (osal_id_t module_id, cpuaddr *symbol_address, const char *symbol_name)

  Find the Address of a Symbol within a module.
- int32 OS_SymbolTableDump (const char *filename, size_t size_limit)

  Dumps the system symbol table to a file.
- int32 OS_ModuleLoad (osal_id_t *module_id, const char *module_name, const char *filename, uint32 flags)

  Loads an object file.
- int32 OS_ModuleUnload (osal_id_t module_id)

  Unloads the module file.
- int32 OS_ModuleInfo (osal_id_t module_id, OS_module_prop_t *module_info)

  Obtain information about a module.

10.71.1 Detailed Description

10.71.2 Function Documentation

10.71.2.1 OS_ModuleInfo()

```
int32 OS_ModuleInfo (
    osal_id_t module_id,
    OS_module_prop_t * module_info )
```

Obtain information about a module.
Returns information about the loadable module

Parameters

in	*module_id*	OSAL ID of the previously the loaded module
out	*module_info*	Buffer to store module information (must not be null)

Returns

Execution status, see OSAL Return Code Defines

Return values

OS_SUCCESS	Successful execution.
OS_ERR_INVALID_ID	if the module id invalid
OS_INVALID_POINTER	if the pointer to the ModuleInfo structure is invalid
OS_ERROR	if an other/unspecified error occurs (return value only verified in coverage test)

10.71.2.2 OS_ModuleLoad()

```
int32 OS_ModuleLoad (
    osal_id_t * module_id,
    const char * module_name,
    const char * filename,
```

```
uint32 flags )
```

Loads an object file.

Loads an object file into the running operating system

The "flags" parameter may influence how the loaded module symbols are made available for use in the application. See OS_MODULE_FLAG_LOCAL_SYMBOLS and OS_MODULE_FLAG_GLOBAL_SYMBOLS for descriptions.

Parameters

out	*module_id*	Non-zero OSAL ID corresponding to the loaded module
in	*module_name*	Name of module (must not be null)
in	*filename*	File containing the object code to load (must not be null)
in	*flags*	Options for the loaded module

Returns

Execution status, see OSAL Return Code Defines

Return values

OS_SUCCESS	Successful execution.
OS_INVALID_POINTER	if one of the parameters is NULL
OS_ERR_NO_FREE_IDS	if the module table is full
OS_ERR_NAME_TAKEN	if the name is in use
OS_ERR_NAME_TOO_LONG	if the module_name is too long
OS_FS_ERR_PATH_INVALID	if the filename argument is not valid
OS_ERROR	if an other/unspecified error occurs (return value only verified in coverage test)

10.71.2.3 OS_ModuleSymbolLookup()

```
int32 OS_ModuleSymbolLookup (
    osal_id_t module_id,
    cpuaddr * symbol_address,
    const char * symbol_name )
```

Find the Address of a Symbol within a module.

This is similar to OS_SymbolLookup() but for a specific module ID. This should be used to look up a symbol in a module that has been loaded with the OS_MODULE_FLAG_LOCAL_SYMBOLS flag.

Parameters

in	*module_id*	Module ID that should contain the symbol
out	*symbol_address*	Set to the address of the symbol (must not be null)
in	*symbol_name*	Name of the symbol to look up (must not be null)

Returns

Execution status, see OSAL Return Code Defines

Return values

OS_SUCCESS	Successful execution.

Return values

OS_ERROR	if the symbol could not be found
OS_INVALID_POINTER	if one of the pointers passed in are NULL

10.71.2.4 OS_ModuleUnload()

```
int32 OS_ModuleUnload (
    osal_id_t module_id )
```

Unloads the module file.
Unloads the module file from the running operating system

Parameters

in	*module_id*	OSAL ID of the previously the loaded module

Returns

Execution status, see OSAL Return Code Defines

Return values

OS_SUCCESS	Successful execution.
OS_ERR_INVALID_ID	if the module id invalid
OS_ERROR	if an other/unspecified error occurs (return value only verified in coverage test)

10.71.2.5 OS_SymbolLookup()

```
int32 OS_SymbolLookup (
    cpuaddr * symbol_address,
    const char * symbol_name )
```

Find the Address of a Symbol.
This calls to the OS dynamic symbol lookup implementation, and/or checks a static symbol table for a matching symbol name.
The static table is intended to support embedded targets that do not have module loading capability or have it disabled.

Parameters

out	*symbol_address*	Set to the address of the symbol (must not be null)
in	*symbol_name*	Name of the symbol to look up (must not be null)

Returns

Execution status, see OSAL Return Code Defines

Return values

OS_SUCCESS	Successful execution.
OS_ERROR	if the symbol could not be found
OS_INVALID_POINTER	if one of the pointers passed in are NULL

10.71.2.6 OS_SymbolTableDump()

```
int32 OS_SymbolTableDump (
    const char * filename,
    size_t size_limit )
```

Dumps the system symbol table to a file.

Dumps the system symbol table to the specified filename

Note

Not all RTOS implementations support this API. If the underlying module subsystem does not provide a facility to iterate through the symbol table, then the OS_ERR_NOT_IMPLEMENTED status code is returned.

Parameters

in	*filename*	File to write to (must not be null)
in	*size_limit*	Maximum number of bytes to write

Returns

Execution status, see OSAL Return Code Defines

Return values

OS_SUCCESS	Successful execution.
OS_ERR_NOT_IMPLEMENTED	Not implemented.
OS_INVALID_POINTER	if the filename argument is NULL
OS_FS_ERR_PATH_INVALID	if the filename argument is not valid
OS_ERR_NAME_TOO_LONG	if any of the symbol names are too long (return value only verified in coverage test)
OS_ERR_OUTPUT_TOO_LARGE	if the size_limit was reached before completing all symbols (return value only verified in coverage test)
OS_ERROR	if an other/unspecified error occurs (return value only verified in coverage test)

10.72 OSAL Mutex APIs

Functions

- int32 OS_MutSemCreate (osal_id_t *sem_id, const char *sem_name, uint32 options)

  Creates a mutex semaphore.
- int32 OS_MutSemGive (osal_id_t sem_id)

  Releases the mutex object referenced by sem_id.
- int32 OS_MutSemTake (osal_id_t sem_id)

  Acquire the mutex object referenced by sem_id.
- int32 OS_MutSemDelete (osal_id_t sem_id)

  Deletes the specified Mutex Semaphore.
- int32 OS_MutSemGetIdByName (osal_id_t *sem_id, const char *sem_name)

  Find an existing mutex ID by name.
- int32 OS_MutSemGetInfo (osal_id_t sem_id, OS_mut_sem_prop_t *mut_prop)

  Fill a property object buffer with details regarding the resource.

10.72.1 Detailed Description

10.72.2 Function Documentation

10.72.2.1 OS_MutSemCreate()

```
int32 OS_MutSemCreate (
    osal_id_t * sem_id,
    const char * sem_name,
    uint32 options )
```

Creates a mutex semaphore.
Mutex semaphores are always created in the unlocked (full) state.

Parameters

out	*sem_id*	will be set to the non-zero ID of the newly-created resource (must not be null)
in	*sem_name*	the name of the new resource to create (must not be null)
in	*options*	reserved for future use. Should be passed as 0.

Returns

Execution status, see OSAL Return Code Defines

Return values

OS_SUCCESS	Successful execution.
OS_INVALID_POINTER	if sem_id or sem_name are NULL
OS_ERR_NAME_TOO_LONG	name length including null terminator greater than OS_MAX_API_NAME
OS_ERR_NO_FREE_IDS	if there are no more free mutex Ids
OS_ERR_NAME_TAKEN	if there is already a mutex with the same name
OS_SEM_FAILURE	if the OS call failed (return value only verified in coverage test)

10.72.2.2 OS_MutSemDelete()

```
int32 OS_MutSemDelete (
    osal_id_t sem_id )
```

Deletes the specified Mutex Semaphore.
Delete the semaphore. This also frees the respective sem_id such that it can be used again when another is created.

Parameters

in	*sem_id*	The object ID to delete

Returns

Execution status, see OSAL Return Code Defines

Return values

OS_SUCCESS	Successful execution.
OS_ERR_INVALID_ID	if the id passed in is not a valid mutex
OS_SEM_FAILURE	if an unspecified error occurs (return value only verified in coverage test)

10.72.2.3 OS_MutSemGetIdByName()

```
int32 OS_MutSemGetIdByName (
    osal_id_t * sem_id,
    const char * sem_name )
```

Find an existing mutex ID by name.
This function tries to find a mutex sem Id given the name of a mut_sem. The id is returned through sem_id

Parameters

out	*sem_id*	will be set to the ID of the existing resource
in	*sem_name*	the name of the existing resource to find (must not be null)

Returns

Execution status, see OSAL Return Code Defines

Return values

OS_SUCCESS	Successful execution.
OS_INVALID_POINTER	is semid or sem_name are NULL pointers
OS_ERR_NAME_TOO_LONG	name length including null terminator greater than OS_MAX_API_NAME
OS_ERR_NAME_NOT_FOUND	if the name was not found in the table

10.72.2.4 OS_MutSemGetInfo()

```
int32 OS_MutSemGetInfo (
    osal_id_t sem_id,
    OS_mut_sem_prop_t * mut_prop )
```

Fill a property object buffer with details regarding the resource.

This function will pass back a pointer to structure that contains all of the relevant info(name and creator) about the specified mutex semaphore.

Parameters

in	*sem_id*	The object ID to operate on
out	*mut_prop*	The property object buffer to fill (must not be null)

Returns

Execution status, see OSAL Return Code Defines

Return values

OS_SUCCESS	Successful execution.
OS_ERR_INVALID_ID	if the id passed in is not a valid semaphore
OS_INVALID_POINTER	if the mut_prop pointer is null

10.72.2.5 OS_MutSemGive()

```
int32 OS_MutSemGive (
    osal_id_t sem_id )
```

Releases the mutex object referenced by sem_id.
If there are threads blocked on the mutex object referenced by mutex when this function is called, resulting in the mutex becoming available, the scheduling policy shall determine which thread shall acquire the mutex.

Parameters

in	*sem↩ _id*	The object ID to operate on

Returns

Execution status, see OSAL Return Code Defines

Return values

OS_SUCCESS	Successful execution.
OS_ERR_INVALID_ID	if the id passed in is not a valid mutex
OS_SEM_FAILURE	if an unspecified error occurs (return value only verified in coverage test)

10.72.2.6 OS_MutSemTake()

```
int32 OS_MutSemTake (
    osal_id_t sem_id )
```

Acquire the mutex object referenced by sem_id.
If the mutex is already locked, the calling thread shall block until the mutex becomes available. This operation shall return with the mutex object referenced by mutex in the locked state with the calling thread as its owner.

Parameters

in	*sem↩ _id*	The object ID to operate on

Returns

Execution status, see OSAL Return Code Defines

Return values

OS_SUCCESS	Successful execution.
OS_ERR_INVALID_ID	the id passed in is not a valid mutex
OS_SEM_FAILURE	if an unspecified error occurs (return value only verified in coverage test)

10.73 OSAL Network ID APIs

Provides some basic methods to query a network host name and ID.

Functions

- int32 OS_NetworkGetID (void)

  Gets the network ID of the local machine.
- int32 OS_NetworkGetHostName (char *host_name, size_t name_len)

  Gets the local machine network host name.

10.73.1 Detailed Description

Provides some basic methods to query a network host name and ID.

10.73.2 Function Documentation

10.73.2.1 OS_NetworkGetHostName()

```
int32 OS_NetworkGetHostName (
    char * host_name,
    size_t name_len )
```

Gets the local machine network host name.
If configured in the underlying network stack, this function retrieves the local hostname of the system.

Parameters

out	*host_name*	Buffer to hold name information (must not be null)
in	*name_len*	Maximum length of host name buffer (must not be zero)

Returns

Execution status, see OSAL Return Code Defines

Return values

OS_SUCCESS	Successful execution.
OS_ERR_INVALID_SIZE	if the name_len is zero
OS_INVALID_POINTER	if the host_name is NULL

10.73.2.2 OS_NetworkGetID()

```
int32 OS_NetworkGetID (
    void )
```

Gets the network ID of the local machine.
The ID is an implementation-defined value and may not be consistent in meaning across different platform types.

Note

This API may be removed in a future version of OSAL due to inconsistencies between platforms.

Returns

The ID or fixed value of -1 if the host id could not be found. Note it is not possible to differentiate between error codes and valid network IDs here. It is assumed, however, that -1 is never a valid ID.

10.74 OSAL Printf APIs

Functions

- void OS_printf (const char *string,...) OS_PRINTF(1

  Abstraction for the system printf() call.
- void void OS_printf_disable (void)

  This function disables the output from OS_printf.
- void OS_printf_enable (void)

  This function enables the output from OS_printf.

10.74.1 Detailed Description

10.74.2 Function Documentation

10.74.2.1 OS_printf()

```
void OS_printf (
    const char * string,
    ... )
```

Abstraction for the system printf() call.
This function abstracts out the printf type statements. This is useful for using OS- specific thats that will allow non-polled print statements for the real time systems.
Operates in a manner similar to the printf() call defined by the standard C library and takes all the parameters and formatting options of printf. This abstraction may implement additional buffering, if necessary, to improve the real-time performance of the call.
Strings (including terminator) longer than OS_BUFFER_SIZE will be truncated.
The output of this routine also may be dynamically enabled or disabled by the OS_printf_enable() and OS_printf_disable() calls, respectively.

Parameters

in	*string*	Format string, followed by additional arguments

10.74.2.2 OS_printf_disable()

```
void void OS_printf_disable (
    void )
```

This function disables the output from OS_printf.

10.74.2.3 OS_printf_enable()

```
void OS_printf_enable (
    void )
```

This function enables the output from OS_printf.

10.75 OSAL Message Queue APIs

Functions

- int32 OS_QueueCreate (osal_id_t *queue_id, const char *queue_name, osal_blockcount_t queue_depth, size↩_t data_size, uint32 flags)

  Create a message queue.
- int32 OS_QueueDelete (osal_id_t queue_id)

  Deletes the specified message queue.
- int32 OS_QueueGet (osal_id_t queue_id, void *data, size_t size, size_t *size_copied, int32 timeout)

  Receive a message on a message queue.
- int32 OS_QueuePut (osal_id_t queue_id, const void *data, size_t size, uint32 flags)

  Put a message on a message queue.
- int32 OS_QueueGetIdByName (osal_id_t *queue_id, const char *queue_name)

  Find an existing queue ID by name.
- int32 OS_QueueGetInfo (osal_id_t queue_id, OS_queue_prop_t *queue_prop)

  Fill a property object buffer with details regarding the resource.

10.75.1 Detailed Description

10.75.2 Function Documentation

10.75.2.1 OS_QueueCreate()

```
int32 OS_QueueCreate (
    osal_id_t * queue_id,
    const char * queue_name,
    osal_blockcount_t queue_depth,
    size_t data_size,
    uint32 flags )
```

Create a message queue.

This is the function used to create a queue in the operating system. Depending on the underlying operating system, the memory for the queue will be allocated automatically or allocated by the code that sets up the queue. Queue names must be unique; if the name already exists this function fails. Names cannot be NULL.

Parameters

out	*queue_id*	will be set to the non-zero ID of the newly-created resource (must not be null)
in	*queue_name*	the name of the new resource to create (must not be null)
in	*queue_depth*	the maximum depth of the queue
in	*data_size*	the size of each entry in the queue (must not be zero)
in	*flags*	options for the queue (reserved for future use, pass as 0)

Returns

Execution status, see OSAL Return Code Defines

Return values

OS_SUCCESS	Successful execution.
OS_INVALID_POINTER	if a pointer passed in is NULL
OS_ERR_NAME_TOO_LONG	name length including null terminator greater than OS_MAX_API_NAME

Return values

OS_ERR_NO_FREE_IDS	if there are already the max queues created
OS_ERR_NAME_TAKEN	if the name is already being used on another queue
OS_ERR_INVALID_SIZE	if data_size is 0
OS_QUEUE_INVALID_SIZE	if the queue depth exceeds the limit
OS_ERROR	if the OS create call fails

10.75.2.2 OS_QueueDelete()

```
int32 OS_QueueDelete (
    osal_id_t queue_id )
```

Deletes the specified message queue.
This is the function used to delete a queue in the operating system. This also frees the respective queue_id to be used again when another queue is created.

Note

If There are messages on the queue, they will be lost and any subsequent calls to QueueGet or QueuePut to this queue will result in errors

Parameters

in	*queue↩ _id*	The object ID to delete

Returns

Execution status, see OSAL Return Code Defines

Return values

OS_SUCCESS	Successful execution.
OS_ERR_INVALID_ID	if the id passed in does not exist
OS_ERROR	if the OS call returns an unexpected error (return value only verified in coverage test)

10.75.2.3 OS_QueueGet()

```
int32 OS_QueueGet (
    osal_id_t queue_id,
    void * data,
    size_t size,
    size_t * size_copied,
    int32 timeout )
```

Receive a message on a message queue.
If a message is pending, it is returned immediately. Otherwise the calling task will block until a message arrives or the timeout expires.

Parameters

in	*queue_id*	The object ID to operate on

Parameters

out	*data*	The buffer to store the received message (must not be null)
in	*size*	The size of the data buffer (must not be zero)
out	*size_copied*	Set to the actual size of the message (must not be null)
in	*timeout*	The maximum amount of time to block, or OS_PEND to wait forever

Returns

Execution status, see OSAL Return Code Defines

Return values

OS_SUCCESS	Successful execution.
OS_ERR_INVALID_ID	if the given ID does not exist
OS_INVALID_POINTER	if a pointer passed in is NULL
OS_QUEUE_EMPTY	if the Queue has no messages on it to be received
OS_QUEUE_TIMEOUT	if the timeout was OS_PEND and the time expired
OS_QUEUE_INVALID_SIZE	if the size copied from the queue was not correct
OS_ERROR	if the OS call returns an unexpected error (return value only verified in coverage test)

10.75.2.4 OS_QueueGetIdByName()

```
int32 OS_QueueGetIdByName (
    osal_id_t * queue_id,
    const char * queue_name )
```

Find an existing queue ID by name.
This function tries to find a queue Id given the name of the queue. The id of the queue is passed back in queue_id.

Parameters

out	*queue_id*	will be set to the ID of the existing resource
in	*queue_name*	the name of the existing resource to find (must not be null)

Returns

Execution status, see OSAL Return Code Defines

Return values

OS_SUCCESS	Successful execution.
OS_INVALID_POINTER	if the name or id pointers are NULL
OS_ERR_NAME_TOO_LONG	name length including null terminator greater than OS_MAX_API_NAME
OS_ERR_NAME_NOT_FOUND	the name was not found in the table

10.75.2.5 OS_QueueGetInfo()

```
int32 OS_QueueGetInfo (
```

```
osal_id_t queue_id,
OS_queue_prop_t * queue_prop )
```

Fill a property object buffer with details regarding the resource.
This function will pass back a pointer to structure that contains all of the relevant info (name and creator) about the specified queue.

Parameters

in	*queue_id*	The object ID to operate on
out	*queue_prop*	The property object buffer to fill (must not be null)

Returns

Execution status, see OSAL Return Code Defines

Return values

OS_SUCCESS	Successful execution.
OS_INVALID_POINTER	if queue_prop is NULL
OS_ERR_INVALID_ID	if the ID given is not a valid queue

10.75.2.6 OS_QueuePut()

```
int32 OS_QueuePut (
osal_id_t queue_id,
const void * data,
size_t size,
uint32 flags )
```

Put a message on a message queue.

Parameters

in	*queue↩ _id*	The object ID to operate on
in	*data*	The buffer containing the message to put (must not be null)
in	*size*	The size of the data buffer (must not be zero)
in	*flags*	Currently reserved/unused, should be passed as 0

Returns

Execution status, see OSAL Return Code Defines

Return values

OS_SUCCESS	Successful execution.
OS_ERR_INVALID_ID	if the queue id passed in is not a valid queue
OS_INVALID_POINTER	if the data pointer is NULL
OS_QUEUE_INVALID_SIZE	if the data message is too large for the queue
OS_QUEUE_FULL	if the queue cannot accept another message
OS_ERROR	if the OS call returns an unexpected error (return value only verified in coverage test)

10.76 OSAL Select APIs

Functions

- int32 OS_SelectMultipleAbs (OS_FdSet *ReadSet, OS_FdSet *WriteSet, OS_time_t abs_timeout)

  Wait for events across multiple file handles.
- int32 OS_SelectMultiple (OS_FdSet *ReadSet, OS_FdSet *WriteSet, int32 msecs)

  Wait for events across multiple file handles.
- int32 OS_SelectSingleAbs (osal_id_t objid, uint32 *StateFlags, OS_time_t abs_timeout)

  Wait for events on a single file handle.
- int32 OS_SelectSingle (osal_id_t objid, uint32 *StateFlags, int32 msecs)

  Wait for events on a single file handle.
- int32 OS_SelectFdZero (OS_FdSet *Set)

  Clear a FdSet structure.
- int32 OS_SelectFdAdd (OS_FdSet *Set, osal_id_t objid)

  Add an ID to an FdSet structure.
- int32 OS_SelectFdClear (OS_FdSet *Set, osal_id_t objid)

  Clear an ID from an FdSet structure.
- bool OS_SelectFdIsSet (const OS_FdSet *Set, osal_id_t objid)

  Check if an FdSet structure contains a given ID.

10.76.1 Detailed Description

10.76.2 Function Documentation

10.76.2.1 OS_SelectFdAdd()

```
int32 OS_SelectFdAdd (
    OS_FdSet * Set,
    osal_id_t objid )
```

Add an ID to an FdSet structure.
After this call the set will contain the given OSAL ID

Parameters

in,out	*Set*	Pointer to OS_FdSet object to operate on (must not be null)
in	*objid*	The handle ID to add to the set

Returns

Execution status, see OSAL Return Code Defines

Return values

OS_SUCCESS	Successful execution.
OS_INVALID_POINTER	if argument is NULL
OS_ERR_INVALID_ID	if the objid is not a valid handle

10.76.2.2 OS_SelectFdClear()

```
int32 OS_SelectFdClear (
```

```
OS_FdSet * Set,
osal_id_t objid )
```

Clear an ID from an FdSet structure.
After this call the set will no longer contain the given OSAL ID

Parameters

in,out	*Set*	Pointer to OS_FdSet object to operate on (must not be null)
in	*objid*	The handle ID to remove from the set

Returns

Execution status, see OSAL Return Code Defines

Return values

OS_SUCCESS	Successful execution.
OS_INVALID_POINTER	if argument is NULL
OS_ERR_INVALID_ID	if the objid is not a valid handle

10.76.2.3 OS_SelectFdIsSet()

```
bool OS_SelectFdIsSet (
const OS_FdSet * Set,
osal_id_t objid )
```

Check if an FdSet structure contains a given ID.

Parameters

in	*Set*	Pointer to OS_FdSet object to operate on (must not be null)
in	*objid*	The handle ID to check for in the set

Returns

Boolean set status

Return values

true	FdSet structure contains ID
false	FDSet structure does not contain ID

10.76.2.4 OS_SelectFdZero()

```
int32 OS_SelectFdZero (
OS_FdSet * Set )
```

Clear a FdSet structure.
After this call the set will contain no OSAL IDs

Parameters

out	*Set*	Pointer to OS_FdSet object to clear (must not be null)

Returns

Execution status, see OSAL Return Code Defines

Return values

OS_SUCCESS	Successful execution.
OS_INVALID_POINTER	if argument is NULL

10.76.2.5 OS_SelectMultiple()

```
int32 OS_SelectMultiple (
    OS_FdSet * ReadSet,
    OS_FdSet * WriteSet,
    int32 msecs )
```

Wait for events across multiple file handles.
Wait for any of the given sets of IDs to become readable or writable
This function will block until any of the following occurs:

- At least one OSAL ID in the ReadSet is readable
- At least one OSAL ID in the WriteSet is writable
- The timeout has elapsed

The sets are input/output parameters. On entry, these indicate the file handle(s) to wait for. On exit, these are set to the actual file handle(s) that have activity.
If the timeout occurs this returns an error code and all output sets should be empty.
The timeout is expressed in milliseconds, relative to the time that the API was invoked. Use OS_SelectMultipleAbs() for higher timing precision.

Note

This does not lock or otherwise protect the file handles in the given sets. If a filehandle supplied via one of the FdSet arguments is closed or modified by another while this function is in progress, the results are undefined. Because of this limitation, it is recommended to use OS_SelectSingle() whenever possible.

Parameters

in,out	*ReadSet*	Set of handles to check/wait to become readable
in,out	*WriteSet*	Set of handles to check/wait to become writable
in	*msecs*	Indicates the timeout. Positive values will wait up to that many milliseconds. Zero will not wait (poll). Negative values will wait forever (pend)

See also

OS_SelectMultipleAbs()

Returns

Execution status, see OSAL Return Code Defines

Return values

OS_SUCCESS	If any handle in the ReadSet or WriteSet is readable or writable, respectively
OS_ERROR_TIMEOUT	If no handles in the ReadSet or WriteSet became readable or writable within the timeout
OS_ERR_OPERATION_NOT_SUPPORTED	if a specified handle does not support select
OS_ERR_INVALID_ID	if no valid handles were contained in the ReadSet/WriteSet

10.76.2.6 OS_SelectMultipleAbs()

```
int32 OS_SelectMultipleAbs (
    OS_FdSet * ReadSet,
    OS_FdSet * WriteSet,
    OS_time_t abs_timeout )
```

Wait for events across multiple file handles.
Wait for any of the given sets of IDs to become readable or writable
This function will block until any of the following occurs:

- At least one OSAL ID in the ReadSet is readable
- At least one OSAL ID in the WriteSet is writable
- The timeout has elapsed

The sets are input/output parameters. On entry, these indicate the file handle(s) to wait for. On exit, these are set to the actual file handle(s) that have activity.
If the timeout occurs this returns an error code and all output sets should be empty.
This API is identical to OS_SelectMultiple() except for the timeout parameter. In this call, timeout is expressed as an absolute value of the OS clock, in the same time domain as obtained via OS_GetLocalTime(). This allows for a more precise timeout than what is possible via the normal OS_SelectMultiple().

Note

This does not lock or otherwise protect the file handles in the given sets. If a filehandle supplied via one of the FdSet arguments is closed or modified by another while this function is in progress, the results are undefined. Because of this limitation, it is recommended to use OS_SelectSingle() whenever possible.

Parameters

`in,out`	*ReadSet*	Set of handles to check/wait to become readable
`in,out`	*WriteSet*	Set of handles to check/wait to become writable
`in`	*abs_timeout*	The absolute time that the call may block until

See also

OS_SelectMultiple()

Returns

Execution status, see OSAL Return Code Defines

Return values

OS_SUCCESS	If any handle in the ReadSet or WriteSet is readable or writable, respectively
OS_ERROR_TIMEOUT	If no handles in the ReadSet or WriteSet became readable or writable within the timeout
OS_ERR_OPERATION_NOT_SUPPORTED	if a specified handle does not support select
OS_ERR_INVALID_ID	if no valid handles were contained in the ReadSet/WriteSet

10.76.2.7 OS_SelectSingle()

```
int32 OS_SelectSingle (
    osal_id_t objid,
    uint32 * StateFlags,
    int32 msecs )
```

Wait for events on a single file handle.

Wait for a single OSAL filehandle to change state

This function can be used to wait for a single OSAL stream ID to become readable or writable. On entry, the "StateFlags" parameter should be set to the desired state (OS_STREAM_STATE_READABLE and/or OS_STREAM_STATE_WR↩ITABLE) and upon return the flags will be set to the state actually detected.

As this operates on a single ID, the filehandle is protected during this call, such that another thread accessing the same handle will return an error. However, it is important to note that once the call returns then other threads may then also read/write and affect the state before the current thread can service it.

To mitigate this risk the application may prefer to use the OS_TimedRead/OS_TimedWrite calls.

The timeout is expressed in milliseconds, relative to the time that the API was invoked. Use OS_SelectSingleAbs() for higher timing precision.

Parameters

in	*objid*	The handle ID to select on
in,out	*StateFlags*	State flag(s) (readable or writable) (must not be null)
in	*msecs*	Indicates the timeout. Positive values will wait up to that many milliseconds. Zero will not wait (poll). Negative values will wait forever (pend)

See also

OS_SelectSingleAbs()

Returns

Execution status, see OSAL Return Code Defines

Return values

OS_SUCCESS	If the handle is readable and/or writable, as requested
OS_ERROR_TIMEOUT	If the handle did not become readable or writable within the timeout
OS_INVALID_POINTER	if argument is NULL
OS_ERR_INVALID_ID	if the objid is not a valid handle

10.76.2.8 OS_SelectSingleAbs()

```
int32 OS_SelectSingleAbs (
    osal_id_t objid,
    uint32 * StateFlags,
    OS_time_t abs_timeout )
```

Wait for events on a single file handle.

Wait for a single OSAL filehandle to change state

This function can be used to wait for a single OSAL stream ID to become readable or writable. On entry, the "StateFlags" parameter should be set to the desired state (OS_STREAM_STATE_READABLE and/or OS_STREAM_STATE_WR↩ITABLE) and upon return the flags will be set to the state actually detected.

As this operates on a single ID, the filehandle is protected during this call, such that another thread accessing the same handle will return an error. However, it is important to note that once the call returns then other threads may then also read/write and affect the state before the current thread can service it.

To mitigate this risk the application may prefer to use the OS_TimedRead/OS_TimedWrite calls.

This API is identical to OS_SelectSingle() except for the timeout parameter. In this call, timeout is expressed as an absolute value of the OS clock, in the same time domain as obtained via OS_GetLocalTime(). This allows for a more precise timeout than what is possible via the normal OS_SelectSingle().

Parameters

in	*objid*	The handle ID to select on
in,out	*StateFlags*	State flag(s) (readable or writable) (must not be null)
in	*abs_timeout*	The absolute time that the call may block until

See also

OS_SelectSingle()

Returns

Execution status, see OSAL Return Code Defines

Return values

OS_SUCCESS	If the handle is readable and/or writable, as requested
OS_ERROR_TIMEOUT	If the handle did not become readable or writable within the timeout
OS_INVALID_POINTER	if argument is NULL
OS_ERR_INVALID_ID	if the objid is not a valid handle

10.77 OSAL Shell APIs

Functions

- int32 OS_ShellOutputToFile (const char ∗Cmd, osal_id_t filedes)

  Executes the command and sends output to a file.

10.77.1 Detailed Description

10.77.2 Function Documentation

10.77.2.1 OS_ShellOutputToFile()

```
int32 OS_ShellOutputToFile (
    const char * Cmd,
    osal_id_t filedes )
```

Executes the command and sends output to a file.
Takes a shell command in and writes the output of that command to the specified file The output file must be opened previously with write access (OS_WRITE_ONLY or OS_READ_WRITE).

Parameters

in	*Cmd*	Command to pass to shell (must not be null)
in	*filedes*	File to send output to.

Returns

Execution status, see OSAL Return Code Defines

Return values

OS_SUCCESS	Successful execution.
OS_ERROR	if the command was not executed properly
OS_INVALID_POINTER	if Cmd argument is NULL
OS_ERR_INVALID_ID	if the file descriptor passed in is invalid

10.78 OSAL Socket Address APIs

These functions provide a means to manipulate network addresses in a manner that is (mostly) agnostic to the actual network address type.

Functions

- int32 OS_SocketAddrInit (OS_SockAddr_t *Addr, OS_SocketDomain_t Domain)

  Initialize a socket address structure to hold an address of the given family.
- int32 OS_SocketAddrToString (char *buffer, size_t buflen, const OS_SockAddr_t *Addr)

  Get a string representation of a network host address.
- int32 OS_SocketAddrFromString (OS_SockAddr_t *Addr, const char *string)

  Set a network host address from a string representation.
- int32 OS_SocketAddrGetPort (uint16 *PortNum, const OS_SockAddr_t *Addr)

  Get the port number of a network address.
- int32 OS_SocketAddrSetPort (OS_SockAddr_t *Addr, uint16 PortNum)

  Set the port number of a network address.

10.78.1 Detailed Description

These functions provide a means to manipulate network addresses in a manner that is (mostly) agnostic to the actual network address type.
Every network address should be representable as a string (i.e. dotted decimal IP, etc). This can serve as the "common denominator" to all address types.

10.78.2 Function Documentation

10.78.2.1 OS_SocketAddrFromString()

```
int32 OS_SocketAddrFromString (
    OS_SockAddr_t * Addr,
    const char * string )
```

Set a network host address from a string representation.
The specific format of the output string depends on the address family.
The address structure should have been previously initialized using OS_SocketAddrInit() to set the address family type.

Note

For IPv4, this would typically be the dotted-decimal format (X.X.X.X). It is up to the discretion of the underlying implementation whether to accept hostnames, as this depends on the availability of DNS services. Since many embedded deployments do not have name services, this should not be relied upon.

Parameters

out	*Addr*	The address buffer to initialize (must not be null)
in	*string*	The string to initialize the address from (must not be null)

Returns

Execution status, see OSAL Return Code Defines

Return values

OS_SUCCESS	Successful execution.
OS_INVALID_POINTER	if argument is NULL
OS_ERROR	if the string cannot be converted to an address

10.78.2.2 OS_SocketAddrGetPort()

```
int32 OS_SocketAddrGetPort (
    uint16 * PortNum,
    const OS_SockAddr_t * Addr )
```

Get the port number of a network address.
For network protocols that have the concept of a port number (such as TCP/IP and UDP/IP) this function gets the port number from the address structure.

Parameters

out	*PortNum*	Buffer to store the port number (must not be null)
in	*Addr*	The network address buffer (must not be null)

Returns

Execution status, see OSAL Return Code Defines

Return values

OS_SUCCESS	Successful execution.
OS_INVALID_POINTER	if argument is NULL
OS_ERR_BAD_ADDRESS	if the address domain is not compatible

10.78.2.3 OS_SocketAddrInit()

```
int32 OS_SocketAddrInit (
    OS_SockAddr_t * Addr,
    OS_SocketDomain_t Domain )
```

Initialize a socket address structure to hold an address of the given family.
The address is set to a suitable default value for the family.

Parameters

out	*Addr*	The address buffer to initialize (must not be null)
in	*Domain*	The address family

Returns

Execution status, see OSAL Return Code Defines

Return values

OS_SUCCESS	Successful execution.

Return values

OS_INVALID_POINTER	if Addr argument is NULL
OS_ERR_NOT_IMPLEMENTED	if the system does not implement the requested domain

10.78.2.4 OS_SocketAddrSetPort()

```
int32 OS_SocketAddrSetPort (
    OS_SockAddr_t * Addr,
    uint16 PortNum )
```

Set the port number of a network address.
For network protocols that have the concept of a port number (such as TCP/IP and UDP/IP) this function sets the port number from the address structure.

Parameters

out	*Addr*	The network address buffer (must not be null)
in	*PortNum*	The port number to set

Returns

Execution status, see OSAL Return Code Defines

Return values

OS_SUCCESS	Successful execution.
OS_INVALID_POINTER	if argument is NULL
OS_ERR_BAD_ADDRESS	if the address domain is not compatible

10.78.2.5 OS_SocketAddrToString()

```
int32 OS_SocketAddrToString (
    char * buffer,
    size_t buflen,
    const OS_SockAddr_t * Addr )
```

Get a string representation of a network host address.
The specific format of the output string depends on the address family.
This string should be suitable to pass back into OS_SocketAddrFromString() which should recreate the same network address, and it should also be meaningful to a user of printed or logged as a C string.

Note

For IPv4, this would typically be the dotted-decimal format (X.X.X.X).

Parameters

out	*buffer*	Buffer to hold the output string (must not be null)
in	*buflen*	Maximum length of the output string (must not be zero)
in	*Addr*	The network address buffer to convert (must not be null)

Returns

Execution status, see OSAL Return Code Defines

Return values

OS_SUCCESS	Successful execution.
OS_INVALID_POINTER	if argument is NULL
OS_ERR_INVALID_SIZE	if passed-in buflen is not valid
OS_ERROR	if the address cannot be converted to string, or string buffer too small

10.79 OSAL Socket Management APIs

These functions are loosely related to the BSD Sockets API but made to be more consistent with other OSAL API functions. That is, they operate on OSAL IDs (32-bit opaque number values) and return an OSAL error code.

Functions

- int32 OS_SocketOpen (osal_id_t *sock_id, OS_SocketDomain_t Domain, OS_SocketType_t Type)

  Opens a socket.
- int32 OS_SocketBind (osal_id_t sock_id, const OS_SockAddr_t *Addr)

  Binds a socket to a given local address and enter listening (server) mode.
- int32 OS_SocketListen (osal_id_t sock_id)

  Places the specified socket into a listening state.
- int32 OS_SocketBindAddress (osal_id_t sock_id, const OS_SockAddr_t *Addr)

  Binds a socket to a given local address.
- int32 OS_SocketConnectAbs (osal_id_t sock_id, const OS_SockAddr_t *Addr, OS_time_t abs_timeout)

  Connects a socket to a given remote address.
- int32 OS_SocketConnect (osal_id_t sock_id, const OS_SockAddr_t *Addr, int32 timeout)

  Connects a socket to a given remote address.
- int32 OS_SocketShutdown (osal_id_t sock_id, OS_SocketShutdownMode_t Mode)

  Implement graceful shutdown of a stream socket.
- int32 OS_SocketAcceptAbs (osal_id_t sock_id, osal_id_t *connsock_id, OS_SockAddr_t *Addr, OS_time_t abs↩_timeout)

  Waits for and accept the next incoming connection on the given socket.
- int32 OS_SocketAccept (osal_id_t sock_id, osal_id_t *connsock_id, OS_SockAddr_t *Addr, int32 timeout)

  Waits for and accept the next incoming connection on the given socket.
- int32 OS_SocketRecvFromAbs (osal_id_t sock_id, void *buffer, size_t buflen, OS_SockAddr_t *RemoteAddr, OS_time_t abs_timeout)

  Reads data from a message-oriented (datagram) socket.
- int32 OS_SocketRecvFrom (osal_id_t sock_id, void *buffer, size_t buflen, OS_SockAddr_t *RemoteAddr, int32 timeout)

  Reads data from a message-oriented (datagram) socket.
- int32 OS_SocketSendTo (osal_id_t sock_id, const void *buffer, size_t buflen, const OS_SockAddr_t *Remote↩Addr)

  Sends data to a message-oriented (datagram) socket.
- int32 OS_SocketGetIdByName (osal_id_t *sock_id, const char *sock_name)

  Gets an OSAL ID from a given name.
- int32 OS_SocketGetInfo (osal_id_t sock_id, OS_socket_prop_t *sock_prop)

  Gets information about an OSAL Socket ID.

10.79.1 Detailed Description

These functions are loosely related to the BSD Sockets API but made to be more consistent with other OSAL API functions. That is, they operate on OSAL IDs (32-bit opaque number values) and return an OSAL error code.
OSAL Socket IDs are very closely related to File IDs and share the same ID number space. Additionally, the file OS_read() / OS_write() / OS_close() calls also work on sockets.
Note that all of functions may return OS_ERR_NOT_IMPLEMENTED if network support is not configured at compile time.

10.79.2 Function Documentation

10.79.2.1 OS_SocketAccept()

```
int32 OS_SocketAccept (
    osal_id_t sock_id,
    osal_id_t * connsock_id,
    OS_SockAddr_t * Addr,
    int32 timeout )
```

Waits for and accept the next incoming connection on the given socket.
This is used for sockets operating in a "server" role. The socket must be a stream type (connection-oriented) and previously bound to a local address using OS_SocketBind(). This will block the caller up to the given timeout or until an incoming connection request occurs, whichever happens first.
The new stream connection is then returned to the caller and the original server socket ID can be reused for the next connection.
The timeout is expressed in milliseconds, relative to the time that the API was invoked. Use OS_SocketAcceptAbs() for higher timing precision.

Parameters

in	*sock_id*	The server socket ID, previously bound using OS_SocketBind()
out	*connsock↩ _id*	The connection socket, a new ID that can be read/written (must not be null)
in	*Addr*	The remote address of the incoming connection (must not be null)
in	*timeout*	The maximum amount of time to wait, or OS_PEND to wait forever

See also

OS_SocketAcceptAbs()

Returns

Execution status, see OSAL Return Code Defines

Return values

OS_SUCCESS	Successful execution.
OS_INVALID_POINTER	if argument is NULL
OS_ERR_INVALID_ID	if the sock_id parameter is not valid
OS_ERR_INCORRECT_OBJ_TYPE	if the handle is not a socket
OS_ERR_INCORRECT_OBJ_STATE	if the socket is not bound or already connected

10.79.2.2 OS_SocketAcceptAbs()

```
int32 OS_SocketAcceptAbs (
    osal_id_t sock_id,
    osal_id_t * connsock_id,
    OS_SockAddr_t * Addr,
    OS_time_t abs_timeout )
```

Waits for and accept the next incoming connection on the given socket.
This is used for sockets operating in a "server" role. The socket must be a stream type (connection-oriented) and previously bound to a local address using OS_SocketBind(). This will block the caller up to the given timeout or until an incoming connection request occurs, whichever happens first.
The new stream connection is then returned to the caller and the original server socket ID can be reused for the next connection.

This API is identical to OS_SocketAccept() except for the timeout parameter. In this call, timeout is expressed as an absolute value of the OS clock, in the same time domain as obtained via OS_GetLocalTime(). This allows for a more precise timeout than what is possible via the normal OS_SocketAccept().

Parameters

in	*sock_id*	The server socket ID, previously bound using OS_SocketBind()
out	*connsock↩ _id*	The connection socket, a new ID that can be read/written (must not be null)
in	*Addr*	The remote address of the incoming connection (must not be null)
in	*abs_timeout*	The absolute time that the call may block until

See also

OS_SocketAccept()

Returns

Execution status, see OSAL Return Code Defines

Return values

OS_SUCCESS	Successful execution.
OS_INVALID_POINTER	if argument is NULL
OS_ERR_INVALID_ID	if the sock_id parameter is not valid
OS_ERR_INCORRECT_OBJ_TYPE	if the handle is not a socket
OS_ERR_INCORRECT_OBJ_STATE	if the socket is not bound or already connected

10.79.2.3 OS_SocketBind()

```
int32 OS_SocketBind (
    osal_id_t sock_id,
    const OS_SockAddr_t * Addr )
```

Binds a socket to a given local address and enter listening (server) mode.
This is a convenience/compatibility routine to perform both OS_SocketBindAddress() and OS_SocketListen() operations in a single call, intended to simplify the setup for a server role.
If the socket is connectionless, then it only binds to the local address.

Parameters

in	*sock↩ _id*	The socket ID
in	*Addr*	The local address to bind to (must not be null)

Returns

Execution status, see OSAL Return Code Defines

Return values

OS_SUCCESS	Successful execution.

Return values

OS_ERR_INVALID_ID	if the sock_id parameter is not valid
OS_INVALID_POINTER	if argument is NULL
OS_ERR_INCORRECT_OBJ_STATE	if the socket is already bound
OS_ERR_INCORRECT_OBJ_TYPE	if the handle is not a socket

10.79.2.4 OS_SocketBindAddress()

```
int32 OS_SocketBindAddress (
    osal_id_t sock_id,
    const OS_SockAddr_t * Addr )
```

Binds a socket to a given local address.

The specified socket will be bound to the local address and port, if available. This controls the source address reflected in network traffic transmitted via this socket.

After binding to the address, a stream socket may be followed by a call to either OS_SocketListen() for a server role or to OS_SocketConnect() for a client role.

Parameters

in	*sock↩ _id*	The socket ID
in	*Addr*	The local address to bind to (must not be null)

Returns

Execution status, see OSAL Return Code Defines

Return values

OS_SUCCESS	Successful execution.
OS_ERR_INVALID_ID	if the sock_id parameter is not valid
OS_INVALID_POINTER	if argument is NULL
OS_ERR_INCORRECT_OBJ_STATE	if the socket is already bound
OS_ERR_INCORRECT_OBJ_TYPE	if the handle is not a socket

10.79.2.5 OS_SocketConnect()

```
int32 OS_SocketConnect (
    osal_id_t sock_id,
    const OS_SockAddr_t * Addr,
    int32 timeout )
```

Connects a socket to a given remote address.

The socket will be connected to the remote address and port, if available. This only applies to stream-oriented sockets. Calling this on a datagram socket will return an error (these sockets should use SendTo/RecvFrom).

The timeout is expressed in milliseconds, relative to the time that the API was invoked. Use OS_SocketConnectAbs() for higher timing precision.

Parameters

in	*sock↩ _id*	The socket ID
in	*Addr*	The remote address to connect to (must not be null)
in	*timeout*	The maximum amount of time to wait, or OS_PEND to wait forever

See also

OS_SocketConnectAbs()

Returns

Execution status, see OSAL Return Code Defines

Return values

OS_SUCCESS	Successful execution.
OS_ERR_INCORRECT_OBJ_STATE	if the socket is already connected
OS_ERR_INVALID_ID	if the sock_id parameter is not valid
OS_ERR_INCORRECT_OBJ_TYPE	if the handle is not a socket
OS_INVALID_POINTER	if Addr argument is NULL

10.79.2.6 OS_SocketConnectAbs()

```
int32 OS_SocketConnectAbs (
    osal_id_t sock_id,
    const OS_SockAddr_t * Addr,
    OS_time_t abs_timeout )
```

Connects a socket to a given remote address.

The socket will be connected to the remote address and port, if available. This only applies to stream-oriented sockets. Calling this on a datagram socket will return an error (these sockets should use SendTo/RecvFrom).

This API is identical to OS_SocketConnect() except for the timeout parameter. In this call, timeout is expressed as an absolute value of the OS clock, in the same time domain as obtained via OS_GetLocalTime(). This allows for a more precise timeout than what is possible via the normal OS_SocketConnect().

Parameters

in	*sock_id*	The socket ID
in	*Addr*	The remote address to connect to (must not be null)
in	*abs_timeout*	The absolute time that the call may block until

See also

OS_SocketConnect()

Returns

Execution status, see OSAL Return Code Defines

Return values

OS_SUCCESS	Successful execution.
OS_ERR_INCORRECT_OBJ_STATE	if the socket is already connected
OS_ERR_INVALID_ID	if the sock_id parameter is not valid
OS_ERR_INCORRECT_OBJ_TYPE	if the handle is not a socket
OS_INVALID_POINTER	if Addr argument is NULL

10.79.2.7 OS_SocketGetIdByName()

```
int32 OS_SocketGetIdByName (
    osal_id_t * sock_id,
    const char * sock_name )
```

Gets an OSAL ID from a given name.

Note

OSAL Sockets use generated names according to the address and type.

See also

OS_SocketGetInfo()

Parameters

out	*sock_id*	Buffer to hold result (must not be null)
in	*sock_name*	Name of socket to find (must not be null)

Returns

Execution status, see OSAL Return Code Defines

Return values

OS_SUCCESS	Successful execution.
OS_INVALID_POINTER	is id or name are NULL pointers
OS_ERR_NAME_TOO_LONG	name length including null terminator greater than OS_MAX_API_NAME
OS_ERR_NAME_NOT_FOUND	if the name was not found in the table

10.79.2.8 OS_SocketGetInfo()

```
int32 OS_SocketGetInfo (
    osal_id_t sock_id,
    OS_socket_prop_t * sock_prop )
```

Gets information about an OSAL Socket ID.
OSAL Sockets use generated names according to the address and type. This allows applications to find the name of a given socket.

Parameters

in	*sock_id*	The socket ID

Parameters

out	*sock_prop*	Buffer to hold socket information (must not be null)

Returns

Execution status, see OSAL Return Code Defines

Return values

OS_SUCCESS	Successful execution.
OS_ERR_INVALID_ID	if the id passed in is not a valid semaphore
OS_INVALID_POINTER	if the count_prop pointer is null

10.79.2.9 OS_SocketListen()

```
int32 OS_SocketListen (
    osal_id_t sock_id )
```

Places the specified socket into a listening state.
This function only applies to connection-oriented (stream) sockets that are intended to be used in a server-side role. This places the socket into a state where it can accept incoming connections from clients.

Parameters

in	*sock↩ _id*	The socket ID

Returns

Execution status, see OSAL Return Code Defines

Return values

OS_SUCCESS	Successful execution.
OS_ERR_INVALID_ID	if the sock_id parameter is not valid
OS_ERR_INCORRECT_OBJ_STATE	if the socket is already listening
OS_ERR_INCORRECT_OBJ_TYPE	if the handle is not a stream socket

10.79.2.10 OS_SocketOpen()

```
int32 OS_SocketOpen (
    osal_id_t * sock_id,
    OS_SocketDomain_t Domain,
    OS_SocketType_t Type )
```

Opens a socket.
A new, unconnected and unbound socket is allocated of the given domain and type.

Parameters

out	*sock↩ _id*	Buffer to hold the non-zero OSAL ID (must not be null)

Parameters

in	*Domain*	The domain / address family of the socket (INET or INET6, etc)
in	*Type*	The type of the socket (STREAM or DATAGRAM)

Returns

Execution status, see OSAL Return Code Defines

Return values

OS_SUCCESS	Successful execution.
OS_INVALID_POINTER	if argument is NULL
OS_ERR_NOT_IMPLEMENTED	if the system does not implement the requested socket/address domain

10.79.2.11 OS_SocketRecvFrom()

```
int32 OS_SocketRecvFrom (
    osal_id_t sock_id,
    void * buffer,
    size_t buflen,
    OS_SockAddr_t * RemoteAddr,
    int32 timeout )
```

Reads data from a message-oriented (datagram) socket.
If a message is already available on the socket, this should immediately return that data without blocking. Otherwise, it may block up to the given timeout.
The timeout is expressed in milliseconds, relative to the time that the API was invoked. Use OS_SocketRecvFromAbs() for higher timing precision.

Parameters

in	*sock_id*	The socket ID, previously bound using OS_SocketBind()
out	*buffer*	Pointer to message data receive buffer (must not be null)
in	*buflen*	The maximum length of the message data to receive (must not be zero)
out	*RemoteAddr*	Buffer to store the remote network address (may be NULL)
in	*timeout*	The maximum amount of time to wait or OS_PEND to wait forever

See also

OS_SocketRecvFromAbs()

Returns

Count of actual bytes received or error status, see OSAL Return Code Defines

Return values

OS_INVALID_POINTER	if argument is NULL
OS_ERR_INVALID_SIZE	if passed-in buflen is not valid
OS_ERR_INVALID_ID	if the sock_id parameter is not valid
OS_ERR_INCORRECT_OBJ_TYPE	if the handle is not a socket

10.79.2.12 OS_SocketRecvFromAbs()

```
int32 OS_SocketRecvFromAbs (
    osal_id_t sock_id,
    void * buffer,
    size_t buflen,
    OS_SockAddr_t * RemoteAddr,
    OS_time_t abs_timeout )
```

Reads data from a message-oriented (datagram) socket.
If a message is already available on the socket, this should immediately return that data without blocking. Otherwise, it may block up to the given timeout.
This API is identical to OS_SocketRecvFrom() except for the timeout parameter. In this call, timeout is expressed as an absolute value of the OS clock, in the same time domain as obtained via OS_GetLocalTime(). This allows for a more precise timeout than what is possible via the normal OS_SocketRecvFrom().

Parameters

in	*sock_id*	The socket ID, previously bound using OS_SocketBind()
out	*buffer*	Pointer to message data receive buffer (must not be null)
in	*buflen*	The maximum length of the message data to receive (must not be zero)
out	*RemoteAddr*	Buffer to store the remote network address (may be NULL)
in	*abs_timeout*	The absolute time at which the call should return if nothing received

Returns

Count of actual bytes received or error status, see OSAL Return Code Defines

Return values

OS_INVALID_POINTER	if argument is NULL
OS_ERR_INVALID_SIZE	if passed-in buflen is not valid
OS_ERR_INVALID_ID	if the sock_id parameter is not valid
OS_ERR_INCORRECT_OBJ_TYPE	if the handle is not a socket

10.79.2.13 OS_SocketSendTo()

```
int32 OS_SocketSendTo (
    osal_id_t sock_id,
    const void * buffer,
    size_t buflen,
    const OS_SockAddr_t * RemoteAddr )
```

Sends data to a message-oriented (datagram) socket.
This sends data in a non-blocking mode. If the socket is not currently able to queue the message, such as if its outbound buffer is full, then this returns an error code.

Parameters

in	*sock_id*	The socket ID, which must be of the datagram type
in	*buffer*	Pointer to message data to send (must not be null)
in	*buflen*	The length of the message data to send (must not be zero)
in	*RemoteAddr*	Buffer containing the remote network address to send to

Returns

Count of actual bytes sent or error status, see OSAL Return Code Defines

Return values

OS_INVALID_POINTER	if argument is NULL
OS_ERR_INVALID_SIZE	if passed-in buflen is not valid
OS_ERR_INVALID_ID	if the sock_id parameter is not valid
OS_ERR_INCORRECT_OBJ_TYPE	if the handle is not a socket

10.79.2.14 OS_SocketShutdown()

```
int32 OS_SocketShutdown (
    osal_id_t sock_id,
    OS_SocketShutdownMode_t Mode )
```

Implement graceful shutdown of a stream socket.
This can be utilized to indicate the end of data stream without immediately closing the socket, giving the remote side an indication that the data transfer is complete.

Parameters

in	*sock_id*	The socket ID
in	*Mode*	Whether to shutdown reading, writing, or both.

Returns

Execution status, see OSAL Return Code Defines

Return values

OS_SUCCESS	Successful execution.
OS_ERR_INVALID_ID	if the sock_id parameter is not valid
OS_ERR_INVALID_ARGUMENT	if the Mode argument is not one of the valid options
OS_ERR_INCORRECT_OBJ_TYPE	if the handle is not a socket
OS_ERR_INCORRECT_OBJ_STATE	if the socket is not connected

10.80 OSAL Task APIs

Functions

- int32 OS_TaskCreate (osal_id_t *task_id, const char *task_name, osal_task_entry function_pointer, osal_stackptr_t stack_pointer, size_t stack_size, osal_priority_t priority, uint32 flags)

  Creates a task and starts running it.
- int32 OS_TaskDelete (osal_id_t task_id)

  Deletes the specified Task.
- void OS_TaskExit (void)

  Exits the calling task.
- int32 OS_TaskInstallDeleteHandler (osal_task_entry function_pointer)

  Installs a handler for when the task is deleted.
- int32 OS_TaskDelay (uint32 millisecond)

  Delay a task for specified amount of milliseconds.
- int32 OS_TaskSetPriority (osal_id_t task_id, osal_priority_t new_priority)

  Sets the given task to a new priority.
- osal_id_t OS_TaskGetId (void)

  Obtain the task id of the calling task.
- int32 OS_TaskGetIdByName (osal_id_t *task_id, const char *task_name)

  Find an existing task ID by name.
- int32 OS_TaskGetInfo (osal_id_t task_id, OS_task_prop_t *task_prop)

  Fill a property object buffer with details regarding the resource.
- int32 OS_TaskFindIdBySystemData (osal_id_t *task_id, const void *sysdata, size_t sysdata_size)

  Reverse-lookup the OSAL task ID from an operating system ID.

10.80.1 Detailed Description

10.80.2 Function Documentation

10.80.2.1 OS_TaskCreate()

```
int32 OS_TaskCreate (
    osal_id_t * task_id,
    const char * task_name,
    osal_task_entry function_pointer,
    osal_stackptr_t stack_pointer,
    size_t stack_size,
    osal_priority_t priority,
    uint32 flags )
```

Creates a task and starts running it.

Creates a task and passes back the id of the task created. Task names must be unique; if the name already exists this function fails. Names cannot be NULL.

Portable applications should always specify the actual stack size in the stack_size parameter, not 0. This size value is not enforced/checked by OSAL, but is simply passed through to the RTOS for stack creation. Some RTOS implementations may assume 0 means a default stack size while others may actually create a task with no stack.

Unlike stack_size, the stack_pointer is optional and can be specified as NULL. In that case, a stack of the requested size will be dynamically allocated from the system heap.

Parameters

out	*task_id*	will be set to the non-zero ID of the newly-created resource (must not be null)

Parameters

in	*task_name*	the name of the new resource to create (must not be null)
in	*function_pointer*	the entry point of the new task (must not be null)
in	*stack_pointer*	pointer to the stack for the task, or NULL to allocate a stack from the system memory heap
in	*stack_size*	the size of the stack (must not be zero)
in	*priority*	initial priority of the new task
in	*flags*	initial options for the new task

Returns

Execution status, see OSAL Return Code Defines

Return values

OS_SUCCESS	Successful execution.
OS_INVALID_POINTER	if any of the necessary pointers are NULL
OS_ERR_INVALID_SIZE	if the stack_size argument is zero
OS_ERR_NAME_TOO_LONG	name length including null terminator greater than OS_MAX_API_NAME
OS_ERR_INVALID_PRIORITY	if the priority is bad (return value only verified in coverage test)
OS_ERR_NO_FREE_IDS	if there can be no more tasks created
OS_ERR_NAME_TAKEN	if the name specified is already used by a task
OS_ERROR	if an unspecified/other error occurs (return value only verified in coverage test)

10.80.2.2 OS_TaskDelay()

```
int32 OS_TaskDelay (
    uint32 millisecond )
```

Delay a task for specified amount of milliseconds.
Causes the current thread to be suspended from execution for the period of millisecond. This is a scheduled wait (clock_nanosleep/rtems_task_wake_after/taskDelay), not a "busy" wait.

Parameters

in	*millisecond*	Amount of time to delay

Returns

Execution status, see OSAL Return Code Defines

Return values

OS_SUCCESS	Successful execution.
OS_ERROR	if an unspecified/other error occurs (return value only verified in coverage test)

Referenced by CF_CFDP_InitEngine().

10.80.2.3 OS_TaskDelete()

```
int32 OS_TaskDelete (
    osal_id_t task_id )
```

Deletes the specified Task.
The task will be removed from the local tables. and the OS will be configured to stop executing the task at the next opportunity.

Parameters

in	*task_id*	The object ID to operate on

Returns

Execution status, see OSAL Return Code Defines

Return values

OS_SUCCESS	Successful execution.
OS_ERR_INVALID_ID	if the ID given to it is invalid
OS_ERROR	if the OS delete call fails (return value only verified in coverage test)

10.80.2.4 OS_TaskExit()

```
void OS_TaskExit (
    void )
```

Exits the calling task.
The calling thread is terminated. This function does not return.

10.80.2.5 OS_TaskFindIdBySystemData()

```
int32 OS_TaskFindIdBySystemData (
    osal_id_t * task_id,
    const void * sysdata,
    size_t sysdata_size )
```

Reverse-lookup the OSAL task ID from an operating system ID.
This provides a method by which an external entity may find the OSAL task ID corresponding to a system-defined identifier (e.g. TASK_ID, pthread_t, rtems_id, etc).
Normally OSAL does not expose the underlying OS-specific values to the application, but in some circumstances, such as exception handling, the OS may provide this information directly to a BSP handler outside of the normal OSAL API.

Parameters

out	*task_id*	The buffer where the task id output is stored (must not be null)
in	*sysdata*	Pointer to the system-provided identification data
in	*sysdata_size*	Size of the system-provided identification data

Returns

Execution status, see OSAL Return Code Defines

Return values

OS_SUCCESS	Successful execution. (return value only verified in coverage test)
OS_INVALID_POINTER	if a pointer argument is NULL

10.80.2.6 OS_TaskGetId()

```
osal_id_t OS_TaskGetId (
    void )
```

Obtain the task id of the calling task.
This function returns the task id of the calling task

Returns

Task ID, or zero if the operation failed (zero is never a valid task ID)

10.80.2.7 OS_TaskGetIdByName()

```
int32 OS_TaskGetIdByName (
    osal_id_t * task_id,
    const char * task_name )
```

Find an existing task ID by name.
This function tries to find a task Id given the name of a task

Parameters

out	*task_id*	will be set to the ID of the existing resource
in	*task_name*	the name of the existing resource to find (must not be null)

Returns

Execution status, see OSAL Return Code Defines

Return values

OS_SUCCESS	Successful execution.
OS_INVALID_POINTER	if the pointers passed in are NULL
OS_ERR_NAME_TOO_LONG	name length including null terminator greater than OS_MAX_API_NAME
OS_ERR_NAME_NOT_FOUND	if the name wasn't found in the table

10.80.2.8 OS_TaskGetInfo()

```
int32 OS_TaskGetInfo (
    osal_id_t task_id,
    OS_task_prop_t * task_prop )
```

Fill a property object buffer with details regarding the resource.
This function will pass back a pointer to structure that contains all of the relevant info (creator, stack size, priority, name) about the specified task.

Parameters

in	*task_id*	The object ID to operate on
out	*task_prop*	The property object buffer to fill (must not be null)

Returns

Execution status, see OSAL Return Code Defines

Return values

OS_SUCCESS	Successful execution.
OS_ERR_INVALID_ID	if the ID passed to it is invalid
OS_INVALID_POINTER	if the task_prop pointer is NULL

10.80.2.9 OS_TaskInstallDeleteHandler()

```
int32 OS_TaskInstallDeleteHandler (
    osal_task_entry function_pointer )
```

Installs a handler for when the task is deleted.

This function is used to install a callback that is called when the task is deleted. The callback is called when OS_Task↩Delete is called with the task ID. A task delete handler is useful for cleaning up resources that a task creates, before the task is removed from the system.

Parameters

in	*function_pointer*	function to be called when task exits

Returns

Execution status, see OSAL Return Code Defines

Return values

OS_ERR_INVALID_ID	if the calling context is not an OSAL task

10.80.2.10 OS_TaskSetPriority()

```
int32 OS_TaskSetPriority (
    osal_id_t task_id,
    osal_priority_t new_priority )
```

Sets the given task to a new priority.

Parameters

in	*task_id*	The object ID to operate on
in	*new_priority*	Set the new priority

Returns

Execution status, see OSAL Return Code Defines

Return values

OS_SUCCESS	Successful execution.
OS_ERR_INVALID_ID	if the ID passed to it is invalid

Return values

OS_ERR_INVALID_PRIORITY	if the priority is greater than the max allowed (return value only verified in coverage test)
OS_ERROR	if an unspecified/other error occurs (return value only verified in coverage test)

10.81 OSAL Time Base APIs

Functions

- int32 OS_TimeBaseCreate (osal_id_t *timebase_id, const char *timebase_name, OS_TimerSync_t external_↩ sync)

  Create an abstract Time Base resource.
- int32 OS_TimeBaseSet (osal_id_t timebase_id, uint32 start_time, uint32 interval_time)

  Sets the tick period for simulated time base objects.
- int32 OS_TimeBaseDelete (osal_id_t timebase_id)

  Deletes a time base object.
- int32 OS_TimeBaseGetIdByName (osal_id_t *timebase_id, const char *timebase_name)

  Find the ID of an existing time base resource.
- int32 OS_TimeBaseGetInfo (osal_id_t timebase_id, OS_timebase_prop_t *timebase_prop)

  Obtain information about a timebase resource.
- int32 OS_TimeBaseGetFreeRun (osal_id_t timebase_id, uint32 *freerun_val)

  Read the value of the timebase free run counter.

10.81.1 Detailed Description

10.81.2 Function Documentation

10.81.2.1 OS_TimeBaseCreate()

```
int32 OS_TimeBaseCreate (
    osal_id_t * timebase_id,
    const char * timebase_name,
    OS_TimerSync_t external_sync )
```

Create an abstract Time Base resource.
An OSAL time base is an abstraction of a "timer tick" that can, in turn, be used for measurement of elapsed time between events.
Time bases can be simulated by the operating system using the OS kernel-provided timing facilities, or based on a hardware timing source if provided by the BSP.
A time base object has a servicing task associated with it, that runs at elevated priority and will thereby interrupt user-level tasks when timing ticks occur.
If the external_sync function is passed as NULL, the operating system kernel timing resources will be utilized for a simulated timer tick.
If the external_sync function is not NULL, this should point to a BSP-provided function that will block the calling task until the next tick occurs. This can be used for synchronizing with hardware events.

Note

When provisioning a tunable RTOS kernel, such as RTEMS, the kernel should be configured to support at least (OS_MAX_TASKS + OS_MAX_TIMEBASES) threads, to account for the helper threads associated with time base objects.

This configuration API must not be used from the context of a timer callback. Timers should only be configured from the context of normal OSAL tasks.

Parameters

out	*timebase_id*	will be set to the non-zero ID of the newly-created resource (must not be null)
in	*timebase_name*	The name of the time base (must not be null)
in	*external_sync*	A synchronization function for BSP hardware-based timer ticks

Returns

Execution status, see OSAL Return Code Defines

Return values

OS_SUCCESS	Successful execution.
OS_ERR_NAME_TAKEN	if the name specified is already used
OS_ERR_NO_FREE_IDS	if there can be no more timebase resources created
OS_ERR_INCORRECT_OBJ_STATE	if called from timer/timebase context
OS_ERR_NAME_TOO_LONG	if the timebase_name is too long
OS_INVALID_POINTER	if a pointer argument is NULL

10.81.2.2 OS_TimeBaseDelete()

```
int32 OS_TimeBaseDelete (
    osal_id_t timebase_id )
```

Deletes a time base object.
The helper task and any other resources associated with the time base abstraction will be freed.

Note

This configuration API must not be used from the context of a timer callback. Timers should only be configured from the context of normal OSAL tasks.

Parameters

in	*timebase_id*	The timebase resource to delete

Returns

Execution status, see OSAL Return Code Defines

Return values

OS_SUCCESS	Successful execution.
OS_ERR_INVALID_ID	if the id passed in is not a valid timebase
OS_ERR_INCORRECT_OBJ_STATE	if called from timer/timebase context

10.81.2.3 OS_TimeBaseGetFreeRun()

```
int32 OS_TimeBaseGetFreeRun (
    osal_id_t timebase_id,
    uint32 * freerun_val )
```

Read the value of the timebase free run counter.
Poll the timer free-running time counter in a lightweight fashion.
The free run count is a monotonically increasing value reflecting the total time elapsed since the timebase inception. Units are the same as the timebase itself, usually microseconds.
Applications may quickly and efficiently calculate relative time differences by polling this value and subtracting the previous counter value.

The absolute value of this counter is not relevant, because it will "roll over" after 2^32 units of time. For a timebase with microsecond units, this occurs approximately every 4294 seconds, or about 1.2 hours.

Note

To ensure consistency of results, the application should sample the value at a minimum of two times the roll over frequency, and calculate the difference between the consecutive samples.

Parameters

in	*timebase↩ _id*	The timebase to operate on
out	*freerun_val*	Buffer to store the free run counter (must not be null)

Returns

Execution status, see OSAL Return Code Defines

Return values

OS_SUCCESS	Successful execution.
OS_ERR_INVALID_ID	if the id passed in is not a valid timebase
OS_INVALID_POINTER	if pointer argument is NULL

10.81.2.4 OS_TimeBaseGetIdByName()

```
int32 OS_TimeBaseGetIdByName (
    osal_id_t * timebase_id,
    const char * timebase_name )
```

Find the ID of an existing time base resource.
Given a time base name, find and output the ID associated with it.

Note

This configuration API must not be used from the context of a timer callback. Timers should only be configured from the context of normal OSAL tasks.

Parameters

out	*timebase_id*	will be set to the non-zero ID of the matching resource (must not be null)
in	*timebase_name*	The name of the timebase resource to find (must not be null)

Returns

Execution status, see OSAL Return Code Defines

Return values

OS_SUCCESS	Successful execution.
OS_INVALID_POINTER	if timebase_id or timebase_name are NULL pointers
OS_ERR_NAME_TOO_LONG	name length including null terminator greater than OS_MAX_API_NAME

Return values

OS_ERR_NAME_NOT_FOUND	if the name was not found in the table
OS_ERR_INCORRECT_OBJ_STATE	if called from timer/timebase context

10.81.2.5 OS_TimeBaseGetInfo()

```
int32 OS_TimeBaseGetInfo (
    osal_id_t timebase_id,
    OS_timebase_prop_t * timebase_prop )
```

Obtain information about a timebase resource.
Fills the buffer referred to by the timebase_prop parameter with relevant information about the time base resource.
This function will pass back a pointer to structure that contains all of the relevant info(name and creator) about the specified timebase.

Note

This configuration API must not be used from the context of a timer callback. Timers should only be configured from the context of normal OSAL tasks.

Parameters

in	*timebase_id*	The timebase resource ID
out	*timebase_prop*	Buffer to store timebase properties (must not be null)

Returns

Execution status, see OSAL Return Code Defines

Return values

OS_SUCCESS	Successful execution.
OS_ERR_INVALID_ID	if the id passed in is not a valid timebase
OS_INVALID_POINTER	if the timebase_prop pointer is null
OS_ERR_INCORRECT_OBJ_STATE	if called from timer/timebase context

10.81.2.6 OS_TimeBaseSet()

```
int32 OS_TimeBaseSet (
    osal_id_t timebase_id,
    uint32 start_time,
    uint32 interval_time )
```

Sets the tick period for simulated time base objects.
This sets the actual tick period for timing ticks that are simulated by the RTOS kernel (i.e. the "external_sync" parameter on the call to OS_TimeBaseCreate() is NULL).
The RTOS will be configured to wake up the helper thread at the requested interval.
This function has no effect for time bases that are using a BSP-provided external_sync function.

Note

This configuration API must not be used from the context of a timer callback. Timers should only be configured from the context of normal OSAL tasks.

Parameters

in	*timebase_id*	The timebase resource to configure
in	*start_time*	The amount of delay for the first tick, in microseconds.
in	*interval_time*	The amount of delay between ticks, in microseconds.

Returns

Execution status, see OSAL Return Code Defines

Return values

OS_SUCCESS	Successful execution.
OS_ERR_INVALID_ID	if the id passed in is not a valid timebase
OS_ERR_INCORRECT_OBJ_STATE	if called from timer/timebase context
OS_TIMER_ERR_INVALID_ARGS	if start_time or interval_time are out of range

10.82 OSAL Timer APIs

Functions

- int32 OS_TimerCreate (osal_id_t *timer_id, const char *timer_name, uint32 *clock_accuracy, OS_TimerCallback_t callback_ptr)

  Create a timer object.
- int32 OS_TimerAdd (osal_id_t *timer_id, const char *timer_name, osal_id_t timebase_id, OS_ArgCallback_t callback_ptr, void *callback_arg)

  Add a timer object based on an existing TimeBase resource.
- int32 OS_TimerSet (osal_id_t timer_id, uint32 start_time, uint32 interval_time)

  Configures a periodic or one shot timer.
- int32 OS_TimerDelete (osal_id_t timer_id)

  Deletes a timer resource.
- int32 OS_TimerGetIdByName (osal_id_t *timer_id, const char *timer_name)

  Locate an existing timer resource by name.
- int32 OS_TimerGetInfo (osal_id_t timer_id, OS_timer_prop_t *timer_prop)

  Gets information about an existing timer.

10.82.1 Detailed Description

10.82.2 Function Documentation

10.82.2.1 OS_TimerAdd()

```
int32 OS_TimerAdd (
    osal_id_t * timer_id,
    const char * timer_name,
    osal_id_t timebase_id,
    OS_ArgCallback_t callback_ptr,
    void * callback_arg )
```

Add a timer object based on an existing TimeBase resource.

A timer object is a resource that invokes the specified application-provided function upon timer expiration. Timers may be one-shot or periodic in nature.

This function uses an existing time base object to service this timer, which must exist prior to adding the timer. The precision of the timer is the same as that of the underlying time base object. Multiple timer objects can be created referring to a single time base object.

This routine also uses a different callback function prototype from OS_TimerCreate(), allowing a single opaque argument to be passed to the callback routine. The OSAL implementation does not use this parameter, and may be set NULL.

The callback function for this method should be declared according to the OS_ArgCallback_t function pointer type. The timer_id is passed in to the function by the OSAL, and the arg parameter is passed through from the callback_arg argument on this call.

Note

This configuration API must not be used from the context of a timer callback. Timers should only be configured from the context of normal OSAL tasks.

See also

OS_ArgCallback_t

Parameters

out	*timer_id*	Will be set to the non-zero resource ID of the timer object (must not be null)
in	*timer_name*	Name of the timer object (must not be null)
in	*timebase↩ _id*	The time base resource to use as a reference
in	*callback_ptr*	Application-provided function to invoke (must not be null)
in	*callback_arg*	Opaque argument to pass to callback function, may be NULL

Returns

Execution status, see OSAL Return Code Defines

Return values

OS_SUCCESS	Successful execution.
OS_INVALID_POINTER	if any parameters are NULL
OS_ERR_INVALID_ID	if the timebase_id parameter is not valid
OS_ERR_NAME_TOO_LONG	name length including null terminator greater than OS_MAX_API_NAME
OS_ERR_NAME_TAKEN	if the name is already in use by another timer.
OS_ERR_NO_FREE_IDS	if all of the timers are already allocated.
OS_ERR_INCORRECT_OBJ_STATE	if invoked from a timer context
OS_TIMER_ERR_INTERNAL	if there was an error programming the OS timer (return value only verified in coverage test)

10.82.2.2 OS_TimerCreate()

```
int32 OS_TimerCreate (
    osal_id_t * timer_id,
    const char * timer_name,
    uint32 * clock_accuracy,
    OS_TimerCallback_t callback_ptr )
```

Create a timer object.

A timer object is a resource that invokes the specified application-provided function upon timer expiration. Timers may be one-shot or periodic in nature.

This function creates a dedicated (hidden) time base object to service this timer, which is created and deleted with the timer object itself. The internal time base is configured for an OS simulated timer tick at the same interval as the timer.

The callback function should be declared according to the OS_TimerCallback_t function pointer type. The timer_id value is passed to the callback function.

Note

clock_accuracy comes from the underlying OS tick value. The nearest integer microsecond value is returned, so may not be exact.

This configuration API must not be used from the context of a timer callback. Timers should only be configured from the context of normal OSAL tasks.

See also

OS_TimerCallback_t

Parameters

out	*timer_id*	Will be set to the non-zero resource ID of the timer object (must not be null)
in	*timer_name*	Name of the timer object (must not be null)
out	*clock_accuracy*	Expected precision of the timer, in microseconds. This is the underlying tick value rounded to the nearest microsecond integer. (must not be null)
in	*callback_ptr*	The function pointer of the timer callback (must not be null).

Returns

Execution status, see OSAL Return Code Defines

Return values

OS_SUCCESS	Successful execution.
OS_INVALID_POINTER	if any parameters are NULL
OS_ERR_NAME_TOO_LONG	name length including null terminator greater than OS_MAX_API_NAME
OS_ERR_NAME_TAKEN	if the name is already in use by another timer.
OS_ERR_NO_FREE_IDS	if all of the timers are already allocated.
OS_ERR_INCORRECT_OBJ_STATE	if invoked from a timer context
OS_TIMER_ERR_INTERNAL	if there was an error programming the OS timer (return value only verified in coverage test)

10.82.2.3 OS_TimerDelete()

```
int32 OS_TimerDelete (
    osal_id_t timer_id )
```

Deletes a timer resource.
The application callback associated with the timer will be stopped, and the resources freed for future use.

Note

This configuration API must not be used from the context of a timer callback. Timers should only be configured from the context of normal OSAL tasks.

Parameters

in	*timer_id*	The timer ID to operate on

Returns

Execution status, see OSAL Return Code Defines

Return values

OS_SUCCESS	Successful execution.
OS_ERR_INVALID_ID	if the timer_id is invalid.
OS_TIMER_ERR_INTERNAL	if there was a problem deleting the timer in the host OS (return value only verified in coverage test)
OS_ERR_INCORRECT_OBJ_STATE	if called from timer/timebase context

10.82.2.4 OS_TimerGetIdByName()

```
int32 OS_TimerGetIdByName (
    osal_id_t * timer_id,
    const char * timer_name )
```

Locate an existing timer resource by name.
Outputs the ID associated with the given timer, if it exists.

Note

This configuration API must not be used from the context of a timer callback. Timers should only be configured from the context of normal OSAL tasks.

Parameters

out	*timer_id*	Will be set to the timer ID corresponding to the name (must not be null)
in	*timer_name*	The timer name to find (must not be null)

Returns

Execution status, see OSAL Return Code Defines

Return values

OS_SUCCESS	Successful execution.
OS_INVALID_POINTER	if timer_id or timer_name are NULL pointers
OS_ERR_NAME_TOO_LONG	name length including null terminator greater than OS_MAX_API_NAME
OS_ERR_NAME_NOT_FOUND	if the name was not found in the table
OS_ERR_INCORRECT_OBJ_STATE	if called from timer/timebase context

10.82.2.5 OS_TimerGetInfo()

```
int32 OS_TimerGetInfo (
    osal_id_t timer_id,
    OS_timer_prop_t * timer_prop )
```

Gets information about an existing timer.
This function takes timer_id, and looks it up in the OS table. It puts all of the information known about that timer into a structure pointer to by timer_prop.

Parameters

Note

This configuration API must not be used from the context of a timer callback. Timers should only be configured from the context of normal OSAL tasks.

Parameters

in	*timer_id*	The timer ID to operate on
out	*timer_prop*	Buffer containing timer properties (must not be null) • creator: the OS task ID of the task that created this timer • name: the string name of the timer • start_time: the start time in microseconds, if any • interval_time: the interval time in microseconds, if any • accuracy: the accuracy of the timer in microseconds

Returns

Execution status, see OSAL Return Code Defines

Return values

OS_SUCCESS	Successful execution.
OS_ERR_INVALID_ID	if the id passed in is not a valid timer
OS_INVALID_POINTER	if the timer_prop pointer is null
OS_ERR_INCORRECT_OBJ_STATE	if called from timer/timebase context

10.82.2.6 OS_TimerSet()

```
int32 OS_TimerSet (
    osal_id_t timer_id,
    uint32 start_time,
    uint32 interval_time )
```

Configures a periodic or one shot timer.

This function programs the timer with a start time and an optional interval time. The start time is the time in microseconds when the user callback function will be called. If the interval time is non-zero, the timer will be reprogrammed with that interval in microseconds to call the user callback function periodically. If the start time and interval time are zero, the function will return an error.

For a "one-shot" timer, the start_time configures the expiration time, and the interval_time should be passed as zero to indicate the timer is not to be automatically reset.

Note

The resolution of the times specified is limited to the clock accuracy returned in the OS_TimerCreate call. If the times specified in the start_msec or interval_msec parameters are less than the accuracy, they will be rounded up to the accuracy of the timer.

This configuration API must not be used from the context of a timer callback. Timers should only be configured from the context of normal OSAL tasks.

Parameters

in	*timer_id*	The timer ID to operate on
in	*start_time*	Time in microseconds to the first expiration
in	*interval_time*	Time in microseconds between subsequent intervals, value of zero will only call the user callback function once after the start_msec time.

Returns

Execution status, see OSAL Return Code Defines

Return values

OS_SUCCESS	Successful execution.
OS_ERR_INVALID_ID	if the timer_id is not valid.
OS_TIMER_ERR_INTERNAL	if there was an error programming the OS timer (return value only verified in coverage test)
OS_ERR_INCORRECT_OBJ_STATE	if called from timer/timebase context
OS_TIMER_ERR_INVALID_ARGS	if the start_time or interval_time is out of range, or both 0

11 Data Structure Documentation

11.1 CCSDS_ExtendedHeader Struct Reference

CCSDS packet extended header.
`#include <ccsds_hdr.h>`

Data Fields

- uint8 Subsystem [2]

  subsystem qualifier
- uint8 SystemId [2]

  system qualifier

11.1.1 Detailed Description

CCSDS packet extended header.
Definition at line 73 of file ccsds_hdr.h.

11.1.2 Field Documentation

11.1.2.1 Subsystem `uint8 CCSDS_ExtendedHeader::Subsystem[2]`

subsystem qualifier
Definition at line 75 of file ccsds_hdr.h.

11.1.2.2 SystemId `uint8 CCSDS_ExtendedHeader::SystemId[2]`

system qualifier
Definition at line 82 of file ccsds_hdr.h.
The documentation for this struct was generated from the following file:

- cfe/modules/msg/fsw/inc/ccsds_hdr.h

11.2 CCSDS_PrimaryHeader Struct Reference

CCSDS packet primary header.
`#include <ccsds_hdr.h>`

Data Fields

- uint8 StreamId [2]

  packet identifier word (stream ID)
- uint8 Sequence [2]

  packet sequence word
- uint8 Length [2]

  packet length word

11.2.1 Detailed Description

CCSDS packet primary header.
Definition at line 51 of file ccsds_hdr.h.

11.2.2 Field Documentation

11.2.2.1 Length `uint8 CCSDS_PrimaryHeader::Length[2]`

packet length word
Definition at line 71 of file ccsds_hdr.h.

11.2.2.2 Sequence `uint8 CCSDS_PrimaryHeader::Sequence[2]`

packet sequence word
Definition at line 66 of file ccsds_hdr.h.

11.2.2.3 StreamId `uint8 CCSDS_PrimaryHeader::StreamId[2]`

packet identifier word (stream ID)
Definition at line 59 of file ccsds_hdr.h.
The documentation for this struct was generated from the following file:

- cfe/modules/msg/fsw/inc/ccsds_hdr.h

11.3 CF_AbandonCmd Struct Reference

Abandon command structure.
`#include <default_cf_msgstruct.h>`

Data Fields

- CFE_MSG_CommandHeader_t CommandHeader

  Command header.
- CF_Transaction_Payload_t Payload

11.3.1 Detailed Description

Abandon command structure.
For command details see CF_ABANDON_CC
Definition at line 280 of file default_cf_msgstruct.h.

11.3.2 Field Documentation

11.3.2.1 CommandHeader `CFE_MSG_CommandHeader_t CF_AbandonCmd::CommandHeader`

Command header.
Definition at line 282 of file default_cf_msgstruct.h.

11.3.2.2 Payload `CF_Transaction_Payload_t CF_AbandonCmd::Payload`

Definition at line 283 of file default_cf_msgstruct.h.
Referenced by CF_AbandonCmd().
The documentation for this struct was generated from the following file:

- apps/cf/config/default_cf_msgstruct.h

11.4 CF_AppData_t Struct Reference

The CF application global state structure.
`#include <cf_app.h>`

Data Fields

- CF_HkPacket_t hk
- uint32 run_status
- CFE_SB_PipeId_t cmd_pipe
- CFE_TBL_Handle_t config_handle
- CF_ConfigTable_t * config_table
- CF_Engine_t engine

11.4.1 Detailed Description

The CF application global state structure.
This contains all variables related to CF application state
Definition at line 80 of file cf_app.h.

11.4.2 Field Documentation

11.4.2.1 cmd_pipe `CFE_SB_PipeId_t CF_AppData_t::cmd_pipe`

Definition at line 90 of file cf_app.h.
Referenced by CF_AppMain(), and CF_Init().

11.4.2.2 config_handle `CFE_TBL_Handle_t CF_AppData_t::config_handle`

Definition at line 92 of file cf_app.h.
Referenced by CF_CheckTables(), and CF_TableInit().

11.4.2.3 config_table `CF_ConfigTable_t* CF_AppData_t::config_table`

Definition at line 93 of file cf_app.h.
Referenced by CF_CFDP_AppendTlv(), CF_CFDP_ArmAckTimer(), CF_CFDP_ArmInactTimer(), CF_CFDP_CycleTx(), CF_CFDP_HandleNotKeepFile(), CF_CFDP_InitEngine(), CF_CFDP_IsPollingDir(), CF_CFDP_MsgOutGet(), CF_CFDP_ProcessPollingDirectories(), CF_CFDP_R2_Complete(), CF_CFDP_R_Init(), CF_CFDP_R_SubstateSendNak(), CF_CFDP_R_Tick(), CF_CFDP_ReceiveMessage(), CF_CFDP_S_SendFileData(), CF_CFDP_S_Tick(), CF_CFDP_SendAck(), CF_CFDP_SendEof(), CF_CFDP_SendFin(), CF_CFDP_SendMd(), CF_CFDP_TxFile_Initiate(), CF_CheckTables(), CF_CmdValidateMaxOutgoing(), CF_DoEnableDisableDequeue(), CF_DoEnableDisablePolldir(), CF_GetSetParamCmd(), CF_TableInit(), and CF_Timer_Sec2Ticks().

11.4.2.4 engine `CF_Engine_t CF_AppData_t::engine`

Definition at line 95 of file cf_app.h.
Referenced by CF_CFDP_CycleEngine(), CF_CFDP_CycleTx(), CF_CFDP_DisableEngine(), CF_CFDP_InitEngine(), CF_CFDP_MsgOutGet(), CF_CFDP_PlaybackDir(), CF_CFDP_ProcessPlaybackDirectories(), CF_CFDP_ProcessPlaybackDirectory(), CF_CFDP_ProcessPollingDirectories(), CF_CFDP_ReceiveMessage(), CF_CFDP_RecvIdle(), CF_CFDP_ResetTransaction(), CF_CFDP_Send(), CF_CFDP_TxFile(), CF_CFDP_TxFile_Initiate(), CF_CheckTables(), CF_CList_InsertAfter_Ex(), CF_CList_InsertBack_Ex(), CF_CList_Remove_Ex(), CF_DequeueTransaction(),

CF_DisableEngineCmd(), CF_DoPurgeQueue(), CF_EnableEngineCmd(), CF_FindTransactionBySequenceNumber↩ AllChannels(), CF_FreeTransaction(), CF_InsertSortPrio(), CF_MoveTransaction(), CF_TraverseAllTransactions_All_↩ Channels(), CF_TsnChanAction(), and CF_WriteQueueCmd().

11.4.2.5 hk `CF_HkPacket_t CF_AppData_t::hk`

Definition at line 86 of file cf_app.h.
Referenced by CF_AbandonCmd(), CF_AppPipe(), CF_CancelCmd(), CF_CFDP_CycleEngine(), CF_CFDP_Disable↩ Engine(), CF_CFDP_MsgOutGet(), CF_CFDP_PlaybackDir_Initiate(), CF_CFDP_ProcessPlaybackDirectories(), C↩ F_CFDP_ProcessPollingDirectories(), CF_CFDP_R2_CalcCrcChunk(), CF_CFDP_R2_Complete(), CF_CFDP_R2↩ _Recv_fin_ack(), CF_CFDP_R2_RecvMd(), CF_CFDP_R_CheckCrc(), CF_CFDP_R_DispatchRecv(), CF_CFDP_↩ R_Init(), CF_CFDP_R_ProcessFd(), CF_CFDP_R_SendInactivityEvent(), CF_CFDP_R_SubstateRecvEof(), CF_C↩ FDP_R_SubstateSendNak(), CF_CFDP_R_Tick(), CF_CFDP_ReceiveMessage(), CF_CFDP_RecvDrop(), CF_CF↩ DP_RecvFd(), CF_CFDP_RecvIdle(), CF_CFDP_RecvMd(), CF_CFDP_RecvPh(), CF_CFDP_S2_Nak(), CF_CFD↩ P_S2_WaitForEofAck(), CF_CFDP_S_DispatchRecv(), CF_CFDP_S_SendFileData(), CF_CFDP_S_SubstateSend↩ Metadata(), CF_CFDP_S_Tick(), CF_CFDP_Send(), CF_CList_InsertAfter_Ex(), CF_CList_InsertBack_Ex(), CF_C↩ List_Remove_Ex(), CF_DequeueTransaction(), CF_DisableDequeueCmd(), CF_DisableDirPollingCmd(), CF_Disable↩ EngineCmd(), CF_DoFreezeThaw(), CF_DoSuspRes(), CF_EnableDequeueCmd(), CF_EnableDirPollingCmd(), CF↩ _EnableEngineCmd(), CF_FreezeCmd(), CF_GetSetParamCmd(), CF_Init(), CF_MoveTransaction(), CF_NoopCmd(), CF_PlaybackDirCmd(), CF_ProcessGroundCommand(), CF_PurgeQueueCmd(), CF_ResetCmd(), CF_SendHkCmd(), CF_ThawCmd(), CF_TxFileCmd(), and CF_WriteQueueCmd().

11.4.2.6 run_status `uint32 CF_AppData_t::run_status`

Definition at line 88 of file cf_app.h.
Referenced by CF_AppMain(), CF_CheckTables(), and CF_Init().
The documentation for this struct was generated from the following file:

- apps/cf/fsw/src/cf_app.h

11.5 CF_CancelCmd Struct Reference

Cancel command structure.
`#include <default_cf_msgstruct.h>`

Data Fields

- CFE_MSG_CommandHeader_t CommandHeader
  Command header.
- CF_Transaction_Payload_t Payload

11.5.1 Detailed Description

Cancel command structure.
For command details see CF_CANCEL_CC
Definition at line 269 of file default_cf_msgstruct.h.

11.5.2 Field Documentation

11.5.2.1 CommandHeader `CFE_MSG_CommandHeader_t CF_CancelCmd::CommandHeader`

Command header.
Definition at line 271 of file default_cf_msgstruct.h.

11.5.2.2 Payload `CF_Transaction_Payload_t CF_CancelCmd::Payload`

Definition at line 272 of file default_cf_msgstruct.h.
Referenced by CF_CancelCmd().
The documentation for this struct was generated from the following file:

- apps/cf/config/default_cf_msgstruct.h

11.6 CF_CFDP_CycleTx_args Struct Reference

Structure for use with the CF_CFDP_CycleTx() function.
`#include <cf_cfdp.h>`

Data Fields

- CF_Channel_t * chan

  channel structure

- int ran_one

  should be set to 1 if a transaction was cycled

11.6.1 Detailed Description

Structure for use with the CF_CFDP_CycleTx() function.
Definition at line 34 of file cf_cfdp.h.

11.6.2 Field Documentation

11.6.2.1 chan `CF_Channel_t* CF_CFDP_CycleTx_args::chan`

channel structure
Definition at line 36 of file cf_cfdp.h.
Referenced by CF_CFDP_CycleTxFirstActive().

11.6.2.2 ran_one `int CF_CFDP_CycleTx_args::ran_one`

should be set to 1 if a transaction was cycled
Definition at line 37 of file cf_cfdp.h.
Referenced by CF_CFDP_CycleTx(), and CF_CFDP_CycleTxFirstActive().
The documentation for this struct was generated from the following file:

- apps/cf/fsw/src/cf_cfdp.h

11.7 CF_CFDP_FileDirectiveDispatchTable_t Struct Reference

A table of receive handler functions based on file directive code.
`#include <cf_cfdp_dispatch.h>`

Data Fields

- CF_CFDP_StateRecvFunc_t fdirective [CF_CFDP_FileDirective_INVALID_MAX]

  a separate recv handler for each possible file directive PDU in this state

11.7.1 Detailed Description

A table of receive handler functions based on file directive code.
For PDUs identified as a "file directive" type - generally anything other than file data - this provides a table to branch to a different handler function depending on the value of the file directive code.
Definition at line 87 of file cf_cfdp_dispatch.h.

11.7.2 Field Documentation

11.7.2.1 fdirective `CF_CFDP_StateRecvFunc_t CF_CFDP_FileDirectiveDispatchTable_t::fdirective[CF_CFDP_FileDirective_`

a separate recv handler for each possible file directive PDU in this state
Definition at line 90 of file cf_cfdp_dispatch.h.
Referenced by CF_CFDP_R1_Recv(), CF_CFDP_R2_Recv(), CF_CFDP_R_DispatchRecv(), CF_CFDP_S2_Recv(), and CF_CFDP_S_DispatchRecv().
The documentation for this struct was generated from the following file:

- apps/cf/fsw/src/cf_cfdp_dispatch.h

11.8 CF_CFDP_lv Struct Reference

Structure representing CFDP LV Object format.
`#include <cf_cfdp_pdu.h>`

Data Fields

- CF_CFDP_uint8_t length

  Length of data field.

11.8.1 Detailed Description

Structure representing CFDP LV Object format.
These Length + Value pairs used in several CFDP PDU types, typically for storage of strings such as file names.
Defined per table 5-2 of CCSDS 727.0-B-5
Definition at line 164 of file cf_cfdp_pdu.h.

11.8.2 Field Documentation

11.8.2.1 length `CF_CFDP_uint8_t CF_CFDP_lv::length`

Length of data field.
Definition at line 166 of file cf_cfdp_pdu.h.
Referenced by CF_CFDP_DecodeLV(), and CF_CFDP_EncodeLV().
The documentation for this struct was generated from the following file:

- apps/cf/fsw/src/cf_cfdp_pdu.h

11.9 CF_CFDP_PduAck Struct Reference

Structure representing CFDP Acknowledge PDU.
`#include <cf_cfdp_pdu.h>`

Data Fields

- CF_CFDP_uint8_t directive_and_subtype_code
- CF_CFDP_uint8_t cc_and_transaction_status

11.9.1 Detailed Description

Structure representing CFDP Acknowledge PDU.
Defined per section 5.2.4 / table 5-8 of CCSDS 727.0-B-5
Definition at line 319 of file cf_cfdp_pdu.h.

11.9.2 Field Documentation

11.9.2.1 cc_and_transaction_status `CF_CFDP_uint8_t CF_CFDP_PduAck::cc_and_transaction_status`

Definition at line 322 of file cf_cfdp_pdu.h.
Referenced by CF_CFDP_DecodeAck(), and CF_CFDP_EncodeAck().

11.9.2.2 directive_and_subtype_code `CF_CFDP_uint8_t CF_CFDP_PduAck::directive_and_subtype_code`

Definition at line 321 of file cf_cfdp_pdu.h.
Referenced by CF_CFDP_DecodeAck(), and CF_CFDP_EncodeAck().
The documentation for this struct was generated from the following file:

- apps/cf/fsw/src/cf_cfdp_pdu.h

11.10 CF_CFDP_PduEof Struct Reference

Structure representing CFDP End of file PDU.
`#include <cf_cfdp_pdu.h>`

Data Fields

- CF_CFDP_uint8_t cc
- CF_CFDP_uint32_t crc
- CF_CFDP_uint32_t size

11.10.1 Detailed Description

Structure representing CFDP End of file PDU.
Defined per section 5.2.2 / table 5-6 of CCSDS 727.0-B-5
Definition at line 297 of file cf_cfdp_pdu.h.

11.10.2 Field Documentation

11.10.2.1 cc `CF_CFDP_uint8_t CF_CFDP_PduEof::cc`

Definition at line 299 of file cf_cfdp_pdu.h.
Referenced by CF_CFDP_DecodeEof(), and CF_CFDP_EncodeEof().

11.10.2.2 crc `CF_CFDP_uint32_t CF_CFDP_PduEof::crc`

Definition at line 300 of file cf_cfdp_pdu.h.
Referenced by CF_CFDP_DecodeEof(), and CF_CFDP_EncodeEof().

11.10.2.3 size `CF_CFDP_uint32_t CF_CFDP_PduEof::size`

Definition at line 301 of file cf_cfdp_pdu.h.
Referenced by CF_CFDP_DecodeEof(), and CF_CFDP_EncodeEof().
The documentation for this struct was generated from the following file:

- apps/cf/fsw/src/cf_cfdp_pdu.h

11.11 CF_CFDP_PduFileDataContent Struct Reference

PDU file data content typedef for limit checking outgoing_file_chunk_size table value and set parameter command.
`#include <cf_cfdp_pdu.h>`

Data Fields

- uint8 data [CF_MAX_PDU_SIZE - sizeof(CF_CFDP_PduFileDataHeader_t) - CF_CFDP_MIN_HEADER_SIZE]

11.11.1 Detailed Description

PDU file data content typedef for limit checking outgoing_file_chunk_size table value and set parameter command.
This definition allows for the largest data block possible, as CF_MAX_PDU_SIZE - the minimum possible header size.
In practice the outgoing file chunk size is limited by whichever is smaller; the remaining data, remaining space in the packet, and outgoing_file_chunk_size.
Definition at line 380 of file cf_cfdp_pdu.h.

11.11.2 Field Documentation

11.11.2.1 data `uint8 CF_CFDP_PduFileDataContent::data[CF_MAX_PDU_SIZE - sizeof(CF_CFDP_PduFileDataHeader_t) - CF_CFDP_MIN_HEADER_SIZE]`

Definition at line 382 of file cf_cfdp_pdu.h.
The documentation for this struct was generated from the following file:

- apps/cf/fsw/src/cf_cfdp_pdu.h

11.12 CF_CFDP_PduFileDataHeader Struct Reference

PDU file data header.
`#include <cf_cfdp_pdu.h>`

Data Fields

- CF_CFDP_uint32_t offset

11.12.1 Detailed Description

PDU file data header.
Definition at line 361 of file cf_cfdp_pdu.h.

11.12.2 Field Documentation

11.12.2.1 offset `CF_CFDP_uint32_t CF_CFDP_PduFileDataHeader::offset`

NOTE: while this is the only fixed/required field in the data PDU, it may have segment metadata prior to this, depending on how the fields in the base header are set
Definition at line 368 of file cf_cfdp_pdu.h.
Referenced by CF_CFDP_DecodeFileDataHeader(), and CF_CFDP_EncodeFileDataHeader().
The documentation for this struct was generated from the following file:

- apps/cf/fsw/src/cf_cfdp_pdu.h

11.13 CF_CFDP_PduFileDirectiveHeader Struct Reference

Structure representing CFDP File Directive Header.
`#include <cf_cfdp_pdu.h>`

Data Fields

- CF_CFDP_uint8_t directive_code

11.13.1 Detailed Description

Structure representing CFDP File Directive Header.
Defined per section 5.2 of CCSDS 727.0-B-5
Definition at line 151 of file cf_cfdp_pdu.h.

11.13.2 Field Documentation

11.13.2.1 directive_code `CF_CFDP_uint8_t CF_CFDP_PduFileDirectiveHeader::directive_code`

Definition at line 153 of file cf_cfdp_pdu.h.
Referenced by CF_CFDP_DecodeFileDirectiveHeader(), and CF_CFDP_EncodeFileDirectiveHeader().
The documentation for this struct was generated from the following file:

- apps/cf/fsw/src/cf_cfdp_pdu.h

11.14 CF_CFDP_PduFin Struct Reference

Structure representing CFDP Finished PDU.
`#include <cf_cfdp_pdu.h>`

Data Fields

- CF_CFDP_uint8_t flags

11.14.1 Detailed Description

Structure representing CFDP Finished PDU.
Defined per section 5.2.3 / table 5-7 of CCSDS 727.0-B-5
Definition at line 309 of file cf_cfdp_pdu.h.

11.14.2 Field Documentation

11.14.2.1 flags `CF_CFDP_uint8_t CF_CFDP_PduFin::flags`

Definition at line 311 of file cf_cfdp_pdu.h.
Referenced by CF_CFDP_DecodeFin(), and CF_CFDP_EncodeFin().
The documentation for this struct was generated from the following file:

- apps/cf/fsw/src/cf_cfdp_pdu.h

11.15 CF_CFDP_PduHeader Struct Reference

Structure representing base CFDP PDU header.
`#include <cf_cfdp_pdu.h>`

Data Fields

- CF_CFDP_uint8_t flags

  Flags indicating the PDU type, direction, mode, etc.
- CF_CFDP_uint16_t length

  Length of the entire PDU, in octets.
- CF_CFDP_uint8_t eid_tsn_lengths

  Lengths of the EID+TSN data (bitfields)

11.15.1 Detailed Description

Structure representing base CFDP PDU header.
This header appears at the beginning of all CFDP PDUs, of all types. Note that the header is variable length, it also contains source and destination entity IDs, and the transaction sequence number.
Defined per section 5.1 of CCSDS 727.0-B-5

Note

this contains variable length data for the EID+TSN, which is *not* included in this definition. As a result, the sizeof(↩ CF_CFDP_PduHeader_t) reflects only the size of the fixed fields. Use CF_HeaderSize() to get the actual size of this structure.

Definition at line 137 of file cf_cfdp_pdu.h.

11.15.2 Field Documentation

11.15.2.1 eid_tsn_lengths `CF_CFDP_uint8_t CF_CFDP_PduHeader::eid_tsn_lengths`

Lengths of the EID+TSN data (bitfields)
Definition at line 141 of file cf_cfdp_pdu.h.
Referenced by CF_CFDP_DecodeHeader(), and CF_CFDP_EncodeHeaderWithoutSize().

11.15.2.2 flags `CF_CFDP_uint8_t CF_CFDP_PduHeader::flags`

Flags indicating the PDU type, direction, mode, etc.
Definition at line 139 of file cf_cfdp_pdu.h.
Referenced by CF_CFDP_DecodeHeader(), and CF_CFDP_EncodeHeaderWithoutSize().

11.15.2.3 length `CF_CFDP_uint16_t CF_CFDP_PduHeader::length`

Length of the entire PDU, in octets.
Definition at line 140 of file cf_cfdp_pdu.h.
Referenced by CF_CFDP_DecodeHeader(), and CF_CFDP_EncodeHeaderFinalSize().
The documentation for this struct was generated from the following file:

- apps/cf/fsw/src/cf_cfdp_pdu.h

11.16 CF_CFDP_PduMd Struct Reference

Structure representing CFDP Metadata PDU.
`#include <cf_cfdp_pdu.h>`

Data Fields

- CF_CFDP_uint8_t segmentation_control
- CF_CFDP_uint32_t size

11.16.1 Detailed Description

Structure representing CFDP Metadata PDU.
Defined per section 5.2.5 / table 5-9 of CCSDS 727.0-B-5
Definition at line 352 of file cf_cfdp_pdu.h.

11.16.2 Field Documentation

11.16.2.1 segmentation_control `CF_CFDP_uint8_t CF_CFDP_PduMd::segmentation_control`

Definition at line 354 of file cf_cfdp_pdu.h.
Referenced by CF_CFDP_DecodeMd(), and CF_CFDP_EncodeMd().

11.16.2.2 size `CF_CFDP_uint32_t CF_CFDP_PduMd::size`

Definition at line 355 of file cf_cfdp_pdu.h.
Referenced by CF_CFDP_DecodeMd(), and CF_CFDP_EncodeMd().
The documentation for this struct was generated from the following file:

- apps/cf/fsw/src/cf_cfdp_pdu.h

11.17 CF_CFDP_PduNak Struct Reference

Structure representing CFDP Non-Acknowledge PDU.
`#include <cf_cfdp_pdu.h>`

Data Fields

- CF_CFDP_uint32_t scope_start
- CF_CFDP_uint32_t scope_end

11.17.1 Detailed Description

Structure representing CFDP Non-Acknowledge PDU.
Defined per section 5.2.6 / table 5-10 of CCSDS 727.0-B-5
Definition at line 341 of file cf_cfdp_pdu.h.

11.17.2 Field Documentation

11.17.2.1 scope_end `CF_CFDP_uint32_t CF_CFDP_PduNak::scope_end`

Definition at line 344 of file cf_cfdp_pdu.h.
Referenced by CF_CFDP_DecodeNak(), and CF_CFDP_EncodeNak().

11.17.2.2 scope_start `CF_CFDP_uint32_t CF_CFDP_PduNak::scope_start`

Definition at line 343 of file cf_cfdp_pdu.h.
Referenced by CF_CFDP_DecodeNak(), and CF_CFDP_EncodeNak().
The documentation for this struct was generated from the following file:

- apps/cf/fsw/src/cf_cfdp_pdu.h

11.18 CF_CFDP_R_SubstateDispatchTable_t Struct Reference

A dispatch table for receive file transactions, receive side.
`#include <cf_cfdp_dispatch.h>`

Data Fields

- const CF_CFDP_FileDirectiveDispatchTable_t * state [CF_RxSubState_NUM_STATES]

11.18.1 Detailed Description

A dispatch table for receive file transactions, receive side.
This is used for "receive file" transactions upon receipt of a directive PDU. Depending on the sub-state of the transaction, a different action may be taken.
Definition at line 99 of file cf_cfdp_dispatch.h.

11.18.2 Field Documentation

11.18.2.1 state `const CF_CFDP_FileDirectiveDispatchTable_t* CF_CFDP_R_SubstateDispatchTable_t↩ ::state[CF_RxSubState_NUM_STATES]`

Definition at line 101 of file cf_cfdp_dispatch.h.
Referenced by CF_CFDP_R1_Recv(), CF_CFDP_R2_Recv(), and CF_CFDP_R_DispatchRecv().
The documentation for this struct was generated from the following file:

- apps/cf/fsw/src/cf_cfdp_dispatch.h

11.19 CF_CFDP_S_SubstateRecvDispatchTable_t Struct Reference

A dispatch table for send file transactions, receive side.
`#include <cf_cfdp_dispatch.h>`

Data Fields

- const CF_CFDP_FileDirectiveDispatchTable_t * substate [CF_TxSubState_NUM_STATES]

11.19.1 Detailed Description

A dispatch table for send file transactions, receive side.
This is used for "send file" transactions upon receipt of a directive PDU. Depending on the sub-state of the transaction, a different action may be taken.
Definition at line 110 of file cf_cfdp_dispatch.h.

11.19.2 Field Documentation

11.19.2.1 substate

`const CF_CFDP_FileDirectiveDispatchTable_t* CF_CFDP_S_SubstateRecvDispatch↩ Table_t::substate[CF_TxSubState_NUM_STATES]`

Definition at line 112 of file cf_cfdp_dispatch.h.
Referenced by CF_CFDP_S2_Recv(), and CF_CFDP_S_DispatchRecv().
The documentation for this struct was generated from the following file:

- apps/cf/fsw/src/cf_cfdp_dispatch.h

11.20 CF_CFDP_S_SubstateSendDispatchTable_t Struct Reference

A dispatch table for send file transactions, transmit side.
`#include <cf_cfdp_dispatch.h>`

Data Fields

- CF_CFDP_StateSendFunc_t substate [CF_TxSubState_NUM_STATES]

11.20.1 Detailed Description

A dispatch table for send file transactions, transmit side.
This is used for "send file" transactions to generate the next PDU to be sent. Depending on the sub-state of the transaction, a different action may be taken.
Definition at line 121 of file cf_cfdp_dispatch.h.

11.20.2 Field Documentation

11.20.2.1 substate

`CF_CFDP_StateSendFunc_t CF_CFDP_S_SubstateSendDispatchTable_t::substate[CF_TxSubState_NUM_STAT`

Definition at line 123 of file cf_cfdp_dispatch.h.
Referenced by CF_CFDP_S1_Tx(), CF_CFDP_S2_Tx(), and CF_CFDP_S_DispatchTransmit().
The documentation for this struct was generated from the following file:

- apps/cf/fsw/src/cf_cfdp_dispatch.h

11.21 CF_CFDP_SegmentRequest Struct Reference

Structure representing CFDP Segment Request.
`#include <cf_cfdp_pdu.h>`

Data Fields

- CF_CFDP_uint32_t offset_start
- CF_CFDP_uint32_t offset_end

11.21.1 Detailed Description

Structure representing CFDP Segment Request.
Defined per section 5.2.6 / table 5-11 of CCSDS 727.0-B-5
Definition at line 330 of file cf_cfdp_pdu.h.

11.21.2 Field Documentation

11.21.2.1 offset_end `CF_CFDP_uint32_t CF_CFDP_SegmentRequest::offset_end`

Definition at line 333 of file cf_cfdp_pdu.h.
Referenced by CF_CFDP_DecodeSegmentRequest(), and CF_CFDP_EncodeSegmentRequest().

11.21.2.2 offset_start `CF_CFDP_uint32_t CF_CFDP_SegmentRequest::offset_start`

Definition at line 332 of file cf_cfdp_pdu.h.
Referenced by CF_CFDP_DecodeSegmentRequest(), and CF_CFDP_EncodeSegmentRequest().
The documentation for this struct was generated from the following file:

- apps/cf/fsw/src/cf_cfdp_pdu.h

11.22 CF_CFDP_Tick_args Struct Reference

Structure for use with the CF_CFDP_DoTick() function.
`#include <cf_cfdp.h>`

Data Fields

- CF_Channel_t * chan

  channel structure
- void(* fn)(CF_Transaction_t *, int *)

  function pointer
- int early_exit

  early exit result
- int cont

  if 1, then re-traverse the list

11.22.1 Detailed Description

Structure for use with the CF_CFDP_DoTick() function.
Definition at line 43 of file cf_cfdp.h.

11.22.2 Field Documentation

11.22.2.1 chan `CF_Channel_t* CF_CFDP_Tick_args::chan`

channel structure
Definition at line 45 of file cf_cfdp.h.
Referenced by CF_CFDP_DoTick().

11.22.2.2 cont `int CF_CFDP_Tick_args::cont`

if 1, then re-traverse the list
Definition at line 48 of file cf_cfdp.h.
Referenced by CF_CFDP_DoTick(), and CF_CFDP_TickTransactions().

11.22.2.3 early_exit `int CF_CFDP_Tick_args::early_exit`

early exit result
Definition at line 47 of file cf_cfdp.h.
Referenced by CF_CFDP_DoTick(), and CF_CFDP_TickTransactions().

11.22.2.4 fn `void(* CF_CFDP_Tick_args::fn) (CF_Transaction_t *, int *)`

function pointer
Definition at line 46 of file cf_cfdp.h.
Referenced by CF_CFDP_DoTick().
The documentation for this struct was generated from the following file:

- apps/cf/fsw/src/cf_cfdp.h

11.23 CF_CFDP_tlv Struct Reference

Structure representing CFDP TLV Object format.
`#include <cf_cfdp_pdu.h>`

Data Fields

- CF_CFDP_uint8_t type

  Nature of data field.
- CF_CFDP_uint8_t length

  Length of data field.

11.23.1 Detailed Description

Structure representing CFDP TLV Object format.
These Type + Length + Value pairs used in several CFDP PDU types, typically for file storage requests (section 5.4).
Defined per table 5-3 of CCSDS 727.0-B-5
Definition at line 177 of file cf_cfdp_pdu.h.

11.23.2 Field Documentation

11.23.2.1 length `CF_CFDP_uint8_t CF_CFDP_tlv::length`

Length of data field.
Definition at line 180 of file cf_cfdp_pdu.h.
Referenced by CF_CFDP_DecodeTLV(), and CF_CFDP_EncodeTLV().

11.23.2.2 type `CF_CFDP_uint8_t CF_CFDP_tlv::type`

Nature of data field.
Definition at line 179 of file cf_cfdp_pdu.h.
Referenced by CF_CFDP_DecodeTLV(), and CF_CFDP_EncodeTLV().
The documentation for this struct was generated from the following file:

- apps/cf/fsw/src/cf_cfdp_pdu.h

11.24 CF_CFDP_TxnRecvDispatchTable_t Struct Reference

A table of receive handler functions based on transaction state.
`#include <cf_cfdp_dispatch.h>`

Data Fields

- CF_CFDP_StateRecvFunc_t rx [CF_TxnState_INVALID]

  a separate recv handler for each possible file directive PDU in this state

11.24.1 Detailed Description

A table of receive handler functions based on transaction state.
This reflects the main dispatch table for the receive side of a transaction. Each possible state has a corresponding function pointer in the table to implement the PDU receive action(s) associated with that state.
Definition at line 74 of file cf_cfdp_dispatch.h.

11.24.2 Field Documentation

11.24.2.1 rx `CF_CFDP_StateRecvFunc_t CF_CFDP_TxnRecvDispatchTable_t::rx[CF_TxnState_INVALID]`

a separate recv handler for each possible file directive PDU in this state
Definition at line 77 of file cf_cfdp_dispatch.h.
Referenced by CF_CFDP_DispatchRecv(), and CF_CFDP_RxStateDispatch().
The documentation for this struct was generated from the following file:

- apps/cf/fsw/src/cf_cfdp_dispatch.h

11.25 CF_CFDP_TxnSendDispatchTable_t Struct Reference

A table of transmit handler functions based on transaction state.
`#include <cf_cfdp_dispatch.h>`

Data Fields

- CF_CFDP_StateSendFunc_t tx [CF_TxnState_INVALID]

  Transmit handler function.

11.25.1 Detailed Description

A table of transmit handler functions based on transaction state.
This reflects the main dispatch table for the transmit side of a transaction. Each possible state has a corresponding function pointer in the table to implement the PDU transmit action(s) associated with that state.
Definition at line 62 of file cf_cfdp_dispatch.h.

11.25.2 Field Documentation

11.25.2.1 tx `CF_CFDP_StateSendFunc_t CF_CFDP_TxnSendDispatchTable_t::tx[CF_TxnState_INVALID]`

Transmit handler function.
Definition at line 64 of file cf_cfdp_dispatch.h.
Referenced by CF_CFDP_DispatchTx(), and CF_CFDP_TxStateDispatch().
The documentation for this struct was generated from the following file:

- apps/cf/fsw/src/cf_cfdp_dispatch.h

11.26 CF_CFDP_uint16_t Struct Reference

Encoded 16-bit value in the CFDP PDU.
`#include <cf_cfdp_pdu.h>`

Data Fields

- uint8 octets [2]

11.26.1 Detailed Description

Encoded 16-bit value in the CFDP PDU.
Definition at line 103 of file cf_cfdp_pdu.h.

11.26.2 Field Documentation

11.26.2.1 octets `uint8 CF_CFDP_uint16_t::octets[2]`

Definition at line 105 of file cf_cfdp_pdu.h.
Referenced by CF_Codec_Load_uint16(), and CF_Codec_Store_uint16().
The documentation for this struct was generated from the following file:

- apps/cf/fsw/src/cf_cfdp_pdu.h

11.27 CF_CFDP_uint32_t Struct Reference

Encoded 32-bit value in the CFDP PDU.
`#include <cf_cfdp_pdu.h>`

Data Fields

- uint8 octets [4]

11.27.1 Detailed Description

Encoded 32-bit value in the CFDP PDU.
Definition at line 111 of file cf_cfdp_pdu.h.

11.27.2 Field Documentation

11.27.2.1 octets `uint8 CF_CFDP_uint32_t::octets[4]`

Definition at line 113 of file cf_cfdp_pdu.h.
Referenced by CF_Codec_Load_uint32(), and CF_Codec_Store_uint32().
The documentation for this struct was generated from the following file:

- apps/cf/fsw/src/cf_cfdp_pdu.h

11.28 CF_CFDP_uint64_t Struct Reference

Encoded 64-bit value in the CFDP PDU.
`#include <cf_cfdp_pdu.h>`

Data Fields

- uint8 octets [8]

11.28.1 Detailed Description

Encoded 64-bit value in the CFDP PDU.
Definition at line 119 of file cf_cfdp_pdu.h.

11.28.2 Field Documentation

11.28.2.1 octets `uint8 CF_CFDP_uint64_t::octets[8]`

Definition at line 121 of file cf_cfdp_pdu.h.
Referenced by CF_Codec_Load_uint64(), and CF_Codec_Store_uint64().
The documentation for this struct was generated from the following file:

- apps/cf/fsw/src/cf_cfdp_pdu.h

11.29 CF_CFDP_uint8_t Struct Reference

Encoded 8-bit value in the CFDP PDU.
`#include <cf_cfdp_pdu.h>`

Data Fields

- uint8 octets [1]

11.29.1 Detailed Description

Encoded 8-bit value in the CFDP PDU.
Definition at line 95 of file cf_cfdp_pdu.h.

11.29.2 Field Documentation

11.29.2.1 octets `uint8 CF_CFDP_uint8_t::octets[1]`

Definition at line 97 of file cf_cfdp_pdu.h.
Referenced by CF_Codec_Load_uint8(), and CF_Codec_Store_uint8().
The documentation for this struct was generated from the following file:

- apps/cf/fsw/src/cf_cfdp_pdu.h

11.30 CF_ChanAction_BoolArg Struct Reference

An object to use with channel-scope actions requiring only a boolean argument.
`#include <cf_cmd.h>`

Data Fields

- bool barg

11.30.1 Detailed Description

An object to use with channel-scope actions requiring only a boolean argument.
Definition at line 58 of file cf_cmd.h.

11.30.2 Field Documentation

11.30.2.1 barg `bool CF_ChanAction_BoolArg::barg`

Definition at line 60 of file cf_cmd.h.
Referenced by CF_DoEnableDisableDequeue(), and CF_DoFreezeThaw().
The documentation for this struct was generated from the following file:

- apps/cf/fsw/src/cf_cmd.h

11.31 CF_ChanAction_BoolMsgArg Struct Reference

An object to use with channel-scope actions that require the message value.
`#include <cf_cmd.h>`

Data Fields

- const CF_UnionArgs_Payload_t * data
- bool barg

11.31.1 Detailed Description

An object to use with channel-scope actions that require the message value.
This combines a boolean action arg with the command message value
Definition at line 87 of file cf_cmd.h.

11.31.2 Field Documentation

11.31.2.1 barg `bool CF_ChanAction_BoolMsgArg::barg`

Definition at line 90 of file cf_cmd.h.
Referenced by CF_DoEnableDisablePolldir().

11.31.2.2 data `const CF_UnionArgs_Payload_t* CF_ChanAction_BoolMsgArg::data`

Definition at line 89 of file cf_cmd.h.
Referenced by CF_DoEnableDisablePolldir().
The documentation for this struct was generated from the following file:

- apps/cf/fsw/src/cf_cmd.h

11.32 CF_ChanAction_MsgArg Struct Reference

An object to use with channel-scope actions that require the message value.
`#include <cf_cmd.h>`

Data Fields

- const CF_UnionArgs_Payload_t * data

11.32.1 Detailed Description

An object to use with channel-scope actions that require the message value.
This combines a boolean action arg with the command message value
Definition at line 98 of file cf_cmd.h.

11.32.2 Field Documentation

11.32.2.1 data `const CF_UnionArgs_Payload_t* CF_ChanAction_MsgArg::data`

Definition at line 100 of file cf_cmd.h.
The documentation for this struct was generated from the following file:

- apps/cf/fsw/src/cf_cmd.h

11.33 CF_ChanAction_SuspResArg Struct Reference

An object to use with channel-scope actions for suspend/resume.
`#include <cf_cmd.h>`

Data Fields

- int same
- bool action

11.33.1 Detailed Description

An object to use with channel-scope actions for suspend/resume.
This combines a boolean action arg with an output that indicates if it was a change or not.
Definition at line 76 of file cf_cmd.h.

11.33.2 Field Documentation

11.33.2.1 action `bool CF_ChanAction_SuspResArg::action`

Definition at line 79 of file cf_cmd.h.
Referenced by CF_DoSuspRes_Txn().

11.33.2.2 same `int CF_ChanAction_SuspResArg::same`

out param – indicates at least one action was set to its current value
Definition at line 78 of file cf_cmd.h.
Referenced by CF_DoSuspRes(), and CF_DoSuspRes_Txn().
The documentation for this struct was generated from the following file:

- apps/cf/fsw/src/cf_cmd.h

11.34 CF_Channel Struct Reference

Channel state object.
`#include <cf_cfdp_types.h>`

Data Fields

- CF_CListNode_t * qs [CF_QueueIdx_NUM]
- CF_CListNode_t * cs [CF_Direction_NUM]
- CFE_SB_PipeId_t pipe
- uint32 num_cmd_tx
- CF_Playback_t playback [CF_MAX_COMMANDED_PLAYBACK_DIRECTORIES_PER_CHAN]
- CF_Poll_t poll [CF_MAX_POLLING_DIR_PER_CHAN]
- osal_id_t sem_id

  semaphore id for output pipe
- const CF_Transaction_t * cur

  current transaction during channel cycle
- uint8 tick_type

11.34.1 Detailed Description

Channel state object.
This keeps the state of CF channels
Each CF channel has a separate transaction list, PDU throttle, playback, and poll state, as well as separate addresses on the underlying message transport (e.g. SB).
Definition at line 392 of file cf_cfdp_types.h.

11.34.2 Field Documentation

11.34.2.1 cs `CF_CListNode_t* CF_Channel::cs[CF_Direction_NUM]`

Definition at line 395 of file cf_cfdp_types.h.
Referenced by CF_CFDP_FindUnusedChunks(), CF_CFDP_InitEngine(), and CF_CFDP_ResetTransaction().

11.34.2.2 cur `const CF_Transaction_t* CF_Channel::cur`

current transaction during channel cycle
Definition at line 408 of file cf_cfdp_types.h.
Referenced by CF_CFDP_CycleTx(), CF_CFDP_CycleTxFirstActive(), CF_CFDP_DoTick(), CF_CFDP_MsgOutGet(), CF_CFDP_ReceiveMessage(), and CF_CFDP_ResetTransaction().

11.34.2.3 num_cmd_tx `uint32 CF_Channel::num_cmd_tx`

Definition at line 399 of file cf_cfdp_types.h.
Referenced by CF_CFDP_ResetTransaction(), and CF_CFDP_TxFile().

11.34.2.4 pipe `CFE_SB_PipeId_t CF_Channel::pipe`

Definition at line 397 of file cf_cfdp_types.h.
Referenced by CF_CFDP_DisableEngine(), CF_CFDP_InitEngine(), and CF_CFDP_ReceiveMessage().

11.34.2.5 playback `CF_Playback_t CF_Channel::playback[CF_MAX_COMMANDED_PLAYBACK_DIRECTORIES_PER_CHAN]`

Definition at line 401 of file cf_cfdp_types.h.
Referenced by CF_CFDP_DisableEngine(), CF_CFDP_PlaybackDir(), and CF_CFDP_ProcessPlaybackDirectories().

11.34.2.6 poll `CF_Poll_t CF_Channel::poll[CF_MAX_POLLING_DIR_PER_CHAN]`

Definition at line 404 of file cf_cfdp_types.h.
Referenced by CF_CFDP_DisableEngine(), and CF_CFDP_ProcessPollingDirectories().

11.34.2.7 qs `CF_CListNode_t* CF_Channel::qs[CF_QueueIdx_NUM]`

Definition at line 394 of file cf_cfdp_types.h.
Referenced by CF_CFDP_CycleTx(), CF_CFDP_DisableEngine(), CF_CFDP_TickTransactions(), CF_CList_InsertAfter_Ex(), CF_CList_InsertBack_Ex(), CF_CList_Remove_Ex(), CF_DequeueTransaction(), CF_DoPurgeQueue(), CF_FindTransactionBySequenceNumber(), CF_FindUnusedTransaction(), CF_InsertSortPrio(), CF_MoveTransaction(), CF_TraverseAllTransactions(), CF_WriteHistoryQueueDataToFile(), and CF_WriteTxnQueueDataToFile().

11.34.2.8 sem_id `osal_id_t CF_Channel::sem_id`

semaphore id for output pipe
Definition at line 406 of file cf_cfdp_types.h.
Referenced by CF_CFDP_InitEngine(), and CF_CFDP_MsgOutGet().

11.34.2.9 tick_type `uint8 CF_Channel::tick_type`

Definition at line 410 of file cf_cfdp_types.h.
Referenced by CF_CFDP_TickTransactions().
The documentation for this struct was generated from the following file:

- apps/cf/fsw/src/cf_cfdp_types.h

11.35 CF_ChannelConfig Struct Reference

Configuration entry for CFDP channel.
`#include <default_cf_tbldefs.h>`

Data Fields

- uint32 max_outgoing_messages_per_wakeup

  max number of messages to send per wakeup (0 - unlimited)
- uint32 rx_max_messages_per_wakeup

  max number of rx messages to process per wakeup
- uint32 ack_timer_s

  Acknowledge timer in seconds.
- uint32 nak_timer_s

  Non-acknowledge timer in seconds.
- uint32 inactivity_timer_s

  Inactivity timer in seconds.
- uint8 ack_limit
- uint8 nak_limit
- CFE_SB_MsgId_Atom_t mid_input

msgid integer value for incoming messages

- CFE_SB_MsgId_Atom_t mid_output

  msgid integer value for outgoing messages

- uint16 pipe_depth_input

  depth of pipe to receive incoming PDU

- CF_PollDir_t polldir [CF_MAX_POLLING_DIR_PER_CHAN]

  Configuration for polled directories.

- char sem_name [OS_MAX_API_NAME]

  name of throttling semaphore in TO

- uint8 dequeue_enabled

  if 1, then the channel will make pending transactions active

- char move_dir [OS_MAX_PATH_LEN]

  Move directory if not empty.

11.35.1 Detailed Description

Configuration entry for CFDP channel.
Definition at line 57 of file default_cf_tbldefs.h.

11.35.2 Field Documentation

11.35.2.1 ack_limit `uint8 CF_ChannelConfig::ack_limit`

number of times to retry ACK (for ex, send FIN and wait for fin-ack)
Definition at line 66 of file default_cf_tbldefs.h.
Referenced by CF_CFDP_R_Tick(), CF_CFDP_S_Tick(), and CF_GetSetParamCmd().

11.35.2.2 ack_timer_s `uint32 CF_ChannelConfig::ack_timer_s`

Acknowledge timer in seconds.
Definition at line 62 of file default_cf_tbldefs.h.
Referenced by CF_CFDP_ArmAckTimer(), and CF_GetSetParamCmd().

11.35.2.3 dequeue_enabled `uint8 CF_ChannelConfig::dequeue_enabled`

if 1, then the channel will make pending transactions active
Definition at line 77 of file default_cf_tbldefs.h.
Referenced by CF_CFDP_CycleTx(), and CF_DoEnableDisableDequeue().

11.35.2.4 inactivity_timer_s `uint32 CF_ChannelConfig::inactivity_timer_s`

Inactivity timer in seconds.
Definition at line 64 of file default_cf_tbldefs.h.
Referenced by CF_CFDP_ArmInactTimer(), and CF_GetSetParamCmd().

11.35.2.5 max_outgoing_messages_per_wakeup `uint32 CF_ChannelConfig::max_outgoing_messages_per↩_wakeup`

max number of messages to send per wakeup (0 - unlimited)
Definition at line 59 of file default_cf_tbldefs.h.
Referenced by CF_CFDP_MsgOutGet(), and CF_GetSetParamCmd().

11.35.2.6 mid_input `CFE_SB_MsgId_Atom_t CF_ChannelConfig::mid_input`

msgid integer value for incoming messages
Definition at line 69 of file default_cf_tbldefs.h.
Referenced by CF_CFDP_InitEngine().

11.35.2.7 mid_output `CFE_SB_MsgId_Atom_t CF_ChannelConfig::mid_output`

msgid integer value for outgoing messages
Definition at line 70 of file default_cf_tbldefs.h.
Referenced by CF_CFDP_MsgOutGet().

11.35.2.8 move_dir `char CF_ChannelConfig::move_dir[OS_MAX_PATH_LEN]`

Move directory if not empty.
Definition at line 78 of file default_cf_tbldefs.h.
Referenced by CF_CFDP_HandleNotKeepFile().

11.35.2.9 nak_limit `uint8 CF_ChannelConfig::nak_limit`

number of times to retry NAK before giving up (resets on a single response
Definition at line 67 of file default_cf_tbldefs.h.
Referenced by CF_CFDP_R2_Complete(), and CF_GetSetParamCmd().

11.35.2.10 nak_timer_s `uint32 CF_ChannelConfig::nak_timer_s`

Non-acknowledge timer in seconds.
Definition at line 63 of file default_cf_tbldefs.h.
Referenced by CF_GetSetParamCmd().

11.35.2.11 pipe_depth_input `uint16 CF_ChannelConfig::pipe_depth_input`

depth of pipe to receive incoming PDU
Definition at line 72 of file default_cf_tbldefs.h.
Referenced by CF_CFDP_InitEngine().

11.35.2.12 polldir `CF_PollDir_t CF_ChannelConfig::polldir[CF_MAX_POLLING_DIR_PER_CHAN]`

Configuration for polled directories.
Definition at line 74 of file default_cf_tbldefs.h.
Referenced by CF_CFDP_IsPollingDir(), CF_CFDP_ProcessPollingDirectories(), and CF_DoEnableDisablePolldir().

11.35.2.13 rx_max_messages_per_wakeup `uint32 CF_ChannelConfig::rx_max_messages_per_wakeup`

max number of rx messages to process per wakeup
Definition at line 60 of file default_cf_tbldefs.h.
Referenced by CF_CFDP_ReceiveMessage().

11.35.2.14 sem_name `char CF_ChannelConfig::sem_name[OS_MAX_API_NAME]`

name of throttling semaphore in TO
Definition at line 76 of file default_cf_tbldefs.h.
Referenced by CF_CFDP_InitEngine(), and CF_CmdValidateMaxOutgoing().

The documentation for this struct was generated from the following file:

- apps/cf/config/default_cf_tbldefs.h

11.36 CF_Chunk Struct Reference

Pairs an offset with a size to identify a specific piece of a file.
`#include <cf_chunk.h>`

Data Fields

- CF_ChunkOffset_t offset

  The start offset of the chunk within the file.
- CF_ChunkSize_t size

  The size of the chunk.

11.36.1 Detailed Description

Pairs an offset with a size to identify a specific piece of a file.
Definition at line 38 of file cf_chunk.h.

11.36.2 Field Documentation

11.36.2.1 offset `CF_ChunkOffset_t CF_Chunk::offset`

The start offset of the chunk within the file.
Definition at line 40 of file cf_chunk.h.
Referenced by CF_CFDP_R2_GapCompute(), CF_CFDP_S_CheckAndRespondNak(), CF_ChunkList_Compute↩Gaps(), CF_ChunkList_RemoveFromFirst(), CF_Chunks_CombineNext(), CF_Chunks_CombinePrevious(), and CF_↩Chunks_FindInsertPosition().

11.36.2.2 size `CF_ChunkSize_t CF_Chunk::size`

The size of the chunk.
Definition at line 41 of file cf_chunk.h.
Referenced by CF_CFDP_R2_GapCompute(), CF_CFDP_S_CheckAndRespondNak(), CF_ChunkList_Compute↩Gaps(), CF_ChunkList_RemoveFromFirst(), CF_Chunks_CombineNext(), CF_Chunks_CombinePrevious(), CF_↩Chunks_FindSmallestSize(), and CF_Chunks_Insert().
The documentation for this struct was generated from the following file:

- apps/cf/fsw/src/cf_chunk.h

11.37 CF_ChunkList Struct Reference

A list of CF_Chunk_t pairs.
`#include <cf_chunk.h>`

Data Fields

- CF_ChunkIdx_t count

  number of chunks currently in the array
- CF_ChunkIdx_t max_chunks

  maximum number of chunks allowed in the list (allocation size)

- CF_Chunk_t * chunks

  chunk list array

11.37.1 Detailed Description

A list of CF_Chunk_t pairs.
This list is ordered by chunk offset, from lowest to highest
Definition at line 49 of file cf_chunk.h.

11.37.2 Field Documentation

11.37.2.1 chunks `CF_Chunk_t* CF_ChunkList::chunks`

chunk list array
Definition at line 53 of file cf_chunk.h.
Referenced by CF_ChunkList_ComputeGaps(), CF_ChunkList_GetFirstChunk(), CF_ChunkList_RemoveFromFirst(), CF_ChunkListInit(), CF_ChunkListReset(), CF_Chunks_CombineNext(), CF_Chunks_CombinePrevious(), CF_Chunks_EraseChunk(), CF_Chunks_EraseRange(), CF_Chunks_FindInsertPosition(), CF_Chunks_FindSmallestSize(), CF_Chunks_Insert(), and CF_Chunks_InsertChunk().

11.37.2.2 count `CF_ChunkIdx_t CF_ChunkList::count`

number of chunks currently in the array
Definition at line 51 of file cf_chunk.h.
Referenced by CF_CFDP_R_SubstateSendNak(), CF_ChunkList_ComputeGaps(), CF_ChunkList_GetFirstChunk(), CF_ChunkListReset(), CF_Chunks_CombineNext(), CF_Chunks_EraseChunk(), CF_Chunks_EraseRange(), CF_Chunks_FindInsertPosition(), CF_Chunks_FindSmallestSize(), CF_Chunks_Insert(), and CF_Chunks_InsertChunk().

11.37.2.3 max_chunks `CF_ChunkIdx_t CF_ChunkList::max_chunks`

maximum number of chunks allowed in the list (allocation size)
Definition at line 52 of file cf_chunk.h.
Referenced by CF_CFDP_R_SubstateSendNak(), CF_ChunkListInit(), CF_ChunkListReset(), CF_Chunks_Insert(), and CF_Chunks_InsertChunk().
The documentation for this struct was generated from the following file:

- apps/cf/fsw/src/cf_chunk.h

11.38 CF_ChunkWrapper Struct Reference

Wrapper around a CF_ChunkList_t object.
`#include <cf_cfdp_types.h>`

Data Fields

- CF_ChunkList_t chunks
- CF_CListNode_t cl_node

11.38.1 Detailed Description

Wrapper around a CF_ChunkList_t object.
This allows a CF_ChunkList_t to be stored within a CList data storage structure
Definition at line 189 of file cf_cfdp_types.h.

11.38.2 Field Documentation

11.38.2.1 chunks `CF_ChunkList_t CF_ChunkWrapper::chunks`

Definition at line 191 of file cf_cfdp_types.h.
Referenced by CF_CFDP_InitEngine(), CF_CFDP_R2_Complete(), CF_CFDP_R2_SubstateRecvFileData(), CF_CF↩DP_R_SubstateSendNak(), CF_CFDP_S2_Nak(), and CF_CFDP_S_CheckAndRespondNak().

11.38.2.2 cl_node `CF_CListNode_t CF_ChunkWrapper::cl_node`

Definition at line 192 of file cf_cfdp_types.h.
Referenced by CF_CFDP_InitEngine(), and CF_CFDP_ResetTransaction().
The documentation for this struct was generated from the following file:

- apps/cf/fsw/src/cf_cfdp_types.h

11.39 CF_CListNode Struct Reference

Node link structure.
`#include <cf_clist.h>`

Data Fields

- struct CF_CListNode * next
- struct CF_CListNode * prev

11.39.1 Detailed Description

Node link structure.
Definition at line 52 of file cf_clist.h.

11.39.2 Field Documentation

11.39.2.1 next `struct CF_CListNode* CF_CListNode::next`

Definition at line 54 of file cf_clist.h.
Referenced by CF_CList_InitNode(), CF_CList_InsertAfter(), CF_CList_InsertBack(), CF_CList_InsertFront(), CF_C↩List_Remove(), and CF_CList_Traverse().

11.39.2.2 prev `struct CF_CListNode* CF_CListNode::prev`

Definition at line 55 of file cf_clist.h.
Referenced by CF_CList_InitNode(), CF_CList_InsertAfter(), CF_CList_InsertBack(), CF_CList_InsertFront(), CF_C↩List_Remove(), and CF_CList_Traverse_R().
The documentation for this struct was generated from the following file:

- apps/cf/fsw/src/cf_clist.h

11.40 CF_Codec_BitField Struct Reference

Data Fields

- uint32 shift
- uint32 mask

11.40.1 Detailed Description

Definition at line 33 of file cf_codec.c.

11.40.2 Field Documentation

11.40.2.1 mask `uint32 CF_Codec_BitField::mask`

Definition at line 36 of file cf_codec.c.

11.40.2.2 shift `uint32 CF_Codec_BitField::shift`

Definition at line 35 of file cf_codec.c.
The documentation for this struct was generated from the following file:

- apps/cf/fsw/src/cf_codec.c

11.41 CF_CodecState Struct Reference

Tracks the current state of an encode or decode operation.
`#include <cf_codec.h>`

Data Fields

- bool is_valid

  whether decode is valid or not. Set false on end of decode or error condition.
- size_t next_offset

  Offset of next byte to encode/decode, current position in PDU.
- size_t max_size

  Maximum number of bytes in the PDU.

11.41.1 Detailed Description

Tracks the current state of an encode or decode operation.
This encapsulates the common state between encode and decode
Definition at line 38 of file cf_codec.h.

11.41.2 Field Documentation

11.41.2.1 is_valid `bool CF_CodecState::is_valid`

whether decode is valid or not. Set false on end of decode or error condition.
Definition at line 40 of file cf_codec.h.
Referenced by CF_CFDP_CodecIsOK(), CF_CFDP_CodecReset(), and CF_CFDP_CodecSetDone().

11.41.2.2 max_size `size_t CF_CodecState::max_size`

Maximum number of bytes in the PDU.
Definition at line 42 of file cf_codec.h.
Referenced by CF_CFDP_CodecCheckSize(), CF_CFDP_CodecGetRemain(), CF_CFDP_CodecGetSize(), CF_CF↩DP_CodecReset(), CF_CFDP_DecodeStart(), and CF_CFDP_EncodeStart().

11.41.2.3 next_offset `size_t CF_CodecState::next_offset`

Offset of next byte to encode/decode, current position in PDU.
Definition at line 41 of file cf_codec.h.
Referenced by CF_CFDP_CodecCheckSize(), CF_CFDP_CodecGetPosition(), CF_CFDP_CodecGetRemain(), and CF_CFDP_CodecReset().
The documentation for this struct was generated from the following file:

- apps/cf/fsw/src/cf_codec.h

11.42 CF_ConfigTable Struct Reference

Top-level CFDP configuration structure.
`#include <default_cf_tblstruct.h>`

Data Fields

- uint32 ticks_per_second

  expected ticks per second to CFDP app
- uint32 rx_crc_calc_bytes_per_wakeup

  max number of bytes per wakeup to calculate r2 CRC for recvd file (must be 1024-byte aligned)
- CF_EntityId_t local_eid

  the local entity ID of the CF app
- CF_ChannelConfig_t chan [CF_NUM_CHANNELS]

  Channel configuration.
- uint16 outgoing_file_chunk_size

  maximum size of outgoing file data chunk in a PDU. Limited by CF_MAX_PDU_SIZE minus the PDU header(s)
- char tmp_dir [CF_FILENAME_MAX_PATH]

  directory to put temp files
- char fail_dir [CF_FILENAME_MAX_PATH]

  fail directory

11.42.1 Detailed Description

Top-level CFDP configuration structure.
Definition at line 40 of file default_cf_tblstruct.h.

11.42.2 Field Documentation

11.42.2.1 chan `CF_ChannelConfig_t CF_ConfigTable::chan[CF_NUM_CHANNELS]`

Channel configuration.
Definition at line 49 of file default_cf_tblstruct.h.
Referenced by CF_CFDP_ArmAckTimer(), CF_CFDP_ArmInactTimer(), CF_CFDP_CycleTx(), CF_CFDP_HandleNotKeepFile(), CF_CFDP_InitEngine(), CF_CFDP_IsPollingDir(), CF_CFDP_MsgOutGet(), CF_CFDP_ProcessPollingDirectories(), CF_CFDP_R2_Complete(), CF_CFDP_R_Tick(), CF_CFDP_ReceiveMessage(), CF_CFDP_S_Tick(), CF_CmdValidateMaxOutgoing(), CF_DoEnableDisableDequeue(), CF_DoEnableDisablePolldir(), and CF_GetSetParamCmd().

11.42.2.2 fail_dir `char CF_ConfigTable::fail_dir[CF_FILENAME_MAX_PATH]`

fail directory
Definition at line 54 of file default_cf_tblstruct.h.
Referenced by CF_CFDP_HandleNotKeepFile().

11.42.2.3 local_eid `CF_EntityId_t CF_ConfigTable::local_eid`

the local entity ID of the CF app
Definition at line 47 of file default_cf_tblstruct.h.
Referenced by CF_CFDP_AppendTlv(), CF_CFDP_R_SubstateSendNak(), CF_CFDP_ReceiveMessage(), CF_CFD↩P_S_SendFileData(), CF_CFDP_SendAck(), CF_CFDP_SendEof(), CF_CFDP_SendFin(), CF_CFDP_SendMd(), C↩F_CFDP_TxFile_Initiate(), and CF_GetSetParamCmd().

11.42.2.4 outgoing_file_chunk_size `uint16 CF_ConfigTable::outgoing_file_chunk_size`

maximum size of outgoing file data chunk in a PDU. Limited by CF_MAX_PDU_SIZE minus the PDU header(s)
Definition at line 51 of file default_cf_tblstruct.h.
Referenced by CF_CFDP_S_SendFileData(), CF_GetSetParamCmd(), and CF_ValidateConfigTable().

11.42.2.5 rx_crc_calc_bytes_per_wakeup `uint32 CF_ConfigTable::rx_crc_calc_bytes_per_wakeup`

max number of bytes per wakeup to calculate r2 CRC for recvd file (must be 1024-byte aligned)
Definition at line 43 of file default_cf_tblstruct.h.
Referenced by CF_GetSetParamCmd(), and CF_ValidateConfigTable().

11.42.2.6 ticks_per_second `uint32 CF_ConfigTable::ticks_per_second`

expected ticks per second to CFDP app
Definition at line 42 of file default_cf_tblstruct.h.
Referenced by CF_GetSetParamCmd(), CF_Timer_Sec2Ticks(), and CF_ValidateConfigTable().

11.42.2.7 tmp_dir `char CF_ConfigTable::tmp_dir[CF_FILENAME_MAX_PATH]`

directory to put temp files
Definition at line 53 of file default_cf_tblstruct.h.
Referenced by CF_CFDP_R_Init().
The documentation for this struct was generated from the following file:

- apps/cf/config/default_cf_tblstruct.h

11.43 CF_Crc Struct Reference

CRC state object.
`#include <cf_crc.h>`

Data Fields

- uint32 working
- uint32 result
- uint8 index

11.43.1 Detailed Description

CRC state object.
Definition at line 34 of file cf_crc.h.

11.43.2 Field Documentation

11.43.2.1 index `uint8 CF_Crc::index`

Definition at line 38 of file cf_crc.h.
Referenced by CF_CRC_Digest(), and CF_CRC_Finalize().

11.43.2.2 result `uint32 CF_Crc::result`

Definition at line 37 of file cf_crc.h.
Referenced by CF_CFDP_R_CheckCrc(), CF_CFDP_SendEof(), CF_CFDP_SendEotPkt(), CF_CRC_Digest(), and CF_CRC_Finalize().

11.43.2.3 working `uint32 CF_Crc::working`

Definition at line 36 of file cf_crc.h.
Referenced by CF_CRC_Digest(), and CF_CRC_Finalize().
The documentation for this struct was generated from the following file:

- apps/cf/fsw/src/cf_crc.h

11.44 CF_DecoderState Struct Reference

Current state of a decode operation.
`#include <cf_codec.h>`

Data Fields

- CF_CodecState_t codec_state

  Common state.
- const uint8 * base

  Pointer to start of encoded PDU data.

11.44.1 Detailed Description

Current state of a decode operation.
State structure for decodes
Definition at line 61 of file cf_codec.h.

11.44.2 Field Documentation

11.44.2.1 base `const uint8* CF_DecoderState::base`

Pointer to start of encoded PDU data.
Definition at line 64 of file cf_codec.h.
Referenced by CF_CFDP_DecodeStart(), and CF_CFDP_DoDecodeChunk().

11.44.2.2 codec_state `CF_CodecState_t CF_DecoderState::codec_state`

Common state.
Definition at line 63 of file cf_codec.h.
Referenced by CF_CFDP_DecodeStart(), and CF_CFDP_DoDecodeChunk().
The documentation for this struct was generated from the following file:

- apps/cf/fsw/src/cf_codec.h

11.45 CF_DisableDequeueCmd Struct Reference

DisableDequeue command structure.
`#include <default_cf_msgstruct.h>`

Data Fields

- CFE_MSG_CommandHeader_t CommandHeader

  Command header.
- CF_UnionArgs_Payload_t Payload

  Generic command arguments.

11.45.1 Detailed Description

DisableDequeue command structure.
For command details see CF_DISABLE_DEQUEUE_CC
Definition at line 148 of file default_cf_msgstruct.h.

11.45.2 Field Documentation

11.45.2.1 CommandHeader `CFE_MSG_CommandHeader_t CF_DisableDequeueCmd::CommandHeader`

Command header.
Definition at line 150 of file default_cf_msgstruct.h.

11.45.2.2 Payload `CF_UnionArgs_Payload_t CF_DisableDequeueCmd::Payload`

Generic command arguments.
Definition at line 151 of file default_cf_msgstruct.h.
Referenced by CF_DisableDequeueCmd().
The documentation for this struct was generated from the following file:

- apps/cf/config/default_cf_msgstruct.h

11.46 CF_DisableDirPollingCmd Struct Reference

DisableDirPolling command structure.
`#include <default_cf_msgstruct.h>`

Data Fields

- CFE_MSG_CommandHeader_t CommandHeader

  Command header.
- CF_UnionArgs_Payload_t Payload

  Generic command arguments.

11.46.1 Detailed Description

DisableDirPolling command structure.
For command details see CF_DISABLE_DIR_POLLING_CC
Definition at line 170 of file default_cf_msgstruct.h.

11.46.2 Field Documentation

11.46.2.1 CommandHeader `CFE_MSG_CommandHeader_t CF_DisableDirPollingCmd::CommandHeader`

Command header.
Definition at line 172 of file default_cf_msgstruct.h.

11.46.2.2 Payload `CF_UnionArgs_Payload_t CF_DisableDirPollingCmd::Payload`

Generic command arguments.
Definition at line 173 of file default_cf_msgstruct.h.
Referenced by CF_DisableDirPollingCmd().
The documentation for this struct was generated from the following file:

- apps/cf/config/default_cf_msgstruct.h

11.47 CF_DisableEngineCmd Struct Reference

DisableEngine command structure.
`#include <default_cf_msgstruct.h>`

Data Fields

- CFE_MSG_CommandHeader_t CommandHeader

  Command header.

11.47.1 Detailed Description

DisableEngine command structure.
For command details see CF_DISABLE_ENGINE_CC
Definition at line 94 of file default_cf_msgstruct.h.

11.47.2 Field Documentation

11.47.2.1 CommandHeader `CFE_MSG_CommandHeader_t CF_DisableEngineCmd::CommandHeader`

Command header.
Definition at line 96 of file default_cf_msgstruct.h.
The documentation for this struct was generated from the following file:

- apps/cf/config/default_cf_msgstruct.h

11.48 CF_EnableDequeueCmd Struct Reference

EnableDequeue command structure.
`#include <default_cf_msgstruct.h>`

Data Fields

- CFE_MSG_CommandHeader_t CommandHeader

  Command header.
- CF_UnionArgs_Payload_t Payload

  Generic command arguments.

11.48.1 Detailed Description

EnableDequeue command structure.
For command details see CF_ENABLE_DEQUEUE_CC
Definition at line 137 of file default_cf_msgstruct.h.

11.48.2 Field Documentation

11.48.2.1 CommandHeader `CFE_MSG_CommandHeader_t CF_EnableDequeueCmd::CommandHeader`

Command header.
Definition at line 139 of file default_cf_msgstruct.h.

11.48.2.2 Payload `CF_UnionArgs_Payload_t CF_EnableDequeueCmd::Payload`

Generic command arguments.
Definition at line 140 of file default_cf_msgstruct.h.
Referenced by CF_EnableDequeueCmd().
The documentation for this struct was generated from the following file:

- apps/cf/config/default_cf_msgstruct.h

11.49 CF_EnableDirPollingCmd Struct Reference

EnableDirPolling command structure.
`#include <default_cf_msgstruct.h>`

Data Fields

- CFE_MSG_CommandHeader_t CommandHeader

  Command header.
- CF_UnionArgs_Payload_t Payload

  Generic command arguments.

11.49.1 Detailed Description

EnableDirPolling command structure.
For command details see CF_ENABLE_DIR_POLLING_CC
Definition at line 159 of file default_cf_msgstruct.h.

11.49.2 Field Documentation

11.49.2.1 CommandHeader `CFE_MSG_CommandHeader_t CF_EnableDirPollingCmd::CommandHeader`

Command header.
Definition at line 161 of file default_cf_msgstruct.h.

11.49.2.2 Payload `CF_UnionArgs_Payload_t CF_EnableDirPollingCmd::Payload`

Generic command arguments.
Definition at line 162 of file default_cf_msgstruct.h.
Referenced by CF_EnableDirPollingCmd().
The documentation for this struct was generated from the following file:

- apps/cf/config/default_cf_msgstruct.h

11.50 CF_EnableEngineCmd Struct Reference

EnableEngine command structure.
`#include <default_cf_msgstruct.h>`

Data Fields

- CFE_MSG_CommandHeader_t CommandHeader

  Command header.

11.50.1 Detailed Description

EnableEngine command structure.
For command details see CF_ENABLE_ENGINE_CC
Definition at line 84 of file default_cf_msgstruct.h.

11.50.2 Field Documentation

11.50.2.1 CommandHeader `CFE_MSG_CommandHeader_t CF_EnableEngineCmd::CommandHeader`

Command header.
Definition at line 86 of file default_cf_msgstruct.h.
The documentation for this struct was generated from the following file:

- apps/cf/config/default_cf_msgstruct.h

11.51 CF_EncoderState Struct Reference

Current state of an encode operation.
`#include <cf_codec.h>`

Data Fields

- CF_CodecState_t codec_state

  Common state.

- uint8 * base

  Pointer to start of encoded PDU data.

11.51.1 Detailed Description

Current state of an encode operation.
State structure for encodes
Definition at line 50 of file cf_codec.h.

11.51.2 Field Documentation

11.51.2.1 base `uint8* CF_EncoderState::base`

Pointer to start of encoded PDU data.
Definition at line 53 of file cf_codec.h.
Referenced by CF_CFDP_DoEncodeChunk(), CF_CFDP_EncodeHeaderFinalSize(), and CF_CFDP_EncodeStart().

11.51.2.2 codec_state `CF_CodecState_t CF_EncoderState::codec_state`

Common state.
Definition at line 52 of file cf_codec.h.
Referenced by CF_CFDP_DoEncodeChunk(), and CF_CFDP_EncodeStart().
The documentation for this struct was generated from the following file:

- apps/cf/fsw/src/cf_codec.h

11.52 CF_Engine Struct Reference

An engine represents a pairing to a local EID.
`#include <cf_cfdp_types.h>`

Data Fields

- CF_TransactionSeq_t seq_num
- CF_Output_t out
- CF_Input_t in
- CF_Transaction_t transactions [CF_NUM_TRANSACTIONS]
- CF_History_t histories [CF_NUM_HISTORIES]
- CF_Channel_t channels [CF_NUM_CHANNELS]
- CF_ChunkWrapper_t chunks [CF_NUM_TRANSACTIONS *CF_Direction_NUM]
- CF_Chunk_t chunk_mem [CF_NUM_CHUNKS_ALL_CHANNELS]
- uint32 outgoing_counter
- uint8 enabled

11.52.1 Detailed Description

An engine represents a pairing to a local EID.
Each engine can have at most CF_MAX_SIMULTANEOUS_TRANSACTIONS
Definition at line 442 of file cf_cfdp_types.h.

11.52.2 Field Documentation

11.52.2.1 channels `CF_Channel_t CF_Engine::channels[CF_NUM_CHANNELS]`

Definition at line 452 of file cf_cfdp_types.h.
Referenced by CF_CFDP_CycleEngine(), CF_CFDP_CycleTx(), CF_CFDP_DisableEngine(), CF_CFDP_InitEngine(), CF_CFDP_MsgOutGet(), CF_CFDP_PlaybackDir(), CF_CFDP_ProcessPlaybackDirectories(), CF_CFDP_Process↩PlaybackDirectory(), CF_CFDP_ProcessPollingDirectories(), CF_CFDP_ReceiveMessage(), CF_CFDP_RecvIdle(), CF_CFDP_ResetTransaction(), CF_CFDP_TxFile(), CF_CFDP_TxFile_Initiate(), CF_CList_InsertAfter_Ex(), C↩F_CList_InsertBack_Ex(), CF_CList_Remove_Ex(), CF_DequeueTransaction(), CF_DoPurgeQueue(), CF_Find↩TransactionBySequenceNumberAllChannels(), CF_FreeTransaction(), CF_InsertSortPrio(), CF_MoveTransaction(), CF_TraverseAllTransactions_All_Channels(), CF_TsnChanAction(), and CF_WriteQueueCmd().

11.52.2.2 chunk_mem `CF_Chunk_t CF_Engine::chunk_mem[CF_NUM_CHUNKS_ALL_CHANNELS]`

Definition at line 455 of file cf_cfdp_types.h.
Referenced by CF_CFDP_InitEngine().

11.52.2.3 chunks `CF_ChunkWrapper_t CF_Engine::chunks[CF_NUM_TRANSACTIONS *CF_Direction_NUM]`

Definition at line 454 of file cf_cfdp_types.h.
Referenced by CF_CFDP_InitEngine().

11.52.2.4 enabled `uint8 CF_Engine::enabled`

Definition at line 458 of file cf_cfdp_types.h.
Referenced by CF_CFDP_CycleEngine(), CF_CFDP_DisableEngine(), CF_CFDP_InitEngine(), CF_CheckTables(), CF_DisableEngineCmd(), and CF_EnableEngineCmd().

11.52.2.5 histories `CF_History_t CF_Engine::histories[CF_NUM_HISTORIES]`

Definition at line 451 of file cf_cfdp_types.h.
Referenced by CF_CFDP_InitEngine().

11.52.2.6 in `CF_Input_t CF_Engine::in`

Definition at line 447 of file cf_cfdp_types.h.
Referenced by CF_CFDP_ReceiveMessage().

11.52.2.7 out `CF_Output_t CF_Engine::out`

Definition at line 446 of file cf_cfdp_types.h.
Referenced by CF_CFDP_MsgOutGet(), and CF_CFDP_Send().

11.52.2.8 outgoing_counter `uint32 CF_Engine::outgoing_counter`

Definition at line 457 of file cf_cfdp_types.h.
Referenced by CF_CFDP_CycleEngine(), and CF_CFDP_MsgOutGet().

11.52.2.9 seq_num `CF_TransactionSeq_t CF_Engine::seq_num`

Definition at line 444 of file cf_cfdp_types.h.
Referenced by CF_CFDP_TxFile_Initiate().

11.52.2.10 transactions `CF_Transaction_t CF_Engine::transactions[CF_NUM_TRANSACTIONS]`

Definition at line 450 of file cf_cfdp_types.h.
Referenced by CF_CFDP_InitEngine().
The documentation for this struct was generated from the following file:

- apps/cf/fsw/src/cf_cfdp_types.h

11.53 CF_EotPacket Struct Reference

End of transaction packet.
`#include <default_cf_msgstruct.h>`

Data Fields

- CFE_MSG_TelemetryHeader_t TelemetryHeader

  Telemetry header.
- CF_EotPacket_Payload_t Payload

11.53.1 Detailed Description

End of transaction packet.
Definition at line 56 of file default_cf_msgstruct.h.

11.53.2 Field Documentation

11.53.2.1 Payload `CF_EotPacket_Payload_t CF_EotPacket::Payload`

Definition at line 59 of file default_cf_msgstruct.h.
Referenced by CF_CFDP_SendEotPkt().

11.53.2.2 TelemetryHeader `CFE_MSG_TelemetryHeader_t CF_EotPacket::TelemetryHeader`

Telemetry header.
Definition at line 58 of file default_cf_msgstruct.h.
Referenced by CF_CFDP_SendEotPkt().
The documentation for this struct was generated from the following file:

- apps/cf/config/default_cf_msgstruct.h

11.54 CF_EotPacket_Payload Struct Reference

End of transaction packet.
`#include <default_cf_msgdefs.h>`

Data Fields

- CF_TransactionSeq_t seq_num

  transaction identifier, stays constant for entire transfer
- uint32 channel

  Channel number.
- uint32 direction

  direction of this transaction
- uint32 state

Transaction state.

- uint32 txn_stat

  final status code of transaction (extended CFDP CC)
- CF_EntityId_t src_eid

  the source eid of the transaction
- CF_EntityId_t peer_eid

  peer_eid is always the "other guy", same src_eid for RX
- uint32 fsize

  File size.
- uint32 crc_result

  CRC result.
- CF_TxnFilenames_t fnames

  file names associated with this transaction

11.54.1 Detailed Description

End of transaction packet.
Definition at line 127 of file default_cf_msgdefs.h.

11.54.2 Field Documentation

11.54.2.1 channel `uint32 CF_EotPacket_Payload::channel`

Channel number.
Definition at line 130 of file default_cf_msgdefs.h.
Referenced by CF_CFDP_SendEotPkt().

11.54.2.2 crc_result `uint32 CF_EotPacket_Payload::crc_result`

CRC result.
Definition at line 137 of file default_cf_msgdefs.h.
Referenced by CF_CFDP_SendEotPkt().

11.54.2.3 direction `uint32 CF_EotPacket_Payload::direction`

direction of this transaction
Definition at line 131 of file default_cf_msgdefs.h.
Referenced by CF_CFDP_SendEotPkt().

11.54.2.4 fnames `CF_TxnFilenames_t CF_EotPacket_Payload::fnames`

file names associated with this transaction
Definition at line 138 of file default_cf_msgdefs.h.
Referenced by CF_CFDP_SendEotPkt().

11.54.2.5 fsize `uint32 CF_EotPacket_Payload::fsize`

File size.
Definition at line 136 of file default_cf_msgdefs.h.
Referenced by CF_CFDP_SendEotPkt().

11.54.2.6 peer_eid `CF_EntityId_t CF_EotPacket_Payload::peer_eid`

peer_eid is always the "other guy", same src_eid for RX
Definition at line 135 of file default_cf_msgdefs.h.
Referenced by CF_CFDP_SendEotPkt().

11.54.2.7 seq_num `CF_TransactionSeq_t CF_EotPacket_Payload::seq_num`

transaction identifier, stays constant for entire transfer
Definition at line 129 of file default_cf_msgdefs.h.
Referenced by CF_CFDP_SendEotPkt().

11.54.2.8 src_eid `CF_EntityId_t CF_EotPacket_Payload::src_eid`

the source eid of the transaction
Definition at line 134 of file default_cf_msgdefs.h.
Referenced by CF_CFDP_SendEotPkt().

11.54.2.9 state `uint32 CF_EotPacket_Payload::state`

Transaction state.
Definition at line 132 of file default_cf_msgdefs.h.
Referenced by CF_CFDP_SendEotPkt().

11.54.2.10 txn_stat `uint32 CF_EotPacket_Payload::txn_stat`

final status code of transaction (extended CFDP CC)
Definition at line 133 of file default_cf_msgdefs.h.
Referenced by CF_CFDP_SendEotPkt().
The documentation for this struct was generated from the following file:

- apps/cf/config/default_cf_msgdefs.h

11.55 CF_Flags_Common Struct Reference

Data that applies to all types of transactions.
`#include <cf_cfdp_types.h>`

Data Fields

- uint8 q_index

  Q index this is in.
- bool ack_timer_armed
- bool suspended
- bool canceled
- bool crc_calc

11.55.1 Detailed Description

Data that applies to all types of transactions.
Definition at line 275 of file cf_cfdp_types.h.

11.55.2 Field Documentation

11.55.2.1 ack_timer_armed `bool CF_Flags_Common::ack_timer_armed`

Definition at line 278 of file cf_cfdp_types.h.
Referenced by CF_CFDP_ArmAckTimer(), CF_CFDP_R_Tick(), CF_CFDP_S2_SubstateSendEof(), CF_CFDP_S2_WaitForEofAck(), and CF_CFDP_S_Tick().

11.55.2.2 canceled `bool CF_Flags_Common::canceled`

Definition at line 280 of file cf_cfdp_types.h.
Referenced by CF_CFDP_CancelTransaction(), and CF_CFDP_R2_Reset().

11.55.2.3 crc_calc `bool CF_Flags_Common::crc_calc`

Definition at line 281 of file cf_cfdp_types.h.
Referenced by CF_CFDP_R2_CalcCrcChunk(), CF_CFDP_R2_SubstateSendFin(), and CF_CFDP_S_SendEof().

11.55.2.4 q_index `uint8 CF_Flags_Common::q_index`

Q index this is in.
Definition at line 277 of file cf_cfdp_types.h.
Referenced by CF_CFDP_CycleTxFirstActive(), CF_CFDP_GetClass(), CF_CFDP_IsSender(), CF_CFDP_ReceiveMessage(), CF_CFDP_ResetTransaction(), CF_DequeueTransaction(), CF_FreeTransaction(), CF_InsertSortPrio(), and CF_MoveTransaction().

11.55.2.5 suspended `bool CF_Flags_Common::suspended`

Definition at line 279 of file cf_cfdp_types.h.
Referenced by CF_CFDP_CycleTxFirstActive(), CF_CFDP_DoTick(), CF_CFDP_MsgOutGet(), and CF_DoSuspRes_Txn().
The documentation for this struct was generated from the following file:

- apps/cf/fsw/src/cf_cfdp_types.h

11.56 CF_Flags_Rx Struct Reference

Flags that apply to receive transactions.
`#include <cf_cfdp_types.h>`

Data Fields

- CF_Flags_Common_t com
- bool md_recv

  md received for r state
- bool eof_recv
- bool send_nak
- bool send_fin
- bool send_ack
- bool inactivity_fired

  used for r2
- bool complete

  r2
- bool fd_nak_sent

  latches that at least one NAK has been sent for file data

11.56.1 Detailed Description

Flags that apply to receive transactions.
Definition at line 287 of file cf_cfdp_types.h.

11.56.2 Field Documentation

11.56.2.1 com `CF_Flags_Common_t CF_Flags_Rx::com`

Definition at line 289 of file cf_cfdp_types.h.

11.56.2.2 complete `bool CF_Flags_Rx::complete`

r2
Definition at line 297 of file cf_cfdp_types.h.
Referenced by CF_CFDP_R2_Complete(), CF_CFDP_R2_SubstateRecvFileData(), CF_CFDP_R_SubstateSendNak(), and CF_CFDP_R_Tick().

11.56.2.3 eof_recv `bool CF_Flags_Rx::eof_recv`

Definition at line 292 of file cf_cfdp_types.h.
Referenced by CF_CFDP_R2_Complete(), CF_CFDP_R2_RecvMd(), and CF_CFDP_R2_SubstateRecvEof().

11.56.2.4 fd_nak_sent `bool CF_Flags_Rx::fd_nak_sent`

latches that at least one NAK has been sent for file data
Definition at line 298 of file cf_cfdp_types.h.
Referenced by CF_CFDP_R2_SubstateRecvFileData(), and CF_CFDP_R_SubstateSendNak().

11.56.2.5 inactivity_fired `bool CF_Flags_Rx::inactivity_fired`

used for r2
Definition at line 296 of file cf_cfdp_types.h.
Referenced by CF_CFDP_R_Tick().

11.56.2.6 md_recv `bool CF_Flags_Rx::md_recv`

md received for r state
Definition at line 291 of file cf_cfdp_types.h.
Referenced by CF_CFDP_R2_Complete(), CF_CFDP_R2_RecvMd(), CF_CFDP_R_Init(), CF_CFDP_R_SubstateRecvEof(), CF_CFDP_R_SubstateSendNak(), and CF_CFDP_RecvIdle().

11.56.2.7 send_ack `bool CF_Flags_Rx::send_ack`

Definition at line 295 of file cf_cfdp_types.h.
Referenced by CF_CFDP_R2_SubstateRecvEof(), and CF_CFDP_R_Tick().

11.56.2.8 send_fin `bool CF_Flags_Rx::send_fin`

Definition at line 294 of file cf_cfdp_types.h.
Referenced by CF_CFDP_R2_Reset(), CF_CFDP_R2_SetFinTxnStatus(), CF_CFDP_R_Cancel(), and CF_CFDP_R_Tick().

11.56.2.9 send_nak `bool CF_Flags_Rx::send_nak`

Definition at line 293 of file cf_cfdp_types.h.
Referenced by CF_CFDP_R2_Complete(), and CF_CFDP_R_Tick().
The documentation for this struct was generated from the following file:

- apps/cf/fsw/src/cf_cfdp_types.h

11.57 CF_Flags_Tx Struct Reference

Flags that apply to send transactions.
`#include <cf_cfdp_types.h>`

Data Fields

- CF_Flags_Common_t com
- bool md_need_send
- bool cmd_tx

  indicates transaction is commanded (ground) tx

11.57.1 Detailed Description

Flags that apply to send transactions.
Definition at line 304 of file cf_cfdp_types.h.

11.57.2 Field Documentation

11.57.2.1 cmd_tx `bool CF_Flags_Tx::cmd_tx`

indicates transaction is commanded (ground) tx
Definition at line 309 of file cf_cfdp_types.h.
Referenced by CF_CFDP_ResetTransaction(), and CF_CFDP_TxFile().

11.57.2.2 com `CF_Flags_Common_t CF_Flags_Tx::com`

Definition at line 306 of file cf_cfdp_types.h.

11.57.2.3 md_need_send `bool CF_Flags_Tx::md_need_send`

Definition at line 308 of file cf_cfdp_types.h.
Referenced by CF_CFDP_S2_Nak(), and CF_CFDP_S_CheckAndRespondNak().
The documentation for this struct was generated from the following file:

- apps/cf/fsw/src/cf_cfdp_types.h

11.58 CF_FreezeCmd Struct Reference

Freeze command structure.
`#include <default_cf_msgstruct.h>`

Data Fields

- CFE_MSG_CommandHeader_t CommandHeader

  Command header.
- CF_UnionArgs_Payload_t Payload

  Generic command arguments.

11.58.1 Detailed Description

Freeze command structure.
For command details see CF_FREEZE_CC
Definition at line 115 of file default_cf_msgstruct.h.

11.58.2 Field Documentation

11.58.2.1 CommandHeader `CFE_MSG_CommandHeader_t CF_FreezeCmd::CommandHeader`

Command header.
Definition at line 117 of file default_cf_msgstruct.h.

11.58.2.2 Payload `CF_UnionArgs_Payload_t CF_FreezeCmd::Payload`

Generic command arguments.
Definition at line 118 of file default_cf_msgstruct.h.
Referenced by CF_FreezeCmd().
The documentation for this struct was generated from the following file:

- apps/cf/config/default_cf_msgstruct.h

11.59 CF_GapComputeArgs_t Struct Reference

Argument for Gap Compute function.
`#include <cf_cfdp_r.h>`

Data Fields

- CF_Transaction_t * txn

  Current transaction being processed.
- CF_Logical_PduNak_t * nak

  Current NAK PDU contents.

11.59.1 Detailed Description

Argument for Gap Compute function.
This is used in conjunction with CF_CFDP_R2_GapCompute
Definition at line 39 of file cf_cfdp_r.h.

11.59.2 Field Documentation

11.59.2.1 nak `CF_Logical_PduNak_t* CF_GapComputeArgs_t::nak`

Current NAK PDU contents.
Definition at line 42 of file cf_cfdp_r.h.
Referenced by CF_CFDP_R2_GapCompute().

11.59.2.2 txn `CF_Transaction_t* CF_GapComputeArgs_t::txn`

Current transaction being processed.
Definition at line 41 of file cf_cfdp_r.h.
The documentation for this struct was generated from the following file:

- apps/cf/fsw/src/cf_cfdp_r.h

11.60 CF_GetParam_Payload Struct Reference

Get parameter command structure.
`#include <default_cf_msgdefs.h>`

Data Fields

- uint8 key

  Parameter key, see CF_GetSet_ValueID_t.
- uint8 chan_num

  Channel number.

11.60.1 Detailed Description

Get parameter command structure.
For command details see CF_GET_PARAM_CC
Definition at line 217 of file default_cf_msgdefs.h.

11.60.2 Field Documentation

11.60.2.1 chan_num `uint8 CF_GetParam_Payload::chan_num`

Channel number.
Definition at line 220 of file default_cf_msgdefs.h.
Referenced by CF_GetParamCmd().

11.60.2.2 key `uint8 CF_GetParam_Payload::key`

Parameter key, see CF_GetSet_ValueID_t.
Definition at line 219 of file default_cf_msgdefs.h.
Referenced by CF_GetParamCmd().
The documentation for this struct was generated from the following file:

- apps/cf/config/default_cf_msgdefs.h

11.61 CF_GetParamCmd Struct Reference

Get parameter command structure.
`#include <default_cf_msgstruct.h>`

Data Fields

- CFE_MSG_CommandHeader_t CommandHeader

  Command header.
- CF_GetParam_Payload_t Payload

11.61.1 Detailed Description

Get parameter command structure.
For command details see CF_GET_PARAM_CC
Definition at line 192 of file default_cf_msgstruct.h.

11.61.2 Field Documentation

11.61.2.1 CommandHeader `CFE_MSG_CommandHeader_t CF_GetParamCmd::CommandHeader`

Command header.
Definition at line 194 of file default_cf_msgstruct.h.

11.61.2.2 Payload `CF_GetParam_Payload_t CF_GetParamCmd::Payload`

Definition at line 195 of file default_cf_msgstruct.h.
Referenced by CF_GetParamCmd().
The documentation for this struct was generated from the following file:

- apps/cf/config/default_cf_msgstruct.h

11.62 CF_History Struct Reference

CF History entry.
`#include <cf_cfdp_types.h>`

Data Fields

- CF_TxnFilenames_t fnames

  file names associated with this history entry
- CF_CListNode_t cl_node

  for connection to a CList
- CF_Direction_t dir

  direction of this history entry
- CF_TxnStatus_t txn_stat

  final status of operation
- CF_EntityId_t src_eid

  the source eid of the transaction
- CF_EntityId_t peer_eid

  peer_eid is always the "other guy", same src_eid for RX
- CF_TransactionSeq_t seq_num

  transaction identifier, stays constant for entire transfer

11.62.1 Detailed Description

CF History entry.
Records CF app operations for future reference
Definition at line 173 of file cf_cfdp_types.h.

11.62.2 Field Documentation

11.62.2.1 cl_node `CF_CListNode_t CF_History::cl_node`

for connection to a CList
Definition at line 176 of file cf_cfdp_types.h.
Referenced by CF_CFDP_InitEngine(), CF_CFDP_ResetTransaction(), CF_FindUnusedTransaction(), and CF_Reset↩History().

11.62.2.2 dir `CF_Direction_t CF_History::dir`

direction of this history entry
Definition at line 177 of file cf_cfdp_types.h.
Referenced by CF_CFDP_ReceiveMessage(), CF_CFDP_ResetTransaction(), CF_CFDP_SendEotPkt(), CF_CFDP_↩TxFile_Initiate(), CF_FindUnusedTransaction(), CF_Traverse_WriteHistoryQueueEntryToFile(), and CF_WriteHistory↩EntryToFile().

11.62.2.3 fnames `CF_TxnFilenames_t CF_History::fnames`

file names associated with this history entry
Definition at line 175 of file cf_cfdp_types.h.
Referenced by CF_CFDP_HandleNotKeepFile(), CF_CFDP_ProcessPlaybackDirectory(), CF_CFDP_R2_RecvMd(), CF_CFDP_R_Init(), CF_CFDP_RecvMd(), CF_CFDP_S_SubstateSendMetadata(), CF_CFDP_SendEotPkt(), CF_↩CFDP_SendMd(), CF_CFDP_TxFile(), CF_CFDP_TxFile_Initiate(), and CF_WriteHistoryEntryToFile().

11.62.2.4 peer_eid `CF_EntityId_t CF_History::peer_eid`

peer_eid is always the "other guy", same src_eid for RX
Definition at line 180 of file cf_cfdp_types.h.
Referenced by CF_CFDP_R_SubstateSendNak(), CF_CFDP_R_Tick(), CF_CFDP_RecvIdle(), CF_CFDP_S_Send↩FileData(), CF_CFDP_S_SubstateSendFinAck(), CF_CFDP_SendEof(), CF_CFDP_SendEotPkt(), CF_CFDP_Send↩Fin(), CF_CFDP_SendMd(), CF_CFDP_TxFile_Initiate(), and CF_WriteHistoryEntryToFile().

11.62.2.5 seq_num `CF_TransactionSeq_t CF_History::seq_num`

transaction identifier, stays constant for entire transfer
Definition at line 181 of file cf_cfdp_types.h.
Referenced by CF_CFDP_R2_CalcCrcChunk(), CF_CFDP_R2_Complete(), CF_CFDP_R2_Recv_fin_ack(), CF_C↩FDP_R2_RecvMd(), CF_CFDP_R_CheckCrc(), CF_CFDP_R_DispatchRecv(), CF_CFDP_R_Init(), CF_CFDP_R_↩ProcessFd(), CF_CFDP_R_SendInactivityEvent(), CF_CFDP_R_SubstateRecvEof(), CF_CFDP_R_SubstateSend↩Nak(), CF_CFDP_R_Tick(), CF_CFDP_RecvIdle(), CF_CFDP_S2_EarlyFin(), CF_CFDP_S2_Nak(), CF_CFDP_S2↩_WaitForEofAck(), CF_CFDP_S_DispatchRecv(), CF_CFDP_S_SendFileData(), CF_CFDP_S_SubstateSendFinAck(), CF_CFDP_S_SubstateSendMetadata(), CF_CFDP_S_Tick(), CF_CFDP_SendEof(), CF_CFDP_SendEotPkt(), CF_↩CFDP_SendFin(), CF_CFDP_SendMd(), CF_CFDP_TxFile_Initiate(), CF_FindTransactionBySequenceNumber_Impl(), and CF_WriteHistoryEntryToFile().

11.62.2.6 src_eid CF_EntityId_t CF_History::src_eid

the source eid of the transaction

Definition at line 179 of file cf_cfdp_types.h.

Referenced by CF_CFDP_R2_CalcCrcChunk(), CF_CFDP_R2_Complete(), CF_CFDP_R2_Recv_fin_ack(), CF_CFDP_R2_RecvMd(), CF_CFDP_R_CheckCrc(), CF_CFDP_R_DispatchRecv(), CF_CFDP_R_Init(), CF_CFDP_R_ProcessFd(), CF_CFDP_R_SendInactivityEvent(), CF_CFDP_R_SubstateRecvEof(), CF_CFDP_R_SubstateSendNak(), CF_CFDP_R_Tick(), CF_CFDP_RecvIdle(), CF_CFDP_S2_EarlyFin(), CF_CFDP_S2_Nak(), CF_CFDP_S2_WaitForEofAck(), CF_CFDP_S_DispatchRecv(), CF_CFDP_S_SendFileData(), CF_CFDP_S_SubstateSendMetadata(), CF_CFDP_S_Tick(), CF_CFDP_SendEotPkt(), CF_CFDP_TxFile_Initiate(), CF_FindTransactionBySequenceNumber_Impl(), and CF_WriteHistoryEntryToFile().

11.62.2.7 txn_stat CF_TxnStatus_t CF_History::txn_stat

final status of operation

Definition at line 178 of file cf_cfdp_types.h.

Referenced by CF_CFDP_HandleNotKeepFile(), CF_CFDP_R2_Complete(), CF_CFDP_R2_Reset(), CF_CFDP_R2_SubstateSendFin(), CF_CFDP_R_DispatchRecv(), CF_CFDP_S2_WaitForEofAck(), CF_CFDP_SendEof(), CF_CFDP_SendEotPkt(), CF_CFDP_SetTxnStatus(), and CF_WriteHistoryEntryToFile().

The documentation for this struct was generated from the following file:

- apps/cf/fsw/src/cf_cfdp_types.h

11.63 CF_HkChannel_Data Struct Reference

Housekeeping channel data.

```
#include <default_cf_msgdefs.h>
```

Data Fields

- CF_HkCounters_t counters

  Counters.

- uint16 q_size [CF_QueueIdx_NUM]

  Queue sizes.

- uint8 poll_counter

  Number of active polling directories.

- uint8 playback_counter

  Number of active playback directories.

- uint8 frozen

  Frozen state: 0 == not frozen, else frozen.

- uint8 spare [7]

  Alignment spare (uint64 values in the counters)

11.63.1 Detailed Description

Housekeeping channel data.

Definition at line 103 of file default_cf_msgdefs.h.

11.63.2 Field Documentation

11.63.2.1 counters `CF_HkCounters_t CF_HkChannel_Data::counters`

Counters.

Definition at line 105 of file default_cf_msgdefs.h.

Referenced by CF_CFDP_PlaybackDir_Initiate(), CF_CFDP_R2_CalcCrcChunk(), CF_CFDP_R2_Complete(), CF_CFDP_R2_Recv_fin_ack(), CF_CFDP_R2_RecvMd(), CF_CFDP_R_CheckCrc(), CF_CFDP_R_DispatchRecv(), CF_CFDP_R_Init(), CF_CFDP_R_ProcessFd(), CF_CFDP_R_SendInactivityEvent(), CF_CFDP_R_SubstateRecvEof(), CF_CFDP_R_SubstateSendNak(), CF_CFDP_R_Tick(), CF_CFDP_ReceiveMessage(), CF_CFDP_RecvDrop(), CF_CFDP_RecvFd(), CF_CFDP_RecvIdle(), CF_CFDP_RecvMd(), CF_CFDP_RecvPh(), CF_CFDP_S2_Nak(), CF_CFDP_S2_WaitForEofAck(), CF_CFDP_S_DispatchRecv(), CF_CFDP_S_SendFileData(), CF_CFDP_S_SubstateSendMetadata(), CF_CFDP_S_Tick(), CF_CFDP_Send(), and CF_ResetCmd().

11.63.2.2 frozen `uint8 CF_HkChannel_Data::frozen`

Frozen state: 0 == not frozen, else frozen.

Definition at line 109 of file default_cf_msgdefs.h.

Referenced by CF_CFDP_CycleEngine(), CF_CFDP_MsgOutGet(), and CF_DoFreezeThaw().

11.63.2.3 playback_counter `uint8 CF_HkChannel_Data::playback_counter`

Number of active playback directories.

Definition at line 108 of file default_cf_msgdefs.h.

Referenced by CF_CFDP_ProcessPlaybackDirectories().

11.63.2.4 poll_counter `uint8 CF_HkChannel_Data::poll_counter`

Number of active polling directories.

Definition at line 107 of file default_cf_msgdefs.h.

Referenced by CF_CFDP_ProcessPollingDirectories().

11.63.2.5 q_size `uint16 CF_HkChannel_Data::q_size[CF_QueueIdx_NUM]`

Queue sizes.

Definition at line 106 of file default_cf_msgdefs.h.

Referenced by CF_CFDP_DisableEngine(), CF_CFDP_ReceiveMessage(), CF_CList_InsertAfter_Ex(), CF_CList_InsertBack_Ex(), CF_CList_Remove_Ex(), CF_DequeueTransaction(), and CF_MoveTransaction().

11.63.2.6 spare `uint8 CF_HkChannel_Data::spare[7]`

Alignment spare (uint64 values in the counters)

Definition at line 110 of file default_cf_msgdefs.h.

The documentation for this struct was generated from the following file:

- apps/cf/config/default_cf_msgdefs.h

11.64 CF_HkCmdCounters Struct Reference

Housekeeping command counters.

`#include <default_cf_msgdefs.h>`

Data Fields

- uint16 cmd

  Command success counter.

- uint16 err

  Command error counter.

11.64.1 Detailed Description

Housekeeping command counters.
Definition at line 39 of file default_cf_msgdefs.h.

11.64.2 Field Documentation

11.64.2.1 cmd `uint16 CF_HkCmdCounters::cmd`

Command success counter.
Definition at line 41 of file default_cf_msgdefs.h.
Referenced by CF_AbandonCmd(), CF_CancelCmd(), CF_DisableDequeueCmd(), CF_DisableDirPollingCmd(), CF_DisableEngineCmd(), CF_DoSuspRes(), CF_EnableDequeueCmd(), CF_EnableDirPollingCmd(), CF_EnableEngineCmd(), CF_FreezeCmd(), CF_GetSetParamCmd(), CF_NoopCmd(), CF_PlaybackDirCmd(), CF_PurgeQueueCmd(), CF_ResetCmd(), CF_ThawCmd(), CF_TxFileCmd(), and CF_WriteQueueCmd().

11.64.2.2 err `uint16 CF_HkCmdCounters::err`

Command error counter.
Definition at line 42 of file default_cf_msgdefs.h.
Referenced by CF_AbandonCmd(), CF_AppPipe(), CF_CancelCmd(), CF_DisableDequeueCmd(), CF_DisableDirPollingCmd(), CF_DoSuspRes(), CF_EnableDequeueCmd(), CF_EnableDirPollingCmd(), CF_EnableEngineCmd(), CF_FreezeCmd(), CF_GetSetParamCmd(), CF_PlaybackDirCmd(), CF_ProcessGroundCommand(), CF_PurgeQueueCmd(), CF_ResetCmd(), CF_ThawCmd(), CF_TxFileCmd(), and CF_WriteQueueCmd().
The documentation for this struct was generated from the following file:

- apps/cf/config/default_cf_msgdefs.h

11.65 CF_HkCounters Struct Reference

Housekeeping counters.
`#include <default_cf_msgdefs.h>`

Data Fields

- CF_HkSent_t sent

  Sent counters.
- CF_HkRecv_t recv

  Received counters.
- CF_HkFault_t fault

  Fault counters.

11.65.1 Detailed Description

Housekeeping counters.
Definition at line 93 of file default_cf_msgdefs.h.

11.65.2 Field Documentation

11.65.2.1 fault `CF_HkFault_t CF_HkCounters::fault`

Fault counters.
Definition at line 97 of file default_cf_msgdefs.h.
Referenced by CF_CFDP_PlaybackDir_Initiate(), CF_CFDP_R2_CalcCrcChunk(), CF_CFDP_R2_Complete(), CF_C↩FDP_R2_RecvMd(), CF_CFDP_R_CheckCrc(), CF_CFDP_R_Init(), CF_CFDP_R_ProcessFd(), CF_CFDP_R_Send↩InactivityEvent(), CF_CFDP_R_SubstateRecvEof(), CF_CFDP_R_Tick(), CF_CFDP_S_SendFileData(), CF_CFDP_↩S_SubstateSendMetadata(), CF_CFDP_S_Tick(), and CF_ResetCmd().

11.65.2.2 recv `CF_HkRecv_t CF_HkCounters::recv`

Received counters.
Definition at line 96 of file default_cf_msgdefs.h.
Referenced by CF_CFDP_R2_Recv_fin_ack(), CF_CFDP_R2_RecvMd(), CF_CFDP_R_DispatchRecv(), CF_CFDP↩_R_ProcessFd(), CF_CFDP_R_SubstateRecvEof(), CF_CFDP_ReceiveMessage(), CF_CFDP_RecvDrop(), CF_CF↩DP_RecvFd(), CF_CFDP_RecvIdle(), CF_CFDP_RecvMd(), CF_CFDP_RecvPh(), CF_CFDP_S2_Nak(), CF_CFDP↩_S2_WaitForEofAck(), CF_CFDP_S_DispatchRecv(), and CF_ResetCmd().

11.65.2.3 sent `CF_HkSent_t CF_HkCounters::sent`

Sent counters.
Definition at line 95 of file default_cf_msgdefs.h.
Referenced by CF_CFDP_R_SubstateSendNak(), CF_CFDP_S_SendFileData(), CF_CFDP_Send(), and CF_Reset↩Cmd().
The documentation for this struct was generated from the following file:

- apps/cf/config/default_cf_msgdefs.h

11.66 CF_HkFault Struct Reference

Housekeeping fault counters.
`#include <default_cf_msgdefs.h>`

Data Fields

- uint16 file_open

  File open fault counter.
- uint16 file_read

  File read fault counter.
- uint16 file_seek

  File seek fault counter.
- uint16 file_write

  File write fault counter.
- uint16 file_rename

  File rename fault counter.
- uint16 directory_read

  Directory read fault counter.
- uint16 crc_mismatch

  CRC mismatch fault counter.
- uint16 file_size_mismatch

  File size mismatch fault counter.
- uint16 nak_limit

  NAK limit exceeded fault counter.

- uint16 ack_limit

  ACK limit exceeded fault counter.
- uint16 inactivity_timer

  Inactivity timer exceeded counter.
- uint16 spare

  Alignment spare to avoid implicit padding.

11.66.1 Detailed Description

Housekeeping fault counters.
Definition at line 74 of file default_cf_msgdefs.h.

11.66.2 Field Documentation

11.66.2.1 ack_limit `uint16 CF_HkFault::ack_limit`

ACK limit exceeded fault counter.
Definition at line 85 of file default_cf_msgdefs.h.
Referenced by CF_CFDP_R_Tick(), and CF_CFDP_S_Tick().

11.66.2.2 crc_mismatch `uint16 CF_HkFault::crc_mismatch`

CRC mismatch fault counter.
Definition at line 82 of file default_cf_msgdefs.h.
Referenced by CF_CFDP_R_CheckCrc().

11.66.2.3 directory_read `uint16 CF_HkFault::directory_read`

Directory read fault counter.
Definition at line 81 of file default_cf_msgdefs.h.
Referenced by CF_CFDP_PlaybackDir_Initiate().

11.66.2.4 file_open `uint16 CF_HkFault::file_open`

File open fault counter.
Definition at line 76 of file default_cf_msgdefs.h.
Referenced by CF_CFDP_R2_RecvMd(), CF_CFDP_R_Init(), and CF_CFDP_S_SubstateSendMetadata().

11.66.2.5 file_read `uint16 CF_HkFault::file_read`

File read fault counter.
Definition at line 77 of file default_cf_msgdefs.h.
Referenced by CF_CFDP_R2_CalcCrcChunk(), and CF_CFDP_S_SendFileData().

11.66.2.6 file_rename `uint16 CF_HkFault::file_rename`

File rename fault counter.
Definition at line 80 of file default_cf_msgdefs.h.
Referenced by CF_CFDP_R2_RecvMd().

11.66.2.7 file_seek `uint16 CF_HkFault::file_seek`

File seek fault counter.
Definition at line 78 of file default_cf_msgdefs.h.
Referenced by CF_CFDP_R2_CalcCrcChunk(), CF_CFDP_R_ProcessFd(), CF_CFDP_S_SendFileData(), and CF_↩CFDP_S_SubstateSendMetadata().

11.66.2.8 file_size_mismatch `uint16 CF_HkFault::file_size_mismatch`

File size mismatch fault counter.
Definition at line 83 of file default_cf_msgdefs.h.
Referenced by CF_CFDP_R2_RecvMd(), and CF_CFDP_R_SubstateRecvEof().

11.66.2.9 file_write `uint16 CF_HkFault::file_write`

File write fault counter.
Definition at line 79 of file default_cf_msgdefs.h.
Referenced by CF_CFDP_R_ProcessFd().

11.66.2.10 inactivity_timer `uint16 CF_HkFault::inactivity_timer`

Inactivity timer exceeded counter.
Definition at line 86 of file default_cf_msgdefs.h.
Referenced by CF_CFDP_R_SendInactivityEvent(), and CF_CFDP_S_Tick().

11.66.2.11 nak_limit `uint16 CF_HkFault::nak_limit`

NAK limit exceeded fault counter.
Definition at line 84 of file default_cf_msgdefs.h.
Referenced by CF_CFDP_R2_Complete().

11.66.2.12 spare `uint16 CF_HkFault::spare`

Alignment spare to avoid implicit padding.
Definition at line 87 of file default_cf_msgdefs.h.
The documentation for this struct was generated from the following file:

- apps/cf/config/default_cf_msgdefs.h

11.67 CF_HkPacket Struct Reference

Housekeeping packet.
`#include <default_cf_msgstruct.h>`

Data Fields

- CFE_MSG_TelemetryHeader_t TelemetryHeader

  Telemetry header.
- CF_HkPacket_Payload_t Payload

11.67.1 Detailed Description

Housekeeping packet.
Definition at line 47 of file default_cf_msgstruct.h.

11.67.2 Field Documentation

11.67.2.1 Payload `CF_HkPacket_Payload_t CF_HkPacket::Payload`

Definition at line 50 of file default_cf_msgstruct.h.
Referenced by CF_AbandonCmd(), CF_AppPipe(), CF_CancelCmd(), CF_CFDP_CycleEngine(), CF_CFDP_DisableEngine(), CF_CFDP_MsgOutGet(), CF_CFDP_PlaybackDir_Initiate(), CF_CFDP_ProcessPlaybackDirectories(), CF_CFDP_ProcessPollingDirectories(), CF_CFDP_R2_CalcCrcChunk(), CF_CFDP_R2_Complete(), CF_CFDP_R2_Recv_fin_ack(), CF_CFDP_R2_RecvMd(), CF_CFDP_R_CheckCrc(), CF_CFDP_R_DispatchRecv(), CF_CFDP_R_Init(), CF_CFDP_R_ProcessFd(), CF_CFDP_R_SendInactivityEvent(), CF_CFDP_R_SubstateRecvEof(), CF_CFDP_R_SubstateSendNak(), CF_CFDP_R_Tick(), CF_CFDP_ReceiveMessage(), CF_CFDP_RecvDrop(), CF_CFDP_RecvFd(), CF_CFDP_RecvIdle(), CF_CFDP_RecvMd(), CF_CFDP_RecvPh(), CF_CFDP_S2_Nak(), CF_CFDP_S2_WaitForEofAck(), CF_CFDP_S_DispatchRecv(), CF_CFDP_S_SendFileData(), CF_CFDP_S_SubstateSendMetadata(), CF_CFDP_S_Tick(), CF_CFDP_Send(), CF_CList_InsertAfter_Ex(), CF_CList_InsertBack_Ex(), CF_CList_Remove_Ex(), CF_DequeueTransaction(), CF_DisableDequeueCmd(), CF_DisableDirPollingCmd(), CF_DisableEngineCmd(), CF_DoFreezeThaw(), CF_DoSuspRes(), CF_EnableDequeueCmd(), CF_EnableDirPollingCmd(), CF_EnableEngineCmd(), CF_FreezeCmd(), CF_GetSetParamCmd(), CF_MoveTransaction(), CF_NoopCmd(), CF_PlaybackDirCmd(), CF_ProcessGroundCommand(), CF_PurgeQueueCmd(), CF_ResetCmd(), CF_ThawCmd(), CF_TxFileCmd(), and CF_WriteQueueCmd().

11.67.2.2 TelemetryHeader `CFE_MSG_TelemetryHeader_t CF_HkPacket::TelemetryHeader`

Telemetry header.
Definition at line 49 of file default_cf_msgstruct.h.
Referenced by CF_Init(), and CF_SendHkCmd().
The documentation for this struct was generated from the following file:

- apps/cf/config/default_cf_msgstruct.h

11.68 CF_HkPacket_Payload Struct Reference

Housekeeping packet.
`#include <default_cf_msgdefs.h>`

Data Fields

- CF_HkCmdCounters_t counters

  Command counters.
- uint8 spare [4]

  Alignment spare (CF_HkCmdCounters_t is 4 bytes)
- CF_HkChannel_Data_t channel_hk [CF_NUM_CHANNELS]

  Per channel housekeeping data.

11.68.1 Detailed Description

Housekeeping packet.
Definition at line 116 of file default_cf_msgdefs.h.

11.68.2 Field Documentation

11.68.2.1 channel_hk `CF_HkChannel_Data_t CF_HkPacket_Payload::channel_hk[CF_NUM_CHANNELS]`

Per channel housekeeping data.

Definition at line 121 of file default_cf_msgdefs.h.

Referenced by CF_CFDP_CycleEngine(), CF_CFDP_DisableEngine(), CF_CFDP_MsgOutGet(), CF_CFDP_PlaybackDir_Initiate(), CF_CFDP_ProcessPlaybackDirectories(), CF_CFDP_ProcessPollingDirectories(), CF_CFDP_R2_CalcCrcChunk(), CF_CFDP_R2_Complete(), CF_CFDP_R2_Recv_fin_ack(), CF_CFDP_R2_RecvMd(), CF_CFDP_R_CheckCrc(), CF_CFDP_R_DispatchRecv(), CF_CFDP_R_Init(), CF_CFDP_R_ProcessFd(), CF_CFDP_R_SendInactivityEvent(), CF_CFDP_R_SubstateRecvEof(), CF_CFDP_R_SubstateSendNak(), CF_CFDP_R_Tick(), CF_CFDP_ReceiveMessage(), CF_CFDP_RecvDrop(), CF_CFDP_RecvFd(), CF_CFDP_RecvIdle(), CF_CFDP_RecvMd(), CF_CFDP_RecvPh(), CF_CFDP_S2_Nak(), CF_CFDP_S2_WaitForEofAck(), CF_CFDP_S_DispatchRecv(), CF_CFDP_S_SendFileData(), CF_CFDP_S_SubstateSendMetadata(), CF_CFDP_S_Tick(), CF_CFDP_Send(), CF_CList_InsertAfter_Ex(), CF_CList_InsertBack_Ex(), CF_CList_Remove_Ex(), CF_DequeueTransaction(), CF_DoFreezeThaw(), CF_MoveTransaction(), and CF_ResetCmd().

11.68.2.2 counters `CF_HkCmdCounters_t CF_HkPacket_Payload::counters`

Command counters.

Definition at line 118 of file default_cf_msgdefs.h.

Referenced by CF_AbandonCmd(), CF_AppPipe(), CF_CancelCmd(), CF_DisableDequeueCmd(), CF_DisableDirPollingCmd(), CF_DisableEngineCmd(), CF_DoSuspRes(), CF_EnableDequeueCmd(), CF_EnableDirPollingCmd(), CF_EnableEngineCmd(), CF_FreezeCmd(), CF_GetSetParamCmd(), CF_NoopCmd(), CF_PlaybackDirCmd(), CF_ProcessGroundCommand(), CF_PurgeQueueCmd(), CF_ResetCmd(), CF_ThawCmd(), CF_TxFileCmd(), and CF_WriteQueueCmd().

11.68.2.3 spare `uint8 CF_HkPacket_Payload::spare[4]`

Alignment spare (CF_HkCmdCounters_t is 4 bytes)

Definition at line 119 of file default_cf_msgdefs.h.

The documentation for this struct was generated from the following file:

- apps/cf/config/default_cf_msgdefs.h

11.69 CF_HkRecv Struct Reference

Housekeeping received counters.

`#include <default_cf_msgdefs.h>`

Data Fields

- uint64 file_data_bytes

  Received File data bytes.
- uint32 pdu

  Received PDUs with valid header counter.
- uint32 error

  Received PDUs with error counter, see related event for cause.
- uint16 spurious

  Received PDUs with invalid directive code for current context or file directive FIN without matching active transaction counter, see related event for cause.
- uint16 dropped

  Received PDUs dropped due to a transaction error.
- uint32 nak_segment_requests

  Received NAK segment requests counter.

11.69.1 Detailed Description

Housekeeping received counters.
Definition at line 58 of file default_cf_msgdefs.h.

11.69.2 Field Documentation

11.69.2.1 dropped `uint16 CF_HkRecv::dropped`

Received PDUs dropped due to a transaction error.
Definition at line 67 of file default_cf_msgdefs.h.
Referenced by CF_CFDP_R_DispatchRecv(), and CF_CFDP_RecvDrop().

11.69.2.2 error `uint32 CF_HkRecv::error`

Received PDUs with error counter, see related event for cause.
Definition at line 62 of file default_cf_msgdefs.h.
Referenced by CF_CFDP_R2_Recv_fin_ack(), CF_CFDP_R2_RecvMd(), CF_CFDP_R_SubstateRecvEof(), CF_CF↩DP_RecvFd(), CF_CFDP_RecvIdle(), CF_CFDP_RecvMd(), CF_CFDP_RecvPh(), CF_CFDP_S2_Nak(), and CF_C↩FDP_S2_WaitForEofAck().

11.69.2.3 file_data_bytes `uint64 CF_HkRecv::file_data_bytes`

Received File data bytes.
Definition at line 60 of file default_cf_msgdefs.h.
Referenced by CF_CFDP_R_ProcessFd().

11.69.2.4 nak_segment_requests `uint32 CF_HkRecv::nak_segment_requests`

Received NAK segment requests counter.
Definition at line 68 of file default_cf_msgdefs.h.
Referenced by CF_CFDP_S2_Nak().

11.69.2.5 pdu `uint32 CF_HkRecv::pdu`

Received PDUs with valid header counter.
Definition at line 61 of file default_cf_msgdefs.h.
Referenced by CF_CFDP_RecvPh().

11.69.2.6 spurious `uint16 CF_HkRecv::spurious`

Received PDUs with invalid directive code for current context or file directive FIN without matching active transaction counter, see related event for cause.
Definition at line 63 of file default_cf_msgdefs.h.
Referenced by CF_CFDP_R_DispatchRecv(), CF_CFDP_ReceiveMessage(), and CF_CFDP_S_DispatchRecv().
The documentation for this struct was generated from the following file:

- apps/cf/config/default_cf_msgdefs.h

11.70 CF_HkSent Struct Reference

Housekeeping sent counters.
`#include <default_cf_msgdefs.h>`

Data Fields

- uint64 file_data_bytes

  Sent File data bytes.
- uint32 pdu

  Sent PDUs counter.
- uint32 nak_segment_requests

  Sent NAK segment requests counter.

11.70.1 Detailed Description

Housekeeping sent counters.
Definition at line 48 of file default_cf_msgdefs.h.

11.70.2 Field Documentation

11.70.2.1 file_data_bytes `uint64 CF_HkSent::file_data_bytes`

Sent File data bytes.
Definition at line 50 of file default_cf_msgdefs.h.
Referenced by CF_CFDP_S_SendFileData().

11.70.2.2 nak_segment_requests `uint32 CF_HkSent::nak_segment_requests`

Sent NAK segment requests counter.
Definition at line 52 of file default_cf_msgdefs.h.
Referenced by CF_CFDP_R_SubstateSendNak().

11.70.2.3 pdu `uint32 CF_HkSent::pdu`

Sent PDUs counter.
Definition at line 51 of file default_cf_msgdefs.h.
Referenced by CF_CFDP_Send().
The documentation for this struct was generated from the following file:

- apps/cf/config/default_cf_msgdefs.h

11.71 CF_Input Struct Reference

CF engine input state.
`#include <cf_cfdp_types.h>`

Data Fields

- CFE_SB_Buffer_t * msg

  Binary message received from underlying transport.
- CF_DecoderState_t decode

  Decoding state (while interpreting message)
- CF_Logical_PduBuffer_t rx_pdudata

  Rx PDU logical values.

11.71.1 Detailed Description

CF engine input state.
Keeps the state of the current input PDU in the CF engine
Definition at line 430 of file cf_cfdp_types.h.

11.71.2 Field Documentation

11.71.2.1 decode `CF_DecoderState_t CF_Input::decode`

Decoding state (while interpreting message)
Definition at line 433 of file cf_cfdp_types.h.
Referenced by CF_CFDP_ReceiveMessage().

11.71.2.2 msg `CFE_SB_Buffer_t* CF_Input::msg`

Binary message received from underlying transport.
Definition at line 432 of file cf_cfdp_types.h.

11.71.2.3 rx_pdudata `CF_Logical_PduBuffer_t CF_Input::rx_pdudata`

Rx PDU logical values.
Definition at line 434 of file cf_cfdp_types.h.
Referenced by CF_CFDP_ReceiveMessage().
The documentation for this struct was generated from the following file:

- apps/cf/fsw/src/cf_cfdp_types.h

11.72 CF_Logical_IntHeader Union Reference

A union of all possible internal header types in a PDU.
`#include <cf_logical_pdu.h>`

Data Fields

- CF_Logical_PduEof_t eof

  valid when pdu_type=0 + directive_code=EOF (4)
- CF_Logical_PduFin_t fin

  valid when pdu_type=0 + directive_code=FIN (5)
- CF_Logical_PduAck_t ack

  valid when pdu_type=0 + directive_code=ACK (6)
- CF_Logical_PduMd_t md

  valid when pdu_type=0 + directive_code=METADATA (7)
- CF_Logical_PduNak_t nak

  valid when pdu_type=0 + directive_code=NAK (8)
- CF_Logical_PduFileDataHeader_t fd

  valid when pdu_type=1 (directive_code is not applicable)

11.72.1 Detailed Description

A union of all possible internal header types in a PDU.
The specific entry which applies depends on the combination of pdu type and directive code.
Definition at line 312 of file cf_logical_pdu.h.

11.72.2 Field Documentation

11.72.2.1 ack `CF_Logical_PduAck_t CF_Logical_IntHeader::ack`

valid when pdu_type=0 + directive_code=ACK (6)
Definition at line 316 of file cf_logical_pdu.h.
Referenced by CF_CFDP_RecvAck(), and CF_CFDP_SendAck().

11.72.2.2 eof `CF_Logical_PduEof_t CF_Logical_IntHeader::eof`

valid when pdu_type=0 + directive_code=EOF (4)
Definition at line 314 of file cf_logical_pdu.h.
Referenced by CF_CFDP_R1_SubstateRecvEof(), CF_CFDP_R2_SubstateRecvEof(), CF_CFDP_R_SubstateRecv↩Eof(), CF_CFDP_RecvEof(), and CF_CFDP_SendEof().

11.72.2.3 fd `CF_Logical_PduFileDataHeader_t CF_Logical_IntHeader::fd`

valid when pdu_type=1 (directive_code is not applicable)
Definition at line 319 of file cf_logical_pdu.h.
Referenced by CF_CFDP_R1_SubstateRecvFileData(), CF_CFDP_R2_SubstateRecvFileData(), CF_CFDP_R_↩ProcessFd(), CF_CFDP_RecvFd(), and CF_CFDP_S_SendFileData().

11.72.2.4 fin `CF_Logical_PduFin_t CF_Logical_IntHeader::fin`

valid when pdu_type=0 + directive_code=FIN (5)
Definition at line 315 of file cf_logical_pdu.h.
Referenced by CF_CFDP_ReceiveMessage(), CF_CFDP_RecvFin(), CF_CFDP_S2_Fin(), and CF_CFDP_SendFin().

11.72.2.5 md `CF_Logical_PduMd_t CF_Logical_IntHeader::md`

valid when pdu_type=0 + directive_code=METADATA (7)
Definition at line 317 of file cf_logical_pdu.h.
Referenced by CF_CFDP_RecvMd(), and CF_CFDP_SendMd().

11.72.2.6 nak `CF_Logical_PduNak_t CF_Logical_IntHeader::nak`

valid when pdu_type=0 + directive_code=NAK (8)
Definition at line 318 of file cf_logical_pdu.h.
Referenced by CF_CFDP_R_SubstateSendNak(), CF_CFDP_RecvNak(), CF_CFDP_S2_Nak(), and CF_CFDP_↩SendNak().
The documentation for this union was generated from the following file:

- apps/cf/fsw/src/cf_logical_pdu.h

11.73 CF_Logical_Lv Struct Reference

Structure representing logical LV Object format.
`#include <cf_logical_pdu.h>`

Data Fields

- uint8 length

Length of data field.

- const void * data_ptr

  Source of actual data in original location.

11.73.1 Detailed Description

Structure representing logical LV Object format.
These Length + Value pairs used in several CFDP PDU types, typically for storage of strings such as file names.
These are only used for string data (mostly filenames) so the data can refer directly to the encoded bits, it does not necessarily need to be duplicated here.
Definition at line 144 of file cf_logical_pdu.h.

11.73.2 Field Documentation

11.73.2.1 data_ptr `const void* CF_Logical_Lv::data_ptr`

Source of actual data in original location.
Definition at line 147 of file cf_logical_pdu.h.
Referenced by CF_CFDP_CopyStringFromLV(), CF_CFDP_DecodeLV(), CF_CFDP_EncodeLV(), and CF_CFDP_SendMd().

11.73.2.2 length `uint8 CF_Logical_Lv::length`

Length of data field.
Definition at line 146 of file cf_logical_pdu.h.
Referenced by CF_CFDP_CopyStringFromLV(), CF_CFDP_DecodeLV(), CF_CFDP_EncodeLV(), CF_CFDP_RecvMd(), and CF_CFDP_SendMd().
The documentation for this struct was generated from the following file:

- apps/cf/fsw/src/cf_logical_pdu.h

11.74 CF_Logical_PduAck Struct Reference

Structure representing CFDP Acknowledge PDU.
`#include <cf_logical_pdu.h>`

Data Fields

- uint8 ack_directive_code

  directive code of the PDU being ACK'ed

- uint8 ack_subtype_code

  depends on ack_directive_code

- CF_CFDP_ConditionCode_t cc
- CF_CFDP_AckTxnStatus_t txn_status

11.74.1 Detailed Description

Structure representing CFDP Acknowledge PDU.
Defined per section 5.2.4 / table 5-8 of CCSDS 727.0-B-5
Definition at line 252 of file cf_logical_pdu.h.

11.74.2 Field Documentation

11.74.2.1 ack_directive_code `uint8 CF_Logical_PduAck::ack_directive_code`

directive code of the PDU being ACK'ed
Definition at line 254 of file cf_logical_pdu.h.
Referenced by CF_CFDP_DecodeAck(), CF_CFDP_EncodeAck(), and CF_CFDP_SendAck().

11.74.2.2 ack_subtype_code `uint8 CF_Logical_PduAck::ack_subtype_code`

depends on ack_directive_code

Definition at line 255 of file cf_logical_pdu.h.
Referenced by CF_CFDP_DecodeAck(), CF_CFDP_EncodeAck(), and CF_CFDP_SendAck().

11.74.2.3 cc `CF_CFDP_ConditionCode_t CF_Logical_PduAck::cc`

Definition at line 256 of file cf_logical_pdu.h.
Referenced by CF_CFDP_DecodeAck(), CF_CFDP_EncodeAck(), and CF_CFDP_SendAck().

11.74.2.4 txn_status `CF_CFDP_AckTxnStatus_t CF_Logical_PduAck::txn_status`

Definition at line 257 of file cf_logical_pdu.h.
Referenced by CF_CFDP_DecodeAck(), CF_CFDP_EncodeAck(), and CF_CFDP_SendAck().
The documentation for this struct was generated from the following file:

- apps/cf/fsw/src/cf_logical_pdu.h

11.75 CF_Logical_PduBuffer Struct Reference

Encapsulates the entire PDU information.
`#include <cf_logical_pdu.h>`

Data Fields

- struct CF_EncoderState * penc
- struct CF_DecoderState * pdec
- CF_Logical_PduHeader_t pdu_header

  Data in PDU header is applicable to all packets.
- CF_Logical_PduFileDirectiveHeader_t fdirective

  The directive code applies to file directive PDUs, where the pdu_type in the common header is 0. Otherwise this value should be set to 0 for data PDUs (which is a reserved value and does not alias any valid directive code).
- CF_Logical_IntHeader_t int_header

  The internal header is specific to the type of PDU being processed. This is a union of all those possible types. See the union definition for which member applies to a given processing cycle.
- uint32 content_crc

  Some PDU types might have a CRC at the end. If so, this field reflects the value of that CRC. Its presence/validity depends on the pdu_type and crc_flag in the pdu_header.

11.75.1 Detailed Description

Encapsulates the entire PDU information.
Definition at line 326 of file cf_logical_pdu.h.

11.75.2 Field Documentation

11.75.2.1 content_crc `uint32 CF_Logical_PduBuffer::content_crc`

Some PDU types might have a CRC at the end. If so, this field reflects the value of that CRC. Its presence/validity depends on the pdu_type and crc_flag in the pdu_header.
Note that all CFDP CRCs are 32 bits in length, the blue book does not permit for any other size.
Definition at line 365 of file cf_logical_pdu.h.

11.75.2.2 fdirective `CF_Logical_PduFileDirectiveHeader_t CF_Logical_PduBuffer::fdirective`

The directive code applies to file directive PDUs, where the pdu_type in the common header is 0. Otherwise this value should be set to 0 for data PDUs (which is a reserved value and does not alias any valid directive code).
Definition at line 347 of file cf_logical_pdu.h.
Referenced by CF_CFDP_ConstructPduHeader(), CF_CFDP_R_DispatchRecv(), CF_CFDP_ReceiveMessage(), CF_CFDP_RecvIdle(), CF_CFDP_RecvPh(), and CF_CFDP_S_DispatchRecv().

11.75.2.3 int_header `CF_Logical_IntHeader_t CF_Logical_PduBuffer::int_header`

The internal header is specific to the type of PDU being processed. This is a union of all those possible types. See the union definition for which member applies to a given processing cycle.
Definition at line 355 of file cf_logical_pdu.h.
Referenced by CF_CFDP_R1_SubstateRecvEof(), CF_CFDP_R1_SubstateRecvFileData(), CF_CFDP_R2_SubstateRecvEof(), CF_CFDP_R2_SubstateRecvFileData(), CF_CFDP_R_ProcessFd(), CF_CFDP_R_SubstateRecvEof(), CF_CFDP_R_SubstateSendNak(), CF_CFDP_ReceiveMessage(), CF_CFDP_RecvAck(), CF_CFDP_RecvEof(), CF_CFDP_RecvFd(), CF_CFDP_RecvFin(), CF_CFDP_RecvMd(), CF_CFDP_RecvNak(), CF_CFDP_S2_Fin(), CF_CFDP_S2_Nak(), CF_CFDP_S_SendFileData(), CF_CFDP_SendAck(), CF_CFDP_SendEof(), CF_CFDP_SendFin(), CF_CFDP_SendMd(), and CF_CFDP_SendNak().

11.75.2.4 pdec `struct CF_DecoderState* CF_Logical_PduBuffer::pdec`

Definition at line 334 of file cf_logical_pdu.h.
Referenced by CF_CFDP_DecodeStart(), CF_CFDP_RecvAck(), CF_CFDP_RecvEof(), CF_CFDP_RecvFd(), CF_CFDP_RecvFin(), CF_CFDP_RecvMd(), CF_CFDP_RecvNak(), and CF_CFDP_RecvPh().

11.75.2.5 pdu_header `CF_Logical_PduHeader_t CF_Logical_PduBuffer::pdu_header`

Data in PDU header is applicable to all packets.
Definition at line 339 of file cf_logical_pdu.h.
Referenced by CF_CFDP_ConstructPduHeader(), CF_CFDP_R_DispatchRecv(), CF_CFDP_ReceiveMessage(), CF_CFDP_RecvFd(), CF_CFDP_RecvIdle(), CF_CFDP_RecvPh(), CF_CFDP_S_DispatchRecv(), CF_CFDP_S_SendFileData(), CF_CFDP_Send(), and CF_CFDP_SetPduLength().

11.75.2.6 penc `struct CF_EncoderState* CF_Logical_PduBuffer::penc`

Definition at line 333 of file cf_logical_pdu.h.
Referenced by CF_CFDP_ConstructPduHeader(), CF_CFDP_EncodeStart(), CF_CFDP_S_SendFileData(), CF_CFDP_SendAck(), CF_CFDP_SendEof(), CF_CFDP_SendFin(), CF_CFDP_SendMd(), CF_CFDP_SendNak(), and CF_CFDP_SetPduLength().
The documentation for this struct was generated from the following file:

- apps/cf/fsw/src/cf_logical_pdu.h

11.76 CF_Logical_PduEof Struct Reference

Structure representing logical End of file PDU.
`#include <cf_logical_pdu.h>`

Data Fields

- CF_CFDP_ConditionCode_t cc
- uint32 crc
- CF_FileSize_t size
- CF_Logical_TlvList_t tlv_list

  Set of all TLV blobs in this PDU.

11.76.1 Detailed Description

Structure representing logical End of file PDU.

See also

CF_CFDP_PduEof_t for encoded form

Definition at line 218 of file cf_logical_pdu.h.

11.76.2 Field Documentation

11.76.2.1 cc `CF_CFDP_ConditionCode_t CF_Logical_PduEof::cc`

Definition at line 220 of file cf_logical_pdu.h.
Referenced by CF_CFDP_DecodeEof(), CF_CFDP_EncodeEof(), CF_CFDP_R2_SubstateRecvEof(), and CF_CFD↩P_SendEof().

11.76.2.2 crc `uint32 CF_Logical_PduEof::crc`

Definition at line 221 of file cf_logical_pdu.h.
Referenced by CF_CFDP_DecodeEof(), CF_CFDP_EncodeEof(), CF_CFDP_R1_SubstateRecvEof(), CF_CFDP_↩R2_SubstateRecvEof(), and CF_CFDP_SendEof().

11.76.2.3 size `CF_FileSize_t CF_Logical_PduEof::size`

Definition at line 222 of file cf_logical_pdu.h.
Referenced by CF_CFDP_DecodeEof(), CF_CFDP_EncodeEof(), CF_CFDP_R2_SubstateRecvEof(), CF_CFDP_R↩_SubstateRecvEof(), and CF_CFDP_SendEof().

11.76.2.4 tlv_list `CF_Logical_TlvList_t CF_Logical_PduEof::tlv_list`

Set of all TLV blobs in this PDU.
Definition at line 227 of file cf_logical_pdu.h.
Referenced by CF_CFDP_DecodeEof(), CF_CFDP_EncodeEof(), and CF_CFDP_SendEof().
The documentation for this struct was generated from the following file:

- apps/cf/fsw/src/cf_logical_pdu.h

11.77 CF_Logical_PduFileDataHeader Struct Reference

`#include <cf_logical_pdu.h>`

Data Fields

- uint8 continuation_state
- CF_Logical_SegmentList_t segment_list

  the segment_meta_length value will be stored in the segment_list.num_segments field below
- CF_FileSize_t offset

  Offset of data in file.
- const void * data_ptr

  pointer to read-only data blob within encoded PDU
- size_t data_len

  Length of data blob within encoded PDU (derived field)

11.77.1 Detailed Description

Definition at line 290 of file cf_logical_pdu.h.

11.77.2 Field Documentation

11.77.2.1 continuation_state `uint8 CF_Logical_PduFileDataHeader::continuation_state`

Definition at line 292 of file cf_logical_pdu.h.
Referenced by CF_CFDP_DecodeFileDataHeader(), and CF_CFDP_EncodeFileDataHeader().

11.77.2.2 data_len `size_t CF_Logical_PduFileDataHeader::data_len`

Length of data blob within encoded PDU (derived field)
Definition at line 303 of file cf_logical_pdu.h.
Referenced by CF_CFDP_DecodeFileDataHeader(), CF_CFDP_R1_SubstateRecvFileData(), CF_CFDP_R2_↩SubstateRecvFileData(), CF_CFDP_R_ProcessFd(), CF_CFDP_RecvFd(), and CF_CFDP_S_SendFileData().

11.77.2.3 data_ptr `const void* CF_Logical_PduFileDataHeader::data_ptr`

pointer to read-only data blob within encoded PDU
Definition at line 302 of file cf_logical_pdu.h.
Referenced by CF_CFDP_DecodeFileDataHeader(), CF_CFDP_R1_SubstateRecvFileData(), CF_CFDP_R_↩ProcessFd(), and CF_CFDP_S_SendFileData().

11.77.2.4 offset `CF_FileSize_t CF_Logical_PduFileDataHeader::offset`

Offset of data in file.
Definition at line 300 of file cf_logical_pdu.h.
Referenced by CF_CFDP_DecodeFileDataHeader(), CF_CFDP_EncodeFileDataHeader(), CF_CFDP_R2_Substate↩RecvFileData(), CF_CFDP_R_ProcessFd(), and CF_CFDP_S_SendFileData().

11.77.2.5 segment_list `CF_Logical_SegmentList_t CF_Logical_PduFileDataHeader::segment_list`

the segment_meta_length value will be stored in the segment_list.num_segments field below
Definition at line 298 of file cf_logical_pdu.h.
Referenced by CF_CFDP_DecodeFileDataHeader(), and CF_CFDP_EncodeFileDataHeader().
The documentation for this struct was generated from the following file:

- apps/cf/fsw/src/cf_logical_pdu.h

11.78 CF_Logical_PduFileDirectiveHeader Struct Reference

Structure representing logical File Directive header.
`#include <cf_logical_pdu.h>`

Data Fields

- CF_CFDP_FileDirective_t directive_code

11.78.1 Detailed Description

Structure representing logical File Directive header.
This contains the file directive code from the PDUs for which it applies. The codes are mapped directly to the CFDP protocol values, but converted to a native value (enum) for direct use by software.
Definition at line 129 of file cf_logical_pdu.h.

11.78.2 Field Documentation

11.78.2.1 directive_code `CF_CFDP_FileDirective_t CF_Logical_PduFileDirectiveHeader::directive_code`

Definition at line 131 of file cf_logical_pdu.h.
Referenced by CF_CFDP_ConstructPduHeader(), CF_CFDP_DecodeFileDirectiveHeader(), CF_CFDP_EncodeFile↩DirectiveHeader(), CF_CFDP_R_DispatchRecv(), CF_CFDP_ReceiveMessage(), CF_CFDP_RecvIdle(), and CF_C↩FDP_S_DispatchRecv().
The documentation for this struct was generated from the following file:

- apps/cf/fsw/src/cf_logical_pdu.h

11.79 CF_Logical_PduFin Struct Reference

Structure representing logical Finished PDU.
`#include <cf_logical_pdu.h>`

Data Fields

- CF_CFDP_ConditionCode_t cc
- CF_CFDP_FinFileStatus_t file_status
- uint8 delivery_code

  complete file indicated by '0'. Nonzero means incomplete.
- CF_Logical_TlvList_t tlv_list

  Set of all TLV blobs in this PDU.

11.79.1 Detailed Description

Structure representing logical Finished PDU.

See also

CF_CFDP_PduFin_t for encoded form

Definition at line 235 of file cf_logical_pdu.h.

11.79.2 Field Documentation

11.79.2.1 cc `CF_CFDP_ConditionCode_t CF_Logical_PduFin::cc`

Definition at line 237 of file cf_logical_pdu.h.
Referenced by CF_CFDP_DecodeFin(), CF_CFDP_EncodeFin(), CF_CFDP_ReceiveMessage(), CF_CFDP_S2_Fin(), and CF_CFDP_SendFin().

11.79.2.2 delivery_code `uint8 CF_Logical_PduFin::delivery_code`

complete file indicated by '0'. Nonzero means incomplete.
Definition at line 239 of file cf_logical_pdu.h.
Referenced by CF_CFDP_DecodeFin(), CF_CFDP_EncodeFin(), and CF_CFDP_SendFin().

11.79.2.3 file_status `CF_CFDP_FinFileStatus_t CF_Logical_PduFin::file_status`

Definition at line 238 of file cf_logical_pdu.h.
Referenced by CF_CFDP_DecodeFin(), CF_CFDP_EncodeFin(), and CF_CFDP_SendFin().

11.79.2.4 tlv_list `CF_Logical_TlvList_t CF_Logical_PduFin::tlv_list`

Set of all TLV blobs in this PDU.
Definition at line 244 of file cf_logical_pdu.h.
Referenced by CF_CFDP_DecodeFin(), CF_CFDP_EncodeFin(), and CF_CFDP_SendFin().
The documentation for this struct was generated from the following file:

- apps/cf/fsw/src/cf_logical_pdu.h

11.80 CF_Logical_PduHeader Struct Reference

Structure representing base CFDP PDU header.
`#include <cf_logical_pdu.h>`

Data Fields

- uint8 version

  Version of the protocol.
- uint8 pdu_type

  File Directive (0) or File Data (1)
- uint8 direction

  Toward Receiver (0) or Toward Sender (1)
- uint8 txm_mode

  Acknowledged (0) or Unacknowledged (1)
- uint8 crc_flag

  CRC not present (0) or CRC present (1)
- uint8 large_flag

  Small/32-bit size (0) or Large/64-bit size (1)
- uint8 segment_meta_flag

  Segment Metatdata not present (0) or Present (1)
- uint8 eid_length

  Length of encoded entity IDs, in octets (NOT size of logical value)
- uint8 txn_seq_length

  Length of encoded sequence number, in octets (NOT size of logical value)
- uint16 header_encoded_length

Length of the encoded PDU header, in octets (NOT sizeof struct)

- uint16 data_encoded_length

  Length of the encoded PDU data, in octets.

- CF_EntityId_t source_eid

  Source entity ID (normalized)

- CF_EntityId_t destination_eid

  Destination entity ID (normalized)

- CF_TransactionSeq_t sequence_num

  Sequence number (normalized)

11.80.1 Detailed Description

Structure representing base CFDP PDU header.
Reflects the common content at the beginning of all CFDP PDUs, of all types.

See also

CF_CFDP_PduHeader_t for encoded form

Definition at line 101 of file cf_logical_pdu.h.

11.80.2 Field Documentation

11.80.2.1 crc_flag `uint8 CF_Logical_PduHeader::crc_flag`

CRC not present (0) or CRC present (1)
Definition at line 107 of file cf_logical_pdu.h.
Referenced by CF_CFDP_DecodeHeader(), and CF_CFDP_RecvFd().

11.80.2.2 data_encoded_length `uint16 CF_Logical_PduHeader::data_encoded_length`

Length of the encoded PDU data, in octets.
Definition at line 115 of file cf_logical_pdu.h.
Referenced by CF_CFDP_DecodeHeader(), CF_CFDP_EncodeHeaderFinalSize(), CF_CFDP_Send(), and CF_CFD↩P_SetPduLength().

11.80.2.3 destination_eid `CF_EntityId_t CF_Logical_PduHeader::destination_eid`

Destination entity ID (normalized)
Definition at line 118 of file cf_logical_pdu.h.
Referenced by CF_CFDP_ConstructPduHeader(), CF_CFDP_DecodeHeader(), CF_CFDP_EncodeHeaderWithout↩Size(), and CF_CFDP_ReceiveMessage().

11.80.2.4 direction `uint8 CF_Logical_PduHeader::direction`

Toward Receiver (0) or Toward Sender (1)
Definition at line 105 of file cf_logical_pdu.h.
Referenced by CF_CFDP_ConstructPduHeader(), CF_CFDP_DecodeHeader(), and CF_CFDP_EncodeHeader↩WithoutSize().

11.80.2.5 eid_length `uint8 CF_Logical_PduHeader::eid_length`

Length of encoded entity IDs, in octets (NOT size of logical value)
Definition at line 111 of file cf_logical_pdu.h.
Referenced by CF_CFDP_ConstructPduHeader(), CF_CFDP_DecodeHeader(), and CF_CFDP_EncodeHeader↩WithoutSize().

11.80.2.6 header_encoded_length `uint16 CF_Logical_PduHeader::header_encoded_length`

Length of the encoded PDU header, in octets (NOT sizeof struct)
Definition at line 114 of file cf_logical_pdu.h.
Referenced by CF_CFDP_DecodeHeader(), CF_CFDP_EncodeHeaderWithoutSize(), CF_CFDP_Send(), and CF_C↩FDP_SetPduLength().

11.80.2.7 large_flag `uint8 CF_Logical_PduHeader::large_flag`

Small/32-bit size (0) or Large/64-bit size (1)
Definition at line 108 of file cf_logical_pdu.h.
Referenced by CF_CFDP_DecodeHeader(), and CF_CFDP_RecvPh().

11.80.2.8 pdu_type `uint8 CF_Logical_PduHeader::pdu_type`

File Directive (0) or File Data (1)
Definition at line 104 of file cf_logical_pdu.h.
Referenced by CF_CFDP_ConstructPduHeader(), CF_CFDP_DecodeHeader(), CF_CFDP_EncodeHeaderWithout↩Size(), CF_CFDP_R_DispatchRecv(), CF_CFDP_RecvIdle(), CF_CFDP_RecvPh(), and CF_CFDP_S_DispatchRecv().

11.80.2.9 segment_meta_flag `uint8 CF_Logical_PduHeader::segment_meta_flag`

Segment Metatdata not present (0) or Present (1)
Definition at line 110 of file cf_logical_pdu.h.
Referenced by CF_CFDP_RecvFd(), and CF_CFDP_S_SendFileData().

11.80.2.10 sequence_num `CF_TransactionSeq_t CF_Logical_PduHeader::sequence_num`

Sequence number (normalized)
Definition at line 119 of file cf_logical_pdu.h.
Referenced by CF_CFDP_ConstructPduHeader(), CF_CFDP_DecodeHeader(), CF_CFDP_EncodeHeaderWithout↩Size(), CF_CFDP_ReceiveMessage(), and CF_CFDP_RecvIdle().

11.80.2.11 source_eid `CF_EntityId_t CF_Logical_PduHeader::source_eid`

Source entity ID (normalized)
Definition at line 117 of file cf_logical_pdu.h.
Referenced by CF_CFDP_ConstructPduHeader(), CF_CFDP_DecodeHeader(), CF_CFDP_EncodeHeaderWithout↩Size(), CF_CFDP_ReceiveMessage(), and CF_CFDP_RecvIdle().

11.80.2.12 txm_mode `uint8 CF_Logical_PduHeader::txm_mode`

Acknowledged (0) or Unacknowledged (1)
Definition at line 106 of file cf_logical_pdu.h.
Referenced by CF_CFDP_ConstructPduHeader(), CF_CFDP_DecodeHeader(), CF_CFDP_EncodeHeaderWithout↩Size(), and CF_CFDP_RecvIdle().

11.80.2.13 txn_seq_length `uint8 CF_Logical_PduHeader::txn_seq_length`

Length of encoded sequence number, in octets (NOT size of logical value)
Definition at line 112 of file cf_logical_pdu.h.
Referenced by CF_CFDP_ConstructPduHeader(), CF_CFDP_DecodeHeader(), and CF_CFDP_EncodeHeader↩WithoutSize().

11.80.2.14 version `uint8 CF_Logical_PduHeader::version`

Version of the protocol.
Definition at line 103 of file cf_logical_pdu.h.
Referenced by CF_CFDP_ConstructPduHeader(), CF_CFDP_DecodeHeader(), and CF_CFDP_EncodeHeader↩WithoutSize().
The documentation for this struct was generated from the following file:

- apps/cf/fsw/src/cf_logical_pdu.h

11.81 CF_Logical_PduMd Struct Reference

Structure representing CFDP Metadata PDU.
`#include <cf_logical_pdu.h>`

Data Fields

- uint8 close_req

  transaction closure not requested (0) or requested (1)
- uint8 checksum_type

  0 indicates legacy modular checksum
- CF_FileSize_t size
- CF_Logical_Lv_t source_filename
- CF_Logical_Lv_t dest_filename

11.81.1 Detailed Description

Structure representing CFDP Metadata PDU.
Defined per section 5.2.5 / table 5-9 of CCSDS 727.0-B-5
Definition at line 265 of file cf_logical_pdu.h.

11.81.2 Field Documentation

11.81.2.1 checksum_type `uint8 CF_Logical_PduMd::checksum_type`

0 indicates legacy modular checksum
Definition at line 268 of file cf_logical_pdu.h.
Referenced by CF_CFDP_DecodeMd(), and CF_CFDP_EncodeMd().

11.81.2.2 close_req `uint8 CF_Logical_PduMd::close_req`

transaction closure not requested (0) or requested (1)
Definition at line 267 of file cf_logical_pdu.h.
Referenced by CF_CFDP_DecodeMd(), and CF_CFDP_EncodeMd().

11.81.2.3 dest_filename `CF_Logical_Lv_t CF_Logical_PduMd::dest_filename`

Definition at line 273 of file cf_logical_pdu.h.
Referenced by CF_CFDP_DecodeMd(), CF_CFDP_EncodeMd(), CF_CFDP_RecvMd(), and CF_CFDP_SendMd().

11.81.2.4 size `CF_FileSize_t CF_Logical_PduMd::size`

Definition at line 270 of file cf_logical_pdu.h.
Referenced by CF_CFDP_DecodeMd(), CF_CFDP_EncodeMd(), CF_CFDP_RecvMd(), and CF_CFDP_SendMd().

11.81.2.5 source_filename `CF_Logical_Lv_t CF_Logical_PduMd::source_filename`

Definition at line 272 of file cf_logical_pdu.h.
Referenced by CF_CFDP_DecodeMd(), CF_CFDP_EncodeMd(), CF_CFDP_RecvMd(), and CF_CFDP_SendMd().
The documentation for this struct was generated from the following file:

- apps/cf/fsw/src/cf_logical_pdu.h

11.82 CF_Logical_PduNak Struct Reference

Structure representing logical Non-Acknowledge PDU.
`#include <cf_logical_pdu.h>`

Data Fields

- CF_FileSize_t scope_start
- CF_FileSize_t scope_end
- CF_Logical_SegmentList_t segment_list

  Set of all segments in this PDU.

11.82.1 Detailed Description

Structure representing logical Non-Acknowledge PDU.
Definition at line 279 of file cf_logical_pdu.h.

11.82.2 Field Documentation

11.82.2.1 scope_end `CF_FileSize_t CF_Logical_PduNak::scope_end`

Definition at line 282 of file cf_logical_pdu.h.
Referenced by CF_CFDP_DecodeNak(), CF_CFDP_EncodeNak(), and CF_CFDP_R_SubstateSendNak().

11.82.2.2 scope_start `CF_FileSize_t CF_Logical_PduNak::scope_start`

Definition at line 281 of file cf_logical_pdu.h.
Referenced by CF_CFDP_DecodeNak(), CF_CFDP_EncodeNak(), CF_CFDP_R2_GapCompute(), and CF_CFDP_↩
R_SubstateSendNak().

11.82.2.3 segment_list `CF_Logical_SegmentList_t CF_Logical_PduNak::segment_list`

Set of all segments in this PDU.
Definition at line 287 of file cf_logical_pdu.h.
Referenced by CF_CFDP_DecodeNak(), CF_CFDP_EncodeNak(), CF_CFDP_R2_GapCompute(), CF_CFDP_R_↩ SubstateSendNak(), and CF_CFDP_S2_Nak().
The documentation for this struct was generated from the following file:

- apps/cf/fsw/src/cf_logical_pdu.h

11.83 CF_Logical_SegmentList Struct Reference

`#include <cf_logical_pdu.h>`

Data Fields

- uint8 num_segments

  number of valid entries in the segment list
- CF_Logical_SegmentRequest_t segments [CF_PDU_MAX_SEGMENTS]

  Set of all segment requests in this PDU.

11.83.1 Detailed Description

Definition at line 193 of file cf_logical_pdu.h.

11.83.2 Field Documentation

11.83.2.1 num_segments `uint8 CF_Logical_SegmentList::num_segments`

number of valid entries in the segment list
Definition at line 195 of file cf_logical_pdu.h.
Referenced by CF_CFDP_DecodeAllSegments(), CF_CFDP_DecodeFileDataHeader(), CF_CFDP_EncodeAll↩ Segments(), CF_CFDP_EncodeFileDataHeader(), CF_CFDP_R2_GapCompute(), CF_CFDP_R_SubstateSendNak(), and CF_CFDP_S2_Nak().

11.83.2.2 segments `CF_Logical_SegmentRequest_t CF_Logical_SegmentList::segments[CF_PDU_MAX_SEGMENTS]`

Set of all segment requests in this PDU.
Number of valid entries is indicated by num_segments, and may be 0 if the PDU does not contain any such fields.
Definition at line 203 of file cf_logical_pdu.h.
Referenced by CF_CFDP_DecodeAllSegments(), CF_CFDP_DecodeFileDataHeader(), CF_CFDP_EncodeAll↩ Segments(), CF_CFDP_R2_GapCompute(), CF_CFDP_R_SubstateSendNak(), and CF_CFDP_S2_Nak().
The documentation for this struct was generated from the following file:

- apps/cf/fsw/src/cf_logical_pdu.h

11.84 CF_Logical_SegmentRequest Struct Reference

Structure representing logical Segment Request data.
`#include <cf_logical_pdu.h>`

Data Fields

- CF_FileSize_t offset_start
- CF_FileSize_t offset_end

11.84.1 Detailed Description

Structure representing logical Segment Request data.
Definition at line 187 of file cf_logical_pdu.h.

11.84.2 Field Documentation

11.84.2.1 offset_end `CF_FileSize_t CF_Logical_SegmentRequest::offset_end`

Definition at line 190 of file cf_logical_pdu.h.
Referenced by CF_CFDP_DecodeSegmentRequest(), CF_CFDP_EncodeSegmentRequest(), CF_CFDP_R2_Gap↩Compute(), CF_CFDP_R_SubstateSendNak(), and CF_CFDP_S2_Nak().

11.84.2.2 offset_start `CF_FileSize_t CF_Logical_SegmentRequest::offset_start`

Definition at line 189 of file cf_logical_pdu.h.
Referenced by CF_CFDP_DecodeSegmentRequest(), CF_CFDP_EncodeSegmentRequest(), CF_CFDP_R2_Gap↩Compute(), CF_CFDP_R_SubstateSendNak(), and CF_CFDP_S2_Nak().
The documentation for this struct was generated from the following file:

- apps/cf/fsw/src/cf_logical_pdu.h

11.85 CF_Logical_Tlv Struct Reference

Structure representing logical TLV Object format.
`#include <cf_logical_pdu.h>`

Data Fields

- CF_CFDP_TlvType_t type

  Nature of data field.
- uint8 length

  Length of data field (encoded length, not local storage size)
- CF_Logical_TlvData_t data

11.85.1 Detailed Description

Structure representing logical TLV Object format.
In the current implementation of CF, only entity IDs are currently encoded in this form where indicated in the spec. This may change in a future version.

See also

CF_CFDP_tlv_t for encoded form

Definition at line 177 of file cf_logical_pdu.h.

11.85.2 Field Documentation

11.85.2.1 data `CF_Logical_TlvData_t CF_Logical_Tlv::data`

Definition at line 181 of file cf_logical_pdu.h.
Referenced by CF_CFDP_AppendTlv(), CF_CFDP_DecodeTLV(), and CF_CFDP_EncodeTLV().

11.85.2.2 length `uint8 CF_Logical_Tlv::length`

Length of data field (encoded length, not local storage size)
Definition at line 180 of file cf_logical_pdu.h.
Referenced by CF_CFDP_AppendTlv(), CF_CFDP_DecodeTLV(), and CF_CFDP_EncodeTLV().

11.85.2.3 type `CF_CFDP_TlvType_t CF_Logical_Tlv::type`

Nature of data field.
Definition at line 179 of file cf_logical_pdu.h.
Referenced by CF_CFDP_AppendTlv(), CF_CFDP_DecodeTLV(), and CF_CFDP_EncodeTLV().
The documentation for this struct was generated from the following file:

- apps/cf/fsw/src/cf_logical_pdu.h

11.86 CF_Logical_TlvData Union Reference

Union of various data items that may occur in a TLV item.
`#include <cf_logical_pdu.h>`

Data Fields

- CF_EntityId_t eid

  Valid when type=ENTITY_ID (6)
- const void * data_ptr

  Source of actual data in original location (other string/binary types)

11.86.1 Detailed Description

Union of various data items that may occur in a TLV item.
The actual type is identified by the "type" field in the enclosing TLV
Currently filestore requests are not implemented in CF, so the TLV use is limited. This may change in the future.
Numeric data needs to actually be copied to this buffer, because it needs to be normalized in length and byte-order. But string data (e.g. filenames, messages) can reside in the original encoded form.
Definition at line 162 of file cf_logical_pdu.h.

11.86.2 Field Documentation

11.86.2.1 data_ptr `const void* CF_Logical_TlvData::data_ptr`

Source of actual data in original location (other string/binary types)
Definition at line 165 of file cf_logical_pdu.h.
Referenced by CF_CFDP_AppendTlv(), CF_CFDP_DecodeTLV(), and CF_CFDP_EncodeTLV().

11.86.2.2 eid `CF_EntityId_t CF_Logical_TlvData::eid`

Valid when type=ENTITY_ID (6)
Definition at line 164 of file cf_logical_pdu.h.
Referenced by CF_CFDP_AppendTlv(), CF_CFDP_DecodeTLV(), and CF_CFDP_EncodeTLV().
The documentation for this union was generated from the following file:

- apps/cf/fsw/src/cf_logical_pdu.h

11.87 CF_Logical_TlvList Struct Reference

`#include <cf_logical_pdu.h>`

Data Fields

- uint8 num_tlv

  number of valid entries in the TLV list

- CF_Logical_Tlv_t tlv [CF_PDU_MAX_TLV]

11.87.1 Detailed Description

Definition at line 206 of file cf_logical_pdu.h.

11.87.2 Field Documentation

11.87.2.1 num_tlv `uint8 CF_Logical_TlvList::num_tlv`

number of valid entries in the TLV list
Definition at line 208 of file cf_logical_pdu.h.
Referenced by CF_CFDP_AppendTlv(), CF_CFDP_DecodeAllTlv(), and CF_CFDP_EncodeAllTlv().

11.87.2.2 tlv `CF_Logical_Tlv_t CF_Logical_TlvList::tlv[CF_PDU_MAX_TLV]`

Definition at line 210 of file cf_logical_pdu.h.
Referenced by CF_CFDP_AppendTlv(), CF_CFDP_DecodeAllTlv(), and CF_CFDP_EncodeAllTlv().
The documentation for this struct was generated from the following file:

- apps/cf/fsw/src/cf_logical_pdu.h

11.88 CF_NoopCmd Struct Reference

Noop command structure.
`#include <default_cf_msgstruct.h>`

Data Fields

- CFE_MSG_CommandHeader_t CommandHeader

  Command header.

11.88.1 Detailed Description

Noop command structure.
For command details see CF_NOOP_CC
Definition at line 74 of file default_cf_msgstruct.h.

11.88.2 Field Documentation

11.88.2.1 CommandHeader `CFE_MSG_CommandHeader_t CF_NoopCmd::CommandHeader`

Command header.
Definition at line 76 of file default_cf_msgstruct.h.
The documentation for this struct was generated from the following file:

- apps/cf/config/default_cf_msgstruct.h

11.89 CF_Output Struct Reference

CF engine output state.
`#include <cf_cfdp_types.h>`

Data Fields

- CFE_SB_Buffer_t * msg

  Binary message to be sent to underlying transport.
- CF_EncoderState_t encode

  Encoding state (while building message)
- CF_Logical_PduBuffer_t tx_pdudata

  Tx PDU logical values.

11.89.1 Detailed Description

CF engine output state.
Keeps the state of the current output PDU in the CF engine
Definition at line 418 of file cf_cfdp_types.h.

11.89.2 Field Documentation

11.89.2.1 encode `CF_EncoderState_t CF_Output::encode`

Encoding state (while building message)
Definition at line 421 of file cf_cfdp_types.h.
Referenced by CF_CFDP_MsgOutGet().

11.89.2.2 msg `CFE_SB_Buffer_t* CF_Output::msg`

Binary message to be sent to underlying transport.
Definition at line 420 of file cf_cfdp_types.h.
Referenced by CF_CFDP_MsgOutGet(), and CF_CFDP_Send().

11.89.2.3 tx_pdudata `CF_Logical_PduBuffer_t CF_Output::tx_pdudata`

Tx PDU logical values.
Definition at line 422 of file cf_cfdp_types.h.
Referenced by CF_CFDP_MsgOutGet().
The documentation for this struct was generated from the following file:

- apps/cf/fsw/src/cf_cfdp_types.h

11.90 CF_PduCmdMsg Struct Reference

PDU command encapsulation structure.
`#include <cf_cfdp_sbintf.h>`

Data Fields

- CFE_MSG_CommandHeader_t hdr

  software bus headers, not really used by CF
- CF_CFDP_PduHeader_t ph

  Beginning of CFDP headers.

11.90.1 Detailed Description

PDU command encapsulation structure.
This encapsulates a CFDP PDU into a format that is sent or received over the software bus, adding "command" encapsulation (even though these are not really commands).

Note

this is only the definition of the header. In reality all messages are larger than this, up to CF_MAX_PDU_SIZE.

Definition at line 44 of file cf_cfdp_sbintf.h.

11.90.2 Field Documentation

11.90.2.1 hdr `CFE_MSG_CommandHeader_t CF_PduCmdMsg::hdr`

software bus headers, not really used by CF
Definition at line 46 of file cf_cfdp_sbintf.h.

11.90.2.2 ph `CF_CFDP_PduHeader_t CF_PduCmdMsg::ph`

Beginning of CFDP headers.
Definition at line 47 of file cf_cfdp_sbintf.h.
The documentation for this struct was generated from the following file:

- apps/cf/fsw/src/cf_cfdp_sbintf.h

11.91 CF_PduTlmMsg Struct Reference

PDU send encapsulation structure.
`#include <cf_cfdp_sbintf.h>`

Data Fields

- CFE_MSG_TelemetryHeader_t hdr

  software bus headers, not really used by CF
- CF_CFDP_PduHeader_t ph

  Beginning of CFDP headers.

11.91.1 Detailed Description

PDU send encapsulation structure.
This encapsulates a CFDP PDU into a format that is sent or received over the software bus, adding "telemetry" encapsulation (even though these are not really telemetry items).

Note

this is only the definition of the header. In reality all messages are larger than this, up to CF_MAX_PDU_SIZE.

Definition at line 60 of file cf_cfdp_sbintf.h.

11.91.2 Field Documentation

11.91.2.1 hdr `CFE_MSG_TelemetryHeader_t CF_PduTlmMsg::hdr`

software bus headers, not really used by CF
Definition at line 62 of file cf_cfdp_sbintf.h.

11.91.2.2 ph `CF_CFDP_PduHeader_t CF_PduTlmMsg::ph`

Beginning of CFDP headers.
Definition at line 63 of file cf_cfdp_sbintf.h.
The documentation for this struct was generated from the following file:

- apps/cf/fsw/src/cf_cfdp_sbintf.h

11.92 CF_Playback Struct Reference

CF Playback entry.
`#include <cf_cfdp_types.h>`

Data Fields

- osal_id_t dir_id
- CF_CFDP_Class_t cfdp_class
- CF_TxnFilenames_t fnames
- uint16 num_ts

  number of transactions
- uint8 priority
- CF_EntityId_t dest_id
- bool busy
- bool diropen
- bool keep
- bool counted

11.92.1 Detailed Description

CF Playback entry.
Keeps the state of CF playback requests
Definition at line 200 of file cf_cfdp_types.h.

11.92.2 Field Documentation

11.92.2.1 busy `bool CF_Playback::busy`

Definition at line 209 of file cf_cfdp_types.h.
Referenced by CF_CFDP_DisableEngine(), CF_CFDP_PlaybackDir(), CF_CFDP_PlaybackDir_Initiate(), CF_CFDP_↩ ProcessPlaybackDirectories(), CF_CFDP_ProcessPlaybackDirectory(), and CF_CFDP_ProcessPollingDirectories().

11.92.2.2 cfdp_class `CF_CFDP_Class_t CF_Playback::cfdp_class`

Definition at line 203 of file cf_cfdp_types.h.
Referenced by CF_CFDP_PlaybackDir_Initiate(), and CF_CFDP_ProcessPlaybackDirectory().

11.92.2.3 counted `bool CF_Playback::counted`

Definition at line 212 of file cf_cfdp_types.h.
Referenced by CF_CFDP_UpdatePollPbCounted().

11.92.2.4 dest_id `CF_EntityId_t CF_Playback::dest_id`

Definition at line 207 of file cf_cfdp_types.h.
Referenced by CF_CFDP_PlaybackDir_Initiate(), and CF_CFDP_ProcessPlaybackDirectory().

11.92.2.5 dir_id `osal_id_t CF_Playback::dir_id`

Definition at line 202 of file cf_cfdp_types.h.
Referenced by CF_CFDP_DisableEngine(), CF_CFDP_PlaybackDir_Initiate(), and CF_CFDP_ProcessPlaybackDirectory().

11.92.2.6 diropen `bool CF_Playback::diropen`

Definition at line 210 of file cf_cfdp_types.h.
Referenced by CF_CFDP_PlaybackDir_Initiate(), and CF_CFDP_ProcessPlaybackDirectory().

11.92.2.7 fnames `CF_TxnFilenames_t CF_Playback::fnames`

Definition at line 204 of file cf_cfdp_types.h.
Referenced by CF_CFDP_PlaybackDir_Initiate(), and CF_CFDP_ProcessPlaybackDirectory().

11.92.2.8 keep `bool CF_Playback::keep`

Definition at line 211 of file cf_cfdp_types.h.
Referenced by CF_CFDP_PlaybackDir_Initiate(), and CF_CFDP_ProcessPlaybackDirectory().

11.92.2.9 num_ts `uint16 CF_Playback::num_ts`

number of transactions
Definition at line 205 of file cf_cfdp_types.h.
Referenced by CF_CFDP_ProcessPlaybackDirectory(), CF_CFDP_ProcessPollingDirectories(), and CF_CFDP_ResetTransaction().

11.92.2.10 priority `uint8 CF_Playback::priority`

Definition at line 206 of file cf_cfdp_types.h.
Referenced by CF_CFDP_PlaybackDir_Initiate(), and CF_CFDP_ProcessPlaybackDirectory().
The documentation for this struct was generated from the following file:

- apps/cf/fsw/src/cf_cfdp_types.h

11.93 CF_PlaybackDirCmd Struct Reference

Playback directory command structure.
`#include <default_cf_msgstruct.h>`

Data Fields

- CFE_MSG_CommandHeader_t CommandHeader

  Command header.
- CF_TxFile_Payload_t Payload

11.93.1 Detailed Description

Playback directory command structure.
For command details see CF_PLAYBACK_DIR_CC
Definition at line 236 of file default_cf_msgstruct.h.

11.93.2 Field Documentation

11.93.2.1 CommandHeader `CFE_MSG_CommandHeader_t CF_PlaybackDirCmd::CommandHeader`

Command header.
Definition at line 238 of file default_cf_msgstruct.h.

11.93.2.2 Payload `CF_TxFile_Payload_t CF_PlaybackDirCmd::Payload`

Definition at line 239 of file default_cf_msgstruct.h.
Referenced by CF_PlaybackDirCmd().
The documentation for this struct was generated from the following file:

- apps/cf/config/default_cf_msgstruct.h

11.94 CF_Poll Struct Reference

CF Poll entry.
`#include <cf_cfdp_types.h>`

Data Fields

- CF_Playback_t pb
- CF_Timer_t interval_timer
- bool timer_set

11.94.1 Detailed Description

CF Poll entry.
Keeps the state of CF directory polling
Definition at line 220 of file cf_cfdp_types.h.

11.94.2 Field Documentation

11.94.2.1 interval_timer `CF_Timer_t CF_Poll::interval_timer`

Definition at line 223 of file cf_cfdp_types.h.
Referenced by CF_CFDP_ProcessPollingDirectories().

11.94.2.2 pb `CF_Playback_t CF_Poll::pb`

Definition at line 222 of file cf_cfdp_types.h.
Referenced by CF_CFDP_DisableEngine(), and CF_CFDP_ProcessPollingDirectories().

11.94.2.3 timer_set `bool CF_Poll::timer_set`

Definition at line 224 of file cf_cfdp_types.h.
Referenced by CF_CFDP_ProcessPollingDirectories().
The documentation for this struct was generated from the following file:

- apps/cf/fsw/src/cf_cfdp_types.h

11.95 CF_PollDir Struct Reference

Configuration entry for directory polling.
`#include <default_cf_tbldefs.h>`

Data Fields

- uint32 interval_sec

  number of seconds to wait before trying a new directory
- uint8 priority

  priority to use when placing transactions on the pending queue
- CF_CFDP_Class_t cfdp_class

  the CFDP class to send
- CF_EntityId_t dest_eid

  destination entity id
- char src_dir [CF_FILENAME_MAX_PATH]

  path to source dir
- char dst_dir [CF_FILENAME_MAX_PATH]

  path to destination dir
- uint8 enabled

  Enabled flag.

11.95.1 Detailed Description

Configuration entry for directory polling.
Definition at line 40 of file default_cf_tbldefs.h.

11.95.2 Field Documentation

11.95.2.1 cfdp_class `CF_CFDP_Class_t CF_PollDir::cfdp_class`

the CFDP class to send
Definition at line 45 of file default_cf_tbldefs.h.
Referenced by CF_CFDP_ProcessPollingDirectories().

11.95.2.2 dest_eid `CF_EntityId_t CF_PollDir::dest_eid`

destination entity id
Definition at line 46 of file default_cf_tbldefs.h.
Referenced by CF_CFDP_ProcessPollingDirectories().

11.95.2.3 dst_dir `char CF_PollDir::dst_dir[CF_FILENAME_MAX_PATH]`

path to destination dir
Definition at line 49 of file default_cf_tbldefs.h.
Referenced by CF_CFDP_ProcessPollingDirectories().

11.95.2.4 enabled `uint8 CF_PollDir::enabled`

Enabled flag.
Definition at line 51 of file default_cf_tbldefs.h.
Referenced by CF_CFDP_ProcessPollingDirectories(), and CF_DoEnableDisablePolldir().

11.95.2.5 interval_sec `uint32 CF_PollDir::interval_sec`

number of seconds to wait before trying a new directory
Definition at line 42 of file default_cf_tbldefs.h.
Referenced by CF_CFDP_ProcessPollingDirectories().

11.95.2.6 priority `uint8 CF_PollDir::priority`

priority to use when placing transactions on the pending queue
Definition at line 44 of file default_cf_tbldefs.h.
Referenced by CF_CFDP_ProcessPollingDirectories().

11.95.2.7 src_dir `char CF_PollDir::src_dir[CF_FILENAME_MAX_PATH]`

path to source dir
Definition at line 48 of file default_cf_tbldefs.h.
Referenced by CF_CFDP_IsPollingDir(), and CF_CFDP_ProcessPollingDirectories().
The documentation for this struct was generated from the following file:

- apps/cf/config/default_cf_tbldefs.h

11.96 CF_PurgeQueueCmd Struct Reference

PurgeQueue command structure.
`#include <default_cf_msgstruct.h>`

Data Fields

- CFE_MSG_CommandHeader_t CommandHeader

  Command header.

- CF_UnionArgs_Payload_t Payload

  Generic command arguments.

11.96.1 Detailed Description

PurgeQueue command structure.
For command details see CF_PURGE_QUEUE_CC
Definition at line 181 of file default_cf_msgstruct.h.

11.96.2 Field Documentation

11.96.2.1 CommandHeader `CFE_MSG_CommandHeader_t CF_PurgeQueueCmd::CommandHeader`

Command header.
Definition at line 183 of file default_cf_msgstruct.h.

11.96.2.2 Payload `CF_UnionArgs_Payload_t CF_PurgeQueueCmd::Payload`

Generic command arguments.
Definition at line 184 of file default_cf_msgstruct.h.
Referenced by CF_PurgeQueueCmd().
The documentation for this struct was generated from the following file:

- apps/cf/config/default_cf_msgstruct.h

11.97 CF_ResetCmd Struct Reference

Reset command structure.
`#include <default_cf_msgstruct.h>`

Data Fields

- CFE_MSG_CommandHeader_t CommandHeader

  Command header.

- CF_UnionArgs_Payload_t Payload

  Generic command arguments.

11.97.1 Detailed Description

Reset command structure.
For command details see CF_RESET_CC
Definition at line 104 of file default_cf_msgstruct.h.

11.97.2 Field Documentation

11.97.2.1 CommandHeader `CFE_MSG_CommandHeader_t CF_ResetCmd::CommandHeader`

Command header.
Definition at line 106 of file default_cf_msgstruct.h.

11.97.2.2 Payload `CF_UnionArgs_Payload_t CF_ResetCmd::Payload`

Generic command arguments.
Definition at line 107 of file default_cf_msgstruct.h.
Referenced by CF_ResetCmd().
The documentation for this struct was generated from the following file:

- apps/cf/config/default_cf_msgstruct.h

11.98 CF_ResumeCmd Struct Reference

Resume command structure.
`#include <default_cf_msgstruct.h>`

Data Fields

- CFE_MSG_CommandHeader_t CommandHeader

  Command header.
- CF_Transaction_Payload_t Payload

11.98.1 Detailed Description

Resume command structure.
For command details see CF_RESUME_CC
Definition at line 258 of file default_cf_msgstruct.h.

11.98.2 Field Documentation

11.98.2.1 CommandHeader `CFE_MSG_CommandHeader_t CF_ResumeCmd::CommandHeader`

Command header.
Definition at line 260 of file default_cf_msgstruct.h.

11.98.2.2 Payload `CF_Transaction_Payload_t CF_ResumeCmd::Payload`

Definition at line 261 of file default_cf_msgstruct.h.
Referenced by CF_ResumeCmd().
The documentation for this struct was generated from the following file:

- apps/cf/config/default_cf_msgstruct.h

11.99 CF_RxS2_Data Struct Reference

Data specific to a class 2 receive file transaction.
`#include <cf_cfdp_types.h>`

Data Fields

- uint32 eof_crc
- uint32 eof_size
- uint32 rx_crc_calc_bytes
- CF_CFDP_FinDeliveryCode_t dc
- CF_CFDP_FinFileStatus_t fs
- uint8 eof_cc

  remember the cc in the received EOF PDU to echo in eof-ack
- uint8 acknak_count

11.99.1 Detailed Description

Data specific to a class 2 receive file transaction.
Definition at line 250 of file cf_cfdp_types.h.

11.99.2 Field Documentation

11.99.2.1 acknak_count `uint8 CF_RxS2_Data::acknak_count`

Definition at line 258 of file cf_cfdp_types.h.
Referenced by CF_CFDP_R2_Complete(), CF_CFDP_R2_RecvMd(), CF_CFDP_R2_SubstateRecvFileData(), and CF_CFDP_R_Tick().

11.99.2.2 dc `CF_CFDP_FinDeliveryCode_t CF_RxS2_Data::dc`

Definition at line 255 of file cf_cfdp_types.h.
Referenced by CF_CFDP_R2_CalcCrcChunk(), CF_CFDP_R2_SubstateSendFin(), and CF_CFDP_Receive↩Message().

11.99.2.3 eof_cc `uint8 CF_RxS2_Data::eof_cc`

remember the cc in the received EOF PDU to echo in eof-ack
Definition at line 257 of file cf_cfdp_types.h.
Referenced by CF_CFDP_R2_Reset(), CF_CFDP_R2_SubstateRecvEof(), and CF_CFDP_R_Tick().

11.99.2.4 eof_crc `uint32 CF_RxS2_Data::eof_crc`

Definition at line 252 of file cf_cfdp_types.h.
Referenced by CF_CFDP_R2_CalcCrcChunk(), and CF_CFDP_R2_SubstateRecvEof().

11.99.2.5 eof_size `uint32 CF_RxS2_Data::eof_size`

Definition at line 253 of file cf_cfdp_types.h.
Referenced by CF_CFDP_R2_RecvMd(), and CF_CFDP_R2_SubstateRecvEof().

11.99.2.6 fs `CF_CFDP_FinFileStatus_t CF_RxS2_Data::fs`

Definition at line 256 of file cf_cfdp_types.h.
Referenced by CF_CFDP_R2_CalcCrcChunk(), CF_CFDP_R2_SubstateSendFin(), and CF_CFDP_Receive↩Message().

11.99.2.7 rx_crc_calc_bytes `uint32 CF_RxS2_Data::rx_crc_calc_bytes`

Definition at line 254 of file cf_cfdp_types.h.
Referenced by CF_CFDP_R2_CalcCrcChunk().
The documentation for this struct was generated from the following file:

- apps/cf/fsw/src/cf_cfdp_types.h

11.100 CF_RxState_Data Struct Reference

Data specific to a receive file transaction.
`#include <cf_cfdp_types.h>`

Data Fields

- CF_RxSubState_t sub_state
- uint32 cached_pos
- CF_RxS2_Data_t r2

11.100.1 Detailed Description

Data specific to a receive file transaction.
Definition at line 264 of file cf_cfdp_types.h.

11.100.2 Field Documentation

11.100.2.1 cached_pos `uint32 CF_RxState_Data::cached_pos`

Definition at line 267 of file cf_cfdp_types.h.
Referenced by CF_CFDP_R2_CalcCrcChunk(), CF_CFDP_R2_RecvMd(), and CF_CFDP_R_ProcessFd().

11.100.2.2 r2 `CF_RxS2_Data_t CF_RxState_Data::r2`

Definition at line 269 of file cf_cfdp_types.h.
Referenced by CF_CFDP_R2_CalcCrcChunk(), CF_CFDP_R2_Complete(), CF_CFDP_R2_RecvMd(), CF_CFDP_R2_Reset(), CF_CFDP_R2_SubstateRecvEof(), CF_CFDP_R2_SubstateRecvFileData(), CF_CFDP_R2_SubstateSendFin(), CF_CFDP_R_Tick(), and CF_CFDP_ReceiveMessage().

11.100.2.3 sub_state `CF_RxSubState_t CF_RxState_Data::sub_state`

Definition at line 266 of file cf_cfdp_types.h.
Referenced by CF_CFDP_R2_Complete(), CF_CFDP_R2_Reset(), CF_CFDP_R2_SubstateRecvEof(), CF_CFDP_R2_SubstateSendFin(), CF_CFDP_R_Cancel(), CF_CFDP_R_DispatchRecv(), CF_CFDP_R_Init(), and CF_CFDP_R_Tick().
The documentation for this struct was generated from the following file:

- apps/cf/fsw/src/cf_cfdp_types.h

11.101 CF_SendHkCmd Struct Reference

Send Housekeeping Command.
`#include <default_cf_msgstruct.h>`

Data Fields

- CFE_MSG_CommandHeader_t CommandHeader

  Command header.

11.101.1 Detailed Description

Send Housekeeping Command.
Internal notification from SCH with no payload
Definition at line 291 of file default_cf_msgstruct.h.

11.101.2 Field Documentation

11.101.2.1 CommandHeader `CFE_MSG_CommandHeader_t CF_SendHkCmd::CommandHeader`

Command header.
Definition at line 293 of file default_cf_msgstruct.h.
The documentation for this struct was generated from the following file:

- apps/cf/config/default_cf_msgstruct.h

11.102 CF_SetParam_Payload Struct Reference

Set parameter command structure.
`#include <default_cf_msgdefs.h>`

Data Fields

- uint32 value

  Parameter value to set.
- uint8 key

  Parameter key, see CF_GetSet_ValueID_t.
- uint8 chan_num

  Channel number.
- uint8 spare [2]

  Alignment spare, uint32 multiple.

11.102.1 Detailed Description

Set parameter command structure.
For command details see CF_SET_PARAM_CC
Definition at line 228 of file default_cf_msgdefs.h.

11.102.2 Field Documentation

11.102.2.1 chan_num `uint8 CF_SetParam_Payload::chan_num`

Channel number.
Definition at line 232 of file default_cf_msgdefs.h.
Referenced by CF_SetParamCmd().

11.102.2.2 key `uint8 CF_SetParam_Payload::key`

Parameter key, see CF_GetSet_ValueID_t.
Definition at line 231 of file default_cf_msgdefs.h.
Referenced by CF_SetParamCmd().

11.102.2.3 spare `uint8 CF_SetParam_Payload::spare[2]`

Alignment spare, uint32 multiple.
Definition at line 233 of file default_cf_msgdefs.h.

11.102.2.4 value `uint32 CF_SetParam_Payload::value`

Parameter value to set.
Definition at line 230 of file default_cf_msgdefs.h.
Referenced by CF_SetParamCmd().
The documentation for this struct was generated from the following file:

- apps/cf/config/default_cf_msgdefs.h

11.103 CF_SetParamCmd Struct Reference

Set parameter command structure.
`#include <default_cf_msgstruct.h>`

Data Fields

- CFE_MSG_CommandHeader_t CommandHeader

  Command header.
- CF_SetParam_Payload_t Payload

11.103.1 Detailed Description

Set parameter command structure.
For command details see CF_SET_PARAM_CC
Definition at line 203 of file default_cf_msgstruct.h.

11.103.2 Field Documentation

11.103.2.1 CommandHeader `CFE_MSG_CommandHeader_t CF_SetParamCmd::CommandHeader`

Command header.
Definition at line 205 of file default_cf_msgstruct.h.

11.103.2.2 Payload `CF_SetParam_Payload_t CF_SetParamCmd::Payload`

Definition at line 206 of file default_cf_msgstruct.h.
Referenced by CF_SetParamCmd().
The documentation for this struct was generated from the following file:

- apps/cf/config/default_cf_msgstruct.h

11.104 CF_StateData Union Reference

Summary of all possible transaction state information (tx and rx)
`#include <cf_cfdp_types.h>`

Data Fields

- CF_TxState_Data_t send

  applies to only send file transactions
- CF_RxState_Data_t receive

  applies to only receive file transactions

11.104.1 Detailed Description

Summary of all possible transaction state information (tx and rx)
Definition at line 325 of file cf_cfdp_types.h.

11.104.2 Field Documentation

11.104.2.1 receive `CF_RxState_Data_t CF_StateData::receive`

applies to only receive file transactions
Definition at line 328 of file cf_cfdp_types.h.
Referenced by CF_CFDP_R2_CalcCrcChunk(), CF_CFDP_R2_Complete(), CF_CFDP_R2_RecvMd(), CF_CFDP_R2_Reset(), CF_CFDP_R2_SubstateRecvEof(), CF_CFDP_R2_SubstateRecvFileData(), CF_CFDP_R2_SubstateSendFin(), CF_CFDP_R_Cancel(), CF_CFDP_R_DispatchRecv(), CF_CFDP_R_Init(), CF_CFDP_R_ProcessFd(), CF_CFDP_R_Tick(), and CF_CFDP_ReceiveMessage().

11.104.2.2 send `CF_TxState_Data_t CF_StateData::send`

applies to only send file transactions
Definition at line 327 of file cf_cfdp_types.h.
Referenced by CF_CFDP_S2_Fin(), CF_CFDP_S2_SubstateSendEof(), CF_CFDP_S2_WaitForEofAck(), CF_CFDP_S_Cancel(), CF_CFDP_S_DispatchRecv(), CF_CFDP_S_DispatchTransmit(), CF_CFDP_S_SendFileData(), CF_CFDP_S_SubstateSendFileData(), CF_CFDP_S_SubstateSendFinAck(), CF_CFDP_S_SubstateSendMetadata(), and CF_CFDP_S_Tick().
The documentation for this union was generated from the following file:

- apps/cf/fsw/src/cf_cfdp_types.h

11.105 CF_StateFlags Union Reference

Summary of all possible transaction flags (tx and rx)
`#include <cf_cfdp_types.h>`

Data Fields

- CF_Flags_Common_t com

  applies to all transactions
- CF_Flags_Rx_t rx

  applies to only receive file transactions
- CF_Flags_Tx_t tx

  applies to only send file transactions

11.105.1 Detailed Description

Summary of all possible transaction flags (tx and rx)
Definition at line 315 of file cf_cfdp_types.h.

11.105.2 Field Documentation

11.105.2.1 com CF_Flags_Common_t CF_StateFlags::com

applies to all transactions

Definition at line 317 of file cf_cfdp_types.h.

Referenced by CF_CFDP_ArmAckTimer(), CF_CFDP_CancelTransaction(), CF_CFDP_CycleTxFirstActive(), CF_CFDP_DoTick(), CF_CFDP_GetClass(), CF_CFDP_IsSender(), CF_CFDP_MsgOutGet(), CF_CFDP_R2_CalcCrcChunk(), CF_CFDP_R2_Reset(), CF_CFDP_R2_SubstateSendFin(), CF_CFDP_R_Tick(), CF_CFDP_ReceiveMessage(), CF_CFDP_ResetTransaction(), CF_CFDP_S2_SubstateSendEof(), CF_CFDP_S2_WaitForEofAck(), CF_CFDP_S_SendEof(), CF_CFDP_S_Tick(), CF_DequeueTransaction(), CF_DoSuspRes_Txn(), CF_FreeTransaction(), CF_InsertSortPrio(), and CF_MoveTransaction().

11.105.2.2 rx CF_Flags_Rx_t CF_StateFlags::rx

applies to only receive file transactions

Definition at line 318 of file cf_cfdp_types.h.

Referenced by CF_CFDP_R2_Complete(), CF_CFDP_R2_RecvMd(), CF_CFDP_R2_Reset(), CF_CFDP_R2_SetFinTxnStatus(), CF_CFDP_R2_SubstateRecvEof(), CF_CFDP_R2_SubstateRecvFileData(), CF_CFDP_R_Cancel(), CF_CFDP_R_Init(), CF_CFDP_R_SubstateRecvEof(), CF_CFDP_R_SubstateSendNak(), CF_CFDP_R_Tick(), and CF_CFDP_RecvIdle().

11.105.2.3 tx CF_Flags_Tx_t CF_StateFlags::tx

applies to only send file transactions

Definition at line 319 of file cf_cfdp_types.h.

Referenced by CF_CFDP_ResetTransaction(), CF_CFDP_S2_Nak(), CF_CFDP_S_CheckAndRespondNak(), and CF_CFDP_TxFile().

The documentation for this union was generated from the following file:

- apps/cf/fsw/src/cf_cfdp_types.h

11.106 CF_SuspendCmd Struct Reference

Suspend command structure.

`#include <default_cf_msgstruct.h>`

Data Fields

- CFE_MSG_CommandHeader_t CommandHeader

  Command header.
- CF_Transaction_Payload_t Payload

11.106.1 Detailed Description

Suspend command structure.

For command details see CF_SUSPEND_CC

Definition at line 247 of file default_cf_msgstruct.h.

11.106.2 Field Documentation

11.106.2.1 CommandHeader CFE_MSG_CommandHeader_t CF_SuspendCmd::CommandHeader

Command header.

Definition at line 249 of file default_cf_msgstruct.h.

11.106.2.2 Payload `CF_Transaction_Payload_t CF_SuspendCmd::Payload`

Definition at line 250 of file default_cf_msgstruct.h.
Referenced by CF_SuspendCmd().
The documentation for this struct was generated from the following file:

- apps/cf/config/default_cf_msgstruct.h

11.107 CF_ThawCmd Struct Reference

Thaw command structure.
`#include <default_cf_msgstruct.h>`

Data Fields

- CFE_MSG_CommandHeader_t CommandHeader

  Command header.
- CF_UnionArgs_Payload_t Payload

  Generic command arguments.

11.107.1 Detailed Description

Thaw command structure.
For command details see CF_THAW_CC
Definition at line 126 of file default_cf_msgstruct.h.

11.107.2 Field Documentation

11.107.2.1 CommandHeader `CFE_MSG_CommandHeader_t CF_ThawCmd::CommandHeader`

Command header.
Definition at line 128 of file default_cf_msgstruct.h.

11.107.2.2 Payload `CF_UnionArgs_Payload_t CF_ThawCmd::Payload`

Generic command arguments.
Definition at line 129 of file default_cf_msgstruct.h.
Referenced by CF_ThawCmd().
The documentation for this struct was generated from the following file:

- apps/cf/config/default_cf_msgstruct.h

11.108 CF_Timer Struct Reference

Basic CF timer object.
`#include <cf_timer.h>`

Data Fields

- CF_Timer_Ticks_t tick

  expires when reaches 0

11.108.1 Detailed Description

Basic CF timer object.
Definition at line 48 of file cf_timer.h.

11.108.2 Field Documentation

11.108.2.1 tick `CF_Timer_Ticks_t CF_Timer::tick`

expires when reaches 0
Definition at line 50 of file cf_timer.h.
Referenced by CF_Timer_Expired(), CF_Timer_InitRelSec(), and CF_Timer_Tick().
The documentation for this struct was generated from the following file:

- apps/cf/fsw/src/cf_timer.h

11.109 CF_Transaction Struct Reference

Transaction state object.
`#include <cf_cfdp_types.h>`

Data Fields

- CF_TxnState_t state

  each engine is commanded to do something, which is the overall state
- CF_History_t * history

  weird, holds active filenames and possibly other info
- CF_ChunkWrapper_t * chunks

  for gap tracking, only used on class 2
- CF_Timer_t inactivity_timer

  set to the overall inactivity timer of a remote
- CF_Timer_t ack_timer

  called ack_timer, but is also nak_timer
- uint32 fsize

  lseek() should be 64-bit on 64-bit system, but osal limits to 32-bit
- uint32 foffs

  offset into file for next read
- osal_id_t fd
- CF_Crc_t crc
- uint8 keep
- uint8 chan_num

  if ever more than one engine, this may need to change to pointer
- uint8 priority
- CF_CListNode_t cl_node
- CF_Playback_t * pb

  NULL if transaction does not belong to a playback.
- CF_StateData_t state_data
- CF_StateFlags_t flags

  State flags.

11.109.1 Detailed Description

Transaction state object.
This keeps the state of CF file transactions
Definition at line 336 of file cf_cfdp_types.h.

11.109.2 Field Documentation

11.109.2.1 ack_timer `CF_Timer_t CF_Transaction::ack_timer`

called ack_timer, but is also nak_timer
Definition at line 343 of file cf_cfdp_types.h.
Referenced by CF_CFDP_ArmAckTimer(), CF_CFDP_R_Tick(), and CF_CFDP_S_Tick().

11.109.2.2 chan_num `uint8 CF_Transaction::chan_num`

if ever more than one engine, this may need to change to pointer
Definition at line 352 of file cf_cfdp_types.h.
Referenced by CF_CFDP_ArmAckTimer(), CF_CFDP_ArmInactTimer(), CF_CFDP_CycleTxFirstActive(), CF_CFDP_HandleNotKeepFile(), CF_CFDP_InitEngine(), CF_CFDP_InitTxnTxFile(), CF_CFDP_MsgOutGet(), CF_CFDP_R2_CalcCrcChunk(), CF_CFDP_R2_Complete(), CF_CFDP_R2_Recv_fin_ack(), CF_CFDP_R2_RecvMd(), CF_CFDP_R_CheckCrc(), CF_CFDP_R_DispatchRecv(), CF_CFDP_R_Init(), CF_CFDP_R_ProcessFd(), CF_CFDP_R_SendInactivityEvent(), CF_CFDP_R_SubstateRecvEof(), CF_CFDP_R_SubstateSendNak(), CF_CFDP_R_Tick(), CF_CFDP_RecvDrop(), CF_CFDP_RecvFd(), CF_CFDP_RecvIdle(), CF_CFDP_RecvMd(), CF_CFDP_ResetTransaction(), CF_CFDP_S2_Nak(), CF_CFDP_S2_WaitForEofAck(), CF_CFDP_S_DispatchRecv(), CF_CFDP_S_SendFileData(), CF_CFDP_S_SubstateSendMetadata(), CF_CFDP_S_Tick(), CF_CFDP_SendAck(), CF_CFDP_SendEof(), CF_CFDP_SendEotPkt(), CF_CFDP_SendFd(), CF_CFDP_SendFin(), CF_CFDP_SendMd(), CF_CFDP_SendNak(), CF_DequeueTransaction(), CF_FreeTransaction(), CF_InsertSortPrio(), and CF_MoveTransaction().

11.109.2.3 chunks `CF_ChunkWrapper_t* CF_Transaction::chunks`

for gap tracking, only used on class 2
Definition at line 341 of file cf_cfdp_types.h.
Referenced by CF_CFDP_R2_Complete(), CF_CFDP_R2_SubstateRecvFileData(), CF_CFDP_R_SubstateSendNak(), CF_CFDP_RecvIdle(), CF_CFDP_ResetTransaction(), CF_CFDP_S2_Nak(), CF_CFDP_S_CheckAndRespondNak(), and CF_CFDP_TxFile_Initiate().

11.109.2.4 cl_node `CF_CListNode_t CF_Transaction::cl_node`

Definition at line 355 of file cf_cfdp_types.h.
Referenced by CF_CFDP_ReceiveMessage(), CF_DequeueTransaction(), CF_FindUnusedTransaction(), CF_FreeTransaction(), CF_InsertSortPrio(), and CF_MoveTransaction().

11.109.2.5 crc `CF_Crc_t CF_Transaction::crc`

Definition at line 349 of file cf_cfdp_types.h.
Referenced by CF_CFDP_R1_SubstateRecvFileData(), CF_CFDP_R2_CalcCrcChunk(), CF_CFDP_R_CheckCrc(), CF_CFDP_S_SendEof(), CF_CFDP_S_SendFileData(), CF_CFDP_SendEof(), and CF_CFDP_SendEotPkt().

11.109.2.6 fd `osal_id_t CF_Transaction::fd`

Definition at line 347 of file cf_cfdp_types.h.

Referenced by CF_CFDP_CloseFiles(), CF_CFDP_R2_CalcCrcChunk(), CF_CFDP_R2_RecvMd(), CF_CFDP_R_Init(), CF_CFDP_R_ProcessFd(), CF_CFDP_ResetTransaction(), CF_CFDP_S_SendFileData(), CF_CFDP_S_SubstateSendMetadata(), and CF_FreeTransaction().

11.109.2.7 flags `CF_StateFlags_t CF_Transaction::flags`

State flags.

Note

The flags here look a little strange, because there are different flags for TX and RX. Both types share the same type of flag, though. Since RX flags plus the global flags is over one byte, storing them this way allows 2 bytes to cover all possible flags. Please ignore the duplicate declarations of the "all" flags.

Definition at line 369 of file cf_cfdp_types.h.
Referenced by CF_CFDP_ArmAckTimer(), CF_CFDP_CancelTransaction(), CF_CFDP_CycleTxFirstActive(), CF_CFDP_DoTick(), CF_CFDP_GetClass(), CF_CFDP_IsSender(), CF_CFDP_MsgOutGet(), CF_CFDP_R2_CalcCrcChunk(), CF_CFDP_R2_Complete(), CF_CFDP_R2_RecvMd(), CF_CFDP_R2_Reset(), CF_CFDP_R2_SetFinTxnStatus(), CF_CFDP_R2_SubstateRecvEof(), CF_CFDP_R2_SubstateRecvFileData(), CF_CFDP_R2_SubstateSendFin(), CF_CFDP_R_Cancel(), CF_CFDP_R_Init(), CF_CFDP_R_SubstateRecvEof(), CF_CFDP_R_SubstateSendNak(), CF_CFDP_R_Tick(), CF_CFDP_ReceiveMessage(), CF_CFDP_RecvIdle(), CF_CFDP_ResetTransaction(), CF_CFDP_S2_Nak(), CF_CFDP_S2_SubstateSendEof(), CF_CFDP_S2_WaitForEofAck(), CF_CFDP_S_CheckAndRespondNak(), CF_CFDP_S_SendEof(), CF_CFDP_S_Tick(), CF_CFDP_TxFile(), CF_DequeueTransaction(), CF_DoSuspRes_Txn(), CF_FreeTransaction(), CF_InsertSortPrio(), and CF_MoveTransaction().

11.109.2.8 foffs `uint32 CF_Transaction::foffs`

offset into file for next read
Definition at line 346 of file cf_cfdp_types.h.
Referenced by CF_CFDP_S_SubstateSendFileData().

11.109.2.9 fsize `uint32 CF_Transaction::fsize`

lseek() should be 64-bit on 64-bit system, but osal limits to 32-bit
Definition at line 345 of file cf_cfdp_types.h.
Referenced by CF_CFDP_R2_CalcCrcChunk(), CF_CFDP_R2_Complete(), CF_CFDP_R2_RecvMd(), CF_CFDP_R_SubstateRecvEof(), CF_CFDP_R_SubstateSendNak(), CF_CFDP_RecvMd(), CF_CFDP_S2_Nak(), CF_CFDP_S_SendFileData(), CF_CFDP_S_SubstateSendFileData(), CF_CFDP_S_SubstateSendMetadata(), CF_CFDP_SendEof(), CF_CFDP_SendEotPkt(), and CF_CFDP_SendMd().

11.109.2.10 history `CF_History_t* CF_Transaction::history`

weird, holds active filenames and possibly other info
Definition at line 340 of file cf_cfdp_types.h.
Referenced by CF_CFDP_HandleNotKeepFile(), CF_CFDP_ProcessPlaybackDirectory(), CF_CFDP_R2_CalcCrcChunk(), CF_CFDP_R2_Complete(), CF_CFDP_R2_Recv_fin_ack(), CF_CFDP_R2_RecvMd(), CF_CFDP_R2_Reset(), CF_CFDP_R2_SubstateSendFin(), CF_CFDP_R_CheckCrc(), CF_CFDP_R_DispatchRecv(), CF_CFDP_R_Init(), CF_CFDP_R_ProcessFd(), CF_CFDP_R_SendInactivityEvent(), CF_CFDP_R_SubstateRecvEof(), CF_CFDP_R_SubstateSendNak(), CF_CFDP_R_Tick(), CF_CFDP_ReceiveMessage(), CF_CFDP_RecvIdle(), CF_CFDP_RecvMd(), CF_CFDP_ResetTransaction(), CF_CFDP_S2_EarlyFin(), CF_CFDP_S2_Nak(), CF_CFDP_S2_WaitForEofAck(), CF_CFDP_S_DispatchRecv(), CF_CFDP_S_SendFileData(), CF_CFDP_S_SubstateSendFinAck(), CF_CFDP_S_SubstateSendMetadata(), CF_CFDP_S_Tick(), CF_CFDP_SendEof(), CF_CFDP_SendEotPkt(), CF_CFDP_SendFin(), CF_CFDP_SendMd(), CF_CFDP_SetTxnStatus(), CF_CFDP_TxFile(), CF_CFDP_TxFile_Initiate(), CF_FindTransactionBySequenceNumber_Impl(), CF_FindUnusedTransaction(), and CF_Traverse_WriteTxnQueueEntryToFile().

11.109.2.11 inactivity_timer `CF_Timer_t CF_Transaction::inactivity_timer`

set to the overall inactivity timer of a remote

Definition at line 342 of file cf_cfdp_types.h.

Referenced by CF_CFDP_ArmInactTimer(), CF_CFDP_R_Tick(), and CF_CFDP_S_Tick().

11.109.2.12 keep `uint8 CF_Transaction::keep`

Definition at line 351 of file cf_cfdp_types.h.

Referenced by CF_CFDP_InitTxnTxFile(), CF_CFDP_R1_SubstateRecvEof(), CF_CFDP_R2_CalcCrcChunk(), and CF_CFDP_ResetTransaction().

11.109.2.13 pb `CF_Playback_t* CF_Transaction::pb`

NULL if transaction does not belong to a playback.

Definition at line 357 of file cf_cfdp_types.h.

Referenced by CF_CFDP_ProcessPlaybackDirectory(), and CF_CFDP_ResetTransaction().

11.109.2.14 priority `uint8 CF_Transaction::priority`

Definition at line 353 of file cf_cfdp_types.h.

Referenced by CF_CFDP_InitTxnTxFile(), CF_InsertSortPrio(), and CF_PrioSearch().

11.109.2.15 state `CF_TxnState_t CF_Transaction::state`

each engine is commanded to do something, which is the overall state

Definition at line 338 of file cf_cfdp_types.h.

Referenced by CF_CFDP_GetClass(), CF_CFDP_InitTxnTxFile(), CF_CFDP_IsSender(), CF_CFDP_R2_CalcCrc↩Chunk(), CF_CFDP_R2_Complete(), CF_CFDP_R2_Recv_fin_ack(), CF_CFDP_R2_RecvMd(), CF_CFDP_R_↩Cancel(), CF_CFDP_R_CheckCrc(), CF_CFDP_R_DispatchRecv(), CF_CFDP_R_Init(), CF_CFDP_R_ProcessFd(), CF_CFDP_R_SendInactivityEvent(), CF_CFDP_R_SubstateRecvEof(), CF_CFDP_R_SubstateSendNak(), CF_CF↩DP_R_Tick(), CF_CFDP_ReceiveMessage(), CF_CFDP_RecvIdle(), CF_CFDP_RxStateDispatch(), CF_CFDP_S2↩_EarlyFin(), CF_CFDP_S2_Nak(), CF_CFDP_S2_WaitForEofAck(), CF_CFDP_S_DispatchRecv(), CF_CFDP_S_↩SendFileData(), CF_CFDP_S_SubstateSendMetadata(), CF_CFDP_S_Tick(), CF_CFDP_SendEotPkt(), CF_CFDP↩_SendMd(), CF_CFDP_TxFile(), CF_CFDP_TxStateDispatch(), CF_FreeTransaction(), and CF_InsertSortPrio().

11.109.2.16 state_data `CF_StateData_t CF_Transaction::state_data`

Definition at line 359 of file cf_cfdp_types.h.

Referenced by CF_CFDP_R2_CalcCrcChunk(), CF_CFDP_R2_Complete(), CF_CFDP_R2_RecvMd(), CF_CFDP_↩R2_Reset(), CF_CFDP_R2_SubstateRecvEof(), CF_CFDP_R2_SubstateRecvFileData(), CF_CFDP_R2_Substate↩SendFin(), CF_CFDP_R_Cancel(), CF_CFDP_R_DispatchRecv(), CF_CFDP_R_Init(), CF_CFDP_R_ProcessFd(), CF_CFDP_R_Tick(), CF_CFDP_ReceiveMessage(), CF_CFDP_S2_Fin(), CF_CFDP_S2_SubstateSendEof(), CF_↩CFDP_S2_WaitForEofAck(), CF_CFDP_S_Cancel(), CF_CFDP_S_DispatchRecv(), CF_CFDP_S_DispatchTransmit(), CF_CFDP_S_SendFileData(), CF_CFDP_S_SubstateSendFileData(), CF_CFDP_S_SubstateSendFinAck(), CF_CF↩DP_S_SubstateSendMetadata(), and CF_CFDP_S_Tick().

The documentation for this struct was generated from the following file:

- apps/cf/fsw/src/cf_cfdp_types.h

11.110 CF_Transaction_Payload Struct Reference

Transaction command structure.
`#include <default_cf_msgdefs.h>`

Data Fields

- CF_TransactionSeq_t ts

  Transaction sequence number.
- CF_EntityId_t eid

  Entity id.
- uint8 chan

  Channel number: 254=use ts, 255=all channels, else channel.
- uint8 spare [3]

  Alignment spare for 32-bit multiple.

11.110.1 Detailed Description

Transaction command structure.
For command details see CF_SUSPEND_CC, CF_RESUME_CC, CF_CANCEL_CC, CF_ABANDON_CC
Definition at line 272 of file default_cf_msgdefs.h.

11.110.2 Field Documentation

11.110.2.1 chan `uint8 CF_Transaction_Payload::chan`

Channel number: 254=use ts, 255=all channels, else channel.
Definition at line 276 of file default_cf_msgdefs.h.
Referenced by CF_TsnChanAction().

11.110.2.2 eid `CF_EntityId_t CF_Transaction_Payload::eid`

Entity id.
Definition at line 275 of file default_cf_msgdefs.h.
Referenced by CF_TsnChanAction().

11.110.2.3 spare `uint8 CF_Transaction_Payload::spare[3]`

Alignment spare for 32-bit multiple.
Definition at line 277 of file default_cf_msgdefs.h.

11.110.2.4 ts `CF_TransactionSeq_t CF_Transaction_Payload::ts`

Transaction sequence number.
Definition at line 274 of file default_cf_msgdefs.h.
Referenced by CF_TsnChanAction().
The documentation for this struct was generated from the following file:

- apps/cf/config/default_cf_msgdefs.h

11.111 CF_Traverse_PriorityArg Struct Reference

Argument structure for use with CF_CList_Traverse_R()
`#include <cf_utils.h>`

Data Fields

- CF_Transaction_t * txn

  OUT: holds value of transaction with which to call CF_CList_InsertAfter on.
- uint8 priority

  seeking this priority

11.111.1 Detailed Description

Argument structure for use with CF_CList_Traverse_R()
This is for searching for transactions of a specific priority
Definition at line 107 of file cf_utils.h.

11.111.2 Field Documentation

11.111.2.1 priority `uint8 CF_Traverse_PriorityArg::priority`

seeking this priority
Definition at line 110 of file cf_utils.h.
Referenced by CF_PrioSearch().

11.111.2.2 txn `CF_Transaction_t* CF_Traverse_PriorityArg::txn`

OUT: holds value of transaction with which to call CF_CList_InsertAfter on.
Definition at line 109 of file cf_utils.h.
Referenced by CF_InsertSortPrio(), and CF_PrioSearch().
The documentation for this struct was generated from the following file:

- apps/cf/fsw/src/cf_utils.h

11.112 CF_Traverse_TransSeqArg Struct Reference

Argument structure for use with CList_Traverse()
`#include <cf_utils.h>`

Data Fields

- CF_TransactionSeq_t transaction_sequence_number
- CF_EntityId_t src_eid
- CF_Transaction_t * txn

  output transaction pointer

11.112.1 Detailed Description

Argument structure for use with CList_Traverse()
This identifies a specific transaction sequence number and entity ID The transaction pointer is set by the implementation
Definition at line 39 of file cf_utils.h.

11.112.2 Field Documentation

11.112.2.1 src_eid `CF_EntityId_t CF_Traverse_TransSeqArg::src_eid`

Definition at line 42 of file cf_utils.h.
Referenced by CF_FindTransactionBySequenceNumber_Impl().

11.112.2.2 transaction_sequence_number `CF_TransactionSeq_t CF_Traverse_TransSeqArg::transaction↩_sequence_number`

Definition at line 41 of file cf_utils.h.
Referenced by CF_FindTransactionBySequenceNumber_Impl().

11.112.2.3 txn `CF_Transaction_t* CF_Traverse_TransSeqArg::txn`

output transaction pointer
Definition at line 43 of file cf_utils.h.
Referenced by CF_FindTransactionBySequenceNumber(), and CF_FindTransactionBySequenceNumber_Impl().
The documentation for this struct was generated from the following file:

- apps/cf/fsw/src/cf_utils.h

11.113 CF_Traverse_WriteHistoryFileArg Struct Reference

Argument structure for use with CF_Traverse_WriteHistoryQueueEntryToFile()
`#include <cf_utils.h>`

Data Fields

- osal_id_t fd
- CF_Direction_t filter_dir
- bool error

  Will be set to true if any write failed.
- uint32 counter

  Total number of entries written.

11.113.1 Detailed Description

Argument structure for use with CF_Traverse_WriteHistoryQueueEntryToFile()
This is used for writing status files. It contains a designated file descriptor for output and counters.
When traversing history, the list contains all entries, and may need additional filtering for direction (TX/RX) depending on what information the user has requested.
Definition at line 55 of file cf_utils.h.

11.113.2 Field Documentation

11.113.2.1 counter `uint32 CF_Traverse_WriteHistoryFileArg::counter`

Total number of entries written.
Definition at line 61 of file cf_utils.h.
Referenced by CF_Traverse_WriteHistoryQueueEntryToFile(), and CF_WriteHistoryQueueDataToFile().

11.113.2.2 error `bool CF_Traverse_WriteHistoryFileArg::error`

Will be set to true if any write failed.
Definition at line 60 of file cf_utils.h.
Referenced by CF_Traverse_WriteHistoryQueueEntryToFile(), and CF_WriteHistoryQueueDataToFile().

11.113.2.3 fd `osal_id_t CF_Traverse_WriteHistoryFileArg::fd`

Definition at line 57 of file cf_utils.h.
Referenced by CF_Traverse_WriteHistoryQueueEntryToFile(), and CF_WriteHistoryQueueDataToFile().

11.113.2.4 filter_dir `CF_Direction_t CF_Traverse_WriteHistoryFileArg::filter_dir`

Definition at line 58 of file cf_utils.h.
Referenced by CF_Traverse_WriteHistoryQueueEntryToFile(), and CF_WriteHistoryQueueDataToFile().
The documentation for this struct was generated from the following file:

- apps/cf/fsw/src/cf_utils.h

11.114 CF_Traverse_WriteTxnFileArg Struct Reference

Argument structure for use with CF_Traverse_WriteTxnQueueEntryToFile()
`#include <cf_utils.h>`

Data Fields

- osal_id_t fd
- bool error

  Will be set to true if any write failed.
- uint32 counter

  Total number of entries written.

11.114.1 Detailed Description

Argument structure for use with CF_Traverse_WriteTxnQueueEntryToFile()
This is used for writing status files. It contains a designated file descriptor for output and counters.
When traversing transactions, the entire list is written to the file. No additional filtering is necessary, because the queues themselves are limited in what they contain (therefore "pre-filtered" to some degree).
Definition at line 74 of file cf_utils.h.

11.114.2 Field Documentation

11.114.2.1 counter `uint32 CF_Traverse_WriteTxnFileArg::counter`

Total number of entries written.
Definition at line 79 of file cf_utils.h.
Referenced by CF_Traverse_WriteTxnQueueEntryToFile(), and CF_WriteTxnQueueDataToFile().

11.114.2.2 error `bool CF_Traverse_WriteTxnFileArg::error`

Will be set to true if any write failed.
Definition at line 78 of file cf_utils.h.
Referenced by CF_Traverse_WriteTxnQueueEntryToFile(), and CF_WriteTxnQueueDataToFile().

11.114.2.3 fd `osal_id_t CF_Traverse_WriteTxnFileArg::fd`

Definition at line 76 of file cf_utils.h.
Referenced by CF_Traverse_WriteTxnQueueEntryToFile(), and CF_WriteTxnQueueDataToFile().
The documentation for this struct was generated from the following file:

- apps/cf/fsw/src/cf_utils.h

11.115 CF_TraverseAll_Arg Struct Reference

Argument structure for use with CF_TraverseAllTransactions()
`#include <cf_utils.h>`

Data Fields

- CF_TraverseAllTransactions_fn_t fn

  internal callback to use for each CList_Traverse
- void * context

  opaque object to pass to internal callback
- int32 counter

  Running tally of all nodes traversed from all lists.

11.115.1 Detailed Description

Argument structure for use with CF_TraverseAllTransactions()
This basically allows for running a CF_Traverse on several lists at once
Definition at line 95 of file cf_utils.h.

11.115.2 Field Documentation

11.115.2.1 context `void* CF_TraverseAll_Arg::context`

opaque object to pass to internal callback
Definition at line 98 of file cf_utils.h.
Referenced by CF_TraverseAllTransactions_Impl().

11.115.2.2 counter `int32 CF_TraverseAll_Arg::counter`

Running tally of all nodes traversed from all lists.
Definition at line 99 of file cf_utils.h.
Referenced by CF_TraverseAllTransactions(), and CF_TraverseAllTransactions_Impl().

11.115.2.3 fn `CF_TraverseAllTransactions_fn_t CF_TraverseAll_Arg::fn`

internal callback to use for each CList_Traverse
Definition at line 97 of file cf_utils.h.
Referenced by CF_TraverseAllTransactions_Impl().
The documentation for this struct was generated from the following file:

- apps/cf/fsw/src/cf_utils.h

11.116 CF_TxFile_Payload Struct Reference

Transmit file command structure.
`#include <default_cf_msgdefs.h>`

Data Fields

- uint8 cfdp_class

  CFDP class: 0=class 1, 1=class 2.
- uint8 keep

  Keep file flag: 1=keep, else delete.
- uint8 chan_num

  Channel number.
- uint8 priority

  Priority: 0=highest priority.
- CF_EntityId_t dest_id

  Destination entity id.
- char src_filename [CF_FILENAME_MAX_LEN]

  Source file/directory name.
- char dst_filename [CF_FILENAME_MAX_LEN]

  Destination file/directory name.

11.116.1 Detailed Description

Transmit file command structure.
For command details see CF_TX_FILE_CC
Definition at line 241 of file default_cf_msgdefs.h.

11.116.2 Field Documentation

11.116.2.1 cfdp_class `uint8 CF_TxFile_Payload::cfdp_class`

CFDP class: 0=class 1, 1=class 2.
Definition at line 243 of file default_cf_msgdefs.h.
Referenced by CF_PlaybackDirCmd(), and CF_TxFileCmd().

11.116.2.2 chan_num `uint8 CF_TxFile_Payload::chan_num`

Channel number.
Definition at line 245 of file default_cf_msgdefs.h.
Referenced by CF_PlaybackDirCmd(), and CF_TxFileCmd().

11.116.2.3 dest_id `CF_EntityId_t CF_TxFile_Payload::dest_id`

Destination entity id.
Definition at line 247 of file default_cf_msgdefs.h.
Referenced by CF_PlaybackDirCmd(), and CF_TxFileCmd().

11.116.2.4 dst_filename `char CF_TxFile_Payload::dst_filename[CF_FILENAME_MAX_LEN]`

Destination file/directory name.
Definition at line 249 of file default_cf_msgdefs.h.
Referenced by CF_PlaybackDirCmd(), and CF_TxFileCmd().

11.116.2.5 keep `uint8 CF_TxFile_Payload::keep`

Keep file flag: 1=keep, else delete.
Definition at line 244 of file default_cf_msgdefs.h.
Referenced by CF_PlaybackDirCmd(), and CF_TxFileCmd().

11.116.2.6 priority `uint8 CF_TxFile_Payload::priority`

Priority: 0=highest priority.
Definition at line 246 of file default_cf_msgdefs.h.
Referenced by CF_PlaybackDirCmd(), and CF_TxFileCmd().

11.116.2.7 src_filename `char CF_TxFile_Payload::src_filename[CF_FILENAME_MAX_LEN]`

Source file/directory name.
Definition at line 248 of file default_cf_msgdefs.h.
Referenced by CF_PlaybackDirCmd(), and CF_TxFileCmd().
The documentation for this struct was generated from the following file:

- apps/cf/config/default_cf_msgdefs.h

11.117 CF_TxFileCmd Struct Reference

Transmit file command structure.
`#include <default_cf_msgstruct.h>`

Data Fields

- CFE_MSG_CommandHeader_t CommandHeader

  Command header.
- CF_TxFile_Payload_t Payload

11.117.1 Detailed Description

Transmit file command structure.
For command details see CF_TX_FILE_CC
Definition at line 214 of file default_cf_msgstruct.h.

11.117.2 Field Documentation

11.117.2.1 CommandHeader `CFE_MSG_CommandHeader_t CF_TxFileCmd::CommandHeader`

Command header.
Definition at line 216 of file default_cf_msgstruct.h.

11.117.2.2 Payload `CF_TxFile_Payload_t CF_TxFileCmd::Payload`

Definition at line 217 of file default_cf_msgstruct.h.
Referenced by CF_TxFileCmd().
The documentation for this struct was generated from the following file:

- apps/cf/config/default_cf_msgstruct.h

11.118 CF_TxnFilenames Struct Reference

Cache of source and destination filename.
`#include <default_cf_extern_typedefs.h>`

Data Fields

- char src_filename [CF_FILENAME_MAX_LEN]
- char dst_filename [CF_FILENAME_MAX_LEN]

11.118.1 Detailed Description

Cache of source and destination filename.
This pairs a source and destination file name together to be retained for future reference in the transaction/history
Definition at line 90 of file default_cf_extern_typedefs.h.

11.118.2 Field Documentation

11.118.2.1 dst_filename `char CF_TxnFilenames::dst_filename[CF_FILENAME_MAX_LEN]`

Definition at line 93 of file default_cf_extern_typedefs.h.
Referenced by CF_CFDP_HandleNotKeepFile(), CF_CFDP_PlaybackDir_Initiate(), CF_CFDP_ProcessPlayback↩Directory(), CF_CFDP_R2_RecvMd(), CF_CFDP_R_Init(), CF_CFDP_RecvMd(), CF_CFDP_SendMd(), CF_CFDP_↩TxFile(), CF_CFDP_TxFile_Initiate(), and CF_WriteHistoryEntryToFile().

11.118.2.2 src_filename `char CF_TxnFilenames::src_filename[CF_FILENAME_MAX_LEN]`

Definition at line 92 of file default_cf_extern_typedefs.h.
Referenced by CF_CFDP_HandleNotKeepFile(), CF_CFDP_PlaybackDir_Initiate(), CF_CFDP_ProcessPlayback↩Directory(), CF_CFDP_RecvMd(), CF_CFDP_S_SubstateSendMetadata(), CF_CFDP_SendMd(), CF_CFDP_TxFile(), CF_CFDP_TxFile_Initiate(), and CF_WriteHistoryEntryToFile().
The documentation for this struct was generated from the following file:

- apps/cf/config/default_cf_extern_typedefs.h

11.119 CF_TxS2_Data Struct Reference

Data specific to a class 2 send file transaction.
`#include <cf_cfdp_types.h>`

Data Fields

- uint8 fin_cc

  remember the cc in the received FIN PDU to echo in eof-fin
- uint8 acknak_count

11.119.1 Detailed Description

Data specific to a class 2 send file transaction.
Definition at line 230 of file cf_cfdp_types.h.

11.119.2 Field Documentation

11.119.2.1 acknak_count `uint8 CF_TxS2_Data::acknak_count`

Definition at line 233 of file cf_cfdp_types.h.
Referenced by CF_CFDP_S_Tick().

11.119.2.2 fin_cc `uint8 CF_TxS2_Data::fin_cc`

remember the cc in the received FIN PDU to echo in eof-fin
Definition at line 232 of file cf_cfdp_types.h.
Referenced by CF_CFDP_S2_Fin(), and CF_CFDP_S_SubstateSendFinAck().
The documentation for this struct was generated from the following file:

- apps/cf/fsw/src/cf_cfdp_types.h

11.120 CF_TxState_Data Struct Reference

Data specific to a send file transaction.
`#include <cf_cfdp_types.h>`

Data Fields

- CF_TxSubState_t sub_state
- uint32 cached_pos
- CF_TxS2_Data_t s2

11.120.1 Detailed Description

Data specific to a send file transaction.
Definition at line 239 of file cf_cfdp_types.h.

11.120.2 Field Documentation

11.120.2.1 cached_pos `uint32 CF_TxState_Data::cached_pos`

Definition at line 242 of file cf_cfdp_types.h.
Referenced by CF_CFDP_S_SendFileData().

11.120.2.2 s2 `CF_TxS2_Data_t CF_TxState_Data::s2`

Definition at line 244 of file cf_cfdp_types.h.
Referenced by CF_CFDP_S2_Fin(), CF_CFDP_S_SubstateSendFinAck(), and CF_CFDP_S_Tick().

11.120.2.3 sub_state `CF_TxSubState_t CF_TxState_Data::sub_state`

Definition at line 241 of file cf_cfdp_types.h.
Referenced by CF_CFDP_S2_Fin(), CF_CFDP_S2_SubstateSendEof(), CF_CFDP_S2_WaitForEofAck(), CF_CFDP↩_S_Cancel(), CF_CFDP_S_DispatchRecv(), CF_CFDP_S_DispatchTransmit(), CF_CFDP_S_SubstateSendFileData(), CF_CFDP_S_SubstateSendMetadata(), and CF_CFDP_S_Tick().
The documentation for this struct was generated from the following file:

- apps/cf/fsw/src/cf_cfdp_types.h

11.121 CF_UnionArgs_Payload Union Reference

Command payload argument union to support 4 uint8's, 2 uint16's or 1 uint32.
`#include <default_cf_msgdefs.h>`

Data Fields

- uint32 dword

  Generic uint32 argument.
- uint16 hword [2]

  Generic uint16 array of arguments.
- uint8 byte [4]

  Generic uint8 array of arguments.

11.121.1 Detailed Description

Command payload argument union to support 4 uint8's, 2 uint16's or 1 uint32.
Definition at line 151 of file default_cf_msgdefs.h.

11.121.2 Field Documentation

11.121.2.1 byte `uint8 CF_UnionArgs_Payload::byte[4]`

Generic uint8 array of arguments.
Definition at line 155 of file default_cf_msgdefs.h.
Referenced by CF_DoChanAction(), CF_DoEnableDisablePolldir(), CF_DoPurgeQueue(), and CF_ResetCmd().

11.121.2.2 dword `uint32 CF_UnionArgs_Payload::dword`

Generic uint32 argument.
Definition at line 153 of file default_cf_msgdefs.h.

11.121.2.3 hword `uint16 CF_UnionArgs_Payload::hword[2]`

Generic uint16 array of arguments.
Definition at line 154 of file default_cf_msgdefs.h.
The documentation for this union was generated from the following file:

- apps/cf/config/default_cf_msgdefs.h

11.122 CF_WakeupCmd Struct Reference

Wake Up Command.
`#include <default_cf_msgstruct.h>`

Data Fields

- CFE_MSG_CommandHeader_t CommandHeader

  Command header.

11.122.1 Detailed Description

Wake Up Command.
Internal notification from SCH with no payload
Definition at line 301 of file default_cf_msgstruct.h.

11.122.2 Field Documentation

11.122.2.1 CommandHeader `CFE_MSG_CommandHeader_t CF_WakeupCmd::CommandHeader`

Command header.
Definition at line 303 of file default_cf_msgstruct.h.
The documentation for this struct was generated from the following file:

- apps/cf/config/default_cf_msgstruct.h

11.123 CF_WriteQueue_Payload Struct Reference

Write Queue command structure.
`#include <default_cf_msgdefs.h>`

Data Fields

- uint8 type

  Transaction direction: all=0, up=1, down=2.
- uint8 chan

  Channel number.
- uint8 queue

  Queue type: 0=pending, 1=active, 2=history, 3=all.
- uint8 spare

  Alignment spare, puts filename on 32-bit boundary.
- char filename [CF_FILENAME_MAX_LEN]

  Filename written to.

11.123.1 Detailed Description

Write Queue command structure.
For command details see CF_WRITE_QUEUE_CC
Definition at line 257 of file default_cf_msgdefs.h.

11.123.2 Field Documentation

11.123.2.1 chan `uint8 CF_WriteQueue_Payload::chan`

Channel number.
Definition at line 260 of file default_cf_msgdefs.h.
Referenced by CF_WriteQueueCmd().

11.123.2.2 filename `char CF_WriteQueue_Payload::filename[CF_FILENAME_MAX_LEN]`

Filename written to.
Definition at line 264 of file default_cf_msgdefs.h.
Referenced by CF_WriteQueueCmd().

11.123.2.3 queue `uint8 CF_WriteQueue_Payload::queue`

Queue type: 0=pending, 1=active, 2=history, 3=all.
Definition at line 261 of file default_cf_msgdefs.h.
Referenced by CF_WriteQueueCmd().

11.123.2.4 spare `uint8 CF_WriteQueue_Payload::spare`

Alignment spare, puts filename on 32-bit boundary.
Definition at line 262 of file default_cf_msgdefs.h.

11.123.2.5 type `uint8 CF_WriteQueue_Payload::type`

Transaction direction: all=0, up=1, down=2.
Definition at line 259 of file default_cf_msgdefs.h.
Referenced by CF_WriteQueueCmd().
The documentation for this struct was generated from the following file:

- apps/cf/config/default_cf_msgdefs.h

11.124 CF_WriteQueueCmd Struct Reference

Write Queue command structure.
`#include <default_cf_msgstruct.h>`

Data Fields

- CFE_MSG_CommandHeader_t CommandHeader

  Command header.
- CF_WriteQueue_Payload_t Payload

11.124.1 Detailed Description

Write Queue command structure.
For command details see CF_WRITE_QUEUE_CC
Definition at line 225 of file default_cf_msgstruct.h.

11.124.2 Field Documentation

11.124.2.1 CommandHeader `CFE_MSG_CommandHeader_t CF_WriteQueueCmd::CommandHeader`

Command header.
Definition at line 227 of file default_cf_msgstruct.h.

11.124.2.2 Payload `CF_WriteQueue_Payload_t CF_WriteQueueCmd::Payload`

Definition at line 228 of file default_cf_msgstruct.h.
Referenced by CF_WriteQueueCmd().
The documentation for this struct was generated from the following file:

- apps/cf/config/default_cf_msgstruct.h

11.125 CFE_Config_ArrayValue Struct Reference

Wrapper type for array configuration.

```
#include <cfe_config_api_typedefs.h>
```

Data Fields

- size_t NumElements
- const void * ElementPtr

11.125.1 Detailed Description

Wrapper type for array configuration.
This is a pair containing a size and pointer that is get/set via a single config table entry
Definition at line 59 of file cfe_config_api_typedefs.h.

11.125.2 Field Documentation

11.125.2.1 ElementPtr `const void* CFE_Config_ArrayValue::ElementPtr`

Definition at line 62 of file cfe_config_api_typedefs.h.

11.125.2.2 NumElements `size_t CFE_Config_ArrayValue::NumElements`

Definition at line 61 of file cfe_config_api_typedefs.h.
The documentation for this struct was generated from the following file:

- cfe/modules/core_api/fsw/inc/cfe_config_api_typedefs.h

11.126 CFE_Config_IdNameEntry Struct Reference

```
#include <cfe_config_nametable.h>
```

Data Fields

- const char * Name

11.126.1 Detailed Description

Definition at line 33 of file cfe_config_nametable.h.

11.126.2 Field Documentation

11.126.2.1 Name `const char* CFE_Config_IdNameEntry::Name`

Definition at line 35 of file cfe_config_nametable.h.

The documentation for this struct was generated from the following file:

- cfe/modules/config/fsw/inc/cfe_config_nametable.h

11.127 CFE_Config_ValueBuffer Union Reference

`#include <cfe_config_table.h>`

Data Fields

- uint32 AsInteger
- const void * AsPointer

11.127.1 Detailed Description

Definition at line 43 of file cfe_config_table.h.

11.127.2 Field Documentation

11.127.2.1 AsInteger `uint32 CFE_Config_ValueBuffer::AsInteger`

Definition at line 45 of file cfe_config_table.h.

11.127.2.2 AsPointer `const void* CFE_Config_ValueBuffer::AsPointer`

Definition at line 46 of file cfe_config_table.h.

The documentation for this union was generated from the following file:

- cfe/modules/config/fsw/inc/cfe_config_table.h

11.128 CFE_Config_ValueEntry Struct Reference

`#include <cfe_config_table.h>`

Data Fields

- CFE_ConfigType_t ActualType
- CFE_Config_ValueBuffer_t Datum

11.128.1 Detailed Description

Definition at line 49 of file cfe_config_table.h.

11.128.2 Field Documentation

11.128.2.1 ActualType `CFE_ConfigType_t CFE_Config_ValueEntry::ActualType`

Definition at line 51 of file cfe_config_table.h.

11.128.2.2 Datum `CFE_Config_ValueBuffer_t CFE_Config_ValueEntry::Datum`

Definition at line 52 of file cfe_config_table.h.

The documentation for this struct was generated from the following file:

- cfe/modules/config/fsw/inc/cfe_config_table.h

11.129 CFE_ES_AppInfo Struct Reference

Application Information.

`#include <default_cfe_es_extern_typedefs.h>`

Data Fields

- CFE_ResourceId_t ResourceId

  Application or Library ID for this resource.
- uint32 Type

  The type of App: CORE or EXTERNAL.
- char Name [CFE_MISSION_MAX_API_LEN]

  The Registered Name of the Application.
- char EntryPoint [CFE_MISSION_MAX_API_LEN]

  The Entry Point label for the Application.
- char FileName [CFE_MISSION_MAX_PATH_LEN]

  The Filename of the file containing the Application.
- CFE_ES_MemOffset_t StackSize

  The Stack Size of the Application.
- uint32 AddressesAreValid

  Indicates that the Code, Data, and BSS addresses/sizes are valid.
- CFE_ES_MemAddress_t CodeAddress

  The Address of the Application Code Segment.
- CFE_ES_MemOffset_t CodeSize

  The Code Size of the Application.
- CFE_ES_MemAddress_t DataAddress

  The Address of the Application Data Segment.
- CFE_ES_MemOffset_t DataSize

  The Data Size of the Application.
- CFE_ES_MemAddress_t BSSAddress

  The Address of the Application BSS Segment.
- CFE_ES_MemOffset_t BSSSize

  The BSS Size of the Application.
- CFE_ES_MemAddress_t StartAddress

  The Start Address of the Application.
- CFE_ES_ExceptionAction_Enum_t ExceptionAction

  What should occur if Application has an exception (Restart Application OR Restart Processor)
- CFE_ES_TaskPriority_Atom_t Priority

  The Priority of the Application.
- CFE_ES_TaskId_t MainTaskId

  The Application's Main Task ID.
- uint32 ExecutionCounter

  The Application's Main Task Execution Counter.

- char MainTaskName [CFE_MISSION_MAX_API_LEN]

  The Application's Main Task ID.
- uint32 NumOfChildTasks

  Number of Child tasks for an App.

11.129.1 Detailed Description

Application Information.
Structure that is used to provide information about an app. It is primarily used for the QueryOne and QueryAll Commands.
While this structure is primarily intended for Application info, it can also represent Library information where only a subset of the information applies.
Definition at line 441 of file default_cfe_es_extern_typedefs.h.

11.129.2 Field Documentation

11.129.2.1 AddressesAreValid `uint32 CFE_ES_AppInfo::AddressesAreValid`

Indicates that the Code, Data, and BSS addresses/sizes are valid.

Telemetry Mnemonic(s) $sc_$cpu_ES_AddrsValid

Definition at line 457 of file default_cfe_es_extern_typedefs.h.

11.129.2.2 BSSAddress `CFE_ES_MemAddress_t CFE_ES_AppInfo::BSSAddress`

The Address of the Application BSS Segment.

Telemetry Mnemonic(s) $sc_$cpu_ES_BSSAddress

Definition at line 467 of file default_cfe_es_extern_typedefs.h.

11.129.2.3 BSSSize `CFE_ES_MemOffset_t CFE_ES_AppInfo::BSSSize`

The BSS Size of the Application.

Telemetry Mnemonic(s) $sc_$cpu_ES_BSSSize

Definition at line 469 of file default_cfe_es_extern_typedefs.h.

11.129.2.4 CodeAddress `CFE_ES_MemAddress_t CFE_ES_AppInfo::CodeAddress`

The Address of the Application Code Segment.

Telemetry Mnemonic(s) $sc_$cpu_ES_CodeAddress

Definition at line 459 of file default_cfe_es_extern_typedefs.h.

11.129.2.5 CodeSize `CFE_ES_MemOffset_t CFE_ES_AppInfo::CodeSize`

The Code Size of the Application.

Telemetry Mnemonic(s) $sc_$cpu_ES_CodeSize

Definition at line 461 of file default_cfe_es_extern_typedefs.h.

11.129.2.6 DataAddress `CFE_ES_MemAddress_t CFE_ES_AppInfo::DataAddress`

The Address of the Application Data Segment.

Telemetry Mnemonic(s) $sc_$cpu_ES_DataAddress

Definition at line 463 of file default_cfe_es_extern_typedefs.h.

11.129.2.7 DataSize `CFE_ES_MemOffset_t CFE_ES_AppInfo::DataSize`

The Data Size of the Application.

Telemetry Mnemonic(s) $sc_$cpu_ES_DataSize

Definition at line 465 of file default_cfe_es_extern_typedefs.h.

11.129.2.8 EntryPoint `char CFE_ES_AppInfo::EntryPoint[CFE_MISSION_MAX_API_LEN]`

The Entry Point label for the Application.

Telemetry Mnemonic(s) $sc_$cpu_ES_AppEntryPt[OS_MAX_API_NAME]

Definition at line 450 of file default_cfe_es_extern_typedefs.h.

11.129.2.9 ExceptionAction `CFE_ES_ExceptionAction_Enum_t CFE_ES_AppInfo::ExceptionAction`

What should occur if Application has an exception (Restart Application OR Restart Processor)

Telemetry Mnemonic(s) $sc_$cpu_ES_ExceptnActn

Definition at line 473 of file default_cfe_es_extern_typedefs.h.

11.129.2.10 ExecutionCounter `uint32 CFE_ES_AppInfo::ExecutionCounter`

The Application's Main Task Execution Counter.

Telemetry Mnemonic(s) $sc_$cpu_ES_ExecutionCtr

Definition at line 480 of file default_cfe_es_extern_typedefs.h.

11.129.2.11 FileName `char CFE_ES_AppInfo::FileName[CFE_MISSION_MAX_PATH_LEN]`

The Filename of the file containing the Application.

Telemetry Mnemonic(s) $sc_$cpu_ES_AppFilename[OS_MAX_PATH_LEN]

Definition at line 452 of file default_cfe_es_extern_typedefs.h.

11.129.2.12 MainTaskId `CFE_ES_TaskId_t CFE_ES_AppInfo::MainTaskId`

The Application's Main Task ID.

Telemetry Mnemonic(s) $sc_$cpu_ES_MainTaskId

Definition at line 478 of file default_cfe_es_extern_typedefs.h.

11.129.2.13 MainTaskName `char CFE_ES_AppInfo::MainTaskName[CFE_MISSION_MAX_API_LEN]`

The Application's Main Task ID.

Telemetry Mnemonic(s) $sc_$cpu_ES_MainTaskName[OS_MAX_API_NAME]

Definition at line 482 of file default_cfe_es_extern_typedefs.h.

11.129.2.14 Name `char CFE_ES_AppInfo::Name[CFE_MISSION_MAX_API_LEN]`

The Registered Name of the Application.

Telemetry Mnemonic(s) $sc_$cpu_ES_AppName[OS_MAX_API_NAME]

Definition at line 448 of file default_cfe_es_extern_typedefs.h.

11.129.2.15 NumOfChildTasks `uint32 CFE_ES_AppInfo::NumOfChildTasks`

Number of Child tasks for an App.

Telemetry Mnemonic(s) $sc_$cpu_ES_ChildTasks

Definition at line 484 of file default_cfe_es_extern_typedefs.h.

11.129.2.16 Priority `CFE_ES_TaskPriority_Atom_t CFE_ES_AppInfo::Priority`

The Priority of the Application.

Telemetry Mnemonic(s) $sc_$cpu_ES_Priority

Definition at line 476 of file default_cfe_es_extern_typedefs.h.

11.129.2.17 ResourceId `CFE_ResourceId_t CFE_ES_AppInfo::ResourceId`

Application or Library ID for this resource.

Telemetry Mnemonic(s) $sc_$cpu_ES_AppID

Definition at line 443 of file default_cfe_es_extern_typedefs.h.

11.129.2.18 StackSize `CFE_ES_MemOffset_t CFE_ES_AppInfo::StackSize`

The Stack Size of the Application.

Telemetry Mnemonic(s) $sc_$cpu_ES_StackSize

Definition at line 455 of file default_cfe_es_extern_typedefs.h.

11.129.2.19 StartAddress `CFE_ES_MemAddress_t CFE_ES_AppInfo::StartAddress`

The Start Address of the Application.

Telemetry Mnemonic(s) $sc_$cpu_ES_StartAddr

Definition at line 471 of file default_cfe_es_extern_typedefs.h.

11.129.2.20 Type `uint32 CFE_ES_AppInfo::Type`

The type of App: CORE or EXTERNAL.

Telemetry Mnemonic(s) $sc_$cpu_ES_AppType

Definition at line 445 of file default_cfe_es_extern_typedefs.h.
The documentation for this struct was generated from the following file:

- cfe/modules/es/config/default_cfe_es_extern_typedefs.h

11.130 CFE_ES_AppNameCmd_Payload Struct Reference

Generic application name command payload.

```
#include <default_cfe_es_msgdefs.h>
```

Data Fields

- char Application [CFE_MISSION_MAX_API_LEN]

  ASCII text string containing Application or Library Name.

11.130.1 Detailed Description

Generic application name command payload.
For command details, see CFE_ES_STOP_APP_CC, CFE_ES_RESTART_APP_CC, CFE_ES_QUERY_ONE_CC
Definition at line 104 of file default_cfe_es_msgdefs.h.

11.130.2 Field Documentation

11.130.2.1 Application `char CFE_ES_AppNameCmd_Payload::Application[CFE_MISSION_MAX_API_LEN]`

ASCII text string containing Application or Library Name.
Definition at line 106 of file default_cfe_es_msgdefs.h.
The documentation for this struct was generated from the following file:

- cfe/modules/es/config/default_cfe_es_msgdefs.h

11.131 CFE_ES_AppReloadCmd_Payload Struct Reference

Reload Application Command Payload.

```
#include <default_cfe_es_msgdefs.h>
```

Data Fields

- char Application [CFE_MISSION_MAX_API_LEN]

  ASCII text string containing Application Name.
- char AppFileName [CFE_MISSION_MAX_PATH_LEN]

  Full path and filename of Application's executable image.

11.131.1 Detailed Description

Reload Application Command Payload.
For command details, see CFE_ES_RELOAD_APP_CC
Definition at line 115 of file default_cfe_es_msgdefs.h.

11.131.2 Field Documentation

11.131.2.1 AppFileName `char CFE_ES_AppReloadCmd_Payload::AppFileName[CFE_MISSION_MAX_PATH_LEN]`

Full path and filename of Application's executable image.
Definition at line 118 of file default_cfe_es_msgdefs.h.

11.131.2.2 Application `char CFE_ES_AppReloadCmd_Payload::Application[CFE_MISSION_MAX_API_LEN]`

ASCII text string containing Application Name.
Definition at line 117 of file default_cfe_es_msgdefs.h.
The documentation for this struct was generated from the following file:

- cfe/modules/es/config/default_cfe_es_msgdefs.h

11.132 CFE_ES_BlockStats Struct Reference

Block statistics.
`#include <default_cfe_es_extern_typedefs.h>`

Data Fields

- CFE_ES_MemOffset_t BlockSize

  Number of bytes in each of these blocks.
- uint32 NumCreated

  Number of Memory Blocks of this size created.
- uint32 NumFree

  Number of Memory Blocks of this size that are free.

11.132.1 Detailed Description

Block statistics.
Sub-Structure that is used to provide information about a specific block size/bucket within a memory pool.
Definition at line 538 of file default_cfe_es_extern_typedefs.h.

11.132.2 Field Documentation

11.132.2.1 BlockSize `CFE_ES_MemOffset_t CFE_ES_BlockStats::BlockSize`

Number of bytes in each of these blocks.
Definition at line 540 of file default_cfe_es_extern_typedefs.h.

11.132.2.2 NumCreated `uint32 CFE_ES_BlockStats::NumCreated`

Number of Memory Blocks of this size created.
Definition at line 541 of file default_cfe_es_extern_typedefs.h.

11.132.2.3 NumFree `uint32 CFE_ES_BlockStats::NumFree`

Number of Memory Blocks of this size that are free.
Definition at line 542 of file default_cfe_es_extern_typedefs.h.
The documentation for this struct was generated from the following file:

- cfe/modules/es/config/default_cfe_es_extern_typedefs.h

11.133 CFE_ES_CDSRegDumpRec Struct Reference

CDS Register Dump Record.
`#include <default_cfe_es_extern_typedefs.h>`

Data Fields

- CFE_ES_CDSHandle_t Handle

  Handle of CDS.
- CFE_ES_MemOffset_t Size

  Size, in bytes, of the CDS memory block.
- bool Table

  Flag that indicates whether CDS contains a Critical Table.
- char Name [CFE_MISSION_ES_CDS_MAX_FULL_NAME_LEN]

  Processor Unique Name of CDS.
- uint8 ByteAlignSpare [3]

  Spare bytes to ensure structure size is multiple of 4 bytes.

11.133.1 Detailed Description

CDS Register Dump Record.
Structure that is used to provide information about a critical data store. It is primarily used for the Dump CDS registry (CFE_ES_DUMP_CDS_REGISTRY_CC) command.

Note

There is not currently a telemetry message directly containing this data structure, but it does define the format of the data file generated by the Dump CDS registry command. Therefore it should be considered part of the overall telemetry interface.

Definition at line 523 of file default_cfe_es_extern_typedefs.h.

11.133.2 Field Documentation

11.133.2.1 ByteAlignSpare `uint8 CFE_ES_CDSRegDumpRec::ByteAlignSpare[3]`

Spare bytes to ensure structure size is multiple of 4 bytes.
Definition at line 529 of file default_cfe_es_extern_typedefs.h.

11.133.2.2 Handle `CFE_ES_CDSHandle_t CFE_ES_CDSRegDumpRec::Handle`

Handle of CDS.
Definition at line 525 of file default_cfe_es_extern_typedefs.h.

11.133.2.3 Name `char CFE_ES_CDSRegDumpRec::Name[CFE_MISSION_ES_CDS_MAX_FULL_NAME_LEN]`

Processor Unique Name of CDS.
Definition at line 528 of file default_cfe_es_extern_typedefs.h.

11.133.2.4 Size `CFE_ES_MemOffset_t CFE_ES_CDSRegDumpRec::Size`

Size, in bytes, of the CDS memory block.
Definition at line 526 of file default_cfe_es_extern_typedefs.h.

11.133.2.5 Table `bool CFE_ES_CDSRegDumpRec::Table`

Flag that indicates whether CDS contains a Critical Table.
Definition at line 527 of file default_cfe_es_extern_typedefs.h.
The documentation for this struct was generated from the following file:

- cfe/modules/es/config/default_cfe_es_extern_typedefs.h

11.134 CFE_ES_ClearERLogCmd Struct Reference

`#include <default_cfe_es_msgstruct.h>`

Data Fields

- CFE_MSG_CommandHeader_t CommandHeader

  Command header.

11.134.1 Detailed Description

Definition at line 68 of file default_cfe_es_msgstruct.h.

11.134.2 Field Documentation

11.134.2.1 CommandHeader `CFE_MSG_CommandHeader_t CFE_ES_ClearERLogCmd::CommandHeader`

Command header.
Definition at line 70 of file default_cfe_es_msgstruct.h.
The documentation for this struct was generated from the following file:

- cfe/modules/es/config/default_cfe_es_msgstruct.h

11.135 CFE_ES_ClearSysLogCmd Struct Reference

`#include <default_cfe_es_msgstruct.h>`

Data Fields

- CFE_MSG_CommandHeader_t CommandHeader

  Command header.

11.135.1 Detailed Description

Definition at line 63 of file default_cfe_es_msgstruct.h.

11.135.2 Field Documentation

11.135.2.1 CommandHeader `CFE_MSG_CommandHeader_t CFE_ES_ClearSysLogCmd::CommandHeader`

Command header.
Definition at line 65 of file default_cfe_es_msgstruct.h.
The documentation for this struct was generated from the following file:

- cfe/modules/es/config/default_cfe_es_msgstruct.h

11.136 CFE_ES_DeleteCDSCmd Struct Reference

Delete Critical Data Store Command.
`#include <default_cfe_es_msgstruct.h>`

Data Fields

- CFE_MSG_CommandHeader_t CommandHeader

  Command header.
- CFE_ES_DeleteCDSCmd_Payload_t Payload

  Command payload.

11.136.1 Detailed Description

Delete Critical Data Store Command.
Definition at line 192 of file default_cfe_es_msgstruct.h.

11.136.2 Field Documentation

11.136.2.1 CommandHeader `CFE_MSG_CommandHeader_t CFE_ES_DeleteCDSCmd::CommandHeader`

Command header.
Definition at line 194 of file default_cfe_es_msgstruct.h.

11.136.2.2 Payload `CFE_ES_DeleteCDSCmd_Payload_t CFE_ES_DeleteCDSCmd::Payload`

Command payload.
Definition at line 195 of file default_cfe_es_msgstruct.h.
The documentation for this struct was generated from the following file:

- cfe/modules/es/config/default_cfe_es_msgstruct.h

11.137 CFE_ES_DeleteCDSCmd_Payload Struct Reference

Delete Critical Data Store Command Payload.
`#include <default_cfe_es_msgdefs.h>`

Data Fields

- char CdsName [CFE_MISSION_ES_CDS_MAX_FULL_NAME_LEN]

  ASCII text string containing name of CDS to delete.

11.137.1 Detailed Description

Delete Critical Data Store Command Payload.
For command details, see CFE_ES_DELETE_CDS_CC
Definition at line 140 of file default_cfe_es_msgdefs.h.

11.137.2 Field Documentation

11.137.2.1 CdsName `char CFE_ES_DeleteCDSCmd_Payload::CdsName[CFE_MISSION_ES_CDS_MAX_FULL_NAME_LEN]`

ASCII text string containing name of CDS to delete.
Definition at line 143 of file default_cfe_es_msgdefs.h.
The documentation for this struct was generated from the following file:

- cfe/modules/es/config/default_cfe_es_msgdefs.h

11.138 CFE_ES_DumpCDSRegistryCmd Struct Reference

Dump CDS Registry Command.
`#include <default_cfe_es_msgstruct.h>`

Data Fields

- CFE_MSG_CommandHeader_t CommandHeader

  Command header.
- CFE_ES_DumpCDSRegistryCmd_Payload_t Payload

  Command payload.

11.138.1 Detailed Description

Dump CDS Registry Command.
Definition at line 246 of file default_cfe_es_msgstruct.h.

11.138.2 Field Documentation

11.138.2.1 CommandHeader `CFE_MSG_CommandHeader_t CFE_ES_DumpCDSRegistryCmd::CommandHeader`

Command header.
Definition at line 248 of file default_cfe_es_msgstruct.h.

11.138.2.2 Payload `CFE_ES_DumpCDSRegistryCmd_Payload_t CFE_ES_DumpCDSRegistryCmd::Payload`

Command payload.
Definition at line 249 of file default_cfe_es_msgstruct.h.
The documentation for this struct was generated from the following file:

- cfe/modules/es/config/default_cfe_es_msgstruct.h

11.139 CFE_ES_DumpCDSRegistryCmd_Payload Struct Reference

Dump CDS Registry Command Payload.
`#include <default_cfe_es_msgdefs.h>`

Data Fields

- char DumpFilename [CFE_MISSION_MAX_PATH_LEN]

  ASCII text string of full path and filename of file CDS Registry is to be written.

11.139.1 Detailed Description

Dump CDS Registry Command Payload.
For command details, see CFE_ES_DUMP_CDS_REGISTRY_CC
Definition at line 225 of file default_cfe_es_msgdefs.h.

11.139.2 Field Documentation

11.139.2.1 DumpFilename `char CFE_ES_DumpCDSRegistryCmd_Payload::DumpFilename[CFE_MISSION_MAX_PATH_LEN]`

ASCII text string of full path and filename of file CDS Registry is to be written.
Definition at line 227 of file default_cfe_es_msgdefs.h.
The documentation for this struct was generated from the following file:

- cfe/modules/es/config/default_cfe_es_msgdefs.h

11.140 CFE_ES_FileNameCmd Struct Reference

Generic file name command.
`#include <default_cfe_es_msgstruct.h>`

Data Fields

- CFE_MSG_CommandHeader_t CommandHeader

  Command header.
- CFE_ES_FileNameCmd_Payload_t Payload

  Command payload.

11.140.1 Detailed Description

Generic file name command.
Definition at line 96 of file default_cfe_es_msgstruct.h.

11.140.2 Field Documentation

11.140.2.1 CommandHeader `CFE_MSG_CommandHeader_t CFE_ES_FileNameCmd::CommandHeader`

Command header.
Definition at line 98 of file default_cfe_es_msgstruct.h.

11.140.2.2 Payload `CFE_ES_FileNameCmd_Payload_t CFE_ES_FileNameCmd::Payload`

Command payload.
Definition at line 99 of file default_cfe_es_msgstruct.h.
The documentation for this struct was generated from the following file:

- cfe/modules/es/config/default_cfe_es_msgstruct.h

11.141 CFE_ES_FileNameCmd_Payload Struct Reference

Generic file name command payload.
`#include <default_cfe_es_msgdefs.h>`

Data Fields

- char FileName [CFE_MISSION_MAX_PATH_LEN]

  ASCII text string containing full path and filename of file in which Application data is to be dumped.

11.141.1 Detailed Description

Generic file name command payload.
This format is shared by several executive services commands. For command details, see CFE_ES_QUERY_ALL_CC, CFE_ES_QUERY_ALL_TASKS_CC, CFE_ES_WRITE_SYS_LOG_CC, and CFE_ES_WRITE_ER_LOG_CC
Definition at line 58 of file default_cfe_es_msgdefs.h.

11.141.2 Field Documentation

11.141.2.1 FileName `char CFE_ES_FileNameCmd_Payload::FileName[CFE_MISSION_MAX_PATH_LEN]`

ASCII text string containing full path and filename of file in which Application data is to be dumped.
Definition at line 60 of file default_cfe_es_msgdefs.h.
The documentation for this struct was generated from the following file:

- cfe/modules/es/config/default_cfe_es_msgdefs.h

11.142 CFE_ES_HousekeepingTlm Struct Reference

`#include <default_cfe_es_msgstruct.h>`

Data Fields

- CFE_MSG_TelemetryHeader_t TelemetryHeader

  Telemetry header.
- CFE_ES_HousekeepingTlm_Payload_t Payload

  Telemetry payload.

11.142.1 Detailed Description

Name Executive Services Housekeeping Packet

Definition at line 279 of file default_cfe_es_msgstruct.h.

11.142.2 Field Documentation

11.142.2.1 Payload `CFE_ES_HousekeepingTlm_Payload_t CFE_ES_HousekeepingTlm::Payload`

Telemetry payload.
Definition at line 282 of file default_cfe_es_msgstruct.h.

11.142.2.2 TelemetryHeader `CFE_MSG_TelemetryHeader_t CFE_ES_HousekeepingTlm::TelemetryHeader`

Telemetry header.

Definition at line 281 of file default_cfe_es_msgstruct.h.

The documentation for this struct was generated from the following file:

- cfe/modules/es/config/default_cfe_es_msgstruct.h

11.143 CFE_ES_HousekeepingTlm_Payload Struct Reference

```
#include <default_cfe_es_msgdefs.h>
```

Data Fields

- uint8 CommandCounter

  The ES Application Command Counter.
- uint8 CommandErrorCounter

  The ES Application Command Error Counter.
- uint16 CFECoreChecksum

  Checksum of cFE Core Code.
- uint8 CFEMajorVersion

  Major Version Number of cFE.
- uint8 CFEMinorVersion

  Minor Version Number of cFE.
- uint8 CFERevision

  Sub-Minor Version Number of cFE.
- uint8 CFEMissionRevision

  Mission Version Number of cFE.
- uint8 OSALMajorVersion

  OS Abstraction Layer Major Version Number.
- uint8 OSALMinorVersion

  OS Abstraction Layer Minor Version Number.
- uint8 OSALRevision

  OS Abstraction Layer Revision Number.
- uint8 OSALMissionRevision

  OS Abstraction Layer MissionRevision Number.
- uint8 PSPMajorVersion

  Platform Support Package Major Version Number.
- uint8 PSPMinorVersion

  Platform Support Package Minor Version Number.
- uint8 PSPRevision

  Platform Support Package Revision Number.
- uint8 PSPMissionRevision

  Platform Support Package MissionRevision Number.
- CFE_ES_MemOffset_t SysLogBytesUsed

  Total number of bytes used in system log.
- CFE_ES_MemOffset_t SysLogSize

  Total size of the system log.
- uint32 SysLogEntries

  Number of entries in the system log.

- uint32 SysLogMode

  Write/Overwrite Mode.
- uint32 ERLogIndex

  Current index of the ER Log (wraps around)
- uint32 ERLogEntries

  Number of entries made in the ER Log since the power on.
- uint32 RegisteredCoreApps

  Number of Applications registered with ES.
- uint32 RegisteredExternalApps

  Number of Applications registered with ES.
- uint32 RegisteredTasks

  Number of Tasks (main AND child tasks) registered with ES.
- uint32 RegisteredLibs

  Number of Libraries registered with ES.
- uint32 ResetType

  Reset type (PROCESSOR or POWERON)
- uint32 ResetSubtype

  Reset Sub Type.
- uint32 ProcessorResets

  Number of processor resets since last power on.
- uint32 MaxProcessorResets

  Max processor resets before a power on is done.
- uint32 BootSource

  Boot source (as provided from BSP)
- uint32 PerfState

  Current state of Performance Analyzer.
- uint32 PerfMode

  Current mode of Performance Analyzer.
- uint32 PerfTriggerCount

  Number of Times Performance Analyzer has Triggered.
- uint32 PerfFilterMask [CFE_MISSION_ES_PERF_MAX_IDS/32]

  Current Setting of Performance Analyzer Filter Masks.
- uint32 PerfTriggerMask [CFE_MISSION_ES_PERF_MAX_IDS/32]

  Current Setting of Performance Analyzer Trigger Masks.
- uint32 PerfDataStart

  Identifies First Stored Entry in Performance Analyzer Log.
- uint32 PerfDataEnd

  Identifies Last Stored Entry in Performance Analyzer Log.
- uint32 PerfDataCount

  Number of Entries Put Into the Performance Analyzer Log.
- uint32 PerfDataToWrite

  Number of Performance Analyzer Log Entries Left to be Written to Log Dump File.
- CFE_ES_MemOffset_t HeapBytesFree

  Number of free bytes remaining in the OS heap.
- CFE_ES_MemOffset_t HeapBlocksFree

  Number of free blocks remaining in the OS heap.
- CFE_ES_MemOffset_t HeapMaxBlockSize

  Number of bytes in the largest free block.

11.143.1 Detailed Description

Name Executive Services Housekeeping Packet

Definition at line 263 of file default_cfe_es_msgdefs.h.

11.143.2 Field Documentation

11.143.2.1 BootSource `uint32 CFE_ES_HousekeepingTlm_Payload::BootSource`

Boot source (as provided from BSP)

Telemetry Mnemonic(s) $sc_$cpu_ES_BootSource

Definition at line 329 of file default_cfe_es_msgdefs.h.

11.143.2.2 CFECoreChecksum `uint16 CFE_ES_HousekeepingTlm_Payload::CFECoreChecksum`

Checksum of cFE Core Code.

Telemetry Mnemonic(s) $sc_$cpu_ES_CKSUM

Definition at line 270 of file default_cfe_es_msgdefs.h.

11.143.2.3 CFEMajorVersion `uint8 CFE_ES_HousekeepingTlm_Payload::CFEMajorVersion`

Major Version Number of cFE.

Telemetry Mnemonic(s) $sc_$cpu_ES_CFEMAJORVER

Definition at line 272 of file default_cfe_es_msgdefs.h.

11.143.2.4 CFEMinorVersion `uint8 CFE_ES_HousekeepingTlm_Payload::CFEMinorVersion`

Minor Version Number of cFE.

Telemetry Mnemonic(s) $sc_$cpu_ES_CFEMINORVER

Definition at line 274 of file default_cfe_es_msgdefs.h.

11.143.2.5 CFEMissionRevision `uint8 CFE_ES_HousekeepingTlm_Payload::CFEMissionRevision`

Mission Version Number of cFE.

Telemetry Mnemonic(s) $sc_$cpu_ES_CFEMISSIONREV

Definition at line 278 of file default_cfe_es_msgdefs.h.

11.143.2.6 CFERevision `uint8 CFE_ES_HousekeepingTlm_Payload::CFERevision`

Sub-Minor Version Number of cFE.

Telemetry Mnemonic(s) $sc_$cpu_ES_CFEREVISION

Definition at line 276 of file default_cfe_es_msgdefs.h.

11.143.2.7 CommandCounter `uint8 CFE_ES_HousekeepingTlm_Payload::CommandCounter`

The ES Application Command Counter.

Telemetry Mnemonic(s) $sc_$cpu_ES_CMDPC

Definition at line 265 of file default_cfe_es_msgdefs.h.

11.143.2.8 CommandErrorCounter `uint8 CFE_ES_HousekeepingTlm_Payload::CommandErrorCounter`

The ES Application Command Error Counter.

Telemetry Mnemonic(s) $sc_$cpu_ES_CMDEC

Definition at line 267 of file default_cfe_es_msgdefs.h.

11.143.2.9 ERLogEntries `uint32 CFE_ES_HousekeepingTlm_Payload::ERLogEntries`

Number of entries made in the ER Log since the power on.

Telemetry Mnemonic(s) $sc_$cpu_ES_ERLOGENTRIES

Definition at line 309 of file default_cfe_es_msgdefs.h.

11.143.2.10 ERLogIndex `uint32 CFE_ES_HousekeepingTlm_Payload::ERLogIndex`

Current index of the ER Log (wraps around)

Telemetry Mnemonic(s) $sc_$cpu_ES_ERLOGINDEX

Definition at line 307 of file default_cfe_es_msgdefs.h.

11.143.2.11 HeapBlocksFree `CFE_ES_MemOffset_t CFE_ES_HousekeepingTlm_Payload::HeapBlocksFree`

Number of free blocks remaining in the OS heap.

Telemetry Mnemonic(s) $sc_$cpu_ES_HeapBlocksFree

Definition at line 354 of file default_cfe_es_msgdefs.h.

11.143.2.12 HeapBytesFree `CFE_ES_MemOffset_t CFE_ES_HousekeepingTlm_Payload::HeapBytesFree`

Number of free bytes remaining in the OS heap.

Telemetry Mnemonic(s) $sc_$cpu_ES_HeapBytesFree

Definition at line 352 of file default_cfe_es_msgdefs.h.

11.143.2.13 HeapMaxBlockSize `CFE_ES_MemOffset_t CFE_ES_HousekeepingTlm_Payload::HeapMaxBlockSize`

Number of bytes in the largest free block.

Telemetry Mnemonic(s) $sc_$cpu_ES_HeapMaxBlkSize

Definition at line 356 of file default_cfe_es_msgdefs.h.

11.143.2.14 MaxProcessorResets `uint32 CFE_ES_HousekeepingTlm_Payload::MaxProcessorResets`

Max processor resets before a power on is done.

Telemetry Mnemonic(s) $sc_$cpu_ES_MaxProcResets

Definition at line 327 of file default_cfe_es_msgdefs.h.

11.143.2.15 OSALMajorVersion `uint8 CFE_ES_HousekeepingTlm_Payload::OSALMajorVersion`

OS Abstraction Layer Major Version Number.

Telemetry Mnemonic(s) $sc_$cpu_ES_OSMAJORVER

Definition at line 280 of file default_cfe_es_msgdefs.h.

11.143.2.16 OSALMinorVersion `uint8 CFE_ES_HousekeepingTlm_Payload::OSALMinorVersion`

OS Abstraction Layer Minor Version Number.

Telemetry Mnemonic(s) $sc_$cpu_ES_OSMINORVER

Definition at line 282 of file default_cfe_es_msgdefs.h.

11.143.2.17 OSALMissionRevision `uint8 CFE_ES_HousekeepingTlm_Payload::OSALMissionRevision`

OS Abstraction Layer MissionRevision Number.

Telemetry Mnemonic(s) $sc_$cpu_ES_OSMISSIONREV

Definition at line 286 of file default_cfe_es_msgdefs.h.

11.143.2.18 OSALRevision `uint8 CFE_ES_HousekeepingTlm_Payload::OSALRevision`

OS Abstraction Layer Revision Number.

Telemetry Mnemonic(s) $sc_$cpu_ES_OSREVISION

Definition at line 284 of file default_cfe_es_msgdefs.h.

11.143.2.19 PerfDataCount `uint32 CFE_ES_HousekeepingTlm_Payload::PerfDataCount`

Number of Entries Put Into the Performance Analyzer Log.

Telemetry Mnemonic(s) $sc_$cpu_ES_PerfDataCnt

Definition at line 347 of file default_cfe_es_msgdefs.h.

11.143.2.20 PerfDataEnd `uint32 CFE_ES_HousekeepingTlm_Payload::PerfDataEnd`

Identifies Last Stored Entry in Performance Analyzer Log.

Telemetry Mnemonic(s) $sc_$cpu_ES_PerfDataEnd

Definition at line 345 of file default_cfe_es_msgdefs.h.

11.143.2.21 PerfDataStart `uint32 CFE_ES_HousekeepingTlm_Payload::PerfDataStart`

Identifies First Stored Entry in Performance Analyzer Log.

Telemetry Mnemonic(s) $sc_$cpu_ES_PerfDataStart

Definition at line 343 of file default_cfe_es_msgdefs.h.

11.143.2.22 PerfDataToWrite `uint32 CFE_ES_HousekeepingTlm_Payload::PerfDataToWrite`

Number of Performance Analyzer Log Entries Left to be Written to Log Dump File.

Telemetry Mnemonic(s) $sc_$cpu_ES_PerfData2Write

Definition at line 350 of file default_cfe_es_msgdefs.h.

11.143.2.23 PerfFilterMask `uint32 CFE_ES_HousekeepingTlm_Payload::PerfFilterMask[CFE_MISSION_ES_PERF_MAX_IDS/32]`

Current Setting of Performance Analyzer Filter Masks.

Telemetry Mnemonic(s) $sc_$cpu_ES_PerfFltrMask[MaskCnt]

Definition at line 338 of file default_cfe_es_msgdefs.h.

11.143.2.24 PerfMode `uint32 CFE_ES_HousekeepingTlm_Payload::PerfMode`

Current mode of Performance Analyzer.

Telemetry Mnemonic(s) $sc_$cpu_ES_PerfMode

Definition at line 334 of file default_cfe_es_msgdefs.h.

11.143.2.25 PerfState `uint32 CFE_ES_HousekeepingTlm_Payload::PerfState`

Current state of Performance Analyzer.

Telemetry Mnemonic(s) $sc_$cpu_ES_PerfState

Definition at line 332 of file default_cfe_es_msgdefs.h.

11.143.2.26 PerfTriggerCount `uint32 CFE_ES_HousekeepingTlm_Payload::PerfTriggerCount`

Number of Times Performance Analyzer has Triggered.

Telemetry Mnemonic(s) $sc_$cpu_ES_PerfTrigCnt

Definition at line 336 of file default_cfe_es_msgdefs.h.

11.143.2.27 PerfTriggerMask `uint32 CFE_ES_HousekeepingTlm_Payload::PerfTriggerMask[CFE_MISSION_ES_PERF_MAX_IDS/32`

Current Setting of Performance Analyzer Trigger Masks.

Telemetry Mnemonic(s) $sc_$cpu_ES_PerfTrigMask[MaskCnt]

Definition at line 341 of file default_cfe_es_msgdefs.h.

11.143.2.28 ProcessorResets `uint32 CFE_ES_HousekeepingTlm_Payload::ProcessorResets`

Number of processor resets since last power on.

Telemetry Mnemonic(s) $sc_$cpu_ES_ProcResetCnt

Definition at line 325 of file default_cfe_es_msgdefs.h.

11.143.2.29 PSPMajorVersion `uint8 CFE_ES_HousekeepingTlm_Payload::PSPMajorVersion`

Platform Support Package Major Version Number.

Telemetry Mnemonic(s) $sc_$cpu_ES_PSPMAJORVER

Definition at line 289 of file default_cfe_es_msgdefs.h.

11.143.2.30 PSPMinorVersion `uint8 CFE_ES_HousekeepingTlm_Payload::PSPMinorVersion`

Platform Support Package Minor Version Number.

Telemetry Mnemonic(s) $sc_$cpu_ES_PSPMINORVER

Definition at line 291 of file default_cfe_es_msgdefs.h.

11.143.2.31 PSPMissionRevision `uint8 CFE_ES_HousekeepingTlm_Payload::PSPMissionRevision`

Platform Support Package MissionRevision Number.

Telemetry Mnemonic(s) $sc_$cpu_ES_PSPMISSIONREV

Definition at line 295 of file default_cfe_es_msgdefs.h.

11.143.2.32 PSPRevision `uint8 CFE_ES_HousekeepingTlm_Payload::PSPRevision`

Platform Support Package Revision Number.

Telemetry Mnemonic(s) $sc_$cpu_ES_PSPREVISION

Definition at line 293 of file default_cfe_es_msgdefs.h.

11.143.2.33 RegisteredCoreApps `uint32 CFE_ES_HousekeepingTlm_Payload::RegisteredCoreApps`

Number of Applications registered with ES.

Telemetry Mnemonic(s) $sc_$cpu_ES_RegCoreApps

Definition at line 312 of file default_cfe_es_msgdefs.h.

11.143.2.34 RegisteredExternalApps `uint32 CFE_ES_HousekeepingTlm_Payload::RegisteredExternalApps`

Number of Applications registered with ES.

Telemetry Mnemonic(s) $sc_$cpu_ES_RegExtApps

Definition at line 314 of file default_cfe_es_msgdefs.h.

11.143.2.35 RegisteredLibs `uint32 CFE_ES_HousekeepingTlm_Payload::RegisteredLibs`

Number of Libraries registered with ES.

Telemetry Mnemonic(s) $sc_$cpu_ES_RegLibs

Definition at line 318 of file default_cfe_es_msgdefs.h.

11.143.2.36 RegisteredTasks `uint32 CFE_ES_HousekeepingTlm_Payload::RegisteredTasks`

Number of Tasks (main AND child tasks) registered with ES.

Telemetry Mnemonic(s) $sc_$cpu_ES_RegTasks

Definition at line 316 of file default_cfe_es_msgdefs.h.

11.143.2.37 ResetSubtype `uint32 CFE_ES_HousekeepingTlm_Payload::ResetSubtype`

Reset Sub Type.

Telemetry Mnemonic(s) $sc_$cpu_ES_ResetSubtype

Definition at line 323 of file default_cfe_es_msgdefs.h.

11.143.2.38 ResetType `uint32 CFE_ES_HousekeepingTlm_Payload::ResetType`

Reset type (PROCESSOR or POWERON)

Telemetry Mnemonic(s) $sc_$cpu_ES_ResetType

Definition at line 321 of file default_cfe_es_msgdefs.h.

11.143.2.39 SysLogBytesUsed `CFE_ES_MemOffset_t CFE_ES_HousekeepingTlm_Payload::SysLogBytesUsed`

Total number of bytes used in system log.

Telemetry Mnemonic(s) $sc_$cpu_ES_SYSLOGBYTEUSED

Definition at line 298 of file default_cfe_es_msgdefs.h.

11.143.2.40 SysLogEntries `uint32 CFE_ES_HousekeepingTlm_Payload::SysLogEntries`

Number of entries in the system log.

Telemetry Mnemonic(s) $sc_$cpu_ES_SYSLOGENTRIES

Definition at line 302 of file default_cfe_es_msgdefs.h.

11.143.2.41 SysLogMode `uint32 CFE_ES_HousekeepingTlm_Payload::SysLogMode`

Write/Overwrite Mode.

Telemetry Mnemonic(s) $sc_$cpu_ES_SYSLOGMODE

Definition at line 304 of file default_cfe_es_msgdefs.h.

11.143.2.42 SysLogSize `CFE_ES_MemOffset_t CFE_ES_HousekeepingTlm_Payload::SysLogSize`

Total size of the system log.

Telemetry Mnemonic(s) $sc_$cpu_ES_SYSLOGSIZE

Definition at line 300 of file default_cfe_es_msgdefs.h.
The documentation for this struct was generated from the following file:

- cfe/modules/es/config/default_cfe_es_msgdefs.h

11.144 CFE_ES_MemPoolStats Struct Reference

Memory Pool Statistics.
`#include <default_cfe_es_extern_typedefs.h>`

Data Fields

- CFE_ES_MemOffset_t PoolSize

  Size of Memory Pool (in bytes)
- uint32 NumBlocksRequested

  Number of times a memory block has been allocated.
- uint32 CheckErrCtr

  Number of errors detected when freeing a memory block.
- CFE_ES_MemOffset_t NumFreeBytes

  Number of bytes never allocated to a block.
- CFE_ES_BlockStats_t BlockStats [CFE_MISSION_ES_POOL_MAX_BUCKETS]

  Contains stats on each block size.

11.144.1 Detailed Description

Memory Pool Statistics.
Structure that is used to provide information about a memory pool. Used by the Memory Pool Stats telemetry message.

See also

CFE_ES_SEND_MEM_POOL_STATS_CC

Definition at line 553 of file default_cfe_es_extern_typedefs.h.

11.144.2 Field Documentation

11.144.2.1 BlockStats `CFE_ES_BlockStats_t CFE_ES_MemPoolStats::BlockStats[CFE_MISSION_ES_POOL_MAX_BUCKETS]`

Contains stats on each block size.

Telemetry Mnemonic(s) $sc_$cpu_ES_BlkStats[BLK_SIZES]

Definition at line 563 of file default_cfe_es_extern_typedefs.h.

11.144.2.2 CheckErrCtr `uint32 CFE_ES_MemPoolStats::CheckErrCtr`

Number of errors detected when freeing a memory block.

Telemetry Mnemonic(s) $sc_$cpu_ES_BlkErrCTR

Definition at line 559 of file default_cfe_es_extern_typedefs.h.

11.144.2.3 NumBlocksRequested `uint32 CFE_ES_MemPoolStats::NumBlocksRequested`

Number of times a memory block has been allocated.

Telemetry Mnemonic(s) $sc_$cpu_ES_BlksREQ

Definition at line 557 of file default_cfe_es_extern_typedefs.h.

11.144.2.4 NumFreeBytes `CFE_ES_MemOffset_t CFE_ES_MemPoolStats::NumFreeBytes`

Number of bytes never allocated to a block.

Telemetry Mnemonic(s) $sc_$cpu_ES_FreeBytes

Definition at line 561 of file default_cfe_es_extern_typedefs.h.

11.144.2.5 PoolSize `CFE_ES_MemOffset_t CFE_ES_MemPoolStats::PoolSize`

Size of Memory Pool (in bytes)

Telemetry Mnemonic(s) $sc_$cpu_ES_PoolSize

Definition at line 555 of file default_cfe_es_extern_typedefs.h.
The documentation for this struct was generated from the following file:

- cfe/modules/es/config/default_cfe_es_extern_typedefs.h

11.145 CFE_ES_MemStatsTlm Struct Reference

```
#include <default_cfe_es_msgstruct.h>
```

Data Fields

- CFE_MSG_TelemetryHeader_t TelemetryHeader
  Telemetry header.
- CFE_ES_PoolStatsTlm_Payload_t Payload
  Telemetry payload.

11.145.1 Detailed Description

Name Memory Pool Statistics Packet

Definition at line 270 of file default_cfe_es_msgstruct.h.

11.145.2 Field Documentation

11.145.2.1 Payload `CFE_ES_PoolStatsTlm_Payload_t CFE_ES_MemStatsTlm::Payload`

Telemetry payload.
Definition at line 273 of file default_cfe_es_msgstruct.h.

11.145.2.2 TelemetryHeader `CFE_MSG_TelemetryHeader_t CFE_ES_MemStatsTlm::TelemetryHeader`

Telemetry header.
Definition at line 272 of file default_cfe_es_msgstruct.h.
The documentation for this struct was generated from the following file:

- cfe/modules/es/config/default_cfe_es_msgstruct.h

11.146 CFE_ES_NoopCmd Struct Reference

`#include <default_cfe_es_msgstruct.h>`

Data Fields

- CFE_MSG_CommandHeader_t CommandHeader

  Command header.

11.146.1 Detailed Description

Definition at line 53 of file default_cfe_es_msgstruct.h.

11.146.2 Field Documentation

11.146.2.1 CommandHeader `CFE_MSG_CommandHeader_t CFE_ES_NoopCmd::CommandHeader`

Command header.
Definition at line 57 of file default_cfe_es_msgstruct.h.
The documentation for this struct was generated from the following file:

- cfe/modules/es/config/default_cfe_es_msgstruct.h

11.147 CFE_ES_OneAppTlm Struct Reference

`#include <default_cfe_es_msgstruct.h>`

Data Fields

- CFE_MSG_TelemetryHeader_t TelemetryHeader

  Telemetry header.
- CFE_ES_OneAppTlm_Payload_t Payload

  Telemetry payload.

11.147.1 Detailed Description

Name Single Application Information Packet

Definition at line 261 of file default_cfe_es_msgstruct.h.

11.147.2 Field Documentation

11.147.2.1 Payload `CFE_ES_OneAppTlm_Payload_t CFE_ES_OneAppTlm::Payload`

Telemetry payload.
Definition at line 264 of file default_cfe_es_msgstruct.h.

11.147.2.2 TelemetryHeader `CFE_MSG_TelemetryHeader_t CFE_ES_OneAppTlm::TelemetryHeader`

Telemetry header.
Definition at line 263 of file default_cfe_es_msgstruct.h.
The documentation for this struct was generated from the following file:

- cfe/modules/es/config/default_cfe_es_msgstruct.h

11.148 CFE_ES_OneAppTlm_Payload Struct Reference

`#include <default_cfe_es_msgdefs.h>`

Data Fields

- CFE_ES_AppInfo_t AppInfo

  For more information, see CFE_ES_AppInfo_t.

11.148.1 Detailed Description

Name Single Application Information Packet

Definition at line 243 of file default_cfe_es_msgdefs.h.

11.148.2 Field Documentation

11.148.2.1 AppInfo `CFE_ES_AppInfo_t CFE_ES_OneAppTlm_Payload::AppInfo`

For more information, see CFE_ES_AppInfo_t.
Definition at line 245 of file default_cfe_es_msgdefs.h.
The documentation for this struct was generated from the following file:

- cfe/modules/es/config/default_cfe_es_msgdefs.h

11.149 CFE_ES_OverWriteSysLogCmd Struct Reference

Overwrite/Discard System Log Configuration Command Payload.
`#include <default_cfe_es_msgstruct.h>`

Data Fields

- CFE_MSG_CommandHeader_t CommandHeader

  Command header.
- CFE_ES_OverWriteSysLogCmd_Payload_t Payload

  Command payload.

11.149.1 Detailed Description

Overwrite/Discard System Log Configuration Command Payload.
Definition at line 133 of file default_cfe_es_msgstruct.h.

11.149.2 Field Documentation

11.149.2.1 CommandHeader `CFE_MSG_CommandHeader_t CFE_ES_OverWriteSysLogCmd::CommandHeader`

Command header.
Definition at line 135 of file default_cfe_es_msgstruct.h.

11.149.2.2 Payload `CFE_ES_OverWriteSysLogCmd_Payload_t CFE_ES_OverWriteSysLogCmd::Payload`

Command payload.
Definition at line 136 of file default_cfe_es_msgstruct.h.
The documentation for this struct was generated from the following file:

- cfe/modules/es/config/default_cfe_es_msgstruct.h

11.150 CFE_ES_OverWriteSysLogCmd_Payload Struct Reference

Overwrite/Discard System Log Configuration Command Payload.
`#include <default_cfe_es_msgdefs.h>`

Data Fields

- uint32 Mode

  CFE_ES_LogMode_DISCARD=Throw away most recent messages, CFE_ES_LogMode_OVERWRITE=Overwrite oldest with most recent

11.150.1 Detailed Description

Overwrite/Discard System Log Configuration Command Payload.
For command details, see CFE_ES_OVER_WRITE_SYS_LOG_CC
Definition at line 70 of file default_cfe_es_msgdefs.h.

11.150.2 Field Documentation

11.150.2.1 Mode `uint32 CFE_ES_OverWriteSysLogCmd_Payload::Mode`

CFE_ES_LogMode_DISCARD=Throw away most recent messages, CFE_ES_LogMode_OVERWRITE=Overwrite oldest with most recent
Definition at line 72 of file default_cfe_es_msgdefs.h.
The documentation for this struct was generated from the following file:

- cfe/modules/es/config/default_cfe_es_msgdefs.h

11.151 CFE_ES_PoolAlign Union Reference

Pool Alignment.
`#include <cfe_es_api_typedefs.h>`

Data Fields

- void * Ptr

  Aligned pointer.

- long long int LongInt

  Aligned Long Integer.

- long double LongDouble

  Aligned Long Double.

11.151.1 Detailed Description

Pool Alignment.
Union that can be used for minimum memory alignment of ES memory pools on the target. It contains the longest native data types such that the alignment of this structure should reflect the largest possible alignment requirements for any data on this processor.
Definition at line 145 of file cfe_es_api_typedefs.h.

11.151.2 Field Documentation

11.151.2.1 LongDouble `long double CFE_ES_PoolAlign::LongDouble`

Aligned Long Double.
Definition at line 150 of file cfe_es_api_typedefs.h.

11.151.2.2 LongInt `long long int CFE_ES_PoolAlign::LongInt`

Aligned Long Integer.
Definition at line 149 of file cfe_es_api_typedefs.h.

11.151.2.3 Ptr `void* CFE_ES_PoolAlign::Ptr`

Aligned pointer.
Definition at line 147 of file cfe_es_api_typedefs.h.
The documentation for this union was generated from the following file:

- cfe/modules/core_api/fsw/inc/cfe_es_api_typedefs.h

11.152 CFE_ES_PoolStatsTlm_Payload Struct Reference

`#include <default_cfe_es_msgdefs.h>`

Data Fields

- CFE_ES_MemHandle_t PoolHandle

  Handle of memory pool whose stats are being telemetered.
- CFE_ES_MemPoolStats_t PoolStats

  For more info, see CFE_ES_MemPoolStats_t.

11.152.1 Detailed Description

Name Memory Pool Statistics Packet

Definition at line 251 of file default_cfe_es_msgdefs.h.

11.152.2 Field Documentation

11.152.2.1 PoolHandle `CFE_ES_MemHandle_t CFE_ES_PoolStatsTlm_Payload::PoolHandle`

Handle of memory pool whose stats are being telemetered.

Telemetry Mnemonic(s) $sc_$cpu_ES_PoolHandle

Definition at line 253 of file default_cfe_es_msgdefs.h.

11.152.2.2 PoolStats `CFE_ES_MemPoolStats_t CFE_ES_PoolStatsTlm_Payload::PoolStats`

For more info, see CFE_ES_MemPoolStats_t.
Definition at line 255 of file default_cfe_es_msgdefs.h.
The documentation for this struct was generated from the following file:

- cfe/modules/es/config/default_cfe_es_msgdefs.h

11.153 CFE_ES_QueryAllCmd Struct Reference

`#include <default_cfe_es_msgstruct.h>`

Data Fields

- CFE_MSG_CommandHeader_t CommandHeader

  Command header.
- CFE_ES_FileNameCmd_Payload_t Payload

  Command payload.

11.153.1 Detailed Description

Definition at line 106 of file default_cfe_es_msgstruct.h.

11.153.2 Field Documentation

11.153.2.1 CommandHeader `CFE_MSG_CommandHeader_t CFE_ES_QueryAllCmd::CommandHeader`

Command header.
Definition at line 108 of file default_cfe_es_msgstruct.h.

11.153.2.2 Payload `CFE_ES_FileNameCmd_Payload_t CFE_ES_QueryAllCmd::Payload`

Command payload.
Definition at line 109 of file default_cfe_es_msgstruct.h.
The documentation for this struct was generated from the following file:

- cfe/modules/es/config/default_cfe_es_msgstruct.h

11.154 CFE_ES_QueryAllTasksCmd Struct Reference

`#include <default_cfe_es_msgstruct.h>`

Data Fields

- CFE_MSG_CommandHeader_t CommandHeader

  Command header.
- CFE_ES_FileNameCmd_Payload_t Payload

  Command payload.

11.154.1 Detailed Description

Definition at line 112 of file default_cfe_es_msgstruct.h.

11.154.2 Field Documentation

11.154.2.1 CommandHeader `CFE_MSG_CommandHeader_t CFE_ES_QueryAllTasksCmd::CommandHeader`

Command header.
Definition at line 114 of file default_cfe_es_msgstruct.h.

11.154.2.2 Payload `CFE_ES_FileNameCmd_Payload_t CFE_ES_QueryAllTasksCmd::Payload`

Command payload.
Definition at line 115 of file default_cfe_es_msgstruct.h.
The documentation for this struct was generated from the following file:

- cfe/modules/es/config/default_cfe_es_msgstruct.h

11.155 CFE_ES_QueryOneCmd Struct Reference

`#include <default_cfe_es_msgstruct.h>`

Data Fields

- CFE_MSG_CommandHeader_t CommandHeader

  Command header.
- CFE_ES_AppNameCmd_Payload_t Payload

  Command payload.

11.155.1 Detailed Description

Definition at line 165 of file default_cfe_es_msgstruct.h.

11.155.2 Field Documentation

11.155.2.1 CommandHeader `CFE_MSG_CommandHeader_t CFE_ES_QueryOneCmd::CommandHeader`

Command header.
Definition at line 167 of file default_cfe_es_msgstruct.h.

11.155.2.2 Payload `CFE_ES_AppNameCmd_Payload_t CFE_ES_QueryOneCmd::Payload`

Command payload.
Definition at line 168 of file default_cfe_es_msgstruct.h.
The documentation for this struct was generated from the following file:

- cfe/modules/es/config/default_cfe_es_msgstruct.h

11.156 CFE_ES_ReloadAppCmd Struct Reference

Reload Application Command.
`#include <default_cfe_es_msgstruct.h>`

Data Fields

- CFE_MSG_CommandHeader_t CommandHeader

  Command header.
- CFE_ES_AppReloadCmd_Payload_t Payload

  Command payload.

11.156.1 Detailed Description

Reload Application Command.
Definition at line 174 of file default_cfe_es_msgstruct.h.

11.156.2 Field Documentation

11.156.2.1 CommandHeader `CFE_MSG_CommandHeader_t CFE_ES_ReloadAppCmd::CommandHeader`

Command header.
Definition at line 176 of file default_cfe_es_msgstruct.h.

11.156.2.2 Payload `CFE_ES_AppReloadCmd_Payload_t CFE_ES_ReloadAppCmd::Payload`

Command payload.
Definition at line 177 of file default_cfe_es_msgstruct.h.
The documentation for this struct was generated from the following file:

- cfe/modules/es/config/default_cfe_es_msgstruct.h

11.157 CFE_ES_ResetCountersCmd Struct Reference

```
#include <default_cfe_es_msgstruct.h>
```

Data Fields

- CFE_MSG_CommandHeader_t CommandHeader

  Command header.

11.157.1 Detailed Description

Definition at line 58 of file default_cfe_es_msgstruct.h.

11.157.2 Field Documentation

11.157.2.1 CommandHeader `CFE_MSG_CommandHeader_t CFE_ES_ResetCountersCmd::CommandHeader`

Command header.
Definition at line 60 of file default_cfe_es_msgstruct.h.
The documentation for this struct was generated from the following file:

- cfe/modules/es/config/default_cfe_es_msgstruct.h

11.158 CFE_ES_ResetPRCountCmd Struct Reference

```
#include <default_cfe_es_msgstruct.h>
```

Data Fields

- CFE_MSG_CommandHeader_t CommandHeader

  Command header.

11.158.1 Detailed Description

Definition at line 73 of file default_cfe_es_msgstruct.h.

11.158.2 Field Documentation

11.158.2.1 CommandHeader `CFE_MSG_CommandHeader_t CFE_ES_ResetPRCountCmd::CommandHeader`

Command header.
Definition at line 75 of file default_cfe_es_msgstruct.h.
The documentation for this struct was generated from the following file:

- cfe/modules/es/config/default_cfe_es_msgstruct.h

11.159 CFE_ES_RestartAppCmd Struct Reference

```
#include <default_cfe_es_msgstruct.h>
```

Data Fields

- CFE_MSG_CommandHeader_t CommandHeader

  Command header.
- CFE_ES_AppNameCmd_Payload_t Payload

  Command payload.

11.159.1 Detailed Description

Definition at line 159 of file default_cfe_es_msgstruct.h.

11.159.2 Field Documentation

11.159.2.1 CommandHeader `CFE_MSG_CommandHeader_t CFE_ES_RestartAppCmd::CommandHeader`

Command header.
Definition at line 161 of file default_cfe_es_msgstruct.h.

11.159.2.2 Payload `CFE_ES_AppNameCmd_Payload_t CFE_ES_RestartAppCmd::Payload`

Command payload.
Definition at line 162 of file default_cfe_es_msgstruct.h.
The documentation for this struct was generated from the following file:

- cfe/modules/es/config/default_cfe_es_msgstruct.h

11.160 CFE_ES_RestartCmd Struct Reference

Restart cFE Command.

```
#include <default_cfe_es_msgstruct.h>
```

Data Fields

- CFE_MSG_CommandHeader_t CommandHeader
  Command header.
- CFE_ES_RestartCmd_Payload_t Payload
  Command payload.

11.160.1 Detailed Description

Restart cFE Command.
Definition at line 86 of file default_cfe_es_msgstruct.h.

11.160.2 Field Documentation

11.160.2.1 CommandHeader `CFE_MSG_CommandHeader_t CFE_ES_RestartCmd::CommandHeader`

Command header.
Definition at line 88 of file default_cfe_es_msgstruct.h.

11.160.2.2 Payload `CFE_ES_RestartCmd_Payload_t CFE_ES_RestartCmd::Payload`

Command payload.
Definition at line 89 of file default_cfe_es_msgstruct.h.
The documentation for this struct was generated from the following file:

- cfe/modules/es/config/default_cfe_es_msgstruct.h

11.161 CFE_ES_RestartCmd_Payload Struct Reference

Restart cFE Command Payload.
`#include <default_cfe_es_msgdefs.h>`

Data Fields

- uint16 RestartType
  CFE_PSP_RST_TYPE_PROCESSOR=Processor Reset or CFE_PSP_RST_TYPE_POWERON=Power-On Reset

11.161.1 Detailed Description

Restart cFE Command Payload.
For command details, see CFE_ES_RESTART_CC
Definition at line 44 of file default_cfe_es_msgdefs.h.

11.161.2 Field Documentation

11.161.2.1 RestartType `uint16 CFE_ES_RestartCmd_Payload::RestartType`

CFE_PSP_RST_TYPE_PROCESSOR=Processor Reset or CFE_PSP_RST_TYPE_POWERON=Power-On Reset

Definition at line 46 of file default_cfe_es_msgdefs.h.
The documentation for this struct was generated from the following file:

- cfe/modules/es/config/default_cfe_es_msgdefs.h

11.162 CFE_ES_SendHkCmd Struct Reference

`#include <default_cfe_es_msgstruct.h>`

Data Fields

- CFE_MSG_CommandHeader_t CommandHeader

  Command header.

11.162.1 Detailed Description

Definition at line 78 of file default_cfe_es_msgstruct.h.

11.162.2 Field Documentation

11.162.2.1 CommandHeader `CFE_MSG_CommandHeader_t CFE_ES_SendHkCmd::CommandHeader`

Command header.
Definition at line 80 of file default_cfe_es_msgstruct.h.
The documentation for this struct was generated from the following file:

- cfe/modules/es/config/default_cfe_es_msgstruct.h

11.163 CFE_ES_SendMemPoolStatsCmd Struct Reference

Send Memory Pool Statistics Command.
`#include <default_cfe_es_msgstruct.h>`

Data Fields

- CFE_MSG_CommandHeader_t CommandHeader

  Command header.
- CFE_ES_SendMemPoolStatsCmd_Payload_t Payload

  Command payload.

11.163.1 Detailed Description

Send Memory Pool Statistics Command.
Definition at line 237 of file default_cfe_es_msgstruct.h.

11.163.2 Field Documentation

11.163.2.1 CommandHeader `CFE_MSG_CommandHeader_t CFE_ES_SendMemPoolStatsCmd::CommandHeader`

Command header.
Definition at line 239 of file default_cfe_es_msgstruct.h.

11.163.2.2 Payload `CFE_ES_SendMemPoolStatsCmd_Payload_t CFE_ES_SendMemPoolStatsCmd::Payload`

Command payload.
Definition at line 240 of file default_cfe_es_msgstruct.h.
The documentation for this struct was generated from the following file:

- cfe/modules/es/config/default_cfe_es_msgstruct.h

11.164 CFE_ES_SendMemPoolStatsCmd_Payload Struct Reference

Send Memory Pool Statistics Command Payload.
`#include <default_cfe_es_msgdefs.h>`

Data Fields

- char Application [CFE_MISSION_MAX_API_LEN]
  - *RESERVED - should be all zeroes*
- CFE_ES_MemHandle_t PoolHandle

  Handle of Pool whose statistics are to be telemetered.

11.164.1 Detailed Description

Send Memory Pool Statistics Command Payload.
For command details, see CFE_ES_SEND_MEM_POOL_STATS_CC
Definition at line 213 of file default_cfe_es_msgdefs.h.

11.164.2 Field Documentation

11.164.2.1 Application `char CFE_ES_SendMemPoolStatsCmd_Payload::Application[CFE_MISSION_MAX_API_LEN]`

- RESERVED - should be all zeroes

Definition at line 215 of file default_cfe_es_msgdefs.h.

11.164.2.2 PoolHandle `CFE_ES_MemHandle_t CFE_ES_SendMemPoolStatsCmd_Payload::PoolHandle`

Handle of Pool whose statistics are to be telemetered.
Definition at line 216 of file default_cfe_es_msgdefs.h.
The documentation for this struct was generated from the following file:

- cfe/modules/es/config/default_cfe_es_msgdefs.h

11.165 CFE_ES_SetMaxPRCountCmd Struct Reference

Set Maximum Processor Reset Count Command.
`#include <default_cfe_es_msgstruct.h>`

Data Fields

- CFE_MSG_CommandHeader_t CommandHeader

  Command header.
- CFE_ES_SetMaxPRCountCmd_Payload_t Payload

  Command payload.

11.165.1 Detailed Description

Set Maximum Processor Reset Count Command.
Definition at line 183 of file default_cfe_es_msgstruct.h.

11.165.2 Field Documentation

11.165.2.1 CommandHeader `CFE_MSG_CommandHeader_t CFE_ES_SetMaxPRCountCmd::CommandHeader`

Command header.
Definition at line 185 of file default_cfe_es_msgstruct.h.

11.165.2.2 Payload `CFE_ES_SetMaxPRCountCmd_Payload_t CFE_ES_SetMaxPRCountCmd::Payload`

Command payload.
Definition at line 186 of file default_cfe_es_msgstruct.h.
The documentation for this struct was generated from the following file:

- cfe/modules/es/config/default_cfe_es_msgstruct.h

11.166 CFE_ES_SetMaxPRCountCmd_Payload Struct Reference

Set Maximum Processor Reset Count Command Payload.
`#include <default_cfe_es_msgdefs.h>`

Data Fields

- uint16 MaxPRCount

  New maximum number of Processor Resets before an automatic Power-On Reset is performed.

11.166.1 Detailed Description

Set Maximum Processor Reset Count Command Payload.
For command details, see CFE_ES_SET_MAX_PR_COUNT_CC
Definition at line 128 of file default_cfe_es_msgdefs.h.

11.166.2 Field Documentation

11.166.2.1 MaxPRCount `uint16 CFE_ES_SetMaxPRCountCmd_Payload::MaxPRCount`

New maximum number of Processor Resets before an automatic Power-On Reset is performed.
Definition at line 130 of file default_cfe_es_msgdefs.h.
The documentation for this struct was generated from the following file:

- cfe/modules/es/config/default_cfe_es_msgdefs.h

11.167 CFE_ES_SetPerfFilterMaskCmd Struct Reference

Set Performance Analyzer Filter Mask Command.
`#include <default_cfe_es_msgstruct.h>`

Data Fields

- CFE_MSG_CommandHeader_t CommandHeader

  Command header.
- CFE_ES_SetPerfFilterMaskCmd_Payload_t Payload

  Command payload.

11.167.1 Detailed Description

Set Performance Analyzer Filter Mask Command.
Definition at line 219 of file default_cfe_es_msgstruct.h.

11.167.2 Field Documentation

11.167.2.1 CommandHeader `CFE_MSG_CommandHeader_t CFE_ES_SetPerfFilterMaskCmd::CommandHeader`

Command header.
Definition at line 221 of file default_cfe_es_msgstruct.h.

11.167.2.2 Payload `CFE_ES_SetPerfFilterMaskCmd_Payload_t CFE_ES_SetPerfFilterMaskCmd::Payload`

Command payload.
Definition at line 222 of file default_cfe_es_msgstruct.h.
The documentation for this struct was generated from the following file:

- cfe/modules/es/config/default_cfe_es_msgstruct.h

11.168 CFE_ES_SetPerfFilterMaskCmd_Payload Struct Reference

Set Performance Analyzer Filter Mask Command Payload.
`#include <default_cfe_es_msgdefs.h>`

Data Fields

- uint32 FilterMaskNum

  Index into array of Filter Masks.
- uint32 FilterMask

  New Mask for specified entry in array of Filter Masks.

11.168.1 Detailed Description

Set Performance Analyzer Filter Mask Command Payload.
For command details, see CFE_ES_SET_PERF_FILTER_MASK_CC
Definition at line 189 of file default_cfe_es_msgdefs.h.

11.168.2 Field Documentation

11.168.2.1 FilterMask `uint32 CFE_ES_SetPerfFilterMaskCmd_Payload::FilterMask`

New Mask for specified entry in array of Filter Masks.
Definition at line 192 of file default_cfe_es_msgdefs.h.

11.168.2.2 FilterMaskNum `uint32 CFE_ES_SetPerfFilterMaskCmd_Payload::FilterMaskNum`

Index into array of Filter Masks.
Definition at line 191 of file default_cfe_es_msgdefs.h.
The documentation for this struct was generated from the following file:

- cfe/modules/es/config/default_cfe_es_msgdefs.h

11.169 CFE_ES_SetPerfTriggerMaskCmd Struct Reference

Set Performance Analyzer Trigger Mask Command.
`#include <default_cfe_es_msgstruct.h>`

Data Fields

- CFE_MSG_CommandHeader_t CommandHeader

  Command header.
- CFE_ES_SetPerfTrigMaskCmd_Payload_t Payload

  Command payload.

11.169.1 Detailed Description

Set Performance Analyzer Trigger Mask Command.
Definition at line 228 of file default_cfe_es_msgstruct.h.

11.169.2 Field Documentation

11.169.2.1 CommandHeader `CFE_MSG_CommandHeader_t CFE_ES_SetPerfTriggerMaskCmd::CommandHeader`

Command header.
Definition at line 230 of file default_cfe_es_msgstruct.h.

11.169.2.2 Payload `CFE_ES_SetPerfTrigMaskCmd_Payload_t CFE_ES_SetPerfTriggerMaskCmd::Payload`

Command payload.
Definition at line 231 of file default_cfe_es_msgstruct.h.
The documentation for this struct was generated from the following file:

- cfe/modules/es/config/default_cfe_es_msgstruct.h

11.170 CFE_ES_SetPerfTrigMaskCmd_Payload Struct Reference

Set Performance Analyzer Trigger Mask Command Payload.
`#include <default_cfe_es_msgdefs.h>`

Data Fields

- uint32 TriggerMaskNum

  Index into array of Trigger Masks.
- uint32 TriggerMask

  New Mask for specified entry in array of Trigger Masks.

11.170.1 Detailed Description

Set Performance Analyzer Trigger Mask Command Payload.
For command details, see CFE_ES_SET_PERF_TRIGGER_MASK_CC
Definition at line 201 of file default_cfe_es_msgdefs.h.

11.170.2 Field Documentation

11.170.2.1 TriggerMask `uint32 CFE_ES_SetPerfTrigMaskCmd_Payload::TriggerMask`

New Mask for specified entry in array of Trigger Masks.
Definition at line 204 of file default_cfe_es_msgdefs.h.

11.170.2.2 TriggerMaskNum `uint32 CFE_ES_SetPerfTrigMaskCmd_Payload::TriggerMaskNum`

Index into array of Trigger Masks.
Definition at line 203 of file default_cfe_es_msgdefs.h.
The documentation for this struct was generated from the following file:

- cfe/modules/es/config/default_cfe_es_msgdefs.h

11.171 CFE_ES_StartApp Struct Reference

Start Application Command.
`#include <default_cfe_es_msgstruct.h>`

Data Fields

- CFE_MSG_CommandHeader_t CommandHeader

  Command header.
- CFE_ES_StartAppCmd_Payload_t Payload

  Command payload.

11.171.1 Detailed Description

Start Application Command.
Definition at line 142 of file default_cfe_es_msgstruct.h.

11.171.2 Field Documentation

11.171.2.1 CommandHeader `CFE_MSG_CommandHeader_t CFE_ES_StartApp::CommandHeader`

Command header.
Definition at line 144 of file default_cfe_es_msgstruct.h.

11.171.2.2 Payload `CFE_ES_StartAppCmd_Payload_t CFE_ES_StartApp::Payload`

Command payload.
Definition at line 145 of file default_cfe_es_msgstruct.h.
The documentation for this struct was generated from the following file:

- cfe/modules/es/config/default_cfe_es_msgstruct.h

11.172 CFE_ES_StartAppCmd_Payload Struct Reference

Start Application Command Payload.
`#include <default_cfe_es_msgdefs.h>`

Data Fields

- char Application [CFE_MISSION_MAX_API_LEN]

  Name of Application to be started.
- char AppEntryPoint [CFE_MISSION_MAX_API_LEN]

  Symbolic name of Application's entry point.
- char AppFileName [CFE_MISSION_MAX_PATH_LEN]

  Full path and filename of Application's executable image.
- CFE_ES_MemOffset_t StackSize

  Desired stack size for the new application.
- CFE_ES_ExceptionAction_Enum_t ExceptionAction

  CFE_ES_ExceptionAction_RESTART_APP=On exception, restart Application, CFE_ES_ExceptionAction_PROC_RESTART=On exception, perform a Processor Reset
- CFE_ES_TaskPriority_Atom_t Priority

  The new Applications runtime priority.

11.172.1 Detailed Description

Start Application Command Payload.
For command details, see CFE_ES_START_APP_CC
Definition at line 82 of file default_cfe_es_msgdefs.h.

11.172.2 Field Documentation

11.172.2.1 AppEntryPoint `char CFE_ES_StartAppCmd_Payload::AppEntryPoint[CFE_MISSION_MAX_API_LEN]`

Symbolic name of Application's entry point.
Definition at line 85 of file default_cfe_es_msgdefs.h.

11.172.2.2 AppFileName `char CFE_ES_StartAppCmd_Payload::AppFileName[CFE_MISSION_MAX_PATH_LEN]`

Full path and filename of Application's executable image.
Definition at line 86 of file default_cfe_es_msgdefs.h.

11.172.2.3 Application `char CFE_ES_StartAppCmd_Payload::Application[CFE_MISSION_MAX_API_LEN]`

Name of Application to be started.
Definition at line 84 of file default_cfe_es_msgdefs.h.

11.172.2.4 ExceptionAction `CFE_ES_ExceptionAction_Enum_t CFE_ES_StartAppCmd_Payload::Exception↩ Action`

CFE_ES_ExceptionAction_RESTART_APP=On exception, restart Application, CFE_ES_ExceptionAction_PROC_RESTART=On exception, perform a Processor Reset
Definition at line 91 of file default_cfe_es_msgdefs.h.

11.172.2.5 Priority `CFE_ES_TaskPriority_Atom_t CFE_ES_StartAppCmd_Payload::Priority`

The new Applications runtime priority.
Definition at line 95 of file default_cfe_es_msgdefs.h.

11.172.2.6 StackSize `CFE_ES_MemOffset_t CFE_ES_StartAppCmd_Payload::StackSize`

Desired stack size for the new application.
Definition at line 89 of file default_cfe_es_msgdefs.h.
The documentation for this struct was generated from the following file:

- cfe/modules/es/config/default_cfe_es_msgdefs.h

11.173 CFE_ES_StartPerfCmd_Payload Struct Reference

Start Performance Analyzer Command Payload.
`#include <default_cfe_es_msgdefs.h>`

Data Fields

- CFE_ES_PerfMode_Enum_t TriggerMode

  Desired trigger position (Start, Center, End). Values defined by CFE_ES_PerfMode.

11.173.1 Detailed Description

Start Performance Analyzer Command Payload.
For command details, see CFE_ES_START_PERF_DATA_CC
Definition at line 165 of file default_cfe_es_msgdefs.h.

11.173.2 Field Documentation

11.173.2.1 TriggerMode `CFE_ES_PerfMode_Enum_t CFE_ES_StartPerfCmd_Payload::TriggerMode`

Desired trigger position (Start, Center, End). Values defined by CFE_ES_PerfMode.
Definition at line 168 of file default_cfe_es_msgdefs.h.
The documentation for this struct was generated from the following file:

- cfe/modules/es/config/default_cfe_es_msgdefs.h

11.174 CFE_ES_StartPerfDataCmd Struct Reference

Start Performance Analyzer Command.
`#include <default_cfe_es_msgstruct.h>`

Data Fields

- CFE_MSG_CommandHeader_t CommandHeader

  Command header.
- CFE_ES_StartPerfCmd_Payload_t Payload

  Command payload.

11.174.1 Detailed Description

Start Performance Analyzer Command.
Definition at line 201 of file default_cfe_es_msgstruct.h.

11.174.2 Field Documentation

11.174.2.1 CommandHeader `CFE_MSG_CommandHeader_t CFE_ES_StartPerfDataCmd::CommandHeader`

Command header.
Definition at line 203 of file default_cfe_es_msgstruct.h.

11.174.2.2 Payload `CFE_ES_StartPerfCmd_Payload_t CFE_ES_StartPerfDataCmd::Payload`

Command payload.
Definition at line 204 of file default_cfe_es_msgstruct.h.
The documentation for this struct was generated from the following file:

- cfe/modules/es/config/default_cfe_es_msgstruct.h

11.175 CFE_ES_StopAppCmd Struct Reference

`#include <default_cfe_es_msgstruct.h>`

Data Fields

- CFE_MSG_CommandHeader_t CommandHeader

  Command header.
- CFE_ES_AppNameCmd_Payload_t Payload

  Command payload.

11.175.1 Detailed Description

Definition at line 153 of file default_cfe_es_msgstruct.h.

11.175.2 Field Documentation

11.175.2.1 CommandHeader `CFE_MSG_CommandHeader_t CFE_ES_StopAppCmd::CommandHeader`

Command header.
Definition at line 155 of file default_cfe_es_msgstruct.h.

11.175.2.2 Payload `CFE_ES_AppNameCmd_Payload_t CFE_ES_StopAppCmd::Payload`

Command payload.
Definition at line 156 of file default_cfe_es_msgstruct.h.
The documentation for this struct was generated from the following file:

- cfe/modules/es/config/default_cfe_es_msgstruct.h

11.176 CFE_ES_StopPerfCmd_Payload Struct Reference

Stop Performance Analyzer Command Payload.
`#include <default_cfe_es_msgdefs.h>`

Data Fields

- char DataFileName [CFE_MISSION_MAX_PATH_LEN]

  ASCII text string of full path and filename of file Performance Analyzer data is to be written.

11.176.1 Detailed Description

Stop Performance Analyzer Command Payload.
For command details, see CFE_ES_STOP_PERF_DATA_CC
Definition at line 177 of file default_cfe_es_msgdefs.h.

11.176.2 Field Documentation

11.176.2.1 DataFileName `char CFE_ES_StopPerfCmd_Payload::DataFileName[CFE_MISSION_MAX_PATH_LEN]`

ASCII text string of full path and filename of file Performance Analyzer data is to be written.
Definition at line 179 of file default_cfe_es_msgdefs.h.
The documentation for this struct was generated from the following file:

- cfe/modules/es/config/default_cfe_es_msgdefs.h

11.177 CFE_ES_StopPerfDataCmd Struct Reference

Stop Performance Analyzer Command.
`#include <default_cfe_es_msgstruct.h>`

Data Fields

- CFE_MSG_CommandHeader_t CommandHeader

  Command header.
- CFE_ES_StopPerfCmd_Payload_t Payload

  Command payload.

11.177.1 Detailed Description

Stop Performance Analyzer Command.
Definition at line 210 of file default_cfe_es_msgstruct.h.

11.177.2 Field Documentation

11.177.2.1 CommandHeader `CFE_MSG_CommandHeader_t CFE_ES_StopPerfDataCmd::CommandHeader`

Command header.
Definition at line 212 of file default_cfe_es_msgstruct.h.

11.177.2.2 Payload `CFE_ES_StopPerfCmd_Payload_t CFE_ES_StopPerfDataCmd::Payload`

Command payload.
Definition at line 213 of file default_cfe_es_msgstruct.h.
The documentation for this struct was generated from the following file:

- cfe/modules/es/config/default_cfe_es_msgstruct.h

11.178 CFE_ES_TaskInfo Struct Reference

Task Information.
`#include <default_cfe_es_extern_typedefs.h>`

Data Fields

- CFE_ES_TaskId_t TaskId

  Task Id.
- uint32 ExecutionCounter

  Task Execution Counter.
- char TaskName [CFE_MISSION_MAX_API_LEN]

  Task Name.
- CFE_ES_AppId_t AppId

  Parent Application ID.
- char AppName [CFE_MISSION_MAX_API_LEN]

  Parent Application Name.
- CFE_ES_MemOffset_t StackSize
- CFE_ES_TaskPriority_Atom_t Priority
- uint8 Spare [2]

11.178.1 Detailed Description

Task Information.
Structure that is used to provide information about a task. It is primarily used for the Query All Tasks (CFE_ES_QUERY_ALL_TASKS_CC) command.

Note

There is not currently a telemetry message directly containing this data structure, but it does define the format of the data file generated by the Query All Tasks command. Therefore it should be considered part of the overall telemetry interface.

Definition at line 499 of file default_cfe_es_extern_typedefs.h.

11.178.2 Field Documentation

11.178.2.1 AppId `CFE_ES_AppId_t CFE_ES_TaskInfo::AppId`

Parent Application ID.
Definition at line 504 of file default_cfe_es_extern_typedefs.h.

11.178.2.2 AppName `char CFE_ES_TaskInfo::AppName[CFE_MISSION_MAX_API_LEN]`

Parent Application Name.
Definition at line 505 of file default_cfe_es_extern_typedefs.h.

11.178.2.3 ExecutionCounter `uint32 CFE_ES_TaskInfo::ExecutionCounter`

Task Execution Counter.
Definition at line 502 of file default_cfe_es_extern_typedefs.h.

11.178.2.4 Priority `CFE_ES_TaskPriority_Atom_t CFE_ES_TaskInfo::Priority`

Priority of task
Definition at line 507 of file default_cfe_es_extern_typedefs.h.

11.178.2.5 Spare `uint8 CFE_ES_TaskInfo::Spare[2]`

Spare bytes for alignment

Definition at line 508 of file default_cfe_es_extern_typedefs.h.

11.178.2.6 StackSize `CFE_ES_MemOffset_t CFE_ES_TaskInfo::StackSize`

Size of task stack

Definition at line 506 of file default_cfe_es_extern_typedefs.h.

11.178.2.7 TaskId `CFE_ES_TaskId_t CFE_ES_TaskInfo::TaskId`

Task Id.

Definition at line 501 of file default_cfe_es_extern_typedefs.h.

11.178.2.8 TaskName `char CFE_ES_TaskInfo::TaskName[CFE_MISSION_MAX_API_LEN]`

Task Name.

Definition at line 503 of file default_cfe_es_extern_typedefs.h.

The documentation for this struct was generated from the following file:

- cfe/modules/es/config/default_cfe_es_extern_typedefs.h

11.179 CFE_ES_WriteERLogCmd Struct Reference

`#include <default_cfe_es_msgstruct.h>`

Data Fields

- CFE_MSG_CommandHeader_t CommandHeader

  Command header.
- CFE_ES_FileNameCmd_Payload_t Payload

  Command payload.

11.179.1 Detailed Description

Definition at line 124 of file default_cfe_es_msgstruct.h.

11.179.2 Field Documentation

11.179.2.1 CommandHeader `CFE_MSG_CommandHeader_t CFE_ES_WriteERLogCmd::CommandHeader`

Command header.

Definition at line 126 of file default_cfe_es_msgstruct.h.

11.179.2.2 Payload `CFE_ES_FileNameCmd_Payload_t CFE_ES_WriteERLogCmd::Payload`

Command payload.

Definition at line 127 of file default_cfe_es_msgstruct.h.

The documentation for this struct was generated from the following file:

- cfe/modules/es/config/default_cfe_es_msgstruct.h

11.180 CFE_ES_WriteSysLogCmd Struct Reference

`#include <default_cfe_es_msgstruct.h>`

Data Fields

- CFE_MSG_CommandHeader_t CommandHeader

  Command header.
- CFE_ES_FileNameCmd_Payload_t Payload

  Command payload.

11.180.1 Detailed Description

Definition at line 118 of file default_cfe_es_msgstruct.h.

11.180.2 Field Documentation

11.180.2.1 CommandHeader `CFE_MSG_CommandHeader_t CFE_ES_WriteSysLogCmd::CommandHeader`

Command header.
Definition at line 120 of file default_cfe_es_msgstruct.h.

11.180.2.2 Payload `CFE_ES_FileNameCmd_Payload_t CFE_ES_WriteSysLogCmd::Payload`

Command payload.
Definition at line 121 of file default_cfe_es_msgstruct.h.
The documentation for this struct was generated from the following file:

- cfe/modules/es/config/default_cfe_es_msgstruct.h

11.181 CFE_EVS_AddEventFilterCmd Struct Reference

`#include <default_cfe_evs_msgstruct.h>`

Data Fields

- CFE_MSG_CommandHeader_t CommandHeader

  Command header.
- CFE_EVS_AppNameEventIDMaskCmd_Payload_t Payload

  Command payload.

11.181.1 Detailed Description

Definition at line 203 of file default_cfe_evs_msgstruct.h.

11.181.2 Field Documentation

11.181.2.1 CommandHeader `CFE_MSG_CommandHeader_t CFE_EVS_AddEventFilterCmd::CommandHeader`

Command header.
Definition at line 205 of file default_cfe_evs_msgstruct.h.

11.181.2.2 Payload `CFE_EVS_AppNameEventIDMaskCmd_Payload_t CFE_EVS_AddEventFilterCmd::Payload`

Command payload.
Definition at line 206 of file default_cfe_evs_msgstruct.h.
The documentation for this struct was generated from the following file:

- cfe/modules/evs/config/default_cfe_evs_msgstruct.h

11.182 CFE_EVS_AppDataCmd_Payload Struct Reference

Write Event Services Application Information to File Command Payload.
`#include <default_cfe_evs_msgdefs.h>`

Data Fields

- char AppDataFilename [CFE_MISSION_MAX_PATH_LEN]

  Filename where application data is to be written.

11.182.1 Detailed Description

Write Event Services Application Information to File Command Payload.
For command details, see CFE_EVS_WRITE_APP_DATA_FILE_CC
Definition at line 68 of file default_cfe_evs_msgdefs.h.

11.182.2 Field Documentation

11.182.2.1 AppDataFilename `char CFE_EVS_AppDataCmd_Payload::AppDataFilename[CFE_MISSION_MAX_PATH_LEN]`

Filename where application data is to be written.
Definition at line 70 of file default_cfe_evs_msgdefs.h.
The documentation for this struct was generated from the following file:

- cfe/modules/evs/config/default_cfe_evs_msgdefs.h

11.183 CFE_EVS_AppNameBitMaskCmd_Payload Struct Reference

Generic App Name and Bitmask Command Payload.
`#include <default_cfe_evs_msgdefs.h>`

Data Fields

- char AppName [CFE_MISSION_MAX_API_LEN]

  Application name to use in the command.
- uint8 BitMask

  BitMask to use in the command.
- uint8 Spare

  Pad to even byte.

11.183.1 Detailed Description

Generic App Name and Bitmask Command Payload.
For command details, see CFE_EVS_ENABLE_APP_EVENT_TYPE_CC and/or CFE_EVS_DISABLE_APP_EVENT_TYPE_CC
Definition at line 140 of file default_cfe_evs_msgdefs.h.

11.183.2 Field Documentation

11.183.2.1 AppName `char CFE_EVS_AppNameBitMaskCmd_Payload::AppName[CFE_MISSION_MAX_API_LEN]`

Application name to use in the command.
Definition at line 142 of file default_cfe_evs_msgdefs.h.

11.183.2.2 BitMask `uint8 CFE_EVS_AppNameBitMaskCmd_Payload::BitMask`

BitMask to use in the command.
Definition at line 143 of file default_cfe_evs_msgdefs.h.

11.183.2.3 Spare `uint8 CFE_EVS_AppNameBitMaskCmd_Payload::Spare`

Pad to even byte.
Definition at line 144 of file default_cfe_evs_msgdefs.h.
The documentation for this struct was generated from the following file:

- cfe/modules/evs/config/default_cfe_evs_msgdefs.h

11.184 CFE_EVS_AppNameCmd_Payload Struct Reference

Generic App Name Command Payload.
`#include <default_cfe_evs_msgdefs.h>`

Data Fields

- char AppName [CFE_MISSION_MAX_API_LEN]

  Application name to use in the command.

11.184.1 Detailed Description

Generic App Name Command Payload.
For command details, see CFE_EVS_ENABLE_APP_EVENTS_CC, CFE_EVS_DISABLE_APP_EVENTS_CC, CFE_EVS_RESET_APP_COUNTER_CC and/or CFE_EVS_RESET_ALL_FILTERS_CC
Definition at line 117 of file default_cfe_evs_msgdefs.h.

11.184.2 Field Documentation

11.184.2.1 AppName `char CFE_EVS_AppNameCmd_Payload::AppName[CFE_MISSION_MAX_API_LEN]`

Application name to use in the command.
Definition at line 119 of file default_cfe_evs_msgdefs.h.
The documentation for this struct was generated from the following file:

- cfe/modules/evs/config/default_cfe_evs_msgdefs.h

11.185 CFE_EVS_AppNameEventIDCmd_Payload Struct Reference

Generic App Name and Event ID Command Payload.
`#include <default_cfe_evs_msgdefs.h>`

Data Fields

- char AppName [CFE_MISSION_MAX_API_LEN]

  Application name to use in the command.
- uint16 EventID

  Event ID to use in the command.

11.185.1 Detailed Description

Generic App Name and Event ID Command Payload.
For command details, see CFE_EVS_RESET_FILTER_CC and CFE_EVS_DELETE_EVENT_FILTER_CC
Definition at line 128 of file default_cfe_evs_msgdefs.h.

11.185.2 Field Documentation

11.185.2.1 AppName `char CFE_EVS_AppNameEventIDCmd_Payload::AppName[CFE_MISSION_MAX_API_LEN]`

Application name to use in the command.
Definition at line 130 of file default_cfe_evs_msgdefs.h.

11.185.2.2 EventID `uint16 CFE_EVS_AppNameEventIDCmd_Payload::EventID`

Event ID to use in the command.
Definition at line 131 of file default_cfe_evs_msgdefs.h.
The documentation for this struct was generated from the following file:

- cfe/modules/evs/config/default_cfe_evs_msgdefs.h

11.186 CFE_EVS_AppNameEventIDMaskCmd_Payload Struct Reference

Generic App Name, Event ID, Mask Command Payload.
`#include <default_cfe_evs_msgdefs.h>`

Data Fields

- char AppName [CFE_MISSION_MAX_API_LEN]

  Application name to use in the command.
- uint16 EventID

  Event ID to use in the command.
- uint16 Mask

  Mask to use in the command.

11.186.1 Detailed Description

Generic App Name, Event ID, Mask Command Payload.
For command details, see CFE_EVS_SET_FILTER_CC, CFE_EVS_ADD_EVENT_FILTER_CC and/or CFE_EVS_DELETE_EVENT_FIL
Definition at line 154 of file default_cfe_evs_msgdefs.h.

11.186.2 Field Documentation

11.186.2.1 AppName `char CFE_EVS_AppNameEventIDMaskCmd_Payload::AppName[CFE_MISSION_MAX_API_LEN]`

Application name to use in the command.
Definition at line 156 of file default_cfe_evs_msgdefs.h.

11.186.2.2 EventID `uint16 CFE_EVS_AppNameEventIDMaskCmd_Payload::EventID`

Event ID to use in the command.
Definition at line 157 of file default_cfe_evs_msgdefs.h.

11.186.2.3 Mask `uint16 CFE_EVS_AppNameEventIDMaskCmd_Payload::Mask`

Mask to use in the command.
Definition at line 158 of file default_cfe_evs_msgdefs.h.
The documentation for this struct was generated from the following file:

- cfe/modules/evs/config/default_cfe_evs_msgdefs.h

11.187 CFE_EVS_AppTlmData Struct Reference

`#include <default_cfe_evs_msgdefs.h>`

Data Fields

- CFE_ES_AppId_t AppID

  Numerical application identifier.
- uint16 AppMessageSentCounter

  Application message sent counter.
- uint8 AppEnableStatus

  Application event service enable status.
- uint8 AppMessageSquelchedCounter

  Number of events squelched.

11.187.1 Detailed Description

Definition at line 167 of file default_cfe_evs_msgdefs.h.

11.187.2 Field Documentation

11.187.2.1 AppEnableStatus `uint8 CFE_EVS_AppTlmData::AppEnableStatus`

Application event service enable status.

Telemetry Mnemonic(s) $sc_$cpu_EVS_APP[CFE_PLATFORM_ES_MAX_APPLICATIONS].APPENASTAT

Definition at line 173 of file default_cfe_evs_msgdefs.h.

11.187.2.2 AppID `CFE_ES_AppId_t CFE_EVS_AppTlmData::AppID`

Numerical application identifier.

Telemetry Mnemonic(s) $sc_$cpu_EVS_APP[CFE_PLATFORM_ES_MAX_APPLICATIONS].APPID

Definition at line 169 of file default_cfe_evs_msgdefs.h.

11.187.2.3 AppMessageSentCounter `uint16 CFE_EVS_AppTlmData::AppMessageSentCounter`

Application message sent counter.

Telemetry Mnemonic(s) $sc_$cpu_EVS_APP[CFE_PLATFORM_ES_MAX_APPLICATIONS].APPMSGSENTC

Definition at line 171 of file default_cfe_evs_msgdefs.h.

11.187.2.4 AppMessageSquelchedCounter `uint8 CFE_EVS_AppTlmData::AppMessageSquelchedCounter`

Number of events squelched.

Telemetry Mnemonic(s) $sc_$cpu_EVS_APP[CFE_PLATFORM_ES_MAX_APPLICATIONS].SQUELCHEDC

Definition at line 175 of file default_cfe_evs_msgdefs.h.
The documentation for this struct was generated from the following file:

- cfe/modules/evs/config/default_cfe_evs_msgdefs.h

11.188 CFE_EVS_BinFilter Struct Reference

Event message filter definition structure.
`#include <cfe_evs_api_typedefs.h>`

Data Fields

- uint16 EventID

  Numerical event identifier.
- uint16 Mask

  Binary filter mask value.

11.188.1 Detailed Description

Event message filter definition structure.
Definition at line 60 of file cfe_evs_api_typedefs.h.

11.188.2 Field Documentation

11.188.2.1 EventID `uint16 CFE_EVS_BinFilter::EventID`

Numerical event identifier.
Definition at line 62 of file cfe_evs_api_typedefs.h.

11.188.2.2 Mask `uint16 CFE_EVS_BinFilter::Mask`

Binary filter mask value.
Definition at line 63 of file cfe_evs_api_typedefs.h.
The documentation for this struct was generated from the following file:

- cfe/modules/core_api/fsw/inc/cfe_evs_api_typedefs.h

11.189 CFE_EVS_BitMaskCmd_Payload Struct Reference

Generic Bitmask Command Payload.
`#include <default_cfe_evs_msgdefs.h>`

Data Fields

- uint8 BitMask

  BitMask to use in the command.
- uint8 Spare

  Pad to even byte.

11.189.1 Detailed Description

Generic Bitmask Command Payload.
For command details, see CFE_EVS_ENABLE_EVENT_TYPE_CC, CFE_EVS_DISABLE_EVENT_TYPE_CC, CFE_EVS_ENABLE_PORTS_CC and/or CFE_EVS_DISABLE_PORTS_CC
Definition at line 104 of file default_cfe_evs_msgdefs.h.

11.189.2 Field Documentation

11.189.2.1 BitMask `uint8 CFE_EVS_BitMaskCmd_Payload::BitMask`

BitMask to use in the command.
Definition at line 106 of file default_cfe_evs_msgdefs.h.

11.189.2.2 Spare `uint8 CFE_EVS_BitMaskCmd_Payload::Spare`

Pad to even byte.
Definition at line 107 of file default_cfe_evs_msgdefs.h.
The documentation for this struct was generated from the following file:

- cfe/modules/evs/config/default_cfe_evs_msgdefs.h

11.190 CFE_EVS_ClearLogCmd Struct Reference

```
#include <default_cfe_evs_msgstruct.h>
```

Data Fields

- CFE_MSG_CommandHeader_t CommandHeader

  Command header.

11.190.1 Detailed Description

Definition at line 60 of file default_cfe_evs_msgstruct.h.

11.190.2 Field Documentation

11.190.2.1 CommandHeader `CFE_MSG_CommandHeader_t CFE_EVS_ClearLogCmd::CommandHeader`

Command header.
Definition at line 62 of file default_cfe_evs_msgstruct.h.
The documentation for this struct was generated from the following file:

- cfe/modules/evs/config/default_cfe_evs_msgstruct.h

11.191 CFE_EVS_DeleteEventFilterCmd Struct Reference

`#include <default_cfe_evs_msgstruct.h>`

Data Fields

- CFE_MSG_CommandHeader_t CommandHeader

  Command header.
- CFE_EVS_AppNameEventIDCmd_Payload_t Payload

  Command payload.

11.191.1 Detailed Description

Definition at line 175 of file default_cfe_evs_msgstruct.h.

11.191.2 Field Documentation

11.191.2.1 CommandHeader `CFE_MSG_CommandHeader_t CFE_EVS_DeleteEventFilterCmd::CommandHeader`

Command header.
Definition at line 177 of file default_cfe_evs_msgstruct.h.

11.191.2.2 Payload `CFE_EVS_AppNameEventIDCmd_Payload_t CFE_EVS_DeleteEventFilterCmd::Payload`

Command payload.
Definition at line 178 of file default_cfe_evs_msgstruct.h.
The documentation for this struct was generated from the following file:

- cfe/modules/evs/config/default_cfe_evs_msgstruct.h

11.192 CFE_EVS_DisableAppEventsCmd Struct Reference

`#include <default_cfe_evs_msgstruct.h>`

Data Fields

- CFE_MSG_CommandHeader_t CommandHeader

  Command header.
- CFE_EVS_AppNameCmd_Payload_t Payload

  Command payload.

11.192.1 Detailed Description

Definition at line 146 of file default_cfe_evs_msgstruct.h.

11.192.2 Field Documentation

11.192.2.1 CommandHeader `CFE_MSG_CommandHeader_t CFE_EVS_DisableAppEventsCmd::CommandHeader`

Command header.
Definition at line 148 of file default_cfe_evs_msgstruct.h.

11.192.2.2 Payload `CFE_EVS_AppNameCmd_Payload_t` `CFE_EVS_DisableAppEventsCmd::Payload`

Command payload.
Definition at line 149 of file default_cfe_evs_msgstruct.h.
The documentation for this struct was generated from the following file:

- cfe/modules/evs/config/default_cfe_evs_msgstruct.h

11.193 CFE_EVS_DisableAppEventTypeCmd Struct Reference

```
#include <default_cfe_evs_msgstruct.h>
```

Data Fields

- CFE_MSG_CommandHeader_t CommandHeader

  Command header.
- CFE_EVS_AppNameBitMaskCmd_Payload_t Payload

  Command payload.

11.193.1 Detailed Description

Definition at line 192 of file default_cfe_evs_msgstruct.h.

11.193.2 Field Documentation

11.193.2.1 CommandHeader `CFE_MSG_CommandHeader_t` `CFE_EVS_DisableAppEventTypeCmd::CommandHeader`

Command header.
Definition at line 194 of file default_cfe_evs_msgstruct.h.

11.193.2.2 Payload `CFE_EVS_AppNameBitMaskCmd_Payload_t` `CFE_EVS_DisableAppEventTypeCmd::Payload`

Command payload.
Definition at line 195 of file default_cfe_evs_msgstruct.h.
The documentation for this struct was generated from the following file:

- cfe/modules/evs/config/default_cfe_evs_msgstruct.h

11.194 CFE_EVS_DisableEventTypeCmd Struct Reference

```
#include <default_cfe_evs_msgstruct.h>
```

Data Fields

- CFE_MSG_CommandHeader_t CommandHeader

  Command header.
- CFE_EVS_BitMaskCmd_Payload_t Payload

  Command payload.

11.194.1 Detailed Description

Definition at line 129 of file default_cfe_evs_msgstruct.h.

11.194.2 Field Documentation

11.194.2.1 CommandHeader `CFE_MSG_CommandHeader_t CFE_EVS_DisableEventTypeCmd::CommandHeader`

Command header.
Definition at line 131 of file default_cfe_evs_msgstruct.h.

11.194.2.2 Payload `CFE_EVS_BitMaskCmd_Payload_t CFE_EVS_DisableEventTypeCmd::Payload`

Command payload.
Definition at line 132 of file default_cfe_evs_msgstruct.h.
The documentation for this struct was generated from the following file:

- cfe/modules/evs/config/default_cfe_evs_msgstruct.h

11.195 CFE_EVS_DisablePortsCmd Struct Reference

```
#include <default_cfe_evs_msgstruct.h>
```

Data Fields

- CFE_MSG_CommandHeader_t CommandHeader

  Command header.
- CFE_EVS_BitMaskCmd_Payload_t Payload

  Command payload.

11.195.1 Detailed Description

Definition at line 117 of file default_cfe_evs_msgstruct.h.

11.195.2 Field Documentation

11.195.2.1 CommandHeader `CFE_MSG_CommandHeader_t CFE_EVS_DisablePortsCmd::CommandHeader`

Command header.
Definition at line 119 of file default_cfe_evs_msgstruct.h.

11.195.2.2 Payload `CFE_EVS_BitMaskCmd_Payload_t CFE_EVS_DisablePortsCmd::Payload`

Command payload.
Definition at line 120 of file default_cfe_evs_msgstruct.h.
The documentation for this struct was generated from the following file:

- cfe/modules/evs/config/default_cfe_evs_msgstruct.h

11.196 CFE_EVS_EnableAppEventsCmd Struct Reference

```
#include <default_cfe_evs_msgstruct.h>
```

Data Fields

- CFE_MSG_CommandHeader_t CommandHeader

  Command header.
- CFE_EVS_AppNameCmd_Payload_t Payload

  Command payload.

11.196.1 Detailed Description

Definition at line 140 of file default_cfe_evs_msgstruct.h.

11.196.2 Field Documentation

11.196.2.1 CommandHeader `CFE_MSG_CommandHeader_t CFE_EVS_EnableAppEventsCmd::CommandHeader`

Command header.
Definition at line 142 of file default_cfe_evs_msgstruct.h.

11.196.2.2 Payload `CFE_EVS_AppNameCmd_Payload_t CFE_EVS_EnableAppEventsCmd::Payload`

Command payload.
Definition at line 143 of file default_cfe_evs_msgstruct.h.
The documentation for this struct was generated from the following file:

- cfe/modules/evs/config/default_cfe_evs_msgstruct.h

11.197 CFE_EVS_EnableAppEventTypeCmd Struct Reference

```
#include <default_cfe_evs_msgstruct.h>
```

Data Fields

- CFE_MSG_CommandHeader_t CommandHeader

  Command header.
- CFE_EVS_AppNameBitMaskCmd_Payload_t Payload

  Command payload.

11.197.1 Detailed Description

Definition at line 186 of file default_cfe_evs_msgstruct.h.

11.197.2 Field Documentation

11.197.2.1 CommandHeader `CFE_MSG_CommandHeader_t CFE_EVS_EnableAppEventTypeCmd::CommandHeader`

Command header.
Definition at line 188 of file default_cfe_evs_msgstruct.h.

11.197.2.2 Payload `CFE_EVS_AppNameBitMaskCmd_Payload_t CFE_EVS_EnableAppEventTypeCmd::Payload`

Command payload.
Definition at line 189 of file default_cfe_evs_msgstruct.h.
The documentation for this struct was generated from the following file:

- cfe/modules/evs/config/default_cfe_evs_msgstruct.h

11.198 CFE_EVS_EnableEventTypeCmd Struct Reference

`#include <default_cfe_evs_msgstruct.h>`

Data Fields

- CFE_MSG_CommandHeader_t CommandHeader

  Command header.
- CFE_EVS_BitMaskCmd_Payload_t Payload

  Command payload.

11.198.1 Detailed Description

Definition at line 123 of file default_cfe_evs_msgstruct.h.

11.198.2 Field Documentation

11.198.2.1 CommandHeader `CFE_MSG_CommandHeader_t CFE_EVS_EnableEventTypeCmd::CommandHeader`

Command header.
Definition at line 125 of file default_cfe_evs_msgstruct.h.

11.198.2.2 Payload `CFE_EVS_BitMaskCmd_Payload_t CFE_EVS_EnableEventTypeCmd::Payload`

Command payload.
Definition at line 126 of file default_cfe_evs_msgstruct.h.
The documentation for this struct was generated from the following file:

- cfe/modules/evs/config/default_cfe_evs_msgstruct.h

11.199 CFE_EVS_EnablePortsCmd Struct Reference

`#include <default_cfe_evs_msgstruct.h>`

Data Fields

- CFE_MSG_CommandHeader_t CommandHeader

  Command header.
- CFE_EVS_BitMaskCmd_Payload_t Payload

  Command payload.

11.199.1 Detailed Description

Definition at line 111 of file default_cfe_evs_msgstruct.h.

11.199.2 Field Documentation

11.199.2.1 CommandHeader `CFE_MSG_CommandHeader_t` `CFE_EVS_EnablePortsCmd::CommandHeader`

Command header.
Definition at line 113 of file default_cfe_evs_msgstruct.h.

11.199.2.2 Payload `CFE_EVS_BitMaskCmd_Payload_t` `CFE_EVS_EnablePortsCmd::Payload`

Command payload.
Definition at line 114 of file default_cfe_evs_msgstruct.h.
The documentation for this struct was generated from the following file:

- cfe/modules/evs/config/default_cfe_evs_msgstruct.h

11.200 CFE_EVS_HousekeepingTlm Struct Reference

```
#include <default_cfe_evs_msgstruct.h>
```

Data Fields

- CFE_MSG_TelemetryHeader_t TelemetryHeader

  Telemetry header.
- CFE_EVS_HousekeepingTlm_Payload_t Payload

  Telemetry payload.

11.200.1 Detailed Description

Definition at line 221 of file default_cfe_evs_msgstruct.h.

11.200.2 Field Documentation

11.200.2.1 Payload `CFE_EVS_HousekeepingTlm_Payload_t` `CFE_EVS_HousekeepingTlm::Payload`

Telemetry payload.
Definition at line 224 of file default_cfe_evs_msgstruct.h.

11.200.2.2 TelemetryHeader `CFE_MSG_TelemetryHeader_t` `CFE_EVS_HousekeepingTlm::TelemetryHeader`

Telemetry header.
Definition at line 223 of file default_cfe_evs_msgstruct.h.
The documentation for this struct was generated from the following file:

- cfe/modules/evs/config/default_cfe_evs_msgstruct.h

11.201 CFE_EVS_HousekeepingTlm_Payload Struct Reference

```
#include <default_cfe_evs_msgdefs.h>
```

Data Fields

- uint8 CommandCounter

  EVS Command Counter.
- uint8 CommandErrorCounter

  EVS Command Error Counter.
- uint8 MessageFormatMode

  Event message format mode (short/long)
- uint8 MessageTruncCounter

  Event message truncation counter.
- uint8 UnregisteredAppCounter

  Unregistered application message send counter.
- uint8 OutputPort

  Output port mask.
- uint8 LogFullFlag

  Local event log full flag.
- uint8 LogMode

  Local event logging mode (overwrite/discard)
- uint16 MessageSendCounter

  Event message send counter.
- uint16 LogOverflowCounter

  Local event log overflow counter.
- uint8 LogEnabled

  Current event log enable/disable state.
- uint8 Spare1

  Padding for 32 bit boundary.
- uint8 Spare2

  Padding for 32 bit boundary.
- uint8 Spare3

  Padding for 32 bit boundary.
- CFE_EVS_AppTlmData_t AppData [CFE_MISSION_ES_MAX_APPLICATIONS]

  Array of registered application table data.

11.201.1 Detailed Description

Name Event Services Housekeeping Telemetry Packet

Definition at line 182 of file default_cfe_evs_msgdefs.h.

11.201.2 Field Documentation

11.201.2.1 AppData `CFE_EVS_AppTlmData_t CFE_EVS_HousekeepingTlm_Payload::AppData[CFE_MISSION_ES_MAX_APPLICATIONS`

Array of registered application table data.

Telemetry Mnemonic(s) $sc_$cpu_EVS_APP[CFE_PLATFORM_ES_MAX_APPLICATIONS]

Definition at line 216 of file default_cfe_evs_msgdefs.h.

11.201.2.2 CommandCounter `uint8 CFE_EVS_HousekeepingTlm_Payload::CommandCounter`

EVS Command Counter.

Telemetry Mnemonic(s) $sc_$cpu_EVS_CMDPC

Definition at line 184 of file default_cfe_evs_msgdefs.h.

11.201.2.3 CommandErrorCounter `uint8 CFE_EVS_HousekeepingTlm_Payload::CommandErrorCounter`

EVS Command Error Counter.

Telemetry Mnemonic(s) $sc_$cpu_EVS_CMDEC

Definition at line 186 of file default_cfe_evs_msgdefs.h.

11.201.2.4 LogEnabled `uint8 CFE_EVS_HousekeepingTlm_Payload::LogEnabled`

Current event log enable/disable state.

Telemetry Mnemonic(s) $sc_$cpu_EVS_LOGENABLED

Definition at line 207 of file default_cfe_evs_msgdefs.h.

11.201.2.5 LogFullFlag `uint8 CFE_EVS_HousekeepingTlm_Payload::LogFullFlag`

Local event log full flag.

Telemetry Mnemonic(s) $sc_$cpu_EVS_LOGFULL

Definition at line 197 of file default_cfe_evs_msgdefs.h.

11.201.2.6 LogMode `uint8 CFE_EVS_HousekeepingTlm_Payload::LogMode`

Local event logging mode (overwrite/discard)

Telemetry Mnemonic(s) $sc_$cpu_EVS_LOGMODE

Definition at line 199 of file default_cfe_evs_msgdefs.h.

11.201.2.7 LogOverflowCounter `uint16 CFE_EVS_HousekeepingTlm_Payload::LogOverflowCounter`

Local event log overflow counter.

Telemetry Mnemonic(s) $sc_$cpu_EVS_LOGOVERFLOWC

Definition at line 204 of file default_cfe_evs_msgdefs.h.

11.201.2.8 MessageFormatMode `uint8 CFE_EVS_HousekeepingTlm_Payload::MessageFormatMode`

Event message format mode (short/long)

Telemetry Mnemonic(s) $sc_$cpu_EVS_MSGFMTMODE

Definition at line 188 of file default_cfe_evs_msgdefs.h.

11.201.2.9 MessageSendCounter `uint16 CFE_EVS_HousekeepingTlm_Payload::MessageSendCounter`

Event message send counter.

Telemetry Mnemonic(s) $sc_$cpu_EVS_MSGSENTC

Definition at line 202 of file default_cfe_evs_msgdefs.h.

11.201.2.10 MessageTruncCounter `uint8 CFE_EVS_HousekeepingTlm_Payload::MessageTruncCounter`

Event message truncation counter.

Telemetry Mnemonic(s) $sc_$cpu_EVS_MSGTRUNC

Definition at line 190 of file default_cfe_evs_msgdefs.h.

11.201.2.11 OutputPort `uint8 CFE_EVS_HousekeepingTlm_Payload::OutputPort`

Output port mask.

Telemetry Mnemonic(s) $sc_$cpu_EVS_OUTPUTPORT

Definition at line 195 of file default_cfe_evs_msgdefs.h.

11.201.2.12 Spare1 `uint8 CFE_EVS_HousekeepingTlm_Payload::Spare1`

Padding for 32 bit boundary.

Telemetry Mnemonic(s) $sc_$cpu_EVS_HK_SPARE1

Definition at line 209 of file default_cfe_evs_msgdefs.h.

11.201.2.13 Spare2 `uint8 CFE_EVS_HousekeepingTlm_Payload::Spare2`

Padding for 32 bit boundary.

Telemetry Mnemonic(s) $sc_$cpu_EVS_HK_SPARE2

Definition at line 211 of file default_cfe_evs_msgdefs.h.

11.201.2.14 Spare3 `uint8 CFE_EVS_HousekeepingTlm_Payload::Spare3`

Padding for 32 bit boundary.

Telemetry Mnemonic(s) $sc_$cpu_EVS_HK_SPARE3

Definition at line 213 of file default_cfe_evs_msgdefs.h.

11.201.2.15 UnregisteredAppCounter `uint8 CFE_EVS_HousekeepingTlm_Payload::UnregisteredAppCounter`

Unregistered application message send counter.

Telemetry Mnemonic(s) $sc_$cpu_EVS_UNREGAPPC

Definition at line 193 of file default_cfe_evs_msgdefs.h.
The documentation for this struct was generated from the following file:

- cfe/modules/evs/config/default_cfe_evs_msgdefs.h

11.202 CFE_EVS_LogFileCmd_Payload Struct Reference

Write Event Log to File Command Payload.
`#include <default_cfe_evs_msgdefs.h>`

Data Fields

- char LogFilename [CFE_MISSION_MAX_PATH_LEN]

  Filename where log data is to be written.

11.202.1 Detailed Description

Write Event Log to File Command Payload.
For command details, see CFE_EVS_WRITE_LOG_DATA_FILE_CC
Definition at line 57 of file default_cfe_evs_msgdefs.h.

11.202.2 Field Documentation

11.202.2.1 LogFilename `char CFE_EVS_LogFileCmd_Payload::LogFilename[CFE_MISSION_MAX_PATH_LEN]`

Filename where log data is to be written.
Definition at line 59 of file default_cfe_evs_msgdefs.h.
The documentation for this struct was generated from the following file:

- cfe/modules/evs/config/default_cfe_evs_msgdefs.h

11.203 CFE_EVS_LongEventTlm Struct Reference

`#include <default_cfe_evs_msgstruct.h>`

Data Fields

- CFE_MSG_TelemetryHeader_t TelemetryHeader

  Telemetry header.

- CFE_EVS_LongEventTlm_Payload_t Payload

  Telemetry payload.

11.203.1 Detailed Description

Definition at line 227 of file default_cfe_evs_msgstruct.h.

11.203.2 Field Documentation

11.203.2.1 Payload `CFE_EVS_LongEventTlm_Payload_t CFE_EVS_LongEventTlm::Payload`

Telemetry payload.
Definition at line 230 of file default_cfe_evs_msgstruct.h.

11.203.2.2 TelemetryHeader `CFE_MSG_TelemetryHeader_t CFE_EVS_LongEventTlm::TelemetryHeader`

Telemetry header.
Definition at line 229 of file default_cfe_evs_msgstruct.h.
The documentation for this struct was generated from the following file:

- cfe/modules/evs/config/default_cfe_evs_msgstruct.h

11.204 CFE_EVS_LongEventTlm_Payload Struct Reference

`#include <default_cfe_evs_msgdefs.h>`

Data Fields

- CFE_EVS_PacketID_t PacketID

  Event packet information.
- char Message [CFE_MISSION_EVS_MAX_MESSAGE_LENGTH]

  Event message string.
- uint8 Spare1

  Structure padding.
- uint8 Spare2

  Structure padding.

11.204.1 Detailed Description

Name Event Message Telemetry Packet (Long format)

Definition at line 239 of file default_cfe_evs_msgdefs.h.

11.204.2 Field Documentation

11.204.2.1 Message `char CFE_EVS_LongEventTlm_Payload::Message[CFE_MISSION_EVS_MAX_MESSAGE_LENGTH]`

Event message string.

Telemetry Mnemonic(s) $sc_$cpu_EVS_EVENT[CFE_MISSION_EVS_MAX_MESSAGE_LENGTH]

Definition at line 242 of file default_cfe_evs_msgdefs.h.

11.204.2.2 PacketID `CFE_EVS_PacketID_t CFE_EVS_LongEventTlm_Payload::PacketID`

Event packet information.
Definition at line 241 of file default_cfe_evs_msgdefs.h.

11.204.2.3 Spare1 `uint8 CFE_EVS_LongEventTlm_Payload::Spare1`

Structure padding.

Telemetry Mnemonic(s) $sc_$cpu_EVS_SPARE1

Definition at line 244 of file default_cfe_evs_msgdefs.h.

11.204.2.4 Spare2 `uint8 CFE_EVS_LongEventTlm_Payload::Spare2`

Structure padding.

Telemetry Mnemonic(s) $sc_$cpu_EVS_SPARE2

Definition at line 246 of file default_cfe_evs_msgdefs.h.
The documentation for this struct was generated from the following file:

- cfe/modules/evs/config/default_cfe_evs_msgdefs.h

11.205 CFE_EVS_NoopCmd Struct Reference

`#include <default_cfe_evs_msgstruct.h>`

Data Fields

- CFE_MSG_CommandHeader_t CommandHeader

  Command header.

11.205.1 Detailed Description

Definition at line 50 of file default_cfe_evs_msgstruct.h.

11.205.2 Field Documentation

11.205.2.1 CommandHeader `CFE_MSG_CommandHeader_t CFE_EVS_NoopCmd::CommandHeader`

Command header.
Definition at line 54 of file default_cfe_evs_msgstruct.h.
The documentation for this struct was generated from the following file:

- cfe/modules/evs/config/default_cfe_evs_msgstruct.h

11.206 CFE_EVS_PacketID Struct Reference

`#include <default_cfe_evs_msgdefs.h>`

Data Fields

- char AppName [CFE_MISSION_MAX_API_LEN]

  Application name.
- uint16 EventID

  Numerical event identifier.
- uint16 EventType

  Numerical event type identifier.
- uint32 SpacecraftID

  Spacecraft identifier.
- uint32 ProcessorID

  Numerical processor identifier.

11.206.1 Detailed Description

Telemetry packet structures
Definition at line 222 of file default_cfe_evs_msgdefs.h.

11.206.2 Field Documentation

11.206.2.1 AppName `char CFE_EVS_PacketID::AppName[CFE_MISSION_MAX_API_LEN]`

Application name.

Telemetry Mnemonic(s) $sc_$cpu_EVS_APPNAME[OS_MAX_API_NAME]

Definition at line 224 of file default_cfe_evs_msgdefs.h.

11.206.2.2 EventID `uint16 CFE_EVS_PacketID::EventID`

Numerical event identifier.

Telemetry Mnemonic(s) $sc_$cpu_EVS_EVENTID

Definition at line 226 of file default_cfe_evs_msgdefs.h.

11.206.2.3 EventType `uint16 CFE_EVS_PacketID::EventType`

Numerical event type identifier.

Telemetry Mnemonic(s) $sc_$cpu_EVS_EVENTTYPE

Definition at line 228 of file default_cfe_evs_msgdefs.h.

11.206.2.4 ProcessorID `uint32 CFE_EVS_PacketID::ProcessorID`

Numerical processor identifier.

Telemetry Mnemonic(s) $sc_$cpu_EVS_PROCESSORID

Definition at line 232 of file default_cfe_evs_msgdefs.h.

11.206.2.5 SpacecraftID `uint32 CFE_EVS_PacketID::SpacecraftID`

Spacecraft identifier.

Telemetry Mnemonic(s) $sc_$cpu_EVS_SCID

Definition at line 230 of file default_cfe_evs_msgdefs.h.
The documentation for this struct was generated from the following file:

- cfe/modules/evs/config/default_cfe_evs_msgdefs.h

11.207 CFE_EVS_ResetAllFiltersCmd Struct Reference

```
#include <default_cfe_evs_msgstruct.h>
```

Data Fields

- CFE_MSG_CommandHeader_t CommandHeader

  Command header.
- CFE_EVS_AppNameCmd_Payload_t Payload

  Command payload.

11.207.1 Detailed Description

Definition at line 158 of file default_cfe_evs_msgstruct.h.

11.207.2 Field Documentation

11.207.2.1 CommandHeader `CFE_MSG_CommandHeader_t CFE_EVS_ResetAllFiltersCmd::CommandHeader`

Command header.
Definition at line 160 of file default_cfe_evs_msgstruct.h.

11.207.2.2 Payload `CFE_EVS_AppNameCmd_Payload_t CFE_EVS_ResetAllFiltersCmd::Payload`

Command payload.
Definition at line 161 of file default_cfe_evs_msgstruct.h.
The documentation for this struct was generated from the following file:

- cfe/modules/evs/config/default_cfe_evs_msgstruct.h

11.208 CFE_EVS_ResetAppCounterCmd Struct Reference

```
#include <default_cfe_evs_msgstruct.h>
```

Data Fields

- CFE_MSG_CommandHeader_t CommandHeader

  Command header.
- CFE_EVS_AppNameCmd_Payload_t Payload

  Command payload.

11.208.1 Detailed Description

Definition at line 152 of file default_cfe_evs_msgstruct.h.

11.208.2 Field Documentation

11.208.2.1 CommandHeader `CFE_MSG_CommandHeader_t CFE_EVS_ResetAppCounterCmd::CommandHeader`

Command header.
Definition at line 154 of file default_cfe_evs_msgstruct.h.

11.208.2.2 Payload `CFE_EVS_AppNameCmd_Payload_t CFE_EVS_ResetAppCounterCmd::Payload`

Command payload.
Definition at line 155 of file default_cfe_evs_msgstruct.h.
The documentation for this struct was generated from the following file:

- cfe/modules/evs/config/default_cfe_evs_msgstruct.h

11.209 CFE_EVS_ResetCountersCmd Struct Reference

```
#include <default_cfe_evs_msgstruct.h>
```

Data Fields

- CFE_MSG_CommandHeader_t CommandHeader

  Command header.

11.209.1 Detailed Description

Definition at line 55 of file default_cfe_evs_msgstruct.h.

11.209.2 Field Documentation

11.209.2.1 CommandHeader `CFE_MSG_CommandHeader_t CFE_EVS_ResetCountersCmd::CommandHeader`

Command header.
Definition at line 57 of file default_cfe_evs_msgstruct.h.
The documentation for this struct was generated from the following file:

- cfe/modules/evs/config/default_cfe_evs_msgstruct.h

11.210 CFE_EVS_ResetFilterCmd Struct Reference

```
#include <default_cfe_evs_msgstruct.h>
```

Data Fields

- CFE_MSG_CommandHeader_t CommandHeader

  Command header.
- CFE_EVS_AppNameEventIDCmd_Payload_t Payload

  Command payload.

11.210.1 Detailed Description

Definition at line 169 of file default_cfe_evs_msgstruct.h.

11.210.2 Field Documentation

11.210.2.1 CommandHeader `CFE_MSG_CommandHeader_t CFE_EVS_ResetFilterCmd::CommandHeader`

Command header.
Definition at line 171 of file default_cfe_evs_msgstruct.h.

11.210.2.2 Payload `CFE_EVS_AppNameEventIDCmd_Payload_t CFE_EVS_ResetFilterCmd::Payload`

Command payload.
Definition at line 172 of file default_cfe_evs_msgstruct.h.
The documentation for this struct was generated from the following file:

- cfe/modules/evs/config/default_cfe_evs_msgstruct.h

11.211 CFE_EVS_SendHkCmd Struct Reference

```
#include <default_cfe_evs_msgstruct.h>
```

Data Fields

- CFE_MSG_CommandHeader_t CommandHeader

  Command header.

11.211.1 Detailed Description

Definition at line 65 of file default_cfe_evs_msgstruct.h.

11.211.2 Field Documentation

11.211.2.1 CommandHeader `CFE_MSG_CommandHeader_t CFE_EVS_SendHkCmd::CommandHeader`

Command header.
Definition at line 67 of file default_cfe_evs_msgstruct.h.
The documentation for this struct was generated from the following file:

- cfe/modules/evs/config/default_cfe_evs_msgstruct.h

11.212 CFE_EVS_SetEventFormatCode_Payload Struct Reference

Set Event Format Mode Command Payload.
`#include <default_cfe_evs_msgdefs.h>`

Data Fields

- CFE_EVS_MsgFormat_Enum_t MsgFormat

  Mode to use in the command.
- uint8 Spare

  Pad to even byte.

11.212.1 Detailed Description

Set Event Format Mode Command Payload.
For command details, see CFE_EVS_SET_EVENT_FORMAT_MODE_CC
Definition at line 91 of file default_cfe_evs_msgdefs.h.

11.212.2 Field Documentation

11.212.2.1 MsgFormat `CFE_EVS_MsgFormat_Enum_t CFE_EVS_SetEventFormatCode_Payload::MsgFormat`

Mode to use in the command.
Definition at line 93 of file default_cfe_evs_msgdefs.h.

11.212.2.2 Spare `uint8 CFE_EVS_SetEventFormatCode_Payload::Spare`

Pad to even byte.
Definition at line 94 of file default_cfe_evs_msgdefs.h.
The documentation for this struct was generated from the following file:

- cfe/modules/evs/config/default_cfe_evs_msgdefs.h

11.213 CFE_EVS_SetEventFormatModeCmd Struct Reference

Set Event Format Mode Command.

`#include <default_cfe_evs_msgstruct.h>`

Data Fields

- CFE_MSG_CommandHeader_t CommandHeader

  Command header.
- CFE_EVS_SetEventFormatMode_Payload_t Payload

  Command payload.

11.213.1 Detailed Description

Set Event Format Mode Command.
Definition at line 100 of file default_cfe_evs_msgstruct.h.

11.213.2 Field Documentation

11.213.2.1 CommandHeader `CFE_MSG_CommandHeader_t CFE_EVS_SetEventFormatModeCmd::CommandHeader`

Command header.
Definition at line 102 of file default_cfe_evs_msgstruct.h.

11.213.2.2 Payload `CFE_EVS_SetEventFormatMode_Payload_t CFE_EVS_SetEventFormatModeCmd::Payload`

Command payload.
Definition at line 103 of file default_cfe_evs_msgstruct.h.
The documentation for this struct was generated from the following file:

- cfe/modules/evs/config/default_cfe_evs_msgstruct.h

11.214 CFE_EVS_SetFilterCmd Struct Reference

`#include <default_cfe_evs_msgstruct.h>`

Data Fields

- CFE_MSG_CommandHeader_t CommandHeader

  Command header.
- CFE_EVS_AppNameEventIDMaskCmd_Payload_t Payload

  Command payload.

11.214.1 Detailed Description

Definition at line 209 of file default_cfe_evs_msgstruct.h.

11.214.2 Field Documentation

11.214.2.1 CommandHeader `CFE_MSG_CommandHeader_t CFE_EVS_SetFilterCmd::CommandHeader`

Command header.
Definition at line 211 of file default_cfe_evs_msgstruct.h.

11.214.2.2 Payload `CFE_EVS_AppNameEventIDMaskCmd_Payload_t CFE_EVS_SetFilterCmd::Payload`

Command payload.
Definition at line 212 of file default_cfe_evs_msgstruct.h.
The documentation for this struct was generated from the following file:

- cfe/modules/evs/config/default_cfe_evs_msgstruct.h

11.215 CFE_EVS_SetLogMode_Payload Struct Reference

Set Log Mode Command Payload.
`#include <default_cfe_evs_msgdefs.h>`

Data Fields

- CFE_EVS_LogMode_Enum_t LogMode

  Mode to use in the command.
- uint8 Spare

  Pad to even byte.

11.215.1 Detailed Description

Set Log Mode Command Payload.
For command details, see CFE_EVS_SET_LOG_MODE_CC
Definition at line 79 of file default_cfe_evs_msgdefs.h.

11.215.2 Field Documentation

11.215.2.1 LogMode `CFE_EVS_LogMode_Enum_t CFE_EVS_SetLogMode_Payload::LogMode`

Mode to use in the command.
Definition at line 81 of file default_cfe_evs_msgdefs.h.

11.215.2.2 Spare `uint8 CFE_EVS_SetLogMode_Payload::Spare`

Pad to even byte.
Definition at line 82 of file default_cfe_evs_msgdefs.h.
The documentation for this struct was generated from the following file:

- cfe/modules/evs/config/default_cfe_evs_msgdefs.h

11.216 CFE_EVS_SetLogModeCmd Struct Reference

Set Log Mode Command.
`#include <default_cfe_evs_msgstruct.h>`

Data Fields

- CFE_MSG_CommandHeader_t CommandHeader

  Command header.
- CFE_EVS_SetLogMode_Payload_t Payload

  Command payload.

11.216.1 Detailed Description

Set Log Mode Command.
Definition at line 91 of file default_cfe_evs_msgstruct.h.

11.216.2 Field Documentation

11.216.2.1 CommandHeader `CFE_MSG_CommandHeader_t CFE_EVS_SetLogModeCmd::CommandHeader`

Command header.
Definition at line 93 of file default_cfe_evs_msgstruct.h.

11.216.2.2 Payload `CFE_EVS_SetLogMode_Payload_t CFE_EVS_SetLogModeCmd::Payload`

Command payload.
Definition at line 94 of file default_cfe_evs_msgstruct.h.
The documentation for this struct was generated from the following file:

- cfe/modules/evs/config/default_cfe_evs_msgstruct.h

11.217 CFE_EVS_ShortEventTlm Struct Reference

```
#include <default_cfe_evs_msgstruct.h>
```

Data Fields

- CFE_MSG_TelemetryHeader_t TelemetryHeader

  Telemetry header.
- CFE_EVS_ShortEventTlm_Payload_t Payload

  Telemetry payload.

11.217.1 Detailed Description

Definition at line 233 of file default_cfe_evs_msgstruct.h.

11.217.2 Field Documentation

11.217.2.1 Payload `CFE_EVS_ShortEventTlm_Payload_t CFE_EVS_ShortEventTlm::Payload`

Telemetry payload.
Definition at line 236 of file default_cfe_evs_msgstruct.h.

11.217.2.2 TelemetryHeader `CFE_MSG_TelemetryHeader_t CFE_EVS_ShortEventTlm::TelemetryHeader`

Telemetry header.
Definition at line 235 of file default_cfe_evs_msgstruct.h.
The documentation for this struct was generated from the following file:

- cfe/modules/evs/config/default_cfe_evs_msgstruct.h

11.218 CFE_EVS_ShortEventTlm_Payload Struct Reference

```
#include <default_cfe_evs_msgdefs.h>
```

Data Fields

- CFE_EVS_PacketID_t PacketID

  Event packet information.

11.218.1 Detailed Description

Name Event Message Telemetry Packet (Short format)

Definition at line 253 of file default_cfe_evs_msgdefs.h.

11.218.2 Field Documentation

11.218.2.1 PacketID `CFE_EVS_PacketID_t CFE_EVS_ShortEventTlm_Payload::PacketID`

Event packet information.
Definition at line 255 of file default_cfe_evs_msgdefs.h.
The documentation for this struct was generated from the following file:

- cfe/modules/evs/config/default_cfe_evs_msgdefs.h

11.219 CFE_EVS_WriteAppDataFileCmd Struct Reference

Write Event Services Application Information to File Command.

```
#include <default_cfe_evs_msgstruct.h>
```

Data Fields

- CFE_MSG_CommandHeader_t CommandHeader

  Command header.
- CFE_EVS_AppDataCmd_Payload_t Payload

  Command payload.

11.219.1 Detailed Description

Write Event Services Application Information to File Command.
Definition at line 82 of file default_cfe_evs_msgstruct.h.

11.219.2 Field Documentation

11.219.2.1 CommandHeader `CFE_MSG_CommandHeader_t CFE_EVS_WriteAppDataFileCmd::CommandHeader`

Command header.
Definition at line 84 of file default_cfe_evs_msgstruct.h.

11.219.2.2 Payload `CFE_EVS_AppDataCmd_Payload_t CFE_EVS_WriteAppDataFileCmd::Payload`

Command payload.
Definition at line 85 of file default_cfe_evs_msgstruct.h.
The documentation for this struct was generated from the following file:

- cfe/modules/evs/config/default_cfe_evs_msgstruct.h

11.220 CFE_EVS_WriteLogDataFileCmd Struct Reference

Write Event Log to File Command.
`#include <default_cfe_evs_msgstruct.h>`

Data Fields

- CFE_MSG_CommandHeader_t CommandHeader

  Command header.
- CFE_EVS_LogFileCmd_Payload_t Payload

  Command payload.

11.220.1 Detailed Description

Write Event Log to File Command.
Definition at line 73 of file default_cfe_evs_msgstruct.h.

11.220.2 Field Documentation

11.220.2.1 CommandHeader `CFE_MSG_CommandHeader_t CFE_EVS_WriteLogDataFileCmd::CommandHeader`

Command header.
Definition at line 75 of file default_cfe_evs_msgstruct.h.

11.220.2.2 Payload `CFE_EVS_LogFileCmd_Payload_t CFE_EVS_WriteLogDataFileCmd::Payload`

Command payload.
Definition at line 76 of file default_cfe_evs_msgstruct.h.
The documentation for this struct was generated from the following file:

- cfe/modules/evs/config/default_cfe_evs_msgstruct.h

11.221 CFE_FS_FileWriteMetaData Struct Reference

External Metadata/State object associated with background file writes.
`#include <cfe_fs_api_typedefs.h>`

Data Fields

- volatile bool IsPending
- char FileName [CFE_MISSION_MAX_PATH_LEN]
- uint32 FileSubType
- char Description [CFE_FS_HDR_DESC_MAX_LEN]
- CFE_FS_FileWriteGetData_t GetData
- CFE_FS_FileWriteOnEvent_t OnEvent

11.221.1 Detailed Description

External Metadata/State object associated with background file writes.
Applications intending to schedule background file write jobs should instantiate this object in static/global data memory. This keeps track of the state of the file write request(s).
Definition at line 124 of file cfe_fs_api_typedefs.h.

11.221.2 Field Documentation

11.221.2.1 Description `char CFE_FS_FileWriteMetaData::Description[CFE_FS_HDR_DESC_MAX_LEN]`

Description of file (for FS header)
Definition at line 132 of file cfe_fs_api_typedefs.h.

11.221.2.2 FileName `char CFE_FS_FileWriteMetaData::FileName[CFE_MISSION_MAX_PATH_LEN]`

Name of file to write
Definition at line 128 of file cfe_fs_api_typedefs.h.

11.221.2.3 FileSubType `uint32 CFE_FS_FileWriteMetaData::FileSubType`

Type of file to write (for FS header)
Definition at line 131 of file cfe_fs_api_typedefs.h.

11.221.2.4 GetData `CFE_FS_FileWriteGetData_t CFE_FS_FileWriteMetaData::GetData`

Application callback to get a data record
Definition at line 134 of file cfe_fs_api_typedefs.h.

11.221.2.5 IsPending `volatile bool CFE_FS_FileWriteMetaData::IsPending`

Whether request is pending (volatile as it may be checked outside lock)
Definition at line 126 of file cfe_fs_api_typedefs.h.

11.221.2.6 OnEvent `CFE_FS_FileWriteOnEvent_t CFE_FS_FileWriteMetaData::OnEvent`

Application callback for abstract event processing
Definition at line 135 of file cfe_fs_api_typedefs.h.
The documentation for this struct was generated from the following file:

- cfe/modules/core_api/fsw/inc/cfe_fs_api_typedefs.h

11.222 CFE_FS_Header Struct Reference

Standard cFE File header structure definition.
`#include <default_cfe_fs_filedef.h>`

Data Fields

- uint32 ContentType

  Identifies the content type (='cFE1'=0x63464531)
- uint32 SubType

  Type of `ContentType`, if necessary.
- uint32 Length

  Length of this header to support external processing.
- uint32 SpacecraftID

  Spacecraft that generated the file.
- uint32 ProcessorID

  Processor that generated the file.
- uint32 ApplicationID

  Application that generated the file.
- uint32 TimeSeconds

  File creation timestamp (seconds)
- uint32 TimeSubSeconds

  File creation timestamp (sub-seconds)
- char Description [CFE_FS_HDR_DESC_MAX_LEN]

  File description.

11.222.1 Detailed Description

Standard cFE File header structure definition.
Definition at line 181 of file default_cfe_fs_filedef.h.

11.222.2 Field Documentation

11.222.2.1 ApplicationID `uint32 CFE_FS_Header::ApplicationID`

Application that generated the file.
Definition at line 190 of file default_cfe_fs_filedef.h.

11.222.2.2 ContentType `uint32 CFE_FS_Header::ContentType`

Identifies the content type (='cFE1'=0x63464531)
Definition at line 183 of file default_cfe_fs_filedef.h.

11.222.2.3 Description `char CFE_FS_Header::Description[CFE_FS_HDR_DESC_MAX_LEN]`

File description.
Definition at line 195 of file default_cfe_fs_filedef.h.

11.222.2.4 Length `uint32 CFE_FS_Header::Length`

Length of this header to support external processing.
Definition at line 187 of file default_cfe_fs_filedef.h.

11.222.2.5 ProcessorID `uint32 CFE_FS_Header::ProcessorID`

Processor that generated the file.
Definition at line 189 of file default_cfe_fs_filedef.h.

11.222.2.6 SpacecraftID `uint32 CFE_FS_Header::SpacecraftID`

Spacecraft that generated the file.
Definition at line 188 of file default_cfe_fs_filedef.h.

11.222.2.7 SubType `uint32 CFE_FS_Header::SubType`

Type of `ContentType`, if necessary.
Standard SubType definitions can be found here
Definition at line 184 of file default_cfe_fs_filedef.h.

11.222.2.8 TimeSeconds `uint32 CFE_FS_Header::TimeSeconds`

File creation timestamp (seconds)
Definition at line 192 of file default_cfe_fs_filedef.h.

11.222.2.9 TimeSubSeconds `uint32 CFE_FS_Header::TimeSubSeconds`

File creation timestamp (sub-seconds)
Definition at line 193 of file default_cfe_fs_filedef.h.
The documentation for this struct was generated from the following file:

- cfe/modules/fs/config/default_cfe_fs_filedef.h

11.223 CFE_SB_AllSubscriptionsTlm Struct Reference

`#include <default_cfe_sb_msgstruct.h>`

Data Fields

- CFE_MSG_TelemetryHeader_t TelemetryHeader

  Telemetry header.
- CFE_SB_AllSubscriptionsTlm_Payload_t Payload

  Telemetry payload.

11.223.1 Detailed Description

Definition at line 145 of file default_cfe_sb_msgstruct.h.

11.223.2 Field Documentation

11.223.2.1 Payload `CFE_SB_AllSubscriptionsTlm_Payload_t CFE_SB_AllSubscriptionsTlm::Payload`

Telemetry payload.
Definition at line 148 of file default_cfe_sb_msgstruct.h.

11.223.2.2 TelemetryHeader `CFE_MSG_TelemetryHeader_t CFE_SB_AllSubscriptionsTlm::TelemetryHeader`

Telemetry header.
Definition at line 147 of file default_cfe_sb_msgstruct.h.
The documentation for this struct was generated from the following file:

- cfe/modules/sb/config/default_cfe_sb_msgstruct.h

11.224 CFE_SB_AllSubscriptionsTlm_Payload Struct Reference

```
#include <default_cfe_sb_msgdefs.h>
```

Data Fields

- uint32 PktSegment

  Pkt number(starts at 1) in the series.
- uint32 TotalSegments

  Total number of pkts needed to complete the request.
- uint32 Entries

  Number of entries in the pkt.
- CFE_SB_SubEntries_t Entry [CFE_SB_SUB_ENTRIES_PER_PKT]

  Array of CFE_SB_SubEntries_t entries.

11.224.1 Detailed Description

Name SB Previous Subscriptions Packet

This structure defines the pkt(s) sent by SB that contains a list of all current subscriptions. This pkt is generated on cmd and intended to be used primarily by the Software Bus Networking Application (SBN). Typically, when the cmd is received there are more subscriptions than can fit in one pkt. The complete list of subscriptions is sent via a series of segmented pkts.
Definition at line 274 of file default_cfe_sb_msgdefs.h.

11.224.2 Field Documentation

11.224.2.1 Entries `uint32 CFE_SB_AllSubscriptionsTlm_Payload::Entries`

Number of entries in the pkt.
Definition at line 278 of file default_cfe_sb_msgdefs.h.

11.224.2.2 Entry `CFE_SB_SubEntries_t CFE_SB_AllSubscriptionsTlm_Payload::Entry[CFE_SB_SUB_ENTRIES_PER_PKT]`

Array of CFE_SB_SubEntries_t entries.
Definition at line 279 of file default_cfe_sb_msgdefs.h.

11.224.2.3 PktSegment `uint32 CFE_SB_AllSubscriptionsTlm_Payload::PktSegment`

Pkt number(starts at 1) in the series.
Definition at line 276 of file default_cfe_sb_msgdefs.h.

11.224.2.4 TotalSegments `uint32 CFE_SB_AllSubscriptionsTlm_Payload::TotalSegments`

Total number of pkts needed to complete the request.
Definition at line 277 of file default_cfe_sb_msgdefs.h.
The documentation for this struct was generated from the following file:

- cfe/modules/sb/config/default_cfe_sb_msgdefs.h

11.225 CFE_SB_DisableRouteCmd Struct Reference

`#include <default_cfe_sb_msgstruct.h>`

Data Fields

- CFE_MSG_CommandHeader_t CommandHeader

  Command header.
- CFE_SB_RouteCmd_Payload_t Payload

  Command payload.

11.225.1 Detailed Description

Definition at line 117 of file default_cfe_sb_msgstruct.h.

11.225.2 Field Documentation

11.225.2.1 CommandHeader `CFE_MSG_CommandHeader_t CFE_SB_DisableRouteCmd::CommandHeader`

Command header.
Definition at line 119 of file default_cfe_sb_msgstruct.h.

11.225.2.2 Payload `CFE_SB_RouteCmd_Payload_t CFE_SB_DisableRouteCmd::Payload`

Command payload.
Definition at line 120 of file default_cfe_sb_msgstruct.h.
The documentation for this struct was generated from the following file:

- cfe/modules/sb/config/default_cfe_sb_msgstruct.h

11.226 CFE_SB_DisableSubReportingCmd Struct Reference

`#include <default_cfe_sb_msgstruct.h>`

Data Fields

- CFE_MSG_CommandHeader_t CommandHeader

11.226.1 Detailed Description

Definition at line 67 of file default_cfe_sb_msgstruct.h.

11.226.2 Field Documentation

11.226.2.1 CommandHeader `CFE_MSG_CommandHeader_t CFE_SB_DisableSubReportingCmd::CommandHeader`

Definition at line 69 of file default_cfe_sb_msgstruct.h.
The documentation for this struct was generated from the following file:

- cfe/modules/sb/config/default_cfe_sb_msgstruct.h

11.227 CFE_SB_EnableRouteCmd Struct Reference

```
#include <default_cfe_sb_msgstruct.h>
```

Data Fields

- CFE_MSG_CommandHeader_t CommandHeader

  Command header.
- CFE_SB_RouteCmd_Payload_t Payload

  Command payload.

11.227.1 Detailed Description

Definition at line 111 of file default_cfe_sb_msgstruct.h.

11.227.2 Field Documentation

11.227.2.1 CommandHeader `CFE_MSG_CommandHeader_t CFE_SB_EnableRouteCmd::CommandHeader`

Command header.
Definition at line 113 of file default_cfe_sb_msgstruct.h.

11.227.2.2 Payload `CFE_SB_RouteCmd_Payload_t CFE_SB_EnableRouteCmd::Payload`

Command payload.
Definition at line 114 of file default_cfe_sb_msgstruct.h.
The documentation for this struct was generated from the following file:

- cfe/modules/sb/config/default_cfe_sb_msgstruct.h

11.228 CFE_SB_EnableSubReportingCmd Struct Reference

```
#include <default_cfe_sb_msgstruct.h>
```

Data Fields

- CFE_MSG_CommandHeader_t CommandHeader

11.228.1 Detailed Description

Definition at line 62 of file default_cfe_sb_msgstruct.h.

11.228.2 Field Documentation

11.228.2.1 CommandHeader `CFE_MSG_CommandHeader_t CFE_SB_EnableSubReportingCmd::CommandHeader`

Definition at line 64 of file default_cfe_sb_msgstruct.h.
The documentation for this struct was generated from the following file:

- cfe/modules/sb/config/default_cfe_sb_msgstruct.h

11.229 CFE_SB_HousekeepingTlm Struct Reference

```
#include <default_cfe_sb_msgstruct.h>
```

Data Fields

- CFE_MSG_TelemetryHeader_t TelemetryHeader

  Telemetry header.
- CFE_SB_HousekeepingTlm_Payload_t Payload

  Telemetry payload.

11.229.1 Detailed Description

Definition at line 127 of file default_cfe_sb_msgstruct.h.

11.229.2 Field Documentation

11.229.2.1 Payload `CFE_SB_HousekeepingTlm_Payload_t CFE_SB_HousekeepingTlm::Payload`

Telemetry payload.
Definition at line 132 of file default_cfe_sb_msgstruct.h.

11.229.2.2 TelemetryHeader `CFE_MSG_TelemetryHeader_t CFE_SB_HousekeepingTlm::TelemetryHeader`

Telemetry header.
Definition at line 131 of file default_cfe_sb_msgstruct.h.
The documentation for this struct was generated from the following file:

- cfe/modules/sb/config/default_cfe_sb_msgstruct.h

11.230 CFE_SB_HousekeepingTlm_Payload Struct Reference

```
#include <default_cfe_sb_msgdefs.h>
```

Data Fields

- uint8 CommandCounter

  Count of valid commands received.
- uint8 CommandErrorCounter

  Count of invalid commands received.
- uint8 NoSubscribersCounter

  Count pkts sent with no subscribers.
- uint8 MsgSendErrorCounter

Count of message send errors.

- uint8 MsgReceiveErrorCounter

  Count of message receive errors.
- uint8 InternalErrorCounter

  Count of queue read or write errors.
- uint8 CreatePipeErrorCounter

  Count of errors in create pipe API.
- uint8 SubscribeErrorCounter

  Count of errors in subscribe API.
- uint8 PipeOptsErrorCounter

  Count of errors in set/get pipe options API.
- uint8 DuplicateSubscriptionsCounter

  Count of duplicate subscriptions.
- uint8 GetPipeIdByNameErrorCounter

  Count of errors in get pipe id by name API.
- uint8 Spare2Align [1]

  Spare bytes to ensure alignment.
- uint16 PipeOverflowErrorCounter

  Count of pipe overflow errors.
- uint16 MsgLimitErrorCounter

  Count of msg id to pipe errors.
- CFE_ES_MemHandle_t MemPoolHandle

  Handle to SB's Memory Pool.
- uint32 MemInUse

  Memory in use.
- uint32 UnmarkedMem

  cfg param CFE_PLATFORM_SB_BUF_MEMORY_BYTES minus Peak Memory in use

11.230.1 Detailed Description

Name Software Bus task housekeeping Packet

Definition at line 67 of file default_cfe_sb_msgdefs.h.

11.230.2 Field Documentation

11.230.2.1 CommandCounter `uint8 CFE_SB_HousekeepingTlm_Payload::CommandCounter`

Count of valid commands received.

Telemetry Mnemonic(s) $sc_$cpu_SB_CMDPC

Definition at line 71 of file default_cfe_sb_msgdefs.h.

11.230.2.2 CommandErrorCounter `uint8 CFE_SB_HousekeepingTlm_Payload::CommandErrorCounter`

Count of invalid commands received.

Telemetry Mnemonic(s) $sc_$cpu_SB_CMDEC

Definition at line 73 of file default_cfe_sb_msgdefs.h.

11.230.2.3 CreatePipeErrorCounter `uint8 CFE_SB_HousekeepingTlm_Payload::CreatePipeErrorCounter`

Count of errors in create pipe API.

Telemetry Mnemonic(s) $sc_$cpu_SB_NewPipeEC

Definition at line 84 of file default_cfe_sb_msgdefs.h.

11.230.2.4 DuplicateSubscriptionsCounter `uint8 CFE_SB_HousekeepingTlm_Payload::DuplicateSubscriptions↩ Counter`

Count of duplicate subscriptions.

Telemetry Mnemonic(s) $sc_$cpu_SB_DupSubCnt

Definition at line 90 of file default_cfe_sb_msgdefs.h.

11.230.2.5 GetPipeIdByNameErrorCounter `uint8 CFE_SB_HousekeepingTlm_Payload::GetPipeIdByName↩ ErrorCounter`

Count of errors in get pipe id by name API.

Telemetry Mnemonic(s) $sc_$cpu_SB_GetPipeIDByNameEC

Definition at line 92 of file default_cfe_sb_msgdefs.h.

11.230.2.6 InternalErrorCounter `uint8 CFE_SB_HousekeepingTlm_Payload::InternalErrorCounter`

Count of queue read or write errors.

Telemetry Mnemonic(s) $sc_$cpu_SB_InternalEC

Definition at line 82 of file default_cfe_sb_msgdefs.h.

11.230.2.7 MemInUse `uint32 CFE_SB_HousekeepingTlm_Payload::MemInUse`

Memory in use.

Telemetry Mnemonic(s) $sc_$cpu_SB_MemInUse

Definition at line 105 of file default_cfe_sb_msgdefs.h.

11.230.2.8 MemPoolHandle `CFE_ES_MemHandle_t CFE_SB_HousekeepingTlm_Payload::MemPoolHandle`

Handle to SB's Memory Pool.

Telemetry Mnemonic(s) $sc_$cpu_SB_MemPoolHdl

Definition at line 102 of file default_cfe_sb_msgdefs.h.

11.230.2.9 MsgLimitErrorCounter `uint16 CFE_SB_HousekeepingTlm_Payload::MsgLimitErrorCounter`

Count of msg id to pipe errors.

Telemetry Mnemonic(s) $sc_$cpu_SB_MsgLimEC

Definition at line 99 of file default_cfe_sb_msgdefs.h.

11.230.2.10 MsgReceiveErrorCounter `uint8 CFE_SB_HousekeepingTlm_Payload::MsgReceiveErrorCounter`

Count of message receive errors.

Telemetry Mnemonic(s) $sc_$cpu_SB_MsgRecEC

Definition at line 80 of file default_cfe_sb_msgdefs.h.

11.230.2.11 MsgSendErrorCounter `uint8 CFE_SB_HousekeepingTlm_Payload::MsgSendErrorCounter`

Count of message send errors.

Telemetry Mnemonic(s) $sc_$cpu_SB_MsgSndEC

Definition at line 77 of file default_cfe_sb_msgdefs.h.

11.230.2.12 NoSubscribersCounter `uint8 CFE_SB_HousekeepingTlm_Payload::NoSubscribersCounter`

Count pkts sent with no subscribers.

Telemetry Mnemonic(s) $sc_$cpu_SB_NoSubEC

Definition at line 75 of file default_cfe_sb_msgdefs.h.

11.230.2.13 PipeOptsErrorCounter `uint8 CFE_SB_HousekeepingTlm_Payload::PipeOptsErrorCounter`

Count of errors in set/get pipe options API.

Telemetry Mnemonic(s) $sc_$cpu_SB_PipeOptsEC

Definition at line 88 of file default_cfe_sb_msgdefs.h.

11.230.2.14 PipeOverflowErrorCounter `uint16 CFE_SB_HousekeepingTlm_Payload::PipeOverflowError↩ Counter`

Count of pipe overflow errors.

Telemetry Mnemonic(s) $sc_$cpu_SB_PipeOvrEC

Definition at line 97 of file default_cfe_sb_msgdefs.h.

11.230.2.15 Spare2Align `uint8 CFE_SB_HousekeepingTlm_Payload::Spare2Align[1]`

Spare bytes to ensure alignment.

Telemetry Mnemonic(s) $sc_$cpu_SB_Spare2Align[2]

Definition at line 94 of file default_cfe_sb_msgdefs.h.

11.230.2.16 SubscribeErrorCounter `uint8 CFE_SB_HousekeepingTlm_Payload::SubscribeErrorCounter`

Count of errors in subscribe API.

Telemetry Mnemonic(s) $sc_$cpu_SB_SubscrEC

Definition at line 86 of file default_cfe_sb_msgdefs.h.

11.230.2.17 UnmarkedMem `uint32 CFE_SB_HousekeepingTlm_Payload::UnmarkedMem`

cfg param CFE_PLATFORM_SB_BUF_MEMORY_BYTES minus Peak Memory in use

Telemetry Mnemonic(s) $sc_$cpu_SB_UnMarkedMem

Definition at line 108 of file default_cfe_sb_msgdefs.h.
The documentation for this struct was generated from the following file:

- cfe/modules/sb/config/default_cfe_sb_msgdefs.h

11.231 CFE_SB_Msg Union Reference

Software Bus generic message.
`#include <cfe_sb_api_typedefs.h>`

Data Fields

- CFE_MSG_Message_t Msg

  Base message type without enforced alignment.
- long long int LongInt

  Align to support Long Integer.
- long double LongDouble

  Align to support Long Double.

11.231.1 Detailed Description

Software Bus generic message.
Definition at line 142 of file cfe_sb_api_typedefs.h.

11.231.2 Field Documentation

11.231.2.1 LongDouble `long double CFE_SB_Msg::LongDouble`

Align to support Long Double.
Definition at line 146 of file cfe_sb_api_typedefs.h.

11.231.2.2 LongInt `long long int CFE_SB_Msg::LongInt`

Align to support Long Integer.
Definition at line 145 of file cfe_sb_api_typedefs.h.

11.231.2.3 Msg `CFE_MSG_Message_t CFE_SB_Msg::Msg`

Base message type without enforced alignment.
Definition at line 144 of file cfe_sb_api_typedefs.h.
Referenced by CF_AppPipe(), CF_CFDP_MsgOutGet(), CF_CFDP_ReceiveMessage(), CF_CFDP_Send(), and CF↩_ProcessGroundCommand().
The documentation for this union was generated from the following file:

- cfe/modules/core_api/fsw/inc/cfe_sb_api_typedefs.h

11.232 CFE_SB_MsgId_t Struct Reference

CFE_SB_MsgId_t type definition.
`#include <default_cfe_sb_extern_typedefs.h>`

Data Fields

- CFE_SB_MsgId_Atom_t Value

11.232.1 Detailed Description

CFE_SB_MsgId_t type definition.
Software Bus message identifier used in many SB APIs
Currently this is directly mapped to the underlying holding type (not wrapped) for compatibility with existing usage semantics in apps (mainly switch/case statements)

Note

In a future version it could become a type-safe wrapper similar to the route index, to avoid message IDs getting mixed between other integer values.

Definition at line 104 of file default_cfe_sb_extern_typedefs.h.

11.232.2 Field Documentation

11.232.2.1 Value `CFE_SB_MsgId_Atom_t CFE_SB_MsgId_t::Value`

Definition at line 106 of file default_cfe_sb_extern_typedefs.h.
The documentation for this struct was generated from the following file:

- cfe/modules/sb/config/default_cfe_sb_extern_typedefs.h

11.233 CFE_SB_MsgMapFileEntry Struct Reference

SB Map File Entry.
`#include <default_cfe_sb_msgdefs.h>`

Data Fields

- CFE_SB_MsgId_t MsgId

  Message Id which has been subscribed to.
- CFE_SB_RouteId_Atom_t Index

  Routing raw index value (0 based, not Route ID)

11.233.1 Detailed Description

SB Map File Entry.
Structure of one element of the map information in response to CFE_SB_WRITE_MAP_INFO_CC
Definition at line 226 of file default_cfe_sb_msgdefs.h.

11.233.2 Field Documentation

11.233.2.1 Index `CFE_SB_RouteId_Atom_t` `CFE_SB_MsgMapFileEntry::Index`

Routing raw index value (0 based, not Route ID)
Definition at line 229 of file default_cfe_sb_msgdefs.h.

11.233.2.2 MsgId `CFE_SB_MsgId_t` `CFE_SB_MsgMapFileEntry::MsgId`

Message Id which has been subscribed to.
Definition at line 228 of file default_cfe_sb_msgdefs.h.
The documentation for this struct was generated from the following file:

- cfe/modules/sb/config/default_cfe_sb_msgdefs.h

11.234 CFE_SB_NoopCmd Struct Reference

`#include <default_cfe_sb_msgstruct.h>`

Data Fields

- CFE_MSG_CommandHeader_t CommandHeader

11.234.1 Detailed Description

Definition at line 52 of file default_cfe_sb_msgstruct.h.

11.234.2 Field Documentation

11.234.2.1 CommandHeader `CFE_MSG_CommandHeader_t` `CFE_SB_NoopCmd::CommandHeader`

Definition at line 58 of file default_cfe_sb_msgstruct.h.
The documentation for this struct was generated from the following file:

- cfe/modules/sb/config/default_cfe_sb_msgstruct.h

11.235 CFE_SB_PipeDepthStats Struct Reference

SB Pipe Depth Statistics.
`#include <default_cfe_sb_msgdefs.h>`

Data Fields

- CFE_SB_PipeId_t PipeId

  Pipe Id associated with the stats below.
- uint16 MaxQueueDepth

  Number of messages the pipe can hold.
- uint16 CurrentQueueDepth

  Number of messages currently on the pipe.
- uint16 PeakQueueDepth

  Peak number of messages that have been on the pipe.
- uint16 Spare

  Spare word to ensure alignment.

11.235.1 Detailed Description

SB Pipe Depth Statistics.
Used in SB Statistics Telemetry Packet CFE_SB_StatsTlm_t
Definition at line 115 of file default_cfe_sb_msgdefs.h.

11.235.2 Field Documentation

11.235.2.1 CurrentQueueDepth `uint16 CFE_SB_PipeDepthStats::CurrentQueueDepth`

Number of messages currently on the pipe.

Telemetry Mnemonic(s) $sc_$cpu_SB_Stat.SB_SMPDS[CFE_PLATFORM_SB_MAX_PIPES].SB_PDINUSE

Definition at line 121 of file default_cfe_sb_msgdefs.h.

11.235.2.2 MaxQueueDepth `uint16 CFE_SB_PipeDepthStats::MaxQueueDepth`

Number of messages the pipe can hold.

Telemetry Mnemonic(s) $sc_$cpu_SB_Stat.SB_SMPDS[CFE_PLATFORM_SB_MAX_PIPES].SB_PDDEPTH

Definition at line 119 of file default_cfe_sb_msgdefs.h.

11.235.2.3 PeakQueueDepth `uint16 CFE_SB_PipeDepthStats::PeakQueueDepth`

Peak number of messages that have been on the pipe.

Telemetry Mnemonic(s) $sc_$cpu_SB_Stat.SB_SMPDS[CFE_PLATFORM_SB_MAX_PIPES].SB_PDPKINUSE

Definition at line 123 of file default_cfe_sb_msgdefs.h.

11.235.2.4 PipeId `CFE_SB_PipeId_t CFE_SB_PipeDepthStats::PipeId`

Pipe Id associated with the stats below.

Telemetry Mnemonic(s) $sc_$cpu_SB_Stat.SB_SMPDS[CFE_PLATFORM_SB_MAX_PIPES].SB_PDPIPEID

Definition at line 117 of file default_cfe_sb_msgdefs.h.

11.235.2.5 Spare `uint16 CFE_SB_PipeDepthStats::Spare`

Spare word to ensure alignment.

Telemetry Mnemonic(s) $sc_$cpu_SB_Stat.SB_SMPDS[CFE_PLATFORM_SB_MAX_PIPES].SB_PDSPARE

Definition at line 125 of file default_cfe_sb_msgdefs.h.
The documentation for this struct was generated from the following file:

- cfe/modules/sb/config/default_cfe_sb_msgdefs.h

11.236 CFE_SB_PipeInfoEntry Struct Reference

SB Pipe Information File Entry.

```
#include <default_cfe_sb_msgdefs.h>
```

Data Fields

- CFE_SB_PipeId_t PipeId
- CFE_ES_AppId_t AppId
- char PipeName [CFE_MISSION_MAX_API_LEN]
- char AppName [CFE_MISSION_MAX_API_LEN]
- uint16 MaxQueueDepth
- uint16 CurrentQueueDepth
- uint16 PeakQueueDepth
- uint16 SendErrors
- uint8 Opts
- uint8 Spare [3]

11.236.1 Detailed Description

SB Pipe Information File Entry.
This statistics structure is output as part of the CFE SB "Send Pipe Info" command (CFE_SB_SEND_PIPE_INFO_CC).
Previous versions of CFE simply wrote the internal CFE_SB_PipeD_t object to the file, but this also contains information such as pointers which are not relevant outside the running CFE process.
By defining the pipe info structure separately, it also provides some independence, such that the internal CFE_SB_↩ PipeD_t definition can evolve without changing the binary format of the information file.
Definition at line 144 of file default_cfe_sb_msgdefs.h.

11.236.2 Field Documentation

11.236.2.1 AppId `CFE_ES_AppId_t CFE_SB_PipeInfoEntry::AppId`

The runtime ID of the application that owns the pipe
Definition at line 147 of file default_cfe_sb_msgdefs.h.

11.236.2.2 AppName `char CFE_SB_PipeInfoEntry::AppName[CFE_MISSION_MAX_API_LEN]`

The Name of the application that owns the pipe
Definition at line 149 of file default_cfe_sb_msgdefs.h.

11.236.2.3 CurrentQueueDepth `uint16 CFE_SB_PipeInfoEntry::CurrentQueueDepth`

The current depth of the pipe
Definition at line 151 of file default_cfe_sb_msgdefs.h.

11.236.2.4 MaxQueueDepth `uint16 CFE_SB_PipeInfoEntry::MaxQueueDepth`

The allocated depth of the pipe (max capacity)
Definition at line 150 of file default_cfe_sb_msgdefs.h.

11.236.2.5 Opts `uint8 CFE_SB_PipeInfoEntry::Opts`

Pipe options set (bitmask)
Definition at line 154 of file default_cfe_sb_msgdefs.h.

11.236.2.6 PeakQueueDepth `uint16 CFE_SB_PipeInfoEntry::PeakQueueDepth`

The peak depth of the pipe (high watermark)
Definition at line 152 of file default_cfe_sb_msgdefs.h.

11.236.2.7 PipeId `CFE_SB_PipeId_t CFE_SB_PipeInfoEntry::PipeId`

The runtime ID of the pipe
Definition at line 146 of file default_cfe_sb_msgdefs.h.

11.236.2.8 PipeName `char CFE_SB_PipeInfoEntry::PipeName[CFE_MISSION_MAX_API_LEN]`

The Name of the pipe
Definition at line 148 of file default_cfe_sb_msgdefs.h.

11.236.2.9 SendErrors `uint16 CFE_SB_PipeInfoEntry::SendErrors`

Number of errors when writing to this pipe
Definition at line 153 of file default_cfe_sb_msgdefs.h.

11.236.2.10 Spare `uint8 CFE_SB_PipeInfoEntry::Spare[3]`

Padding to make this structure a multiple of 4 bytes
Definition at line 155 of file default_cfe_sb_msgdefs.h.
The documentation for this struct was generated from the following file:

- cfe/modules/sb/config/default_cfe_sb_msgdefs.h

11.237 CFE_SB_Qos_t Struct Reference

Quality Of Service Type Definition.
`#include <default_cfe_sb_extern_typedefs.h>`

Data Fields

- uint8 Priority

  Specify high(1) or low(0) message priority for off-board routing, currently unused.
- uint8 Reliability

  Specify high(1) or low(0) message transfer reliability for off-board routing, currently unused.

11.237.1 Detailed Description

Quality Of Service Type Definition.
Currently an unused parameter in CFE_SB_SubscribeEx Intended to be used for interprocessor communication only
Definition at line 121 of file default_cfe_sb_extern_typedefs.h.

11.237.2 Field Documentation

11.237.2.1 Priority `uint8 CFE_SB_Qos_t::Priority`

Specify high(1) or low(0) message priority for off-board routing, currently unused.
Definition at line 123 of file default_cfe_sb_extern_typedefs.h.

11.237.2.2 Reliability `uint8 CFE_SB_Qos_t::Reliability`

Specify high(1) or low(0) message transfer reliability for off-board routing, currently unused.
Definition at line 124 of file default_cfe_sb_extern_typedefs.h.
The documentation for this struct was generated from the following file:

- cfe/modules/sb/config/default_cfe_sb_extern_typedefs.h

11.238 CFE_SB_ResetCountersCmd Struct Reference

`#include <default_cfe_sb_msgstruct.h>`

Data Fields

- CFE_MSG_CommandHeader_t CommandHeader

11.238.1 Detailed Description

Definition at line 57 of file default_cfe_sb_msgstruct.h.

11.238.2 Field Documentation

11.238.2.1 CommandHeader `CFE_MSG_CommandHeader_t CFE_SB_ResetCountersCmd::CommandHeader`

Definition at line 59 of file default_cfe_sb_msgstruct.h.
The documentation for this struct was generated from the following file:

- cfe/modules/sb/config/default_cfe_sb_msgstruct.h

11.239 CFE_SB_RouteCmd_Payload Struct Reference

Enable/Disable Route Command Payload.
`#include <default_cfe_sb_msgdefs.h>`

Data Fields

- CFE_SB_MsgId_t MsgId

  Message ID of route to be enabled or disabled CFE_SB_MsgId_t.
- CFE_SB_PipeId_t Pipe

  Pipe ID of route to be enabled or disabled CFE_SB_PipeId_t.
- uint8 Spare

  Spare byte to make command even number of bytes.

11.239.1 Detailed Description

Enable/Disable Route Command Payload.
This structure contains a definition used by two SB commands, 'Enable Route' CFE_SB_ENABLE_ROUTE_CC and 'Disable Route' CFE_SB_DISABLE_ROUTE_CC. A route is the destination pipe for a particular message and is therefore defined as a MsgId and PipeId combination.
Definition at line 53 of file default_cfe_sb_msgdefs.h.

11.239.2 Field Documentation

11.239.2.1 MsgId `CFE_SB_MsgId_t CFE_SB_RouteCmd_Payload::MsgId`

Message ID of route to be enabled or disabled CFE_SB_MsgId_t.
Definition at line 55 of file default_cfe_sb_msgdefs.h.

11.239.2.2 Pipe `CFE_SB_PipeId_t CFE_SB_RouteCmd_Payload::Pipe`

Pipe ID of route to be enabled or disabled CFE_SB_PipeId_t.
Definition at line 56 of file default_cfe_sb_msgdefs.h.

11.239.2.3 Spare `uint8 CFE_SB_RouteCmd_Payload::Spare`

Spare byte to make command even number of bytes.
Definition at line 57 of file default_cfe_sb_msgdefs.h.
The documentation for this struct was generated from the following file:

- cfe/modules/sb/config/default_cfe_sb_msgdefs.h

11.240 CFE_SB_RoutingFileEntry Struct Reference

SB Routing File Entry.
`#include <default_cfe_sb_msgdefs.h>`

Data Fields

- CFE_SB_MsgId_t MsgId

  Message Id portion of the route.
- CFE_SB_PipeId_t PipeId

  Pipe Id portion of the route.
- uint8 State

  Route Enabled or Disabled.
- uint16 MsgCnt

  Number of msgs with this MsgId sent to this PipeId.
- char AppName [CFE_MISSION_MAX_API_LEN]

  Pipe Depth Statistics.
- char PipeName [CFE_MISSION_MAX_API_LEN]

  Pipe Depth Statistics.

11.240.1 Detailed Description

SB Routing File Entry.
Structure of one element of the routing information in response to CFE_SB_WRITE_ROUTING_INFO_CC
Definition at line 211 of file default_cfe_sb_msgdefs.h.

11.240.2 Field Documentation

11.240.2.1 AppName `char CFE_SB_RoutingFileEntry::AppName[CFE_MISSION_MAX_API_LEN]`

Pipe Depth Statistics.
Definition at line 217 of file default_cfe_sb_msgdefs.h.

11.240.2.2 MsgCnt `uint16 CFE_SB_RoutingFileEntry::MsgCnt`

Number of msgs with this MsgId sent to this PipeId.
Definition at line 216 of file default_cfe_sb_msgdefs.h.

11.240.2.3 MsgId `CFE_SB_MsgId_t CFE_SB_RoutingFileEntry::MsgId`

Message Id portion of the route.
Definition at line 213 of file default_cfe_sb_msgdefs.h.

11.240.2.4 PipeId `CFE_SB_PipeId_t CFE_SB_RoutingFileEntry::PipeId`

Pipe Id portion of the route.
Definition at line 214 of file default_cfe_sb_msgdefs.h.

11.240.2.5 PipeName `char CFE_SB_RoutingFileEntry::PipeName[CFE_MISSION_MAX_API_LEN]`

Pipe Depth Statistics.
Definition at line 218 of file default_cfe_sb_msgdefs.h.

11.240.2.6 State `uint8 CFE_SB_RoutingFileEntry::State`

Route Enabled or Disabled.
Definition at line 215 of file default_cfe_sb_msgdefs.h.
The documentation for this struct was generated from the following file:

- cfe/modules/sb/config/default_cfe_sb_msgdefs.h

11.241 CFE_SB_SendHkCmd Struct Reference

`#include <default_cfe_sb_msgstruct.h>`

Data Fields

- CFE_MSG_CommandHeader_t CommandHeader

11.241.1 Detailed Description

Definition at line 82 of file default_cfe_sb_msgstruct.h.

11.241.2 Field Documentation

11.241.2.1 CommandHeader `CFE_MSG_CommandHeader_t CFE_SB_SendHkCmd::CommandHeader`

Definition at line 84 of file default_cfe_sb_msgstruct.h.
The documentation for this struct was generated from the following file:

- cfe/modules/sb/config/default_cfe_sb_msgstruct.h

11.242 CFE_SB_SendPrevSubsCmd Struct Reference

`#include <default_cfe_sb_msgstruct.h>`

Data Fields

- CFE_MSG_CommandHeader_t CommandHeader

11.242.1 Detailed Description

Definition at line 77 of file default_cfe_sb_msgstruct.h.

11.242.2 Field Documentation

11.242.2.1 CommandHeader `CFE_MSG_CommandHeader_t CFE_SB_SendPrevSubsCmd::CommandHeader`

Definition at line 79 of file default_cfe_sb_msgstruct.h.
The documentation for this struct was generated from the following file:

- cfe/modules/sb/config/default_cfe_sb_msgstruct.h

11.243 CFE_SB_SendSbStatsCmd Struct Reference

```
#include <default_cfe_sb_msgstruct.h>
```

Data Fields

- CFE_MSG_CommandHeader_t CommandHeader

11.243.1 Detailed Description

Definition at line 72 of file default_cfe_sb_msgstruct.h.

11.243.2 Field Documentation

11.243.2.1 CommandHeader `CFE_MSG_CommandHeader_t CFE_SB_SendSbStatsCmd::CommandHeader`

Definition at line 74 of file default_cfe_sb_msgstruct.h.
The documentation for this struct was generated from the following file:

- cfe/modules/sb/config/default_cfe_sb_msgstruct.h

11.244 CFE_SB_SingleSubscriptionTlm Struct Reference

```
#include <default_cfe_sb_msgstruct.h>
```

Data Fields

- CFE_MSG_TelemetryHeader_t TelemetryHeader

  Telemetry header.
- CFE_SB_SingleSubscriptionTlm_Payload_t Payload

  Telemetry payload.

11.244.1 Detailed Description

Definition at line 139 of file default_cfe_sb_msgstruct.h.

11.244.2 Field Documentation

11.244.2.1 Payload `CFE_SB_SingleSubscriptionTlm_Payload_t CFE_SB_SingleSubscriptionTlm::Payload`

Telemetry payload.
Definition at line 142 of file default_cfe_sb_msgstruct.h.

11.244.2.2 TelemetryHeader `CFE_MSG_TelemetryHeader_t CFE_SB_SingleSubscriptionTlm::Telemetry↩ Header`

Telemetry header.
Definition at line 141 of file default_cfe_sb_msgstruct.h.
The documentation for this struct was generated from the following file:

- cfe/modules/sb/config/default_cfe_sb_msgstruct.h

11.245 CFE_SB_SingleSubscriptionTlm_Payload Struct Reference

`#include <default_cfe_sb_msgdefs.h>`

Data Fields

- uint8 SubType

  Subscription or Unsubscription.
- CFE_SB_MsgId_t MsgId

  MsgId subscribed or unsubscribe to.
- CFE_SB_Qos_t Qos

  Quality of Service, used only for interprocessor communication.
- CFE_SB_PipeId_t Pipe

  Destination pipe id to send above msg id

11.245.1 Detailed Description

Name SB Subscription Report Packet

This structure defines the pkt sent by SB when a subscription or a request to unsubscribe is received while subscription reporting is enabled. By default subscription reporting is disabled. This feature is intended to be used primarily by Software Bus Networking Application (SBN)

See also

CFE_SB_ENABLE_SUB_REPORTING_CC, CFE_SB_DISABLE_SUB_REPORTING_CC

Definition at line 242 of file default_cfe_sb_msgdefs.h.

11.245.2 Field Documentation

11.245.2.1 MsgId `CFE_SB_MsgId_t CFE_SB_SingleSubscriptionTlm_Payload::MsgId`

MsgId subscribed or unsubscribe to.
Definition at line 245 of file default_cfe_sb_msgdefs.h.

11.245.2.2 Pipe `CFE_SB_PipeId_t CFE_SB_SingleSubscriptionTlm_Payload::Pipe`

Destination pipe id to send above msg id

Definition at line 247 of file default_cfe_sb_msgdefs.h.

11.245.2.3 Qos `CFE_SB_Qos_t CFE_SB_SingleSubscriptionTlm_Payload::Qos`

Quality of Service, used only for interprocessor communication.
Definition at line 246 of file default_cfe_sb_msgdefs.h.

11.245.2.4 SubType `uint8 CFE_SB_SingleSubscriptionTlm_Payload::SubType`

Subscription or Unsubscription.
Definition at line 244 of file default_cfe_sb_msgdefs.h.
The documentation for this struct was generated from the following file:

- cfe/modules/sb/config/default_cfe_sb_msgdefs.h

11.246 CFE_SB_StatsTlm Struct Reference

`#include <default_cfe_sb_msgstruct.h>`

Data Fields

- CFE_MSG_TelemetryHeader_t TelemetryHeader

  Telemetry header.
- CFE_SB_StatsTlm_Payload_t Payload

  Telemetry payload.

11.246.1 Detailed Description

Definition at line 133 of file default_cfe_sb_msgstruct.h.

11.246.2 Field Documentation

11.246.2.1 Payload `CFE_SB_StatsTlm_Payload_t CFE_SB_StatsTlm::Payload`

Telemetry payload.
Definition at line 136 of file default_cfe_sb_msgstruct.h.

11.246.2.2 TelemetryHeader `CFE_MSG_TelemetryHeader_t CFE_SB_StatsTlm::TelemetryHeader`

Telemetry header.
Definition at line 135 of file default_cfe_sb_msgstruct.h.
The documentation for this struct was generated from the following file:

- cfe/modules/sb/config/default_cfe_sb_msgstruct.h

11.247 CFE_SB_StatsTlm_Payload Struct Reference

`#include <default_cfe_sb_msgdefs.h>`

Data Fields

- uint32 MsgIdsInUse

  Current number of MsgIds with a destination.
- uint32 PeakMsgIdsInUse

  Peak number of MsgIds with a destination.
- uint32 MaxMsgIdsAllowed

  cFE Cfg Param CFE_PLATFORM_SB_MAX_MSG_IDS
- uint32 PipesInUse

  Number of pipes currently in use.
- uint32 PeakPipesInUse

  Peak number of pipes since last reboot.
- uint32 MaxPipesAllowed

  cFE Cfg Param CFE_PLATFORM_SB_MAX_PIPES
- uint32 MemInUse

  Memory bytes currently in use for SB msg transfers.
- uint32 PeakMemInUse

  Peak memory bytes in use for SB msg transfers.
- uint32 MaxMemAllowed

  cFE Cfg Param CFE_PLATFORM_SB_BUF_MEMORY_BYTES
- uint32 SubscriptionsInUse

  Number of current subscriptions.
- uint32 PeakSubscriptionsInUse

  Peak number of subscriptions.
- uint32 MaxSubscriptionsAllowed

  product of CFE_PLATFORM_SB_MAX_MSG_IDS and CFE_PLATFORM_SB_MAX_DEST_PER_PKT
- uint32 SBBuffersInUse

  Number of SB message buffers currently in use.
- uint32 PeakSBBuffersInUse

  Max number of SB message buffers in use.
- uint32 MaxPipeDepthAllowed

  Maximum allowed pipe depth.
- CFE_SB_PipeDepthStats_t PipeDepthStats [CFE_MISSION_SB_MAX_PIPES]

  Pipe Depth Statistics CFE_SB_PipeDepthStats_t.

11.247.1 Detailed Description

Name SB Statistics Telemetry Packet

SB Statistics packet sent in response to CFE_SB_SEND_SB_STATS_CC
Definition at line 163 of file default_cfe_sb_msgdefs.h.

11.247.2 Field Documentation

11.247.2.1 MaxMemAllowed `uint32 CFE_SB_StatsTlm_Payload::MaxMemAllowed`

cFE Cfg Param CFE_PLATFORM_SB_BUF_MEMORY_BYTES

Telemetry Mnemonic(s) $sc_$cpu_SB_Stat.SB_SMMBMALW

Definition at line 183 of file default_cfe_sb_msgdefs.h.

11.247.2.2 MaxMsgIdsAllowed `uint32 CFE_SB_StatsTlm_Payload::MaxMsgIdsAllowed`

cFE Cfg Param CFE_PLATFORM_SB_MAX_MSG_IDS

Telemetry Mnemonic(s) $sc_$cpu_SB_Stat.SB_SMMMIDALW

Definition at line 169 of file default_cfe_sb_msgdefs.h.

11.247.2.3 MaxPipeDepthAllowed `uint32 CFE_SB_StatsTlm_Payload::MaxPipeDepthAllowed`

Maximum allowed pipe depth.

Telemetry Mnemonic(s) $sc_$cpu_SB_Stat.SB_SMMPDALW

Definition at line 199 of file default_cfe_sb_msgdefs.h.

11.247.2.4 MaxPipesAllowed `uint32 CFE_SB_StatsTlm_Payload::MaxPipesAllowed`

cFE Cfg Param CFE_PLATFORM_SB_MAX_PIPES

Telemetry Mnemonic(s) $sc_$cpu_SB_Stat.SB_SMMPALW

Definition at line 176 of file default_cfe_sb_msgdefs.h.

11.247.2.5 MaxSubscriptionsAllowed `uint32 CFE_SB_StatsTlm_Payload::MaxSubscriptionsAllowed`

product of CFE_PLATFORM_SB_MAX_MSG_IDS and CFE_PLATFORM_SB_MAX_DEST_PER_PKT

Telemetry Mnemonic(s) $sc_$cpu_SB_Stat.SB_SMMSALW

Definition at line 190 of file default_cfe_sb_msgdefs.h.

11.247.2.6 MemInUse `uint32 CFE_SB_StatsTlm_Payload::MemInUse`

Memory bytes currently in use for SB msg transfers.

Telemetry Mnemonic(s) $sc_$cpu_SB_Stat.SB_SMBMIU

Definition at line 179 of file default_cfe_sb_msgdefs.h.

11.247.2.7 MsgIdsInUse `uint32 CFE_SB_StatsTlm_Payload::MsgIdsInUse`

Current number of MsgIds with a destination.

Telemetry Mnemonic(s) $sc_$cpu_SB_Stat.SB_SMMIDIU

Definition at line 165 of file default_cfe_sb_msgdefs.h.

11.247.2.8 PeakMemInUse `uint32 CFE_SB_StatsTlm_Payload::PeakMemInUse`

Peak memory bytes in use for SB msg transfers.

Telemetry Mnemonic(s) $sc_$cpu_SB_Stat.SB_SMPBMIU

Definition at line 181 of file default_cfe_sb_msgdefs.h.

11.247.2.9 PeakMsgIdsInUse `uint32 CFE_SB_StatsTlm_Payload::PeakMsgIdsInUse`

Peak number of MsgIds with a destination.

Telemetry Mnemonic(s) $sc_$cpu_SB_Stat.SB_SMPMIDIU

Definition at line 167 of file default_cfe_sb_msgdefs.h.

11.247.2.10 PeakPipesInUse `uint32 CFE_SB_StatsTlm_Payload::PeakPipesInUse`

Peak number of pipes since last reboot.

Telemetry Mnemonic(s) $sc_$cpu_SB_Stat.SB_SMPPIU

Definition at line 174 of file default_cfe_sb_msgdefs.h.

11.247.2.11 PeakSBBuffersInUse `uint32 CFE_SB_StatsTlm_Payload::PeakSBBuffersInUse`

Max number of SB message buffers in use.

Telemetry Mnemonic(s) $sc_$cpu_SB_Stat.SB_SMPSBBIU

Definition at line 196 of file default_cfe_sb_msgdefs.h.

11.247.2.12 PeakSubscriptionsInUse `uint32 CFE_SB_StatsTlm_Payload::PeakSubscriptionsInUse`

Peak number of subscriptions.

Telemetry Mnemonic(s) $sc_$cpu_SB_Stat.SB_SMPSIU

Definition at line 188 of file default_cfe_sb_msgdefs.h.

11.247.2.13 PipeDepthStats `CFE_SB_PipeDepthStats_t CFE_SB_StatsTlm_Payload::PipeDepthStats[CFE_MISSION_SB_MAX_PIP`

Pipe Depth Statistics CFE_SB_PipeDepthStats_t.

Telemetry Mnemonic(s) $sc_$cpu_SB_Stat.SB_SMPDS[CFE_PLATFORM_SB_MAX_PIPES]

Definition at line 202 of file default_cfe_sb_msgdefs.h.

11.247.2.14 PipesInUse `uint32 CFE_SB_StatsTlm_Payload::PipesInUse`

Number of pipes currently in use.

Telemetry Mnemonic(s) $sc_$cpu_SB_Stat.SB_SMPIU

Definition at line 172 of file default_cfe_sb_msgdefs.h.

11.247.2.15 SBBuffersInUse `uint32 CFE_SB_StatsTlm_Payload::SBBuffersInUse`

Number of SB message buffers currently in use.

Telemetry Mnemonic(s) $sc_$cpu_SB_Stat.SB_SMSBBIU

Definition at line 194 of file default_cfe_sb_msgdefs.h.

11.247.2.16 SubscriptionsInUse `uint32 CFE_SB_StatsTlm_Payload::SubscriptionsInUse`

Number of current subscriptions.

Telemetry Mnemonic(s) $sc_$cpu_SB_Stat.SB_SMSIU

Definition at line 186 of file default_cfe_sb_msgdefs.h.
The documentation for this struct was generated from the following file:

- cfe/modules/sb/config/default_cfe_sb_msgdefs.h

11.248 CFE_SB_SubEntries Struct Reference

SB Previous Subscriptions Entry.
`#include <default_cfe_sb_msgdefs.h>`

Data Fields

- CFE_SB_MsgId_t MsgId

  MsgId portion of the subscription.
- CFE_SB_Qos_t Qos

  Qos portion of the subscription.
- CFE_SB_PipeId_t Pipe

  PipeId portion of the subscription.

11.248.1 Detailed Description

SB Previous Subscriptions Entry.
This structure defines an entry used in the CFE_SB_PrevSubsPkt_t Intended to be used primarily by Software Bus Networking Application (SBN)
Used in structure definition CFE_SB_AllSubscriptionsTlm_t
Definition at line 258 of file default_cfe_sb_msgdefs.h.

11.248.2 Field Documentation

11.248.2.1 MsgId `CFE_SB_MsgId_t CFE_SB_SubEntries::MsgId`

MsgId portion of the subscription.
Definition at line 260 of file default_cfe_sb_msgdefs.h.

11.248.2.2 Pipe `CFE_SB_PipeId_t CFE_SB_SubEntries::Pipe`

PipeId portion of the subscription.
Definition at line 262 of file default_cfe_sb_msgdefs.h.

11.248.2.3 Qos `CFE_SB_Qos_t CFE_SB_SubEntries::Qos`

Qos portion of the subscription.
Definition at line 261 of file default_cfe_sb_msgdefs.h.
The documentation for this struct was generated from the following file:

- cfe/modules/sb/config/default_cfe_sb_msgdefs.h

11.249 CFE_SB_WriteFileInfoCmd_Payload Struct Reference

Write File Info Command Payload.
`#include <default_cfe_sb_msgdefs.h>`

Data Fields

- char Filename [CFE_MISSION_MAX_PATH_LEN]

  Path and Filename of data to be loaded.

11.249.1 Detailed Description

Write File Info Command Payload.
This structure contains a generic definition used by SB commands that write to a file
Definition at line 40 of file default_cfe_sb_msgdefs.h.

11.249.2 Field Documentation

11.249.2.1 Filename `char CFE_SB_WriteFileInfoCmd_Payload::Filename[CFE_MISSION_MAX_PATH_LEN]`

Path and Filename of data to be loaded.
Definition at line 42 of file default_cfe_sb_msgdefs.h.
The documentation for this struct was generated from the following file:

- cfe/modules/sb/config/default_cfe_sb_msgdefs.h

11.250 CFE_SB_WriteMapInfoCmd Struct Reference

`#include <default_cfe_sb_msgstruct.h>`

Data Fields

- CFE_MSG_CommandHeader_t CommandHeader

  Command header.

- CFE_SB_WriteFileInfoCmd_Payload_t Payload

  Command payload.

11.250.1 Detailed Description

Definition at line 102 of file default_cfe_sb_msgstruct.h.

11.250.2 Field Documentation

11.250.2.1 CommandHeader `CFE_MSG_CommandHeader_t CFE_SB_WriteMapInfoCmd::CommandHeader`

Command header.
Definition at line 104 of file default_cfe_sb_msgstruct.h.

11.250.2.2 Payload `CFE_SB_WriteFileInfoCmd_Payload_t` `CFE_SB_WriteMapInfoCmd::Payload`

Command payload.
Definition at line 105 of file default_cfe_sb_msgstruct.h.
The documentation for this struct was generated from the following file:

- cfe/modules/sb/config/default_cfe_sb_msgstruct.h

11.251 CFE_SB_WritePipeInfoCmd Struct Reference

```
#include <default_cfe_sb_msgstruct.h>
```

Data Fields

- CFE_MSG_CommandHeader_t CommandHeader

  Command header.
- CFE_SB_WriteFileInfoCmd_Payload_t Payload

  Command payload.

11.251.1 Detailed Description

Definition at line 96 of file default_cfe_sb_msgstruct.h.

11.251.2 Field Documentation

11.251.2.1 CommandHeader `CFE_MSG_CommandHeader_t` `CFE_SB_WritePipeInfoCmd::CommandHeader`

Command header.
Definition at line 98 of file default_cfe_sb_msgstruct.h.

11.251.2.2 Payload `CFE_SB_WriteFileInfoCmd_Payload_t` `CFE_SB_WritePipeInfoCmd::Payload`

Command payload.
Definition at line 99 of file default_cfe_sb_msgstruct.h.
The documentation for this struct was generated from the following file:

- cfe/modules/sb/config/default_cfe_sb_msgstruct.h

11.252 CFE_SB_WriteRoutingInfoCmd Struct Reference

```
#include <default_cfe_sb_msgstruct.h>
```

Data Fields

- CFE_MSG_CommandHeader_t CommandHeader

  Command header.
- CFE_SB_WriteFileInfoCmd_Payload_t Payload

  Command payload.

11.252.1 Detailed Description

Definition at line 90 of file default_cfe_sb_msgstruct.h.

11.252.2 Field Documentation

11.252.2.1 CommandHeader `CFE_MSG_CommandHeader_t CFE_SB_WriteRoutingInfoCmd::CommandHeader`

Command header.
Definition at line 92 of file default_cfe_sb_msgstruct.h.

11.252.2.2 Payload `CFE_SB_WriteFileInfoCmd_Payload_t CFE_SB_WriteRoutingInfoCmd::Payload`

Command payload.
Definition at line 93 of file default_cfe_sb_msgstruct.h.
The documentation for this struct was generated from the following file:

- cfe/modules/sb/config/default_cfe_sb_msgstruct.h

11.253 CFE_TBL_AbortLoadCmd Struct Reference

Abort Load Command.
`#include <default_cfe_tbl_msgstruct.h>`

Data Fields

- CFE_MSG_CommandHeader_t CommandHeader

  Command header.
- CFE_TBL_AbortLoadCmd_Payload_t Payload

  Command payload.

11.253.1 Detailed Description

Abort Load Command.
Definition at line 131 of file default_cfe_tbl_msgstruct.h.

11.253.2 Field Documentation

11.253.2.1 CommandHeader `CFE_MSG_CommandHeader_t CFE_TBL_AbortLoadCmd::CommandHeader`

Command header.
Definition at line 133 of file default_cfe_tbl_msgstruct.h.

11.253.2.2 Payload `CFE_TBL_AbortLoadCmd_Payload_t CFE_TBL_AbortLoadCmd::Payload`

Command payload.
Definition at line 134 of file default_cfe_tbl_msgstruct.h.
The documentation for this struct was generated from the following file:

- cfe/modules/tbl/config/default_cfe_tbl_msgstruct.h

11.254 CFE_TBL_AbortLoadCmd_Payload Struct Reference

Abort Load Command Payload.
`#include <default_cfe_tbl_msgdefs.h>`

Data Fields

- char TableName [CFE_MISSION_TBL_MAX_FULL_NAME_LEN]

  Full Name of Table whose load is to be aborted.

11.254.1 Detailed Description

Abort Load Command Payload.
For command details, see CFE_TBL_ABORT_LOAD_CC
Definition at line 147 of file default_cfe_tbl_msgdefs.h.

11.254.2 Field Documentation

11.254.2.1 TableName `char CFE_TBL_AbortLoadCmd_Payload::TableName[CFE_MISSION_TBL_MAX_FULL_NAME_LEN]`

Full Name of Table whose load is to be aborted.
ASCII string containing full table name identifier of a table whose load is to be aborted
Definition at line 149 of file default_cfe_tbl_msgdefs.h.
The documentation for this struct was generated from the following file:

- cfe/modules/tbl/config/default_cfe_tbl_msgdefs.h

11.255 CFE_TBL_ActivateCmd Struct Reference

Activate Table Command.
`#include <default_cfe_tbl_msgstruct.h>`

Data Fields

- CFE_MSG_CommandHeader_t CommandHeader

  Command header.
- CFE_TBL_ActivateCmd_Payload_t Payload

  Command payload.

11.255.1 Detailed Description

Activate Table Command.
Definition at line 95 of file default_cfe_tbl_msgstruct.h.

11.255.2 Field Documentation

11.255.2.1 CommandHeader `CFE_MSG_CommandHeader_t CFE_TBL_ActivateCmd::CommandHeader`

Command header.
Definition at line 97 of file default_cfe_tbl_msgstruct.h.

11.255.2.2 Payload `CFE_TBL_ActivateCmd_Payload_t CFE_TBL_ActivateCmd::Payload`

Command payload.
Definition at line 98 of file default_cfe_tbl_msgstruct.h.
The documentation for this struct was generated from the following file:

- cfe/modules/tbl/config/default_cfe_tbl_msgstruct.h

11.256 CFE_TBL_ActivateCmd_Payload Struct Reference

Activate Table Command Payload.
`#include <default_cfe_tbl_msgdefs.h>`

Data Fields

- char TableName [CFE_MISSION_TBL_MAX_FULL_NAME_LEN]

  Full Name of Table to be activated.

11.256.1 Detailed Description

Activate Table Command Payload.
For command details, see CFE_TBL_ACTIVATE_CC
Definition at line 94 of file default_cfe_tbl_msgdefs.h.

11.256.2 Field Documentation

11.256.2.1 TableName `char CFE_TBL_ActivateCmd_Payload::TableName[CFE_MISSION_TBL_MAX_FULL_NAME_LEN]`

Full Name of Table to be activated.
ASCII string containing full table name identifier of table to be activated
Definition at line 96 of file default_cfe_tbl_msgdefs.h.
The documentation for this struct was generated from the following file:

- cfe/modules/tbl/config/default_cfe_tbl_msgdefs.h

11.257 CFE_TBL_DelCDSCmd_Payload Struct Reference

Delete Critical Table CDS Command Payload.
`#include <default_cfe_tbl_msgdefs.h>`

Data Fields

- char TableName [CFE_MISSION_TBL_MAX_FULL_NAME_LEN]

  Full Name of Table whose CDS is to be deleted.

11.257.1 Detailed Description

Delete Critical Table CDS Command Payload.
For command details, see CFE_TBL_DELETE_CDS_CC
Definition at line 133 of file default_cfe_tbl_msgdefs.h.

11.257.2 Field Documentation

11.257.2.1 TableName `char CFE_TBL_DelCDSCmd_Payload::TableName[CFE_MISSION_TBL_MAX_FULL_NAME_LEN]`

Full Name of Table whose CDS is to be deleted.
ASCII string containing full table name identifier of a critical table whose CDS is to be deleted
Definition at line 135 of file default_cfe_tbl_msgdefs.h.
The documentation for this struct was generated from the following file:

- cfe/modules/tbl/config/default_cfe_tbl_msgdefs.h

11.258 CFE_TBL_DeleteCDSCmd Struct Reference

Delete Critical Table CDS Command.
`#include <default_cfe_tbl_msgstruct.h>`

Data Fields

- CFE_MSG_CommandHeader_t CommandHeader

  Command header.
- CFE_TBL_DelCDSCmd_Payload_t Payload

  Command payload.

11.258.1 Detailed Description

Delete Critical Table CDS Command.
Definition at line 122 of file default_cfe_tbl_msgstruct.h.

11.258.2 Field Documentation

11.258.2.1 CommandHeader `CFE_MSG_CommandHeader_t CFE_TBL_DeleteCDSCmd::CommandHeader`

Command header.
Definition at line 124 of file default_cfe_tbl_msgstruct.h.

11.258.2.2 Payload `CFE_TBL_DelCDSCmd_Payload_t CFE_TBL_DeleteCDSCmd::Payload`

Command payload.
Definition at line 125 of file default_cfe_tbl_msgstruct.h.
The documentation for this struct was generated from the following file:

- cfe/modules/tbl/config/default_cfe_tbl_msgstruct.h

11.259 CFE_TBL_DumpCmd Struct Reference

`#include <default_cfe_tbl_msgstruct.h>`

Data Fields

- CFE_MSG_CommandHeader_t CommandHeader

  Command header.
- CFE_TBL_DumpCmd_Payload_t Payload

  Command payload.

11.259.1 Detailed Description

/brief Dump Table Command
Definition at line 77 of file default_cfe_tbl_msgstruct.h.

11.259.2 Field Documentation

11.259.2.1 CommandHeader `CFE_MSG_CommandHeader_t CFE_TBL_DumpCmd::CommandHeader`

Command header.
Definition at line 79 of file default_cfe_tbl_msgstruct.h.

11.259.2.2 Payload `CFE_TBL_DumpCmd_Payload_t CFE_TBL_DumpCmd::Payload`

Command payload.
Definition at line 80 of file default_cfe_tbl_msgstruct.h.
The documentation for this struct was generated from the following file:

- cfe/modules/tbl/config/default_cfe_tbl_msgstruct.h

11.260 CFE_TBL_DumpCmd_Payload Struct Reference

Dump Table Command Payload.
`#include <default_cfe_tbl_msgdefs.h>`

Data Fields

- uint16 ActiveTableFlag

  CFE_TBL_BufferSelect_INACTIVE=Inactive Table, CFE_TBL_BufferSelect_ACTIVE=Active Table
- char TableName [CFE_MISSION_TBL_MAX_FULL_NAME_LEN]

  Full name of table to be dumped.
- char DumpFilename [CFE_MISSION_MAX_PATH_LEN]

  Full Filename where data is to be written.

11.260.1 Detailed Description

Dump Table Command Payload.
For command details, see CFE_TBL_DUMP_CC
Definition at line 55 of file default_cfe_tbl_msgdefs.h.

11.260.2 Field Documentation

11.260.2.1 ActiveTableFlag `uint16 CFE_TBL_DumpCmd_Payload::ActiveTableFlag`

CFE_TBL_BufferSelect_INACTIVE=Inactive Table, CFE_TBL_BufferSelect_ACTIVE=Active Table
Selects either the "Inactive" (CFE_TBL_BufferSelect_INACTIVE) buffer or the "Active" (CFE_TBL_BufferSelect_ACTIVE) buffer to be dumped
Definition at line 57 of file default_cfe_tbl_msgdefs.h.

11.260.2.2 DumpFilename `char CFE_TBL_DumpCmd_Payload::DumpFilename[CFE_MISSION_MAX_PATH_LEN]`

Full Filename where data is to be written.
ASCII string containing full path of filename where data is to be dumped
Definition at line 66 of file default_cfe_tbl_msgdefs.h.

11.260.2.3 TableName `char CFE_TBL_DumpCmd_Payload::TableName[CFE_MISSION_TBL_MAX_FULL_NAME_LEN]`

Full name of table to be dumped.
ASCII string containing full table name identifier of table to be dumped
Definition at line 63 of file default_cfe_tbl_msgdefs.h.
The documentation for this struct was generated from the following file:

- cfe/modules/tbl/config/default_cfe_tbl_msgdefs.h

11.261 CFE_TBL_DumpRegistryCmd Struct Reference

Dump Registry Command.
`#include <default_cfe_tbl_msgstruct.h>`

Data Fields

- CFE_MSG_CommandHeader_t CommandHeader
  Command header.
- CFE_TBL_DumpRegistryCmd_Payload_t Payload
  Command payload.

11.261.1 Detailed Description

Dump Registry Command.
Definition at line 104 of file default_cfe_tbl_msgstruct.h.

11.261.2 Field Documentation

11.261.2.1 CommandHeader `CFE_MSG_CommandHeader_t CFE_TBL_DumpRegistryCmd::CommandHeader`

Command header.
Definition at line 106 of file default_cfe_tbl_msgstruct.h.

11.261.2.2 Payload `CFE_TBL_DumpRegistryCmd_Payload_t CFE_TBL_DumpRegistryCmd::Payload`

Command payload.
Definition at line 107 of file default_cfe_tbl_msgstruct.h.
The documentation for this struct was generated from the following file:

- cfe/modules/tbl/config/default_cfe_tbl_msgstruct.h

11.262 CFE_TBL_DumpRegistryCmd_Payload Struct Reference

Dump Registry Command Payload.
`#include <default_cfe_tbl_msgdefs.h>`

Data Fields

- char DumpFilename [CFE_MISSION_MAX_PATH_LEN]
  Full Filename where dumped data is to be written.

11.262.1 Detailed Description

Dump Registry Command Payload.
For command details, see CFE_TBL_DUMP_REGISTRY_CC
Definition at line 106 of file default_cfe_tbl_msgdefs.h.

11.262.2 Field Documentation

11.262.2.1 DumpFilename `char CFE_TBL_DumpRegistryCmd_Payload::DumpFilename[CFE_MISSION_MAX_PATH_LEN]`

Full Filename where dumped data is to be written.
ASCII string containing full path of filename where registry is to be dumped
Definition at line 108 of file default_cfe_tbl_msgdefs.h.
The documentation for this struct was generated from the following file:

- cfe/modules/tbl/config/default_cfe_tbl_msgdefs.h

11.263 CFE_TBL_File_Hdr Struct Reference

The definition of the header fields that are included in CFE Table Data files.
`#include <default_cfe_tbl_extern_typedefs.h>`

Data Fields

- uint32 Reserved
- uint32 Offset
- uint32 NumBytes
- char TableName [CFE_MISSION_TBL_MAX_FULL_NAME_LEN]

11.263.1 Detailed Description

The definition of the header fields that are included in CFE Table Data files.
This header follows the CFE_FS header and precedes the actual table data.

Note

The Offset and NumBytes fields in the table header are to 32 bits for backward compatibility with existing CFE versions. This means that even on 64-bit CPUs, individual table files will be limited to 4GiB in size.

Definition at line 64 of file default_cfe_tbl_extern_typedefs.h.

11.263.2 Field Documentation

11.263.2.1 NumBytes `uint32 CFE_TBL_File_Hdr::NumBytes`

Number of bytes to load into table
Definition at line 68 of file default_cfe_tbl_extern_typedefs.h.

11.263.2.2 Offset `uint32 CFE_TBL_File_Hdr::Offset`

Byte Offset at which load should commence
Definition at line 67 of file default_cfe_tbl_extern_typedefs.h.

11.263.2.3 Reserved `uint32 CFE_TBL_File_Hdr::Reserved`

Future Use: NumTblSegments in File?

Definition at line 66 of file default_cfe_tbl_extern_typedefs.h.

11.263.2.4 TableName `char CFE_TBL_File_Hdr::TableName[CFE_MISSION_TBL_MAX_FULL_NAME_LEN]`

Fully qualified name of table to load
Definition at line 69 of file default_cfe_tbl_extern_typedefs.h.
The documentation for this struct was generated from the following file:

- cfe/modules/tbl/config/default_cfe_tbl_extern_typedefs.h

11.264 CFE_TBL_FileDef Struct Reference

Table File summary object.
`#include <cfe_tbl_filedef.h>`

Data Fields

- char ObjectName [64]

  Name of instantiated variable that contains desired table image.
- char TableName [CFE_MISSION_TBL_MAX_FULL_NAME_LEN]

  Name of Table as defined onboard.
- char Description [CFE_FS_HDR_DESC_MAX_LEN]

  Description of table image that is included in cFE File Header.
- char TgtFilename [CFE_MISSION_MAX_FILE_LEN]

  Default filename to be used for output of elf2cfetbl utility.
- uint32 ObjectSize

  Size, in bytes, of instantiated object.

11.264.1 Detailed Description

Table File summary object.
The definition of the file definition metadata that can be used by external tools (e.g. elf2cfetbl) to generate CFE table data files.
Definition at line 58 of file cfe_tbl_filedef.h.

11.264.2 Field Documentation

11.264.2.1 Description `char CFE_TBL_FileDef::Description[CFE_FS_HDR_DESC_MAX_LEN]`

Description of table image that is included in cFE File Header.
This is a free-form text string that can be any meaningful value
Definition at line 94 of file cfe_tbl_filedef.h.

11.264.2.2 ObjectName `char CFE_TBL_FileDef::ObjectName[64]`

Name of instantiated variable that contains desired table image.

Note

> For consistency and future compatibility with auto-generated table files and table definitions, the "ObjectName" should match the table struct typedef name without the "_t" suffix. For example, the limit checker action table (ADT) is defined by a type called "LC_ADT_t", the ObjectName should be "LC_ADT".

This naming convention allows the type name to be inferred from the ObjectName (and vice-versa) without having to directly specify both the type name and object name here.

Although the traditional elf2cfetbl tool does not currently do any type checking, future tool versions may add more robust type verification and therefore need to know the type name as well as the object name.
Definition at line 76 of file cfe_tbl_filedef.h.

11.264.2.3 ObjectSize `uint32 CFE_TBL_FileDef::ObjectSize`

Size, in bytes, of instantiated object.
This may be used by tools to check for consistency between the actual defined table size and the expected table size. This is set automatically via the CFE_TBL_FILEDEF macro.
Definition at line 112 of file cfe_tbl_filedef.h.

11.264.2.4 TableName `char CFE_TBL_FileDef::TableName[CFE_MISSION_TBL_MAX_FULL_NAME_LEN]`

Name of Table as defined onboard.
This should be in the form of "APP_NAME.TABLE_NAME" where APP_NAME matches what the app is named at runtime (the 4th column of cfe_es_startup.scr) and TABLE_NAME matches the 2nd parameter of the call to CFE_TBL_Register(). Preferably the TABLE_NAME should also match the ObjectName here in this structure, although this is not strictly required, it helps keep things consistent.
Definition at line 87 of file cfe_tbl_filedef.h.

11.264.2.5 TgtFilename `char CFE_TBL_FileDef::TgtFilename[CFE_MISSION_MAX_FILE_LEN]`

Default filename to be used for output of elf2cfetbl utility.
This must match the expected table file name, which is the name of the source file but the ".c" extension replaced with ".tbl". This is the filename only - do not include a directory/path name here, it can be copied to any runtime directory on the target by external scripts, but should not be renamed.
Definition at line 104 of file cfe_tbl_filedef.h.
The documentation for this struct was generated from the following file:

- cfe/modules/core_api/fsw/inc/cfe_tbl_filedef.h

11.265 CFE_TBL_HousekeepingTlm Struct Reference

`#include <default_cfe_tbl_msgstruct.h>`

Data Fields

- CFE_MSG_TelemetryHeader_t TelemetryHeader
  Telemetry header.
- CFE_TBL_HousekeepingTlm_Payload_t Payload
  Telemetry payload.

11.265.1 Detailed Description

Definition at line 154 of file default_cfe_tbl_msgstruct.h.

11.265.2 Field Documentation

11.265.2.1 Payload `CFE_TBL_HousekeepingTlm_Payload_t CFE_TBL_HousekeepingTlm::Payload`

Telemetry payload.
Definition at line 157 of file default_cfe_tbl_msgstruct.h.

11.265.2.2 TelemetryHeader `CFE_MSG_TelemetryHeader_t CFE_TBL_HousekeepingTlm::TelemetryHeader`

Telemetry header.

Definition at line 156 of file default_cfe_tbl_msgstruct.h.

The documentation for this struct was generated from the following file:

- cfe/modules/tbl/config/default_cfe_tbl_msgstruct.h

11.266 CFE_TBL_HousekeepingTlm_Payload Struct Reference

`#include <default_cfe_tbl_msgdefs.h>`

Data Fields

- uint8 CommandCounter

  Count of valid commands received.
- uint8 CommandErrorCounter

  Count of invalid commands received.
- uint16 NumTables

  Number of Tables Registered.
- uint16 NumLoadPending

  Number of Tables pending on Applications for their update.
- uint16 ValidationCounter

  Number of completed table validations.
- uint32 LastValCrc

  Data Integrity Value computed for last table validated.
- int32 LastValStatus

  Returned status from validation function for last table validated.
- bool ActiveBuffer

  Indicator of whether table buffer validated was 0=Inactive, 1=Active.
- char LastValTableName [CFE_MISSION_TBL_MAX_FULL_NAME_LEN]

  Name of last table validated.
- uint8 SuccessValCounter

  Total number of successful table validations.
- uint8 FailedValCounter

  Total number of unsuccessful table validations.
- uint8 NumValRequests

  Number of times Table Services has requested validations from Apps.
- uint8 NumFreeSharedBufs

  Number of free Shared Working Buffers.
- uint8 ByteAlignPad1

  Spare byte to ensure longword alignment.
- CFE_ES_MemHandle_t MemPoolHandle

  Handle to TBL's memory pool.
- CFE_TIME_SysTime_t LastUpdateTime

  Time of last table update.
- char LastUpdatedTable [CFE_MISSION_TBL_MAX_FULL_NAME_LEN]

  Name of the last table updated.
- char LastFileLoaded [CFE_MISSION_MAX_PATH_LEN]

  Path and Name of last table image file loaded.

- char LastFileDumped [CFE_MISSION_MAX_PATH_LEN]

  Path and Name of last file dumped to.
- char LastTableLoaded [CFE_MISSION_TBL_MAX_FULL_NAME_LEN]

  Name of the last table loaded.

11.266.1 Detailed Description

Name Table Services Housekeeping Packet

Definition at line 178 of file default_cfe_tbl_msgdefs.h.

11.266.2 Field Documentation

11.266.2.1 ActiveBuffer `bool CFE_TBL_HousekeepingTlm_Payload::ActiveBuffer`

Indicator of whether table buffer validated was 0=Inactive, 1=Active.

Telemetry Mnemonic(s) $sc_$cpu_TBL_LastValBuf

Definition at line 205 of file default_cfe_tbl_msgdefs.h.

11.266.2.2 ByteAlignPad1 `uint8 CFE_TBL_HousekeepingTlm_Payload::ByteAlignPad1`

Spare byte to ensure longword alignment.

Telemetry Mnemonic(s) $sc_$cpu_TBL_ByteAlignPad1

Definition at line 221 of file default_cfe_tbl_msgdefs.h.

11.266.2.3 CommandCounter `uint8 CFE_TBL_HousekeepingTlm_Payload::CommandCounter`

Count of valid commands received.

Telemetry Mnemonic(s) $sc_$cpu_TBL_CMDPC

Definition at line 183 of file default_cfe_tbl_msgdefs.h.

11.266.2.4 CommandErrorCounter `uint8 CFE_TBL_HousekeepingTlm_Payload::CommandErrorCounter`

Count of invalid commands received.

Telemetry Mnemonic(s) $sc_$cpu_TBL_CMDEC

Definition at line 185 of file default_cfe_tbl_msgdefs.h.

11.266.2.5 FailedValCounter `uint8 CFE_TBL_HousekeepingTlm_Payload::FailedValCounter`

Total number of unsuccessful table validations.

Telemetry Mnemonic(s) $sc_$cpu_TBL_ValFailedCtr

Definition at line 211 of file default_cfe_tbl_msgdefs.h.

11.266.2.6 LastFileDumped

`char CFE_TBL_HousekeepingTlm_Payload::LastFileDumped[CFE_MISSION_MAX_PATH_LEN]`

Path and Name of last file dumped to.

Telemetry Mnemonic(s) $sc_$cpu_TBL_LastFileDumped[OS_MAX_PATH_LEN]

Definition at line 231 of file default_cfe_tbl_msgdefs.h.

11.266.2.7 LastFileLoaded

`char CFE_TBL_HousekeepingTlm_Payload::LastFileLoaded[CFE_MISSION_MAX_PATH_LEN]`

Path and Name of last table image file loaded.

Telemetry Mnemonic(s) $sc_$cpu_TBL_LastFileLoaded[OS_MAX_PATH_LEN]

Definition at line 229 of file default_cfe_tbl_msgdefs.h.

11.266.2.8 LastTableLoaded

`char CFE_TBL_HousekeepingTlm_Payload::LastTableLoaded[CFE_MISSION_TBL_MAX_FULL_NAME_LE`

Name of the last table loaded.

Telemetry Mnemonic(s) $sc_$cpu_TBL_LastTableLoaded[CFE_TBL_MAX_FULL_NAME_LEN]

Definition at line 233 of file default_cfe_tbl_msgdefs.h.

11.266.2.9 LastUpdatedTable

`char CFE_TBL_HousekeepingTlm_Payload::LastUpdatedTable[CFE_MISSION_TBL_MAX_FULL_NAME_`

Name of the last table updated.

Telemetry Mnemonic(s) $sc_$cpu_TBL_LastUpdTblName[CFE_TB_MAX_FULL_NAME_LEN]

Definition at line 227 of file default_cfe_tbl_msgdefs.h.

11.266.2.10 LastUpdateTime

`CFE_TIME_SysTime_t CFE_TBL_HousekeepingTlm_Payload::LastUpdateTime`

Time of last table update.

Telemetry Mnemonic(s) $sc_$cpu_TBL_LastUpdTime, $sc_$cpu_TBL_SECONDS, $sc_$cpu_TBL_SUBSECONDS

Definition at line 225 of file default_cfe_tbl_msgdefs.h.

11.266.2.11 LastValCrc

`uint32 CFE_TBL_HousekeepingTlm_Payload::LastValCrc`

Data Integrity Value computed for last table validated.

Telemetry Mnemonic(s) $sc_$cpu_TBL_LastValCRC

Definition at line 201 of file default_cfe_tbl_msgdefs.h.

11.266.2.12 LastValStatus

`int32 CFE_TBL_HousekeepingTlm_Payload::LastValStatus`

Returned status from validation function for last table validated.

Telemetry Mnemonic(s) $sc_$cpu_TBl_LastValS

Definition at line 203 of file default_cfe_tbl_msgdefs.h.

11.266.2.13 LastValTableName `char CFE_TBL_HousekeepingTlm_Payload::LastValTableName[CFE_MISSION_TBL_MAX_FULL_NAM`

Name of last table validated.

Telemetry Mnemonic(s) $sc_$cpu_TBL_LastValTblName[CFE_TB_MAX_FULL_NAME_LEN]

Definition at line 207 of file default_cfe_tbl_msgdefs.h.

11.266.2.14 MemPoolHandle `CFE_ES_MemHandle_t CFE_TBL_HousekeepingTlm_Payload::MemPoolHandle`

Handle to TBL's memory pool.

Telemetry Mnemonic(s) $sc_$cpu_TBL_MemPoolHandle

Definition at line 223 of file default_cfe_tbl_msgdefs.h.

11.266.2.15 NumFreeSharedBufs `uint8 CFE_TBL_HousekeepingTlm_Payload::NumFreeSharedBufs`

Number of free Shared Working Buffers.

Telemetry Mnemonic(s) $sc_$cpu_TBL_NumFreeShrBuf

Definition at line 219 of file default_cfe_tbl_msgdefs.h.

11.266.2.16 NumLoadPending `uint16 CFE_TBL_HousekeepingTlm_Payload::NumLoadPending`

Number of Tables pending on Applications for their update.

Telemetry Mnemonic(s) $sc_$cpu_TBL_NumUpdatesPend

Definition at line 193 of file default_cfe_tbl_msgdefs.h.

11.266.2.17 NumTables `uint16 CFE_TBL_HousekeepingTlm_Payload::NumTables`

Number of Tables Registered.

Telemetry Mnemonic(s) $sc_$cpu_TBL_NumTables

Definition at line 191 of file default_cfe_tbl_msgdefs.h.

11.266.2.18 NumValRequests `uint8 CFE_TBL_HousekeepingTlm_Payload::NumValRequests`

Number of times Table Services has requested validations from Apps.

Telemetry Mnemonic(s) $sc_$cpu_TBL_ValReqCtr

Definition at line 213 of file default_cfe_tbl_msgdefs.h.

11.266.2.19 SuccessValCounter `uint8 CFE_TBL_HousekeepingTlm_Payload::SuccessValCounter`

Total number of successful table validations.

Telemetry Mnemonic(s) $sc_$cpu_TBL_ValSuccessCtr

Definition at line 209 of file default_cfe_tbl_msgdefs.h.

11.266.2.20 ValidationCounter `uint16 CFE_TBL_HousekeepingTlm_Payload::ValidationCounter`

Number of completed table validations.

Telemetry Mnemonic(s) $sc_$cpu_TBL_ValCompltdCtr

Definition at line 199 of file default_cfe_tbl_msgdefs.h.
The documentation for this struct was generated from the following file:

- cfe/modules/tbl/config/default_cfe_tbl_msgdefs.h

11.267 CFE_TBL_Info Struct Reference

Table Info.
`#include <cfe_tbl_api_typedefs.h>`

Data Fields

- size_t Size

  Size, in bytes, of Table.
- uint32 NumUsers

  Number of Apps with access to the table.
- CFE_TIME_SysTime_t FileTime

  File creation time from last file loaded into table.
- uint32 Crc

  Most recently calculated CRC by TBL services on table contents.
- CFE_TIME_SysTime_t TimeOfLastUpdate

  Time when Table was last updated.
- bool TableLoadedOnce

  Flag indicating whether table has been loaded once or not.
- bool DumpOnly

  Flag indicating Table is NOT to be loaded.
- bool DoubleBuffered

  Flag indicating Table has a dedicated inactive buffer.
- bool UserDefAddr

  Flag indicating Table address was defined by Owner Application.
- bool Critical

  Flag indicating Table contents are maintained in a CDS.
- char LastFileLoaded [CFE_MISSION_MAX_PATH_LEN]

  Filename of last file loaded into table.

11.267.1 Detailed Description

Table Info.
Definition at line 109 of file cfe_tbl_api_typedefs.h.

11.267.2 Field Documentation

11.267.2.1 Crc `uint32 CFE_TBL_Info::Crc`

Most recently calculated CRC by TBL services on table contents.
Definition at line 114 of file cfe_tbl_api_typedefs.h.

11.267.2.2 Critical `bool CFE_TBL_Info::Critical`

Flag indicating Table contents are maintained in a CDS.
Definition at line 120 of file cfe_tbl_api_typedefs.h.

11.267.2.3 DoubleBuffered `bool CFE_TBL_Info::DoubleBuffered`

Flag indicating Table has a dedicated inactive buffer.
Definition at line 118 of file cfe_tbl_api_typedefs.h.

11.267.2.4 DumpOnly `bool CFE_TBL_Info::DumpOnly`

Flag indicating Table is NOT to be loaded.
Definition at line 117 of file cfe_tbl_api_typedefs.h.

11.267.2.5 FileTime `CFE_TIME_SysTime_t CFE_TBL_Info::FileTime`

File creation time from last file loaded into table.
Definition at line 113 of file cfe_tbl_api_typedefs.h.

11.267.2.6 LastFileLoaded `char CFE_TBL_Info::LastFileLoaded[CFE_MISSION_MAX_PATH_LEN]`

Filename of last file loaded into table.
Definition at line 121 of file cfe_tbl_api_typedefs.h.

11.267.2.7 NumUsers `uint32 CFE_TBL_Info::NumUsers`

Number of Apps with access to the table.
Definition at line 112 of file cfe_tbl_api_typedefs.h.

11.267.2.8 Size `size_t CFE_TBL_Info::Size`

Size, in bytes, of Table.
Definition at line 111 of file cfe_tbl_api_typedefs.h.

11.267.2.9 TableLoadedOnce `bool CFE_TBL_Info::TableLoadedOnce`

Flag indicating whether table has been loaded once or not.
Definition at line 116 of file cfe_tbl_api_typedefs.h.

11.267.2.10 TimeOfLastUpdate `CFE_TIME_SysTime_t CFE_TBL_Info::TimeOfLastUpdate`

Time when Table was last updated.
Definition at line 115 of file cfe_tbl_api_typedefs.h.

11.267.2.11 UserDefAddr `bool CFE_TBL_Info::UserDefAddr`

Flag indicating Table address was defined by Owner Application.
Definition at line 119 of file cfe_tbl_api_typedefs.h.
The documentation for this struct was generated from the following file:

- cfe/modules/core_api/fsw/inc/cfe_tbl_api_typedefs.h

11.268 CFE_TBL_LoadCmd Struct Reference

Load Table Command.
`#include <default_cfe_tbl_msgstruct.h>`

Data Fields

- CFE_MSG_CommandHeader_t CommandHeader

  Command header.
- CFE_TBL_LoadCmd_Payload_t Payload

  Command payload.

11.268.1 Detailed Description

Load Table Command.
Definition at line 68 of file default_cfe_tbl_msgstruct.h.

11.268.2 Field Documentation

11.268.2.1 CommandHeader `CFE_MSG_CommandHeader_t CFE_TBL_LoadCmd::CommandHeader`

Command header.
Definition at line 70 of file default_cfe_tbl_msgstruct.h.

11.268.2.2 Payload `CFE_TBL_LoadCmd_Payload_t CFE_TBL_LoadCmd::Payload`

Command payload.
Definition at line 71 of file default_cfe_tbl_msgstruct.h.
The documentation for this struct was generated from the following file:

- cfe/modules/tbl/config/default_cfe_tbl_msgstruct.h

11.269 CFE_TBL_LoadCmd_Payload Struct Reference

Load Table Command Payload.
`#include <default_cfe_tbl_msgdefs.h>`

Data Fields

- char LoadFilename [CFE_MISSION_MAX_PATH_LEN]

  Filename (and path) of data to be loaded.

11.269.1 Detailed Description

Load Table Command Payload.
For command details, see CFE_TBL_LOAD_CC
Definition at line 45 of file default_cfe_tbl_msgdefs.h.

11.269.2 Field Documentation

11.269.2.1 LoadFilename `char CFE_TBL_LoadCmd_Payload::LoadFilename[CFE_MISSION_MAX_PATH_LEN]`

Filename (and path) of data to be loaded.
Definition at line 47 of file default_cfe_tbl_msgdefs.h.
The documentation for this struct was generated from the following file:

- cfe/modules/tbl/config/default_cfe_tbl_msgdefs.h

11.270 CFE_TBL_NoopCmd Struct Reference

`#include <default_cfe_tbl_msgstruct.h>`

Data Fields

- CFE_MSG_CommandHeader_t CommandHeader

  Command header.

11.270.1 Detailed Description

Definition at line 50 of file default_cfe_tbl_msgstruct.h.

11.270.2 Field Documentation

11.270.2.1 CommandHeader `CFE_MSG_CommandHeader_t CFE_TBL_NoopCmd::CommandHeader`

Command header.
Definition at line 54 of file default_cfe_tbl_msgstruct.h.
The documentation for this struct was generated from the following file:

- cfe/modules/tbl/config/default_cfe_tbl_msgstruct.h

11.271 CFE_TBL_NotifyCmd Struct Reference

`#include <default_cfe_tbl_msgstruct.h>`

Data Fields

- CFE_MSG_CommandHeader_t CommandHeader

  Command header.
- CFE_TBL_NotifyCmd_Payload_t Payload

  Command payload.

11.271.1 Detailed Description

/brief Table Management Notification Command
Definition at line 142 of file default_cfe_tbl_msgstruct.h.

11.271.2 Field Documentation

11.271.2.1 CommandHeader `CFE_MSG_CommandHeader_t CFE_TBL_NotifyCmd::CommandHeader`

Command header.
Definition at line 144 of file default_cfe_tbl_msgstruct.h.

11.271.2.2 Payload `CFE_TBL_NotifyCmd_Payload_t CFE_TBL_NotifyCmd::Payload`

Command payload.
Definition at line 145 of file default_cfe_tbl_msgstruct.h.
The documentation for this struct was generated from the following file:

- cfe/modules/tbl/config/default_cfe_tbl_msgstruct.h

11.272 CFE_TBL_NotifyCmd_Payload Struct Reference

Table Management Notification Command Payload.
`#include <default_cfe_tbl_msgdefs.h>`

Data Fields

- uint32 Parameter

  Application specified command parameter.

11.272.1 Detailed Description

Table Management Notification Command Payload.

Description

Whenever an application that owns a table calls the CFE_TBL_NotifyByMessage API following the table registration, Table services will generate the following command message with the application specified message ID, command code and parameter whenever the table requires management (e.g. - loads and validations).

Definition at line 165 of file default_cfe_tbl_msgdefs.h.

11.272.2 Field Documentation

11.272.2.1 Parameter `uint32 CFE_TBL_NotifyCmd_Payload::Parameter`

Application specified command parameter.
Definition at line 167 of file default_cfe_tbl_msgdefs.h.
The documentation for this struct was generated from the following file:

- cfe/modules/tbl/config/default_cfe_tbl_msgdefs.h

11.273 CFE_TBL_ResetCountersCmd Struct Reference

`#include <default_cfe_tbl_msgstruct.h>`

Data Fields

- CFE_MSG_CommandHeader_t CommandHeader

  Command header.

11.273.1 Detailed Description

Definition at line 55 of file default_cfe_tbl_msgstruct.h.

11.273.2 Field Documentation

11.273.2.1 CommandHeader `CFE_MSG_CommandHeader_t CFE_TBL_ResetCountersCmd::CommandHeader`

Command header.
Definition at line 57 of file default_cfe_tbl_msgstruct.h.
The documentation for this struct was generated from the following file:

- cfe/modules/tbl/config/default_cfe_tbl_msgstruct.h

11.274 CFE_TBL_SendHkCmd Struct Reference

`#include <default_cfe_tbl_msgstruct.h>`

Data Fields

- CFE_MSG_CommandHeader_t CommandHeader

  Command header.

11.274.1 Detailed Description

Definition at line 60 of file default_cfe_tbl_msgstruct.h.

11.274.2 Field Documentation

11.274.2.1 CommandHeader `CFE_MSG_CommandHeader_t CFE_TBL_SendHkCmd::CommandHeader`

Command header.
Definition at line 62 of file default_cfe_tbl_msgstruct.h.
The documentation for this struct was generated from the following file:

- cfe/modules/tbl/config/default_cfe_tbl_msgstruct.h

11.275 CFE_TBL_SendRegistryCmd Struct Reference

Send Table Registry Command.
`#include <default_cfe_tbl_msgstruct.h>`

Data Fields

- CFE_MSG_CommandHeader_t CommandHeader

  Command header.
- CFE_TBL_SendRegistryCmd_Payload_t Payload

  Command payload.

11.275.1 Detailed Description

Send Table Registry Command.
Definition at line 113 of file default_cfe_tbl_msgstruct.h.

11.275.2 Field Documentation

11.275.2.1 CommandHeader `CFE_MSG_CommandHeader_t CFE_TBL_SendRegistryCmd::CommandHeader`

Command header.
Definition at line 115 of file default_cfe_tbl_msgstruct.h.

11.275.2.2 Payload `CFE_TBL_SendRegistryCmd_Payload_t CFE_TBL_SendRegistryCmd::Payload`

Command payload.
Definition at line 116 of file default_cfe_tbl_msgstruct.h.
The documentation for this struct was generated from the following file:

- cfe/modules/tbl/config/default_cfe_tbl_msgstruct.h

11.276 CFE_TBL_SendRegistryCmd_Payload Struct Reference

Send Table Registry Command Payload.
`#include <default_cfe_tbl_msgdefs.h>`

Data Fields

- char TableName [CFE_MISSION_TBL_MAX_FULL_NAME_LEN]

  Full Name of Table whose registry entry is to be telemetered.

11.276.1 Detailed Description

Send Table Registry Command Payload.
For command details, see CFE_TBL_SEND_REGISTRY_CC
Definition at line 119 of file default_cfe_tbl_msgdefs.h.

11.276.2 Field Documentation

11.276.2.1 TableName `char CFE_TBL_SendRegistryCmd_Payload::TableName[CFE_MISSION_TBL_MAX_FULL_NAME_LEN]`

Full Name of Table whose registry entry is to be telemetered.
ASCII string containing full table name identifier of table whose registry entry is to be telemetered via CFE_TBL_TableRegistryTlm_t
Definition at line 121 of file default_cfe_tbl_msgdefs.h.
The documentation for this struct was generated from the following file:

- cfe/modules/tbl/config/default_cfe_tbl_msgdefs.h

11.277 CFE_TBL_TableRegistryTlm Struct Reference

`#include <default_cfe_tbl_msgstruct.h>`

Data Fields

- CFE_MSG_TelemetryHeader_t TelemetryHeader

  Telemetry header.
- CFE_TBL_TblRegPacket_Payload_t Payload

  Telemetry payload.

11.277.1 Detailed Description

Definition at line 160 of file default_cfe_tbl_msgstruct.h.

11.277.2 Field Documentation

11.277.2.1 Payload CFE_TBL_TblRegPacket_Payload_t CFE_TBL_TableRegistryTlm::Payload

Telemetry payload.
Definition at line 163 of file default_cfe_tbl_msgstruct.h.

11.277.2.2 TelemetryHeader CFE_MSG_TelemetryHeader_t CFE_TBL_TableRegistryTlm::TelemetryHeader

Telemetry header.
Definition at line 162 of file default_cfe_tbl_msgstruct.h.
The documentation for this struct was generated from the following file:

- cfe/modules/tbl/config/default_cfe_tbl_msgstruct.h

11.278 CFE_TBL_TblRegPacket_Payload Struct Reference

```
#include <default_cfe_tbl_msgdefs.h>
```

Data Fields

- CFE_ES_MemOffset_t Size

  Size, in bytes, of Table.
- uint32 Crc

  Most recently calculated CRC of Table.
- CFE_ES_MemAddress_t ActiveBufferAddr

  Address of Active Buffer.
- CFE_ES_MemAddress_t InactiveBufferAddr

  Address of Inactive Buffer.
- CFE_ES_MemAddress_t ValidationFuncPtr

  Ptr to Owner App's function that validates tbl contents.
- CFE_TIME_SysTime_t TimeOfLastUpdate

  Time when Table was last updated.
- CFE_TIME_SysTime_t FileTime

  File creation time from last file loaded into table.
- bool TableLoadedOnce

  Flag indicating whether table has been loaded once or not.
- bool LoadPending

  Flag indicating an inactive buffer is ready to be copied.
- bool DumpOnly

  Flag indicating Table is NOT to be loaded.
- bool DoubleBuffered

  Flag indicating Table has a dedicated inactive buffer.
- char Name [CFE_MISSION_TBL_MAX_FULL_NAME_LEN]

  Processor specific table name.
- char LastFileLoaded [CFE_MISSION_MAX_PATH_LEN]

  Filename of last file loaded into table.
- char OwnerAppName [CFE_MISSION_MAX_API_LEN]

  Name of owning application.

- bool Critical

  Indicates whether table is Critical or not.
- uint8 ByteAlign4

  Spare byte to maintain byte alignment.

11.278.1 Detailed Description

Name Table Registry Info Packet

Definition at line 240 of file default_cfe_tbl_msgdefs.h.

11.278.2 Field Documentation

11.278.2.1 ActiveBufferAddr `CFE_ES_MemAddress_t CFE_TBL_TblRegPacket_Payload::ActiveBufferAddr`

Address of Active Buffer.

Telemetry Mnemonic(s) $sc_$cpu_TBL_ActBufAdd

Definition at line 246 of file default_cfe_tbl_msgdefs.h.

11.278.2.2 ByteAlign4 `uint8 CFE_TBL_TblRegPacket_Payload::ByteAlign4`

Spare byte to maintain byte alignment.

Telemetry Mnemonic(s) $sc_$cpu_TBL_Spare4

Definition at line 272 of file default_cfe_tbl_msgdefs.h.

11.278.2.3 Crc `uint32 CFE_TBL_TblRegPacket_Payload::Crc`

Most recently calculated CRC of Table.

Telemetry Mnemonic(s) $sc_$cpu_TBL_CRC

Definition at line 244 of file default_cfe_tbl_msgdefs.h.

11.278.2.4 Critical `bool CFE_TBL_TblRegPacket_Payload::Critical`

Indicates whether table is Critical or not.

Telemetry Mnemonic(s) $sc_$cpu_TBL_Spare3

Definition at line 270 of file default_cfe_tbl_msgdefs.h.

11.278.2.5 DoubleBuffered `bool CFE_TBL_TblRegPacket_Payload::DoubleBuffered`

Flag indicating Table has a dedicated inactive buffer.

Telemetry Mnemonic(s) $sc_$cpu_TBL_DblBuffered

Definition at line 262 of file default_cfe_tbl_msgdefs.h.

11.278.2.6 DumpOnly `bool CFE_TBL_TblRegPacket_Payload::DumpOnly`

Flag indicating Table is NOT to be loaded.

Telemetry Mnemonic(s) $sc_$cpu_TBL_DumpOnly

Definition at line 260 of file default_cfe_tbl_msgdefs.h.

11.278.2.7 FileTime `CFE_TIME_SysTime_t CFE_TBL_TblRegPacket_Payload::FileTime`

File creation time from last file loaded into table.

Telemetry Mnemonic(s) $sc_$cpu_TBL_FILECTIME

Definition at line 254 of file default_cfe_tbl_msgdefs.h.

11.278.2.8 InactiveBufferAddr `CFE_ES_MemAddress_t CFE_TBL_TblRegPacket_Payload::InactiveBufferAddr`

Address of Inactive Buffer.

Telemetry Mnemonic(s) $sc_$cpu_TBL_IActBufAdd

Definition at line 248 of file default_cfe_tbl_msgdefs.h.

11.278.2.9 LastFileLoaded `char CFE_TBL_TblRegPacket_Payload::LastFileLoaded[CFE_MISSION_MAX_PATH_LEN]`

Filename of last file loaded into table.

Telemetry Mnemonic(s) $sc_$cpu_TBL_LastFileUpd[OS_MAX_PATH_LEN]

Definition at line 266 of file default_cfe_tbl_msgdefs.h.

11.278.2.10 LoadPending `bool CFE_TBL_TblRegPacket_Payload::LoadPending`

Flag indicating an inactive buffer is ready to be copied.

Telemetry Mnemonic(s) $sc_$cpu_TBL_UpdatePndng

Definition at line 258 of file default_cfe_tbl_msgdefs.h.

11.278.2.11 Name `char CFE_TBL_TblRegPacket_Payload::Name[CFE_MISSION_TBL_MAX_FULL_NAME_LEN]`

Processor specific table name.

Telemetry Mnemonic(s) $sc_$cpu_TBL_Name[CFE_TB_MAX_FULL_NAME_LEN]

Definition at line 264 of file default_cfe_tbl_msgdefs.h.

11.278.2.12 OwnerAppName `char CFE_TBL_TblRegPacket_Payload::OwnerAppName[CFE_MISSION_MAX_API_LEN]`

Name of owning application.

Telemetry Mnemonic(s) $sc_$cpu_TBL_OwnerApp[OS_MAX_API_NAME]

Definition at line 268 of file default_cfe_tbl_msgdefs.h.

11.278.2.13 Size `CFE_ES_MemOffset_t CFE_TBL_TblRegPacket_Payload::Size`

Size, in bytes, of Table.

Telemetry Mnemonic(s) $sc_$cpu_TBL_SIZE

Definition at line 242 of file default_cfe_tbl_msgdefs.h.

11.278.2.14 TableLoadedOnce `bool CFE_TBL_TblRegPacket_Payload::TableLoadedOnce`

Flag indicating whether table has been loaded once or not.

Telemetry Mnemonic(s) $sc_$cpu_TBL_LoadedOnce

Definition at line 256 of file default_cfe_tbl_msgdefs.h.

11.278.2.15 TimeOfLastUpdate `CFE_TIME_SysTime_t CFE_TBL_TblRegPacket_Payload::TimeOfLastUpdate`

Time when Table was last updated.

Telemetry Mnemonic(s) $sc_$cpu_TBL_TimeLastUpd, $sc_$cpu_TBL_TLUSECONDS, $sc_$cpu_TBL_TLUSUB↩ SECONDS

Definition at line 252 of file default_cfe_tbl_msgdefs.h.

11.278.2.16 ValidationFuncPtr `CFE_ES_MemAddress_t CFE_TBL_TblRegPacket_Payload::ValidationFuncPtr`

Ptr to Owner App's function that validates tbl contents.

Telemetry Mnemonic(s) $sc_$cpu_TBL_ValFuncPtr

Definition at line 250 of file default_cfe_tbl_msgdefs.h.
The documentation for this struct was generated from the following file:

- cfe/modules/tbl/config/default_cfe_tbl_msgdefs.h

11.279 CFE_TBL_ValidateCmd Struct Reference

Validate Table Command.
`#include <default_cfe_tbl_msgstruct.h>`

Data Fields

- CFE_MSG_CommandHeader_t CommandHeader

  Command header.
- CFE_TBL_ValidateCmd_Payload_t Payload

  Command payload.

11.279.1 Detailed Description

Validate Table Command.
Definition at line 86 of file default_cfe_tbl_msgstruct.h.

11.279.2 Field Documentation

11.279.2.1 CommandHeader `CFE_MSG_CommandHeader_t CFE_TBL_ValidateCmd::CommandHeader`

Command header.
Definition at line 88 of file default_cfe_tbl_msgstruct.h.

11.279.2.2 Payload `CFE_TBL_ValidateCmd_Payload_t CFE_TBL_ValidateCmd::Payload`

Command payload.
Definition at line 89 of file default_cfe_tbl_msgstruct.h.
The documentation for this struct was generated from the following file:

- cfe/modules/tbl/config/default_cfe_tbl_msgstruct.h

11.280 CFE_TBL_ValidateCmd_Payload Struct Reference

Validate Table Command Payload.
`#include <default_cfe_tbl_msgdefs.h>`

Data Fields

- uint16 ActiveTableFlag

  CFE_TBL_BufferSelect_INACTIVE=Inactive Table, CFE_TBL_BufferSelect_ACTIVE=Active Table
- char TableName [CFE_MISSION_TBL_MAX_FULL_NAME_LEN]

  Full Name of Table to be validated.

11.280.1 Detailed Description

Validate Table Command Payload.
For command details, see CFE_TBL_VALIDATE_CC
Definition at line 76 of file default_cfe_tbl_msgdefs.h.

11.280.2 Field Documentation

11.280.2.1 ActiveTableFlag `uint16 CFE_TBL_ValidateCmd_Payload::ActiveTableFlag`

CFE_TBL_BufferSelect_INACTIVE=Inactive Table, CFE_TBL_BufferSelect_ACTIVE=Active Table
Selects either the "Inactive" (CFE_TBL_BufferSelect_INACTIVE) buffer or the "Active" (CFE_TBL_BufferSelect_ACTIVE) buffer to be validated
Definition at line 78 of file default_cfe_tbl_msgdefs.h.

11.280.2.2 TableName `char CFE_TBL_ValidateCmd_Payload::TableName[CFE_MISSION_TBL_MAX_FULL_NAME_LEN]`

Full Name of Table to be validated.
ASCII string containing full table name identifier of table to be validated
Definition at line 84 of file default_cfe_tbl_msgdefs.h.
The documentation for this struct was generated from the following file:

- cfe/modules/tbl/config/default_cfe_tbl_msgdefs.h

11.281 CFE_TIME_AddAdjustCmd Struct Reference

`#include <default_cfe_time_msgstruct.h>`

Data Fields

- CFE_MSG_CommandHeader_t CommandHeader

  Command header.
- CFE_TIME_TimeCmd_Payload_t Payload

  Command payload.

11.281.1 Detailed Description

Definition at line 146 of file default_cfe_time_msgstruct.h.

11.281.2 Field Documentation

11.281.2.1 CommandHeader `CFE_MSG_CommandHeader_t CFE_TIME_AddAdjustCmd::CommandHeader`

Command header.
Definition at line 148 of file default_cfe_time_msgstruct.h.

11.281.2.2 Payload `CFE_TIME_TimeCmd_Payload_t CFE_TIME_AddAdjustCmd::Payload`

Command payload.
Definition at line 149 of file default_cfe_time_msgstruct.h.
The documentation for this struct was generated from the following file:

- cfe/modules/time/config/default_cfe_time_msgstruct.h

11.282 CFE_TIME_AddDelayCmd Struct Reference

```
#include <default_cfe_time_msgstruct.h>
```

Data Fields

- CFE_MSG_CommandHeader_t CommandHeader

  Command header.
- CFE_TIME_TimeCmd_Payload_t Payload

  Command payload.

11.282.1 Detailed Description

Definition at line 122 of file default_cfe_time_msgstruct.h.

11.282.2 Field Documentation

11.282.2.1 CommandHeader `CFE_MSG_CommandHeader_t CFE_TIME_AddDelayCmd::CommandHeader`

Command header.
Definition at line 124 of file default_cfe_time_msgstruct.h.

11.282.2.2 Payload `CFE_TIME_TimeCmd_Payload_t` `CFE_TIME_AddDelayCmd::Payload`

Command payload.
Definition at line 125 of file default_cfe_time_msgstruct.h.
The documentation for this struct was generated from the following file:

- cfe/modules/time/config/default_cfe_time_msgstruct.h

11.283 CFE_TIME_AddOneHzAdjustmentCmd Struct Reference

```
#include <default_cfe_time_msgstruct.h>
```

Data Fields

- CFE_MSG_CommandHeader_t CommandHeader

  Command header.
- CFE_TIME_OneHzAdjustmentCmd_Payload_t Payload

  Command payload.

11.283.1 Detailed Description

Definition at line 169 of file default_cfe_time_msgstruct.h.

11.283.2 Field Documentation

11.283.2.1 CommandHeader `CFE_MSG_CommandHeader_t` `CFE_TIME_AddOneHzAdjustmentCmd::CommandHeader`

Command header.
Definition at line 171 of file default_cfe_time_msgstruct.h.

11.283.2.2 Payload `CFE_TIME_OneHzAdjustmentCmd_Payload_t` `CFE_TIME_AddOneHzAdjustmentCmd::Payload`

Command payload.
Definition at line 172 of file default_cfe_time_msgstruct.h.
The documentation for this struct was generated from the following file:

- cfe/modules/time/config/default_cfe_time_msgstruct.h

11.284 CFE_TIME_DiagnosticTlm Struct Reference

```
#include <default_cfe_time_msgstruct.h>
```

Data Fields

- CFE_MSG_TelemetryHeader_t TelemetryHeader

  Telemetry header.
- CFE_TIME_DiagnosticTlm_Payload_t Payload

  Telemetry payload.

11.284.1 Detailed Description

Definition at line 198 of file default_cfe_time_msgstruct.h.

11.284.2 Field Documentation

11.284.2.1 Payload `CFE_TIME_DiagnosticTlm_Payload_t` `CFE_TIME_DiagnosticTlm::Payload`

Telemetry payload.
Definition at line 201 of file default_cfe_time_msgstruct.h.

11.284.2.2 TelemetryHeader `CFE_MSG_TelemetryHeader_t` `CFE_TIME_DiagnosticTlm::TelemetryHeader`

Telemetry header.
Definition at line 200 of file default_cfe_time_msgstruct.h.
The documentation for this struct was generated from the following file:

- cfe/modules/time/config/default_cfe_time_msgstruct.h

11.285 CFE_TIME_DiagnosticTlm_Payload Struct Reference

```
#include <default_cfe_time_msgdefs.h>
```

Data Fields

- CFE_TIME_SysTime_t AtToneMET

  MET at time of tone.
- CFE_TIME_SysTime_t AtToneSTCF

  STCF at time of tone.
- CFE_TIME_SysTime_t AtToneDelay

  Adjustment for slow tone detection.
- CFE_TIME_SysTime_t AtToneLatch

  Local clock latched at time of tone.
- int16 AtToneLeapSeconds

  Leap Seconds at time of tone.
- CFE_TIME_ClockState_Enum_t ClockStateAPI

  Clock state as per API.
- CFE_TIME_SysTime_t TimeSinceTone

  Time elapsed since the tone.
- CFE_TIME_SysTime_t CurrentLatch

  Local clock latched just "now".
- CFE_TIME_SysTime_t CurrentMET

  MET at this instant.
- CFE_TIME_SysTime_t CurrentTAI

  TAI at this instant.
- CFE_TIME_SysTime_t CurrentUTC

  UTC at this instant.
- int16 ClockSetState

  Time has been "set".
- int16 ClockFlyState

  Current fly-wheel state.
- int16 ClockSource

  Internal vs external, etc.

- int16 ClockSignal

  Primary vs redundant, etc.
- int16 ServerFlyState

  Used by clients only.
- int16 Forced2Fly

  Commanded into fly-wheel.
- uint16 ClockStateFlags

  Clock State Flags.
- int16 OneTimeDirection

  One time STCF adjustment direction (Add = 1, Sub = 2)
- int16 OneHzDirection

  1Hz STCF adjustment direction
- int16 DelayDirection

  Client latency adjustment direction.
- CFE_TIME_SysTime_t OneTimeAdjust

  Previous one-time STCF adjustment.
- CFE_TIME_SysTime_t OneHzAdjust

  Current 1Hz STCF adjustment.
- CFE_TIME_SysTime_t ToneSignalLatch

  Local Clock latched at most recent tone signal.
- CFE_TIME_SysTime_t ToneDataLatch

  Local Clock latched at arrival of tone data.
- uint32 ToneMatchCounter

  Tone signal / data verification count.
- uint32 ToneMatchErrorCounter

  Tone signal / data verification error count.
- uint32 ToneSignalCounter

  Tone signal detected SB message count.
- uint32 ToneDataCounter

  Time at the tone data SB message count.
- uint32 ToneIntCounter

  Tone signal ISR execution count.
- uint32 ToneIntErrorCounter

  Tone signal ISR error count.
- uint32 ToneTaskCounter

  Tone task execution count.
- uint32 VersionCounter

  Count of mods to time at tone reference data (version)
- uint32 LocalIntCounter

  Local 1Hz ISR execution count.
- uint32 LocalTaskCounter

  Local 1Hz task execution count.
- uint32 VirtualMET

  Software MET.
- uint32 MinElapsed

  Min tone signal / data pkt arrival window (Sub-seconds)
- uint32 MaxElapsed

Max tone signal / data pkt arrival window (Sub-seconds)

- CFE_TIME_SysTime_t MaxLocalClock

  Max local clock value before rollover.

- uint32 ToneOverLimit

  Max between tone signal interrupts.

- uint32 ToneUnderLimit

  Min between tone signal interrupts.

- uint32 DataStoreStatus

  Data Store status (preserved across processor reset)

11.285.1 Detailed Description

Name Time Services Diagnostics Packet

Definition at line 190 of file default_cfe_time_msgdefs.h.

11.285.2 Field Documentation

11.285.2.1 AtToneDelay `CFE_TIME_SysTime_t CFE_TIME_DiagnosticTlm_Payload::AtToneDelay`

Adjustment for slow tone detection.

Telemetry Mnemonic(s) $sc_$cpu_TIME_DLatentS, $sc_$cpu_TIME_DLatentSs

Definition at line 199 of file default_cfe_time_msgdefs.h.

11.285.2.2 AtToneLatch `CFE_TIME_SysTime_t CFE_TIME_DiagnosticTlm_Payload::AtToneLatch`

Local clock latched at time of tone.

Telemetry Mnemonic(s) $sc_$cpu_TIME_DTValidS, $sc_$cpu_TIME_DTValidSs

Definition at line 201 of file default_cfe_time_msgdefs.h.

11.285.2.3 AtToneLeapSeconds `int16 CFE_TIME_DiagnosticTlm_Payload::AtToneLeapSeconds`

Leap Seconds at time of tone.

Telemetry Mnemonic(s) $sc_$cpu_TIME_DLeapS

Definition at line 204 of file default_cfe_time_msgdefs.h.

11.285.2.4 AtToneMET `CFE_TIME_SysTime_t CFE_TIME_DiagnosticTlm_Payload::AtToneMET`

MET at time of tone.

Telemetry Mnemonic(s) $sc_$cpu_TIME_DTMETS, $sc_$cpu_TIME_DTMETSs

Definition at line 195 of file default_cfe_time_msgdefs.h.

11.285.2.5 AtToneSTCF `CFE_TIME_SysTime_t CFE_TIME_DiagnosticTlm_Payload::AtToneSTCF`

STCF at time of tone.

Telemetry Mnemonic(s) $sc_$cpu_TIME_DSTCFS, $sc_$cpu_TIME_DSTCFSS

Definition at line 197 of file default_cfe_time_msgdefs.h.

11.285.2.6 ClockFlyState `int16 CFE_TIME_DiagnosticTlm_Payload::ClockFlyState`

Current fly-wheel state.

Telemetry Mnemonic(s) $sc_$cpu_TIME_DFlywheel

Definition at line 228 of file default_cfe_time_msgdefs.h.

11.285.2.7 ClockSetState `int16 CFE_TIME_DiagnosticTlm_Payload::ClockSetState`

Time has been "set".

Telemetry Mnemonic(s) $sc_$cpu_TIME_DValid

Definition at line 226 of file default_cfe_time_msgdefs.h.

11.285.2.8 ClockSignal `int16 CFE_TIME_DiagnosticTlm_Payload::ClockSignal`

Primary vs redundant, etc.

Telemetry Mnemonic(s) $sc_$cpu_TIME_DSignal

Definition at line 232 of file default_cfe_time_msgdefs.h.

11.285.2.9 ClockSource `int16 CFE_TIME_DiagnosticTlm_Payload::ClockSource`

Internal vs external, etc.

Telemetry Mnemonic(s) $sc_$cpu_TIME_DSource

Definition at line 230 of file default_cfe_time_msgdefs.h.

11.285.2.10 ClockStateAPI `CFE_TIME_ClockState_Enum_t CFE_TIME_DiagnosticTlm_Payload::ClockStateAPI`

Clock state as per API.

Telemetry Mnemonic(s) $sc_$cpu_TIME_DAPIState

Definition at line 206 of file default_cfe_time_msgdefs.h.

11.285.2.11 ClockStateFlags `uint16 CFE_TIME_DiagnosticTlm_Payload::ClockStateFlags`

Clock State Flags.

Telemetry Mnemonic(s) $sc_$cpu_TIME_DStateFlags, $sc_$cpu_TIME_DFlagSet, $sc_$cpu_TIME_DFlagFly, $sc_$cpu_TIME_DFlagSrc, $sc_$cpu_TIME_DFlagPri, $sc_$cpu_TIME_DFlagSfly, $sc_↩ $cpu_TIME_DFlagCfly, $sc_$cpu_TIME_DFlagAdjd, $sc_$cpu_TIME_DFlag1Hzd, $sc_↩ $cpu_TIME_DFlagClat, $sc_$cpu_TIME_DFlagSorC, $sc_$cpu_TIME_DFlagNIU

Definition at line 242 of file default_cfe_time_msgdefs.h.

11.285.2.12 CurrentLatch `CFE_TIME_SysTime_t CFE_TIME_DiagnosticTlm_Payload::CurrentLatch`

Local clock latched just "now".

Telemetry Mnemonic(s) $sc_$cpu_TIME_DLocalS, $sc_$cpu_TIME_DLocalSs

Definition at line 214 of file default_cfe_time_msgdefs.h.

11.285.2.13 CurrentMET `CFE_TIME_SysTime_t CFE_TIME_DiagnosticTlm_Payload::CurrentMET`

MET at this instant.

Telemetry Mnemonic(s) $sc_$cpu_TIME_DMETS, $sc_$cpu_TIME_DMETSs

Definition at line 216 of file default_cfe_time_msgdefs.h.

11.285.2.14 CurrentTAI `CFE_TIME_SysTime_t CFE_TIME_DiagnosticTlm_Payload::CurrentTAI`

TAI at this instant.

Telemetry Mnemonic(s) $sc_$cpu_TIME_DTAIS, $sc_$cpu_TIME_DTAISS

Definition at line 218 of file default_cfe_time_msgdefs.h.

11.285.2.15 CurrentUTC `CFE_TIME_SysTime_t CFE_TIME_DiagnosticTlm_Payload::CurrentUTC`

UTC at this instant.

Telemetry Mnemonic(s) $sc_$cpu_TIME_DUTCS, $sc_$cpu_TIME_DUTCSS

Definition at line 220 of file default_cfe_time_msgdefs.h.

11.285.2.16 DataStoreStatus `uint32 CFE_TIME_DiagnosticTlm_Payload::DataStoreStatus`

Data Store status (preserved across processor reset)

Telemetry Mnemonic(s) $sc_$cpu_TIME_DataStStat

Definition at line 332 of file default_cfe_time_msgdefs.h.

11.285.2.17 DelayDirection `int16 CFE_TIME_DiagnosticTlm_Payload::DelayDirection`

Client latency adjustment direction.

Telemetry Mnemonic(s) $sc_$cpu_TIME_DLatentDir

Definition at line 252 of file default_cfe_time_msgdefs.h.

11.285.2.18 Forced2Fly `int16 CFE_TIME_DiagnosticTlm_Payload::Forced2Fly`

Commanded into fly-wheel.

Telemetry Mnemonic(s) $sc_$cpu_TIME_DCMD2Fly

Definition at line 236 of file default_cfe_time_msgdefs.h.

11.285.2.19 LocalIntCounter `uint32 CFE_TIME_DiagnosticTlm_Payload::LocalIntCounter`

Local 1Hz ISR execution count.

Telemetry Mnemonic(s) $sc_$cpu_TIME_D1HzISRCNT

Definition at line 290 of file default_cfe_time_msgdefs.h.

11.285.2.20 LocalTaskCounter `uint32 CFE_TIME_DiagnosticTlm_Payload::LocalTaskCounter`

Local 1Hz task execution count.

Telemetry Mnemonic(s) $sc_$cpu_TIME_D1HzTaskCNT

Definition at line 292 of file default_cfe_time_msgdefs.h.

11.285.2.21 MaxElapsed `uint32 CFE_TIME_DiagnosticTlm_Payload::MaxElapsed`

Max tone signal / data pkt arrival window (Sub-seconds)

Telemetry Mnemonic(s) $sc_$cpu_TIME_DMaxWindow

Definition at line 312 of file default_cfe_time_msgdefs.h.

11.285.2.22 MaxLocalClock `CFE_TIME_SysTime_t CFE_TIME_DiagnosticTlm_Payload::MaxLocalClock`

Max local clock value before rollover.

Telemetry Mnemonic(s) $sc_$cpu_TIME_DWrapS, $sc_$cpu_TIME_DWrapSs

Definition at line 318 of file default_cfe_time_msgdefs.h.

11.285.2.23 MinElapsed `uint32 CFE_TIME_DiagnosticTlm_Payload::MinElapsed`

Min tone signal / data pkt arrival window (Sub-seconds)

Telemetry Mnemonic(s) $sc_$cpu_TIME_DMinWindow

Definition at line 310 of file default_cfe_time_msgdefs.h.

11.285.2.24 OneHzAdjust `CFE_TIME_SysTime_t CFE_TIME_DiagnosticTlm_Payload::OneHzAdjust`

Current 1Hz STCF adjustment.

Telemetry Mnemonic(s) $sc_$cpu_TIME_D1HzAdjS, $sc_$cpu_TIME_D1HzAdjSs

Definition at line 260 of file default_cfe_time_msgdefs.h.

11.285.2.25 OneHzDirection `int16 CFE_TIME_DiagnosticTlm_Payload::OneHzDirection`

1Hz STCF adjustment direction

Telemetry Mnemonic(s) $sc_$cpu_TIME_D1HzAdjDir

Definition at line 250 of file default_cfe_time_msgdefs.h.

11.285.2.26 OneTimeAdjust `CFE_TIME_SysTime_t CFE_TIME_DiagnosticTlm_Payload::OneTimeAdjust`

Previous one-time STCF adjustment.

Telemetry Mnemonic(s) $sc_$cpu_TIME_DAdjustS, $sc_$cpu_TIME_DAdjustSs

Definition at line 258 of file default_cfe_time_msgdefs.h.

11.285.2.27 OneTimeDirection `int16 CFE_TIME_DiagnosticTlm_Payload::OneTimeDirection`

One time STCF adjustment direction (Add = 1, Sub = 2)

Telemetry Mnemonic(s) $sc_$cpu_TIME_DAdjustDir

Definition at line 248 of file default_cfe_time_msgdefs.h.

11.285.2.28 ServerFlyState `int16 CFE_TIME_DiagnosticTlm_Payload::ServerFlyState`

Used by clients only.

Telemetry Mnemonic(s) $sc_$cpu_TIME_DSrvFly

Definition at line 234 of file default_cfe_time_msgdefs.h.

11.285.2.29 TimeSinceTone `CFE_TIME_SysTime_t CFE_TIME_DiagnosticTlm_Payload::TimeSinceTone`

Time elapsed since the tone.

Telemetry Mnemonic(s) $sc_$cpu_TIME_DElapsedS, $sc_$cpu_TIME_DElapsedSs

Definition at line 212 of file default_cfe_time_msgdefs.h.

11.285.2.30 ToneDataCounter `uint32 CFE_TIME_DiagnosticTlm_Payload::ToneDataCounter`

Time at the tone data SB message count.

Telemetry Mnemonic(s) $sc_$cpu_TIME_DTatTCNT

Definition at line 280 of file default_cfe_time_msgdefs.h.

11.285.2.31 ToneDataLatch `CFE_TIME_SysTime_t CFE_TIME_DiagnosticTlm_Payload::ToneDataLatch`

Local Clock latched at arrival of tone data.

Telemetry Mnemonic(s) $sc_$cpu_TIME_DTDS, $sc_$cpu_TIME_DTDSs

Definition at line 268 of file default_cfe_time_msgdefs.h.

11.285.2.32 ToneIntCounter `uint32 CFE_TIME_DiagnosticTlm_Payload::ToneIntCounter`

Tone signal ISR execution count.

Telemetry Mnemonic(s) $sc_$cpu_TIME_DTsISRCNT

Definition at line 282 of file default_cfe_time_msgdefs.h.

11.285.2.33 ToneIntErrorCounter `uint32 CFE_TIME_DiagnosticTlm_Payload::ToneIntErrorCounter`

Tone signal ISR error count.

Telemetry Mnemonic(s) $sc_$cpu_TIME_DTsISRERR

Definition at line 284 of file default_cfe_time_msgdefs.h.

11.285.2.34 ToneMatchCounter `uint32 CFE_TIME_DiagnosticTlm_Payload::ToneMatchCounter`

Tone signal / data verification count.

Telemetry Mnemonic(s) $sc_$cpu_TIME_DVerifyCNT

Definition at line 274 of file default_cfe_time_msgdefs.h.

11.285.2.35 ToneMatchErrorCounter `uint32 CFE_TIME_DiagnosticTlm_Payload::ToneMatchErrorCounter`

Tone signal / data verification error count.

Telemetry Mnemonic(s) $sc_$cpu_TIME_DVerifyER

Definition at line 276 of file default_cfe_time_msgdefs.h.

11.285.2.36 ToneOverLimit `uint32 CFE_TIME_DiagnosticTlm_Payload::ToneOverLimit`

Max between tone signal interrupts.

Telemetry Mnemonic(s) $sc_$cpu_TIME_DMaxSs

Definition at line 324 of file default_cfe_time_msgdefs.h.

11.285.2.37 ToneSignalCounter `uint32 CFE_TIME_DiagnosticTlm_Payload::ToneSignalCounter`

Tone signal detected SB message count.

Telemetry Mnemonic(s) $sc_$cpu_TIME_DTSDetCNT

Definition at line 278 of file default_cfe_time_msgdefs.h.

11.285.2.38 ToneSignalLatch `CFE_TIME_SysTime_t CFE_TIME_DiagnosticTlm_Payload::ToneSignalLatch`

Local Clock latched at most recent tone signal.

Telemetry Mnemonic(s) $sc_$cpu_TIME_DTTS, $sc_$cpu_TIME_DTTSs

Definition at line 266 of file default_cfe_time_msgdefs.h.

11.285.2.39 ToneTaskCounter `uint32 CFE_TIME_DiagnosticTlm_Payload::ToneTaskCounter`

Tone task execution count.

Telemetry Mnemonic(s) $sc_$cpu_TIME_DTsTaskCNT

Definition at line 286 of file default_cfe_time_msgdefs.h.

11.285.2.40 ToneUnderLimit `uint32 CFE_TIME_DiagnosticTlm_Payload::ToneUnderLimit`

Min between tone signal interrupts.

Telemetry Mnemonic(s) $sc_$cpu_TIME_DMinSs

Definition at line 326 of file default_cfe_time_msgdefs.h.

11.285.2.41 VersionCounter `uint32 CFE_TIME_DiagnosticTlm_Payload::VersionCounter`

Count of mods to time at tone reference data (version)

Telemetry Mnemonic(s) $sc_$cpu_TIME_DVersionCNT

Definition at line 288 of file default_cfe_time_msgdefs.h.

11.285.2.42 VirtualMET `uint32 CFE_TIME_DiagnosticTlm_Payload::VirtualMET`

Software MET.

Telemetry Mnemonic(s) $sc_$cpu_TIME_DLogicalMET

Definition at line 298 of file default_cfe_time_msgdefs.h.
The documentation for this struct was generated from the following file:

- cfe/modules/time/config/default_cfe_time_msgdefs.h

11.286 CFE_TIME_FakeToneCmd Struct Reference

`#include <default_cfe_time_msgstruct.h>`

Data Fields

- CFE_MSG_CommandHeader_t CommandHeader

  Command header.

11.286.1 Detailed Description

Definition at line 71 of file default_cfe_time_msgstruct.h.

11.286.2 Field Documentation

11.286.2.1 CommandHeader `CFE_MSG_CommandHeader_t CFE_TIME_FakeToneCmd::CommandHeader`

Command header.
Definition at line 73 of file default_cfe_time_msgstruct.h.
The documentation for this struct was generated from the following file:

- cfe/modules/time/config/default_cfe_time_msgstruct.h

11.287 CFE_TIME_HousekeepingTlm Struct Reference

`#include <default_cfe_time_msgstruct.h>`

Data Fields

- CFE_MSG_TelemetryHeader_t TelemetryHeader

  Telemetry header.
- CFE_TIME_HousekeepingTlm_Payload_t Payload

  Telemetry payload.

11.287.1 Detailed Description

Definition at line 192 of file default_cfe_time_msgstruct.h.

11.287.2 Field Documentation

11.287.2.1 Payload `CFE_TIME_HousekeepingTlm_Payload_t CFE_TIME_HousekeepingTlm::Payload`

Telemetry payload.
Definition at line 195 of file default_cfe_time_msgstruct.h.

11.287.2.2 TelemetryHeader `CFE_MSG_TelemetryHeader_t CFE_TIME_HousekeepingTlm::TelemetryHeader`

Telemetry header.
Definition at line 194 of file default_cfe_time_msgstruct.h.
The documentation for this struct was generated from the following file:

- cfe/modules/time/config/default_cfe_time_msgstruct.h

11.288 CFE_TIME_HousekeepingTlm_Payload Struct Reference

```
#include <default_cfe_time_msgdefs.h>
```

Data Fields

- uint8 CommandCounter

  Time Command Execution Counter.
- uint8 CommandErrorCounter

  Time Command Error Counter.
- uint16 ClockStateFlags

  State Flags.
- CFE_TIME_ClockState_Enum_t ClockStateAPI

  API State.
- int16 LeapSeconds

  Current Leaps Seconds.
- uint32 SecondsMET

  Current MET (seconds)
- uint32 SubsecsMET

  Current MET (sub-seconds)
- uint32 SecondsSTCF

  Current STCF (seconds)
- uint32 SubsecsSTCF

  Current STCF (sub-seconds)

- uint32 Seconds1HzAdj

  Current 1 Hz SCTF adjustment (seconds)
- uint32 Subsecs1HzAdj

  Current 1 Hz SCTF adjustment (sub-seconds)
- uint32 SecondsDelay

  Current 1 Hz SCTF Delay (seconds)
- uint32 SubsecsDelay

  Current 1 Hz SCTF Delay (sub-seconds)

11.288.1 Detailed Description

Name Time Services Housekeeping Packet

Definition at line 127 of file default_cfe_time_msgdefs.h.

11.288.2 Field Documentation

11.288.2.1 ClockStateAPI `CFE_TIME_ClockState_Enum_t CFE_TIME_HousekeepingTlm_Payload::ClockStateAPI`

API State.

Telemetry Mnemonic(s) $sc_$cpu_TIME_DAPIState

Definition at line 142 of file default_cfe_time_msgdefs.h.

11.288.2.2 ClockStateFlags `uint16 CFE_TIME_HousekeepingTlm_Payload::ClockStateFlags`

State Flags.

Telemetry Mnemonic(s) $sc_$cpu_TIME_StateFlg, $sc_$cpu_TIME_FlagSet, $sc_$cpu_TIME_FlagFly, $sc_$cpu_TIME_FlagSrc, $sc_$cpu_TIME_FlagPri, $sc_$cpu_TIME_FlagSfly, $sc_$cpu_TIME_FlagCfly, $sc_$cpu_TIME_FlagAdjd, $sc_$cpu_TIME_Flag1Hzd, $sc_$cpu_TIME_FlagClat, $sc_$cpu_TIME_FlagSorC, $sc_$cpu_TIME_FlagNIU

Definition at line 140 of file default_cfe_time_msgdefs.h.

11.288.2.3 CommandCounter `uint8 CFE_TIME_HousekeepingTlm_Payload::CommandCounter`

Time Command Execution Counter.

Telemetry Mnemonic(s) $sc_$cpu_TIME_CMDPC

Definition at line 132 of file default_cfe_time_msgdefs.h.

11.288.2.4 CommandErrorCounter `uint8 CFE_TIME_HousekeepingTlm_Payload::CommandErrorCounter`

Time Command Error Counter.

Telemetry Mnemonic(s) $sc_$cpu_TIME_CMDEC

Definition at line 134 of file default_cfe_time_msgdefs.h.

11.288.2.5 LeapSeconds `int16 CFE_TIME_HousekeepingTlm_Payload::LeapSeconds`

Current Leaps Seconds.

Telemetry Mnemonic(s) $sc_$cpu_TIME_LeapSecs

Definition at line 148 of file default_cfe_time_msgdefs.h.

11.288.2.6 Seconds1HzAdj `uint32 CFE_TIME_HousekeepingTlm_Payload::Seconds1HzAdj`

Current 1 Hz SCTF adjustment (seconds)

Telemetry Mnemonic(s) $sc_$cpu_TIME_1HzAdjSecs

Definition at line 168 of file default_cfe_time_msgdefs.h.

11.288.2.7 SecondsDelay `uint32 CFE_TIME_HousekeepingTlm_Payload::SecondsDelay`

Current 1 Hz SCTF Delay (seconds)

Telemetry Mnemonic(s) $sc_$cpu_TIME_1HzAdjSecs

Definition at line 178 of file default_cfe_time_msgdefs.h.

11.288.2.8 SecondsMET `uint32 CFE_TIME_HousekeepingTlm_Payload::SecondsMET`

Current MET (seconds)

Telemetry Mnemonic(s) $sc_$cpu_TIME_METSecs

Definition at line 154 of file default_cfe_time_msgdefs.h.

11.288.2.9 SecondsSTCF `uint32 CFE_TIME_HousekeepingTlm_Payload::SecondsSTCF`

Current STCF (seconds)

Telemetry Mnemonic(s) $sc_$cpu_TIME_STCFSecs

Definition at line 159 of file default_cfe_time_msgdefs.h.

11.288.2.10 Subsecs1HzAdj `uint32 CFE_TIME_HousekeepingTlm_Payload::Subsecs1HzAdj`

Current 1 Hz SCTF adjustment (sub-seconds)

Telemetry Mnemonic(s) $sc_$cpu_TIME_1HzAdjSSecs

Definition at line 170 of file default_cfe_time_msgdefs.h.

11.288.2.11 SubsecsDelay `uint32 CFE_TIME_HousekeepingTlm_Payload::SubsecsDelay`

Current 1 Hz SCTF Delay (sub-seconds)

Telemetry Mnemonic(s) $sc_$cpu_TIME_1HzAdjSSecs

Definition at line 180 of file default_cfe_time_msgdefs.h.

11.288.2.12 SubsecsMET `uint32 CFE_TIME_HousekeepingTlm_Payload::SubsecsMET`

Current MET (sub-seconds)

Telemetry Mnemonic(s) $sc_$cpu_TIME_METSubsecs

Definition at line 156 of file default_cfe_time_msgdefs.h.

11.288.2.13 SubsecsSTCF `uint32 CFE_TIME_HousekeepingTlm_Payload::SubsecsSTCF`

Current STCF (sub-seconds)

Telemetry Mnemonic(s) $sc_$cpu_TIME_STCFSubsecs

Definition at line 161 of file default_cfe_time_msgdefs.h.
The documentation for this struct was generated from the following file:

- cfe/modules/time/config/default_cfe_time_msgdefs.h

11.289 CFE_TIME_LeapsCmd_Payload Struct Reference

Set leap seconds command payload.

```
#include <default_cfe_time_msgdefs.h>
```

Data Fields

- int16 LeapSeconds

11.289.1 Detailed Description

Set leap seconds command payload.
Definition at line 56 of file default_cfe_time_msgdefs.h.

11.289.2 Field Documentation

11.289.2.1 LeapSeconds `int16 CFE_TIME_LeapsCmd_Payload::LeapSeconds`

Definition at line 58 of file default_cfe_time_msgdefs.h.
The documentation for this struct was generated from the following file:

- cfe/modules/time/config/default_cfe_time_msgdefs.h

11.290 CFE_TIME_NoopCmd Struct Reference

```
#include <default_cfe_time_msgstruct.h>
```

Data Fields

- CFE_MSG_CommandHeader_t CommandHeader

  Command header.

11.290.1 Detailed Description

Definition at line 46 of file default_cfe_time_msgstruct.h.

11.290.2 Field Documentation

11.290.2.1 CommandHeader `CFE_MSG_CommandHeader_t CFE_TIME_NoopCmd::CommandHeader`

Command header.
Definition at line 50 of file default_cfe_time_msgstruct.h.
The documentation for this struct was generated from the following file:

- cfe/modules/time/config/default_cfe_time_msgstruct.h

11.291 CFE_TIME_OneHzAdjustmentCmd_Payload Struct Reference

Generic seconds, subseconds command payload.
`#include <default_cfe_time_msgdefs.h>`

Data Fields

- uint32 Seconds
- uint32 Subseconds

11.291.1 Detailed Description

Generic seconds, subseconds command payload.
Definition at line 105 of file default_cfe_time_msgdefs.h.

11.291.2 Field Documentation

11.291.2.1 Seconds `uint32 CFE_TIME_OneHzAdjustmentCmd_Payload::Seconds`

Definition at line 107 of file default_cfe_time_msgdefs.h.

11.291.2.2 Subseconds `uint32 CFE_TIME_OneHzAdjustmentCmd_Payload::Subseconds`

Definition at line 108 of file default_cfe_time_msgdefs.h.
The documentation for this struct was generated from the following file:

- cfe/modules/time/config/default_cfe_time_msgdefs.h

11.292 CFE_TIME_OneHzCmd Struct Reference

`#include <default_cfe_time_msgstruct.h>`

Data Fields

- CFE_MSG_CommandHeader_t CommandHeader

  Command header.

11.292.1 Detailed Description

Definition at line 61 of file default_cfe_time_msgstruct.h.

11.292.2 Field Documentation

11.292.2.1 CommandHeader `CFE_MSG_CommandHeader_t` `CFE_TIME_OneHzCmd::CommandHeader`

Command header.
Definition at line 63 of file default_cfe_time_msgstruct.h.
The documentation for this struct was generated from the following file:

- cfe/modules/time/config/default_cfe_time_msgstruct.h

11.293 CFE_TIME_ResetCountersCmd Struct Reference

```
#include <default_cfe_time_msgstruct.h>
```

Data Fields

- CFE_MSG_CommandHeader_t CommandHeader

  Command header.

11.293.1 Detailed Description

Definition at line 51 of file default_cfe_time_msgstruct.h.

11.293.2 Field Documentation

11.293.2.1 CommandHeader `CFE_MSG_CommandHeader_t` `CFE_TIME_ResetCountersCmd::CommandHeader`

Command header.
Definition at line 53 of file default_cfe_time_msgstruct.h.
The documentation for this struct was generated from the following file:

- cfe/modules/time/config/default_cfe_time_msgstruct.h

11.294 CFE_TIME_SendDiagnosticCmd Struct Reference

```
#include <default_cfe_time_msgstruct.h>
```

Data Fields

- CFE_MSG_CommandHeader_t CommandHeader

  Command header.

11.294.1 Detailed Description

Definition at line 56 of file default_cfe_time_msgstruct.h.

11.294.2 Field Documentation

11.294.2.1 CommandHeader `CFE_MSG_CommandHeader_t` `CFE_TIME_SendDiagnosticCmd::CommandHeader`

Command header.
Definition at line 58 of file default_cfe_time_msgstruct.h.
The documentation for this struct was generated from the following file:

- cfe/modules/time/config/default_cfe_time_msgstruct.h

11.295 CFE_TIME_SendHkCmd Struct Reference

`#include <default_cfe_time_msgstruct.h>`

Data Fields

- CFE_MSG_CommandHeader_t CommandHeader

  Command header.

11.295.1 Detailed Description

Definition at line 76 of file default_cfe_time_msgstruct.h.

11.295.2 Field Documentation

11.295.2.1 CommandHeader `CFE_MSG_CommandHeader_t CFE_TIME_SendHkCmd::CommandHeader`

Command header.
Definition at line 78 of file default_cfe_time_msgstruct.h.
The documentation for this struct was generated from the following file:

- cfe/modules/time/config/default_cfe_time_msgstruct.h

11.296 CFE_TIME_SetLeapSecondsCmd Struct Reference

Set leap seconds command.
`#include <default_cfe_time_msgstruct.h>`

Data Fields

- CFE_MSG_CommandHeader_t CommandHeader

  Command header.
- CFE_TIME_LeapsCmd_Payload_t Payload

  Command payload.

11.296.1 Detailed Description

Set leap seconds command.
Definition at line 84 of file default_cfe_time_msgstruct.h.

11.296.2 Field Documentation

11.296.2.1 CommandHeader `CFE_MSG_CommandHeader_t CFE_TIME_SetLeapSecondsCmd::CommandHeader`

Command header.
Definition at line 86 of file default_cfe_time_msgstruct.h.

11.296.2.2 Payload `CFE_TIME_LeapsCmd_Payload_t CFE_TIME_SetLeapSecondsCmd::Payload`

Command payload.
Definition at line 87 of file default_cfe_time_msgstruct.h.
The documentation for this struct was generated from the following file:

- cfe/modules/time/config/default_cfe_time_msgstruct.h

11.297 CFE_TIME_SetMETCmd Struct Reference

`#include <default_cfe_time_msgstruct.h>`

Data Fields

- CFE_MSG_CommandHeader_t CommandHeader

  Command header.
- CFE_TIME_TimeCmd_Payload_t Payload

  Command payload.

11.297.1 Detailed Description

Definition at line 134 of file default_cfe_time_msgstruct.h.

11.297.2 Field Documentation

11.297.2.1 CommandHeader `CFE_MSG_CommandHeader_t CFE_TIME_SetMETCmd::CommandHeader`

Command header.
Definition at line 136 of file default_cfe_time_msgstruct.h.

11.297.2.2 Payload `CFE_TIME_TimeCmd_Payload_t CFE_TIME_SetMETCmd::Payload`

Command payload.
Definition at line 137 of file default_cfe_time_msgstruct.h.
The documentation for this struct was generated from the following file:

- cfe/modules/time/config/default_cfe_time_msgstruct.h

11.298 CFE_TIME_SetSignalCmd Struct Reference

Set tone signal source command.
`#include <default_cfe_time_msgstruct.h>`

Data Fields

- CFE_MSG_CommandHeader_t CommandHeader

  Command header.
- CFE_TIME_SignalCmd_Payload_t Payload

  Command payload.

11.298.1 Detailed Description

Set tone signal source command.
Definition at line 111 of file default_cfe_time_msgstruct.h.

11.298.2 Field Documentation

11.298.2.1 CommandHeader `CFE_MSG_CommandHeader_t CFE_TIME_SetSignalCmd::CommandHeader`

Command header.
Definition at line 113 of file default_cfe_time_msgstruct.h.

11.298.2.2 Payload `CFE_TIME_SignalCmd_Payload_t CFE_TIME_SetSignalCmd::Payload`

Command payload.
Definition at line 114 of file default_cfe_time_msgstruct.h.
The documentation for this struct was generated from the following file:

- cfe/modules/time/config/default_cfe_time_msgstruct.h

11.299 CFE_TIME_SetSourceCmd Struct Reference

Set time data source command.
`#include <default_cfe_time_msgstruct.h>`

Data Fields

- CFE_MSG_CommandHeader_t CommandHeader

  Command header.
- CFE_TIME_SourceCmd_Payload_t Payload

  Command payload.

11.299.1 Detailed Description

Set time data source command.
Definition at line 102 of file default_cfe_time_msgstruct.h.

11.299.2 Field Documentation

11.299.2.1 CommandHeader `CFE_MSG_CommandHeader_t CFE_TIME_SetSourceCmd::CommandHeader`

Command header.
Definition at line 104 of file default_cfe_time_msgstruct.h.

11.299.2.2 Payload `CFE_TIME_SourceCmd_Payload_t CFE_TIME_SetSourceCmd::Payload`

Command payload.
Definition at line 105 of file default_cfe_time_msgstruct.h.
The documentation for this struct was generated from the following file:

- cfe/modules/time/config/default_cfe_time_msgstruct.h

11.300 CFE_TIME_SetStateCmd Struct Reference

Set clock state command.
`#include <default_cfe_time_msgstruct.h>`

Data Fields

- CFE_MSG_CommandHeader_t CommandHeader

  Command header.
- CFE_TIME_StateCmd_Payload_t Payload

  Command payload.

11.300.1 Detailed Description

Set clock state command.
Definition at line 93 of file default_cfe_time_msgstruct.h.

11.300.2 Field Documentation

11.300.2.1 CommandHeader `CFE_MSG_CommandHeader_t CFE_TIME_SetStateCmd::CommandHeader`

Command header.
Definition at line 95 of file default_cfe_time_msgstruct.h.

11.300.2.2 Payload `CFE_TIME_StateCmd_Payload_t CFE_TIME_SetStateCmd::Payload`

Command payload.
Definition at line 96 of file default_cfe_time_msgstruct.h.
The documentation for this struct was generated from the following file:

- cfe/modules/time/config/default_cfe_time_msgstruct.h

11.301 CFE_TIME_SetSTCFCmd Struct Reference

```
#include <default_cfe_time_msgstruct.h>
```

Data Fields

- CFE_MSG_CommandHeader_t CommandHeader

  Command header.
- CFE_TIME_TimeCmd_Payload_t Payload

  Command payload.

11.301.1 Detailed Description

Definition at line 140 of file default_cfe_time_msgstruct.h.

11.301.2 Field Documentation

11.301.2.1 CommandHeader `CFE_MSG_CommandHeader_t CFE_TIME_SetSTCFCmd::CommandHeader`

Command header.
Definition at line 142 of file default_cfe_time_msgstruct.h.

11.301.2.2 Payload `CFE_TIME_TimeCmd_Payload_t` `CFE_TIME_SetSTCFCmd::Payload`

Command payload.
Definition at line 143 of file default_cfe_time_msgstruct.h.
The documentation for this struct was generated from the following file:

- cfe/modules/time/config/default_cfe_time_msgstruct.h

11.302 CFE_TIME_SetTimeCmd Struct Reference

`#include <default_cfe_time_msgstruct.h>`

Data Fields

- CFE_MSG_CommandHeader_t CommandHeader

  Command header.
- CFE_TIME_TimeCmd_Payload_t Payload

  Command payload.

11.302.1 Detailed Description

Definition at line 158 of file default_cfe_time_msgstruct.h.

11.302.2 Field Documentation

11.302.2.1 CommandHeader `CFE_MSG_CommandHeader_t` `CFE_TIME_SetTimeCmd::CommandHeader`

Command header.
Definition at line 160 of file default_cfe_time_msgstruct.h.

11.302.2.2 Payload `CFE_TIME_TimeCmd_Payload_t` `CFE_TIME_SetTimeCmd::Payload`

Command payload.
Definition at line 161 of file default_cfe_time_msgstruct.h.
The documentation for this struct was generated from the following file:

- cfe/modules/time/config/default_cfe_time_msgstruct.h

11.303 CFE_TIME_SignalCmd_Payload Struct Reference

Set tone signal source command payload.
`#include <default_cfe_time_msgdefs.h>`

Data Fields

- int16 ToneSource

  CFE_TIME_ToneSignalSelect_PRIMARY=Primary Source, CFE_TIME_ToneSignalSelect_REDUNDANT=Redundant Source

11.303.1 Detailed Description

Set tone signal source command payload.
Definition at line 86 of file default_cfe_time_msgdefs.h.

11.303.2 Field Documentation

11.303.2.1 ToneSource `int16 CFE_TIME_SignalCmd_Payload::ToneSource`

CFE_TIME_ToneSignalSelect_PRIMARY=Primary Source, CFE_TIME_ToneSignalSelect_REDUNDANT=Redundant Source

Selects either the "Primary" or "Redundant" tone signal source
Definition at line 88 of file default_cfe_time_msgdefs.h.
The documentation for this struct was generated from the following file:

- cfe/modules/time/config/default_cfe_time_msgdefs.h

11.304 CFE_TIME_SourceCmd_Payload Struct Reference

Set time data source command payload.
`#include <default_cfe_time_msgdefs.h>`

Data Fields

- int16 TimeSource

  CFE_TIME_SourceSelect_INTERNAL=Internal Source, CFE_TIME_SourceSelect_EXTERNAL=External Source

11.304.1 Detailed Description

Set time data source command payload.
Definition at line 76 of file default_cfe_time_msgdefs.h.

11.304.2 Field Documentation

11.304.2.1 TimeSource `int16 CFE_TIME_SourceCmd_Payload::TimeSource`

CFE_TIME_SourceSelect_INTERNAL=Internal Source, CFE_TIME_SourceSelect_EXTERNAL=External Source

Selects either the "Internal" and "External" clock source
Definition at line 78 of file default_cfe_time_msgdefs.h.
The documentation for this struct was generated from the following file:

- cfe/modules/time/config/default_cfe_time_msgdefs.h

11.305 CFE_TIME_StateCmd_Payload Struct Reference

Set clock state command payload.
`#include <default_cfe_time_msgdefs.h>`

Data Fields

- CFE_TIME_ClockState_Enum_t ClockState

  CFE_TIME_ClockState_INVALID=Spacecraft time has not been accurately set, CFE_TIME_ClockState_VALID=Spacecraft clock has been accurately set, CFE_TIME_ClockState_FLYWHEEL=Force into FLYWHEEL mode

11.305.1 Detailed Description

Set clock state command payload.
Definition at line 64 of file default_cfe_time_msgdefs.h.

11.305.2 Field Documentation

11.305.2.1 ClockState `CFE_TIME_ClockState_Enum_t CFE_TIME_StateCmd_Payload::ClockState`

CFE_TIME_ClockState_INVALID=Spacecraft time has not been accurately set, CFE_TIME_ClockState_VALID=Spacecraft clock has been accurately set, CFE_TIME_ClockState_FLYWHEEL=Force into FLYWHEEL mode

Selects the current clock state
Definition at line 66 of file default_cfe_time_msgdefs.h.
The documentation for this struct was generated from the following file:

- cfe/modules/time/config/default_cfe_time_msgdefs.h

11.306 CFE_TIME_SubAdjustCmd Struct Reference

`#include <default_cfe_time_msgstruct.h>`

Data Fields

- CFE_MSG_CommandHeader_t CommandHeader

  Command header.
- CFE_TIME_TimeCmd_Payload_t Payload

  Command payload.

11.306.1 Detailed Description

Definition at line 152 of file default_cfe_time_msgstruct.h.

11.306.2 Field Documentation

11.306.2.1 CommandHeader `CFE_MSG_CommandHeader_t CFE_TIME_SubAdjustCmd::CommandHeader`

Command header.
Definition at line 154 of file default_cfe_time_msgstruct.h.

11.306.2.2 Payload `CFE_TIME_TimeCmd_Payload_t CFE_TIME_SubAdjustCmd::Payload`

Command payload.
Definition at line 155 of file default_cfe_time_msgstruct.h.
The documentation for this struct was generated from the following file:

- cfe/modules/time/config/default_cfe_time_msgstruct.h

11.307 CFE_TIME_SubDelayCmd Struct Reference

`#include <default_cfe_time_msgstruct.h>`

Data Fields

- CFE_MSG_CommandHeader_t CommandHeader

  Command header.
- CFE_TIME_TimeCmd_Payload_t Payload

  Command payload.

11.307.1 Detailed Description

Definition at line 128 of file default_cfe_time_msgstruct.h.

11.307.2 Field Documentation

11.307.2.1 CommandHeader `CFE_MSG_CommandHeader_t CFE_TIME_SubDelayCmd::CommandHeader`

Command header.
Definition at line 130 of file default_cfe_time_msgstruct.h.

11.307.2.2 Payload `CFE_TIME_TimeCmd_Payload_t CFE_TIME_SubDelayCmd::Payload`

Command payload.
Definition at line 131 of file default_cfe_time_msgstruct.h.
The documentation for this struct was generated from the following file:

- cfe/modules/time/config/default_cfe_time_msgstruct.h

11.308 CFE_TIME_SubOneHzAdjustmentCmd Struct Reference

```
#include <default_cfe_time_msgstruct.h>
```

Data Fields

- CFE_MSG_CommandHeader_t CommandHeader

  Command header.
- CFE_TIME_OneHzAdjustmentCmd_Payload_t Payload

  Command payload.

11.308.1 Detailed Description

Definition at line 175 of file default_cfe_time_msgstruct.h.

11.308.2 Field Documentation

11.308.2.1 CommandHeader `CFE_MSG_CommandHeader_t CFE_TIME_SubOneHzAdjustmentCmd::CommandHeader`

Command header.
Definition at line 177 of file default_cfe_time_msgstruct.h.

11.308.2.2 Payload `CFE_TIME_OneHzAdjustmentCmd_Payload_t` `CFE_TIME_SubOneHzAdjustmentCmd::Payload`

Command payload.
Definition at line 178 of file default_cfe_time_msgstruct.h.
The documentation for this struct was generated from the following file:

- cfe/modules/time/config/default_cfe_time_msgstruct.h

11.309 CFE_TIME_SysTime Struct Reference

Data structure used to hold system time values.
`#include <default_cfe_time_extern_typedefs.h>`

Data Fields

- uint32 Seconds

  Number of seconds since epoch.
- uint32 Subseconds

  Number of subseconds since epoch (LSB = 2^(-32) seconds)

11.309.1 Detailed Description

Data structure used to hold system time values.

Description

The CFE_TIME_SysTime_t data structure is used to hold time values. Time is referred to as the elapsed time (in seconds and subseconds) since a specified epoch time. The subseconds field contains the number of 2^(-32) second intervals that have elapsed since the epoch.

Definition at line 41 of file default_cfe_time_extern_typedefs.h.

11.309.2 Field Documentation

11.309.2.1 Seconds `uint32` `CFE_TIME_SysTime::Seconds`

Number of seconds since epoch.
Definition at line 43 of file default_cfe_time_extern_typedefs.h.

11.309.2.2 Subseconds `uint32` `CFE_TIME_SysTime::Subseconds`

Number of subseconds since epoch (LSB = 2^(-32) seconds)
Definition at line 44 of file default_cfe_time_extern_typedefs.h.
The documentation for this struct was generated from the following file:

- cfe/modules/time/config/default_cfe_time_extern_typedefs.h

11.310 CFE_TIME_TimeCmd_Payload Struct Reference

Generic seconds, microseconds command payload.
`#include <default_cfe_time_msgdefs.h>`

Data Fields

- uint32 Seconds
- uint32 MicroSeconds

11.310.1 Detailed Description

Generic seconds, microseconds command payload.
Definition at line 96 of file default_cfe_time_msgdefs.h.

11.310.2 Field Documentation

11.310.2.1 MicroSeconds `uint32 CFE_TIME_TimeCmd_Payload::MicroSeconds`

Definition at line 99 of file default_cfe_time_msgdefs.h.

11.310.2.2 Seconds `uint32 CFE_TIME_TimeCmd_Payload::Seconds`

Definition at line 98 of file default_cfe_time_msgdefs.h.
The documentation for this struct was generated from the following file:

- cfe/modules/time/config/default_cfe_time_msgdefs.h

11.311 CFE_TIME_ToneDataCmd Struct Reference

Time at tone data command.
`#include <default_cfe_time_msgstruct.h>`

Data Fields

- CFE_MSG_CommandHeader_t CommandHeader

  Command header.
- CFE_TIME_ToneDataCmd_Payload_t Payload

  Command payload.

11.311.1 Detailed Description

Time at tone data command.
Definition at line 184 of file default_cfe_time_msgstruct.h.

11.311.2 Field Documentation

11.311.2.1 CommandHeader `CFE_MSG_CommandHeader_t CFE_TIME_ToneDataCmd::CommandHeader`

Command header.
Definition at line 186 of file default_cfe_time_msgstruct.h.

11.311.2.2 Payload `CFE_TIME_ToneDataCmd_Payload_t CFE_TIME_ToneDataCmd::Payload`

Command payload.
Definition at line 187 of file default_cfe_time_msgstruct.h.
The documentation for this struct was generated from the following file:

- cfe/modules/time/config/default_cfe_time_msgstruct.h

11.312 CFE_TIME_ToneDataCmd_Payload Struct Reference

Time at tone data command payload.
`#include <default_cfe_time_msgdefs.h>`

Data Fields

- CFE_TIME_SysTime_t AtToneMET

  MET at time of tone.
- CFE_TIME_SysTime_t AtToneSTCF

  STCF at time of tone.
- int16 AtToneLeapSeconds

  Leap Seconds at time of tone.
- CFE_TIME_ClockState_Enum_t AtToneState

  Clock state at time of tone.

11.312.1 Detailed Description

Time at tone data command payload.
Definition at line 114 of file default_cfe_time_msgdefs.h.

11.312.2 Field Documentation

11.312.2.1 AtToneLeapSeconds `int16 CFE_TIME_ToneDataCmd_Payload::AtToneLeapSeconds`

Leap Seconds at time of tone.
Definition at line 118 of file default_cfe_time_msgdefs.h.

11.312.2.2 AtToneMET `CFE_TIME_SysTime_t CFE_TIME_ToneDataCmd_Payload::AtToneMET`

MET at time of tone.
Definition at line 116 of file default_cfe_time_msgdefs.h.

11.312.2.3 AtToneState `CFE_TIME_ClockState_Enum_t CFE_TIME_ToneDataCmd_Payload::AtToneState`

Clock state at time of tone.
Definition at line 119 of file default_cfe_time_msgdefs.h.

11.312.2.4 AtToneSTCF `CFE_TIME_SysTime_t CFE_TIME_ToneDataCmd_Payload::AtToneSTCF`

STCF at time of tone.
Definition at line 117 of file default_cfe_time_msgdefs.h.
The documentation for this struct was generated from the following file:

- cfe/modules/time/config/default_cfe_time_msgdefs.h

11.313 CFE_TIME_ToneSignalCmd Struct Reference

`#include <default_cfe_time_msgstruct.h>`

Data Fields

- CFE_MSG_CommandHeader_t CommandHeader

  Command header.

11.313.1 Detailed Description

Definition at line 66 of file default_cfe_time_msgstruct.h.

11.313.2 Field Documentation

11.313.2.1 CommandHeader `CFE_MSG_CommandHeader_t CFE_TIME_ToneSignalCmd::CommandHeader`

Command header.
Definition at line 68 of file default_cfe_time_msgstruct.h.
The documentation for this struct was generated from the following file:

- cfe/modules/time/config/default_cfe_time_msgstruct.h

11.314 OS_bin_sem_prop_t Struct Reference

OSAL binary semaphore properties.
`#include <osapi-binsem.h>`

Data Fields

- char name [OS_MAX_API_NAME]
- osal_id_t creator
- int32 value

11.314.1 Detailed Description

OSAL binary semaphore properties.
Definition at line 39 of file osapi-binsem.h.

11.314.2 Field Documentation

11.314.2.1 creator `osal_id_t OS_bin_sem_prop_t::creator`

Definition at line 42 of file osapi-binsem.h.

11.314.2.2 name `char OS_bin_sem_prop_t::name[OS_MAX_API_NAME]`

Definition at line 41 of file osapi-binsem.h.

11.314.2.3 value `int32 OS_bin_sem_prop_t::value`

Definition at line 43 of file osapi-binsem.h.
The documentation for this struct was generated from the following file:

- osal/src/os/inc/osapi-binsem.h

11.315 OS_condvar_prop_t Struct Reference

OSAL condition variable properties.
`#include <osapi-condvar.h>`

Data Fields

- char name [OS_MAX_API_NAME]
- osal_id_t creator

11.315.1 Detailed Description

OSAL condition variable properties.
Definition at line 34 of file osapi-condvar.h.

11.315.2 Field Documentation

11.315.2.1 creator `osal_id_t OS_condvar_prop_t::creator`

Definition at line 37 of file osapi-condvar.h.

11.315.2.2 name `char OS_condvar_prop_t::name[OS_MAX_API_NAME]`

Definition at line 36 of file osapi-condvar.h.
The documentation for this struct was generated from the following file:

- osal/src/os/inc/osapi-condvar.h

11.316 OS_count_sem_prop_t Struct Reference

OSAL counting semaphore properties.
`#include <osapi-countsem.h>`

Data Fields

- char name [OS_MAX_API_NAME]
- osal_id_t creator
- int32 value

11.316.1 Detailed Description

OSAL counting semaphore properties.
Definition at line 32 of file osapi-countsem.h.

11.316.2 Field Documentation

11.316.2.1 creator `osal_id_t OS_count_sem_prop_t::creator`

Definition at line 35 of file osapi-countsem.h.

11.316.2.2 name `char OS_count_sem_prop_t::name[OS_MAX_API_NAME]`

Definition at line 34 of file osapi-countsem.h.

11.316.2.3 value `int32 OS_count_sem_prop_t::value`

Definition at line 36 of file osapi-countsem.h.

The documentation for this struct was generated from the following file:

- osal/src/os/inc/osapi-countsem.h

11.317 os_dirent_t Struct Reference

Directory entry.

`#include <osapi-dir.h>`

Data Fields

- char FileName [OS_MAX_FILE_NAME]

11.317.1 Detailed Description

Directory entry.

Definition at line 32 of file osapi-dir.h.

11.317.2 Field Documentation

11.317.2.1 FileName `char os_dirent_t::FileName[OS_MAX_FILE_NAME]`

Definition at line 34 of file osapi-dir.h.

Referenced by CF_CFDP_ProcessPlaybackDirectory().

The documentation for this struct was generated from the following file:

- osal/src/os/inc/osapi-dir.h

11.318 OS_FdSet Struct Reference

An abstract structure capable of holding several OSAL IDs.

`#include <osapi-select.h>`

Data Fields

- uint8 object_ids [(OS_MAX_NUM_OPEN_FILES+7)/8]

11.318.1 Detailed Description

An abstract structure capable of holding several OSAL IDs.

This is part of the select API and is manipulated using the related API calls. It should not be modified directly by applications.

Note: Math is to determine uint8 array size needed to represent single bit OS_MAX_NUM_OPEN_FILES objects, + 7 rounds up and 8 is the size of uint8.

See also

OS_SelectFdZero(), OS_SelectFdAdd(), OS_SelectFdClear(), OS_SelectFdIsSet()

Definition at line 44 of file osapi-select.h.

11.318.2 Field Documentation

11.318.2.1 object_ids `uint8 OS_FdSet::object_ids[(OS_MAX_NUM_OPEN_FILES+7)/8]`

Definition at line 46 of file osapi-select.h.
The documentation for this struct was generated from the following file:

- osal/src/os/inc/osapi-select.h

11.319 OS_file_prop_t Struct Reference

OSAL file properties.
`#include <osapi-file.h>`

Data Fields

- char Path [OS_MAX_PATH_LEN]
- osal_id_t User
- uint8 IsValid

11.319.1 Detailed Description

OSAL file properties.
Definition at line 49 of file osapi-file.h.

11.319.2 Field Documentation

11.319.2.1 IsValid `uint8 OS_file_prop_t::IsValid`

Definition at line 53 of file osapi-file.h.

11.319.2.2 Path `char OS_file_prop_t::Path[OS_MAX_PATH_LEN]`

Definition at line 51 of file osapi-file.h.

11.319.2.3 User `osal_id_t OS_file_prop_t::User`

Definition at line 52 of file osapi-file.h.
The documentation for this struct was generated from the following file:

- osal/src/os/inc/osapi-file.h

11.320 os_fsinfo_t Struct Reference

OSAL file system info.
`#include <osapi-filesys.h>`

Data Fields

- uint32 MaxFds

  Total number of file descriptors.
- uint32 FreeFds

Total number that are free.

- uint32 MaxVolumes

  Maximum number of volumes.

- uint32 FreeVolumes

  Total number of volumes free.

11.320.1 Detailed Description

OSAL file system info.
Definition at line 35 of file osapi-filesys.h.

11.320.2 Field Documentation

11.320.2.1 FreeFds `uint32 os_fsinfo_t::FreeFds`

Total number that are free.
Definition at line 38 of file osapi-filesys.h.

11.320.2.2 FreeVolumes `uint32 os_fsinfo_t::FreeVolumes`

Total number of volumes free.
Definition at line 40 of file osapi-filesys.h.

11.320.2.3 MaxFds `uint32 os_fsinfo_t::MaxFds`

Total number of file descriptors.
Definition at line 37 of file osapi-filesys.h.

11.320.2.4 MaxVolumes `uint32 os_fsinfo_t::MaxVolumes`

Maximum number of volumes.
Definition at line 39 of file osapi-filesys.h.
The documentation for this struct was generated from the following file:

- osal/src/os/inc/osapi-filesys.h

11.321 os_fstat_t Struct Reference

File system status.
`#include <osapi-file.h>`

Data Fields

- uint32 FileModeBits
- OS_time_t FileTime
- size_t FileSize

11.321.1 Detailed Description

File system status.

Note

This used to be directly typedef'ed to the "struct stat" from the C library

Some C libraries (glibc in particular) actually define member names to reference into sub-structures, so attempting to reuse a name like "st_mtime" might not work.
Definition at line 64 of file osapi-file.h.

11.321.2 Field Documentation

11.321.2.1 FileModeBits `uint32 os_fstat_t::FileModeBits`

Definition at line 66 of file osapi-file.h.

11.321.2.2 FileSize `size_t os_fstat_t::FileSize`

Definition at line 68 of file osapi-file.h.

11.321.2.3 FileTime `OS_time_t os_fstat_t::FileTime`

Definition at line 67 of file osapi-file.h.
The documentation for this struct was generated from the following file:

- osal/src/os/inc/osapi-file.h

11.322 OS_heap_prop_t Struct Reference

OSAL heap properties.
`#include <osapi-heap.h>`

Data Fields

- size_t free_bytes
- osal_blockcount_t free_blocks
- size_t largest_free_block

11.322.1 Detailed Description

OSAL heap properties.

See also

OS_HeapGetInfo()

Definition at line 36 of file osapi-heap.h.

11.322.2 Field Documentation

11.322.2.1 free_blocks `osal_blockcount_t OS_heap_prop_t::free_blocks`

Definition at line 39 of file osapi-heap.h.

11.322.2.2 free_bytes `size_t OS_heap_prop_t::free_bytes`

Definition at line 38 of file osapi-heap.h.

11.322.2.3 largest_free_block `size_t OS_heap_prop_t::largest_free_block`

Definition at line 40 of file osapi-heap.h.

The documentation for this struct was generated from the following file:

- osal/src/os/inc/osapi-heap.h

11.323 OS_module_address_t Struct Reference

OSAL module address properties.

`#include <osapi-module.h>`

Data Fields

- uint32 valid
- uint32 flags
- cpuaddr code_address
- cpuaddr code_size
- cpuaddr data_address
- cpuaddr data_size
- cpuaddr bss_address
- cpuaddr bss_size

11.323.1 Detailed Description

OSAL module address properties.

Definition at line 78 of file osapi-module.h.

11.323.2 Field Documentation

11.323.2.1 bss_address `cpuaddr OS_module_address_t::bss_address`

Definition at line 86 of file osapi-module.h.

11.323.2.2 bss_size `cpuaddr OS_module_address_t::bss_size`

Definition at line 87 of file osapi-module.h.

11.323.2.3 code_address `cpuaddr OS_module_address_t::code_address`

Definition at line 82 of file osapi-module.h.

11.323.2.4 code_size `cpuaddr OS_module_address_t::code_size`

Definition at line 83 of file osapi-module.h.

11.323.2.5 data_address `cpuaddr OS_module_address_t::data_address`

Definition at line 84 of file osapi-module.h.

11.323.2.6 data_size `cpuaddr OS_module_address_t::data_size`

Definition at line 85 of file osapi-module.h.

11.323.2.7 flags `uint32 OS_module_address_t::flags`

Definition at line 81 of file osapi-module.h.

11.323.2.8 valid `uint32 OS_module_address_t::valid`

Definition at line 80 of file osapi-module.h.

The documentation for this struct was generated from the following file:

- osal/src/os/inc/osapi-module.h

11.324 OS_module_prop_t Struct Reference

OSAL module properties.

```
#include <osapi-module.h>
```

Data Fields

- cpuaddr entry_point
- cpuaddr host_module_id
- char filename [OS_MAX_PATH_LEN]
- char name [OS_MAX_API_NAME]
- OS_module_address_t addr

11.324.1 Detailed Description

OSAL module properties.

Definition at line 91 of file osapi-module.h.

11.324.2 Field Documentation

11.324.2.1 addr `OS_module_address_t OS_module_prop_t::addr`

Definition at line 97 of file osapi-module.h.

11.324.2.2 entry_point `cpuaddr OS_module_prop_t::entry_point`

Definition at line 93 of file osapi-module.h.

11.324.2.3 filename `char OS_module_prop_t::filename[OS_MAX_PATH_LEN]`

Definition at line 95 of file osapi-module.h.

11.324.2.4 host_module_id `cpuaddr OS_module_prop_t::host_module_id`

Definition at line 94 of file osapi-module.h.

11.324.2.5 name `char OS_module_prop_t::name[OS_MAX_API_NAME]`

Definition at line 96 of file osapi-module.h.
The documentation for this struct was generated from the following file:

- osal/src/os/inc/osapi-module.h

11.325 OS_mut_sem_prop_t Struct Reference

OSAL mutex properties.
`#include <osapi-mutex.h>`

Data Fields

- char name [OS_MAX_API_NAME]
- osal_id_t creator

11.325.1 Detailed Description

OSAL mutex properties.
Definition at line 32 of file osapi-mutex.h.

11.325.2 Field Documentation

11.325.2.1 creator `osal_id_t OS_mut_sem_prop_t::creator`

Definition at line 35 of file osapi-mutex.h.

11.325.2.2 name `char OS_mut_sem_prop_t::name[OS_MAX_API_NAME]`

Definition at line 34 of file osapi-mutex.h.
The documentation for this struct was generated from the following file:

- osal/src/os/inc/osapi-mutex.h

11.326 OS_queue_prop_t Struct Reference

OSAL queue properties.
`#include <osapi-queue.h>`

Data Fields

- char name [OS_MAX_API_NAME]
- osal_id_t creator

11.326.1 Detailed Description

OSAL queue properties.
Definition at line 32 of file osapi-queue.h.

11.326.2 Field Documentation

11.326.2.1 creator `osal_id_t OS_queue_prop_t::creator`

Definition at line 35 of file osapi-queue.h.

11.326.2.2 name `char OS_queue_prop_t::name[OS_MAX_API_NAME]`

Definition at line 34 of file osapi-queue.h.
The documentation for this struct was generated from the following file:

- osal/src/os/inc/osapi-queue.h

11.327 OS_SockAddr_t Struct Reference

Encapsulates a generic network address.
`#include <osapi-sockets.h>`

Data Fields

- size_t ActualLength

  Length of the actual address data.

- OS_SockAddrData_t AddrData

  Abstract Address data.

11.327.1 Detailed Description

Encapsulates a generic network address.
This is just an abstract buffer type that holds a network address. It is allocated for the worst-case size defined by OS_SOCKADDR_MAX_LEN, and the real size is stored within.
Definition at line 110 of file osapi-sockets.h.

11.327.2 Field Documentation

11.327.2.1 ActualLength `size_t OS_SockAddr_t::ActualLength`

Length of the actual address data.
Definition at line 112 of file osapi-sockets.h.

11.327.2.2 AddrData `OS_SockAddrData_t OS_SockAddr_t::AddrData`

Abstract Address data.
Definition at line 113 of file osapi-sockets.h.
The documentation for this struct was generated from the following file:

- osal/src/os/inc/osapi-sockets.h

11.328 OS_SockAddrData_t Union Reference

Storage buffer for generic network address.
`#include <osapi-sockets.h>`

Data Fields

- uint8 Buffer [OS_SOCKADDR_MAX_LEN]

  Ensures length of at least OS_SOCKADDR_MAX_LEN.
- uint32 AlignU32

  Ensures uint32 alignment.
- void * AlignPtr

  Ensures pointer alignment.

11.328.1 Detailed Description

Storage buffer for generic network address.
This is a union type that helps to ensure a minimum alignment value for the data storage, such that it can be cast to the system-specific type without increasing alignment requirements.
Definition at line 96 of file osapi-sockets.h.

11.328.2 Field Documentation

11.328.2.1 AlignPtr `void* OS_SockAddrData_t::AlignPtr`

Ensures pointer alignment.
Definition at line 100 of file osapi-sockets.h.

11.328.2.2 AlignU32 `uint32 OS_SockAddrData_t::AlignU32`

Ensures uint32 alignment.
Definition at line 99 of file osapi-sockets.h.

11.328.2.3 Buffer `uint8 OS_SockAddrData_t::Buffer[OS_SOCKADDR_MAX_LEN]`

Ensures length of at least OS_SOCKADDR_MAX_LEN.
Definition at line 98 of file osapi-sockets.h.
The documentation for this union was generated from the following file:

- osal/src/os/inc/osapi-sockets.h

11.329 OS_socket_prop_t Struct Reference

Encapsulates socket properties.
`#include <osapi-sockets.h>`

Data Fields

- char name [OS_MAX_API_NAME]

  Name of the socket.
- osal_id_t creator

  OSAL TaskID which opened the socket.

11.329.1 Detailed Description

Encapsulates socket properties.
This is for consistency with other OSAL resource types. Currently no extra properties are exposed here but this could change in a future revision of OSAL as needed.
Definition at line 123 of file osapi-sockets.h.

11.329.2 Field Documentation

11.329.2.1 creator `osal_id_t OS_socket_prop_t::creator`

OSAL TaskID which opened the socket.
Definition at line 126 of file osapi-sockets.h.

11.329.2.2 name `char OS_socket_prop_t::name[OS_MAX_API_NAME]`

Name of the socket.
Definition at line 125 of file osapi-sockets.h.
The documentation for this struct was generated from the following file:

- osal/src/os/inc/osapi-sockets.h

11.330 OS_static_symbol_record_t Struct Reference

Associates a single symbol name with a memory address.
`#include <osapi-module.h>`

Data Fields

- const char * Name
- void(* Address)(void)
- const char * Module

11.330.1 Detailed Description

Associates a single symbol name with a memory address.
If the OS_STATIC_SYMBOL_TABLE feature is enabled, then an array of these structures should be provided by the application. When the application needs to find a symbol address, the static table will be checked in addition to (or instead of) the OS/library-provided lookup function.
This static symbol allows systems that do not implement dynamic module loading to maintain the same semantics as dynamically loaded modules.
Definition at line 113 of file osapi-module.h.

11.330.2 Field Documentation

11.330.2.1 Address `void(* OS_static_symbol_record_t::Address) (void)`

Definition at line 116 of file osapi-module.h.

11.330.2.2 Module `const char* OS_static_symbol_record_t::Module`

Definition at line 117 of file osapi-module.h.

11.330.2.3 Name `const char* OS_static_symbol_record_t::Name`

Definition at line 115 of file osapi-module.h.
The documentation for this struct was generated from the following file:

- osal/src/os/inc/osapi-module.h

11.331 OS_statvfs_t Struct Reference

`#include <osapi-filesys.h>`

Data Fields

- size_t block_size
- osal_blockcount_t total_blocks
- osal_blockcount_t blocks_free

11.331.1 Detailed Description

Definition at line 49 of file osapi-filesys.h.

11.331.2 Field Documentation

11.331.2.1 block_size `size_t OS_statvfs_t::block_size`

Block size of underlying FS
Definition at line 51 of file osapi-filesys.h.

11.331.2.2 blocks_free `osal_blockcount_t OS_statvfs_t::blocks_free`

Available blocks in underlying FS
Definition at line 53 of file osapi-filesys.h.

11.331.2.3 total_blocks `osal_blockcount_t OS_statvfs_t::total_blocks`

Total blocks in underlying FS
Definition at line 52 of file osapi-filesys.h.
The documentation for this struct was generated from the following file:

- osal/src/os/inc/osapi-filesys.h

11.332 OS_task_prop_t Struct Reference

OSAL task properties.
`#include <osapi-task.h>`

Data Fields

- char name [OS_MAX_API_NAME]
- osal_id_t creator
- size_t stack_size
- osal_priority_t priority

11.332.1 Detailed Description

OSAL task properties.
Definition at line 57 of file osapi-task.h.

11.332.2 Field Documentation

11.332.2.1 creator `osal_id_t OS_task_prop_t::creator`

Definition at line 60 of file osapi-task.h.

11.332.2.2 name `char OS_task_prop_t::name[OS_MAX_API_NAME]`

Definition at line 59 of file osapi-task.h.

11.332.2.3 priority `osal_priority_t OS_task_prop_t::priority`

Definition at line 62 of file osapi-task.h.

11.332.2.4 stack_size `size_t OS_task_prop_t::stack_size`

Definition at line 61 of file osapi-task.h.

The documentation for this struct was generated from the following file:

- osal/src/os/inc/osapi-task.h

11.333 OS_time_t Struct Reference

OSAL time interval structure.

`#include <osapi-clock.h>`

Data Fields

- int64 ticks

11.333.1 Detailed Description

OSAL time interval structure.

This is used to represent a basic time interval.

When used with OS_GetLocalTime/OS_SetLocalTime, this represents the interval from the OS's epoch point, typically 01 Jan 1970 00:00:00 UTC on systems that have a persistent real time clock (RTC), or the system boot time if there is no RTC available.

Applications should not directly access fields within this structure, as the definition may change in future versions of OSAL. Instead, applications should use the accessor/conversion methods defined below.

Definition at line 45 of file osapi-clock.h.

11.333.2 Field Documentation

11.333.2.1 ticks `int64 OS_time_t::ticks`

Ticks elapsed since reference point

Definition at line 47 of file osapi-clock.h.

Referenced by OS_TimeAdd(), OS_TimeAssembleFromMicroseconds(), OS_TimeAssembleFromMilliseconds(), OS_TimeAssembleFromNanoseconds(), OS_TimeAssembleFromSubseconds(), OS_TimeEqual(), OS_TimeGet↩FractionalPart(), OS_TimeGetSign(), OS_TimeGetTotalMicroseconds(), OS_TimeGetTotalMilliseconds(), OS_Time↩GetTotalNanoseconds(), OS_TimeGetTotalSeconds(), and OS_TimeSubtract().

The documentation for this struct was generated from the following file:

- osal/src/os/inc/osapi-clock.h

11.334 OS_timebase_prop_t Struct Reference

Time base properties.
`#include <osapi-timebase.h>`

Data Fields

- char name [OS_MAX_API_NAME]
- osal_id_t creator
- uint32 nominal_interval_time
- uint32 freerun_time
- uint32 accuracy

11.334.1 Detailed Description

Time base properties.
Definition at line 37 of file osapi-timebase.h.

11.334.2 Field Documentation

11.334.2.1 accuracy `uint32 OS_timebase_prop_t::accuracy`

Definition at line 43 of file osapi-timebase.h.

11.334.2.2 creator `osal_id_t OS_timebase_prop_t::creator`

Definition at line 40 of file osapi-timebase.h.

11.334.2.3 freerun_time `uint32 OS_timebase_prop_t::freerun_time`

Definition at line 42 of file osapi-timebase.h.

11.334.2.4 name `char OS_timebase_prop_t::name[OS_MAX_API_NAME]`

Definition at line 39 of file osapi-timebase.h.

11.334.2.5 nominal_interval_time `uint32 OS_timebase_prop_t::nominal_interval_time`

Definition at line 41 of file osapi-timebase.h.
The documentation for this struct was generated from the following file:

- osal/src/os/inc/osapi-timebase.h

11.335 OS_timer_prop_t Struct Reference

Timer properties.
`#include <osapi-timer.h>`

Data Fields

- char name [OS_MAX_API_NAME]
- osal_id_t creator
- uint32 start_time
- uint32 interval_time
- uint32 accuracy

11.335.1 Detailed Description

Timer properties.
Definition at line 37 of file osapi-timer.h.

11.335.2 Field Documentation

11.335.2.1 accuracy `uint32 OS_timer_prop_t::accuracy`

Definition at line 43 of file osapi-timer.h.

11.335.2.2 creator `osal_id_t OS_timer_prop_t::creator`

Definition at line 40 of file osapi-timer.h.

11.335.2.3 interval_time `uint32 OS_timer_prop_t::interval_time`

Definition at line 42 of file osapi-timer.h.

11.335.2.4 name `char OS_timer_prop_t::name[OS_MAX_API_NAME]`

Definition at line 39 of file osapi-timer.h.

11.335.2.5 start_time `uint32 OS_timer_prop_t::start_time`

Definition at line 41 of file osapi-timer.h.
The documentation for this struct was generated from the following file:

- osal/src/os/inc/osapi-timer.h

12 File Documentation

12.1 apps/cf/config/default_cf_extern_typedefs.h File Reference

```
#include "cf_mission_cfg.h"
```

Data Structures

- struct CF_TxnFilenames

  Cache of source and destination filename.

Typedefs

- typedef struct CF_TxnFilenames CF_TxnFilenames_t

  Cache of source and destination filename.
- typedef uint32 CF_EntityId_t

  Entity id size.
- typedef uint32 CF_TransactionSeq_t

  transaction sequence number size

Enumerations

- enum CF_CFDP_Class_t { CF_CFDP_CLASS_1 = 0, CF_CFDP_CLASS_2 = 1 }

  Values for CFDP file transfer class.
- enum CF_QueueIdx_t {
  CF_QueueIdx_PEND = 0, CF_QueueIdx_TXA = 1, CF_QueueIdx_TXW = 2, CF_QueueIdx_RX = 3,
  CF_QueueIdx_HIST = 4, CF_QueueIdx_HIST_FREE = 5, CF_QueueIdx_FREE = 6, CF_QueueIdx_NUM = 7 }

  CF queue identifiers.

12.1.1 Detailed Description

Declarations and prototypes for cf_extern_typedefs module

12.1.2 Typedef Documentation

12.1.2.1 CF_EntityId_t `typedef uint32 CF_EntityId_t`

Entity id size.

Description:

The maximum size of the entity id as expected for all CFDP packets. CF supports the spec's variable size of EID, where the actual size is selected at runtime, and therefore the size in CFDP PDUs may be smaller than the size specified here. This type only establishes the maximum size (and therefore maximum value) that an EID may be.

Note

This type is used in several CF commands, and so changing the size of this type will affect the following structs: CF_ConfigTable_t, configuration table - will change size of file CF_ConfigPacket_t, set config params command CF_TxFileCmd_t, transmit file command CF_PlaybackDirCmd_t, equivalent to above CF_Transaction_Payload_t, any command that selects a transaction based on EID

Limits

Must be one of uint8, uint16, uint32, uint64.

Definition at line 117 of file default_cf_extern_typedefs.h.

12.1.2.2 CF_TransactionSeq_t `typedef uint32 CF_TransactionSeq_t`

transaction sequence number size

Description:

The max size of the transaction sequence number as expected for all CFDP packets. CF supports the spec's variable size of TSN, where the actual size is selected at runtime, and therefore the size in CFDP PDUs may be smaller than the size specified here. This type only establishes the maximum size (and therefore maximum value) that a TSN may be.

Note

This type is used in several CF commands, and so changing the size of this type will affect the following structure: CF_Transaction_Payload_t, any command that selects a transaction based on TSN

Limits

Must be one of uint8, uint16, uint32, uint64.

Definition at line 136 of file default_cf_extern_typedefs.h.

12.1.2.3 CF_TxnFilenames_t `typedef struct CF_TxnFilenames CF_TxnFilenames_t`

Cache of source and destination filename.
This pairs a source and destination file name together to be retained for future reference in the transaction/history

12.1.3 Enumeration Type Documentation

12.1.3.1 CF_CFDP_Class_t `enum CF_CFDP_Class_t`

Values for CFDP file transfer class.
The CFDP specification prescribes two classes/modes of file transfer protocol operation - unacknowledged/simple or acknowledged/reliable.
Defined per section 7.1 of CCSDS 727.0-B-5

Enumerator

CF_CFDP_CLASS↩_1	CFDP class 1 - Unreliable transfer.
CF_CFDP_CLASS↩_2	CFDP class 2 - Reliable transfer.

Definition at line 63 of file default_cf_extern_typedefs.h.

12.1.3.2 CF_QueueIdx_t `enum CF_QueueIdx_t`

CF queue identifiers.

Enumerator

CF_QueueIdx_PEND	first one on this list is active
CF_QueueIdx_TXA	
CF_QueueIdx_TXW	
CF_QueueIdx_RX	
CF_QueueIdx_HIST	
CF_QueueIdx_HIST_FREE	

Enumerator

CF_QueueIdx_FREE	
CF_QueueIdx_NUM	

Definition at line 72 of file default_cf_extern_typedefs.h.

12.2 apps/cf/config/default_cf_fcncodes.h File Reference

Enumerations

- enum CF_CMDS {
  CF_NOOP_CC = 0, CF_RESET_CC = 1, CF_TX_FILE_CC = 2, CF_PLAYBACK_DIR_CC = 3,
  CF_FREEZE_CC = 4, CF_THAW_CC = 5, CF_SUSPEND_CC = 6, CF_RESUME_CC = 7,
  CF_CANCEL_CC = 8, CF_ABANDON_CC = 9, CF_SET_PARAM_CC = 10, CF_GET_PARAM_CC = 11,
  CF_WRITE_QUEUE_CC = 15, CF_ENABLE_DEQUEUE_CC = 16, CF_DISABLE_DEQUEUE_CC = 17,
  CF_ENABLE_DIR_POLLING_CC = 18,
  CF_DISABLE_DIR_POLLING_CC = 19, CF_PURGE_QUEUE_CC = 21, CF_ENABLE_ENGINE_CC = 22,
  CF_DISABLE_ENGINE_CC = 23,
  CF_NUM_COMMANDS = 24 }

12.2.1 Detailed Description

Specification for the CFS CFDP (CF) command function codes

Note

This file should be strictly limited to the command/function code (CC) macro definitions. Other definitions such as enums, typedefs, or other macros should be placed in the msgdefs.h or msg.h files.

12.3 apps/cf/config/default_cf_interface_cfg.h File Reference

```
#include "common_types.h"
#include "cfe_mission_cfg.h"
```

Macros

- #define CF_NUM_CHANNELS (2)

  Number of channels.
- #define CF_NAK_MAX_SEGMENTS (58)

  Max NAK segments supported in a NAK PDU.
- #define CF_MAX_POLLING_DIR_PER_CHAN (5)

  Max number of polling directories per channel.
- #define CF_MAX_PDU_SIZE (512)

  Max PDU size.
- #define CF_FILENAME_MAX_NAME CFE_MISSION_MAX_FILE_LEN

  Maximum file name length.
- #define CF_FILENAME_MAX_LEN CFE_MISSION_MAX_PATH_LEN

  Max filename and path length.
- #define CF_PDU_ENCAPSULATION_EXTRA_TRAILING_BYTES 0

  Number of trailing bytes to add to CFDP PDU.

12.3.1 Detailed Description

CFS CFDP (CF) Application Public Definitions
This provides default values for configurable items that affect the interface(s) of this module. This includes the CMD/TLM message interface, tables definitions, and any other data products that serve to exchange information with other entities.

Note

This file may be overridden/superceded by mission-provided defintions either by overriding this header or by generating definitions from a command/data dictionary tool.

12.4 apps/cf/config/default_cf_internal_cfg.h File Reference

Macros

- #define CF_CHANNEL_NUM_RX_CHUNKS_PER_TRANSACTION

  RX chunks per transaction (per channel)
- #define CF_CHANNEL_NUM_TX_CHUNKS_PER_TRANSACTION

  TX chunks per transaction (per channel)
- #define CF_PIPE_DEPTH (32)

  Application Pipe Depth.
- #define CF_MAX_COMMANDED_PLAYBACK_FILES_PER_CHAN (10)

  Number of max commanded playback files per chan.
- #define CF_MAX_SIMULTANEOUS_RX (5)

  Max number of simultaneous file receives.
- #define CF_MAX_COMMANDED_PLAYBACK_DIRECTORIES_PER_CHAN (2)

  Max number of commanded playback directories per channel.
- #define CF_NUM_HISTORIES_PER_CHANNEL (256)

  Number of histories per channel.
- #define CF_NUM_TRANSACTIONS_PER_PLAYBACK (5)

  Number of transactions per playback directory.
- #define CF_CONFIG_TABLE_NAME ("config_table")

  Name of the CF Configuration Table.
- #define CF_CONFIG_TABLE_FILENAME ("/cf/cf_def_config.tbl")

  CF Configuration Table Filename.
- #define CF_R2_CRC_CHUNK_SIZE (1024)

  R2 CRC calc chunk size.
- #define CF_RCVMSG_TIMEOUT (100)

  Number of milliseconds to wait for a SB message.
- #define CF_STARTUP_SEM_MAX_RETRIES 25

  Limits the number of retries to obtain the CF throttle sem.
- #define CF_STARTUP_SEM_TASK_DELAY 100

  Number of milliseconds to wait if CF throttle sem is not available.

12.4.1 Detailed Description

CFS CFDP (CF) Application Private Config Definitions
This provides default values for configurable items that are internal to this module and do NOT affect the interface(s) of this module. Changes to items in this file only affect the local module and will be transparent to external entities that are using the public interface(s).

Note

This file may be overridden/superceded by mission-provided defintions either by overriding this header or by generating definitions from a command/data dictionary tool.

12.5 apps/cf/config/default_cf_mission_cfg.h File Reference

```
#include "cf_interface_cfg.h"
```

Macros

- #define CF_FILENAME_MAX_PATH (CFE_MISSION_MAX_PATH_LEN - CFE_MISSION_MAX_FILE_LEN)

  Maximum file path (not including file name)

12.5.1 Detailed Description

CFS CFDP (CF) Application Mission Configuration Header File
This is a compatibility header for the "mission_cfg.h" file that has traditionally provided public config definitions for each CFS app.

Note

This file may be overridden/superceded by mission-provided defintions either by overriding this header or by generating definitions from a command/data dictionary tool.

12.5.2 Macro Definition Documentation

12.5.2.1 CF_FILENAME_MAX_PATH `#define CF_FILENAME_MAX_PATH (CFE_MISSION_MAX_PATH_LEN - CFE_MISSION_MAX_FILE_L`

Maximum file path (not including file name)

Limits:

Definition at line 43 of file default_cf_mission_cfg.h.

12.6 apps/cf/config/default_cf_msg.h File Reference

```
#include "cf_interface_cfg.h"
#include "cf_fcncodes.h"
#include "cf_msgdefs.h"
#include "cf_msgstruct.h"
```

Macros

- #define CF_COMPOUND_KEY (254)
- #define CF_ALL_CHANNELS (255)
- #define CF_ALL_POLLDIRS (CF_ALL_CHANNELS)

12.6.1 Detailed Description

Specification for the CFS CFDP (CF) command and telemetry message data types.
This is a compatibility header for the "cf_msg.h" file that has traditionally provided the message definitions for cFS apps.

Note

This file may be overridden/superceded by mission-provided defintions either by overriding this header or by generating definitions from a command/data dictionary tool.

12.6.2 Macro Definition Documentation

12.6.2.1 CF_ALL_CHANNELS `#define CF_ALL_CHANNELS (255)`

Definition at line 41 of file default_cf_msg.h.

12.6.2.2 CF_ALL_POLLDIRS `#define CF_ALL_POLLDIRS (CF_ALL_CHANNELS)`

Definition at line 42 of file default_cf_msg.h.

12.6.2.3 CF_COMPOUND_KEY `#define CF_COMPOUND_KEY (254)`

Definition at line 40 of file default_cf_msg.h.

12.7 apps/cf/config/default_cf_msgdefs.h File Reference

```
#include "common_types.h"
#include "cf_extern_typedefs.h"
```

Data Structures

- struct CF_HkCmdCounters

  Housekeeping command counters.
- struct CF_HkSent

  Housekeeping sent counters.
- struct CF_HkRecv

  Housekeeping received counters.
- struct CF_HkFault

  Housekeeping fault counters.
- struct CF_HkCounters

  Housekeeping counters.
- struct CF_HkChannel_Data

  Housekeeping channel data.
- struct CF_HkPacket_Payload

  Housekeeping packet.
- struct CF_EotPacket_Payload

  End of transaction packet.
- union CF_UnionArgs_Payload

  Command payload argument union to support 4 uint8's, 2 uint16's or 1 uint32.
- struct CF_GetParam_Payload

  Get parameter command structure.
- struct CF_SetParam_Payload

  Set parameter command structure.
- struct CF_TxFile_Payload

  Transmit file command structure.
- struct CF_WriteQueue_Payload

  Write Queue command structure.
- struct CF_Transaction_Payload

  Transaction command structure.

Typedefs

- typedef struct CF_HkCmdCounters CF_HkCmdCounters_t

  Housekeeping command counters.
- typedef struct CF_HkSent CF_HkSent_t

  Housekeeping sent counters.
- typedef struct CF_HkRecv CF_HkRecv_t

  Housekeeping received counters.
- typedef struct CF_HkFault CF_HkFault_t

  Housekeeping fault counters.
- typedef struct CF_HkCounters CF_HkCounters_t

  Housekeeping counters.
- typedef struct CF_HkChannel_Data CF_HkChannel_Data_t

  Housekeeping channel data.
- typedef struct CF_HkPacket_Payload CF_HkPacket_Payload_t

  Housekeeping packet.
- typedef struct CF_EotPacket_Payload CF_EotPacket_Payload_t

  End of transaction packet.
- typedef union CF_UnionArgs_Payload CF_UnionArgs_Payload_t

  Command payload argument union to support 4 uint8's, 2 uint16's or 1 uint32.
- typedef struct CF_GetParam_Payload CF_GetParam_Payload_t

  Get parameter command structure.
- typedef struct CF_SetParam_Payload CF_SetParam_Payload_t

  Set parameter command structure.
- typedef struct CF_TxFile_Payload CF_TxFile_Payload_t

  Transmit file command structure.
- typedef struct CF_WriteQueue_Payload CF_WriteQueue_Payload_t

  Write Queue command structure.
- typedef struct CF_Transaction_Payload CF_Transaction_Payload_t

  Transaction command structure.

Enumerations

- enum CF_Reset_t {
  CF_Reset_all = 0, CF_Reset_command = 1, CF_Reset_fault = 2, CF_Reset_up = 3,
  CF_Reset_down = 4 }

  IDs for use for Reset cmd.
- enum CF_Type_t { CF_Type_all = 0, CF_Type_up = 1, CF_Type_down = 2 }

  Type IDs for use for Write Queue cmd.
- enum CF_Queue_t { CF_Queue_pend = 0, CF_Queue_active = 1, CF_Queue_history = 2, CF_Queue_all = 3 }

  Queue IDs for use for Write Queue cmd.
- enum CF_GetSet_ValueID_t {
  CF_GetSet_ValueID_ticks_per_second, CF_GetSet_ValueID_rx_crc_calc_bytes_per_wakeup, CF_GetSet_ValueID_ack_timer_s,
  CF_GetSet_ValueID_nak_timer_s,
  CF_GetSet_ValueID_inactivity_timer_s, CF_GetSet_ValueID_outgoing_file_chunk_size, CF_GetSet_ValueID_ack_limit,
  CF_GetSet_ValueID_nak_limit,
  CF_GetSet_ValueID_local_eid, CF_GetSet_ValueID_chan_max_outgoing_messages_per_wakeup, CF_GetSet_ValueID_MAX
  }

  Parameter IDs for use with Get/Set parameter messages.

12.7.1 Detailed Description

Specification for the CFS CFDP (CF) command and telemetry message payload content definitions.

12.8 apps/cf/config/default_cf_msgids.h File Reference

```
#include "cfe_core_api_base_msgids.h"
#include "cf_topicids.h"
```

Macros

- #define CF_CMD_MID CFE_PLATFORM_CMD_TOPICID_TO_MIDV(CFE_MISSION_CF_CMD_TOPICID)

  Message ID for commands.
- #define CF_SEND_HK_MID CFE_PLATFORM_CMD_TOPICID_TO_MIDV(CFE_MISSION_CF_SEND_HK_TOPICID)

  Message ID to request housekeeping telemetry.
- #define CF_WAKE_UP_MID CFE_PLATFORM_CMD_TOPICID_TO_MIDV(CFE_MISSION_CF_WAKE_UP_TOPICID)

  Message ID for waking up the processing cycle.
- #define CF_HK_TLM_MID CFE_PLATFORM_TLM_TOPICID_TO_MIDV(CFE_MISSION_CF_HK_TLM_TOPICID)

  Message ID for housekeeping telemetry.
- #define CF_EOT_TLM_MID CFE_PLATFORM_TLM_TOPICID_TO_MIDV(CFE_MISSION_CF_EOT_TLM_TOPICID)

  Message ID for end of transaction telemetry.
- #define CF_CH0_TX_MID CFE_PLATFORM_TLM_TOPICID_TO_MIDV(CFE_MISSION_CF_CH0_TX_TOPICID)
- #define CF_CH1_TX_MID CFE_PLATFORM_TLM_TOPICID_TO_MIDV(CFE_MISSION_CF_CH1_TX_TOPICID)
- #define CF_CH0_RX_MID CFE_PLATFORM_CMD_TOPICID_TO_MIDV(CFE_MISSION_CF_CH0_RX_TOPICID)
- #define CF_CH1_RX_MID CFE_PLATFORM_CMD_TOPICID_TO_MIDV(CFE_MISSION_CF_CH1_RX_TOPICID)

12.8.1 Detailed Description

CFS CFDP (CF) Application Message IDs

12.9 apps/cf/config/default_cf_msgstruct.h File Reference

```
#include "cf_msgdefs.h"
#include "cf_mission_cfg.h"
#include "cfe_msg_hdr.h"
```

Data Structures

- struct CF_HkPacket

  Housekeeping packet.
- struct CF_EotPacket

  End of transaction packet.
- struct CF_NoopCmd

  Noop command structure.
- struct CF_EnableEngineCmd

  EnableEngine command structure.
- struct CF_DisableEngineCmd

  DisableEngine command structure.
- struct CF_ResetCmd

Reset command structure.

- struct CF_FreezeCmd

  Freeze command structure.
- struct CF_ThawCmd

  Thaw command structure.
- struct CF_EnableDequeueCmd

  EnableDequeue command structure.
- struct CF_DisableDequeueCmd

  DisableDequeue command structure.
- struct CF_EnableDirPollingCmd

  EnableDirPolling command structure.
- struct CF_DisableDirPollingCmd

  DisableDirPolling command structure.
- struct CF_PurgeQueueCmd

  PurgeQueue command structure.
- struct CF_GetParamCmd

  Get parameter command structure.
- struct CF_SetParamCmd

  Set parameter command structure.
- struct CF_TxFileCmd

  Transmit file command structure.
- struct CF_WriteQueueCmd

  Write Queue command structure.
- struct CF_PlaybackDirCmd

  Playback directory command structure.
- struct CF_SuspendCmd

  Suspend command structure.
- struct CF_ResumeCmd

  Resume command structure.
- struct CF_CancelCmd

  Cancel command structure.
- struct CF_AbandonCmd

  Abandon command structure.
- struct CF_SendHkCmd

  Send Housekeeping Command.
- struct CF_WakeupCmd

  Wake Up Command.

Typedefs

- typedef struct CF_HkPacket CF_HkPacket_t

  Housekeeping packet.
- typedef struct CF_EotPacket CF_EotPacket_t

  End of transaction packet.
- typedef struct CF_NoopCmd CF_NoopCmd_t

  Noop command structure.
- typedef struct CF_EnableEngineCmd CF_EnableEngineCmd_t

  EnableEngine command structure.

- typedef struct CF_DisableEngineCmd CF_DisableEngineCmd_t

  DisableEngine command structure.
- typedef struct CF_ResetCmd CF_ResetCmd_t

  Reset command structure.
- typedef struct CF_FreezeCmd CF_FreezeCmd_t

  Freeze command structure.
- typedef struct CF_ThawCmd CF_ThawCmd_t

  Thaw command structure.
- typedef struct CF_EnableDequeueCmd CF_EnableDequeueCmd_t

  EnableDequeue command structure.
- typedef struct CF_DisableDequeueCmd CF_DisableDequeueCmd_t

  DisableDequeue command structure.
- typedef struct CF_EnableDirPollingCmd CF_EnableDirPollingCmd_t

  EnableDirPolling command structure.
- typedef struct CF_DisableDirPollingCmd CF_DisableDirPollingCmd_t

  DisableDirPolling command structure.
- typedef struct CF_PurgeQueueCmd CF_PurgeQueueCmd_t

  PurgeQueue command structure.
- typedef struct CF_GetParamCmd CF_GetParamCmd_t

  Get parameter command structure.
- typedef struct CF_SetParamCmd CF_SetParamCmd_t

  Set parameter command structure.
- typedef struct CF_TxFileCmd CF_TxFileCmd_t

  Transmit file command structure.
- typedef struct CF_WriteQueueCmd CF_WriteQueueCmd_t

  Write Queue command structure.
- typedef struct CF_PlaybackDirCmd CF_PlaybackDirCmd_t

  Playback directory command structure.
- typedef struct CF_SuspendCmd CF_SuspendCmd_t

  Suspend command structure.
- typedef struct CF_ResumeCmd CF_ResumeCmd_t

  Resume command structure.
- typedef struct CF_CancelCmd CF_CancelCmd_t

  Cancel command structure.
- typedef struct CF_AbandonCmd CF_AbandonCmd_t

  Abandon command structure.
- typedef struct CF_SendHkCmd CF_SendHkCmd_t

  Send Housekeeping Command.
- typedef struct CF_WakeupCmd CF_WakeupCmd_t

  Wake Up Command.

12.9.1 Detailed Description

Specification for the CFS CFDP (CF) command and telemetry message data types.

Note

Constants and enumerated types related to these message structures are defined in cf_msgdefs.h.

12.10 apps/cf/config/default_cf_platform_cfg.h File Reference

```
#include "cf_mission_cfg.h"
#include "cf_internal_cfg.h"
```

Macros

- #define CF_TOTAL_CHUNKS (CF_NAK_MAX_SEGMENTS ∗ 4)

  Total number of chunks (tx, rx, all channels)
- #define CF_MISSION_REV 0

  Mission specific version number.

12.10.1 Detailed Description

CFS CFDP (CF) Application Platform Configuration Header File
This is a compatibility header for the "platform_cfg.h" file that has traditionally provided both public and private config definitions for each CFS app.
These definitions are now provided in two separate files, one for the public/mission scope and one for internal scope.

Note

This file may be overridden/superceded by mission-provided defintions either by overriding this header or by generating definitions from a command/data dictionary tool.

12.10.2 Macro Definition Documentation

12.10.2.1 CF_MISSION_REV `#define CF_MISSION_REV 0`

Mission specific version number.

Description:

An application version number consists of four parts: major version number, minor version number, revision number and mission specific revision number. The mission specific revision number is defined here such that missions can manage as a configuration definition

Limits:

Must be defined as a numeric value that is greater than or equal to zero.

Definition at line 70 of file default_cf_platform_cfg.h.

12.10.2.2 CF_TOTAL_CHUNKS `#define CF_TOTAL_CHUNKS (CF_NAK_MAX_SEGMENTS ∗ 4)`

Total number of chunks (tx, rx, all channels)

Description:

Must be equal to the sum of all values input in CF_CHANNEL_NUM_RX_CHUNKS_PER_TRANSACTION and CF_CHANNEL_NUM_TX_CHUNKS_PER_TRANSACTION.

Limits:

Definition at line 54 of file default_cf_platform_cfg.h.

12.11 apps/cf/config/default_cf_tbl.h File Reference

```
#include "cf_mission_cfg.h"
#include "cf_tbldefs.h"
#include "cf_tblstruct.h"
```

12.11.1 Detailed Description

Specification for the CFS CFDP (CF) table structures

Note

Constants and enumerated types related to these table structures are defined in cf_tbldefs.h.

12.12 apps/cf/config/default_cf_tbldefs.h File Reference

```
#include "cf_mission_cfg.h"
#include "cf_extern_typedefs.h"
#include "cf_tblstruct.h"
```

Data Structures

- struct CF_PollDir

  Configuration entry for directory polling.
- struct CF_ChannelConfig

  Configuration entry for CFDP channel.

Typedefs

- typedef struct CF_PollDir CF_PollDir_t

  Configuration entry for directory polling.
- typedef struct CF_ChannelConfig CF_ChannelConfig_t

  Configuration entry for CFDP channel.

12.12.1 Detailed Description

Specification for the CFS CFDP (CF) table related constant definitions.

Note

These Macro definitions have been put in this file (instead of cf_tbl.h). DO NOT PUT ANY TYPEDEFS OR STR↩ UCTURE DEFINITIONS IN THIS FILE! ADD THEM TO cf_tbl.h IF NEEDED!

12.12.2 Typedef Documentation

12.12.2.1 CF_ChannelConfig_t `typedef struct CF_ChannelConfig CF_ChannelConfig_t`

Configuration entry for CFDP channel.

12.12.2.2 CF_PollDir_t `typedef struct CF_PollDir CF_PollDir_t`

Configuration entry for directory polling.

12.13 apps/cf/config/default_cf_tblstruct.h File Reference

```
#include "common_types.h"
#include "cf_mission_cfg.h"
#include "cf_tbldefs.h"
```

Data Structures

- struct CF_ConfigTable

  Top-level CFDP configuration structure.

Typedefs

- typedef struct CF_ConfigTable CF_ConfigTable_t

  Top-level CFDP configuration structure.

12.13.1 Detailed Description

Specification for the CFS CFDP (CF) table structures
Provides default definitions for HK table structures

Note

This file may be overridden/superceded by mission-provided defintions either by overriding this header or by generating definitions from a command/data dictionary tool.

12.13.2 Typedef Documentation

12.13.2.1 CF_ConfigTable_t `typedef struct CF_ConfigTable CF_ConfigTable_t`

Top-level CFDP configuration structure.

12.14 apps/cf/config/default_cf_topicids.h File Reference

Macros

- #define CFE_MISSION_CF_CMD_TOPICID 0xB3

  Message ID for commands.
- #define CFE_MISSION_CF_SEND_HK_TOPICID 0xB4

  Message ID to request housekeeping telemetry.
- #define CFE_MISSION_CF_WAKE_UP_TOPICID 0xB5

  Message ID for waking up the processing cycle.
- #define CFE_MISSION_CF_HK_TLM_TOPICID 0xB0

  Message ID for housekeeping telemetry.
- #define CFE_MISSION_CF_EOT_TLM_TOPICID 0xB3

  Message ID for end of transaction telemetry.
- #define CFE_MISSION_CF_CH0_TX_TOPICID 0xB4
- #define CFE_MISSION_CF_CH1_TX_TOPICID 0xB5
- #define CFE_MISSION_CF_CH0_RX_TOPICID 0xB6
- #define CFE_MISSION_CF_CH1_RX_TOPICID 0xB7

12.14.1 Detailed Description

CFDP (CF) Application Topic IDs

12.14.2 Macro Definition Documentation

12.14.2.1 CFE_MISSION_CF_CH0_RX_TOPICID `#define CFE_MISSION_CF_CH0_RX_TOPICID 0xB6`

Definition at line 50 of file default_cf_topicids.h.

12.14.2.2 CFE_MISSION_CF_CH0_TX_TOPICID `#define CFE_MISSION_CF_CH0_TX_TOPICID 0xB4`

Definition at line 48 of file default_cf_topicids.h.

12.14.2.3 CFE_MISSION_CF_CH1_RX_TOPICID `#define CFE_MISSION_CF_CH1_RX_TOPICID 0xB7`

Definition at line 51 of file default_cf_topicids.h.

12.14.2.4 CFE_MISSION_CF_CH1_TX_TOPICID `#define CFE_MISSION_CF_CH1_TX_TOPICID 0xB5`

Definition at line 49 of file default_cf_topicids.h.

12.14.2.5 CFE_MISSION_CF_CMD_TOPICID `#define CFE_MISSION_CF_CMD_TOPICID 0xB3`

Message ID for commands.
Definition at line 33 of file default_cf_topicids.h.

12.14.2.6 CFE_MISSION_CF_EOT_TLM_TOPICID `#define CFE_MISSION_CF_EOT_TLM_TOPICID 0xB3`

Message ID for end of transaction telemetry.
Definition at line 37 of file default_cf_topicids.h.

12.14.2.7 CFE_MISSION_CF_HK_TLM_TOPICID `#define CFE_MISSION_CF_HK_TLM_TOPICID 0xB0`

Message ID for housekeeping telemetry.
Definition at line 36 of file default_cf_topicids.h.

12.14.2.8 CFE_MISSION_CF_SEND_HK_TOPICID `#define CFE_MISSION_CF_SEND_HK_TOPICID 0xB4`

Message ID to request housekeeping telemetry.
Definition at line 34 of file default_cf_topicids.h.

12.14.2.9 CFE_MISSION_CF_WAKE_UP_TOPICID `#define CFE_MISSION_CF_WAKE_UP_TOPICID 0xB5`

Message ID for waking up the processing cycle.
Definition at line 35 of file default_cf_topicids.h.

12.15 apps/cf/docs/dox_src/cfs_cf.dox File Reference

12.16 apps/cf/fsw/inc/cf_events.h File Reference

Macros

- #define CF_INIT_INF_EID (20)

  CF Initialization Event ID.
- #define CF_INIT_TBL_CHECK_REL_ERR_EID (21)

  CF Check Table Release Address Failed Event ID.
- #define CF_INIT_TBL_CHECK_MAN_ERR_EID (22)

  CF Check Table Manage Failed Event ID.
- #define CF_INIT_TBL_CHECK_GA_ERR_EID (23)

  CF Check Table Get Address Failed Event ID.
- #define CF_INIT_TBL_REG_ERR_EID (24)

  CF Table Registration At Initialization Failed Event ID.
- #define CF_INIT_TBL_LOAD_ERR_EID (25)

  CF Table Load At Initialization Failed Event ID.
- #define CF_INIT_TBL_MANAGE_ERR_EID (26)

  CF Table Manage At Initialization Failed Event ID.
- #define CF_INIT_TBL_GETADDR_ERR_EID (27)

  CF Table Get Address At Initialization Failed Event ID.
- #define CF_MID_ERR_EID (28)

  CF Message ID Invalid Event ID.
- #define CF_INIT_MSG_RECV_ERR_EID (29)

  CF SB Receive Buffer Failed Event ID.
- #define CF_INIT_SEM_ERR_EID (30)

  CF Channel Semaphore Initialization Failed Event ID.
- #define CF_CR_PIPE_ERR_EID (31)

  CF Channel Create Pipe Failed Event ID.
- #define CF_INIT_SUB_ERR_EID (32)

  CF Channel Message Subscription Failed Event ID.
- #define CF_INIT_TPS_ERR_EID (33)

  CF Ticks Per Second Config Table Validation Failed Event ID.
- #define CF_INIT_CRC_ALIGN_ERR_EID (34)

  CF CRC Bytes Per Wakeup Config Table Validation Failed Event ID.
- #define CF_INIT_OUTGOING_SIZE_ERR_EID (35)

  CF Outgoing Chunk Size Config Table Validation Failed Event ID.
- #define CF_PDU_MD_RECVD_INF_EID (40)

  CF Metadata PDU Received Event ID.
- #define CF_PDU_SHORT_HEADER_ERR_EID (41)

  CF PDU Header Too Short Event ID.
- #define CF_PDU_MD_SHORT_ERR_EID (43)

  CF Metadata PDU Too Short Event ID.
- #define CF_PDU_INVALID_SRC_LEN_ERR_EID (44)

  CF Metadata PDU Source Filename Length Invalid Event ID.
- #define CF_PDU_INVALID_DST_LEN_ERR_EID (45)

  CF Metadata PDU Destination Filename Length Invalid Event ID.
- #define CF_PDU_FD_SHORT_ERR_EID (46)

CF File Data PDU Too Short Event ID.

- #define CF_PDU_EOF_SHORT_ERR_EID (47)

  CF End-Of-File PDU Too Short Event ID.
- #define CF_PDU_ACK_SHORT_ERR_EID (48)

  CF Acknowledgment PDU Too Short Event ID.
- #define CF_PDU_FIN_SHORT_ERR_EID (49)

  CF Finished PDU Too Short Event ID.
- #define CF_PDU_NAK_SHORT_ERR_EID (50)

  CF Negative Acknowledgment PDU Too Short Event ID.
- #define CF_PDU_FD_UNSUPPORTED_ERR_EID (54)

  CF File Data PDU Unsupported Option Event ID.
- #define CF_PDU_LARGE_FILE_ERR_EID (55)

  CF PDU Header Large File Flag Set Event ID.
- #define CF_PDU_TRUNCATION_ERR_EID (56)

  CF PDU Header Field Truncation.
- #define CF_RESET_FREED_XACT_DBG_EID (59)

  Attempt to reset a transaction that has already been freed.
- #define CF_CFDP_RX_DROPPED_ERR_EID (60)

  CF PDU Received Without Existing Transaction, Dropped Due To Max RX Reached Event ID.
- #define CF_CFDP_INVALID_DST_ERR_EID (61)

  CF PDU Received With Invalid Destination Entity ID Event ID.
- #define CF_CFDP_IDLE_MD_ERR_EID (62)

  CF Invalid Metadata PDU Received On Idle Transaction Event ID.
- #define CF_CFDP_FD_UNHANDLED_ERR_EID (63)

  CF Non-metadata File Directive PDU Received On Idle Transaction Event ID.
- #define CF_CFDP_MAX_CMD_TX_ERR_EID (64)

  CF Transmission Request Rejected Due To Max Commanded TX Reached Event ID.
- #define CF_CFDP_OPENDIR_ERR_EID (65)

  CF Playback/Polling Directory Open Failed Event ID.
- #define CF_CFDP_DIR_SLOT_ERR_EID (66)

  CF Playback Request Rejected Due to Max Playback Directories Reached Event ID.
- #define CF_CFDP_NO_MSG_ERR_EID (67)

  CF No Message Buffer Available Event ID.
- #define CF_CFDP_CLOSE_ERR_EID (68)

  CF Close File Failed Event ID.
- #define CF_CFDP_R_REQUEST_MD_INF_EID (70)

  CF Requesting RX Metadata Event ID.
- #define CF_CFDP_R_TEMP_FILE_INF_EID (71)

  CF Creating Temp File For RX Transaction Without Metadata PDU.
- #define CF_CFDP_R_NAK_LIMIT_ERR_EID (72)

  CF RX Transaction NAK Limit Reached Event ID.
- #define CF_CFDP_R_ACK_LIMIT_ERR_EID (73)

  CF RX Transaction ACK Limit Reached Event ID.
- #define CF_CFDP_R_CRC_ERR_EID (74)

  CF RX Transaction CRC Mismatch Event ID.
- #define CF_CFDP_R_SEEK_FD_ERR_EID (75)

  CF RX File Data PDU Seek Failed Event ID.

- #define CF_CFDP_R_SEEK_CRC_ERR_EID (76)

  CF RX Class 2 CRC Seek Failed Event ID.
- #define CF_CFDP_R_WRITE_ERR_EID (77)

  CF RX File Data PDU Write Failed Event ID.
- #define CF_CFDP_R_SIZE_MISMATCH_ERR_EID (78)

  CF RX End-Of-File PDU File Size Mismatch Event ID.
- #define CF_CFDP_R_PDU_EOF_ERR_EID (79)

  CF Invalid End-Of-File PDU Event ID.
- #define CF_CFDP_R_CREAT_ERR_EID (80)

  CF RX Transaction File Create Failed Event ID.
- #define CF_CFDP_R_PDU_FINACK_ERR_EID (81)

  CF Class 2 RX Transaction Invalid FIN-ACK PDU Event ID.
- #define CF_CFDP_R_EOF_MD_SIZE_ERR_EID (82)

  CF RX Class 2 Metadata PDU Size Mismatch Event ID.
- #define CF_CFDP_R_RENAME_ERR_EID (83)

  CF RX Class 2 Metadata PDU File Rename Failed Event ID.
- #define CF_CFDP_R_OPEN_ERR_EID (84)

  CF RX Class 2 Metadata PDU File Open Failed Event ID.
- #define CF_CFDP_R_PDU_MD_ERR_EID (85)

  CF Invalid Out-of-order Metadata PDU Received Event ID.
- #define CF_CFDP_R_READ_ERR_EID (86)

  CF Class 2 CRC Read From File Failed Event ID.
- #define CF_CFDP_R_DC_INV_ERR_EID (87)

  CF RX Invalid File Directive PDU Code Received Event ID.
- #define CF_CFDP_R_INACT_TIMER_ERR_EID (88)

  CF RX Inactivity Timer Expired Event ID.
- #define CF_CFDP_S_START_SEND_INF_EID (90)

  CF TX Initiated Event ID.
- #define CF_CFDP_S_SEEK_FD_ERR_EID (91)

  CF TX File Data PDU Seek Failed Event ID.
- #define CF_CFDP_S_READ_ERR_EID (92)

  CF TX File Data PDU Read Failed Event ID.
- #define CF_CFDP_S_SEND_FD_ERR_EID (93)

  CF TX File Data PDU Send Failed Event ID.
- #define CF_CFDP_S_ALREADY_OPEN_ERR_EID (94)

  CF TX Metadata PDU File Already Open Event ID.
- #define CF_CFDP_S_OPEN_ERR_EID (95)

  CF TX Metadata PDU File Open Failed Event ID.
- #define CF_CFDP_S_SEEK_END_ERR_EID (96)

  CF TX Metadata PDU File Seek End Failed Event ID.
- #define CF_CFDP_S_SEEK_BEG_ERR_EID (97)

  CF TX Metadata PDU File Seek Beginning Failed Event ID.
- #define CF_CFDP_S_SEND_MD_ERR_EID (98)

  CF TX Metadata PDU Send Failed Event ID.
- #define CF_CFDP_S_INVALID_SR_ERR_EID (100)

  CF TX Received NAK PDU Bad Segment Request Event ID.
- #define CF_CFDP_S_PDU_NAK_ERR_EID (101)

CF TX Received NAK PDU Invalid Event ID.

- #define CF_CFDP_S_PDU_EOF_ERR_EID (102)

  CF TX Received EOF ACK PDU Invalid Event ID.
- #define CF_CFDP_S_EARLY_FIN_ERR_EID (103)

  CF TX Received Early FIN PDU Event ID.
- #define CF_CFDP_S_DC_INV_ERR_EID (104)

  CF Invalid TX File Directive PDU Code Event ID.
- #define CF_CFDP_S_NON_FD_PDU_ERR_EID (105)

  CF Received TX Non-File Directive PDU Event ID.
- #define CF_CFDP_S_ACK_LIMIT_ERR_EID (106)

  CF TX EOF PDU Send Limit Reached Event ID.
- #define CF_CFDP_S_INACT_TIMER_ERR_EID (107)

  CF TX Inactivity Timer Expired Event ID.
- #define CF_NOOP_INF_EID (110)

  CF NOOP Command Received Event ID.
- #define CF_RESET_INF_EID (111)

  CF Reset Counters Command Received Event ID.
- #define CF_CMD_GETSET1_INF_EID (112)

  CF Set Parameter Command Received Event ID.
- #define CF_CMD_GETSET2_INF_EID (113)

  CF Get Parameter Command Received Event ID.
- #define CF_CMD_SUSPRES_INF_EID (114)

  CF Suspend/Resume Command Received Event ID.
- #define CF_CMD_WQ_INF_EID (115)

  CF Write Queue Command Received Event ID.
- #define CF_CMD_ENABLE_ENGINE_INF_EID (116)

  CF Enable Engine Command Received Event ID.
- #define CF_CMD_DISABLE_ENGINE_INF_EID (117)

  CF Disable Engine Command Received Event ID.
- #define CF_CMD_TX_FILE_INF_EID (118)

  CF Transfer File Command Received Event ID.
- #define CF_CMD_PLAYBACK_DIR_INF_EID (119)

  CF Playback Directory Command Received Event ID.
- #define CF_CMD_FREEZE_INF_EID (120)

  CF Freeze Command Received Event ID.
- #define CF_CMD_THAW_INF_EID (121)

  CF Thaw Command Received Event ID.
- #define CF_CMD_CANCEL_INF_EID (122)

  CF Cancel Command Received Event ID.
- #define CF_CMD_ABANDON_INF_EID (123)

  CF Abandon Command Received Event ID.
- #define CF_CMD_ENABLE_DEQUEUE_INF_EID (124)

  CF Enable Dequeue Command Received Event ID.
- #define CF_CMD_DISABLE_DEQUEUE_INF_EID (125)

  CF Disable Dequeue Command Received Event ID.
- #define CF_CMD_ENABLE_POLLDIR_INF_EID (126)

  CF Enable Polldir Command Received Event ID.

- #define CF_CMD_DISABLE_POLLDIR_INF_EID (127)

  CF Disable Polldir Command Received Event ID.
- #define CF_CMD_PURGE_QUEUE_INF_EID (128)

  CF Purge Queue Command Received Event ID.
- #define CF_CMD_RESET_INVALID_ERR_EID (129)

  CF Reset Counters Command Invalid Event ID.
- #define CF_CMD_CHAN_PARAM_ERR_EID (130)

  CF Command Channel Invalid Event ID.
- #define CF_CMD_TRANS_NOT_FOUND_ERR_EID (131)

  CF Command Transaction Invalid Event ID.
- #define CF_CMD_TSN_CHAN_INVALID_ERR_EID (132)

  CF Command All Transaction Channel Invalid Event ID.
- #define CF_CMD_SUSPRES_SAME_INF_EID (133)

  CF Suspend/Resume Command For Single Transaction State Unchanged Event ID.
- #define CF_CMD_SUSPRES_CHAN_ERR_EID (134)

  CF Suspend/Resume Command No Matching Transaction Event ID.
- #define CF_CMD_POLLDIR_INVALID_ERR_EID (135)

  CF Enable/Disable Polling Directory Command Invalid Polling Directory Index Event ID.
- #define CF_CMD_PURGE_ARG_ERR_EID (136)

  CF Purge Queue Command Invalid Argument Event ID.
- #define CF_CMD_WQ_CHAN_ERR_EID (137)

  CF Write Queue Command Invalid Channel Event ID.
- #define CF_CMD_WQ_ARGS_ERR_EID (138)

  CF Write Queue Command Invalid Queue Event ID.
- #define CF_CMD_WQ_OPEN_ERR_EID (139)

  CF Write Queue Command File Open Failed Event ID.
- #define CF_CMD_WQ_WRITEQ_RX_ERR_EID (140)

  CF Write Queue Command RX Active File Write Failed Event ID.
- #define CF_CMD_WQ_WRITEHIST_RX_ERR_EID (141)

  CF Write Queue Command RX History File Write Failed Event ID.
- #define CF_CMD_WQ_WRITEQ_TX_ERR_EID (142)

  CF Write Queue Command TX Active File Write Failed Event ID.
- #define CF_CMD_WQ_WRITEQ_PEND_ERR_EID (143)

  CF Write Queue Command TX Pending File Write Failed Event ID.
- #define CF_CMD_WQ_WRITEHIST_TX_ERR_EID (144)

  CF Write Queue Command TX History File Write Failed Event ID.
- #define CF_CMD_GETSET_VALIDATE_ERR_EID (145)

  CF Set Parameter Command Parameter Validation Failed Event ID.
- #define CF_CMD_GETSET_PARAM_ERR_EID (146)

  CF Set/Get Parameter Command Invalid Parameter ID Event ID.
- #define CF_CMD_GETSET_CHAN_ERR_EID (147)

  CF Set/Get Parameter Command Invalid Channel Event ID.
- #define CF_CMD_ENABLE_ENGINE_ERR_EID (148)

  CF Enable Engine Command Failed Event ID.
- #define CF_CMD_ENG_ALREADY_ENA_INF_EID (149)

  CF Enable Engine Command Engine Already Enabled Event ID.
- #define CF_CMD_ENG_ALREADY_DIS_INF_EID (150)

CF Disable Engine Command Engine Already Disabled Event ID.

- #define CF_CMD_LEN_ERR_EID (151)

  CF Command Length Verification Failed Event ID.
- #define CF_CC_ERR_EID (152)

  CF Command Code Invalid Event ID.
- #define CF_CMD_WHIST_WRITE_ERR_EID (153)

  CF Write Entry To File Failed Event ID.
- #define CF_CMD_BAD_PARAM_ERR_EID (154)

  CF Playback Dir Or TX File Command Bad Parameter Event ID.
- #define CF_CMD_CANCEL_CHAN_ERR_EID (155)

  CF Cancel Command No Matching Transaction Event ID.
- #define CF_CMD_ABANDON_CHAN_ERR_EID (156)

  CF Abandon Command No Matching Transaction Event ID.
- #define CF_CMD_TX_FILE_ERR_EID (157)

  CF Transfer File Command Failed Event ID.
- #define CF_CMD_PLAYBACK_DIR_ERR_EID (158)

  CF Playback Directory Command Failed Event ID.
- #define CF_CMD_FREEZE_ERR_EID (159)

  CF Freeze Command Failed Event ID.
- #define CF_CMD_THAW_ERR_EID (160)

  CF Thaw Command Failed Event ID.
- #define CF_CMD_ENABLE_DEQUEUE_ERR_EID (161)

  CF Enable Dequeue Command Failed Event ID.
- #define CF_CMD_DISABLE_DEQUEUE_ERR_EID (162)

  CF Disable Dequeue Command Failed Event ID.
- #define CF_CMD_ENABLE_POLLDIR_ERR_EID (163)

  CF Enable Polldir Command Failed Event ID.
- #define CF_CMD_DISABLE_POLLDIR_ERR_EID (164)

  CF Disable Polldir Command Failed Event ID.
- #define CF_CMD_PURGE_QUEUE_ERR_EID (165)

  CF Purge Queue Command Failed Event ID.

12.16.1 Detailed Description

The CF Application event id definition header file

12.17 apps/cf/fsw/inc/cf_perfids.h File Reference

Macros

- #define CF_PERF_ID_APPMAIN (11)

  Main application performance ID.
- #define CF_PERF_ID_FSEEK (12)

  File seek performance ID.
- #define CF_PERF_ID_FOPEN (13)

  File open performance ID.
- #define CF_PERF_ID_FCLOSE (14)

  File close performance ID.
- #define CF_PERF_ID_FREAD (15)

File read performance ID.

- #define CF_PERF_ID_FWRITE (16)

  File write performance ID.
- #define CF_PERF_ID_CYCLE_ENG (17)

  Cycle engine performance ID.
- #define CF_PERF_ID_DIRREAD (18)

  Directory read performance ID.
- #define CF_PERF_ID_CREAT (19)

  Create performance ID.
- #define CF_PERF_ID_RENAME (20)

  Rename performance ID.
- #define CF_PERF_ID_PDURCVD(x) (30 + x)

  PDU Received performance ID.
- #define CF_PERF_ID_PDUSENT(x) (40 + x)

  PDU Sent performance ID.

12.17.1 Detailed Description

Define CF Performance IDs

12.18 apps/cf/fsw/src/cf_app.c File Reference

```
#include "cfe.h"
#include "cf_verify.h"
#include "cf_app.h"
#include "cf_events.h"
#include "cf_perfids.h"
#include "cf_cfdp.h"
#include "cf_version.h"
#include "cf_dispatch.h"
#include "cf_tbl.h"
#include <string.h>
```

Functions

- void CF_CheckTables (void)

  Checks to see if a table update is pending, and perform it.
- CFE_Status_t CF_ValidateConfigTable (void *tbl_ptr)

  Validation function for config table.
- CFE_Status_t CF_TableInit (void)

  Load the table on application start.
- CFE_Status_t CF_Init (void)

  CF app init function.
- void CF_AppMain (void)

  CF app entry point.

Variables

- CF_AppData_t CF_AppData

  Singleton instance of the application global data.

12.18.1 Detailed Description

The CF Application main application source file
This file contains the functions that initialize the application and link all logic and functionality to the CFS.

12.18.2 Function Documentation

12.18.2.1 CF_AppMain() `void CF_AppMain ( void )`

CF app entry point.

Description

Main entry point of CF application. Calls the init function and manages the app run loop.

Assumptions, External Events, and Notes:

This must only be called once.

Definition at line 258 of file cf_app.c.
References CF_AppData, CF_AppPipe(), CF_Init(), CF_INIT_MSG_RECV_ERR_EID, CF_PERF_ID_APPMAIN, CF_RCVMSG_TIMEOUT, CFE_ES_ExitApp(), CFE_ES_PerfLogEntry, CFE_ES_PerfLogExit, CFE_ES_RunLoop(), CFE_ES_RunStatus_APP_ERROR, CFE_EVS_EventType_ERROR, CFE_EVS_SendEvent(), CFE_SB_NO_MESSAGE, CFE_SB_ReceiveBuffer(), CFE_SB_TIME_OUT, CFE_SUCCESS, CF_AppData_t::cmd_pipe, and CF_AppData_t::run_status.
Here is the call graph for this function:

12.18.2.2 CF_CheckTables() `void CF_CheckTables ( void )`

Checks to see if a table update is pending, and perform it.

Description

Updates the table if the engine is disabled.

Assumptions, External Events, and Notes:

None

Definition at line 48 of file cf_app.c.
References CF_AppData, CF_INIT_TBL_CHECK_GA_ERR_EID, CF_INIT_TBL_CHECK_MAN_ERR_EID, CF_INIT_TBL_CHECK_REL_ERR_EID, CFE_ES_RunStatus_APP_ERROR, CFE_EVS_EventType_ERROR, CFE_EVS_SendEvent(), CFE_SUCCESS, CFE_TBL_GetAddress(), CFE_TBL_Manage(), CFE_TBL_ReleaseAddress(), CF_AppData_t::config_handle, CF_AppData_t::config_table, CF_Engine::enabled, CF_AppData_t::engine, and CF_AppData_t::run_status.
Referenced by CF_SendHkCmd().
Here is the call graph for this function:

12.18.2.3 CF_Init() `CFE_Status_t CF_Init ( void )`

CF app init function.

Description

Initializes all aspects of the CF application. Messages, pipes, events, table, and the CFDP engine.

Assumptions, External Events, and Notes:

This must only be called once.

Return values

CFE_SUCCESS	Successful execution. Operation was performed successfully
Returns	anything else on error.

Definition at line 189 of file cf_app.c.
References CF_AppData, CF_CFDP_InitEngine(), CF_CMD_MID, CF_HK_TLM_MID, CF_INIT_INF_EID, CF_MAJOR_VERSION, CF_MINOR_VERSION, CF_MISSION_REV, CF_PIPE_DEPTH, CF_PIPE_NAME, CF_REVISION, CF_SEND_HK_MID, CF_TableInit(), CF_WAKE_UP_MID, CFE_ES_RunStatus_APP_RUN, CFE_ES_WriteToSysLog(), CFE_EVS_EventFilter_BINARY, CFE_EVS_EventType_INFORMATION, CFE_EVS_Register(), CFE_EVS_SendEvent(), CFE_MSG_Init(), CFE_SB_CreatePipe(), CFE_SB_Subscribe(), CFE_SB_ValueToMsgId(), CFE_SUCCESS, CF_AppData_t::cmd_pipe, CF_AppData_t::hk, CF_AppData_t::run_status, and CF_HkPacket::TelemetryHeader.
Referenced by CF_AppMain().
Here is the call graph for this function:

12.18.2.4 CF_TableInit()

```
CFE_Status_t CF_TableInit (
    void )
```

Load the table on application start.

Assumptions, External Events, and Notes:

None

Return values

CFE_SUCCESS	Successful execution. Operation was performed successfully
Returns	anything else on error.

Definition at line 134 of file cf_app.c.
References CF_AppData, CF_CONFIG_TABLE_FILENAME, CF_CONFIG_TABLE_NAME, CF_INIT_TBL_GETADDR_ERR_EID, CF_INIT_TBL_LOAD_ERR_EID, CF_INIT_TBL_MANAGE_ERR_EID, CF_INIT_TBL_REG_ERR_EID, CF_ValidateConfigTable(), CFE_EVS_EventType_ERROR, CFE_EVS_SendEvent(), CFE_SUCCESS, CFE_TBL_GetAddress(), CFE_TBL_INFO_UPDATED, CFE_TBL_Load(), CFE_TBL_Manage(), CFE_TBL_OPT_LOAD_DUMP, CFE_TBL_OPT_SNGL_BUFFER, CFE_TBL_Register(), CFE_TBL_SRC_FILE, CF_AppData_t::config_handle, and CF_AppData_t::config_table.
Referenced by CF_Init().
Here is the call graph for this function:

12.18.2.5 CF_ValidateConfigTable()

```
CFE_Status_t CF_ValidateConfigTable (
    void * tbl_ptr )
```

Validation function for config table.

Description

Checks that the config table being loaded has correct data.

Assumptions, External Events, and Notes:

None

Return values

CFE_SUCCESS	Successful execution. Operation was performed successfully
CFE_STATUS_VALIDATION_FAILURE	if the config table fails one of the validation checks

Definition at line 101 of file cf_app.c.
References CF_INIT_CRC_ALIGN_ERR_EID, CF_INIT_OUTGOING_SIZE_ERR_EID, CF_INIT_TPS_ERR_EID, CFE_EVS_EventType_ERROR, CFE_EVS_SendEvent(), CFE_STATUS_VALIDATION_FAILURE, CFE_SUCCESS, CF_ConfigTable::outgoing_file_chunk_size, CF_ConfigTable::rx_crc_calc_bytes_per_wakeup, and CF_ConfigTable::ticks_per_second.
Referenced by CF_TableInit().
Here is the call graph for this function:

12.18.3 Variable Documentation

12.18.3.1 CF_AppData `CF_AppData_t CF_AppData`

Singleton instance of the application global data.
Definition at line 40 of file cf_app.c.
Referenced by CF_AbandonCmd(), CF_AppMain(), CF_AppPipe(), CF_CancelCmd(), CF_CFDP_AppendTlv(), CF_CFDP_ArmAckTimer(), CF_CFDP_ArmInactTimer(), CF_CFDP_CycleEngine(), CF_CFDP_CycleTx(), CF_CFDP_DisableEngine(), CF_CFDP_HandleNotKeepFile(), CF_CFDP_InitEngine(), CF_CFDP_IsPollingDir(), CF_CFDP_MsgOutGet(), CF_CFDP_PlaybackDir(), CF_CFDP_PlaybackDir_Initiate(), CF_CFDP_ProcessPlaybackDirectories(), CF_CFDP_ProcessPlaybackDirectory(), CF_CFDP_ProcessPollingDirectories(), CF_CFDP_R2_CalcCrcChunk(), CF_CFDP_R2_Complete(), CF_CFDP_R2_Recv_fin_ack(), CF_CFDP_R2_RecvMd(), CF_CFDP_R_CheckCrc(), CF_CFDP_R_DispatchRecv(), CF_CFDP_R_Init(), CF_CFDP_R_ProcessFd(), CF_CFDP_R_SendInactivityEvent(), CF_CFDP_R_SubstateRecvEof(), CF_CFDP_R_SubstateSendNak(), CF_CFDP_R_Tick(), CF_CFDP_ReceiveMessage(), CF_CFDP_RecvDrop(), CF_CFDP_RecvFd(), CF_CFDP_RecvIdle(), CF_CFDP_RecvMd(), CF_CFDP_RecvPh(), CF_CFDP_ResetTransaction(), CF_CFDP_S2_Nak(), CF_CFDP_S2_WaitForEofAck(), CF_CFDP_S_DispatchRecv(), CF_CFDP_S_SendFileData(), CF_CFDP_S_SubstateSendMetadata(), CF_CFDP_S_Tick(), CF_CFDP_Send(), CF_CFDP_SendAck(), CF_CFDP_SendEof(), CF_CFDP_SendFin(), CF_CFDP_SendMd(), CF_CFDP_TxFile(), CF_CFDP_TxFile_Initiate(), CF_CheckTables(), CF_CList_InsertAfter_Ex(), CF_CList_InsertBack_Ex(), CF_CList_Remove_Ex(), CF_CmdValidateMaxOutgoing(), CF_DequeueTransaction(), CF_DisableDequeueCmd(), CF_DisableDirPollingCmd(), CF_DisableEngineCmd(), CF_DoEnableDisableDequeue(), CF_DoEnableDisablePolldir(), CF_DoFreezeThaw(), CF_DoPurgeQueue(), CF_DoSuspRes(), CF_EnableDequeueCmd(), CF_EnableDirPollingCmd(), CF_EnableEngineCmd(), CF_FindTransactionBySequenceNumberAllChannels(), CF_FreeTransaction(), CF_FreezeCmd(), CF_GetSetParamCmd(), CF_Init(), CF_InsertSortPrio(), CF_MoveTransaction(), CF_NoopCmd(), CF_PlaybackDirCmd(), CF_ProcessGroundCommand(), CF_PurgeQueueCmd(), CF_ResetCmd(), CF_SendHkCmd(), CF_TableInit(), CF_ThawCmd(), CF_Timer_Sec2Ticks(), CF_TraverseAllTransactions_All_Channels(), CF_TsnChanAction(), CF_TxFileCmd(), and CF_WriteQueueCmd().

12.19 apps/cf/fsw/src/cf_app.h File Reference

```
#include "cfe.h"
#include "cf_msg.h"
#include "cf_tbl.h"
#include "cf_msgids.h"
#include "cf_tbldefs.h"
```

```
#include "cf_mission_cfg.h"
#include "cf_platform_cfg.h"
#include "cf_cfdp.h"
#include "cf_clist.h"
```

Data Structures

- struct CF_AppData_t

  The CF application global state structure.

Macros

- #define CF_PIPE_NAME ("CF_CMD_PIPE")

  The name of the application command pipe for CF.
- #define CF_CHANNEL_PIPE_PREFIX ("CF_CHAN_")

  A common prefix for all data pipes for CF.

CF Error Codes

- #define CF_ERROR -1

  Generic CF error return code.
- #define CF_PDU_METADATA_ERROR -2

  Invalid metadata PDU.
- #define CF_SHORT_PDU_ERROR -3

  PDU too short.
- #define CF_REC_PDU_FSIZE_MISMATCH_ERROR -4

  Receive PDU: EOF file size mismatch.
- #define CF_REC_PDU_BAD_EOF_ERROR -5

  Receive PDU: Invalid EOF packet.
- #define CF_SEND_PDU_NO_BUF_AVAIL_ERROR -6

  Send PDU: No send buffer available, throttling limit reached.
- #define CF_SEND_PDU_ERROR -7

  Send PDU: Send failed.

Functions

- void CF_CheckTables (void)

  Checks to see if a table update is pending, and perform it.
- CFE_Status_t CF_ValidateConfigTable (void *tbl_ptr)

  Validation function for config table.
- CFE_Status_t CF_TableInit (void)

  Load the table on application start.
- CFE_Status_t CF_Init (void)

  CF app init function.
- void CF_AppMain (void)

  CF app entry point.

Variables

- CF_AppData_t CF_AppData

  Singleton instance of the application global data.

12.19.1 Detailed Description

The CF Application main application header file

12.19.2 Macro Definition Documentation

12.19.2.1 CF_CHANNEL_PIPE_PREFIX `#define CF_CHANNEL_PIPE_PREFIX ("CF_CHAN_")`

A common prefix for all data pipes for CF.
Definition at line 67 of file cf_app.h.

12.19.2.2 CF_ERROR `#define CF_ERROR -1`

Generic CF error return code.
Definition at line 50 of file cf_app.h.

12.19.2.3 CF_PDU_METADATA_ERROR `#define CF_PDU_METADATA_ERROR -2`

Invalid metadata PDU.
Definition at line 51 of file cf_app.h.

12.19.2.4 CF_PIPE_NAME `#define CF_PIPE_NAME ("CF_CMD_PIPE")`

The name of the application command pipe for CF.
Definition at line 62 of file cf_app.h.

12.19.2.5 CF_REC_PDU_BAD_EOF_ERROR `#define CF_REC_PDU_BAD_EOF_ERROR -5`

Receive PDU: Invalid EOF packet.
Definition at line 54 of file cf_app.h.

12.19.2.6 CF_REC_PDU_FSIZE_MISMATCH_ERROR `#define CF_REC_PDU_FSIZE_MISMATCH_ERROR -4`

Receive PDU: EOF file size mismatch.
Definition at line 53 of file cf_app.h.

12.19.2.7 CF_SEND_PDU_ERROR `#define CF_SEND_PDU_ERROR -7`

Send PDU: Send failed.
Definition at line 56 of file cf_app.h.

12.19.2.8 CF_SEND_PDU_NO_BUF_AVAIL_ERROR `#define CF_SEND_PDU_NO_BUF_AVAIL_ERROR -6`

Send PDU: No send buffer available, throttling limit reached.
Definition at line 55 of file cf_app.h.

12.19.2.9 CF_SHORT_PDU_ERROR `#define CF_SHORT_PDU_ERROR -3`

PDU too short.
Definition at line 52 of file cf_app.h.

12.19.3 Function Documentation

12.19.3.1 CF_AppMain() `void CF_AppMain ( void )`

CF app entry point.

Description

Main entry point of CF application. Calls the init function and manages the app run loop.

Assumptions, External Events, and Notes:

This must only be called once.

Definition at line 258 of file cf_app.c.
References CF_AppData, CF_AppPipe(), CF_Init(), CF_INIT_MSG_RECV_ERR_EID, CF_PERF_ID_APPMAIN, CF_RCVMSG_TIMEOUT, CFE_ES_ExitApp(), CFE_ES_PerfLogEntry, CFE_ES_PerfLogExit, CFE_ES_RunLoop(), CFE_ES_RunStatus_APP_ERROR, CFE_EVS_EventType_ERROR, CFE_EVS_SendEvent(), CFE_SB_NO_MESSAGE, CFE_SB_ReceiveBuffer(), CFE_SB_TIME_OUT, CFE_SUCCESS, CF_AppData_t::cmd_pipe, and CF_AppData_t::run_status.
Here is the call graph for this function:

12.19.3.2 CF_CheckTables() `void CF_CheckTables ( void )`

Checks to see if a table update is pending, and perform it.

Description

Updates the table if the engine is disabled.

Assumptions, External Events, and Notes:

None

Definition at line 48 of file cf_app.c.
References CF_AppData, CF_INIT_TBL_CHECK_GA_ERR_EID, CF_INIT_TBL_CHECK_MAN_ERR_EID, CF_INIT_TBL_CHECK_REL_ERR_EID, CFE_ES_RunStatus_APP_ERROR, CFE_EVS_EventType_ERROR, CFE_EVS_SendEvent(), CFE_SUCCESS, CFE_TBL_GetAddress(), CFE_TBL_Manage(), CFE_TBL_ReleaseAddress(), CF_AppData_t::config_handle, CF_AppData_t::config_table, CF_Engine::enabled, CF_AppData_t::engine, and CF_AppData_t::run_status.
Referenced by CF_SendHkCmd().
Here is the call graph for this function:

12.19.3.3 CF_Init() `CFE_Status_t CF_Init ( void )`

CF app init function.

Description

Initializes all aspects of the CF application. Messages, pipes, events, table, and the CFDP engine.

Assumptions, External Events, and Notes:

This must only be called once.

Return values

CFE_SUCCESS	Successful execution. Operation was performed successfully
Returns	anything else on error.

Definition at line 189 of file cf_app.c.
References CF_AppData, CF_CFDP_InitEngine(), CF_CMD_MID, CF_HK_TLM_MID, CF_INIT_INF_EID, CF_MAJOR_VERSION, CF_MINOR_VERSION, CF_MISSION_REV, CF_PIPE_DEPTH, CF_PIPE_NAME, CF_REVISION, CF_SEND_HK_MID, CF_TableInit(), CF_WAKE_UP_MID, CFE_ES_RunStatus_APP_RUN, CFE_ES_WriteToSysLog(), CFE_EVS_EventFilter_BINARY, CFE_EVS_EventType_INFORMATION, CFE_EVS_Register(), CFE_EVS_SendEvent(), CFE_MSG_Init(), CFE_SB_CreatePipe(), CFE_SB_Subscribe(), CFE_SB_ValueToMsgId(), CFE_SUCCESS, CF_AppData_t::cmd_pipe, CF_AppData_t::hk, CF_AppData_t::run_status, and CF_HkPacket::TelemetryHeader.
Referenced by CF_AppMain().
Here is the call graph for this function:

12.19.3.4 CF_TableInit()

```
CFE_Status_t CF_TableInit (
    void )
```

Load the table on application start.

Assumptions, External Events, and Notes:

None

Return values

CFE_SUCCESS	Successful execution. Operation was performed successfully
Returns	anything else on error.

Definition at line 134 of file cf_app.c.
References CF_AppData, CF_CONFIG_TABLE_FILENAME, CF_CONFIG_TABLE_NAME, CF_INIT_TBL_GETADDR_ERR_EID, CF_INIT_TBL_LOAD_ERR_EID, CF_INIT_TBL_MANAGE_ERR_EID, CF_INIT_TBL_REG_ERR_EID, CF_ValidateConfigTable(), CFE_EVS_EventType_ERROR, CFE_EVS_SendEvent(), CFE_SUCCESS, CFE_TBL_GetAddress(), CFE_TBL_INFO_UPDATED, CFE_TBL_Load(), CFE_TBL_Manage(), CFE_TBL_OPT_LOAD_DUMP, CFE_TBL_OPT_SNGL_BUFFER, CFE_TBL_Register(), CFE_TBL_SRC_FILE, CF_AppData_t::config_handle, and CF_AppData_t::config_table.
Referenced by CF_Init().
Here is the call graph for this function:

12.19.3.5 CF_ValidateConfigTable()

```
CFE_Status_t CF_ValidateConfigTable (
    void * tbl_ptr )
```

Validation function for config table.

Description

Checks that the config table being loaded has correct data.

Assumptions, External Events, and Notes:

None

Return values

CFE_SUCCESS	Successful execution. Operation was performed successfully
CFE_STATUS_VALIDATION_FAILURE	if the config table fails one of the validation checks

Definition at line 101 of file cf_app.c.
References CF_INIT_CRC_ALIGN_ERR_EID, CF_INIT_OUTGOING_SIZE_ERR_EID, CF_INIT_TPS_ERR_EID, CFE_EVS_EventType_ERROR, CFE_EVS_SendEvent(), CFE_STATUS_VALIDATION_FAILURE, CFE_SUCCESS, CF_ConfigTable::outgoing_file_chunk_size, CF_ConfigTable::rx_crc_calc_bytes_per_wakeup, and CF_ConfigTable::ticks_per_second.
Referenced by CF_TableInit().
Here is the call graph for this function:

12.19.4 Variable Documentation

12.19.4.1 CF_AppData `CF_AppData_t CF_AppData`

Singleton instance of the application global data.
Definition at line 40 of file cf_app.c.
Referenced by CF_AbandonCmd(), CF_AppMain(), CF_AppPipe(), CF_CancelCmd(), CF_CFDP_AppendTlv(), CF_CFDP_ArmAckTimer(), CF_CFDP_ArmInactTimer(), CF_CFDP_CycleEngine(), CF_CFDP_CycleTx(), CF_CFDP_DisableEngine(), CF_CFDP_HandleNotKeepFile(), CF_CFDP_InitEngine(), CF_CFDP_IsPollingDir(), CF_CFDP_MsgOutGet(), CF_CFDP_PlaybackDir(), CF_CFDP_PlaybackDir_Initiate(), CF_CFDP_ProcessPlaybackDirectories(), CF_CFDP_ProcessPlaybackDirectory(), CF_CFDP_ProcessPollingDirectories(), CF_CFDP_R2_CalcCrcChunk(), CF_CFDP_R2_Complete(), CF_CFDP_R2_Recv_fin_ack(), CF_CFDP_R2_RecvMd(), CF_CFDP_R_CheckCrc(), CF_CFDP_R_DispatchRecv(), CF_CFDP_R_Init(), CF_CFDP_R_ProcessFd(), CF_CFDP_R_SendInactivityEvent(), CF_CFDP_R_SubstateRecvEof(), CF_CFDP_R_SubstateSendNak(), CF_CFDP_R_Tick(), CF_CFDP_ReceiveMessage(), CF_CFDP_RecvDrop(), CF_CFDP_RecvFd(), CF_CFDP_RecvIdle(), CF_CFDP_RecvMd(), CF_CFDP_RecvPh(), CF_CFDP_ResetTransaction(), CF_CFDP_S2_Nak(), CF_CFDP_S2_WaitForEofAck(), CF_CFDP_S_DispatchRecv(), CF_CFDP_S_SendFileData(), CF_CFDP_S_SubstateSendMetadata(), CF_CFDP_S_Tick(), CF_CFDP_Send(), CF_CFDP_SendAck(), CF_CFDP_SendEof(), CF_CFDP_SendFin(), CF_CFDP_SendMd(), CF_CFDP_TxFile(), CF_CFDP_TxFile_Initiate(), CF_CheckTables(), CF_CList_InsertAfter_Ex(), CF_CList_InsertBack_Ex(), CF_CList_Remove_Ex(), CF_CmdValidateMaxOutgoing(), CF_DequeueTransaction(), CF_DisableDequeueCmd(), CF_DisableDirPollingCmd(), CF_DisableEngineCmd(), CF_DoEnableDisableDequeue(), CF_DoEnableDisablePolldir(), CF_DoFreezeThaw(), CF_DoPurgeQueue(), CF_DoSuspRes(), CF_EnableDequeueCmd(), CF_EnableDirPollingCmd(), CF_EnableEngineCmd(), CF_FindTransactionBySequenceNumberAllChannels(), CF_FreeTransaction(), CF_FreezeCmd(), CF_GetSetParamCmd(), CF_Init(), CF_InsertSortPrio(), CF_MoveTransaction(), CF_NoopCmd(), CF_PlaybackDirCmd(), CF_ProcessGroundCommand(), CF_PurgeQueueCmd(), CF_ResetCmd(), CF_SendHkCmd(), CF_TableInit(), CF_ThawCmd(), CF_Timer_Sec2Ticks(), CF_TraverseAllTransactions_All_Channels(), CF_TsnChanAction(), CF_TxFileCmd(), and CF_WriteQueueCmd().

12.20 apps/cf/fsw/src/cf_assert.h File Reference

```
#include "cfe.h"
```

Macros

CF assert macro

CF_Assert statements within the code are primarily informational for developers, as the conditions within them should always be true. Barring any unforeseen bugs in the code, they should never get triggered. However, if the code is modified, these conditions could happen, so it is still worthwhile to keep these statements in the source code, so they can be enabled if necessary.

The debug build assert translates CF_Assert to the system assert. Note that asserts may still get disabled if building with NDEBUG flag set, even if CF_DEBUG_BUILD flag is enabled.

It should be impossible to get any conditions which are asserted, so it should be safe to turn these off via the normal build assert. This is the configuration that the code should be normally tested and verified in.

- #define CF_Assert(x) /∗ no-op ∗/

  Normal build assert.

12.20.1 Detailed Description

The CF Application CF_Assert macro

12.20.2 Macro Definition Documentation

12.20.2.1 CF_Assert `#define CF_Assert( x ) /∗ no-op ∗/`

Normal build assert.
Definition at line 63 of file cf_assert.h.

12.21 apps/cf/fsw/src/cf_cfdp.c File Reference

```
#include "cfe.h"
#include "cf_verify.h"
#include "cf_app.h"
#include "cf_events.h"
#include "cf_perfids.h"
#include "cf_cfdp.h"
#include "cf_utils.h"
#include "cf_cfdp_r.h"
#include "cf_cfdp_s.h"
#include "cf_cfdp_dispatch.h"
#include "cf_cfdp_sbintf.h"
#include <string.h>
#include "cf_assert.h"
```

Functions

- void CF_CFDP_EncodeStart (CF_EncoderState_t ∗penc, void ∗msgbuf, CF_Logical_PduBuffer_t ∗ph, size_t encap_hdr_size, size_t total_size)

  Initiate the process of encoding a new PDU to send.
- void CF_CFDP_DecodeStart (CF_DecoderState_t ∗pdec, const void ∗msgbuf, CF_Logical_PduBuffer_t ∗ph, size_t encap_hdr_size, size_t total_size)

  Initiate the process of decoding a received PDU.

- void CF_CFDP_ArmAckTimer (CF_Transaction_t *txn)

  Arm the ACK timer.
- static CF_CFDP_Class_t CF_CFDP_GetClass (const CF_Transaction_t *txn)
- static bool CF_CFDP_IsSender (CF_Transaction_t *txn)
- static void CF_CFDP_ArmInactTimer (CF_Transaction_t *txn)
- void CF_CFDP_DispatchRecv (CF_Transaction_t *txn, CF_Logical_PduBuffer_t *ph)

  Dispatch received packet to its handler.
- static void CF_CFDP_DispatchTx (CF_Transaction_t *txn)
- static CF_ChunkWrapper_t * CF_CFDP_FindUnusedChunks (CF_Channel_t *chan, CF_Direction_t dir)
- static void CF_CFDP_SetPduLength (CF_Logical_PduBuffer_t *ph)
- CF_Logical_PduBuffer_t * CF_CFDP_ConstructPduHeader (const CF_Transaction_t *txn, CF_CFDP_FileDirective_t directive_code, CF_EntityId_t src_eid, CF_EntityId_t dst_eid, bool towards_sender, CF_TransactionSeq_t tsn, bool silent)

  Build the PDU header in the output buffer to prepare to send a packet.
- CFE_Status_t CF_CFDP_SendMd (CF_Transaction_t *txn)

  Build a metadata PDU for transmit.
- CFE_Status_t CF_CFDP_SendFd (CF_Transaction_t *txn, CF_Logical_PduBuffer_t *ph)

  Send a previously-assembled filedata PDU for transmit.
- void CF_CFDP_AppendTlv (CF_Logical_TlvList_t *ptlv_list, CF_CFDP_TlvType_t tlv_type)

  Appends a single TLV value to the logical PDU data.
- CFE_Status_t CF_CFDP_SendEof (CF_Transaction_t *txn)

  Build an EOF PDU for transmit.
- CFE_Status_t CF_CFDP_SendAck (CF_Transaction_t *txn, CF_CFDP_AckTxnStatus_t ts, CF_CFDP_FileDirective_t dir_code, CF_CFDP_ConditionCode_t cc, CF_EntityId_t peer_eid, CF_TransactionSeq_t tsn)

  Build an ACK PDU for transmit.
- CFE_Status_t CF_CFDP_SendFin (CF_Transaction_t *txn, CF_CFDP_FinDeliveryCode_t dc, CF_CFDP_FinFileStatus_t fs, CF_CFDP_ConditionCode_t cc)

  Build a FIN PDU for transmit.
- CFE_Status_t CF_CFDP_SendNak (CF_Transaction_t *txn, CF_Logical_PduBuffer_t *ph)

  Send a previously-assembled NAK PDU for transmit.
- CFE_Status_t CF_CFDP_RecvPh (uint8 chan_num, CF_Logical_PduBuffer_t *ph)

  Unpack a basic PDU header from a received message.
- CFE_Status_t CF_CFDP_RecvMd (CF_Transaction_t *txn, CF_Logical_PduBuffer_t *ph)

  Unpack a metadata PDU from a received message.
- CFE_Status_t CF_CFDP_RecvFd (CF_Transaction_t *txn, CF_Logical_PduBuffer_t *ph)

  Unpack a file data PDU from a received message.
- CFE_Status_t CF_CFDP_RecvEof (CF_Transaction_t *txn, CF_Logical_PduBuffer_t *ph)

  Unpack an EOF PDU from a received message.
- CFE_Status_t CF_CFDP_RecvAck (CF_Transaction_t *txn, CF_Logical_PduBuffer_t *ph)

  Unpack an ACK PDU from a received message.
- CFE_Status_t CF_CFDP_RecvFin (CF_Transaction_t *txn, CF_Logical_PduBuffer_t *ph)

  Unpack an FIN PDU from a received message.
- CFE_Status_t CF_CFDP_RecvNak (CF_Transaction_t *txn, CF_Logical_PduBuffer_t *ph)

  Unpack a NAK PDU from a received message.
- void CF_CFDP_RecvDrop (CF_Transaction_t *txn, CF_Logical_PduBuffer_t *ph)

  Receive state function to ignore a packet.
- void CF_CFDP_RecvIdle (CF_Transaction_t *txn, CF_Logical_PduBuffer_t *ph)

  Receive state function to process new rx transaction.

- CFE_Status_t CF_CFDP_InitEngine (void)

  Initialization function for the CFDP engine.
- CF_CListTraverse_Status_t CF_CFDP_CycleTxFirstActive (CF_CListNode_t ∗node, void ∗context)

  List traversal function that cycles the first active tx.
- void CF_CFDP_CycleTx (CF_Channel_t ∗chan)

  Cycle the current active tx or make a new one active.
- CF_CListTraverse_Status_t CF_CFDP_DoTick (CF_CListNode_t ∗node, void ∗context)

  List traversal function that calls a r or s tick function.
- void CF_CFDP_TickTransactions (CF_Channel_t ∗chan)

  Call R and then S tick functions for all active transactions.
- void CF_CFDP_InitTxnTxFile (CF_Transaction_t ∗txn, CF_CFDP_Class_t cfdp_class, uint8 keep, uint8 chan, uint8 priority)

  Helper function to set tx file state in a transaction.
- static void CF_CFDP_TxFile_Initiate (CF_Transaction_t ∗txn, CF_CFDP_Class_t cfdp_class, uint8 keep, uint8 chan, uint8 priority, CF_EntityId_t dest_id)
- CFE_Status_t CF_CFDP_TxFile (const char ∗src_filename, const char ∗dst_filename, CF_CFDP_Class_t cfdp↩_class, uint8 keep, uint8 chan_num, uint8 priority, CF_EntityId_t dest_id)

  Begin transmit of a file.
- static CFE_Status_t CF_CFDP_PlaybackDir_Initiate (CF_Playback_t ∗pb, const char ∗src_filename, const char ∗dst_filename, CF_CFDP_Class_t cfdp_class, uint8 keep, uint8 chan, uint8 priority, CF_EntityId_t dest_id)
- CFE_Status_t CF_CFDP_PlaybackDir (const char ∗src_filename, const char ∗dst_filename, CF_CFDP_Class_t cfdp_class, uint8 keep, uint8 chan, uint8 priority, uint16 dest_id)

  Begin transmit of a directory.
- void CF_CFDP_ProcessPlaybackDirectory (CF_Channel_t ∗chan, CF_Playback_t ∗pb)

  Step each active playback directory.
- static void CF_CFDP_UpdatePollPbCounted (CF_Playback_t ∗pb, int up, uint8 ∗counter)
- static void CF_CFDP_ProcessPlaybackDirectories (CF_Channel_t ∗chan)
- void CF_CFDP_ProcessPollingDirectories (CF_Channel_t ∗chan)

  Kick the dir playback if timer elapsed.
- void CF_CFDP_CycleEngine (void)

  Cycle the engine. Called once per wakeup.
- void CF_CFDP_ResetTransaction (CF_Transaction_t ∗txn, int keep_history)

  Reset a transaction and all its internals to an unused state.
- void CF_CFDP_SetTxnStatus (CF_Transaction_t ∗txn, CF_TxnStatus_t txn_stat)

  Helper function to store transaction status code only.
- void CF_CFDP_SendEotPkt (CF_Transaction_t ∗txn)

  Send an end of transaction packet.
- int CF_CFDP_CopyStringFromLV (char ∗buf, size_t buf_maxsz, const CF_Logical_Lv_t ∗src_lv)

  Copy string data from a lv (length, value) pair.
- void CF_CFDP_CancelTransaction (CF_Transaction_t ∗txn)

  Cancels a transaction.
- CF_CListTraverse_Status_t CF_CFDP_CloseFiles (CF_CListNode_t ∗node, void ∗context)

  List traversal function to close all files in all active transactions.
- void CF_CFDP_DisableEngine (void)

  Disables the CFDP engine and resets all state in it.
- bool CF_CFDP_IsPollingDir (const char ∗src_file, uint8 chan_num)

  Check if source file came from polling directory.
- void CF_CFDP_HandleNotKeepFile (CF_Transaction_t ∗txn)

  Remove/Move file after transaction.
- void CF_CFDP_MoveFile (const char ∗src, const char ∗dest_dir)

  Move File.

12.21.1 Detailed Description

The CF Application main CFDP engine and PDU parsing implementation
This file contains two sets of functions. The first is what is needed to deal with CFDP PDUs. Specifically validating them for correctness and ensuring the byte-order is correct for the target. The second is incoming and outgoing CFDP PDUs pass through here. All receive CFDP PDU logic is performed here and the data is passed to the R (rx) and S (tx) logic.

12.21.2 Function Documentation

12.21.2.1 CF_CFDP_AppendTlv()

```
void CF_CFDP_AppendTlv (
    CF_Logical_TlvList_t * ptlv_list,
    CF_CFDP_TlvType_t tlv_type )
```

Appends a single TLV value to the logical PDU data.
This function implements common functionality between SendEof and SendFin which append a TLV value specifying the faulting entity ID.

Assumptions, External Events, and Notes:

ptlv_list must not be NULL. Only CF_CFDP_TLV_TYPE_ENTITY_ID type is currently implemented

Parameters

ptlv_list	TLV list from current PDU buffer.
tlv_type	Type of TLV to append. Currently must be CF_CFDP_TLV_TYPE_ENTITY_ID.

Definition at line 371 of file cf_cfdp.c.
References CF_AppData, CF_CFDP_GetValueEncodedSize(), CF_CFDP_TLV_TYPE_ENTITY_ID, CF_PDU_MAX_TLV, CF_AppData_t::config_table, CF_Logical_Tlv::data, CF_Logical_TlvData::data_ptr, CF_Logical_TlvData::eid, CF_Logical_Tlv::length, CF_ConfigTable::local_eid, CF_Logical_TlvList::num_tlv, CF_Logical_TlvList::tlv, and CF_Logical_Tlv::type.
Referenced by CF_CFDP_SendEof(), and CF_CFDP_SendFin().
Here is the call graph for this function:

12.21.2.2 CF_CFDP_ArmAckTimer()

```
void CF_CFDP_ArmAckTimer (
    CF_Transaction_t * txn )
```

Arm the ACK timer.

Description

Helper function to arm the ACK timer and set the flag.

Assumptions, External Events, and Notes:

txn must not be NULL.

Parameters

txn	Pointer to the transaction state

Definition at line 123 of file cf_cfdp.c.
References CF_Transaction::ack_timer, CF_Flags_Common::ack_timer_armed, CF_ChannelConfig::ack_timer_s, CF_AppData, CF_Timer_InitRelSec(), CF_ConfigTable::chan, CF_Transaction::chan_num, CF_StateFlags::com, CF_AppData_t::config_table, and CF_Transaction::flags.
Referenced by CF_CFDP_R2_SubstateRecvFileData(), CF_CFDP_R_Init(), CF_CFDP_R_Tick(), CF_CFDP_S2_Nak_Arm(), and CF_CFDP_S_Tick().
Here is the call graph for this function:

12.21.2.3 CF_CFDP_ArmInactTimer()

```
static void CF_CFDP_ArmInactTimer (
    CF_Transaction_t * txn ) [inline], [static]
```

Definition at line 158 of file cf_cfdp.c.
References CF_AppData, CF_Timer_InitRelSec(), CF_ConfigTable::chan, CF_Transaction::chan_num, CF_AppData_t::config_table, CF_Transaction::inactivity_timer, and CF_ChannelConfig::inactivity_timer_s.
Referenced by CF_CFDP_DispatchRecv(), and CF_CFDP_TxFile_Initiate().
Here is the call graph for this function:

12.21.2.4 CF_CFDP_CancelTransaction()

```
void CF_CFDP_CancelTransaction (
    CF_Transaction_t * txn )
```

Cancels a transaction.

Assumptions, External Events, and Notes:

txn must not be NULL.

Parameters

txn	Pointer to the transaction state

Definition at line 1734 of file cf_cfdp.c.
References CF_Flags_Common::canceled, CF_CFDP_IsSender(), CF_CFDP_R_Cancel(), CF_CFDP_S_Cancel(), CF_CFDP_SetTxnStatus(), CF_TxnStatus_CANCEL_REQUEST_RECEIVED, CF_StateFlags::com, and CF_Transaction::flags.
Referenced by CF_CmdCancel_Txn().
Here is the call graph for this function:

12.21.2.5 CF_CFDP_CloseFiles()

```
CF_CListTraverse_Status_t CF_CFDP_CloseFiles (
    CF_CListNode_t * node,
    void * context )
```

List traversal function to close all files in all active transactions.
This helper is used in conjunction with CF_CList_Traverse().

Assumptions, External Events, and Notes:

node must not be NULL.

Parameters

node	List node pointer
context	Opaque pointer, not used in this function

Returns

integer traversal code

Return values

Always	CF_LIST_CONT indicate list traversal should not exit early.

Definition at line 1751 of file cf_cfdp.c.
References CF_CLIST_CONT, CF_WrappedClose(), container_of, CF_Transaction::fd, and OS_ObjectIdDefined().

Referenced by CF_CFDP_DisableEngine().
Here is the call graph for this function:

12.21.2.6 CF_CFDP_ConstructPduHeader()

```
CF_Logical_PduBuffer_t* CF_CFDP_ConstructPduHeader (
    const CF_Transaction_t * txn,
    CF_CFDP_FileDirective_t directive_code,
    CF_EntityId_t src_eid,
    CF_EntityId_t dst_eid,
    bool towards_sender,
    CF_TransactionSeq_t tsn,
    bool silent )
```

Build the PDU header in the output buffer to prepare to send a packet.

Assumptions, External Events, and Notes:

txn must not be NULL.

Parameters

txn	Pointer to the transaction object
directive_code	Code to use for file directive headers (set to 0 for data)
src_eid	Value to set in source entity ID field
dst_eid	Value to set in destination entity ID field
towards_sender	Whether this is transmitting toward the sender entity
tsn	Transaction sequence number to put into PDU
silent	If true, suppress error event if no message buffer available

Returns

Pointer to PDU buffer which may be filled with additional data

Return values

NULL	if no message buffer available

Definition at line 238 of file cf_cfdp.c.
References CF_CFDP_CLASS_1, CF_CFDP_EncodeFileDirectiveHeader(), CF_CFDP_EncodeHeaderWithout↩

Size(), CF_CFDP_GetClass(), CF_CFDP_GetValueEncodedSize(), CF_CFDP_MsgOutGet(), CF_Logical_Pdu↩ Header::destination_eid, CF_Logical_PduHeader::direction, CF_Logical_PduFileDirectiveHeader::directive_code, CF_Logical_PduHeader::eid_length, CF_Logical_PduBuffer::fdirective, CF_Logical_PduBuffer::pdu_header, CF_↩ Logical_PduHeader::pdu_type, CF_Logical_PduBuffer::penc, CF_Logical_PduHeader::sequence_num, CF_Logical↩ _PduHeader::source_eid, CF_Logical_PduHeader::txm_mode, CF_Logical_PduHeader::txn_seq_length, and CF_↩ Logical_PduHeader::version.
Referenced by CF_CFDP_R_SubstateSendNak(), CF_CFDP_S_SendFileData(), CF_CFDP_SendAck(), CF_CFDP↩ _SendEof(), CF_CFDP_SendFin(), and CF_CFDP_SendMd().
Here is the call graph for this function:

12.21.2.7 CF_CFDP_CopyStringFromLV()

```
int CF_CFDP_CopyStringFromLV (
    char * buf,
    size_t buf_maxsz,
    const CF_Logical_Lv_t * src_lv )
```

Copy string data from a lv (length, value) pair.
This copies a string value from an LV pair inside a PDU buffer. In CF this is used for file names embedded within PDUs.

Note

This function assures that the output string is terminated appropriately, such that it can be used as a normal C string. As such, the buffer size must be at least 1 byte larger than the maximum string length.

Assumptions, External Events, and Notes:

src_lv must not be NULL. buf must not be NULL.

Parameters

buf	Pointer to buffer to store string
buf_maxsz	Total size of buffer pointer to by buf (usable size is 1 byte less, for termination)
src_lv	Pointer to LV pair from logical PDU buffer

Returns

The resulting string length, NOT including termination character

Return values

CF_ERROR	on error

Definition at line 1714 of file cf_cfdp.c.
References CF_ERROR, CF_Logical_Lv::data_ptr, and CF_Logical_Lv::length.
Referenced by CF_CFDP_RecvMd().

12.21.2.8 CF_CFDP_CycleEngine() `void CF_CFDP_CycleEngine ( void )`

Cycle the engine. Called once per wakeup.

Assumptions, External Events, and Notes:

None

Definition at line 1549 of file cf_cfdp.c.
References CF_AppData, CF_CFDP_CycleTx(), CF_CFDP_ProcessPlaybackDirectories(), CF_CFDP_Process↩PollingDirectories(), CF_CFDP_ReceiveMessage(), CF_CFDP_TickTransactions(), CF_NUM_CHANNELS, CF_Hk↩Packet_Payload::channel_hk, CF_Engine::channels, CF_Engine::enabled, CF_AppData_t::engine, CF_HkChannel_↩Data::frozen, CF_AppData_t::hk, CF_Engine::outgoing_counter, and CF_HkPacket::Payload.
Referenced by CF_WakeupCmd().

Here is the call graph for this function:

12.21.2.9 CF_CFDP_CycleTx()

```
void CF_CFDP_CycleTx (
    CF_Channel_t * chan )
```

Cycle the current active tx or make a new one active.

Description

First traverses all tx transactions on the active queue. If at least one is found, then it stops. Otherwise it moves a transaction on the pending queue to the active queue and tries again to find an active one.

Assumptions, External Events, and Notes:

None

Parameters

chan	Channel to cycle

Definition at line 1077 of file cf_cfdp.c.
References CF_AppData, CF_CFDP_CycleTxFirstActive(), CF_CList_Traverse(), CF_MoveTransaction(), CF_QueueIdx_PEND, CF_QueueIdx_TXA, CF_ConfigTable::chan, CF_Engine::channels, CF_AppData_t::config_table, container_of, CF_Channel::cur, CF_ChannelConfig::dequeue_enabled, CF_AppData_t::engine, CF_Channel::qs, and CF_CFDP_CycleTx_args::ran_one.
Referenced by CF_CFDP_CycleEngine().
Here is the call graph for this function:

12.21.2.10 CF_CFDP_CycleTxFirstActive()

```
CF_CListTraverse_Status_t CF_CFDP_CycleTxFirstActive (
    CF_CListNode_t * node,
    void * context )
```

List traversal function that cycles the first active tx.
This helper is used in conjunction with CF_CList_Traverse().

Description

There can only be one active tx transaction per engine cycle. This function finds the first active, and then sends file data PDUs until there are no outgoing message buffers.

Assumptions, External Events, and Notes:

node must not be NULL. Context must not be NULL.

Parameters

node	Pointer to list node
context	Pointer to CF_CFDP_CycleTx_args_t object (passed through)

Returns

integer traversal code

Return values

CF_CLIST_EXIT	when it's found, which terminates list traversal
CF_CLIST_CONT	when it's isn't found, which causes list traversal to continue

Definition at line 1041 of file cf_cfdp.c.
References CF_Assert, CF_CFDP_DispatchTx(), CF_CLIST_CONT, CF_CLIST_EXIT, CF_PERF_ID_PDUSENT, CF_QueueIdx_TXA, CFE_ES_PerfLogEntry, CFE_ES_PerfLogExit, CF_CFDP_CycleTx_args::chan, CF_Transaction::chan_num, CF_StateFlags::com, container_of, CF_Channel::cur, CF_Transaction::flags, CF_Flags_Common::q_index, CF_CFDP_CycleTx_args::ran_one, and CF_Flags_Common::suspended.
Referenced by CF_CFDP_CycleTx().
Here is the call graph for this function:

12.21.2.11 CF_CFDP_DecodeStart()

```
void CF_CFDP_DecodeStart (
    CF_DecoderState_t * pdec,
    const void * msgbuf,
    CF_Logical_PduBuffer_t * ph,
    size_t encap_hdr_size,
    size_t total_size )
```

Initiate the process of decoding a received PDU.
This resets the decoder and PDU buffer to initial values, and prepares for decoding a new PDU that was received from a remote entity.

Parameters

pdec	Decoder state structure, will be reset/initialized by this call to point to msgbuf.
msgbuf	Pointer to encapsulation message, in this case a CFE software bus message
ph	Pointer to logical PDU buffer content, will be cleared to all zero by this call
encap_hdr_size	Offset of first CFDP PDU octet within buffer
total_size	Total size of msgbuf encapsulation structure (decoding cannot exceed this)

Definition at line 89 of file cf_cfdp.c.
References CF_DecoderState::base, CF_CFDP_CodecReset(), CF_CFDP_CodecSetDone(), CF_DecoderState::codec_state, CF_CodecState::max_size, and CF_Logical_PduBuffer::pdec.
Referenced by CF_CFDP_ReceiveMessage().

Here is the call graph for this function:

12.21.2.12 CF_CFDP_DisableEngine() `void CF_CFDP_DisableEngine ( void )`

Disables the CFDP engine and resets all state in it.

Assumptions, External Events, and Notes:

None

Definition at line 1767 of file cf_cfdp.c.
References CF_Playback::busy, CF_AppData, CF_CFDP_CloseFiles(), CF_CList_Traverse(), CF_MAX_COMMANDED_PLAYBACK_DIRECTORIES_PER_CHAN, CF_MAX_POLLING_DIR_PER_CHAN, CF_NUM_CHANNELS, CF_QueueIdx_RX, CF_QueueIdx_TXA, CF_QueueIdx_TXW, CFE_SB_DeletePipe(), CF_HkPacket_Payload::channel_hk, CF_Engine::channels, CF_Playback::dir_id, CF_Engine::enabled, CF_AppData_t::engine, CF_AppData_t::hk, OS_DirectoryClose(), CF_HkPacket::Payload, CF_Poll::pb, CF_Channel::pipe, CF_Channel::playback, CF_Channel::poll, CF_HkChannel_Data::q_size, and CF_Channel::qs.
Referenced by CF_DisableEngineCmd().
Here is the call graph for this function:

12.21.2.13 CF_CFDP_DispatchRecv() `void CF_CFDP_DispatchRecv ( CF_Transaction_t * txn, CF_Logical_PduBuffer_t * ph )`

Dispatch received packet to its handler.
This dispatches the PDU to the appropriate handler based on the transaction state

Assumptions, External Events, and Notes:

txn must not be null. It must be an initialized transaction.

Parameters

txn	Pointer to the transaction state
ph	The logical PDU buffer being received

Definition at line 169 of file cf_cfdp.c.
References CF_CFDP_ArmInactTimer(), CF_CFDP_R1_Recv(), CF_CFDP_R2_Recv(), CF_CFDP_RecvDrop(), CF↩_CFDP_RecvIdle(), CF_CFDP_RxStateDispatch(), CF_CFDP_S1_Recv(), CF_CFDP_S2_Recv(), CF_TxnState_DR↩OP, CF_TxnState_IDLE, CF_TxnState_R1, CF_TxnState_R2, CF_TxnState_S1, CF_TxnState_S2, and CF_CFDP_↩TxnRecvDispatchTable_t::rx.
Referenced by CF_CFDP_ReceiveMessage(), and CF_CFDP_RecvIdle().
Here is the call graph for this function:

12.21.2.14 CF_CFDP_DispatchTx()

```
static void CF_CFDP_DispatchTx (
    CF_Transaction_t * txn ) [static]
```

Definition at line 187 of file cf_cfdp.c.
References CF_CFDP_S1_Tx(), CF_CFDP_S2_Tx(), CF_CFDP_TxStateDispatch(), CF_TxnState_S1, CF_Txn↩State_S2, and CF_CFDP_TxnSendDispatchTable_t::tx.
Referenced by CF_CFDP_CycleTxFirstActive().

Here is the call graph for this function:

12.21.2.15 CF_CFDP_DoTick()

```
CF_CListTraverse_Status_t CF_CFDP_DoTick (
    CF_CListNode_t * node,
    void * context )
```

List traversal function that calls a r or s tick function.
This helper is used in conjunction with CF_CList_Traverse().

Assumptions, External Events, and Notes:

node must not be NULL, context must not be NULL.

Parameters

node	Pointer to list node
context	Pointer to CF_CFDP_Tick_args_t object (passed through)

Returns

integer traversal code

Return values

CF_CLIST_EXIT	when it's found, which terminates list traversal
CF_CLIST_CONT	when it's isn't found, which causes list traversal to continue

Definition at line 1120 of file cf_cfdp.c.
References CF_CLIST_CONT, CF_CLIST_EXIT, CF_CFDP_Tick_args::chan, CF_StateFlags::com, CF_CFDP_Tick↩

_args::cont, container_of, CF_Channel::cur, CF_CFDP_Tick_args::early_exit, CF_Transaction::flags, CF_CFDP_Tick↩_args::fn, and CF_Flags_Common::suspended.
Referenced by CF_CFDP_TickTransactions().

12.21.2.16 CF_CFDP_EncodeStart()

```
void CF_CFDP_EncodeStart (
    CF_EncoderState_t * penc,
    void * msgbuf,
    CF_Logical_PduBuffer_t * ph,
    size_t encap_hdr_size,
    size_t total_size )
```

Initiate the process of encoding a new PDU to send.
This resets the encoder and PDU buffer to initial values, and prepares for encoding a new PDU for sending to a remote entity.

Parameters

penc	Encoder state structure, will be reset/initialized by this call to point to msgbuf.
msgbuf	Pointer to encapsulation message, in this case a CFE software bus message
ph	Pointer to logical PDU buffer content, will be cleared to all zero by this call
encap_hdr_size	Offset of first CFDP PDU octet within buffer
total_size	Allocated size of msgbuf encapsulation structure (encoding cannot exceed this)

Definition at line 55 of file cf_cfdp.c.
References CF_EncoderState::base, CF_CFDP_CodecReset(), CF_CFDP_CodecSetDone(), CF_EncoderState↩::codec_state, CF_CodecState::max_size, and CF_Logical_PduBuffer::penc.
Referenced by CF_CFDP_MsgOutGet().
Here is the call graph for this function:

12.21.2.17 CF_CFDP_FindUnusedChunks()

```
static CF_ChunkWrapper_t* CF_CFDP_FindUnusedChunks (
    CF_Channel_t * chan,
    CF_Direction_t dir ) [static]
```

Definition at line 200 of file cf_cfdp.c.
References CF_Assert, CF_CList_Pop(), CF_Direction_NUM, container_of, and CF_Channel::cs.
Referenced by CF_CFDP_RecvIdle(), and CF_CFDP_TxFile_Initiate().

Here is the call graph for this function:

12.21.2.18 CF_CFDP_GetClass()

```
static CF_CFDP_Class_t CF_CFDP_GetClass (
    const CF_Transaction_t * txn ) [inline], [static]
```

Definition at line 134 of file cf_cfdp.c.
References CF_Assert, CF_QueueIdx_FREE, CF_TxnState_R2, CF_TxnState_S2, CF_StateFlags::com, CF_Transaction::flags, CF_Flags_Common::q_index, and CF_Transaction::state.
Referenced by CF_CFDP_ConstructPduHeader(), and CF_CFDP_SendNak().

12.21.2.19 CF_CFDP_HandleNotKeepFile()

```
void CF_CFDP_HandleNotKeepFile (
    CF_Transaction_t * txn )
```

Remove/Move file after transaction.
This helper is used to handle "not keep" file option after a transaction.

Assumptions, External Events, and Notes:

Definition at line 1850 of file cf_cfdp.c.
References CF_AppData, CF_CFDP_IsPollingDir(), CF_CFDP_IsSender(), CF_CFDP_MoveFile(), CF_TxnStatus_IsError(), CF_ConfigTable::chan, CF_Transaction::chan_num, CF_AppData_t::config_table, CF_TxnFilenames::dst_filename, CF_ConfigTable::fail_dir, CF_History::fnames, CF_Transaction::history, CF_ChannelConfig::move_dir, OS_remove(), CF_TxnFilenames::src_filename, and CF_History::txn_stat.
Referenced by CF_CFDP_ResetTransaction().
Here is the call graph for this function:

12.21.2.20 CF_CFDP_InitEngine() `CFE_Status_t CF_CFDP_InitEngine ( void )`

Initialization function for the CFDP engine.

Description

Performs all initialization of the CFDP engine

Assumptions, External Events, and Notes:

Only called once.

Return values

CFE_SUCCESS	Successful execution. Operation was performed successfully

Returns

anything else on error.

Definition at line 931 of file cf_cfdp.c.
References CF_AppData, CF_Assert, CF_CHANNEL_NUM_RX_CHUNKS_PER_TRANSACTION, CF_CHANNEL_NUM_TX_CHUNKS_PER_TRANSACTION, CF_CHANNEL_PIPE_PREFIX, CF_ChunkListInit(), CF_CList_InitNode(), CF_CList_InsertBack(), CF_CList_InsertBack_Ex(), CF_CR_PIPE_ERR_EID, CF_Direction_NUM, CF_FreeTransaction(), CF_INIT_SEM_ERR_EID, CF_INIT_SUB_ERR_EID, CF_NUM_CHANNELS, CF_NUM_CHUNKS_ALL_CHANNELS, CF_NUM_HISTORIES_PER_CHANNEL, CF_NUM_TRANSACTIONS_PER_CHANNEL, CF_QueueIdx_HIST_FREE, CF_STARTUP_SEM_MAX_RETRIES, CF_STARTUP_SEM_TASK_DELAY, CFE_EVS_EventType_ERROR, CFE_EVS_SendEvent(), CFE_SB_CreatePipe(), CFE_SB_SubscribeLocal(), CFE_SB_ValueToMsgId(), CFE_SUCCESS, CF_ConfigTable::chan, CF_Transaction::chan_num, CF_Engine::channels, CF_Engine::chunk_mem, CF_ChunkWrapper::chunks, CF_Engine::chunks, CF_History::cl_node, CF_ChunkWrapper::cl_node, CF_AppData_t::config_table, CF_Channel::cs, CF_Engine::enabled, CF_AppData_t::engine, CF_Engine::histories, CF_ChannelConfig::mid_input, OS_CountSemGetIdByName(), OS_ERR_NAME_NOT_FOUND, OS_SUCCESS, OS_TaskDelay(), CF_Channel::pipe, CF_ChannelConfig::pipe_depth_input, CF_Channel::sem_id, CF_ChannelConfig::sem_name, and CF_Engine::transactions.
Referenced by CF_EnableEngineCmd(), and CF_Init().

Here is the call graph for this function:

12.21.2.21 CF_CFDP_InitTxnTxFile()

```
void CF_CFDP_InitTxnTxFile (
    CF_Transaction_t * txn,
    CF_CFDP_Class_t cfdp_class,
    uint8 keep,
    uint8 chan,
    uint8 priority )
```

Helper function to set tx file state in a transaction.
This sets various fields inside a newly-allocated transaction structure appropriately for sending a file.

Assumptions, External Events, and Notes:

txn must not be NULL.

Parameters

txn	Pointer to the transaction state
cfdp_class	Set to class 1 or class 2
keep	Whether to keep the local file
chan	CF channel number
priority	Priority of transfer

Definition at line 1216 of file cf_cfdp.c.
References CF_TxnState_S1, CF_TxnState_S2, CF_Transaction::chan_num, CF_Transaction::keep, CF_↩ Transaction::priority, and CF_Transaction::state.
Referenced by CF_CFDP_ReceiveMessage(), and CF_CFDP_TxFile_Initiate().

12.21.2.22 CF_CFDP_IsPollingDir()

```
bool CF_CFDP_IsPollingDir (
    const char * src_file,
    uint8 chan_num )
```

Check if source file came from polling directory.

Assumptions, External Events, and Notes:

Return values

true/false	

Definition at line 1816 of file cf_cfdp.c.
References CF_AppData, CF_FILENAME_MAX_LEN, CF_MAX_POLLING_DIR_PER_CHAN, CF_ConfigTable::chan, CF_AppData_t::config_table, CF_ChannelConfig::polldir, and CF_PollDir::src_dir.
Referenced by CF_CFDP_HandleNotKeepFile().

12.21.2.23 CF_CFDP_IsSender()

```
static bool CF_CFDP_IsSender (
    CF_Transaction_t * txn ) [inline], [static]
```

Definition at line 145 of file cf_cfdp.c.
References CF_Assert, CF_QueueIdx_FREE, CF_TxnState_S1, CF_TxnState_S2, CF_StateFlags::com, CF_Transaction::flags, CF_Flags_Common::q_index, and CF_Transaction::state.
Referenced by CF_CFDP_CancelTransaction(), CF_CFDP_HandleNotKeepFile(), CF_CFDP_ResetTransaction(), and CF_CFDP_SendAck().

12.21.2.24 CF_CFDP_MoveFile()

```
void CF_CFDP_MoveFile (
    const char * src,
    const char * dest_dir )
```

Move File.
This helper is used to move a file.

Assumptions, External Events, and Notes:

Definition at line 1884 of file cf_cfdp.c.
References OS_ERROR, OS_MAX_PATH_LEN, OS_mv(), OS_remove(), and OS_SUCCESS.
Referenced by CF_CFDP_HandleNotKeepFile().
Here is the call graph for this function:

12.21.2.25 CF_CFDP_PlaybackDir()

```
CFE_Status_t CF_CFDP_PlaybackDir (
    const char * src_filename,
    const char * dst_filename,
    CF_CFDP_Class_t cfdp_class,
    uint8 keep,
    uint8 chan,
    uint8 priority,
    uint16 dest_id )
```

Begin transmit of a directory.

Description

This function sets up CF_Playback_t structure with state so it can become part of the directory polling done at each engine cycle.

Assumptions, External Events, and Notes:

src_filename must not be NULL. dst_filename must not be NULL.

Parameters

src_filename	Local filename
dst_filename	Remote filename
cfdp_class	Whether to perform a class 1 or class 2 transfer
keep	Whether to keep or delete the local file after completion
chan	CF channel number to use
priority	CF priority level
dest_id	Entity ID of remote receiver

Return values

CFE_SUCCESS	Successful execution. Operation was performed successfully

Returns

CFE_SUCCESS on success. CF_ERROR on error.

Definition at line 1343 of file cf_cfdp.c.
References CF_Playback::busy, CF_AppData, CF_CFDP_DIR_SLOT_ERR_EID, CF_CFDP_PlaybackDir_Initiate(), CF_ERROR, CF_MAX_COMMANDED_PLAYBACK_DIRECTORIES_PER_CHAN, CFE_EVS_EventType_ERROR, CFE_EVS_SendEvent(), CF_Engine::channels, CF_AppData_t::engine, and CF_Channel::playback.
Referenced by CF_PlaybackDirCmd().
Here is the call graph for this function:

12.21.2.26 CF_CFDP_PlaybackDir_Initiate()

```
static CFE_Status_t CF_CFDP_PlaybackDir_Initiate (
    CF_Playback_t * pb,
    const char * src_filename,
    const char * dst_filename,
    CF_CFDP_Class_t cfdp_class,
    uint8 keep,
    uint8 chan,
    uint8 priority,
    CF_EntityId_t dest_id ) [static]
```

Definition at line 1303 of file cf_cfdp.c.
References CF_Playback::busy, CF_AppData, CF_CFDP_OPENDIR_ERR_EID, CF_Playback::cfdp_class, CFE_EVS_EventType_ERROR, CFE_EVS_SendEvent(), CF_HkPacket_Payload::channel_hk, CF_HkChannel_Data::counters, CF_Playback::dest_id, CF_Playback::dir_id, CF_HkFault::directory_read, CF_Playback::diropen, CF_TxnFilenames::dst_filename, CF_HkCounters::fault, CF_Playback::fnames, CF_AppData_t::hk, CF_Playback::keep, OS_DirectoryOpen(), OS_SUCCESS, CF_HkPacket::Payload, CF_Playback::priority, and CF_TxnFilenames::src_filename.
Referenced by CF_CFDP_PlaybackDir(), and CF_CFDP_ProcessPollingDirectories().

Here is the call graph for this function:

12.21.2.27 CF_CFDP_ProcessPlaybackDirectories()

```
static void CF_CFDP_ProcessPlaybackDirectories (
    CF_Channel_t * chan ) [static]
```

Definition at line 1461 of file cf_cfdp.c.

References CF_Playback::busy, CF_AppData, CF_CFDP_ProcessPlaybackDirectory(), CF_CFDP_UpdatePollPb↩Counted(), CF_MAX_COMMANDED_PLAYBACK_DIRECTORIES_PER_CHAN, CF_HkPacket_Payload::channel_hk, CF_Engine::channels, CF_AppData_t::engine, CF_AppData_t::hk, CF_HkPacket::Payload, CF_Channel::playback, and CF_HkChannel_Data::playback_counter.

Referenced by CF_CFDP_CycleEngine().

Here is the call graph for this function:

12.21.2.28 CF_CFDP_ProcessPlaybackDirectory()

```
void CF_CFDP_ProcessPlaybackDirectory (
    CF_Channel_t * chan,
    CF_Playback_t * pb )
```

Step each active playback directory.

Description

Check if a playback directory needs iterated, and if so does, and if a valid file is found initiates playback on it.

Assumptions, External Events, and Notes:

chan must not be NULL, pb must not be NULL.

Parameters

chan	The channel associated with the playback
pb	The playback state

Definition at line 1373 of file cf_cfdp.c.
References CF_Playback::busy, CF_AppData, CF_Assert, CF_CFDP_TxFile_Initiate(), CF_FILENAME_MAX_LEN, CF_FILENAME_MAX_NAME, CF_FILENAME_MAX_PATH, CF_FindUnusedTransaction(), CF_NUM_TRANSACTI↩ ONS_PER_PLAYBACK, CF_PERF_ID_DIRREAD, CF_Playback::cfdp_class, CFE_ES_PerfLogEntry, CFE_ES_Perf↩ LogExit, CFE_SUCCESS, CF_Engine::channels, CF_Playback::dest_id, CF_Playback::dir_id, CF_Playback::diropen, CF_TxnFilenames::dst_filename, CF_AppData_t::engine, os_dirent_t::FileName, CF_History::fnames, CF_Playback↩ ::fnames, CF_Transaction::history, CF_Playback::keep, CF_Playback::num_ts, OS_DirectoryClose(), OS_Directory↩ Read(), CF_Transaction::pb, CF_Playback::priority, and CF_TxnFilenames::src_filename.
Referenced by CF_CFDP_ProcessPlaybackDirectories(), and CF_CFDP_ProcessPollingDirectories().
Here is the call graph for this function:

12.21.2.29 CF_CFDP_ProcessPollingDirectories()

```
void CF_CFDP_ProcessPollingDirectories ( CF_Channel_t * chan )
```

Kick the dir playback if timer elapsed.

Description

This function waits for the polling directory interval timer, and if it has expired, starts a playback in the polling directory.

Assumptions, External Events, and Notes:

chan must not be NULL.

Parameters

chan	The channel associated with the playback

Definition at line 1480 of file cf_cfdp.c.
References CF_Playback::busy, CF_AppData, CF_CFDP_PlaybackDir_Initiate(), CF_CFDP_ProcessPlayback↩ Directory(), CF_CFDP_UpdatePollPbCounted(), CF_MAX_POLLING_DIR_PER_CHAN, CF_Timer_Expired(), C↩ F_Timer_InitRelSec(), CF_Timer_Tick(), CF_PollDir::cfdp_class, CF_ConfigTable::chan, CF_HkPacket_Payload↩ ::channel_hk, CF_Engine::channels, CF_AppData_t::config_table, CF_PollDir::dest_eid, CF_PollDir::dst_dir, CF_↩ PollDir::enabled, CF_AppData_t::engine, CF_AppData_t::hk, CF_PollDir::interval_sec, CF_Poll::interval_timer, C↩

F_Playback::num_ts, CF_HkPacket::Payload, CF_Poll::pb, CF_Channel::poll, CF_HkChannel_Data::poll_counter, CF_ChannelConfig::polldir, CF_PollDir::priority, CF_PollDir::src_dir, and CF_Poll::timer_set.
Referenced by CF_CFDP_CycleEngine().
Here is the call graph for this function:

12.21.2.30 CF_CFDP_RecvAck()

```
CFE_Status_t CF_CFDP_RecvAck (
    CF_Transaction_t * txn,
    CF_Logical_PduBuffer_t * ph )
```

Unpack an ACK PDU from a received message.
This should only be invoked for buffers that have been identified as an acknowledgment PDU.

Assumptions, External Events, and Notes:

txn must not be NULL.

Parameters

txn	Pointer to the transaction state
ph	The logical PDU buffer being received

Returns

integer status code

Return values

CFE_SUCCESS	on success
CF_SHORT_PDU_ERROR	on error

Definition at line 767 of file cf_cfdp.c.
References CF_Logical_IntHeader::ack, CF_CFDP_DecodeAck(), CF_CODEC_GET_SIZE, CF_CODEC_IS_OK, CF_PDU_ACK_SHORT_ERR_EID, CF_SHORT_PDU_ERROR, CFE_EVS_EventType_ERROR, CFE_EVS_Send↩Event(), CFE_SUCCESS, CF_Logical_PduBuffer::int_header, and CF_Logical_PduBuffer::pdec.
Referenced by CF_CFDP_R2_Recv_fin_ack(), and CF_CFDP_S2_WaitForEofAck().

Here is the call graph for this function:

12.21.2.31 CF_CFDP_RecvDrop()

```
void CF_CFDP_RecvDrop (
    CF_Transaction_t * txn,
    CF_Logical_PduBuffer_t * ph )
```

Receive state function to ignore a packet.

Description

This function signature must match all receive state functions. The parameter txn is ignored here.

Assumptions, External Events, and Notes:

txn must not be NULL.

Parameters

txn	Pointer to the transaction state
ph	The logical PDU buffer being received

Definition at line 836 of file cf_cfdp.c.
References CF_AppData, CF_Transaction::chan_num, CF_HkPacket_Payload::channel_hk, CF_HkChannel_Data↩::counters, CF_HkRecv::dropped, CF_AppData_t::hk, CF_HkPacket::Payload, and CF_HkCounters::recv.
Referenced by CF_CFDP_DispatchRecv().

12.21.2.32 CF_CFDP_RecvEof()

```
CFE_Status_t CF_CFDP_RecvEof (
    CF_Transaction_t * txn,
    CF_Logical_PduBuffer_t * ph )
```

Unpack an EOF PDU from a received message.
This should only be invoked for buffers that have been identified as an end of file PDU.

Assumptions, External Events, and Notes:

txn must not be NULL.

Parameters

txn	Pointer to the transaction state
ph	The logical PDU buffer being received

Returns

integer status code

Return values

CFE_SUCCESS	on success
CF_SHORT_PDU_ERROR	on error

Definition at line 745 of file cf_cfdp.c.
References CF_CFDP_DecodeEof(), CF_CODEC_GET_SIZE, CF_CODEC_IS_OK, CF_PDU_EOF_SHORT_ERR↩_EID, CF_SHORT_PDU_ERROR, CFE_EVS_EventType_ERROR, CFE_EVS_SendEvent(), CFE_SUCCESS, CF_↩Logical_IntHeader::eof, CF_Logical_PduBuffer::int_header, and CF_Logical_PduBuffer::pdec.
Referenced by CF_CFDP_R_SubstateRecvEof().
Here is the call graph for this function:

12.21.2.33 CF_CFDP_RecvFd()

```
CFE_Status_t CF_CFDP_RecvFd (
    CF_Transaction_t * txn,
    CF_Logical_PduBuffer_t * ph )
```

Unpack a file data PDU from a received message.
This should only be invoked for buffers that have been identified as a file data PDU.

Assumptions, External Events, and Notes:

txn must not be NULL.

Parameters

txn	Pointer to the transaction state
ph	The logical PDU buffer being received

Returns

integer status code

Return values

CFE_SUCCESS	on success

Return values

CF_ERROR	for general errors
CF_SHORT_PDU_ERROR	PDU too short

Definition at line 699 of file cf_cfdp.c.
References CF_AppData, CF_CFDP_DecodeFileDataHeader(), CF_CFDP_SetTxnStatus(), CF_CODEC_GET_SIZE, CF_CODEC_IS_OK, CF_CODEC_SET_DONE, CF_ERROR, CF_PDU_FD_SHORT_ERR_EID, CF_PDU_FD_UNS↩UPPORTED_ERR_EID, CF_SHORT_PDU_ERROR, CF_TxnStatus_PROTOCOL_ERROR, CFE_EVS_EventType_↩ERROR, CFE_EVS_SendEvent(), CFE_SUCCESS, CF_Transaction::chan_num, CF_HkPacket_Payload::channel_↩hk, CF_HkChannel_Data::counters, CF_Logical_PduHeader::crc_flag, CF_Logical_PduFileDataHeader::data_len, C↩F_HkRecv::error, CF_Logical_IntHeader::fd, CF_AppData_t::hk, CF_Logical_PduBuffer::int_header, CF_HkPacket::↩Payload, CF_Logical_PduBuffer::pdec, CF_Logical_PduBuffer::pdu_header, CF_HkCounters::recv, and CF_Logical_↩PduHeader::segment_meta_flag.
Referenced by CF_CFDP_R1_SubstateRecvFileData(), and CF_CFDP_R2_SubstateRecvFileData().
Here is the call graph for this function:

12.21.2.34 CF_CFDP_RecvFin()

```
CFE_Status_t CF_CFDP_RecvFin (
    CF_Transaction_t * txn,
    CF_Logical_PduBuffer_t * ph )
```

Unpack an FIN PDU from a received message.
This should only be invoked for buffers that have been identified as a final PDU.

Assumptions, External Events, and Notes:

txn must not be NULL.

Parameters

txn	Pointer to the transaction state
ph	The logical PDU buffer being received

Returns

integer status code

Return values

CFE_SUCCESS	on success
CF_SHORT_PDU_ERROR	on error

Definition at line 790 of file cf_cfdp.c.
References CF_CFDP_DecodeFin(), CF_CODEC_GET_SIZE, CF_CODEC_IS_OK, CF_PDU_FIN_SHORT_ERR_EID, CF_SHORT_PDU_ERROR, CFE_EVS_EventType_ERROR, CFE_EVS_SendEvent(), CFE_SUCCESS, CF_Logical_IntHeader::fin, CF_Logical_PduBuffer::int_header, and CF_Logical_PduBuffer::pdec.
Referenced by CF_CFDP_ReceiveMessage().
Here is the call graph for this function:

12.21.2.35 CF_CFDP_RecvIdle()

```
void CF_CFDP_RecvIdle (
    CF_Transaction_t * txn,
    CF_Logical_PduBuffer_t * ph )
```

Receive state function to process new rx transaction.

Description

An idle transaction has never had message processing performed on it. Typically, the first packet received for a transaction would be the metadata PDU. There's a special case for R2 where the metadata PDU could be missed, and filedata comes in instead. In that case, an R2 transaction must still be started.

Assumptions, External Events, and Notes:

txn must not be NULL. There must be a received message.

Parameters

txn	Pointer to the transaction state
ph	The logical PDU buffer being received

Definition at line 847 of file cf_cfdp.c.
References CF_AppData, CF_CFDP_DispatchRecv(), CF_CFDP_FD_UNHANDLED_ERR_EID, CF_CFDP_FileDirective_METADATA, CF_CFDP_FindUnusedChunks(), CF_CFDP_IDLE_MD_ERR_EID, CF_CFDP_R_Init(), CF_CFDP_RecvMd(), CF_CFDP_ResetTransaction(), CF_Direction_RX, CF_TxnState_DROP, CF_TxnState_IDLE, CF_TxnState_R1, CF_TxnState_R2, CFE_EVS_EventType_ERROR, CFE_EVS_SendEvent(), CF_Transaction::chan_num, CF_HkPacket_Payload::channel_hk, CF_Engine::channels, CF_Transaction::chunks, CF_HkChannel_Data::counters, CF_Logical_PduFileDirectiveHeader::directive_code, CF_AppData_t::engine, CF_HkRecv::error, CF_Logical_PduBuffer::fdirective, CF_Transaction::flags, CF_Transaction::history, CF_AppData_t::hk, CF_Flags_Rx::md_recv, CF_HkPacket::Payload, CF_Logical_PduBuffer::pdu_header, CF_Logical_PduHeader::pdu_type, CF_History::peer_eid, CF_HkCounters::recv, CF_StateFlags::rx, CF_History::seq_num, CF_Logical_PduHeader::sequence_num, CF_Logical_PduHeader::source_eid, CF_History::src_eid, CF_Transaction::state, and CF_Logical_PduHeader::txm_mode.
Referenced by CF_CFDP_DispatchRecv().

Here is the call graph for this function:

12.21.2.36 CF_CFDP_RecvMd()

```
CFE_Status_t CF_CFDP_RecvMd (
    CF_Transaction_t * txn,
    CF_Logical_PduBuffer_t * ph )
```

Unpack a metadata PDU from a received message.
This should only be invoked for buffers that have been identified as a metadata PDU.

Assumptions, External Events, and Notes:

txn must not be NULL.

Parameters

txn	Pointer to the transaction state
ph	The logical PDU buffer being received

Returns

integer status code

Return values

CFE_SUCCESS	on success
CF_PDU_METADATA_ERROR	on error

Definition at line 632 of file cf_cfdp.c.
References CF_AppData, CF_CFDP_CopyStringFromLV(), CF_CFDP_DecodeMd(), CF_CODEC_GET_SIZE, CF↩_CODEC_IS_OK, CF_PDU_INVALID_DST_LEN_ERR_EID, CF_PDU_INVALID_SRC_LEN_ERR_EID, CF_PDU_M↩D_RECVD_INF_EID, CF_PDU_MD_SHORT_ERR_EID, CF_PDU_METADATA_ERROR, CFE_EVS_EventType_E↩

RROR, CFE_EVS_EventType_INFORMATION, CFE_EVS_SendEvent(), CFE_SUCCESS, CF_Transaction::chan_↩num, CF_HkPacket_Payload::channel_hk, CF_HkChannel_Data::counters, CF_Logical_PduMd::dest_filename, CF_↩TxnFilenames::dst_filename, CF_HkRecv::error, CF_History::fnames, CF_Transaction::fsize, CF_Transaction::history, CF_AppData_t::hk, CF_Logical_PduBuffer::int_header, CF_Logical_Lv::length, CF_Logical_IntHeader::md, CF_Hk↩Packet::Payload, CF_Logical_PduBuffer::pdec, CF_HkCounters::recv, CF_Logical_PduMd::size, CF_Logical_PduMd↩::source_filename, and CF_TxnFilenames::src_filename.
Referenced by CF_CFDP_R2_RecvMd(), and CF_CFDP_RecvIdle().
Here is the call graph for this function:

12.21.2.37 CF_CFDP_RecvNak()

```
CFE_Status_t CF_CFDP_RecvNak (
    CF_Transaction_t * txn,
    CF_Logical_PduBuffer_t * ph )
```

Unpack a NAK PDU from a received message.
This should only be invoked for buffers that have been identified as a negative/non-acknowledgment PDU.

Assumptions, External Events, and Notes:

txn must not be NULL.

Parameters

txn	Pointer to the transaction state
ph	The logical PDU buffer being received

Returns

integer status code

Return values

CFE_SUCCESS	on success
CF_SHORT_PDU_ERROR	on error

Definition at line 814 of file cf_cfdp.c.
References CF_CFDP_DecodeNak(), CF_CODEC_GET_SIZE, CF_CODEC_IS_OK, CF_PDU_NAK_SHORT_ERR↩_EID, CF_SHORT_PDU_ERROR, CFE_EVS_EventType_ERROR, CFE_EVS_SendEvent(), CFE_SUCCESS, CF_↩Logical_PduBuffer::int_header, CF_Logical_IntHeader::nak, and CF_Logical_PduBuffer::pdec.
Referenced by CF_CFDP_S2_Nak().

Here is the call graph for this function:

12.21.2.38 CF_CFDP_RecvPh()

```
CFE_Status_t CF_CFDP_RecvPh (
    uint8 chan_num,
    CF_Logical_PduBuffer_t * ph )
```

Unpack a basic PDU header from a received message.

Description

This interprets the common PDU header and the file directive header (if applicable) and populates the logical PDU buffer.

Assumptions, External Events, and Notes:

A new message has been received.

Parameters

chan_num	The channel number for statistics purposes
ph	The logical PDU buffer being received

Returns

integer status code

Return values

CFE_SUCCESS	on success
CF_ERROR	for general errors
CF_SHORT_PDU_ERROR	if PDU too short

Definition at line 572 of file cf_cfdp.c.
References CF_AppData, CF_Assert, CF_CFDP_DecodeFileDirectiveHeader(), CF_CFDP_DecodeHeader(), CF_CODEC_GET_SIZE, CF_CODEC_IS_OK, CF_ERROR, CF_NUM_CHANNELS, CF_PDU_LARGE_FILE_ERR_EID, CF_PDU_SHORT_HEADER_ERR_EID, CF_PDU_TRUNCATION_ERR_EID, CF_SHORT_PDU_ERROR, CFE_EVS_EventType_ERROR, CFE_EVS_SendEvent(), CFE_SUCCESS, CF_HkPacket_Payload::channel_hk, CF_HkChannel_Data::counters, CF_HkRecv::error, CF_Logical_PduBuffer::fdirective, CF_AppData_t::hk, CF_Logical_PduHeader::large_flag, CF_HkPacket::Payload, CF_Logical_PduBuffer::pdec, CF_HkRecv::pdu, CF_Logical_PduBuffer::pdu_header, CF_Logical_PduHeader::pdu_type, and CF_HkCounters::recv.
Referenced by CF_CFDP_ReceiveMessage().

Here is the call graph for this function:

12.21.2.39 CF_CFDP_ResetTransaction()

```
void CF_CFDP_ResetTransaction (
    CF_Transaction_t * txn,
    int keep_history )
```

Reset a transaction and all its internals to an unused state.

Assumptions, External Events, and Notes:

txn must not be NULL.

Parameters

txn	Pointer to the transaction object
keep_history	Whether the transaction info should be preserved in history

Definition at line 1589 of file cf_cfdp.c.
References CF_AppData, CF_Assert, CF_CFDP_HandleNotKeepFile(), CF_CFDP_IsSender(), CF_CFDP_SendEot↩Pkt(), CF_CList_InsertBack(), CF_CList_InsertBack_Ex(), CF_DequeueTransaction(), CF_Direction_TX, CF_Free↩Transaction(), CF_NUM_CHANNELS, CF_QueueIdx_FREE, CF_QueueIdx_HIST, CF_QueueIdx_HIST_FREE, CF_↩RESET_FREED_XACT_DBG_EID, CF_WrappedClose(), CFE_EVS_EventType_DEBUG, CFE_EVS_SendEvent(), CF_Transaction::chan_num, CF_Engine::channels, CF_Transaction::chunks, CF_History::cl_node, CF_Chunk↩Wrapper::cl_node, CF_Flags_Tx::cmd_tx, CF_StateFlags::com, CF_Channel::cs, CF_Channel::cur, CF_History::dir, CF_AppData_t::engine, CF_Transaction::fd, CF_Transaction::flags, CF_Transaction::history, CF_Transaction::keep, CF_Channel::num_cmd_tx, CF_Playback::num_ts, OS_ObjectIdDefined(), CF_Transaction::pb, CF_Flags_Common↩::q_index, and CF_StateFlags::tx.
Referenced by CF_CFDP_R1_Reset(), CF_CFDP_RecvIdle(), CF_CFDP_S_Reset(), CF_CmdAbandon_Txn(), and CF_PurgeTransaction().

Here is the call graph for this function:

12.21.2.40 CF_CFDP_SendAck()

```
CFE_Status_t CF_CFDP_SendAck (
    CF_Transaction_t * txn,
    CF_CFDP_AckTxnStatus_t ts,
    CF_CFDP_FileDirective_t dir_code,
    CF_CFDP_ConditionCode_t cc,
    CF_EntityId_t peer_eid,
    CF_TransactionSeq_t tsn )
```

Build an ACK PDU for transmit.

Assumptions, External Events, and Notes:

txn must not be NULL.

Note

CF_CFDP_SendAck() takes a CF_TransactionSeq_t instead of getting it from transaction history because of the special case where a FIN-ACK must be sent for an unknown transaction. It's better for long term maintenance to not build an incomplete CF_History_t for it.

Parameters

txn	Pointer to the transaction object

Parameters

ts	Transaction ACK status
dir_code	File directive code being ACK'ed
cc	Condition code of transaction
peer_eid	Remote entity ID
tsn	Transaction sequence number

Returns

CFE_Status_t status code

Return values

CFE_SUCCESS	on success.
CF_SEND_PDU_NO_BUF_AVAIL_ERROR	if message buffer cannot be obtained.

Definition at line 447 of file cf_cfdp.c.
References CF_Logical_IntHeader::ack, CF_Logical_PduAck::ack_directive_code, CF_Logical_PduAck::ack_↩subtype_code, CF_Logical_PduAck::cc, CF_AppData, CF_Assert, CF_CFDP_ConstructPduHeader(), CF_CFD↩P_EncodeAck(), CF_CFDP_FileDirective_ACK, CF_CFDP_FileDirective_EOF, CF_CFDP_FileDirective_FIN, CF↩_CFDP_IsSender(), CF_CFDP_Send(), CF_CFDP_SetPduLength(), CF_SEND_PDU_NO_BUF_AVAIL_ERROR, CFE_SUCCESS, CF_Transaction::chan_num, CF_AppData_t::config_table, CF_Logical_PduBuffer::int_header, CF_↩ConfigTable::local_eid, CF_Logical_PduBuffer::penc, and CF_Logical_PduAck::txn_status.
Referenced by CF_CFDP_R_Tick(), CF_CFDP_ReceiveMessage(), and CF_CFDP_S_SubstateSendFinAck().
Here is the call graph for this function:

12.21.2.41 CF_CFDP_SendEof()

```
CFE_Status_t CF_CFDP_SendEof (
    CF_Transaction_t * txn )
```

Build an EOF PDU for transmit.

Assumptions, External Events, and Notes:

txn must not be NULL.

Parameters

txn	Pointer to the transaction object

Returns

CFE_Status_t status code

Return values

CFE_SUCCESS	on success.
CF_SEND_PDU_NO_BUF_AVAIL_ERROR	if message buffer cannot be obtained.

Definition at line 408 of file cf_cfdp.c.
References CF_Logical_PduEof::cc, CF_AppData, CF_CFDP_AppendTlv(), CF_CFDP_ConditionCode_NO_ERROR, CF_CFDP_ConstructPduHeader(), CF_CFDP_EncodeEof(), CF_CFDP_FileDirective_EOF, CF_CFDP_Send(), CF↩_CFDP_SetPduLength(), CF_CFDP_TLV_TYPE_ENTITY_ID, CF_SEND_PDU_NO_BUF_AVAIL_ERROR, CF_Txn↩Status_To_ConditionCode(), CFE_SUCCESS, CF_Transaction::chan_num, CF_AppData_t::config_table, CF_Logical↩_PduEof::crc, CF_Transaction::crc, CF_Logical_IntHeader::eof, CF_Transaction::fsize, CF_Transaction::history, CF_↩Logical_PduBuffer::int_header, CF_ConfigTable::local_eid, CF_History::peer_eid, CF_Logical_PduBuffer::penc, CF_↩Crc::result, CF_History::seq_num, CF_Logical_PduEof::size, CF_Logical_PduEof::tlv_list, and CF_History::txn_stat.
Referenced by CF_CFDP_S_SendEof().
Here is the call graph for this function:

12.21.2.42 CF_CFDP_SendEotPkt()

```
void CF_CFDP_SendEotPkt (
    CF_Transaction_t * txn )
```

Send an end of transaction packet.

Assumptions, External Events, and Notes:

txn must not be NULL.

Parameters

txn	Pointer to the transaction object

Definition at line 1673 of file cf_cfdp.c.
References CF_EOT_TLM_MID, CFE_MSG_Init(), CFE_SB_AllocateMessageBuffer(), CFE_SB_TimeStampMsg(), CFE_SB_TransmitBuffer(), CFE_SB_ValueToMsgId(), CF_Transaction::chan_num, CF_EotPacket_Payload::channel, CF_Transaction::crc, CF_EotPacket_Payload::crc_result, CF_History::dir, CF_EotPacket_Payload::direction, CF_EotPacket_Payload::fnames, CF_History::fnames, CF_EotPacket_Payload::fsize, CF_Transaction::fsize, CF_Transaction::history, CF_EotPacket::Payload, CF_EotPacket_Payload::peer_eid, CF_History::peer_eid, CF_Crc::result, CF_EotPacket_Payload::seq_num, CF_History::seq_num, CF_EotPacket_Payload::src_eid, CF_History::src_eid, CF_EotPacket_Payload::state, CF_Transaction::state, CF_EotPacket::TelemetryHeader, CF_EotPacket_Payload::txn_stat, and CF_History::txn_stat.
Referenced by CF_CFDP_ResetTransaction().
Here is the call graph for this function:

12.21.2.43 CF_CFDP_SendFd()

```
CFE_Status_t CF_CFDP_SendFd (
    CF_Transaction_t * txn,
    CF_Logical_PduBuffer_t * ph )
```

Send a previously-assembled filedata PDU for transmit.

Assumptions, External Events, and Notes:

txn must not be NULL.

Parameters

txn	Pointer to the transaction object
ph	Pointer to logical PDU buffer content

Note

Unlike other "send" routines, the file data PDU must be acquired and filled by the caller prior to invoking this routine. This routine only sends the PDU that was previously allocated and assembled. As such, the typical failure possibilities do not apply to this call.

Returns

CFE_Status_t status code

Return values

CFE_SUCCESS	on success. (error checks not yet implemented)

Definition at line 351 of file cf_cfdp.c.
References CF_CFDP_Send(), CF_CFDP_SetPduLength(), CFE_SUCCESS, and CF_Transaction::chan_num.
Referenced by CF_CFDP_S_SendFileData().
Here is the call graph for this function:

12.21.2.44 CF_CFDP_SendFin()

```
CFE_Status_t CF_CFDP_SendFin (
    CF_Transaction_t * txn,
    CF_CFDP_FinDeliveryCode_t dc,
    CF_CFDP_FinFileStatus_t fs,
    CF_CFDP_ConditionCode_t cc )
```

Build a FIN PDU for transmit.

Assumptions, External Events, and Notes:

txn must not be NULL.

Parameters

txn	Pointer to the transaction object
dc	Final delivery status code (complete or incomplete)
fs	Final file status (retained or rejected, etc)
cc	Final CFDP condition code

Returns

CFE_Status_t status code

Return values

CFE_SUCCESS	on success.
CF_SEND_PDU_NO_BUF_AVAIL_ERROR	if message buffer cannot be obtained.

Definition at line 498 of file cf_cfdp.c.
References CF_Logical_PduFin::cc, CF_AppData, CF_CFDP_AppendTlv(), CF_CFDP_ConditionCode_NO_ERROR, CF_CFDP_ConstructPduHeader(), CF_CFDP_EncodeFin(), CF_CFDP_FileDirective_FIN, CF_CFDP_Send(), CF_CFDP_SetPduLength(), CF_CFDP_TLV_TYPE_ENTITY_ID, CF_SEND_PDU_NO_BUF_AVAIL_ERROR, CFE_SUCCESS, CF_Transaction::chan_num, CF_AppData_t::config_table, CF_Logical_PduFin::delivery_code, CF_Logical_PduFin::file_status, CF_Logical_IntHeader::fin, CF_Transaction::history, CF_Logical_PduBuffer::int_header, CF_ConfigTable::local_eid, CF_History::peer_eid, CF_Logical_PduBuffer::penc, CF_History::seq_num, and CF_Logical_PduFin::tlv_list.
Referenced by CF_CFDP_R2_SubstateSendFin().
Here is the call graph for this function:

12.21.2.45 CF_CFDP_SendMd() `CFE_Status_t CF_CFDP_SendMd ( CF_Transaction_t * txn )`

Build a metadata PDU for transmit.

Assumptions, External Events, and Notes:

txn must not be NULL.

Parameters

txn	Pointer to the transaction object

Returns

CFE_Status_t status code

Return values

CFE_SUCCESS	on success.
CF_SEND_PDU_NO_BUF_AVAIL_ERROR	if message buffer cannot be obtained.

Definition at line 308 of file cf_cfdp.c.
References CF_AppData, CF_Assert, CF_CFDP_ConstructPduHeader(), CF_CFDP_EncodeMd(), CF_CFDP_File↩Directive_METADATA, CF_CFDP_Send(), CF_CFDP_SetPduLength(), CF_SEND_PDU_NO_BUF_AVAIL_ERROR, CF_TxnState_S1, CF_TxnState_S2, CFE_SUCCESS, CF_Transaction::chan_num, CF_AppData_t::config_table, CF↩_Logical_Lv::data_ptr, CF_Logical_PduMd::dest_filename, CF_TxnFilenames::dst_filename, CF_History::fnames, C↩F_Transaction::fsize, CF_Transaction::history, CF_Logical_PduBuffer::int_header, CF_Logical_Lv::length, CF_Config↩Table::local_eid, CF_Logical_IntHeader::md, OS_strnlen(), CF_History::peer_eid, CF_Logical_PduBuffer::penc, CF↩_History::seq_num, CF_Logical_PduMd::size, CF_Logical_PduMd::source_filename, CF_TxnFilenames::src_filename, and CF_Transaction::state.
Referenced by CF_CFDP_S_CheckAndRespondNak(), and CF_CFDP_S_SubstateSendMetadata().
Here is the call graph for this function:

12.21.2.46 CF_CFDP_SendNak()

```
CFE_Status_t CF_CFDP_SendNak (
    CF_Transaction_t * txn,
    CF_Logical_PduBuffer_t * ph )
```

Send a previously-assembled NAK PDU for transmit.

Assumptions, External Events, and Notes:

txn must not be NULL.

Parameters

txn	Pointer to the transaction object
ph	Pointer to logical PDU buffer content

Note

Unlike other "send" routines, the NAK PDU must be acquired and filled by the caller prior to invoking this routine. This routine only encodes and sends the previously-assembled PDU buffer. As such, the typical failure possibilities do not apply to this call.

Returns

CFE_Status_t status code

Return values

CFE_SUCCESS	on success.
CF_SEND_PDU_NO_BUF_AVAIL_ERROR	if message buffer cannot be obtained.

Definition at line 538 of file cf_cfdp.c.
References CF_Assert, CF_CFDP_CLASS_2, CF_CFDP_EncodeNak(), CF_CFDP_GetClass(), CF_CFDP_Send(), CF_CFDP_SetPduLength(), CF_SEND_PDU_NO_BUF_AVAIL_ERROR, CFE_SUCCESS, CF_Transaction::chan_↩num, CF_Logical_PduBuffer::int_header, CF_Logical_IntHeader::nak, and CF_Logical_PduBuffer::penc.
Referenced by CF_CFDP_R_SubstateSendNak().
Here is the call graph for this function:

12.21.2.47 CF_CFDP_SetPduLength()

```
static void CF_CFDP_SetPduLength (
    CF_Logical_PduBuffer_t * ph ) [static]
```

Definition at line 216 of file cf_cfdp.c.
References CF_CFDP_EncodeHeaderFinalSize(), CF_CODEC_GET_POSITION, CF_Logical_PduHeader::data_↩encoded_length, CF_Logical_PduHeader::header_encoded_length, CF_Logical_PduBuffer::pdu_header, and CF_↩Logical_PduBuffer::penc.
Referenced by CF_CFDP_SendAck(), CF_CFDP_SendEof(), CF_CFDP_SendFd(), CF_CFDP_SendFin(), CF_CFD↩P_SendMd(), and CF_CFDP_SendNak().
Here is the call graph for this function:

12.21.2.48 CF_CFDP_SetTxnStatus()

```
void CF_CFDP_SetTxnStatus (
    CF_Transaction_t * txn,
    CF_TxnStatus_t txn_stat )
```

Helper function to store transaction status code only.
This records the status in the history block but does not set FIN flag or take any other protocol/state machine actions.

Assumptions, External Events, and Notes:

txn must not be NULL.

Parameters

txn	Pointer to the transaction object
txn_stat	Status Code value to set within transaction

Definition at line 1659 of file cf_cfdp.c.
References CF_TxnStatus_IsError(), CF_Transaction::history, and CF_History::txn_stat.
Referenced by CF_CFDP_CancelTransaction(), CF_CFDP_R2_CalcCrcChunk(), CF_CFDP_R2_Complete(), CF_CFDP_R2_SetFinTxnStatus(), CF_CFDP_R2_SubstateRecvEof(), CF_CFDP_R_ProcessFd(), CF_CFDP_R_Tick(), CF_CFDP_RecvFd(), CF_CFDP_S2_EarlyFin(), CF_CFDP_S2_SubstateSendFileData(), CF_CFDP_S_SubstateSendFileData(), CF_CFDP_S_SubstateSendFinAck(), CF_CFDP_S_SubstateSendMetadata(), and CF_CFDP_S_Tick().
Here is the call graph for this function:

12.21.2.49 CF_CFDP_TickTransactions()

```
void CF_CFDP_TickTransactions (
    CF_Channel_t * chan )
```

Call R and then S tick functions for all active transactions.

Description

Traverses all transactions in the RX and TXW queues, and calls their tick functions. Note that the TXW queue is used twice: once for regular tick processing, and one for NAK response.

Assumptions, External Events, and Notes:

chan must not be NULL.

Parameters

chan	Channel to tick

Definition at line 1153 of file cf_cfdp.c.

References CF_Assert, CF_CFDP_DoTick(), CF_CFDP_R_Tick(), CF_CFDP_S_Tick(), CF_CFDP_S_Tick_Nak(), CF_CList_Traverse(), CF_QueueIdx_RX, CF_QueueIdx_TXW, CF_TickType_NUM_TYPES, CF_TickType_RX, CF_TickType_TXW_NAK, CF_CFDP_Tick_args::cont, CF_CFDP_Tick_args::early_exit, CF_Channel::qs, and CF_Channel::tick_type.
Referenced by CF_CFDP_CycleEngine().
Here is the call graph for this function:

12.21.2.50 CF_CFDP_TxFile()

```
CFE_Status_t CF_CFDP_TxFile (
    const char * src_filename,
    const char * dst_filename,
    CF_CFDP_Class_t cfdp_class,
    uint8 keep,
    uint8 chan,
    uint8 priority,
    CF_EntityId_t dest_id )
```

Begin transmit of a file.

Description

This function sets up a transaction for and starts transmit of the given filename.

Assumptions, External Events, and Notes:

src_filename must not be NULL. dst_filename must not be NULL.

Parameters

src_filename	Local filename
dst_filename	Remote filename
cfdp_class	Whether to perform a class 1 or class 2 transfer
keep	Whether to keep or delete the local file after completion
chan	CF channel number to use
priority	CF priority level
dest_id	Entity ID of remote receiver

Return values

CFE_SUCCESS	Successful execution. Operation was performed successfully

Returns

CFE_SUCCESS on success. CF_ERROR on error.

Definition at line 1262 of file cf_cfdp.c.
References CF_AppData, CF_Assert, CF_CFDP_MAX_CMD_TX_ERR_EID, CF_CFDP_TxFile_Initiate(), CF_ERROR, CF_FindUnusedTransaction(), CF_MAX_COMMANDED_PLAYBACK_FILES_PER_CHAN, CF_NUM_CHANNELS, CF_TxnState_IDLE, CFE_EVS_EventType_ERROR, CFE_EVS_SendEvent(), CFE_SUCCESS, CF_Engine::channels, CF_Flags_Tx::cmd_tx, CF_TxnFilenames::dst_filename, CF_AppData_t::engine, CF_Transaction::flags, CF_History::fnames, CF_Transaction::history, CF_Channel::num_cmd_tx, CF_TxnFilenames::src_filename, CF_Transaction::state, and CF_StateFlags::tx.
Referenced by CF_TxFileCmd().
Here is the call graph for this function:

12.21.2.51 CF_CFDP_TxFile_Initiate()

```
static void CF_CFDP_TxFile_Initiate (
    CF_Transaction_t * txn,
    CF_CFDP_Class_t cfdp_class,
    uint8 keep,
    uint8 chan,
    uint8 priority,
    CF_EntityId_t dest_id ) [static]
```

Definition at line 1229 of file cf_cfdp.c.
References CF_AppData, CF_CFDP_ArmInactTimer(), CF_CFDP_FindUnusedChunks(), CF_CFDP_InitTxnTxFile(), CF_CFDP_S_START_SEND_INF_EID, CF_Direction_TX, CF_FILENAME_MAX_LEN, CF_InsertSortPrio(),

CF_QueueIdx_PEND, CFE_EVS_EventType_INFORMATION, CFE_EVS_SendEvent(), CF_Engine::channels, CF_Transaction::chunks, CF_AppData_t::config_table, CF_History::dir, CF_TxnFilenames::dst_filename, CF_AppData_t::engine, CF_History::fnames, CF_Transaction::history, CF_ConfigTable::local_eid, CF_History::peer_eid, CF_History::seq_num, CF_Engine::seq_num, CF_History::src_eid, and CF_TxnFilenames::src_filename.
Referenced by CF_CFDP_ProcessPlaybackDirectory(), and CF_CFDP_TxFile().
Here is the call graph for this function:

12.21.2.52 CF_CFDP_UpdatePollPbCounted()

```
static void CF_CFDP_UpdatePollPbCounted (
    CF_Playback_t * pb,
    int up,
    uint8 * counter ) [static]
```

Definition at line 1437 of file cf_cfdp.c.
References CF_Assert, and CF_Playback::counted.
Referenced by CF_CFDP_ProcessPlaybackDirectories(), and CF_CFDP_ProcessPollingDirectories().

12.22 apps/cf/fsw/src/cf_cfdp.h File Reference

```
#include "cf_cfdp_types.h"
```

Data Structures

- struct CF_CFDP_CycleTx_args

  Structure for use with the CF_CFDP_CycleTx() function.
- struct CF_CFDP_Tick_args

  Structure for use with the CF_CFDP_DoTick() function.

Typedefs

- typedef struct CF_CFDP_CycleTx_args CF_CFDP_CycleTx_args_t

  Structure for use with the CF_CFDP_CycleTx() function.
- typedef struct CF_CFDP_Tick_args CF_CFDP_Tick_args_t

  Structure for use with the CF_CFDP_DoTick() function.

Functions

- void CF_CFDP_EncodeStart (CF_EncoderState_t *penc, void *msgbuf, CF_Logical_PduBuffer_t *ph, size_t encap_hdr_size, size_t total_size)

  Initiate the process of encoding a new PDU to send.

- void CF_CFDP_DecodeStart (CF_DecoderState_t *pdec, const void *msgbuf, CF_Logical_PduBuffer_t *ph, size_t encap_hdr_size, size_t total_size)

  Initiate the process of decoding a received PDU.
- void CF_CFDP_ResetTransaction (CF_Transaction_t *txn, int keep_history)

  Reset a transaction and all its internals to an unused state.
- void CF_CFDP_SetTxnStatus (CF_Transaction_t *txn, CF_TxnStatus_t txn_stat)

  Helper function to store transaction status code only.
- void CF_CFDP_SendEotPkt (CF_Transaction_t *txn)

  Send an end of transaction packet.
- CFE_Status_t CF_CFDP_InitEngine (void)

  Initialization function for the CFDP engine.
- void CF_CFDP_CycleEngine (void)

  Cycle the engine. Called once per wakeup.
- void CF_CFDP_DisableEngine (void)

  Disables the CFDP engine and resets all state in it.
- CFE_Status_t CF_CFDP_TxFile (const char *src_filename, const char *dst_filename, CF_CFDP_Class_t cfdp↩_class, uint8 keep, uint8 chan, uint8 priority, CF_EntityId_t dest_id)

  Begin transmit of a file.
- CFE_Status_t CF_CFDP_PlaybackDir (const char *src_filename, const char *dst_filename, CF_CFDP_Class_t cfdp_class, uint8 keep, uint8 chan, uint8 priority, uint16 dest_id)

  Begin transmit of a directory.
- CF_Logical_PduBuffer_t * CF_CFDP_ConstructPduHeader (const CF_Transaction_t *txn, CF_CFDP_FileDirective_t directive_code, CF_EntityId_t src_eid, CF_EntityId_t dst_eid, bool towards_sender, CF_TransactionSeq_t tsn, bool silent)

  Build the PDU header in the output buffer to prepare to send a packet.
- CFE_Status_t CF_CFDP_SendMd (CF_Transaction_t *txn)

  Build a metadata PDU for transmit.
- CFE_Status_t CF_CFDP_SendFd (CF_Transaction_t *txn, CF_Logical_PduBuffer_t *ph)

  Send a previously-assembled filedata PDU for transmit.
- CFE_Status_t CF_CFDP_SendEof (CF_Transaction_t *txn)

  Build an EOF PDU for transmit.
- CFE_Status_t CF_CFDP_SendAck (CF_Transaction_t *txn, CF_CFDP_AckTxnStatus_t ts, CF_CFDP_FileDirective_t dir_code, CF_CFDP_ConditionCode_t cc, CF_EntityId_t peer_eid, CF_TransactionSeq_t tsn)

  Build an ACK PDU for transmit.
- CFE_Status_t CF_CFDP_SendFin (CF_Transaction_t *txn, CF_CFDP_FinDeliveryCode_t dc, CF_CFDP_FinFileStatus_t fs, CF_CFDP_ConditionCode_t cc)

  Build a FIN PDU for transmit.
- CFE_Status_t CF_CFDP_SendNak (CF_Transaction_t *txn, CF_Logical_PduBuffer_t *ph)

  Send a previously-assembled NAK PDU for transmit.
- void CF_CFDP_AppendTlv (CF_Logical_TlvList_t *ptlv_list, CF_CFDP_TlvType_t tlv_type)

  Appends a single TLV value to the logical PDU data.
- CFE_Status_t CF_CFDP_RecvPh (uint8 chan_num, CF_Logical_PduBuffer_t *ph)

  Unpack a basic PDU header from a received message.
- CFE_Status_t CF_CFDP_RecvMd (CF_Transaction_t *txn, CF_Logical_PduBuffer_t *ph)

  Unpack a metadata PDU from a received message.
- CFE_Status_t CF_CFDP_RecvFd (CF_Transaction_t *txn, CF_Logical_PduBuffer_t *ph)

  Unpack a file data PDU from a received message.
- CFE_Status_t CF_CFDP_RecvEof (CF_Transaction_t *txn, CF_Logical_PduBuffer_t *ph)

Unpack an EOF PDU from a received message.

- CFE_Status_t CF_CFDP_RecvAck (CF_Transaction_t ∗txn, CF_Logical_PduBuffer_t ∗ph)

  Unpack an ACK PDU from a received message.
- CFE_Status_t CF_CFDP_RecvFin (CF_Transaction_t ∗txn, CF_Logical_PduBuffer_t ∗ph)

  Unpack an FIN PDU from a received message.
- CFE_Status_t CF_CFDP_RecvNak (CF_Transaction_t ∗txn, CF_Logical_PduBuffer_t ∗ph)

  Unpack a NAK PDU from a received message.
- void CF_CFDP_DispatchRecv (CF_Transaction_t ∗txn, CF_Logical_PduBuffer_t ∗ph)

  Dispatch received packet to its handler.
- void CF_CFDP_CancelTransaction (CF_Transaction_t ∗txn)

  Cancels a transaction.
- void CF_CFDP_InitTxnTxFile (CF_Transaction_t ∗txn, CF_CFDP_Class_t cfdp_class, uint8 keep, uint8 chan, uint8 priority)

  Helper function to set tx file state in a transaction.
- int CF_CFDP_CopyStringFromLV (char ∗buf, size_t buf_maxsz, const CF_Logical_Lv_t ∗src_lv)

  Copy string data from a lv (length, value) pair.
- void CF_CFDP_ArmAckTimer (CF_Transaction_t ∗txn)

  Arm the ACK timer.
- void CF_CFDP_RecvDrop (CF_Transaction_t ∗txn, CF_Logical_PduBuffer_t ∗ph)

  Receive state function to ignore a packet.
- void CF_CFDP_RecvIdle (CF_Transaction_t ∗txn, CF_Logical_PduBuffer_t ∗ph)

  Receive state function to process new rx transaction.
- CF_CListTraverse_Status_t CF_CFDP_CloseFiles (CF_CListNode_t ∗node, void ∗context)

  List traversal function to close all files in all active transactions.
- void CF_CFDP_CycleTx (CF_Channel_t ∗chan)

  Cycle the current active tx or make a new one active.
- CF_CListTraverse_Status_t CF_CFDP_CycleTxFirstActive (CF_CListNode_t ∗node, void ∗context)

  List traversal function that cycles the first active tx.
- void CF_CFDP_TickTransactions (CF_Channel_t ∗chan)

  Call R and then S tick functions for all active transactions.
- void CF_CFDP_ProcessPlaybackDirectory (CF_Channel_t ∗chan, CF_Playback_t ∗pb)

  Step each active playback directory.
- void CF_CFDP_ProcessPollingDirectories (CF_Channel_t ∗chan)

  Kick the dir playback if timer elapsed.
- CF_CListTraverse_Status_t CF_CFDP_DoTick (CF_CListNode_t ∗node, void ∗context)

  List traversal function that calls a r or s tick function.
- bool CF_CFDP_IsPollingDir (const char ∗src_file, uint8 chan_num)

  Check if source file came from polling directory.
- void CF_CFDP_HandleNotKeepFile (CF_Transaction_t ∗txn)

  Remove/Move file after transaction.
- void CF_CFDP_MoveFile (const char ∗src, const char ∗dest_dir)

  Move File.

12.22.1 Detailed Description

The CF Application CFDP engine and packet parsing header file

12.22.2 Typedef Documentation

12.22.2.1 CF_CFDP_CycleTx_args_t `typedef struct CF_CFDP_CycleTx_args CF_CFDP_CycleTx_args_t`

Structure for use with the CF_CFDP_CycleTx() function.

12.22.2.2 CF_CFDP_Tick_args_t `typedef struct CF_CFDP_Tick_args CF_CFDP_Tick_args_t`

Structure for use with the CF_CFDP_DoTick() function.

12.22.3 Function Documentation

12.22.3.1 CF_CFDP_AppendTlv()

```
void CF_CFDP_AppendTlv (
    CF_Logical_TlvList_t * ptlv_list,
    CF_CFDP_TlvType_t tlv_type )
```

Appends a single TLV value to the logical PDU data.

This function implements common functionality between SendEof and SendFin which append a TLV value specifying the faulting entity ID.

Assumptions, External Events, and Notes:

ptlv_list must not be NULL. Only CF_CFDP_TLV_TYPE_ENTITY_ID type is currently implemented

Parameters

ptlv_list	TLV list from current PDU buffer.
tlv_type	Type of TLV to append. Currently must be CF_CFDP_TLV_TYPE_ENTITY_ID.

Definition at line 371 of file cf_cfdp.c.

References CF_AppData, CF_CFDP_GetValueEncodedSize(), CF_CFDP_TLV_TYPE_ENTITY_ID, CF_PDU_MAX_TLV, CF_AppData_t::config_table, CF_Logical_Tlv::data, CF_Logical_TlvData::data_ptr, CF_Logical_TlvData::eid, CF_Logical_Tlv::length, CF_ConfigTable::local_eid, CF_Logical_TlvList::num_tlv, CF_Logical_TlvList::tlv, and CF_Logical_Tlv::type.

Referenced by CF_CFDP_SendEof(), and CF_CFDP_SendFin().

Here is the call graph for this function:

12.22.3.2 CF_CFDP_ArmAckTimer()

```
void CF_CFDP_ArmAckTimer (
    CF_Transaction_t * txn )
```

Arm the ACK timer.

Description

Helper function to arm the ACK timer and set the flag.

Assumptions, External Events, and Notes:

txn must not be NULL.

Parameters

txn	Pointer to the transaction state

Definition at line 123 of file cf_cfdp.c.
References CF_Transaction::ack_timer, CF_Flags_Common::ack_timer_armed, CF_ChannelConfig::ack_timer_s, CF_AppData, CF_Timer_InitRelSec(), CF_ConfigTable::chan, CF_Transaction::chan_num, CF_StateFlags::com, CF_AppData_t::config_table, and CF_Transaction::flags.
Referenced by CF_CFDP_R2_SubstateRecvFileData(), CF_CFDP_R_Init(), CF_CFDP_R_Tick(), CF_CFDP_S2_Nak_Arm(), and CF_CFDP_S_Tick().
Here is the call graph for this function:

12.22.3.3 CF_CFDP_CancelTransaction()

```
void CF_CFDP_CancelTransaction ( CF_Transaction_t * txn )
```

Cancels a transaction.

Assumptions, External Events, and Notes:

txn must not be NULL.

Parameters

txn	Pointer to the transaction state

Definition at line 1734 of file cf_cfdp.c.
References CF_Flags_Common::canceled, CF_CFDP_IsSender(), CF_CFDP_R_Cancel(), CF_CFDP_S_Cancel(), CF_CFDP_SetTxnStatus(), CF_TxnStatus_CANCEL_REQUEST_RECEIVED, CF_StateFlags::com, and CF_Transaction::flags.
Referenced by CF_CmdCancel_Txn().

Here is the call graph for this function:

12.22.3.4 CF_CFDP_CloseFiles()

```
CF_CListTraverse_Status_t CF_CFDP_CloseFiles (
    CF_CListNode_t * node,
    void * context )
```

List traversal function to close all files in all active transactions.
This helper is used in conjunction with CF_CList_Traverse().

Assumptions, External Events, and Notes:

node must not be NULL.

Parameters

node	List node pointer
context	Opaque pointer, not used in this function

Returns

integer traversal code

Return values

Always	CF_LIST_CONT indicate list traversal should not exit early.

Definition at line 1751 of file cf_cfdp.c.
References CF_CLIST_CONT, CF_WrappedClose(), container_of, CF_Transaction::fd, and OS_ObjectIdDefined().
Referenced by CF_CFDP_DisableEngine().

Here is the call graph for this function:

12.22.3.5 CF_CFDP_ConstructPduHeader()

```
CF_Logical_PduBuffer_t* CF_CFDP_ConstructPduHeader (
    const CF_Transaction_t * txn,
    CF_CFDP_FileDirective_t directive_code,
    CF_EntityId_t src_eid,
    CF_EntityId_t dst_eid,
    bool towards_sender,
    CF_TransactionSeq_t tsn,
    bool silent )
```

Build the PDU header in the output buffer to prepare to send a packet.

Assumptions, External Events, and Notes:

txn must not be NULL.

Parameters

txn	Pointer to the transaction object
directive_code	Code to use for file directive headers (set to 0 for data)
src_eid	Value to set in source entity ID field
dst_eid	Value to set in destination entity ID field
towards_sender	Whether this is transmitting toward the sender entity
tsn	Transaction sequence number to put into PDU
silent	If true, suppress error event if no message buffer available

Returns

Pointer to PDU buffer which may be filled with additional data

Return values

NULL	if no message buffer available

Definition at line 238 of file cf_cfdp.c.
References CF_CFDP_CLASS_1, CF_CFDP_EncodeFileDirectiveHeader(), CF_CFDP_EncodeHeaderWithout↩Size(), CF_CFDP_GetClass(), CF_CFDP_GetValueEncodedSize(), CF_CFDP_MsgOutGet(), CF_Logical_Pdu↩

Header::destination_eid, CF_Logical_PduHeader::direction, CF_Logical_PduFileDirectiveHeader::directive_code, CF_Logical_PduHeader::eid_length, CF_Logical_PduBuffer::fdirective, CF_Logical_PduBuffer::pdu_header, CF_Logical_PduHeader::pdu_type, CF_Logical_PduBuffer::penc, CF_Logical_PduHeader::sequence_num, CF_Logical_PduHeader::source_eid, CF_Logical_PduHeader::txm_mode, CF_Logical_PduHeader::txn_seq_length, and CF_Logical_PduHeader::version.
Referenced by CF_CFDP_R_SubstateSendNak(), CF_CFDP_S_SendFileData(), CF_CFDP_SendAck(), CF_CFDP_SendEof(), CF_CFDP_SendFin(), and CF_CFDP_SendMd().
Here is the call graph for this function:

12.22.3.6 CF_CFDP_CopyStringFromLV()

```
int CF_CFDP_CopyStringFromLV (
    char * buf,
    size_t buf_maxsz,
    const CF_Logical_Lv_t * src_lv )
```

Copy string data from a lv (length, value) pair.
This copies a string value from an LV pair inside a PDU buffer. In CF this is used for file names embedded within PDUs.

Note

This function assures that the output string is terminated appropriately, such that it can be used as a normal C string. As such, the buffer size must be at least 1 byte larger than the maximum string length.

Assumptions, External Events, and Notes:

src_lv must not be NULL. buf must not be NULL.

Parameters

buf	Pointer to buffer to store string
buf_maxsz	Total size of buffer pointer to by buf (usable size is 1 byte less, for termination)
src_lv	Pointer to LV pair from logical PDU buffer

Returns

The resulting string length, NOT including termination character

Return values

CF_ERROR	on error

Definition at line 1714 of file cf_cfdp.c.
References CF_ERROR, CF_Logical_Lv::data_ptr, and CF_Logical_Lv::length.
Referenced by CF_CFDP_RecvMd().

12.22.3.7 CF_CFDP_CycleEngine() `void CF_CFDP_CycleEngine ( void )`

Cycle the engine. Called once per wakeup.

Assumptions, External Events, and Notes:

None

Definition at line 1549 of file cf_cfdp.c.
References CF_AppData, CF_CFDP_CycleTx(), CF_CFDP_ProcessPlaybackDirectories(), CF_CFDP_Process↩PollingDirectories(), CF_CFDP_ReceiveMessage(), CF_CFDP_TickTransactions(), CF_NUM_CHANNELS, CF_Hk↩Packet_Payload::channel_hk, CF_Engine::channels, CF_Engine::enabled, CF_AppData_t::engine, CF_HkChannel_↩Data::frozen, CF_AppData_t::hk, CF_Engine::outgoing_counter, and CF_HkPacket::Payload.
Referenced by CF_WakeupCmd().
Here is the call graph for this function:

12.22.3.8 CF_CFDP_CycleTx()

```
void CF_CFDP_CycleTx (
    CF_Channel_t * chan )
```

Cycle the current active tx or make a new one active.

Description

First traverses all tx transactions on the active queue. If at least one is found, then it stops. Otherwise it moves a transaction on the pending queue to the active queue and tries again to find an active one.

Assumptions, External Events, and Notes:

None

Parameters

chan	Channel to cycle

Definition at line 1077 of file cf_cfdp.c.
References CF_AppData, CF_CFDP_CycleTxFirstActive(), CF_CList_Traverse(), CF_MoveTransaction(), CF_QueueIdx_PEND, CF_QueueIdx_TXA, CF_ConfigTable::chan, CF_Engine::channels, CF_AppData_t::config_table, container_of, CF_Channel::cur, CF_ChannelConfig::dequeue_enabled, CF_AppData_t::engine, CF_Channel::qs, and CF_CFDP_CycleTx_args::ran_one.
Referenced by CF_CFDP_CycleEngine().
Here is the call graph for this function:

12.22.3.9 CF_CFDP_CycleTxFirstActive()

```
CF_CListTraverse_Status_t CF_CFDP_CycleTxFirstActive (
    CF_CListNode_t * node,
    void * context )
```

List traversal function that cycles the first active tx.
This helper is used in conjunction with CF_CList_Traverse().

Description

There can only be one active tx transaction per engine cycle. This function finds the first active, and then sends file data PDUs until there are no outgoing message buffers.

Assumptions, External Events, and Notes:

node must not be NULL. Context must not be NULL.

Parameters

node	Pointer to list node
context	Pointer to CF_CFDP_CycleTx_args_t object (passed through)

Returns

integer traversal code

Return values

CF_CLIST_EXIT	when it's found, which terminates list traversal
CF_CLIST_CONT	when it's isn't found, which causes list traversal to continue

Definition at line 1041 of file cf_cfdp.c.
References CF_Assert, CF_CFDP_DispatchTx(), CF_CLIST_CONT, CF_CLIST_EXIT, CF_PERF_ID_PDUSENT, CF_QueueIdx_TXA, CFE_ES_PerfLogEntry, CFE_ES_PerfLogExit, CF_CFDP_CycleTx_args::chan, CF_Transaction::chan_num, CF_StateFlags::com, container_of, CF_Channel::cur, CF_Transaction::flags, CF_Flags_Common::q_index, CF_CFDP_CycleTx_args::ran_one, and CF_Flags_Common::suspended.
Referenced by CF_CFDP_CycleTx().
Here is the call graph for this function:

12.22.3.10 CF_CFDP_DecodeStart()

```
void CF_CFDP_DecodeStart (
    CF_DecoderState_t * pdec,
    const void * msgbuf,
    CF_Logical_PduBuffer_t * ph,
    size_t encap_hdr_size,
    size_t total_size )
```

Initiate the process of decoding a received PDU.
This resets the decoder and PDU buffer to initial values, and prepares for decoding a new PDU that was received from a remote entity.

Parameters

pdec	Decoder state structure, will be reset/initialized by this call to point to msgbuf.
msgbuf	Pointer to encapsulation message, in this case a CFE software bus message
ph	Pointer to logical PDU buffer content, will be cleared to all zero by this call
encap_hdr_size	Offset of first CFDP PDU octet within buffer
total_size	Total size of msgbuf encapsulation structure (decoding cannot exceed this)

Definition at line 89 of file cf_cfdp.c.
References CF_DecoderState::base, CF_CFDP_CodecReset(), CF_CFDP_CodecSetDone(), CF_DecoderState↩::codec_state, CF_CodecState::max_size, and CF_Logical_PduBuffer::pdec.
Referenced by CF_CFDP_ReceiveMessage().
Here is the call graph for this function:

12.22.3.11 CF_CFDP_DisableEngine() `void CF_CFDP_DisableEngine ( void )`

Disables the CFDP engine and resets all state in it.

Assumptions, External Events, and Notes:

None

Definition at line 1767 of file cf_cfdp.c.
References CF_Playback::busy, CF_AppData, CF_CFDP_CloseFiles(), CF_CList_Traverse(), CF_MAX_COMMAND↩ED_PLAYBACK_DIRECTORIES_PER_CHAN, CF_MAX_POLLING_DIR_PER_CHAN, CF_NUM_CHANNELS, CF_↩QueueIdx_RX, CF_QueueIdx_TXA, CF_QueueIdx_TXW, CFE_SB_DeletePipe(), CF_HkPacket_Payload::channel_hk, CF_Engine::channels, CF_Playback::dir_id, CF_Engine::enabled, CF_AppData_t::engine, CF_AppData_t::hk, OS_↩DirectoryClose(), CF_HkPacket::Payload, CF_Poll::pb, CF_Channel::pipe, CF_Channel::playback, CF_Channel::poll, CF_HkChannel_Data::q_size, and CF_Channel::qs.
Referenced by CF_DisableEngineCmd().

Here is the call graph for this function:

12.22.3.12 CF_CFDP_DispatchRecv()

```
void CF_CFDP_DispatchRecv (
    CF_Transaction_t * txn,
    CF_Logical_PduBuffer_t * ph )
```

Dispatch received packet to its handler.

This dispatches the PDU to the appropriate handler based on the transaction state

Assumptions, External Events, and Notes:

txn must not be null. It must be an initialized transaction.

Parameters

txn	Pointer to the transaction state
ph	The logical PDU buffer being received

Definition at line 169 of file cf_cfdp.c.

References CF_CFDP_ArmInactTimer(), CF_CFDP_R1_Recv(), CF_CFDP_R2_Recv(), CF_CFDP_RecvDrop(), CF↩_CFDP_RecvIdle(), CF_CFDP_RxStateDispatch(), CF_CFDP_S1_Recv(), CF_CFDP_S2_Recv(), CF_TxnState_DR↩OP, CF_TxnState_IDLE, CF_TxnState_R1, CF_TxnState_R2, CF_TxnState_S1, CF_TxnState_S2, and CF_CFDP_↩TxnRecvDispatchTable_t::rx.

Referenced by CF_CFDP_ReceiveMessage(), and CF_CFDP_RecvIdle().

Here is the call graph for this function:

12.22.3.13 CF_CFDP_DoTick()

```
CF_CListTraverse_Status_t CF_CFDP_DoTick (
    CF_CListNode_t * node,
    void * context )
```

List traversal function that calls a r or s tick function.
This helper is used in conjunction with CF_CList_Traverse().

Assumptions, External Events, and Notes:

node must not be NULL, context must not be NULL.

Parameters

node	Pointer to list node
context	Pointer to CF_CFDP_Tick_args_t object (passed through)

Returns

integer traversal code

Return values

CF_CLIST_EXIT	when it's found, which terminates list traversal
CF_CLIST_CONT	when it's isn't found, which causes list traversal to continue

Definition at line 1120 of file cf_cfdp.c.
References CF_CLIST_CONT, CF_CLIST_EXIT, CF_CFDP_Tick_args::chan, CF_StateFlags::com, CF_CFDP_Tick↩

_args::cont, container_of, CF_Channel::cur, CF_CFDP_Tick_args::early_exit, CF_Transaction::flags, CF_CFDP_Tick↩ _args::fn, and CF_Flags_Common::suspended.
Referenced by CF_CFDP_TickTransactions().

12.22.3.14 CF_CFDP_EncodeStart()

```
void CF_CFDP_EncodeStart (
    CF_EncoderState_t * penc,
    void * msgbuf,
    CF_Logical_PduBuffer_t * ph,
    size_t encap_hdr_size,
    size_t total_size )
```

Initiate the process of encoding a new PDU to send.
This resets the encoder and PDU buffer to initial values, and prepares for encoding a new PDU for sending to a remote entity.

Parameters

penc	Encoder state structure, will be reset/initialized by this call to point to msgbuf.
msgbuf	Pointer to encapsulation message, in this case a CFE software bus message
ph	Pointer to logical PDU buffer content, will be cleared to all zero by this call
encap_hdr_size	Offset of first CFDP PDU octet within buffer
total_size	Allocated size of msgbuf encapsulation structure (encoding cannot exceed this)

Definition at line 55 of file cf_cfdp.c.
References CF_EncoderState::base, CF_CFDP_CodecReset(), CF_CFDP_CodecSetDone(), CF_EncoderState↩ ::codec_state, CF_CodecState::max_size, and CF_Logical_PduBuffer::penc.
Referenced by CF_CFDP_MsgOutGet().
Here is the call graph for this function:

12.22.3.15 CF_CFDP_HandleNotKeepFile()

```
void CF_CFDP_HandleNotKeepFile (
    CF_Transaction_t * txn )
```

Remove/Move file after transaction.
This helper is used to handle "not keep" file option after a transaction.

Assumptions, External Events, and Notes:

Definition at line 1850 of file cf_cfdp.c.
References CF_AppData, CF_CFDP_IsPollingDir(), CF_CFDP_IsSender(), CF_CFDP_MoveFile(), CF_TxnStatus_↩IsError(), CF_ConfigTable::chan, CF_Transaction::chan_num, CF_AppData_t::config_table, CF_TxnFilenames::dst_↩filename, CF_ConfigTable::fail_dir, CF_History::fnames, CF_Transaction::history, CF_ChannelConfig::move_dir, OS_↩remove(), CF_TxnFilenames::src_filename, and CF_History::txn_stat.
Referenced by CF_CFDP_ResetTransaction().
Here is the call graph for this function:

12.22.3.16 CF_CFDP_InitEngine()

```
CFE_Status_t CF_CFDP_InitEngine (
    void )
```

Initialization function for the CFDP engine.

Description

Performs all initialization of the CFDP engine

Assumptions, External Events, and Notes:

Only called once.

Return values

CFE_SUCCESS	Successful execution. Operation was performed successfully

Returns

anything else on error.

Definition at line 931 of file cf_cfdp.c.
References CF_AppData, CF_Assert, CF_CHANNEL_NUM_RX_CHUNKS_PER_TRANSACTION, CF_CHANN↩EL_NUM_TX_CHUNKS_PER_TRANSACTION, CF_CHANNEL_PIPE_PREFIX, CF_ChunkListInit(), CF_CList_↩InitNode(), CF_CList_InsertBack(), CF_CList_InsertBack_Ex(), CF_CR_PIPE_ERR_EID, CF_Direction_NUM, C↩

F_FreeTransaction(), CF_INIT_SEM_ERR_EID, CF_INIT_SUB_ERR_EID, CF_NUM_CHANNELS, CF_NUM_CHUNKS_ALL_CHANNELS, CF_NUM_HISTORIES_PER_CHANNEL, CF_NUM_TRANSACTIONS_PER_CHANNEL, CF_QueueIdx_HIST_FREE, CF_STARTUP_SEM_MAX_RETRIES, CF_STARTUP_SEM_TASK_DELAY, CFE_EVS_EventType_ERROR, CFE_EVS_SendEvent(), CFE_SB_CreatePipe(), CFE_SB_SubscribeLocal(), CFE_SB_ValueToMsgId(), CFE_SUCCESS, CF_ConfigTable::chan, CF_Transaction::chan_num, CF_Engine::channels, CF_Engine::chunk_mem, CF_ChunkWrapper::chunks, CF_Engine::chunks, CF_History::cl_node, CF_ChunkWrapper::cl_node, CF_AppData_t::config_table, CF_Channel::cs, CF_Engine::enabled, CF_AppData_t::engine, CF_Engine::histories, CF_ChannelConfig::mid_input, OS_CountSemGetIdByName(), OS_ERR_NAME_NOT_FOUND, OS_SUCCESS, OS_TaskDelay(), CF_Channel::pipe, CF_ChannelConfig::pipe_depth_input, CF_Channel::sem_id, CF_ChannelConfig::sem_name, and CF_Engine::transactions.
Referenced by CF_EnableEngineCmd(), and CF_Init().
Here is the call graph for this function:

12.22.3.17 CF_CFDP_InitTxnTxFile()

```
void CF_CFDP_InitTxnTxFile (
    CF_Transaction_t * txn,
    CF_CFDP_Class_t cfdp_class,
    uint8 keep,
    uint8 chan,
    uint8 priority )
```

Helper function to set tx file state in a transaction.
This sets various fields inside a newly-allocated transaction structure appropriately for sending a file.

Assumptions, External Events, and Notes:

txn must not be NULL.

Parameters

txn	Pointer to the transaction state
cfdp_class	Set to class 1 or class 2

Parameters

keep	Whether to keep the local file
chan	CF channel number
priority	Priority of transfer

Definition at line 1216 of file cf_cfdp.c.
References CF_TxnState_S1, CF_TxnState_S2, CF_Transaction::chan_num, CF_Transaction::keep, CF_↩ Transaction::priority, and CF_Transaction::state.
Referenced by CF_CFDP_ReceiveMessage(), and CF_CFDP_TxFile_Initiate().

12.22.3.18 CF_CFDP_IsPollingDir()

```
bool CF_CFDP_IsPollingDir (
    const char * src_file,
    uint8 chan_num )
```

Check if source file came from polling directory.

Assumptions, External Events, and Notes:

Return values

true/false	

Definition at line 1816 of file cf_cfdp.c.
References CF_AppData, CF_FILENAME_MAX_LEN, CF_MAX_POLLING_DIR_PER_CHAN, CF_ConfigTable::chan, CF_AppData_t::config_table, CF_ChannelConfig::polldir, and CF_PollDir::src_dir.
Referenced by CF_CFDP_HandleNotKeepFile().

12.22.3.19 CF_CFDP_MoveFile()

```
void CF_CFDP_MoveFile (
    const char * src,
    const char * dest_dir )
```

Move File.
This helper is used to move a file.

Assumptions, External Events, and Notes:

Definition at line 1884 of file cf_cfdp.c.
References OS_ERROR, OS_MAX_PATH_LEN, OS_mv(), OS_remove(), and OS_SUCCESS.
Referenced by CF_CFDP_HandleNotKeepFile().
Here is the call graph for this function:

12.22.3.20 CF_CFDP_PlaybackDir()

```
CFE_Status_t CF_CFDP_PlaybackDir (
    const char * src_filename,
    const char * dst_filename,
    CF_CFDP_Class_t cfdp_class,
    uint8 keep,
    uint8 chan,
    uint8 priority,
    uint16 dest_id )
```

Begin transmit of a directory.

Description

This function sets up CF_Playback_t structure with state so it can become part of the directory polling done at each engine cycle.

Assumptions, External Events, and Notes:

src_filename must not be NULL. dst_filename must not be NULL.

Parameters

src_filename	Local filename
dst_filename	Remote filename
cfdp_class	Whether to perform a class 1 or class 2 transfer
keep	Whether to keep or delete the local file after completion
chan	CF channel number to use
priority	CF priority level
dest_id	Entity ID of remote receiver

Return values

CFE_SUCCESS	Successful execution. Operation was performed successfully

Returns

CFE_SUCCESS on success. CF_ERROR on error.

Definition at line 1343 of file cf_cfdp.c.
References CF_Playback::busy, CF_AppData, CF_CFDP_DIR_SLOT_ERR_EID, CF_CFDP_PlaybackDir_Initiate(), CF_ERROR, CF_MAX_COMMANDED_PLAYBACK_DIRECTORIES_PER_CHAN, CFE_EVS_EventType_ERROR, CFE_EVS_SendEvent(), CF_Engine::channels, CF_AppData_t::engine, and CF_Channel::playback.
Referenced by CF_PlaybackDirCmd().
Here is the call graph for this function:

12.22.3.21 CF_CFDP_ProcessPlaybackDirectory()

```
void CF_CFDP_ProcessPlaybackDirectory (
    CF_Channel_t * chan,
    CF_Playback_t * pb )
```

Step each active playback directory.

Description

Check if a playback directory needs iterated, and if so does, and if a valid file is found initiates playback on it.

Assumptions, External Events, and Notes:

chan must not be NULL, pb must not be NULL.

Parameters

chan	The channel associated with the playback
pb	The playback state

Definition at line 1373 of file cf_cfdp.c.
References CF_Playback::busy, CF_AppData, CF_Assert, CF_CFDP_TxFile_Initiate(), CF_FILENAME_MAX_LEN, CF_FILENAME_MAX_NAME, CF_FILENAME_MAX_PATH, CF_FindUnusedTransaction(), CF_NUM_TRANSACTI↩ ONS_PER_PLAYBACK, CF_PERF_ID_DIRREAD, CF_Playback::cfdp_class, CFE_ES_PerfLogEntry, CFE_ES_Perf↩ LogExit, CFE_SUCCESS, CF_Engine::channels, CF_Playback::dest_id, CF_Playback::dir_id, CF_Playback::diropen, CF_TxnFilenames::dst_filename, CF_AppData_t::engine, os_dirent_t::FileName, CF_History::fnames, CF_Playback↩ ::fnames, CF_Transaction::history, CF_Playback::keep, CF_Playback::num_ts, OS_DirectoryClose(), OS_Directory↩ Read(), CF_Transaction::pb, CF_Playback::priority, and CF_TxnFilenames::src_filename.

Referenced by CF_CFDP_ProcessPlaybackDirectories(), and CF_CFDP_ProcessPollingDirectories().
Here is the call graph for this function:

12.22.3.22 CF_CFDP_ProcessPollingDirectories()

```
void CF_CFDP_ProcessPollingDirectories ( CF_Channel_t * chan )
```

Kick the dir playback if timer elapsed.

Description

This function waits for the polling directory interval timer, and if it has expired, starts a playback in the polling directory.

Assumptions, External Events, and Notes:

chan must not be NULL.

Parameters

chan	The channel associated with the playback

Definition at line 1480 of file cf_cfdp.c.
References CF_Playback::busy, CF_AppData, CF_CFDP_PlaybackDir_Initiate(), CF_CFDP_ProcessPlaybackDirectory(), CF_CFDP_UpdatePollPbCounted(), CF_MAX_POLLING_DIR_PER_CHAN, CF_Timer_Expired(), CF_Timer_InitRelSec(), CF_Timer_Tick(), CF_PollDir::cfdp_class, CF_ConfigTable::chan, CF_HkPacket_Payload::channel_hk, CF_Engine::channels, CF_AppData_t::config_table, CF_PollDir::dest_eid, CF_PollDir::dst_dir, CF_PollDir::enabled, CF_AppData_t::engine, CF_AppData_t::hk, CF_PollDir::interval_sec, CF_Poll::interval_timer, CF_Playback::num_ts, CF_HkPacket::Payload, CF_Poll::pb, CF_Channel::poll, CF_HkChannel_Data::poll_counter, CF_ChannelConfig::polldir, CF_PollDir::priority, CF_PollDir::src_dir, and CF_Poll::timer_set.
Referenced by CF_CFDP_CycleEngine().

Here is the call graph for this function:

12.22.3.23 CF_CFDP_RecvAck()

```
CFE_Status_t CF_CFDP_RecvAck (
    CF_Transaction_t * txn,
    CF_Logical_PduBuffer_t * ph )
```

Unpack an ACK PDU from a received message.
This should only be invoked for buffers that have been identified as an acknowledgment PDU.

Assumptions, External Events, and Notes:

txn must not be NULL.

Parameters

txn	Pointer to the transaction state
ph	The logical PDU buffer being received

Returns

integer status code

Return values

CFE_SUCCESS	on success
CF_SHORT_PDU_ERROR	on error

Definition at line 767 of file cf_cfdp.c.
References CF_Logical_IntHeader::ack, CF_CFDP_DecodeAck(), CF_CODEC_GET_SIZE, CF_CODEC_IS_OK, CF_PDU_ACK_SHORT_ERR_EID, CF_SHORT_PDU_ERROR, CFE_EVS_EventType_ERROR, CFE_EVS_Send↩Event(), CFE_SUCCESS, CF_Logical_PduBuffer::int_header, and CF_Logical_PduBuffer::pdec.
Referenced by CF_CFDP_R2_Recv_fin_ack(), and CF_CFDP_S2_WaitForEofAck().

Here is the call graph for this function:

12.22.3.24 CF_CFDP_RecvDrop()

```
void CF_CFDP_RecvDrop (
    CF_Transaction_t * txn,
    CF_Logical_PduBuffer_t * ph )
```

Receive state function to ignore a packet.

Description

This function signature must match all receive state functions. The parameter txn is ignored here.

Assumptions, External Events, and Notes:

txn must not be NULL.

Parameters

txn	Pointer to the transaction state
ph	The logical PDU buffer being received

Definition at line 836 of file cf_cfdp.c.
References CF_AppData, CF_Transaction::chan_num, CF_HkPacket_Payload::channel_hk, CF_HkChannel_Data↩ ::counters, CF_HkRecv::dropped, CF_AppData_t::hk, CF_HkPacket::Payload, and CF_HkCounters::recv.
Referenced by CF_CFDP_DispatchRecv().

12.22.3.25 CF_CFDP_RecvEof()

```
CFE_Status_t CF_CFDP_RecvEof (
    CF_Transaction_t * txn,
    CF_Logical_PduBuffer_t * ph )
```

Unpack an EOF PDU from a received message.
This should only be invoked for buffers that have been identified as an end of file PDU.

Assumptions, External Events, and Notes:

txn must not be NULL.

Parameters

txn	Pointer to the transaction state
ph	The logical PDU buffer being received

Returns

integer status code

Return values

CFE_SUCCESS	on success
CF_SHORT_PDU_ERROR	on error

Definition at line 745 of file cf_cfdp.c.
References CF_CFDP_DecodeEof(), CF_CODEC_GET_SIZE, CF_CODEC_IS_OK, CF_PDU_EOF_SHORT_ERR↩_EID, CF_SHORT_PDU_ERROR, CFE_EVS_EventType_ERROR, CFE_EVS_SendEvent(), CFE_SUCCESS, CF_↩Logical_IntHeader::eof, CF_Logical_PduBuffer::int_header, and CF_Logical_PduBuffer::pdec.
Referenced by CF_CFDP_R_SubstateRecvEof().
Here is the call graph for this function:

12.22.3.26 CF_CFDP_RecvFd()

```
CFE_Status_t CF_CFDP_RecvFd (
    CF_Transaction_t * txn,
    CF_Logical_PduBuffer_t * ph )
```

Unpack a file data PDU from a received message.
This should only be invoked for buffers that have been identified as a file data PDU.

Assumptions, External Events, and Notes:

txn must not be NULL.

Parameters

txn	Pointer to the transaction state
ph	The logical PDU buffer being received

Returns

integer status code

Return values

CFE_SUCCESS	on success

Return values

CF_ERROR	for general errors
CF_SHORT_PDU_ERROR	PDU too short

Definition at line 699 of file cf_cfdp.c.
References CF_AppData, CF_CFDP_DecodeFileDataHeader(), CF_CFDP_SetTxnStatus(), CF_CODEC_GET_SIZE, CF_CODEC_IS_OK, CF_CODEC_SET_DONE, CF_ERROR, CF_PDU_FD_SHORT_ERR_EID, CF_PDU_FD_UNS↩UPPORTED_ERR_EID, CF_SHORT_PDU_ERROR, CF_TxnStatus_PROTOCOL_ERROR, CFE_EVS_EventType_↩ERROR, CFE_EVS_SendEvent(), CFE_SUCCESS, CF_Transaction::chan_num, CF_HkPacket_Payload::channel_↩hk, CF_HkChannel_Data::counters, CF_Logical_PduHeader::crc_flag, CF_Logical_PduFileDataHeader::data_len, C↩F_HkRecv::error, CF_Logical_IntHeader::fd, CF_AppData_t::hk, CF_Logical_PduBuffer::int_header, CF_HkPacket::↩Payload, CF_Logical_PduBuffer::pdec, CF_Logical_PduBuffer::pdu_header, CF_HkCounters::recv, and CF_Logical_↩PduHeader::segment_meta_flag.
Referenced by CF_CFDP_R1_SubstateRecvFileData(), and CF_CFDP_R2_SubstateRecvFileData().
Here is the call graph for this function:

12.22.3.27 CF_CFDP_RecvFin()

```
CFE_Status_t CF_CFDP_RecvFin (
    CF_Transaction_t * txn,
    CF_Logical_PduBuffer_t * ph )
```

Unpack an FIN PDU from a received message.
This should only be invoked for buffers that have been identified as a final PDU.

Assumptions, External Events, and Notes:

txn must not be NULL.

Parameters

txn	Pointer to the transaction state
ph	The logical PDU buffer being received

Returns

integer status code

Return values

CFE_SUCCESS	on success
CF_SHORT_PDU_ERROR	on error

Definition at line 790 of file cf_cfdp.c.
References CF_CFDP_DecodeFin(), CF_CODEC_GET_SIZE, CF_CODEC_IS_OK, CF_PDU_FIN_SHORT_ERR_EID, CF_SHORT_PDU_ERROR, CFE_EVS_EventType_ERROR, CFE_EVS_SendEvent(), CFE_SUCCESS, CF_Logical_IntHeader::fin, CF_Logical_PduBuffer::int_header, and CF_Logical_PduBuffer::pdec.
Referenced by CF_CFDP_ReceiveMessage().
Here is the call graph for this function:

12.22.3.28 CF_CFDP_RecvIdle()

```
void CF_CFDP_RecvIdle (
    CF_Transaction_t * txn,
    CF_Logical_PduBuffer_t * ph )
```

Receive state function to process new rx transaction.

Description

An idle transaction has never had message processing performed on it. Typically, the first packet received for a transaction would be the metadata PDU. There's a special case for R2 where the metadata PDU could be missed, and filedata comes in instead. In that case, an R2 transaction must still be started.

Assumptions, External Events, and Notes:

txn must not be NULL. There must be a received message.

Parameters

txn	Pointer to the transaction state
ph	The logical PDU buffer being received

Definition at line 847 of file cf_cfdp.c.
References CF_AppData, CF_CFDP_DispatchRecv(), CF_CFDP_FD_UNHANDLED_ERR_EID, CF_CFDP_FileDirective_METADATA, CF_CFDP_FindUnusedChunks(), CF_CFDP_IDLE_MD_ERR_EID, CF_CFDP_R_Init(), CF_CFDP_RecvMd(), CF_CFDP_ResetTransaction(), CF_Direction_RX, CF_TxnState_DROP, CF_TxnState_IDLE, CF_TxnState_R1, CF_TxnState_R2, CFE_EVS_EventType_ERROR, CFE_EVS_SendEvent(), CF_Transaction::chan_num, CF_HkPacket_Payload::channel_hk, CF_Engine::channels, CF_Transaction::chunks, CF_HkChannel_Data::counters, CF_Logical_PduFileDirectiveHeader::directive_code, CF_AppData_t::engine, CF_HkRecv::error, CF_Logical_PduBuffer::fdirective, CF_Transaction::flags, CF_Transaction::history, CF_AppData_t::hk, CF_Flags_Rx::md_recv, CF_HkPacket::Payload, CF_Logical_PduBuffer::pdu_header, CF_Logical_PduHeader::pdu_type, CF_History::peer_eid, CF_HkCounters::recv, CF_StateFlags::rx, CF_History::seq_num, CF_Logical_PduHeader::sequence_num, CF_Logical_PduHeader::source_eid, CF_History::src_eid, CF_Transaction::state, and CF_Logical_PduHeader::txm_mode.
Referenced by CF_CFDP_DispatchRecv().

Here is the call graph for this function:

12.22.3.29 CF_CFDP_RecvMd()

```
CFE_Status_t CF_CFDP_RecvMd (
    CF_Transaction_t * txn,
    CF_Logical_PduBuffer_t * ph )
```

Unpack a metadata PDU from a received message.
This should only be invoked for buffers that have been identified as a metadata PDU.

Assumptions, External Events, and Notes:

txn must not be NULL.

Parameters

txn	Pointer to the transaction state
ph	The logical PDU buffer being received

Returns

integer status code

Return values

CFE_SUCCESS	on success
CF_PDU_METADATA_ERROR	on error

Definition at line 632 of file cf_cfdp.c.
References CF_AppData, CF_CFDP_CopyStringFromLV(), CF_CFDP_DecodeMd(), CF_CODEC_GET_SIZE, CF↩_CODEC_IS_OK, CF_PDU_INVALID_DST_LEN_ERR_EID, CF_PDU_INVALID_SRC_LEN_ERR_EID, CF_PDU_M↩

D_RECVD_INF_EID, CF_PDU_MD_SHORT_ERR_EID, CF_PDU_METADATA_ERROR, CFE_EVS_EventType_E↩ RROR, CFE_EVS_EventType_INFORMATION, CFE_EVS_SendEvent(), CFE_SUCCESS, CF_Transaction::chan_↩ num, CF_HkPacket_Payload::channel_hk, CF_HkChannel_Data::counters, CF_Logical_PduMd::dest_filename, CF_↩ TxnFilenames::dst_filename, CF_HkRecv::error, CF_History::fnames, CF_Transaction::fsize, CF_Transaction::history, CF_AppData_t::hk, CF_Logical_PduBuffer::int_header, CF_Logical_Lv::length, CF_Logical_IntHeader::md, CF_Hk↩ Packet::Payload, CF_Logical_PduBuffer::pdec, CF_HkCounters::recv, CF_Logical_PduMd::size, CF_Logical_PduMd↩ ::source_filename, and CF_TxnFilenames::src_filename.
Referenced by CF_CFDP_R2_RecvMd(), and CF_CFDP_RecvIdle().
Here is the call graph for this function:

12.22.3.30 CF_CFDP_RecvNak()

```
CFE_Status_t CF_CFDP_RecvNak (
    CF_Transaction_t * txn,
    CF_Logical_PduBuffer_t * ph )
```

Unpack a NAK PDU from a received message.
This should only be invoked for buffers that have been identified as a negative/non-acknowledgment PDU.

Assumptions, External Events, and Notes:

txn must not be NULL.

Parameters

txn	Pointer to the transaction state
ph	The logical PDU buffer being received

Returns

integer status code

Return values

CFE_SUCCESS	on success
CF_SHORT_PDU_ERROR	on error

Definition at line 814 of file cf_cfdp.c.
References CF_CFDP_DecodeNak(), CF_CODEC_GET_SIZE, CF_CODEC_IS_OK, CF_PDU_NAK_SHORT_ERR↩ _EID, CF_SHORT_PDU_ERROR, CFE_EVS_EventType_ERROR, CFE_EVS_SendEvent(), CFE_SUCCESS, CF_↩ Logical_PduBuffer::int_header, CF_Logical_IntHeader::nak, and CF_Logical_PduBuffer::pdec.
Referenced by CF_CFDP_S2_Nak().

Here is the call graph for this function:

12.22.3.31 CF_CFDP_RecvPh()

```
CFE_Status_t CF_CFDP_RecvPh (
    uint8 chan_num,
    CF_Logical_PduBuffer_t * ph )
```

Unpack a basic PDU header from a received message.

Description

This interprets the common PDU header and the file directive header (if applicable) and populates the logical PDU buffer.

Assumptions, External Events, and Notes:

A new message has been received.

Parameters

chan_num	The channel number for statistics purposes
ph	The logical PDU buffer being received

Returns

integer status code

Return values

CFE_SUCCESS	on success
CF_ERROR	for general errors
CF_SHORT_PDU_ERROR	if PDU too short

Definition at line 572 of file cf_cfdp.c.
References CF_AppData, CF_Assert, CF_CFDP_DecodeFileDirectiveHeader(), CF_CFDP_DecodeHeader(), CF↩_CODEC_GET_SIZE, CF_CODEC_IS_OK, CF_ERROR, CF_NUM_CHANNELS, CF_PDU_LARGE_FILE_ERR_E↩ID, CF_PDU_SHORT_HEADER_ERR_EID, CF_PDU_TRUNCATION_ERR_EID, CF_SHORT_PDU_ERROR, CFE↩_EVS_EventType_ERROR, CFE_EVS_SendEvent(), CFE_SUCCESS, CF_HkPacket_Payload::channel_hk, CF_Hk↩Channel_Data::counters, CF_HkRecv::error, CF_Logical_PduBuffer::fdirective, CF_AppData_t::hk, CF_Logical_Pdu↩Header::large_flag, CF_HkPacket::Payload, CF_Logical_PduBuffer::pdec, CF_HkRecv::pdu, CF_Logical_PduBuffer↩::pdu_header, CF_Logical_PduHeader::pdu_type, and CF_HkCounters::recv.
Referenced by CF_CFDP_ReceiveMessage().

Here is the call graph for this function:

12.22.3.32 CF_CFDP_ResetTransaction()

```
void CF_CFDP_ResetTransaction (
    CF_Transaction_t * txn,
    int keep_history )
```

Reset a transaction and all its internals to an unused state.

Assumptions, External Events, and Notes:

txn must not be NULL.

Parameters

txn	Pointer to the transaction object
keep_history	Whether the transaction info should be preserved in history

Definition at line 1589 of file cf_cfdp.c.
References CF_AppData, CF_Assert, CF_CFDP_HandleNotKeepFile(), CF_CFDP_IsSender(), CF_CFDP_SendEot↩Pkt(), CF_CList_InsertBack(), CF_CList_InsertBack_Ex(), CF_DequeueTransaction(), CF_Direction_TX, CF_Free↩Transaction(), CF_NUM_CHANNELS, CF_QueueIdx_FREE, CF_QueueIdx_HIST, CF_QueueIdx_HIST_FREE, CF_↩RESET_FREED_XACT_DBG_EID, CF_WrappedClose(), CFE_EVS_EventType_DEBUG, CFE_EVS_SendEvent(), CF_Transaction::chan_num, CF_Engine::channels, CF_Transaction::chunks, CF_History::cl_node, CF_Chunk↩Wrapper::cl_node, CF_Flags_Tx::cmd_tx, CF_StateFlags::com, CF_Channel::cs, CF_Channel::cur, CF_History::dir, CF_AppData_t::engine, CF_Transaction::fd, CF_Transaction::flags, CF_Transaction::history, CF_Transaction::keep, CF_Channel::num_cmd_tx, CF_Playback::num_ts, OS_ObjectIdDefined(), CF_Transaction::pb, CF_Flags_Common↩::q_index, and CF_StateFlags::tx.
Referenced by CF_CFDP_R1_Reset(), CF_CFDP_RecvIdle(), CF_CFDP_S_Reset(), CF_CmdAbandon_Txn(), and CF_PurgeTransaction().

Here is the call graph for this function:

12.22.3.33 CF_CFDP_SendAck()

```
CFE_Status_t CF_CFDP_SendAck (
    CF_Transaction_t * txn,
    CF_CFDP_AckTxnStatus_t ts,
    CF_CFDP_FileDirective_t dir_code,
    CF_CFDP_ConditionCode_t cc,
    CF_EntityId_t peer_eid,
    CF_TransactionSeq_t tsn )
```

Build an ACK PDU for transmit.

Assumptions, External Events, and Notes:

txn must not be NULL.

Note

CF_CFDP_SendAck() takes a CF_TransactionSeq_t instead of getting it from transaction history because of the special case where a FIN-ACK must be sent for an unknown transaction. It's better for long term maintenance to not build an incomplete CF_History_t for it.

Parameters

txn	Pointer to the transaction object

Parameters

ts	Transaction ACK status
dir_code	File directive code being ACK'ed
cc	Condition code of transaction
peer_eid	Remote entity ID
tsn	Transaction sequence number

Returns

CFE_Status_t status code

Return values

CFE_SUCCESS	on success.
CF_SEND_PDU_NO_BUF_AVAIL_ERROR	if message buffer cannot be obtained.

Definition at line 447 of file cf_cfdp.c.
References CF_Logical_IntHeader::ack, CF_Logical_PduAck::ack_directive_code, CF_Logical_PduAck::ack_↩subtype_code, CF_Logical_PduAck::cc, CF_AppData, CF_Assert, CF_CFDP_ConstructPduHeader(), CF_CFD↩P_EncodeAck(), CF_CFDP_FileDirective_ACK, CF_CFDP_FileDirective_EOF, CF_CFDP_FileDirective_FIN, CF↩_CFDP_IsSender(), CF_CFDP_Send(), CF_CFDP_SetPduLength(), CF_SEND_PDU_NO_BUF_AVAIL_ERROR, CFE_SUCCESS, CF_Transaction::chan_num, CF_AppData_t::config_table, CF_Logical_PduBuffer::int_header, CF_↩ConfigTable::local_eid, CF_Logical_PduBuffer::penc, and CF_Logical_PduAck::txn_status.
Referenced by CF_CFDP_R_Tick(), CF_CFDP_ReceiveMessage(), and CF_CFDP_S_SubstateSendFinAck().
Here is the call graph for this function:

12.22.3.34 CF_CFDP_SendEof()

```
CFE_Status_t CF_CFDP_SendEof (
    CF_Transaction_t * txn )
```

Build an EOF PDU for transmit.

Assumptions, External Events, and Notes:

txn must not be NULL.

Parameters

txn	Pointer to the transaction object

Returns

CFE_Status_t status code

Return values

CFE_SUCCESS	on success.
CF_SEND_PDU_NO_BUF_AVAIL_ERROR	if message buffer cannot be obtained.

Definition at line 408 of file cf_cfdp.c.
References CF_Logical_PduEof::cc, CF_AppData, CF_CFDP_AppendTlv(), CF_CFDP_ConditionCode_NO_ERROR, CF_CFDP_ConstructPduHeader(), CF_CFDP_EncodeEof(), CF_CFDP_FileDirective_EOF, CF_CFDP_Send(), CF↩_CFDP_SetPduLength(), CF_CFDP_TLV_TYPE_ENTITY_ID, CF_SEND_PDU_NO_BUF_AVAIL_ERROR, CF_Txn↩Status_To_ConditionCode(), CFE_SUCCESS, CF_Transaction::chan_num, CF_AppData_t::config_table, CF_Logical↩_PduEof::crc, CF_Transaction::crc, CF_Logical_IntHeader::eof, CF_Transaction::fsize, CF_Transaction::history, CF_↩Logical_PduBuffer::int_header, CF_ConfigTable::local_eid, CF_History::peer_eid, CF_Logical_PduBuffer::penc, CF_↩Crc::result, CF_History::seq_num, CF_Logical_PduEof::size, CF_Logical_PduEof::tlv_list, and CF_History::txn_stat.
Referenced by CF_CFDP_S_SendEof().
Here is the call graph for this function:

12.22.3.35 CF_CFDP_SendEotPkt()

```
void CF_CFDP_SendEotPkt (
    CF_Transaction_t * txn )
```

Send an end of transaction packet.

Assumptions, External Events, and Notes:

txn must not be NULL.

Parameters

txn	Pointer to the transaction object

Definition at line 1673 of file cf_cfdp.c.
References CF_EOT_TLM_MID, CFE_MSG_Init(), CFE_SB_AllocateMessageBuffer(), CFE_SB_TimeStampMsg(), CFE_SB_TransmitBuffer(), CFE_SB_ValueToMsgId(), CF_Transaction::chan_num, CF_EotPacket_Payload::channel, CF_Transaction::crc, CF_EotPacket_Payload::crc_result, CF_History::dir, CF_EotPacket_Payload::direction, CF_EotPacket_Payload::fnames, CF_History::fnames, CF_EotPacket_Payload::fsize, CF_Transaction::fsize, CF_Transaction::history, CF_EotPacket::Payload, CF_EotPacket_Payload::peer_eid, CF_History::peer_eid, CF_Crc::result, CF_EotPacket_Payload::seq_num, CF_History::seq_num, CF_EotPacket_Payload::src_eid, CF_History::src_eid, CF_EotPacket_Payload::state, CF_Transaction::state, CF_EotPacket::TelemetryHeader, CF_EotPacket_Payload::txn_stat, and CF_History::txn_stat.
Referenced by CF_CFDP_ResetTransaction().
Here is the call graph for this function:

12.22.3.36 CF_CFDP_SendFd()

```
CFE_Status_t CF_CFDP_SendFd (
    CF_Transaction_t * txn,
    CF_Logical_PduBuffer_t * ph )
```

Send a previously-assembled filedata PDU for transmit.

Assumptions, External Events, and Notes:

txn must not be NULL.

Parameters

txn	Pointer to the transaction object
ph	Pointer to logical PDU buffer content

Note

Unlike other "send" routines, the file data PDU must be acquired and filled by the caller prior to invoking this routine. This routine only sends the PDU that was previously allocated and assembled. As such, the typical failure possibilities do not apply to this call.

Returns

CFE_Status_t status code

Return values

CFE_SUCCESS	on success. (error checks not yet implemented)

Definition at line 351 of file cf_cfdp.c.
References CF_CFDP_Send(), CF_CFDP_SetPduLength(), CFE_SUCCESS, and CF_Transaction::chan_num.
Referenced by CF_CFDP_S_SendFileData().
Here is the call graph for this function:

12.22.3.37 CF_CFDP_SendFin()

```
CFE_Status_t CF_CFDP_SendFin (
    CF_Transaction_t * txn,
    CF_CFDP_FinDeliveryCode_t dc,
    CF_CFDP_FinFileStatus_t fs,
    CF_CFDP_ConditionCode_t cc )
```

Build a FIN PDU for transmit.

Assumptions, External Events, and Notes:

txn must not be NULL.

Parameters

txn	Pointer to the transaction object
dc	Final delivery status code (complete or incomplete)
fs	Final file status (retained or rejected, etc)
cc	Final CFDP condition code

Returns

CFE_Status_t status code

Return values

CFE_SUCCESS	on success.
CF_SEND_PDU_NO_BUF_AVAIL_ERROR	if message buffer cannot be obtained.

Definition at line 498 of file cf_cfdp.c.
References CF_Logical_PduFin::cc, CF_AppData, CF_CFDP_AppendTlv(), CF_CFDP_ConditionCode_NO_ERROR, CF_CFDP_ConstructPduHeader(), CF_CFDP_EncodeFin(), CF_CFDP_FileDirective_FIN, CF_CFDP_Send(), CF_CFDP_SetPduLength(), CF_CFDP_TLV_TYPE_ENTITY_ID, CF_SEND_PDU_NO_BUF_AVAIL_ERROR, CFE_SUCCESS, CF_Transaction::chan_num, CF_AppData_t::config_table, CF_Logical_PduFin::delivery_code, CF_Logical_PduFin::file_status, CF_Logical_IntHeader::fin, CF_Transaction::history, CF_Logical_PduBuffer::int_header, CF_ConfigTable::local_eid, CF_History::peer_eid, CF_Logical_PduBuffer::penc, CF_History::seq_num, and CF_Logical_PduFin::tlv_list.
Referenced by CF_CFDP_R2_SubstateSendFin().
Here is the call graph for this function:

12.22.3.38 CF_CFDP_SendMd() `CFE_Status_t CF_CFDP_SendMd ( CF_Transaction_t * txn )`

Build a metadata PDU for transmit.

Assumptions, External Events, and Notes:

txn must not be NULL.

Parameters

txn	Pointer to the transaction object

Returns

CFE_Status_t status code

Return values

CFE_SUCCESS	on success.
CF_SEND_PDU_NO_BUF_AVAIL_ERROR	if message buffer cannot be obtained.

Definition at line 308 of file cf_cfdp.c.
References CF_AppData, CF_Assert, CF_CFDP_ConstructPduHeader(), CF_CFDP_EncodeMd(), CF_CFDP_File↩ Directive_METADATA, CF_CFDP_Send(), CF_CFDP_SetPduLength(), CF_SEND_PDU_NO_BUF_AVAIL_ERROR, CF_TxnState_S1, CF_TxnState_S2, CFE_SUCCESS, CF_Transaction::chan_num, CF_AppData_t::config_table, CF↩ _Logical_Lv::data_ptr, CF_Logical_PduMd::dest_filename, CF_TxnFilenames::dst_filename, CF_History::fnames, C↩ F_Transaction::fsize, CF_Transaction::history, CF_Logical_PduBuffer::int_header, CF_Logical_Lv::length, CF_Config↩ Table::local_eid, CF_Logical_IntHeader::md, OS_strnlen(), CF_History::peer_eid, CF_Logical_PduBuffer::penc, CF↩ _History::seq_num, CF_Logical_PduMd::size, CF_Logical_PduMd::source_filename, CF_TxnFilenames::src_filename, and CF_Transaction::state.
Referenced by CF_CFDP_S_CheckAndRespondNak(), and CF_CFDP_S_SubstateSendMetadata().
Here is the call graph for this function:

12.22.3.39 CF_CFDP_SendNak()

```
CFE_Status_t CF_CFDP_SendNak (
    CF_Transaction_t * txn,
    CF_Logical_PduBuffer_t * ph )
```

Send a previously-assembled NAK PDU for transmit.

Assumptions, External Events, and Notes:

txn must not be NULL.

Parameters

txn	Pointer to the transaction object
ph	Pointer to logical PDU buffer content

Note

Unlike other "send" routines, the NAK PDU must be acquired and filled by the caller prior to invoking this routine. This routine only encodes and sends the previously-assembled PDU buffer. As such, the typical failure possibilities do not apply to this call.

Returns

CFE_Status_t status code

Return values

CFE_SUCCESS	on success.
CF_SEND_PDU_NO_BUF_AVAIL_ERROR	if message buffer cannot be obtained.

Definition at line 538 of file cf_cfdp.c.
References CF_Assert, CF_CFDP_CLASS_2, CF_CFDP_EncodeNak(), CF_CFDP_GetClass(), CF_CFDP_Send(), CF_CFDP_SetPduLength(), CF_SEND_PDU_NO_BUF_AVAIL_ERROR, CFE_SUCCESS, CF_Transaction::chan_num, CF_Logical_PduBuffer::int_header, CF_Logical_IntHeader::nak, and CF_Logical_PduBuffer::penc.
Referenced by CF_CFDP_R_SubstateSendNak().
Here is the call graph for this function:

12.22.3.40 CF_CFDP_SetTxnStatus()

```
void CF_CFDP_SetTxnStatus (
    CF_Transaction_t * txn,
    CF_TxnStatus_t txn_stat )
```

Helper function to store transaction status code only.
This records the status in the history block but does not set FIN flag or take any other protocol/state machine actions.

Assumptions, External Events, and Notes:

txn must not be NULL.

Parameters

txn	Pointer to the transaction object
txn_stat	Status Code value to set within transaction

Definition at line 1659 of file cf_cfdp.c.
References CF_TxnStatus_IsError(), CF_Transaction::history, and CF_History::txn_stat.

Referenced by CF_CFDP_CancelTransaction(), CF_CFDP_R2_CalcCrcChunk(), CF_CFDP_R2_Complete(), CF_CF↩DP_R2_SetFinTxnStatus(), CF_CFDP_R2_SubstateRecvEof(), CF_CFDP_R_ProcessFd(), CF_CFDP_R_Tick(), CF↩_CFDP_RecvFd(), CF_CFDP_S2_EarlyFin(), CF_CFDP_S2_SubstateSendFileData(), CF_CFDP_S_SubstateSend↩FileData(), CF_CFDP_S_SubstateSendFinAck(), CF_CFDP_S_SubstateSendMetadata(), and CF_CFDP_S_Tick().
Here is the call graph for this function:

12.22.3.41 CF_CFDP_TickTransactions() `void CF_CFDP_TickTransactions ( CF_Channel_t * chan )`

Call R and then S tick functions for all active transactions.

Description

Traverses all transactions in the RX and TXW queues, and calls their tick functions. Note that the TXW queue is used twice: once for regular tick processing, and one for NAK response.

Assumptions, External Events, and Notes:

chan must not be NULL.

Parameters

chan	Channel to tick

Definition at line 1153 of file cf_cfdp.c.
References CF_Assert, CF_CFDP_DoTick(), CF_CFDP_R_Tick(), CF_CFDP_S_Tick(), CF_CFDP_S_Tick_Nak(), CF_CList_Traverse(), CF_QueueIdx_RX, CF_QueueIdx_TXW, CF_TickType_NUM_TYPES, CF_TickType_RX, C↩F_TickType_TXW_NAK, CF_CFDP_Tick_args::cont, CF_CFDP_Tick_args::early_exit, CF_Channel::qs, and CF_↩Channel::tick_type.
Referenced by CF_CFDP_CycleEngine().

Here is the call graph for this function:

12.22.3.42 CF_CFDP_TxFile()

```
CFE_Status_t CF_CFDP_TxFile (
    const char * src_filename,
    const char * dst_filename,
    CF_CFDP_Class_t cfdp_class,
    uint8 keep,
    uint8 chan,
    uint8 priority,
    CF_EntityId_t dest_id )
```

Begin transmit of a file.

Description

This function sets up a transaction for and starts transmit of the given filename.

Assumptions, External Events, and Notes:

src_filename must not be NULL. dst_filename must not be NULL.

Parameters

src_filename	Local filename
dst_filename	Remote filename

Parameters

cfdp_class	Whether to perform a class 1 or class 2 transfer
keep	Whether to keep or delete the local file after completion
chan	CF channel number to use
priority	CF priority level
dest_id	Entity ID of remote receiver

Return values

CFE_SUCCESS	Successful execution. Operation was performed successfully

Returns

CFE_SUCCESS on success. CF_ERROR on error.

Definition at line 1262 of file cf_cfdp.c.
References CF_AppData, CF_Assert, CF_CFDP_MAX_CMD_TX_ERR_EID, CF_CFDP_TxFile_Initiate(), CF_ERROR, CF_FindUnusedTransaction(), CF_MAX_COMMANDED_PLAYBACK_FILES_PER_CHAN, CF_NUM_CHANNELS, CF_TxnState_IDLE, CFE_EVS_EventType_ERROR, CFE_EVS_SendEvent(), CFE_SUCCESS, CF_Engine::channels, CF_Flags_Tx::cmd_tx, CF_TxnFilenames::dst_filename, CF_AppData_t::engine, CF_Transaction::flags, CF_History::fnames, CF_Transaction::history, CF_Channel::num_cmd_tx, CF_TxnFilenames::src_filename, CF_Transaction::state, and CF_StateFlags::tx.
Referenced by CF_TxFileCmd().
Here is the call graph for this function:

12.23 apps/cf/fsw/src/cf_cfdp_dispatch.c File Reference

```
#include "cfe.h"
#include "cf_verify.h"
#include "cf_app.h"
#include "cf_events.h"
#include "cf_perfids.h"
#include "cf_cfdp.h"
#include "cf_utils.h"
#include "cf_cfdp_dispatch.h"
#include <stdio.h>
#include <string.h>
#include "cf_assert.h"
```

Functions

- void CF_CFDP_R_DispatchRecv (CF_Transaction_t *txn, CF_Logical_PduBuffer_t *ph, const CF_CFDP_R_SubstateDispatchTabl *dispatch, CF_CFDP_StateRecvFunc_t fd_fn)

  Dispatch function for received PDUs on receive-file transactions.
- void CF_CFDP_S_DispatchRecv (CF_Transaction_t *txn, CF_Logical_PduBuffer_t *ph, const CF_CFDP_S_SubstateRecvDispatch *dispatch)

  Dispatch function for received PDUs on send-file transactions.
- void CF_CFDP_S_DispatchTransmit (CF_Transaction_t *txn, const CF_CFDP_S_SubstateSendDispatchTable_t *dispatch)

  Dispatch function to send/generate PDUs on send-file transactions.
- void CF_CFDP_TxStateDispatch (CF_Transaction_t *txn, const CF_CFDP_TxnSendDispatchTable_t *dispatch)

  Top-level Dispatch function send a PDU based on current state of a transaction.
- void CF_CFDP_RxStateDispatch (CF_Transaction_t *txn, CF_Logical_PduBuffer_t *ph, const CF_CFDP_TxnRecvDispatchTable_t *dispatch)

  Top-level Dispatch function receive a PDU based on current state of a transaction.

12.23.1 Function Documentation

12.23.1.1 CF_CFDP_R_DispatchRecv()

```
void CF_CFDP_R_DispatchRecv (
    CF_Transaction_t * txn,
    CF_Logical_PduBuffer_t * ph,
    const CF_CFDP_R_SubstateDispatchTable_t * dispatch,
    CF_CFDP_StateRecvFunc_t fd_fn )
```

Dispatch function for received PDUs on receive-file transactions.
Receive file transactions primarily only react/respond to received PDUs

Parameters

txn	Transaction
ph	PDU Buffer
dispatch	Dispatch table for file directive PDUs
fd_fn	Function to handle file data PDUs

Definition at line 40 of file cf_cfdp_dispatch.c.
References CF_AppData, CF_Assert, CF_CFDP_FileDirective_INVALID_MAX, CF_CFDP_R_DC_INV_ERR_EID, CF_RxSubState_NUM_STATES, CF_TxnState_R2, CF_TxnStatus_IsError(), CFE_EVS_EventType_ERROR, CFE_EVS_SendEvent(), CF_Transaction::chan_num, CF_HkPacket_Payload::channel_hk, CF_HkChannel_Data::counters, CF_Logical_PduFileDirectiveHeader::directive_code, CF_HkRecv::dropped, CF_CFDP_FileDirectiveDispatchTable_t::fdirective, CF_Logical_PduBuffer::fdirective, CF_Transaction::history, CF_AppData_t::hk, CF_HkPacket::Payload, CF_Logical_PduBuffer::pdu_header, CF_Logical_PduHeader::pdu_type, CF_StateData::receive, CF_HkCounters::recv, CF_History::seq_num, CF_HkRecv::spurious, CF_History::src_eid, CF_CFDP_R_SubstateDispatchTable_t::state, CF_Transaction::state, CF_Transaction::state_data, CF_RxState_Data::sub_state, and CF_History::txn_stat.
Referenced by CF_CFDP_R1_Recv(), and CF_CFDP_R2_Recv().

Here is the call graph for this function:

12.23.1.2 CF_CFDP_RxStateDispatch()

```
void CF_CFDP_RxStateDispatch (
    CF_Transaction_t * txn,
    CF_Logical_PduBuffer_t * ph,
    const CF_CFDP_TxnRecvDispatchTable_t * dispatch )
```

Top-level Dispatch function receive a PDU based on current state of a transaction.

Parameters

txn	Transaction
ph	Received PDU Buffer
dispatch	Transaction State-based Dispatch table

Definition at line 190 of file cf_cfdp_dispatch.c.
References CF_Assert, CF_TxnState_INVALID, CF_CFDP_TxnRecvDispatchTable_t::rx, and CF_Transaction::state.
Referenced by CF_CFDP_DispatchRecv().

12.23.1.3 CF_CFDP_S_DispatchRecv()

```
void CF_CFDP_S_DispatchRecv (
    CF_Transaction_t * txn,
    CF_Logical_PduBuffer_t * ph,
    const CF_CFDP_S_SubstateRecvDispatchTable_t * dispatch )
```

Dispatch function for received PDUs on send-file transactions.
Send file transactions also react/respond to received PDUs. Note that a file data PDU is not expected here.

Parameters

txn	Transaction
ph	PDU Buffer
dispatch	Dispatch table for file directive PDUs

Definition at line 98 of file cf_cfdp_dispatch.c.
References CF_AppData, CF_Assert, CF_CFDP_FileDirective_INVALID_MAX, CF_CFDP_S_DC_INV_ERR_EID, CF_CFDP_S_NON_FD_PDU_ERR_EID, CF_TxnState_S2, CF_TxSubState_NUM_STATES, CFE_EVS_EventType_ERROR, CFE_EVS_SendEvent(), CF_Transaction::chan_num, CF_HkPacket_Payload::channel_hk, CF_HkChannel_Data::counters, CF_Logical_PduFileDirectiveHeader::directive_code, CF_CFDP_FileDirectiveDispatchTable_t::fdirective, CF_Logical_PduBuffer::fdirective, CF_Transaction::history, CF_AppData_t::hk, CF_HkPacket::Payload,

CF_Logical_PduBuffer::pdu_header, CF_Logical_PduHeader::pdu_type, CF_HkCounters::recv, CF_StateData::send, CF_History::seq_num, CF_HkRecv::spurious, CF_History::src_eid, CF_Transaction::state, CF_Transaction::state_data, CF_TxState_Data::sub_state, and CF_CFDP_S_SubstateRecvDispatchTable_t::substate.
Referenced by CF_CFDP_S1_Recv(), and CF_CFDP_S2_Recv().
Here is the call graph for this function:

12.23.1.4 CF_CFDP_S_DispatchTransmit()

```
void CF_CFDP_S_DispatchTransmit (
    CF_Transaction_t * txn,
    const CF_CFDP_S_SubstateSendDispatchTable_t * dispatch )
```

Dispatch function to send/generate PDUs on send-file transactions.
Send file transactions also generate PDUs each cycle based on the transaction state
This does not have an existing PDU buffer at the time of dispatch, but one may be generated by the invoked function.

Parameters

txn	Transaction
dispatch	State-based dispatch table

Definition at line 155 of file cf_cfdp_dispatch.c.
References CF_StateData::send, CF_Transaction::state_data, CF_TxState_Data::sub_state, and CF_CFDP_S_↩ SubstateSendDispatchTable_t::substate.
Referenced by CF_CFDP_S1_Tx(), and CF_CFDP_S2_Tx().

12.23.1.5 CF_CFDP_TxStateDispatch()

```
void CF_CFDP_TxStateDispatch (
    CF_Transaction_t * txn,
    const CF_CFDP_TxnSendDispatchTable_t * dispatch )
```

Top-level Dispatch function send a PDU based on current state of a transaction.
This does not have an existing PDU buffer at the time of dispatch, but one may be generated by the invoked function.

Parameters

txn	Transaction
dispatch	Transaction State-based Dispatch table

Definition at line 172 of file cf_cfdp_dispatch.c.
References CF_Assert, CF_TxnState_INVALID, CF_Transaction::state, and CF_CFDP_TxnSendDispatchTable_t::tx.
Referenced by CF_CFDP_DispatchTx().

12.24 apps/cf/fsw/src/cf_cfdp_dispatch.h File Reference

```
#include "cf_cfdp_types.h"
```

Data Structures

- struct CF_CFDP_TxnSendDispatchTable_t

  A table of transmit handler functions based on transaction state.
- struct CF_CFDP_TxnRecvDispatchTable_t

  A table of receive handler functions based on transaction state.
- struct CF_CFDP_FileDirectiveDispatchTable_t

  A table of receive handler functions based on file directive code.
- struct CF_CFDP_R_SubstateDispatchTable_t

  A dispatch table for receive file transactions, receive side.
- struct CF_CFDP_S_SubstateRecvDispatchTable_t

  A dispatch table for send file transactions, receive side.
- struct CF_CFDP_S_SubstateSendDispatchTable_t

  A dispatch table for send file transactions, transmit side.

Typedefs

- typedef void(∗ CF_CFDP_StateSendFunc_t) (CF_Transaction_t ∗txn)

  A function for dispatching actions to a handler, without existing PDU data.
- typedef void(∗ CF_CFDP_StateRecvFunc_t) (CF_Transaction_t ∗txn, CF_Logical_PduBuffer_t ∗ph)

  A function for dispatching actions to a handler, with existing PDU data.

Functions

- void CF_CFDP_R_DispatchRecv (CF_Transaction_t ∗txn, CF_Logical_PduBuffer_t ∗ph, const CF_CFDP_R_SubstateDispatchTabl ∗dispatch, CF_CFDP_StateRecvFunc_t fd_fn)

  Dispatch function for received PDUs on receive-file transactions.
- void CF_CFDP_S_DispatchRecv (CF_Transaction_t ∗txn, CF_Logical_PduBuffer_t ∗ph, const CF_CFDP_S_SubstateRecvDispatch ∗dispatch)

  Dispatch function for received PDUs on send-file transactions.
- void CF_CFDP_S_DispatchTransmit (CF_Transaction_t ∗txn, const CF_CFDP_S_SubstateSendDispatchTable_t ∗dispatch)

  Dispatch function to send/generate PDUs on send-file transactions.
- void CF_CFDP_TxStateDispatch (CF_Transaction_t ∗txn, const CF_CFDP_TxnSendDispatchTable_t ∗dispatch)

  Top-level Dispatch function send a PDU based on current state of a transaction.
- void CF_CFDP_RxStateDispatch (CF_Transaction_t ∗txn, CF_Logical_PduBuffer_t ∗ph, const CF_CFDP_TxnRecvDispatchTable_t ∗dispatch)

  Top-level Dispatch function receive a PDU based on current state of a transaction.

12.24.1 Detailed Description

Common routines to dispatch operations based on a transaction state and/or received PDU type.

12.24.2 Typedef Documentation

12.24.2.1 CF_CFDP_StateRecvFunc_t `typedef void(* CF_CFDP_StateRecvFunc_t) (CF_Transaction_t *txn, CF_Logical_PduBuffer_t *ph)`

A function for dispatching actions to a handler, with existing PDU data.
This allows quick delegation of PDUs to handler functions using dispatch tables. This version is used on the receive side where a PDU buffer is associated with the activity, which is then interpreted by the handler being invoked.

Parameters

in,out	*txn*	The transaction object
in,out	*ph*	The PDU buffer currently being received/processed

Definition at line 53 of file cf_cfdp_dispatch.h.

12.24.2.2 CF_CFDP_StateSendFunc_t `typedef void(* CF_CFDP_StateSendFunc_t) (CF_Transaction_t *txn)`

A function for dispatching actions to a handler, without existing PDU data.
This allows quick delegation to handler functions using dispatch tables. This version is used on the transmit side, where a PDU will likely be generated/sent by the handler being invoked.

Parameters

in,out	*txn*	The transaction object

Definition at line 41 of file cf_cfdp_dispatch.h.

12.24.3 Function Documentation

12.24.3.1 CF_CFDP_R_DispatchRecv()

```
void CF_CFDP_R_DispatchRecv (
    CF_Transaction_t * txn,
    CF_Logical_PduBuffer_t * ph,
    const CF_CFDP_R_SubstateDispatchTable_t * dispatch,
    CF_CFDP_StateRecvFunc_t fd_fn )
```

Dispatch function for received PDUs on receive-file transactions.
Receive file transactions primarily only react/respond to received PDUs

Parameters

txn	Transaction
ph	PDU Buffer
dispatch	Dispatch table for file directive PDUs
fd_fn	Function to handle file data PDUs

Definition at line 40 of file cf_cfdp_dispatch.c.
References CF_AppData, CF_Assert, CF_CFDP_FileDirective_INVALID_MAX, CF_CFDP_R_DC_INV_ERR_EID, CF_RxSubState_NUM_STATES, CF_TxnState_R2, CF_TxnStatus_IsError(), CFE_EVS_EventType_ERROR, CFE_EVS_SendEvent(), CF_Transaction::chan_num, CF_HkPacket_Payload::channel_hk, CF_HkChannel_Data::counters, CF_Logical_PduFileDirectiveHeader::directive_code, CF_HkRecv::dropped, CF_CFDP_FileDirectiveDispatchTable_t::fdirective, CF_Logical_PduBuffer::fdirective, CF_Transaction::history, CF_AppData_t::hk, CF_HkPacket::Payload, CF_Logical_PduBuffer::pdu_header, CF_Logical_PduHeader::pdu_type, CF_StateData::receive, CF_HkCounters::recv,

CF_History::seq_num, CF_HkRecv::spurious, CF_History::src_eid, CF_CFDP_R_SubstateDispatchTable_t::state, CF_Transaction::state, CF_Transaction::state_data, CF_RxState_Data::sub_state, and CF_History::txn_stat.
Referenced by CF_CFDP_R1_Recv(), and CF_CFDP_R2_Recv().
Here is the call graph for this function:

12.24.3.2 CF_CFDP_RxStateDispatch()

```
void CF_CFDP_RxStateDispatch (
    CF_Transaction_t * txn,
    CF_Logical_PduBuffer_t * ph,
    const CF_CFDP_TxnRecvDispatchTable_t * dispatch )
```

Top-level Dispatch function receive a PDU based on current state of a transaction.

Parameters

txn	Transaction
ph	Received PDU Buffer
dispatch	Transaction State-based Dispatch table

Definition at line 190 of file cf_cfdp_dispatch.c.
References CF_Assert, CF_TxnState_INVALID, CF_CFDP_TxnRecvDispatchTable_t::rx, and CF_Transaction::state.
Referenced by CF_CFDP_DispatchRecv().

12.24.3.3 CF_CFDP_S_DispatchRecv()

```
void CF_CFDP_S_DispatchRecv (
    CF_Transaction_t * txn,
    CF_Logical_PduBuffer_t * ph,
    const CF_CFDP_S_SubstateRecvDispatchTable_t * dispatch )
```

Dispatch function for received PDUs on send-file transactions.
Send file transactions also react/respond to received PDUs. Note that a file data PDU is not expected here.

Parameters

txn	Transaction
ph	PDU Buffer
dispatch	Dispatch table for file directive PDUs

Definition at line 98 of file cf_cfdp_dispatch.c.
References CF_AppData, CF_Assert, CF_CFDP_FileDirective_INVALID_MAX, CF_CFDP_S_DC_INV_ERR_EID, CF_CFDP_S_NON_FD_PDU_ERR_EID, CF_TxnState_S2, CF_TxSubState_NUM_STATES, CFE_EVS_EventType_

ERROR, CFE_EVS_SendEvent(), CF_Transaction::chan_num, CF_HkPacket_Payload::channel_hk, CF_HkChannel↩_Data::counters, CF_Logical_PduFileDirectiveHeader::directive_code, CF_CFDP_FileDirectiveDispatchTable_t↩::fdirective, CF_Logical_PduBuffer::fdirective, CF_Transaction::history, CF_AppData_t::hk, CF_HkPacket::Payload, CF_Logical_PduBuffer::pdu_header, CF_Logical_PduHeader::pdu_type, CF_HkCounters::recv, CF_StateData::send, CF_History::seq_num, CF_HkRecv::spurious, CF_History::src_eid, CF_Transaction::state, CF_Transaction::state_data, CF_TxState_Data::sub_state, and CF_CFDP_S_SubstateRecvDispatchTable_t::substate.
Referenced by CF_CFDP_S1_Recv(), and CF_CFDP_S2_Recv().
Here is the call graph for this function:

12.24.3.4 CF_CFDP_S_DispatchTransmit()

```
void CF_CFDP_S_DispatchTransmit (
    CF_Transaction_t * txn,
    const CF_CFDP_S_SubstateSendDispatchTable_t * dispatch )
```

Dispatch function to send/generate PDUs on send-file transactions.
Send file transactions also generate PDUs each cycle based on the transaction state
This does not have an existing PDU buffer at the time of dispatch, but one may be generated by the invoked function.

Parameters

txn	Transaction
dispatch	State-based dispatch table

Definition at line 155 of file cf_cfdp_dispatch.c.
References CF_StateData::send, CF_Transaction::state_data, CF_TxState_Data::sub_state, and CF_CFDP_S_↩SubstateSendDispatchTable_t::substate.
Referenced by CF_CFDP_S1_Tx(), and CF_CFDP_S2_Tx().

12.24.3.5 CF_CFDP_TxStateDispatch()

```
void CF_CFDP_TxStateDispatch (
    CF_Transaction_t * txn,
    const CF_CFDP_TxnSendDispatchTable_t * dispatch )
```

Top-level Dispatch function send a PDU based on current state of a transaction.
This does not have an existing PDU buffer at the time of dispatch, but one may be generated by the invoked function.

Parameters

txn	Transaction
dispatch	Transaction State-based Dispatch table

Definition at line 172 of file cf_cfdp_dispatch.c.
References CF_Assert, CF_TxnState_INVALID, CF_Transaction::state, and CF_CFDP_TxnSendDispatchTable_t::tx.
Referenced by CF_CFDP_DispatchTx().

12.25 apps/cf/fsw/src/cf_cfdp_pdu.h File Reference

```
#include "common_types.h"
#include "cf_platform_cfg.h"
#include <stddef.h>
```

Data Structures

- struct CF_CFDP_uint8_t

  Encoded 8-bit value in the CFDP PDU.
- struct CF_CFDP_uint16_t

  Encoded 16-bit value in the CFDP PDU.
- struct CF_CFDP_uint32_t

  Encoded 32-bit value in the CFDP PDU.
- struct CF_CFDP_uint64_t

  Encoded 64-bit value in the CFDP PDU.
- struct CF_CFDP_PduHeader

  Structure representing base CFDP PDU header.
- struct CF_CFDP_PduFileDirectiveHeader

  Structure representing CFDP File Directive Header.
- struct CF_CFDP_lv

  Structure representing CFDP LV Object format.
- struct CF_CFDP_tlv

  Structure representing CFDP TLV Object format.
- struct CF_CFDP_PduEof

  Structure representing CFDP End of file PDU.
- struct CF_CFDP_PduFin

  Structure representing CFDP Finished PDU.
- struct CF_CFDP_PduAck

  Structure representing CFDP Acknowledge PDU.
- struct CF_CFDP_SegmentRequest

  Structure representing CFDP Segment Request.
- struct CF_CFDP_PduNak

  Structure representing CFDP Non-Acknowledge PDU.
- struct CF_CFDP_PduMd

  Structure representing CFDP Metadata PDU.
- struct CF_CFDP_PduFileDataHeader

  PDU file data header.
- struct CF_CFDP_PduFileDataContent

  PDU file data content typedef for limit checking outgoing_file_chunk_size table value and set parameter command.

Macros

- #define CF_CFDP_MAX_HEADER_SIZE (sizeof(CF_CFDP_PduHeader_t) + (3 ∗ sizeof(CF_CFDP_uint64_t))) /∗ 8 bytes for each variable item ∗/

  Maximum encoded size of a CFDP PDU header.
- #define CF_CFDP_MIN_HEADER_SIZE (sizeof(CF_CFDP_PduHeader_t) + (3 ∗ sizeof(CF_CFDP_uint8_t))) /∗ 1 byte for each variable item ∗/

Minimum encoded size of a CFDP PDU header.

- #define CF_APP_MAX_HEADER_SIZE (sizeof(CF_CFDP_PduHeader_t) + sizeof(CF_TransactionSeq_t) + (3 ∗ sizeof(CF_EntityId_t)))

  Maximum encoded size of a CFDP PDU that this implementation can accept.

Typedefs

- typedef struct CF_CFDP_PduHeader CF_CFDP_PduHeader_t

  Structure representing base CFDP PDU header.
- typedef struct CF_CFDP_PduFileDirectiveHeader CF_CFDP_PduFileDirectiveHeader_t

  Structure representing CFDP File Directive Header.
- typedef struct CF_CFDP_lv CF_CFDP_lv_t

  Structure representing CFDP LV Object format.
- typedef struct CF_CFDP_tlv CF_CFDP_tlv_t

  Structure representing CFDP TLV Object format.
- typedef struct CF_CFDP_PduEof CF_CFDP_PduEof_t

  Structure representing CFDP End of file PDU.
- typedef struct CF_CFDP_PduFin CF_CFDP_PduFin_t

  Structure representing CFDP Finished PDU.
- typedef struct CF_CFDP_PduAck CF_CFDP_PduAck_t

  Structure representing CFDP Acknowledge PDU.
- typedef struct CF_CFDP_SegmentRequest CF_CFDP_SegmentRequest_t

  Structure representing CFDP Segment Request.
- typedef struct CF_CFDP_PduNak CF_CFDP_PduNak_t

  Structure representing CFDP Non-Acknowledge PDU.
- typedef struct CF_CFDP_PduMd CF_CFDP_PduMd_t

  Structure representing CFDP Metadata PDU.
- typedef struct CF_CFDP_PduFileDataHeader CF_CFDP_PduFileDataHeader_t

  PDU file data header.
- typedef struct CF_CFDP_PduFileDataContent CF_CFDP_PduFileDataContent_t

  PDU file data content typedef for limit checking outgoing_file_chunk_size table value and set parameter command.

Enumerations

- enum CF_CFDP_TlvType_t {
  CF_CFDP_TLV_TYPE_FILESTORE_REQUEST = 0, CF_CFDP_TLV_TYPE_FILESTORE_RESPONSE = 1, CF_CFDP_TLV_TYPE_MESSAGE_TO_USER = 2, CF_CFDP_TLV_TYPE_FAULT_HANDLER_OVERRIDE = 4,
  CF_CFDP_TLV_TYPE_FLOW_LABEL = 5, CF_CFDP_TLV_TYPE_ENTITY_ID = 6, CF_CFDP_TLV_TYPE_INVALID_MAX = 7 }

  Values for "type" field of TLV structure.
- enum CF_CFDP_FileDirective_t {
  CF_CFDP_FileDirective_INVALID_MIN = 0, CF_CFDP_FileDirective_EOF = 4, CF_CFDP_FileDirective_FIN = 5, CF_CFDP_FileDirective_ACK = 6,
  CF_CFDP_FileDirective_METADATA = 7, CF_CFDP_FileDirective_NAK = 8, CF_CFDP_FileDirective_PROMPT = 9, CF_CFDP_FileDirective_KEEP_ALIVE = 12,
  CF_CFDP_FileDirective_INVALID_MAX = 13 }

  Values for "directive_code" within CF_CFDP_PduFileDirectiveHeader_t.

- enum CF_CFDP_AckTxnStatus_t { CF_CFDP_AckTxnStatus_UNDEFINED = 0, CF_CFDP_AckTxnStatus_ACTIVE = 1, CF_CFDP_AckTxnStatus_TERMINATED = 2, CF_CFDP_AckTxnStatus_UNRECOGNIZED = 3, CF_CFDP_AckTxnStatus_INVALID = 4 }

  Values for "acknowledgment transfer status".
- enum CF_CFDP_FinDeliveryCode_t { CF_CFDP_FinDeliveryCode_COMPLETE = 0, CF_CFDP_FinDeliveryCode_INCOMPLETE = 1, CF_CFDP_FinDeliveryCode_INVALID = 2 }

  Values for "finished delivery code".
- enum CF_CFDP_FinFileStatus_t { CF_CFDP_FinFileStatus_DISCARDED = 0, CF_CFDP_FinFileStatus_DISCARDED_FILESTORE = 1, CF_CFDP_FinFileStatus_RETAINED = 2, CF_CFDP_FinFileStatus_UNREPORTED = 3, CF_CFDP_FinFileStatus_INVALID = 4 }

  Values for "finished file status".
- enum CF_CFDP_ConditionCode_t { CF_CFDP_ConditionCode_NO_ERROR = 0, CF_CFDP_ConditionCode_POS_ACK_LIMIT_REACHED = 1, CF_CFDP_ConditionCode_KEEP_ALIVE_LIMIT_REACHED = 2, CF_CFDP_ConditionCode_INVALID_TRANSMISSION_MODE = 3, CF_CFDP_ConditionCode_FILESTORE_REJECTION = 4, CF_CFDP_ConditionCode_FILE_CHECKSUM_FAILURE = 5, CF_CFDP_ConditionCode_FILE_SIZE_ERROR = 6, CF_CFDP_ConditionCode_NAK_LIMIT_REACHED = 7, CF_CFDP_ConditionCode_INACTIVITY_DETECTED = 8, CF_CFDP_ConditionCode_INVALID_FILE_STRUCTURE = 9, CF_CFDP_ConditionCode_CHECK_LIMIT_REACHED = 10, CF_CFDP_ConditionCode_UNSUPPORTED_CHECKSUM_TYP = 11, CF_CFDP_ConditionCode_SUSPEND_REQUEST_RECEIVED = 14, CF_CFDP_ConditionCode_CANCEL_REQUEST_RECEIVE = 15 }

  Values for "condition code".

12.25.1 Detailed Description

Structures defining to CFDP PDUs
Note that structures and enumerations defined in this file with a CF_CFDP prefix are defined according to the CCSDS CFDP specification (727.0-B-5). These values must match the specification for that structure/field, they are not locally changeable.

Note

Many of the structures defined in this file are variably-sized when encoded for network transmission. As a result, C structures used to map to these structures are of limited usefulness, generally only capable of describing the first element(s) where offsets are fixed. A marker member is utilized to indicate where the fixed data ends and variable length data begins. At some point, the structures in this file should change to encode/decode functions.

12.25.2 Macro Definition Documentation

12.25.2.1 CF_APP_MAX_HEADER_SIZE `#define CF_APP_MAX_HEADER_SIZE (sizeof(CF_CFDP_PduHeader_t) + sizeof(CF_TransactionSeq_t) + (3 * sizeof(CF_EntityId_t)))`

Maximum encoded size of a CFDP PDU that this implementation can accept.
This definition reflects the current configuration of the CF application. Note that this is based on the size of the native representation of Entity ID and sequence number. Although the bitwise representations of these items are different in the encoded packets vs. the native representation, the basic size still correlates (e.g. if it takes 4 bytes natively, it will be encoded into 4 bytes).
Definition at line 75 of file cf_cfdp_pdu.h.

12.25.2.2 CF_CFDP_MAX_HEADER_SIZE

```
#define CF_CFDP_MAX_HEADER_SIZE (sizeof(CF_CFDP_PduHeader_t)
+ (3 * sizeof(CF_CFDP_uint64_t))) /* 8 bytes for each variable item */
```

Maximum encoded size of a CFDP PDU header.
Per the blue book, the size of the Entity ID and Sequence Number may be up to 8 bytes. CF is configurable in what it can accept and transmit, which may be smaller than what the blue book permits.
Definition at line 54 of file cf_cfdp_pdu.h.

12.25.2.3 CF_CFDP_MIN_HEADER_SIZE

```
#define CF_CFDP_MIN_HEADER_SIZE (sizeof(CF_CFDP_PduHeader_t)
+ (3 * sizeof(CF_CFDP_uint8_t))) /* 1 byte for each variable item */
```

Minimum encoded size of a CFDP PDU header.
Per the blue book, the size of the Entity ID and Sequence Number must be at least 1 byte.
Definition at line 62 of file cf_cfdp_pdu.h.

12.25.3 Typedef Documentation

12.25.3.1 CF_CFDP_lv_t

```
typedef struct CF_CFDP_lv CF_CFDP_lv_t
```

Structure representing CFDP LV Object format.
These Length + Value pairs used in several CFDP PDU types, typically for storage of strings such as file names.
Defined per table 5-2 of CCSDS 727.0-B-5

12.25.3.2 CF_CFDP_PduAck_t

```
typedef struct CF_CFDP_PduAck CF_CFDP_PduAck_t
```

Structure representing CFDP Acknowledge PDU.
Defined per section 5.2.4 / table 5-8 of CCSDS 727.0-B-5

12.25.3.3 CF_CFDP_PduEof_t

```
typedef struct CF_CFDP_PduEof CF_CFDP_PduEof_t
```

Structure representing CFDP End of file PDU.
Defined per section 5.2.2 / table 5-6 of CCSDS 727.0-B-5

12.25.3.4 CF_CFDP_PduFileDataContent_t

```
typedef struct CF_CFDP_PduFileDataContent CF_CFDP_PduFileDataContent_t
```

PDU file data content typedef for limit checking outgoing_file_chunk_size table value and set parameter command.
This definition allows for the largest data block possible, as CF_MAX_PDU_SIZE - the minimum possible header size.
In practice the outgoing file chunk size is limited by whichever is smaller; the remaining data, remaining space in the packet, and outgoing_file_chunk_size.

12.25.3.5 CF_CFDP_PduFileDataHeader_t

```
typedef struct CF_CFDP_PduFileDataHeader CF_CFDP_PduFileDataHeader_t
```

PDU file data header.

12.25.3.6 CF_CFDP_PduFileDirectiveHeader_t

```
typedef struct CF_CFDP_PduFileDirectiveHeader CF_CFDP_PduFileDirective
```

Structure representing CFDP File Directive Header.
Defined per section 5.2 of CCSDS 727.0-B-5

12.25.3.7 CF_CFDP_PduFin_t

```
typedef struct CF_CFDP_PduFin CF_CFDP_PduFin_t
```

Structure representing CFDP Finished PDU.
Defined per section 5.2.3 / table 5-7 of CCSDS 727.0-B-5

12.25.3.8 CF_CFDP_PduHeader_t `typedef struct CF_CFDP_PduHeader CF_CFDP_PduHeader_t`

Structure representing base CFDP PDU header.
This header appears at the beginning of all CFDP PDUs, of all types. Note that the header is variable length, it also contains source and destination entity IDs, and the transaction sequence number.
Defined per section 5.1 of CCSDS 727.0-B-5

Note

this contains variable length data for the EID+TSN, which is *not* included in this definition. As a result, the sizeof(↩ CF_CFDP_PduHeader_t) reflects only the size of the fixed fields. Use CF_HeaderSize() to get the actual size of this structure.

12.25.3.9 CF_CFDP_PduMd_t `typedef struct CF_CFDP_PduMd CF_CFDP_PduMd_t`

Structure representing CFDP Metadata PDU.
Defined per section 5.2.5 / table 5-9 of CCSDS 727.0-B-5

12.25.3.10 CF_CFDP_PduNak_t `typedef struct CF_CFDP_PduNak CF_CFDP_PduNak_t`

Structure representing CFDP Non-Acknowledge PDU.
Defined per section 5.2.6 / table 5-10 of CCSDS 727.0-B-5

12.25.3.11 CF_CFDP_SegmentRequest_t `typedef struct CF_CFDP_SegmentRequest CF_CFDP_SegmentRequest_t`

Structure representing CFDP Segment Request.
Defined per section 5.2.6 / table 5-11 of CCSDS 727.0-B-5

12.25.3.12 CF_CFDP_tlv_t `typedef struct CF_CFDP_tlv CF_CFDP_tlv_t`

Structure representing CFDP TLV Object format.
These Type + Length + Value pairs used in several CFDP PDU types, typically for file storage requests (section 5.4).
Defined per table 5-3 of CCSDS 727.0-B-5

12.25.4 Enumeration Type Documentation

12.25.4.1 CF_CFDP_AckTxnStatus_t `enum CF_CFDP_AckTxnStatus_t`

Values for "acknowledgment transfer status".
This enum is pertinent to the ACK PDU type, defines the values for the directive field.
Defined per section 5.2.4 / table 5-8 of CCSDS 727.0-B-5

Enumerator

CF_CFDP_AckTxnStatus_UNDEFINED	
CF_CFDP_AckTxnStatus_ACTIVE	
CF_CFDP_AckTxnStatus_TERMINATED	
CF_CFDP_AckTxnStatus_UNRECOGNIZED	
CF_CFDP_AckTxnStatus_INVALID	

Definition at line 225 of file cf_cfdp_pdu.h.

12.25.4.2 CF_CFDP_ConditionCode_t `enum CF_CFDP_ConditionCode_t`

Values for "condition code".

This enum defines the values for the condition code field for the PDU types which have this field (EOF, FIN, ACK)
Defined per table 5-5 of CCSDS 727.0-B-5

Enumerator

CF_CFDP_ConditionCode_NO_ERROR	
CF_CFDP_ConditionCode_POS_ACK_LIMIT_REACHED	
CF_CFDP_ConditionCode_KEEP_ALIVE_LIMIT_REACHED	
CF_CFDP_ConditionCode_INVALID_TRANSMISSION_MODE	
CF_CFDP_ConditionCode_FILESTORE_REJECTION	
CF_CFDP_ConditionCode_FILE_CHECKSUM_FAILURE	
CF_CFDP_ConditionCode_FILE_SIZE_ERROR	
CF_CFDP_ConditionCode_NAK_LIMIT_REACHED	
CF_CFDP_ConditionCode_INACTIVITY_DETECTED	
CF_CFDP_ConditionCode_INVALID_FILE_STRUCTURE	
CF_CFDP_ConditionCode_CHECK_LIMIT_REACHED	
CF_CFDP_ConditionCode_UNSUPPORTED_CHECKSUM_TYPE	
CF_CFDP_ConditionCode_SUSPEND_REQUEST_RECEIVED	
CF_CFDP_ConditionCode_CANCEL_REQUEST_RECEIVED	

Definition at line 274 of file cf_cfdp_pdu.h.

12.25.4.3 CF_CFDP_FileDirective_t `enum CF_CFDP_FileDirective_t`

Values for "directive_code" within CF_CFDP_PduFileDirectiveHeader_t.
Defined per table 5-4 of CCSDS 727.0-B-5

Enumerator

CF_CFDP_FileDirective_INVALID_MIN	Minimum used to limit range.
CF_CFDP_FileDirective_EOF	
CF_CFDP_FileDirective_FIN	
CF_CFDP_FileDirective_ACK	
CF_CFDP_FileDirective_METADATA	
CF_CFDP_FileDirective_NAK	
CF_CFDP_FileDirective_PROMPT	
CF_CFDP_FileDirective_KEEP_ALIVE	
CF_CFDP_FileDirective_INVALID_MAX	Maximum used to limit range.

Definition at line 204 of file cf_cfdp_pdu.h.

12.25.4.4 CF_CFDP_FinDeliveryCode_t `enum CF_CFDP_FinDeliveryCode_t`

Values for "finished delivery code".
This enum is pertinent to the FIN PDU type, defines the values for the delivery code field.
Defined per section 5.2.3 / table 5-7 of CCSDS 727.0-B-5

Enumerator

CF_CFDP_FinDeliveryCode_COMPLETE	

Enumerator

CF_CFDP_FinDeliveryCode_INCOMPLETE	
CF_CFDP_FinDeliveryCode_INVALID	

Definition at line 242 of file cf_cfdp_pdu.h.

12.25.4.5 CF_CFDP_FinFileStatus_t `enum CF_CFDP_FinFileStatus_t`

Values for "finished file status".
This enum is pertinent to the FIN PDU type, defines the values for the file status field.
Defined per section 5.2.3 / table 5-7 of CCSDS 727.0-B-5

Enumerator

CF_CFDP_FinFileStatus_DISCARDED	
CF_CFDP_FinFileStatus_DISCARDED_FILESTORE	
CF_CFDP_FinFileStatus_RETAINED	
CF_CFDP_FinFileStatus_UNREPORTED	
CF_CFDP_FinFileStatus_INVALID	

Definition at line 257 of file cf_cfdp_pdu.h.

12.25.4.6 CF_CFDP_TlvType_t `enum CF_CFDP_TlvType_t`

Values for "type" field of TLV structure.
Defined per section 5.4 of CCSDS 727.0-B-5

Enumerator

CF_CFDP_TLV_TYPE_FILESTORE_REQUEST	
CF_CFDP_TLV_TYPE_FILESTORE_RESPONSE	
CF_CFDP_TLV_TYPE_MESSAGE_TO_USER	
CF_CFDP_TLV_TYPE_FAULT_HANDLER_OVERRIDE	
CF_CFDP_TLV_TYPE_FLOW_LABEL	
CF_CFDP_TLV_TYPE_ENTITY_ID	
CF_CFDP_TLV_TYPE_INVALID_MAX	

Definition at line 188 of file cf_cfdp_pdu.h.

12.26 apps/cf/fsw/src/cf_cfdp_r.c File Reference

```
#include "cfe.h"
#include "cf_verify.h"
#include "cf_app.h"
#include "cf_events.h"
#include "cf_perfids.h"
#include "cf_cfdp.h"
#include "cf_utils.h"
#include "cf_cfdp_r.h"
#include "cf_cfdp_dispatch.h"
```

```
#include <stdio.h>
#include <string.h>
#include "cf_assert.h"
```

Functions

- void CF_CFDP_R2_SetFinTxnStatus (CF_Transaction_t *txn, CF_TxnStatus_t txn_stat)

  Helper function to store transaction status code and set send_fin flag.
- void CF_CFDP_R1_Reset (CF_Transaction_t *txn)

  CFDP R1 transaction reset function.
- void CF_CFDP_R2_Reset (CF_Transaction_t *txn)

  CFDP R2 transaction reset function.
- CFE_Status_t CF_CFDP_R_CheckCrc (CF_Transaction_t *txn, uint32 expected_crc)

  Checks that the transaction file's CRC matches expected.
- void CF_CFDP_R2_Complete (CF_Transaction_t *txn, int ok_to_send_nak)

  Checks R2 transaction state for transaction completion status.
- CFE_Status_t CF_CFDP_R_ProcessFd (CF_Transaction_t *txn, CF_Logical_PduBuffer_t *ph)

  Process a filedata PDU on a transaction.
- CFE_Status_t CF_CFDP_R_SubstateRecvEof (CF_Transaction_t *txn, CF_Logical_PduBuffer_t *ph)

  Processing receive EOF common functionality for R1/R2.
- void CF_CFDP_R1_SubstateRecvEof (CF_Transaction_t *txn, CF_Logical_PduBuffer_t *ph)

  Process receive EOF for R1.
- void CF_CFDP_R2_SubstateRecvEof (CF_Transaction_t *txn, CF_Logical_PduBuffer_t *ph)

  Process receive EOF for R2.
- void CF_CFDP_R1_SubstateRecvFileData (CF_Transaction_t *txn, CF_Logical_PduBuffer_t *ph)

  Process received file data for R1.
- void CF_CFDP_R2_SubstateRecvFileData (CF_Transaction_t *txn, CF_Logical_PduBuffer_t *ph)

  Process received file data for R2.
- void CF_CFDP_R2_GapCompute (const CF_ChunkList_t *chunks, const CF_Chunk_t *chunk, void *opaque)

  Loads a single NAK segment request.
- CFE_Status_t CF_CFDP_R_SubstateSendNak (CF_Transaction_t *txn)

  Send a NAK PDU for R2.
- void CF_CFDP_R_Init (CF_Transaction_t *txn)

  Initialize a transaction structure for R.
- CFE_Status_t CF_CFDP_R2_CalcCrcChunk (CF_Transaction_t *txn)

  Calculate up to the configured amount of bytes of CRC.
- CFE_Status_t CF_CFDP_R2_SubstateSendFin (CF_Transaction_t *txn)

  Send a FIN PDU.
- void CF_CFDP_R2_Recv_fin_ack (CF_Transaction_t *txn, CF_Logical_PduBuffer_t *ph)

  Process receive FIN-ACK PDU.
- void CF_CFDP_R2_RecvMd (CF_Transaction_t *txn, CF_Logical_PduBuffer_t *ph)

  Process receive metadata PDU for R2.
- void CF_CFDP_R1_Recv (CF_Transaction_t *txn, CF_Logical_PduBuffer_t *ph)

  R1 receive PDU processing.
- void CF_CFDP_R2_Recv (CF_Transaction_t *txn, CF_Logical_PduBuffer_t *ph)

  R2 receive PDU processing.
- void CF_CFDP_R_Cancel (CF_Transaction_t *txn)

Cancel an R transaction.

- void CF_CFDP_R_SendInactivityEvent (CF_Transaction_t *txn)

  Sends an inactivity timer expired event to EVS.

- void CF_CFDP_R_Tick (CF_Transaction_t *txn, int *cont)

  Perform tick (time-based) processing for R transactions.

12.26.1 Detailed Description

The CF Application CFDP receive logic source file
Handles all CFDP engine functionality specific to RX transactions.

12.26.2 Function Documentation

12.26.2.1 CF_CFDP_R1_Recv()

```
void CF_CFDP_R1_Recv (
    CF_Transaction_t * txn,
    CF_Logical_PduBuffer_t * ph )
```

R1 receive PDU processing.

Assumptions, External Events, and Notes:

txn must not be NULL.

Parameters

txn	Pointer to the transaction object
ph	Pointer to the PDU information

Definition at line 881 of file cf_cfdp_r.c.
References CF_CFDP_FileDirective_EOF, CF_CFDP_R1_SubstateRecvEof(), CF_CFDP_R1_SubstateRecvFileData(), CF_CFDP_R_DispatchRecv(), CF_RxSubState_EOF, CF_RxSubState_FILEDATA, CF_RxSubState_WAIT_FOR_FIN_ACK, CF_CFDP_FileDirectiveDispatchTable_t::fdirective, and CF_CFDP_R_SubstateDispatchTable_t::state.
Referenced by CF_CFDP_DispatchRecv().

Here is the call graph for this function:

12.26.2.2 CF_CFDP_R1_Reset()

```
void CF_CFDP_R1_Reset (
    CF_Transaction_t * txn )
```

CFDP R1 transaction reset function.

Description

All R transactions use this call to indicate the transaction state can be returned to the system. While this function currently only calls CF_CFDP_ResetTransaction(), it is here as a placeholder.

Assumptions, External Events, and Notes:

txn must not be NULL.

Parameters

txn	Pointer to the transaction object

Definition at line 59 of file cf_cfdp_r.c.
References CF_CFDP_ResetTransaction().
Referenced by CF_CFDP_R1_SubstateRecvEof(), CF_CFDP_R1_SubstateRecvFileData(), CF_CFDP_R2_Reset(), CF_CFDP_R_Cancel(), CF_CFDP_R_Init(), and CF_CFDP_R_Tick().

Here is the call graph for this function:

12.26.2.3 CF_CFDP_R1_SubstateRecvEof()

```
void CF_CFDP_R1_SubstateRecvEof (
    CF_Transaction_t * txn,
    CF_Logical_PduBuffer_t * ph )
```

Process receive EOF for R1.

Description

Only need to confirm CRC for R1.

Assumptions, External Events, and Notes:

txn must not be NULL. ph must not be NULL.

Parameters

txn	Pointer to the transaction object
ph	Pointer to the PDU information

Definition at line 290 of file cf_cfdp_r.c.
References CF_CFDP_R1_Reset(), CF_CFDP_R_CheckCrc(), CF_CFDP_R_SubstateRecvEof(), CFE_SUCCESS, CF_Logical_PduEof::crc, CF_Logical_IntHeader::eof, CF_Logical_PduBuffer::int_header, and CF_Transaction::keep.
Referenced by CF_CFDP_R1_Recv().

Here is the call graph for this function:

12.26.2.4 CF_CFDP_R1_SubstateRecvFileData()

```
void CF_CFDP_R1_SubstateRecvFileData (
    CF_Transaction_t * txn,
    CF_Logical_PduBuffer_t * ph )
```

Process received file data for R1.

Description

For R1, only need to digest the CRC.

Assumptions, External Events, and Notes:

txn must not be NULL. ph must not be NULL.

Parameters

txn	Pointer to the transaction object
ph	Pointer to the PDU information

Definition at line 379 of file cf_cfdp_r.c.
References CF_CFDP_R1_Reset(), CF_CFDP_R_ProcessFd(), CF_CFDP_RecvFd(), CF_CRC_Digest(), CFE_S↩UCCESS, CF_Transaction::crc, CF_Logical_PduFileDataHeader::data_len, CF_Logical_PduFileDataHeader::data_ptr, CF_Logical_IntHeader::fd, and CF_Logical_PduBuffer::int_header.
Referenced by CF_CFDP_R1_Recv().

Here is the call graph for this function:

12.26.2.5 CF_CFDP_R2_CalcCrcChunk()

```
CFE_Status_t CF_CFDP_R2_CalcCrcChunk ( CF_Transaction_t * txn )
```

Calculate up to the configured amount of bytes of CRC.

Description

The configuration table has a number of bytes to calculate per transaction per wakeup. At each wakeup, the file is read and this number of bytes are calculated. This function will set the checksum error condition code if the final CRC does not match.

PTFO

Increase throughput by consuming all CRC bytes per wakeup in transaction-order. This would require a change to the meaning of the value in the configuration table.

Assumptions, External Events, and Notes:

txn must not be NULL.

Return values

CFE_SUCCESS	on completion.
CF_ERROR	on non-completion.

Definition at line 620 of file cf_cfdp_r.c.
References CF_RxState_Data::cached_pos, CF_AppData, CF_CFDP_FinDeliveryCode_COMPLETE, CF_CFDP↩_FinFileStatus_RETAINED, CF_CFDP_R2_SetFinTxnStatus(), CF_CFDP_R_CheckCrc(), CF_CFDP_R_READ_↩ERR_EID, CF_CFDP_R_SEEK_CRC_ERR_EID, CF_CFDP_SetTxnStatus(), CF_CRC_Digest(), CF_CRC_Start(), CF_ERROR, CF_R2_CRC_CHUNK_SIZE, CF_TxnState_R2, CF_TxnStatus_FILE_CHECKSUM_FAILURE, CF_↩

TxnStatus_FILE_SIZE_ERROR, CF_WrappedLseek(), CF_WrappedRead(), CFE_EVS_EventType_ERROR, CFE↩_EVS_SendEvent(), CFE_SUCCESS, CF_Transaction::chan_num, CF_HkPacket_Payload::channel_hk, CF_State↩Flags::com, CF_HkChannel_Data::counters, CF_Transaction::crc, CF_Flags_Common::crc_calc, CF_RxS2_Data::dc, CF_RxS2_Data::eof_crc, CF_HkCounters::fault, CF_Transaction::fd, CF_HkFault::file_read, CF_HkFault::file_seek, CF_Transaction::flags, CF_RxS2_Data::fs, CF_Transaction::fsize, CF_Transaction::history, CF_AppData_t::hk, C↩F_Transaction::keep, OS_SEEK_SET, CF_HkPacket::Payload, CF_RxState_Data::r2, CF_StateData::receive, C↩F_RxS2_Data::rx_crc_calc_bytes, CF_History::seq_num, CF_History::src_eid, CF_Transaction::state, and CF_↩Transaction::state_data.
Referenced by CF_CFDP_R2_SubstateSendFin().
Here is the call graph for this function:

12.26.2.6 CF_CFDP_R2_Complete()

```
void CF_CFDP_R2_Complete (
    CF_Transaction_t * txn,
    int ok_to_send_nak )
```

Checks R2 transaction state for transaction completion status.

Description

This function is called anywhere there's a desire to know if the transaction has completed. It may trigger other actions by setting flags to be handled during tick processing. In order for a transaction to be complete, it must have had its meta-data PDU received, the EOF must have been received, and there must be no gaps in the file. EOF is not checked in this function, because it's only called from functions after EOF is received.

Assumptions, External Events, and Notes:

txn must not be NULL.

Parameters

txn	Pointer to the transaction object
ok_to_send_nak	If set to 0, suppress sending of a NAK packet

Definition at line 115 of file cf_cfdp_r.c.
References CF_RxS2_Data::acknak_count, CF_AppData, CF_CFDP_R2_SetFinTxnStatus(), CF_CFDP_R_NAK_L↩IMIT_ERR_EID, CF_CFDP_SetTxnStatus(), CF_ChunkList_ComputeGaps(), CF_RxSubState_FILEDATA, CF_Txn↩

State_R2, CF_TxnStatus_IsError(), CF_TxnStatus_NAK_LIMIT_REACHED, CF_TxnStatus_NO_ERROR, CFE_EVS_EventType_ERROR, CFE_EVS_SendEvent(), CF_ConfigTable::chan, CF_Transaction::chan_num, CF_HkPacket_Payload::channel_hk, CF_ChunkWrapper::chunks, CF_Transaction::chunks, CF_Flags_Rx::complete, CF_AppData_t::config_table, CF_HkChannel_Data::counters, CF_Flags_Rx::eof_recv, CF_HkCounters::fault, CF_Transaction::flags, CF_Transaction::fsize, CF_Transaction::history, CF_AppData_t::hk, CF_Flags_Rx::md_recv, CF_ChannelConfig::nak_limit, CF_HkFault::nak_limit, CF_HkPacket::Payload, CF_RxState_Data::r2, CF_StateData::receive, CF_StateFlags::rx, CF_Flags_Rx::send_nak, CF_History::seq_num, CF_History::src_eid, CF_Transaction::state, CF_Transaction::state_data, CF_RxState_Data::sub_state, and CF_History::txn_stat.
Referenced by CF_CFDP_R2_RecvMd(), CF_CFDP_R2_SubstateRecvEof(), CF_CFDP_R2_SubstateRecvFileData(), and CF_CFDP_R_Tick().
Here is the call graph for this function:

12.26.2.7 CF_CFDP_R2_GapCompute()

```
void CF_CFDP_R2_GapCompute (
    const CF_ChunkList_t * chunks,
    const CF_Chunk_t * chunk,
    void * opaque )
```

Loads a single NAK segment request.

Description

This is a function callback from CF_ChunkList_ComputeGaps().

Assumptions, External Events, and Notes:

chunks must not be NULL, chunk must not be NULL, opaque must not be NULL.

Parameters

chunks	Not used, required for compatibility with CF_ChunkList_ComputeGaps
chunk	Pointer to a single chunk information
opaque	Pointer to a CF_GapComputeArgs_t object (passed via CF_ChunkList_ComputeGaps)

Definition at line 453 of file cf_cfdp_r.c.
References CF_Assert, CF_PDU_MAX_SEGMENTS, CF_GapComputeArgs_t::nak, CF_Logical_SegmentList::num_segments, CF_Chunk::offset, CF_Logical_SegmentRequest::offset_end, CF_Logical_SegmentRequest::offset_start, CF_Logical_PduNak::scope_start, CF_Logical_PduNak::segment_list, CF_Logical_SegmentList::segments, and CF_Chunk::size.
Referenced by CF_CFDP_R_SubstateSendNak().

12.26.2.8 CF_CFDP_R2_Recv()

```
void CF_CFDP_R2_Recv (
    CF_Transaction_t * txn,
    CF_Logical_PduBuffer_t * ph )
```

R2 receive PDU processing.

Assumptions, External Events, and Notes:

txn must not be NULL.

Parameters

txn	Pointer to the transaction object
ph	Pointer to the PDU information

Definition at line 899 of file cf_cfdp_r.c.
References CF_CFDP_FileDirective_ACK, CF_CFDP_FileDirective_EOF, CF_CFDP_FileDirective_METADATA, CF_CFDP_R2_Recv_fin_ack(), CF_CFDP_R2_RecvMd(), CF_CFDP_R2_SubstateRecvEof(), CF_CFDP_R2_SubstateRecvFileData(), CF_CFDP_R_DispatchRecv(), CF_RxSubState_EOF, CF_RxSubState_FILEDATA, CF_RxSubState_WAIT_FOR_FIN_ACK, CF_CFDP_FileDirectiveDispatchTable_t::fdirective, and CF_CFDP_R_SubstateDispatchTable_t::state.
Referenced by CF_CFDP_DispatchRecv().
Here is the call graph for this function:

12.26.2.9 CF_CFDP_R2_Recv_fin_ack()

```
void CF_CFDP_R2_Recv_fin_ack (
    CF_Transaction_t * txn,
    CF_Logical_PduBuffer_t * ph )
```

Process receive FIN-ACK PDU.

Description

This is the end of an R2 transaction. Simply reset the transaction state.

Assumptions, External Events, and Notes:

txn must not be NULL. ph must not be NULL.

Parameters

txn	Pointer to the transaction object
ph	Pointer to the PDU information

Definition at line 757 of file cf_cfdp_r.c.
References CF_AppData, CF_CFDP_R2_Reset(), CF_CFDP_R_PDU_FINACK_ERR_EID, CF_CFDP_RecvAck(), CF_TxnState_R2, CFE_EVS_EventType_ERROR, CFE_EVS_SendEvent(), CF_Transaction::chan_num, CF_Hk↩ Packet_Payload::channel_hk, CF_HkChannel_Data::counters, CF_HkRecv::error, CF_Transaction::history, CF_App↩ Data_t::hk, CF_HkPacket::Payload, CF_HkCounters::recv, CF_History::seq_num, CF_History::src_eid, and CF_↩ Transaction::state.
Referenced by CF_CFDP_R2_Recv().
Here is the call graph for this function:

12.26.2.10 CF_CFDP_R2_RecvMd()

```
void CF_CFDP_R2_RecvMd (
    CF_Transaction_t * txn,
    CF_Logical_PduBuffer_t * ph )
```

Process receive metadata PDU for R2.

Description

It's possible that metadata PDU was missed in cf_cfdp.c, or that it was re-sent. This function checks if it was already processed, and if not, handles it. If there was a temp file opened due to missed metadata PDU, it will move the file to the correct destination according to the metadata PDU.

Assumptions, External Events, and Notes:

txn must not be NULL. ph must not be NULL.

Parameters

txn	Pointer to the transaction object
ph	Pointer to the PDU information

Definition at line 779 of file cf_cfdp_r.c.
References CF_RxS2_Data::acknak_count, CF_RxState_Data::cached_pos, CF_AppData, CF_CFDP_R2_Complete(), CF_CFDP_R2_SetFinTxnStatus(), CF_CFDP_R_EOF_MD_SIZE_ERR_EID, CF_CFDP_R_OPEN_ERR_EID, CF_CFDP_R_PDU_MD_ERR_EID, CF_CFDP_R_RENAME_ERR_EID, CF_CFDP_RecvMd(), CF_FILENAME_MAX_LEN, CF_PERF_ID_RENAME, CF_TxnState_R2, CF_TxnStatus_FILE_SIZE_ERROR, CF_TxnStatus_FILESTORE_REJECTION, CF_WrappedClose(), CF_WrappedOpenCreate(), CFE_ES_PerfLogEntry, CFE_ES_PerfLogExit, CFE_EVS_EventType_ERROR, CFE_EVS_SendEvent(), CF_Transaction::chan_num, CF_HkPacket_Payload::channel_hk, CF_HkChannel_Data::counters, CF_TxnFilenames::dst_filename, CF_Flags_Rx::eof_recv, CF_RxS2_Data::eof_size, CF_HkRecv::error, CF_HkCounters::fault, CF_Transaction::fd, CF_HkFault::file_open, CF_HkFault::file_rename, CF_HkFault::file_size_mismatch, CF_Transaction::flags, CF_History::fnames, CF_Transaction::fsize, CF_Transaction::history, CF_AppData_t::hk, CF_Flags_Rx::md_recv, OS_FILE_FLAG_NONE, OS_mv(), OS_OBJECT_ID_UNDEFINED, OS_READ_WRITE, OS_SUCCESS, CF_HkPacket::Payload, CF_RxState_Data::r2, CF_StateData::receive, CF_HkCounters::recv, CF_StateFlags::rx, CF_History::seq_num, CF_History::src_eid, CF_Transaction::state, and CF_Transaction::state_data.
Referenced by CF_CFDP_R2_Recv().
Here is the call graph for this function:

12.26.2.11 CF_CFDP_R2_Reset()

```
void CF_CFDP_R2_Reset (
    CF_Transaction_t * txn )
```

CFDP R2 transaction reset function.

Description

Handles reset logic for R2, then calls R1 reset logic.

Assumptions, External Events, and Notes:

txn must not be NULL.

Parameters

txn	Pointer to the transaction object

Definition at line 70 of file cf_cfdp_r.c.
References CF_Flags_Common::canceled, CF_CFDP_ConditionCode_NO_ERROR, CF_CFDP_R1_Reset(), CF_RxSubState_WAIT_FOR_FIN_ACK, CF_TxnStatus_IsError(), CF_StateFlags::com, CF_RxS2_Data::eof_cc, CF_Transaction::flags, CF_Transaction::history, CF_RxState_Data::r2, CF_StateData::receive, CF_StateFlags::rx, CF_Flags_Rx::send_fin, CF_Transaction::state_data, CF_RxState_Data::sub_state, and CF_History::txn_stat.
Referenced by CF_CFDP_R2_Recv_fin_ack(), CF_CFDP_R2_SubstateRecvEof(), CF_CFDP_R2_SubstateRecvFileData(), and CF_CFDP_R_Tick().
Here is the call graph for this function:

12.26.2.12 CF_CFDP_R2_SetFinTxnStatus()

```
void CF_CFDP_R2_SetFinTxnStatus (
    CF_Transaction_t * txn,
    CF_TxnStatus_t txn_stat )
```

Helper function to store transaction status code and set send_fin flag.

Assumptions, External Events, and Notes:

txn must not be NULL.

Parameters

txn	Pointer to the transaction object
txn_stat	Status Code value to set within transaction

Definition at line 47 of file cf_cfdp_r.c.
References CF_CFDP_SetTxnStatus(), CF_Transaction::flags, CF_StateFlags::rx, and CF_Flags_Rx::send_fin.
Referenced by CF_CFDP_R2_CalcCrcChunk(), CF_CFDP_R2_Complete(), CF_CFDP_R2_RecvMd(), CF_CFDP_R2_SubstateRecvEof(), CF_CFDP_R_Init(), and CF_CFDP_R_Tick().
Here is the call graph for this function:

12.26.2.13 CF_CFDP_R2_SubstateRecvEof()

```
void CF_CFDP_R2_SubstateRecvEof (
    CF_Transaction_t * txn,
    CF_Logical_PduBuffer_t * ph )
```

Process receive EOF for R2.

Description

For R2, need to trigger the send of EOF-ACK and then call the check complete function which will either send NAK or FIN.

Assumptions, External Events, and Notes:

txn must not be NULL. ph must not be NULL.

Parameters

txn	Pointer to the transaction object
ph	Pointer to the PDU information

Definition at line 322 of file cf_cfdp_r.c.
References CF_Logical_PduEof::cc, CF_CFDP_ConditionCode_NO_ERROR, CF_CFDP_R2_Complete(), CF_CFDP_R2_Reset(), CF_CFDP_R2_SetFinTxnStatus(), CF_CFDP_R_SubstateRecvEof(), CF_CFDP_SetTxnStatus(), CF_REC_PDU_FSIZE_MISMATCH_ERROR, CF_RxSubState_FILEDATA, CF_TxnStatus_FILE_SIZE_ERROR, CF_TxnStatus_From_ConditionCode(), CFE_SUCCESS, CF_Logical_PduEof::crc, CF_Logical_IntHeader::eof, CF_RxS2_Data::eof_cc, CF_RxS2_Data::eof_crc, CF_Flags_Rx::eof_recv, CF_RxS2_Data::eof_size, CF_Transaction::flags, CF_Logical_PduBuffer::int_header, CF_RxState_Data::r2, CF_StateData::receive, CF_StateFlags::rx, CF_Flags_Rx::send_ack, CF_Logical_PduEof::size, CF_Transaction::state_data, and CF_RxState_Data::sub_state.
Referenced by CF_CFDP_R2_Recv().

Here is the call graph for this function:

12.26.2.14 CF_CFDP_R2_SubstateRecvFileData()

```
void CF_CFDP_R2_SubstateRecvFileData (
    CF_Transaction_t * txn,
    CF_Logical_PduBuffer_t * ph )
```

Process received file data for R2.

Description

For R2, the CRC is checked after the whole file is received since there may be gaps. Instead, insert file received range data into chunks. Once NAK has been received, this function always checks for completion. This function also re-arms the ACK timer.

Assumptions, External Events, and Notes:

txn must not be NULL. ph must not be NULL.

Parameters

txn	Pointer to the transaction object
ph	Pointer to the PDU information

Definition at line 408 of file cf_cfdp_r.c.
References CF_RxS2_Data::acknak_count, CF_CFDP_ArmAckTimer(), CF_CFDP_R2_Complete(), CF_CFDP_R2_Reset(), CF_CFDP_R_ProcessFd(), CF_CFDP_RecvFd(), CF_ChunkListAdd(), CFE_SUCCESS, CF_ChunkWrapper::chunks, CF_Transaction::chunks, CF_Flags_Rx::complete, CF_Logical_PduFileDataHeader::data_len, CF_Logical_IntHeader::fd, CF_Flags_Rx::fd_nak_sent, CF_Transaction::flags, CF_Logical_PduBuffer::int_header, CF_Logical_PduFileDataHeader::offset, CF_RxState_Data::r2, CF_StateData::receive, CF_StateFlags::rx, and CF_Transaction::state_data.
Referenced by CF_CFDP_R2_Recv().

Here is the call graph for this function:

12.26.2.15 CF_CFDP_R2_SubstateSendFin()

```
CFE_Status_t CF_CFDP_R2_SubstateSendFin ( CF_Transaction_t * txn )
```

Send a FIN PDU.

Assumptions, External Events, and Notes:

txn must not be NULL.

Return values

CFE_SUCCESS	on success. CF_ERROR on error.

Parameters

txn	Pointer to the transaction object

Definition at line 720 of file cf_cfdp_r.c.
References CF_Assert, CF_CFDP_R2_CalcCrcChunk(), CF_CFDP_SendFin(), CF_ERROR, CF_RxSubState_WA↩IT_FOR_FIN_ACK, CF_SEND_PDU_ERROR, CF_TxnStatus_IsError(), CF_TxnStatus_To_ConditionCode(), CFE_↩SUCCESS, CF_StateFlags::com, CF_Flags_Common::crc_calc, CF_RxS2_Data::dc, CF_Transaction::flags, CF_Rx↩S2_Data::fs, CF_Transaction::history, CF_RxState_Data::r2, CF_StateData::receive, CF_Transaction::state_data, C↩F_RxState_Data::sub_state, and CF_History::txn_stat.
Referenced by CF_CFDP_R_Tick().

Here is the call graph for this function:

12.26.2.16 CF_CFDP_R_Cancel()

```
void CF_CFDP_R_Cancel (
    CF_Transaction_t * txn )
```

Cancel an R transaction.

Assumptions, External Events, and Notes:

txn must not be NULL.

Parameters

txn	Pointer to the transaction object

Definition at line 925 of file cf_cfdp_r.c.
References CF_CFDP_R1_Reset(), CF_RxSubState_WAIT_FOR_FIN_ACK, CF_TxnState_R2, CF_Transaction::flags, CF_StateData::receive, CF_StateFlags::rx, CF_Flags_Rx::send_fin, CF_Transaction::state, CF_Transaction::state_↩data, and CF_RxState_Data::sub_state.
Referenced by CF_CFDP_CancelTransaction().

Here is the call graph for this function:

12.26.2.17 CF_CFDP_R_CheckCrc()

```
CFE_Status_t CF_CFDP_R_CheckCrc (
    CF_Transaction_t * txn,
    uint32 expected_crc )
```

Checks that the transaction file's CRC matches expected.

Assumptions, External Events, and Notes:

txn must not be NULL.

Return values

CFE_SUCCESS	on CRC match, otherwise error.

Parameters

txn	Pointer to the transaction object
expected_crc	Expected CRC

Definition at line 91 of file cf_cfdp_r.c.
References CF_AppData, CF_CFDP_R_CRC_ERR_EID, CF_CRC_Finalize(), CF_TxnState_R2, CFE_EVS_Event↩Type_ERROR, CFE_EVS_SendEvent(), CFE_SUCCESS, CF_Transaction::chan_num, CF_HkPacket_Payload↩::channel_hk, CF_HkChannel_Data::counters, CF_Transaction::crc, CF_HkFault::crc_mismatch, CF_HkCounters↩::fault, CF_Transaction::history, CF_AppData_t::hk, CF_HkPacket::Payload, CF_Crc::result, CF_History::seq_num, CF_History::src_eid, and CF_Transaction::state.
Referenced by CF_CFDP_R1_SubstateRecvEof(), and CF_CFDP_R2_CalcCrcChunk().

Here is the call graph for this function:

12.26.2.18 CF_CFDP_R_Init()

```
void CF_CFDP_R_Init (
    CF_Transaction_t * txn )
```

Initialize a transaction structure for R.

Assumptions, External Events, and Notes:

txn must not be NULL.

Parameters

txn	Pointer to the transaction object

Definition at line 566 of file cf_cfdp_r.c.
References CF_AppData, CF_CFDP_ArmAckTimer(), CF_CFDP_R1_Reset(), CF_CFDP_R2_SetFinTxnStatus(), CF_CFDP_R_CREAT_ERR_EID, CF_CFDP_R_TEMP_FILE_INF_EID, CF_FILENAME_MAX_PATH, CF_RxSub↩State_FILEDATA, CF_TxnState_R2, CF_TxnStatus_FILESTORE_REJECTION, CF_WrappedOpenCreate(), CFE_↩EVS_EventType_ERROR, CFE_EVS_EventType_INFORMATION, CFE_EVS_SendEvent(), CF_Transaction::chan↩_num, CF_HkPacket_Payload::channel_hk, CF_AppData_t::config_table, CF_HkChannel_Data::counters, CF_Txn↩Filenames::dst_filename, CF_HkCounters::fault, CF_Transaction::fd, CF_HkFault::file_open, CF_Transaction::flags, CF_History::fnames, CF_Transaction::history, CF_AppData_t::hk, CF_Flags_Rx::md_recv, OS_FILE_FLAG_CR↩EATE, OS_FILE_FLAG_TRUNCATE, OS_OBJECT_ID_UNDEFINED, OS_READ_WRITE, CF_HkPacket::Payload, CF_StateData::receive, CF_StateFlags::rx, CF_History::seq_num, CF_History::src_eid, CF_Transaction::state, CF_↩Transaction::state_data, CF_RxState_Data::sub_state, and CF_ConfigTable::tmp_dir.
Referenced by CF_CFDP_RecvIdle().

Here is the call graph for this function:

12.26.2.19 CF_CFDP_R_ProcessFd()

```
CFE_Status_t CF_CFDP_R_ProcessFd (
    CF_Transaction_t * txn,
    CF_Logical_PduBuffer_t * ph )
```

Process a filedata PDU on a transaction.

Assumptions, External Events, and Notes:

txn must not be NULL.

Return values

CFE_SUCCESS	on success. CF_ERROR on error.

Parameters

txn	Pointer to the transaction object
ph	Pointer to the PDU information

Definition at line 190 of file cf_cfdp_r.c.

References CF_RxState_Data::cached_pos, CF_AppData, CF_CFDP_R_SEEK_FD_ERR_EID, CF_CFDP_R_W↩RITE_ERR_EID, CF_CFDP_SetTxnStatus(), CF_ERROR, CF_TxnState_R2, CF_TxnStatus_FILE_SIZE_ERROR, CF_TxnStatus_FILESTORE_REJECTION, CF_WrappedLseek(), CF_WrappedWrite(), CFE_EVS_EventType_ER↩ROR, CFE_EVS_SendEvent(), CFE_SUCCESS, CF_Transaction::chan_num, CF_HkPacket_Payload::channel_hk, CF_HkChannel_Data::counters, CF_Logical_PduFileDataHeader::data_len, CF_Logical_PduFileDataHeader::data_↩ptr, CF_HkCounters::fault, CF_Logical_IntHeader::fd, CF_Transaction::fd, CF_HkRecv::file_data_bytes, CF_HkFault↩::file_seek, CF_HkFault::file_write, CF_Transaction::history, CF_AppData_t::hk, CF_Logical_PduBuffer::int_header, CF_Logical_PduFileDataHeader::offset, OS_SEEK_SET, CF_HkPacket::Payload, CF_StateData::receive, CF_Hk↩

Counters::recv, CF_History::seq_num, CF_History::src_eid, CF_Transaction::state, and CF_Transaction::state_data.
Referenced by CF_CFDP_R1_SubstateRecvFileData(), and CF_CFDP_R2_SubstateRecvFileData().
Here is the call graph for this function:

12.26.2.20 CF_CFDP_R_SendInactivityEvent()

```
void CF_CFDP_R_SendInactivityEvent (
    CF_Transaction_t * txn )
```

Sends an inactivity timer expired event to EVS.

Assumptions, External Events, and Notes:

txn must not be NULL.

Parameters

txn	Pointer to the transaction object

Definition at line 944 of file cf_cfdp_r.c.
References CF_AppData, CF_CFDP_R_INACT_TIMER_ERR_EID, CF_TxnState_R2, CFE_EVS_EventType_ER↩ROR, CFE_EVS_SendEvent(), CF_Transaction::chan_num, CF_HkPacket_Payload::channel_hk, CF_HkChannel_↩Data::counters, CF_HkCounters::fault, CF_Transaction::history, CF_AppData_t::hk, CF_HkFault::inactivity_timer, C↩F_HkPacket::Payload, CF_History::seq_num, CF_History::src_eid, and CF_Transaction::state.
Referenced by CF_CFDP_R_Tick().
Here is the call graph for this function:

12.26.2.21 CF_CFDP_R_SubstateRecvEof()

```
CFE_Status_t CF_CFDP_R_SubstateRecvEof (
```

```
CF_Transaction_t * txn,
CF_Logical_PduBuffer_t * ph )
```

Processing receive EOF common functionality for R1/R2.

Description

This function is used for both R1 and R2 EOF receive. It calls the unmarshaling function and then checks known transaction data against the PDU.

Assumptions, External Events, and Notes:

txn must not be NULL. ph must not be NULL.

Return values

CFE_SUCCESS	on success. Returns anything else on error.

Parameters

txn	Pointer to the transaction object
ph	Pointer to the PDU information

Definition at line 250 of file cf_cfdp_r.c.
References CF_AppData, CF_CFDP_R_PDU_EOF_ERR_EID, CF_CFDP_R_SIZE_MISMATCH_ERR_EID, CF_CFDP_RecvEof(), CF_REC_PDU_BAD_EOF_ERROR, CF_REC_PDU_FSIZE_MISMATCH_ERROR, CF_TxnState_R2, CFE_EVS_EventType_ERROR, CFE_EVS_SendEvent(), CFE_SUCCESS, CF_Transaction::chan_num, CF_HkPacket_Payload::channel_hk, CF_HkChannel_Data::counters, CF_Logical_IntHeader::eof, CF_HkRecv::error, CF_HkCounters::fault, CF_HkFault::file_size_mismatch, CF_Transaction::flags, CF_Transaction::fsize, CF_Transaction::history, CF_AppData_t::hk, CF_Logical_PduBuffer::int_header, CF_Flags_Rx::md_recv, CF_HkPacket::Payload, CF_HkCounters::recv, CF_StateFlags::rx, CF_History::seq_num, CF_Logical_PduEof::size, CF_History::src_eid, and CF_Transaction::state.
Referenced by CF_CFDP_R1_SubstateRecvEof(), and CF_CFDP_R2_SubstateRecvEof().
Here is the call graph for this function:

12.26.2.22 CF_CFDP_R_SubstateSendNak()

```
CFE_Status_t CF_CFDP_R_SubstateSendNak (
CF_Transaction_t * txn )
```

Send a NAK PDU for R2.

Description

NAK PDU is sent when there are gaps in the received data. The chunks class tracks this and generates the NAK PDU by calculating gaps internally and calling CF_CFDP_R2_GapCompute(). There is a special case where if a metadata PDU has not been received, then a NAK packet will be sent to request another.

Assumptions, External Events, and Notes:

txn must not be NULL.

Return values

CFE_SUCCESS	on success. CF_ERROR on error.

Parameters

txn	Pointer to the transaction object

Definition at line 485 of file cf_cfdp_r.c.
References CF_AppData, CF_Assert, CF_CFDP_ConstructPduHeader(), CF_CFDP_FileDirective_NAK, CF_CFDP_R2_GapCompute(), CF_CFDP_R_REQUEST_MD_INF_EID, CF_CFDP_SendNak(), CF_ChunkList_ComputeGaps(), CF_ERROR, CF_SEND_PDU_ERROR, CF_TxnState_R2, CFE_EVS_EventType_INFORMATION, CFE_EVS_SendEvent(), CFE_SUCCESS, CF_Transaction::chan_num, CF_HkPacket_Payload::channel_hk, CF_ChunkWrapper::chunks, CF_Transaction::chunks, CF_Flags_Rx::complete, CF_AppData_t::config_table, CF_ChunkList::count, CF_HkChannel_Data::counters, CF_Flags_Rx::fd_nak_sent, CF_Transaction::flags, CF_Transaction::fsize, CF_Transaction::history, CF_AppData_t::hk, CF_Logical_PduBuffer::int_header, CF_ConfigTable::local_eid, CF_ChunkList::max_chunks, CF_Flags_Rx::md_recv, CF_Logical_IntHeader::nak, CF_HkSent::nak_segment_requests, CF_Logical_SegmentList::num_segments, CF_Logical_SegmentRequest::offset_end, CF_Logical_SegmentRequest::offset_start, CF_HkPacket::Payload, CF_History::peer_eid, CF_StateFlags::rx, CF_Logical_PduNak::scope_end, CF_Logical_PduNak::scope_start, CF_Logical_PduNak::segment_list, CF_Logical_SegmentList::segments, CF_HkCounters::sent, CF_History::seq_num, CF_History::src_eid, and CF_Transaction::state.
Referenced by CF_CFDP_R_Tick().
Here is the call graph for this function:

12.26.2.23 CF_CFDP_R_Tick()

```
void CF_CFDP_R_Tick (
    CF_Transaction_t * txn,
    int * cont )
```

Perform tick (time-based) processing for R transactions.

Description

This function is called on every transaction by the engine on every CF wakeup. This is where flags are checked to send ACK, NAK, and FIN. It checks for inactivity timer and processes the ACK timer. The ACK timer is what triggers re-sends of PDUs that require acknowledgment.

Assumptions, External Events, and Notes:

txn must not be NULL. cont is unused, so may be NULL

Parameters

txn	Pointer to the transaction object
cont	Ignored/Unused

Definition at line 958 of file cf_cfdp_r.c.
References CF_ChannelConfig::ack_limit, CF_HkFault::ack_limit, CF_Transaction::ack_timer, CF_Flags_Common↩::ack_timer_armed, CF_RxS2_Data::acknak_count, CF_AppData, CF_Assert, CF_CFDP_AckTxnStatus_ACTIVE, CF_CFDP_ArmAckTimer(), CF_CFDP_FileDirective_EOF, CF_CFDP_R1_Reset(), CF_CFDP_R2_Complete(), C↩F_CFDP_R2_Reset(), CF_CFDP_R2_SetFinTxnStatus(), CF_CFDP_R2_SubstateSendFin(), CF_CFDP_R_ACK↩_LIMIT_ERR_EID, CF_CFDP_R_SendInactivityEvent(), CF_CFDP_R_SubstateSendNak(), CF_CFDP_SendAck(), CF_CFDP_SetTxnStatus(), CF_RxSubState_WAIT_FOR_FIN_ACK, CF_SEND_PDU_ERROR, CF_SEND_PD↩U_NO_BUF_AVAIL_ERROR, CF_Timer_Expired(), CF_Timer_Tick(), CF_TxnState_R2, CF_TxnStatus_ACK_LI↩MIT_NO_FIN, CF_TxnStatus_INACTIVITY_DETECTED, CFE_EVS_EventType_ERROR, CFE_EVS_SendEvent(), CF_ConfigTable::chan, CF_Transaction::chan_num, CF_HkPacket_Payload::channel_hk, CF_StateFlags::com, CF↩_Flags_Rx::complete, CF_AppData_t::config_table, CF_HkChannel_Data::counters, CF_RxS2_Data::eof_cc, CF_↩HkCounters::fault, CF_Transaction::flags, CF_Transaction::history, CF_AppData_t::hk, CF_Flags_Rx::inactivity_fired, CF_Transaction::inactivity_timer, CF_HkPacket::Payload, CF_History::peer_eid, CF_RxState_Data::r2, CF_State↩Data::receive, CF_StateFlags::rx, CF_Flags_Rx::send_ack, CF_Flags_Rx::send_fin, CF_Flags_Rx::send_nak, CF_↩History::seq_num, CF_History::src_eid, CF_Transaction::state, CF_Transaction::state_data, and CF_RxState_Data↩::sub_state.
Referenced by CF_CFDP_TickTransactions().

Here is the call graph for this function:

12.27 apps/cf/fsw/src/cf_cfdp_r.h File Reference

```
#include "cf_cfdp.h"
```

Data Structures

- struct CF_GapComputeArgs_t

  Argument for Gap Compute function.

Functions

- void CF_CFDP_R1_Recv (CF_Transaction_t ∗txn, CF_Logical_PduBuffer_t ∗ph)

  R1 receive PDU processing.
- void CF_CFDP_R2_Recv (CF_Transaction_t ∗txn, CF_Logical_PduBuffer_t ∗ph)

  R2 receive PDU processing.
- void CF_CFDP_R_Tick (CF_Transaction_t ∗txn, int ∗cont)

Perform tick (time-based) processing for R transactions.

- void CF_CFDP_R_Cancel (CF_Transaction_t *txn)

  Cancel an R transaction.
- void CF_CFDP_R_Init (CF_Transaction_t *txn)

  Initialize a transaction structure for R.
- void CF_CFDP_R2_SetFinTxnStatus (CF_Transaction_t *txn, CF_TxnStatus_t txn_stat)

  Helper function to store transaction status code and set send_fin flag.
- void CF_CFDP_R1_Reset (CF_Transaction_t *txn)

  CFDP R1 transaction reset function.
- void CF_CFDP_R2_Reset (CF_Transaction_t *txn)

  CFDP R2 transaction reset function.
- CFE_Status_t CF_CFDP_R_CheckCrc (CF_Transaction_t *txn, uint32 expected_crc)

  Checks that the transaction file's CRC matches expected.
- void CF_CFDP_R2_Complete (CF_Transaction_t *txn, int ok_to_send_nak)

  Checks R2 transaction state for transaction completion status.
- CFE_Status_t CF_CFDP_R_ProcessFd (CF_Transaction_t *txn, CF_Logical_PduBuffer_t *ph)

  Process a filedata PDU on a transaction.
- CFE_Status_t CF_CFDP_R_SubstateRecvEof (CF_Transaction_t *txn, CF_Logical_PduBuffer_t *ph)

  Processing receive EOF common functionality for R1/R2.
- void CF_CFDP_R1_SubstateRecvEof (CF_Transaction_t *txn, CF_Logical_PduBuffer_t *ph)

  Process receive EOF for R1.
- void CF_CFDP_R2_SubstateRecvEof (CF_Transaction_t *txn, CF_Logical_PduBuffer_t *ph)

  Process receive EOF for R2.
- void CF_CFDP_R1_SubstateRecvFileData (CF_Transaction_t *txn, CF_Logical_PduBuffer_t *ph)

  Process received file data for R1.
- void CF_CFDP_R2_SubstateRecvFileData (CF_Transaction_t *txn, CF_Logical_PduBuffer_t *ph)

  Process received file data for R2.
- void CF_CFDP_R2_GapCompute (const CF_ChunkList_t *chunks, const CF_Chunk_t *chunk, void *opaque)

  Loads a single NAK segment request.
- CFE_Status_t CF_CFDP_R_SubstateSendNak (CF_Transaction_t *txn)

  Send a NAK PDU for R2.
- CFE_Status_t CF_CFDP_R2_CalcCrcChunk (CF_Transaction_t *txn)

  Calculate up to the configured amount of bytes of CRC.
- CFE_Status_t CF_CFDP_R2_SubstateSendFin (CF_Transaction_t *txn)

  Send a FIN PDU.
- void CF_CFDP_R2_Recv_fin_ack (CF_Transaction_t *txn, CF_Logical_PduBuffer_t *ph)

  Process receive FIN-ACK PDU.
- void CF_CFDP_R2_RecvMd (CF_Transaction_t *txn, CF_Logical_PduBuffer_t *ph)

  Process receive metadata PDU for R2.
- void CF_CFDP_R_SendInactivityEvent (CF_Transaction_t *txn)

  Sends an inactivity timer expired event to EVS.

12.27.1 Detailed Description

Implementation related to CFDP Receive File transactions
This file contains various state handling routines for transactions which are receiving a file.

12.27.2 Function Documentation

12.27.2.1 CF_CFDP_R1_Recv()

```
void CF_CFDP_R1_Recv (
    CF_Transaction_t * txn,
    CF_Logical_PduBuffer_t * ph )
```

R1 receive PDU processing.

Assumptions, External Events, and Notes:

txn must not be NULL.

Parameters

txn	Pointer to the transaction object
ph	Pointer to the PDU information

Definition at line 881 of file cf_cfdp_r.c.
References CF_CFDP_FileDirective_EOF, CF_CFDP_R1_SubstateRecvEof(), CF_CFDP_R1_SubstateRecvFileData(), CF_CFDP_R_DispatchRecv(), CF_RxSubState_EOF, CF_RxSubState_FILEDATA, CF_RxSubState_WAIT_FOR_FIN_ACK, CF_CFDP_FileDirectiveDispatchTable_t::fdirective, and CF_CFDP_R_SubstateDispatchTable_t::state.
Referenced by CF_CFDP_DispatchRecv().
Here is the call graph for this function:

12.27.2.2 CF_CFDP_R1_Reset()

```
void CF_CFDP_R1_Reset (
```

```
CF_Transaction_t * txn )
```

CFDP R1 transaction reset function.

Description

All R transactions use this call to indicate the transaction state can be returned to the system. While this function currently only calls CF_CFDP_ResetTransaction(), it is here as a placeholder.

Assumptions, External Events, and Notes:

txn must not be NULL.

Parameters

txn	Pointer to the transaction object

Definition at line 59 of file cf_cfdp_r.c.
References CF_CFDP_ResetTransaction().
Referenced by CF_CFDP_R1_SubstateRecvEof(), CF_CFDP_R1_SubstateRecvFileData(), CF_CFDP_R2_Reset(), CF_CFDP_R_Cancel(), CF_CFDP_R_Init(), and CF_CFDP_R_Tick().
Here is the call graph for this function:

12.27.2.3 CF_CFDP_R1_SubstateRecvEof()

```
void CF_CFDP_R1_SubstateRecvEof (
    CF_Transaction_t * txn,
    CF_Logical_PduBuffer_t * ph )
```

Process receive EOF for R1.

Description

Only need to confirm CRC for R1.

Assumptions, External Events, and Notes:

txn must not be NULL. ph must not be NULL.

Parameters

txn	Pointer to the transaction object
ph	Pointer to the PDU information

Definition at line 290 of file cf_cfdp_r.c.
References CF_CFDP_R1_Reset(), CF_CFDP_R_CheckCrc(), CF_CFDP_R_SubstateRecvEof(), CFE_SUCCESS, CF_Logical_PduEof::crc, CF_Logical_IntHeader::eof, CF_Logical_PduBuffer::int_header, and CF_Transaction::keep.
Referenced by CF_CFDP_R1_Recv().
Here is the call graph for this function:

12.27.2.4 CF_CFDP_R1_SubstateRecvFileData()

```
void CF_CFDP_R1_SubstateRecvFileData (
    CF_Transaction_t * txn,
    CF_Logical_PduBuffer_t * ph )
```

Process received file data for R1.

Description

For R1, only need to digest the CRC.

Assumptions, External Events, and Notes:

txn must not be NULL. ph must not be NULL.

Parameters

txn	Pointer to the transaction object
ph	Pointer to the PDU information

Definition at line 379 of file cf_cfdp_r.c.
References CF_CFDP_R1_Reset(), CF_CFDP_R_ProcessFd(), CF_CFDP_RecvFd(), CF_CRC_Digest(), CFE_S↩UCCESS, CF_Transaction::crc, CF_Logical_PduFileDataHeader::data_len, CF_Logical_PduFileDataHeader::data_ptr, CF_Logical_IntHeader::fd, and CF_Logical_PduBuffer::int_header.
Referenced by CF_CFDP_R1_Recv().
Here is the call graph for this function:

12.27.2.5 CF_CFDP_R2_CalcCrcChunk()

```
CFE_Status_t CF_CFDP_R2_CalcCrcChunk (
    CF_Transaction_t * txn )
```

Calculate up to the configured amount of bytes of CRC.

Description

The configuration table has a number of bytes to calculate per transaction per wakeup. At each wakeup, the file is read and this number of bytes are calculated. This function will set the checksum error condition code if the final CRC does not match.

PTFO

Increase throughput by consuming all CRC bytes per wakeup in transaction-order. This would require a change to the meaning of the value in the configuration table.

Assumptions, External Events, and Notes:

txn must not be NULL.

Return values

CFE_SUCCESS	on completion.
CF_ERROR	on non-completion.

Definition at line 620 of file cf_cfdp_r.c.
References CF_RxState_Data::cached_pos, CF_AppData, CF_CFDP_FinDeliveryCode_COMPLETE, CF_CFDP↩_FinFileStatus_RETAINED, CF_CFDP_R2_SetFinTxnStatus(), CF_CFDP_R_CheckCrc(), CF_CFDP_R_READ_↩ERR_EID, CF_CFDP_R_SEEK_CRC_ERR_EID, CF_CFDP_SetTxnStatus(), CF_CRC_Digest(), CF_CRC_Start(), CF_ERROR, CF_R2_CRC_CHUNK_SIZE, CF_TxnState_R2, CF_TxnStatus_FILE_CHECKSUM_FAILURE, CF_↩TxnStatus_FILE_SIZE_ERROR, CF_WrappedLseek(), CF_WrappedRead(), CFE_EVS_EventType_ERROR, CFE↩_EVS_SendEvent(), CFE_SUCCESS, CF_Transaction::chan_num, CF_HkPacket_Payload::channel_hk, CF_State↩Flags::com, CF_HkChannel_Data::counters, CF_Transaction::crc, CF_Flags_Common::crc_calc, CF_RxS2_Data::dc, CF_RxS2_Data::eof_crc, CF_HkCounters::fault, CF_Transaction::fd, CF_HkFault::file_read, CF_HkFault::file_seek, CF_Transaction::flags, CF_RxS2_Data::fs, CF_Transaction::fsize, CF_Transaction::history, CF_AppData_t::hk, C↩F_Transaction::keep, OS_SEEK_SET, CF_HkPacket::Payload, CF_RxState_Data::r2, CF_StateData::receive, C↩F_RxS2_Data::rx_crc_calc_bytes, CF_History::seq_num, CF_History::src_eid, CF_Transaction::state, and CF_↩Transaction::state_data.
Referenced by CF_CFDP_R2_SubstateSendFin().
Here is the call graph for this function:

12.27.2.6 CF_CFDP_R2_Complete()

```
void CF_CFDP_R2_Complete (
    CF_Transaction_t * txn,
    int ok_to_send_nak )
```

Checks R2 transaction state for transaction completion status.

Description

This function is called anywhere there's a desire to know if the transaction has completed. It may trigger other actions by setting flags to be handled during tick processing. In order for a transaction to be complete, it must have had its meta-data PDU received, the EOF must have been received, and there must be no gaps in the file. EOF is not checked in this function, because it's only called from functions after EOF is received.

Assumptions, External Events, and Notes:

txn must not be NULL.

Parameters

txn	Pointer to the transaction object
ok_to_send_nak	If set to 0, suppress sending of a NAK packet

Definition at line 115 of file cf_cfdp_r.c.
References CF_RxS2_Data::acknak_count, CF_AppData, CF_CFDP_R2_SetFinTxnStatus(), CF_CFDP_R_NAK_L↩IMIT_ERR_EID, CF_CFDP_SetTxnStatus(), CF_ChunkList_ComputeGaps(), CF_RxSubState_FILEDATA, CF_Txn↩State_R2, CF_TxnStatus_IsError(), CF_TxnStatus_NAK_LIMIT_REACHED, CF_TxnStatus_NO_ERROR, CFE_EV↩S_EventType_ERROR, CFE_EVS_SendEvent(), CF_ConfigTable::chan, CF_Transaction::chan_num, CF_HkPacket_↩Payload::channel_hk, CF_ChunkWrapper::chunks, CF_Transaction::chunks, CF_Flags_Rx::complete, CF_AppData_↩t::config_table, CF_HkChannel_Data::counters, CF_Flags_Rx::eof_recv, CF_HkCounters::fault, CF_Transaction::flags, CF_Transaction::fsize, CF_Transaction::history, CF_AppData_t::hk, CF_Flags_Rx::md_recv, CF_ChannelConfig::nak↩_limit, CF_HkFault::nak_limit, CF_HkPacket::Payload, CF_RxState_Data::r2, CF_StateData::receive, CF_StateFlags↩::rx, CF_Flags_Rx::send_nak, CF_History::seq_num, CF_History::src_eid, CF_Transaction::state, CF_Transaction↩::state_data, CF_RxState_Data::sub_state, and CF_History::txn_stat.
Referenced by CF_CFDP_R2_RecvMd(), CF_CFDP_R2_SubstateRecvEof(), CF_CFDP_R2_SubstateRecvFileData(), and CF_CFDP_R_Tick().
Here is the call graph for this function:

12.27.2.7 CF_CFDP_R2_GapCompute()

```
void CF_CFDP_R2_GapCompute (
    const CF_ChunkList_t * chunks,
    const CF_Chunk_t * chunk,
    void * opaque )
```

Loads a single NAK segment request.

Description

This is a function callback from CF_ChunkList_ComputeGaps().

Assumptions, External Events, and Notes:

chunks must not be NULL, chunk must not be NULL, opaque must not be NULL.

Parameters

chunks	Not used, required for compatibility with CF_ChunkList_ComputeGaps
chunk	Pointer to a single chunk information
opaque	Pointer to a CF_GapComputeArgs_t object (passed via CF_ChunkList_ComputeGaps)

Definition at line 453 of file cf_cfdp_r.c.
References CF_Assert, CF_PDU_MAX_SEGMENTS, CF_GapComputeArgs_t::nak, CF_Logical_SegmentList::num↩_segments, CF_Chunk::offset, CF_Logical_SegmentRequest::offset_end, CF_Logical_SegmentRequest::offset_start, CF_Logical_PduNak::scope_start, CF_Logical_PduNak::segment_list, CF_Logical_SegmentList::segments, and CF↩

_Chunk::size.
Referenced by CF_CFDP_R_SubstateSendNak().

12.27.2.8 CF_CFDP_R2_Recv()

```
void CF_CFDP_R2_Recv (
    CF_Transaction_t * txn,
    CF_Logical_PduBuffer_t * ph )
```

R2 receive PDU processing.

Assumptions, External Events, and Notes:

txn must not be NULL.

Parameters

txn	Pointer to the transaction object
ph	Pointer to the PDU information

Definition at line 899 of file cf_cfdp_r.c.
References CF_CFDP_FileDirective_ACK, CF_CFDP_FileDirective_EOF, CF_CFDP_FileDirective_METADATA, CF_CFDP_R2_Recv_fin_ack(), CF_CFDP_R2_RecvMd(), CF_CFDP_R2_SubstateRecvEof(), CF_CFDP_R2_↩SubstateRecvFileData(), CF_CFDP_R_DispatchRecv(), CF_RxSubState_EOF, CF_RxSubState_FILEDATA, CF_↩RxSubState_WAIT_FOR_FIN_ACK, CF_CFDP_FileDirectiveDispatchTable_t::fdirective, and CF_CFDP_R_Substate↩DispatchTable_t::state.
Referenced by CF_CFDP_DispatchRecv().
Here is the call graph for this function:

12.27.2.9 CF_CFDP_R2_Recv_fin_ack()

```
void CF_CFDP_R2_Recv_fin_ack (
    CF_Transaction_t * txn,
    CF_Logical_PduBuffer_t * ph )
```

Process receive FIN-ACK PDU.

Description

This is the end of an R2 transaction. Simply reset the transaction state.

Assumptions, External Events, and Notes:

txn must not be NULL. ph must not be NULL.

Parameters

txn	Pointer to the transaction object
ph	Pointer to the PDU information

Definition at line 757 of file cf_cfdp_r.c.
References CF_AppData, CF_CFDP_R2_Reset(), CF_CFDP_R_PDU_FINACK_ERR_EID, CF_CFDP_RecvAck(), CF_TxnState_R2, CFE_EVS_EventType_ERROR, CFE_EVS_SendEvent(), CF_Transaction::chan_num, CF_Hk↩Packet_Payload::channel_hk, CF_HkChannel_Data::counters, CF_HkRecv::error, CF_Transaction::history, CF_App↩Data_t::hk, CF_HkPacket::Payload, CF_HkCounters::recv, CF_History::seq_num, CF_History::src_eid, and CF_↩Transaction::state.
Referenced by CF_CFDP_R2_Recv().
Here is the call graph for this function:

12.27.2.10 CF_CFDP_R2_RecvMd()

```
void CF_CFDP_R2_RecvMd (
    CF_Transaction_t * txn,
    CF_Logical_PduBuffer_t * ph )
```

Process receive metadata PDU for R2.

Description

It's possible that metadata PDU was missed in cf_cfdp.c, or that it was re-sent. This function checks if it was already processed, and if not, handles it. If there was a temp file opened due to missed metadata PDU, it will move the file to the correct destination according to the metadata PDU.

Assumptions, External Events, and Notes:

txn must not be NULL. ph must not be NULL.

Parameters

txn	Pointer to the transaction object
ph	Pointer to the PDU information

Definition at line 779 of file cf_cfdp_r.c.
References CF_RxS2_Data::acknak_count, CF_RxState_Data::cached_pos, CF_AppData, CF_CFDP_R2_Complete(), CF_CFDP_R2_SetFinTxnStatus(), CF_CFDP_R_EOF_MD_SIZE_ERR_EID, CF_CFDP_R_OPEN_ERR_EID, CF_CFDP_R_PDU_MD_ERR_EID, CF_CFDP_R_RENAME_ERR_EID, CF_CFDP_RecvMd(), CF_FILENAME_MAX_LEN, CF_PERF_ID_RENAME, CF_TxnState_R2, CF_TxnStatus_FILE_SIZE_ERROR, CF_TxnStatus_FILESTORE_REJECTION, CF_WrappedClose(), CF_WrappedOpenCreate(), CFE_ES_PerfLogEntry, CFE_ES_PerfLogExit, CFE_EVS_EventType_ERROR, CFE_EVS_SendEvent(), CF_Transaction::chan_num, CF_HkPacket_Payload::channel_hk, CF_HkChannel_Data::counters, CF_TxnFilenames::dst_filename, CF_Flags_Rx::eof_recv, CF_RxS2_Data::eof_size, CF_HkRecv::error, CF_HkCounters::fault, CF_Transaction::fd, CF_HkFault::file_open, CF_HkFault::file_rename, CF_HkFault::file_size_mismatch, CF_Transaction::flags, CF_History::fnames, CF_Transaction::fsize, CF_Transaction::history, CF_AppData_t::hk, CF_Flags_Rx::md_recv, OS_FILE_FLAG_NONE, OS_mv(), OS_OBJECT_ID_UNDEFINED, OS_READ_WRITE, OS_SUCCESS, CF_HkPacket::Payload, CF_RxState_Data::r2, CF_StateData::receive, CF_HkCounters::recv, CF_StateFlags::rx, CF_History::seq_num, CF_History::src_eid, CF_Transaction::state, and CF_Transaction::state_data.
Referenced by CF_CFDP_R2_Recv().
Here is the call graph for this function:

12.27.2.11 CF_CFDP_R2_Reset()

```
void CF_CFDP_R2_Reset (
    CF_Transaction_t * txn )
```

CFDP R2 transaction reset function.

Description

Handles reset logic for R2, then calls R1 reset logic.

Assumptions, External Events, and Notes:

txn must not be NULL.

Parameters

txn	Pointer to the transaction object

Definition at line 70 of file cf_cfdp_r.c.
References CF_Flags_Common::canceled, CF_CFDP_ConditionCode_NO_ERROR, CF_CFDP_R1_Reset(), CF_RxSubState_WAIT_FOR_FIN_ACK, CF_TxnStatus_IsError(), CF_StateFlags::com, CF_RxS2_Data::eof_cc, CF_Transaction::flags, CF_Transaction::history, CF_RxState_Data::r2, CF_StateData::receive, CF_StateFlags::rx, CF_Flags_Rx::send_fin, CF_Transaction::state_data, CF_RxState_Data::sub_state, and CF_History::txn_stat.
Referenced by CF_CFDP_R2_Recv_fin_ack(), CF_CFDP_R2_SubstateRecvEof(), CF_CFDP_R2_SubstateRecvFileData(), and CF_CFDP_R_Tick().
Here is the call graph for this function:

12.27.2.12 CF_CFDP_R2_SetFinTxnStatus()

```
void CF_CFDP_R2_SetFinTxnStatus (
    CF_Transaction_t * txn,
    CF_TxnStatus_t txn_stat )
```

Helper function to store transaction status code and set send_fin flag.

Assumptions, External Events, and Notes:

txn must not be NULL.

Parameters

txn	Pointer to the transaction object
txn_stat	Status Code value to set within transaction

Definition at line 47 of file cf_cfdp_r.c.
References CF_CFDP_SetTxnStatus(), CF_Transaction::flags, CF_StateFlags::rx, and CF_Flags_Rx::send_fin.
Referenced by CF_CFDP_R2_CalcCrcChunk(), CF_CFDP_R2_Complete(), CF_CFDP_R2_RecvMd(), CF_CFDP_R2_SubstateRecvEof(), CF_CFDP_R_Init(), and CF_CFDP_R_Tick().
Here is the call graph for this function:

12.27.2.13 CF_CFDP_R2_SubstateRecvEof()

```
void CF_CFDP_R2_SubstateRecvEof (
    CF_Transaction_t * txn,
    CF_Logical_PduBuffer_t * ph )
```

Process receive EOF for R2.

Description

For R2, need to trigger the send of EOF-ACK and then call the check complete function which will either send NAK or FIN.

Assumptions, External Events, and Notes:

txn must not be NULL. ph must not be NULL.

Parameters

txn	Pointer to the transaction object
ph	Pointer to the PDU information

Definition at line 322 of file cf_cfdp_r.c.
References CF_Logical_PduEof::cc, CF_CFDP_ConditionCode_NO_ERROR, CF_CFDP_R2_Complete(), CF_CFDP_R2_Reset(), CF_CFDP_R2_SetFinTxnStatus(), CF_CFDP_R_SubstateRecvEof(), CF_CFDP_SetTxnStatus(), CF_REC_PDU_FSIZE_MISMATCH_ERROR, CF_RxSubState_FILEDATA, CF_TxnStatus_FILE_SIZE_ERROR, CF_TxnStatus_From_ConditionCode(), CFE_SUCCESS, CF_Logical_PduEof::crc, CF_Logical_IntHeader::eof, CF_RxS2_Data::eof_cc, CF_RxS2_Data::eof_crc, CF_Flags_Rx::eof_recv, CF_RxS2_Data::eof_size, CF_Transaction::flags, CF_Logical_PduBuffer::int_header, CF_RxState_Data::r2, CF_StateData::receive, CF_StateFlags::rx, CF_Flags_Rx::send_ack, CF_Logical_PduEof::size, CF_Transaction::state_data, and CF_RxState_Data::sub_state.
Referenced by CF_CFDP_R2_Recv().

Here is the call graph for this function:

12.27.2.14 CF_CFDP_R2_SubstateRecvFileData()

```
void CF_CFDP_R2_SubstateRecvFileData (
    CF_Transaction_t * txn,
    CF_Logical_PduBuffer_t * ph )
```

Process received file data for R2.

Description

For R2, the CRC is checked after the whole file is received since there may be gaps. Instead, insert file received range data into chunks. Once NAK has been received, this function always checks for completion. This function also re-arms the ACK timer.

Assumptions, External Events, and Notes:

txn must not be NULL. ph must not be NULL.

Parameters

txn	Pointer to the transaction object
ph	Pointer to the PDU information

Definition at line 408 of file cf_cfdp_r.c.
References CF_RxS2_Data::acknak_count, CF_CFDP_ArmAckTimer(), CF_CFDP_R2_Complete(), CF_CFDP_R2_Reset(), CF_CFDP_R_ProcessFd(), CF_CFDP_RecvFd(), CF_ChunkListAdd(), CFE_SUCCESS, CF_ChunkWrapper::chunks, CF_Transaction::chunks, CF_Flags_Rx::complete, CF_Logical_PduFileDataHeader::data_len, CF_Logical_IntHeader::fd, CF_Flags_Rx::fd_nak_sent, CF_Transaction::flags, CF_Logical_PduBuffer::int_header, CF_Logical_PduFileDataHeader::offset, CF_RxState_Data::r2, CF_StateData::receive, CF_StateFlags::rx, and CF_Transaction::state_data.
Referenced by CF_CFDP_R2_Recv().

Here is the call graph for this function:

12.27.2.15 CF_CFDP_R2_SubstateSendFin()

```
CFE_Status_t CF_CFDP_R2_SubstateSendFin ( CF_Transaction_t * txn )
```

Send a FIN PDU.

Assumptions, External Events, and Notes:

txn must not be NULL.

Return values

CFE_SUCCESS	on success. CF_ERROR on error.

Parameters

txn	Pointer to the transaction object

Definition at line 720 of file cf_cfdp_r.c.
References CF_Assert, CF_CFDP_R2_CalcCrcChunk(), CF_CFDP_SendFin(), CF_ERROR, CF_RxSubState_WA↩IT_FOR_FIN_ACK, CF_SEND_PDU_ERROR, CF_TxnStatus_IsError(), CF_TxnStatus_To_ConditionCode(), CFE_↩SUCCESS, CF_StateFlags::com, CF_Flags_Common::crc_calc, CF_RxS2_Data::dc, CF_Transaction::flags, CF_Rx↩S2_Data::fs, CF_Transaction::history, CF_RxState_Data::r2, CF_StateData::receive, CF_Transaction::state_data, C↩F_RxState_Data::sub_state, and CF_History::txn_stat.
Referenced by CF_CFDP_R_Tick().

Here is the call graph for this function:

12.27.2.16 CF_CFDP_R_Cancel()

```
void CF_CFDP_R_Cancel (
    CF_Transaction_t * txn )
```

Cancel an R transaction.

Assumptions, External Events, and Notes:

txn must not be NULL.

Parameters

txn	Pointer to the transaction object

Definition at line 925 of file cf_cfdp_r.c.
References CF_CFDP_R1_Reset(), CF_RxSubState_WAIT_FOR_FIN_ACK, CF_TxnState_R2, CF_Transaction::flags, CF_StateData::receive, CF_StateFlags::rx, CF_Flags_Rx::send_fin, CF_Transaction::state, CF_Transaction::state_↩data, and CF_RxState_Data::sub_state.
Referenced by CF_CFDP_CancelTransaction().

Here is the call graph for this function:

12.27.2.17 CF_CFDP_R_CheckCrc()

```
CFE_Status_t CF_CFDP_R_CheckCrc (
    CF_Transaction_t * txn,
    uint32 expected_crc )
```

Checks that the transaction file's CRC matches expected.

Assumptions, External Events, and Notes:

txn must not be NULL.

Return values

CFE_SUCCESS	on CRC match, otherwise error.

Parameters

txn	Pointer to the transaction object
expected_crc	Expected CRC

Definition at line 91 of file cf_cfdp_r.c.
References CF_AppData, CF_CFDP_R_CRC_ERR_EID, CF_CRC_Finalize(), CF_TxnState_R2, CFE_EVS_Event↩Type_ERROR, CFE_EVS_SendEvent(), CFE_SUCCESS, CF_Transaction::chan_num, CF_HkPacket_Payload↩::channel_hk, CF_HkChannel_Data::counters, CF_Transaction::crc, CF_HkFault::crc_mismatch, CF_HkCounters↩::fault, CF_Transaction::history, CF_AppData_t::hk, CF_HkPacket::Payload, CF_Crc::result, CF_History::seq_num, CF_History::src_eid, and CF_Transaction::state.
Referenced by CF_CFDP_R1_SubstateRecvEof(), and CF_CFDP_R2_CalcCrcChunk().

Here is the call graph for this function:

12.27.2.18 CF_CFDP_R_Init()

```
void CF_CFDP_R_Init (
    CF_Transaction_t * txn )
```

Initialize a transaction structure for R.

Assumptions, External Events, and Notes:

txn must not be NULL.

Parameters

txn	Pointer to the transaction object

Definition at line 566 of file cf_cfdp_r.c.
References CF_AppData, CF_CFDP_ArmAckTimer(), CF_CFDP_R1_Reset(), CF_CFDP_R2_SetFinTxnStatus(), CF_CFDP_R_CREAT_ERR_EID, CF_CFDP_R_TEMP_FILE_INF_EID, CF_FILENAME_MAX_PATH, CF_RxSub↩State_FILEDATA, CF_TxnState_R2, CF_TxnStatus_FILESTORE_REJECTION, CF_WrappedOpenCreate(), CFE_↩EVS_EventType_ERROR, CFE_EVS_EventType_INFORMATION, CFE_EVS_SendEvent(), CF_Transaction::chan↩_num, CF_HkPacket_Payload::channel_hk, CF_AppData_t::config_table, CF_HkChannel_Data::counters, CF_Txn↩Filenames::dst_filename, CF_HkCounters::fault, CF_Transaction::fd, CF_HkFault::file_open, CF_Transaction::flags, CF_History::fnames, CF_Transaction::history, CF_AppData_t::hk, CF_Flags_Rx::md_recv, OS_FILE_FLAG_CR↩EATE, OS_FILE_FLAG_TRUNCATE, OS_OBJECT_ID_UNDEFINED, OS_READ_WRITE, CF_HkPacket::Payload, CF_StateData::receive, CF_StateFlags::rx, CF_History::seq_num, CF_History::src_eid, CF_Transaction::state, CF_↩Transaction::state_data, CF_RxState_Data::sub_state, and CF_ConfigTable::tmp_dir.
Referenced by CF_CFDP_RecvIdle().

Here is the call graph for this function:

12.27.2.19 CF_CFDP_R_ProcessFd()

```
CFE_Status_t CF_CFDP_R_ProcessFd (
    CF_Transaction_t * txn,
    CF_Logical_PduBuffer_t * ph )
```

Process a filedata PDU on a transaction.

Assumptions, External Events, and Notes:

txn must not be NULL.

Return values

CFE_SUCCESS	on success. CF_ERROR on error.

Parameters

txn	Pointer to the transaction object
ph	Pointer to the PDU information

Definition at line 190 of file cf_cfdp_r.c.

References CF_RxState_Data::cached_pos, CF_AppData, CF_CFDP_R_SEEK_FD_ERR_EID, CF_CFDP_R_W↩RITE_ERR_EID, CF_CFDP_SetTxnStatus(), CF_ERROR, CF_TxnState_R2, CF_TxnStatus_FILE_SIZE_ERROR, CF_TxnStatus_FILESTORE_REJECTION, CF_WrappedLseek(), CF_WrappedWrite(), CFE_EVS_EventType_ER↩ROR, CFE_EVS_SendEvent(), CFE_SUCCESS, CF_Transaction::chan_num, CF_HkPacket_Payload::channel_hk, CF_HkChannel_Data::counters, CF_Logical_PduFileDataHeader::data_len, CF_Logical_PduFileDataHeader::data_↩ptr, CF_HkCounters::fault, CF_Logical_IntHeader::fd, CF_Transaction::fd, CF_HkRecv::file_data_bytes, CF_HkFault↩::file_seek, CF_HkFault::file_write, CF_Transaction::history, CF_AppData_t::hk, CF_Logical_PduBuffer::int_header, CF_Logical_PduFileDataHeader::offset, OS_SEEK_SET, CF_HkPacket::Payload, CF_StateData::receive, CF_Hk↩

Counters::recv, CF_History::seq_num, CF_History::src_eid, CF_Transaction::state, and CF_Transaction::state_data.
Referenced by CF_CFDP_R1_SubstateRecvFileData(), and CF_CFDP_R2_SubstateRecvFileData().
Here is the call graph for this function:

12.27.2.20 CF_CFDP_R_SendInactivityEvent()

```
void CF_CFDP_R_SendInactivityEvent ( CF_Transaction_t * txn )
```

Sends an inactivity timer expired event to EVS.

Assumptions, External Events, and Notes:

txn must not be NULL.

Parameters

txn	Pointer to the transaction object

Definition at line 944 of file cf_cfdp_r.c.
References CF_AppData, CF_CFDP_R_INACT_TIMER_ERR_EID, CF_TxnState_R2, CFE_EVS_EventType_ER↩ROR, CFE_EVS_SendEvent(), CF_Transaction::chan_num, CF_HkPacket_Payload::channel_hk, CF_HkChannel_↩Data::counters, CF_HkCounters::fault, CF_Transaction::history, CF_AppData_t::hk, CF_HkFault::inactivity_timer, C↩F_HkPacket::Payload, CF_History::seq_num, CF_History::src_eid, and CF_Transaction::state.
Referenced by CF_CFDP_R_Tick().
Here is the call graph for this function:

12.27.2.21 CF_CFDP_R_SubstateRecvEof()

```
CFE_Status_t CF_CFDP_R_SubstateRecvEof (
```

```
CF_Transaction_t * txn,
CF_Logical_PduBuffer_t * ph )
```

Processing receive EOF common functionality for R1/R2.

Description

This function is used for both R1 and R2 EOF receive. It calls the unmarshaling function and then checks known transaction data against the PDU.

Assumptions, External Events, and Notes:

txn must not be NULL. ph must not be NULL.

Return values

CFE_SUCCESS	on success. Returns anything else on error.

Parameters

txn	Pointer to the transaction object
ph	Pointer to the PDU information

Definition at line 250 of file cf_cfdp_r.c.
References CF_AppData, CF_CFDP_R_PDU_EOF_ERR_EID, CF_CFDP_R_SIZE_MISMATCH_ERR_EID, CF_CFDP_RecvEof(), CF_REC_PDU_BAD_EOF_ERROR, CF_REC_PDU_FSIZE_MISMATCH_ERROR, CF_TxnState_R2, CFE_EVS_EventType_ERROR, CFE_EVS_SendEvent(), CFE_SUCCESS, CF_Transaction::chan_num, CF_HkPacket_Payload::channel_hk, CF_HkChannel_Data::counters, CF_Logical_IntHeader::eof, CF_HkRecv::error, CF_HkCounters::fault, CF_HkFault::file_size_mismatch, CF_Transaction::flags, CF_Transaction::fsize, CF_Transaction::history, CF_AppData_t::hk, CF_Logical_PduBuffer::int_header, CF_Flags_Rx::md_recv, CF_HkPacket::Payload, CF_HkCounters::recv, CF_StateFlags::rx, CF_History::seq_num, CF_Logical_PduEof::size, CF_History::src_eid, and CF_Transaction::state.
Referenced by CF_CFDP_R1_SubstateRecvEof(), and CF_CFDP_R2_SubstateRecvEof().
Here is the call graph for this function:

12.27.2.22 CF_CFDP_R_SubstateSendNak()

```
CFE_Status_t CF_CFDP_R_SubstateSendNak (
CF_Transaction_t * txn )
```

Send a NAK PDU for R2.

Description

NAK PDU is sent when there are gaps in the received data. The chunks class tracks this and generates the NAK PDU by calculating gaps internally and calling CF_CFDP_R2_GapCompute(). There is a special case where if a metadata PDU has not been received, then a NAK packet will be sent to request another.

Assumptions, External Events, and Notes:

txn must not be NULL.

Return values

CFE_SUCCESS	on success. CF_ERROR on error.

Parameters

txn	Pointer to the transaction object

Definition at line 485 of file cf_cfdp_r.c.
References CF_AppData, CF_Assert, CF_CFDP_ConstructPduHeader(), CF_CFDP_FileDirective_NAK, CF_CFDP_R2_GapCompute(), CF_CFDP_R_REQUEST_MD_INF_EID, CF_CFDP_SendNak(), CF_ChunkList_ComputeGaps(), CF_ERROR, CF_SEND_PDU_ERROR, CF_TxnState_R2, CFE_EVS_EventType_INFORMATION, CFE_EVS_SendEvent(), CFE_SUCCESS, CF_Transaction::chan_num, CF_HkPacket_Payload::channel_hk, CF_ChunkWrapper::chunks, CF_Transaction::chunks, CF_Flags_Rx::complete, CF_AppData_t::config_table, CF_ChunkList::count, CF_HkChannel_Data::counters, CF_Flags_Rx::fd_nak_sent, CF_Transaction::flags, CF_Transaction::fsize, CF_Transaction::history, CF_AppData_t::hk, CF_Logical_PduBuffer::int_header, CF_ConfigTable::local_eid, CF_ChunkList::max_chunks, CF_Flags_Rx::md_recv, CF_Logical_IntHeader::nak, CF_HkSent::nak_segment_requests, CF_Logical_SegmentList::num_segments, CF_Logical_SegmentRequest::offset_end, CF_Logical_SegmentRequest::offset_start, CF_HkPacket::Payload, CF_History::peer_eid, CF_StateFlags::rx, CF_Logical_PduNak::scope_end, CF_Logical_PduNak::scope_start, CF_Logical_PduNak::segment_list, CF_Logical_SegmentList::segments, CF_HkCounters::sent, CF_History::seq_num, CF_History::src_eid, and CF_Transaction::state.
Referenced by CF_CFDP_R_Tick().
Here is the call graph for this function:

12.27.2.23 CF_CFDP_R_Tick()

```
void CF_CFDP_R_Tick (
    CF_Transaction_t * txn,
    int * cont )
```

Perform tick (time-based) processing for R transactions.

Description

This function is called on every transaction by the engine on every CF wakeup. This is where flags are checked to send ACK, NAK, and FIN. It checks for inactivity timer and processes the ACK timer. The ACK timer is what triggers re-sends of PDUs that require acknowledgment.

Assumptions, External Events, and Notes:

txn must not be NULL. cont is unused, so may be NULL

Parameters

txn	Pointer to the transaction object
cont	Ignored/Unused

Definition at line 958 of file cf_cfdp_r.c.
References CF_ChannelConfig::ack_limit, CF_HkFault::ack_limit, CF_Transaction::ack_timer, CF_Flags_Common↩::ack_timer_armed, CF_RxS2_Data::acknak_count, CF_AppData, CF_Assert, CF_CFDP_AckTxnStatus_ACTIVE, CF_CFDP_ArmAckTimer(), CF_CFDP_FileDirective_EOF, CF_CFDP_R1_Reset(), CF_CFDP_R2_Complete(), C↩F_CFDP_R2_Reset(), CF_CFDP_R2_SetFinTxnStatus(), CF_CFDP_R2_SubstateSendFin(), CF_CFDP_R_ACK↩_LIMIT_ERR_EID, CF_CFDP_R_SendInactivityEvent(), CF_CFDP_R_SubstateSendNak(), CF_CFDP_SendAck(), CF_CFDP_SetTxnStatus(), CF_RxSubState_WAIT_FOR_FIN_ACK, CF_SEND_PDU_ERROR, CF_SEND_PD↩U_NO_BUF_AVAIL_ERROR, CF_Timer_Expired(), CF_Timer_Tick(), CF_TxnState_R2, CF_TxnStatus_ACK_LI↩MIT_NO_FIN, CF_TxnStatus_INACTIVITY_DETECTED, CFE_EVS_EventType_ERROR, CFE_EVS_SendEvent(), CF_ConfigTable::chan, CF_Transaction::chan_num, CF_HkPacket_Payload::channel_hk, CF_StateFlags::com, CF↩_Flags_Rx::complete, CF_AppData_t::config_table, CF_HkChannel_Data::counters, CF_RxS2_Data::eof_cc, CF_↩HkCounters::fault, CF_Transaction::flags, CF_Transaction::history, CF_AppData_t::hk, CF_Flags_Rx::inactivity_fired, CF_Transaction::inactivity_timer, CF_HkPacket::Payload, CF_History::peer_eid, CF_RxState_Data::r2, CF_State↩Data::receive, CF_StateFlags::rx, CF_Flags_Rx::send_ack, CF_Flags_Rx::send_fin, CF_Flags_Rx::send_nak, CF_↩History::seq_num, CF_History::src_eid, CF_Transaction::state, CF_Transaction::state_data, and CF_RxState_Data↩::sub_state.
Referenced by CF_CFDP_TickTransactions().

Here is the call graph for this function:

12.28 apps/cf/fsw/src/cf_cfdp_s.c File Reference

```
#include "cfe.h"
#include "cf_verify.h"
#include "cf_app.h"
#include "cf_events.h"
#include "cf_perfids.h"
#include "cf_cfdp.h"
#include "cf_utils.h"
#include "cf_cfdp_s.h"
#include "cf_cfdp_dispatch.h"
#include <stdio.h>
#include <string.h>
#include "cf_assert.h"
```

Functions

- static void CF_CFDP_S_Reset (CF_Transaction_t *txn)
- CFE_Status_t CF_CFDP_S_SendEof (CF_Transaction_t *txn)

  Send an EOF PDU.
- void CF_CFDP_S1_SubstateSendEof (CF_Transaction_t *txn)

  Sends an EOF for S1.
- void CF_CFDP_S2_SubstateSendEof (CF_Transaction_t *txn)

  Triggers tick processing to send an EOF and wait for EOF-ACK for S2.
- CFE_Status_t CF_CFDP_S_SendFileData (CF_Transaction_t *txn, uint32 foffs, uint32 bytes_to_read, uint8 calc_crc)

  Helper function to populate the PDU with file data and send it.
- void CF_CFDP_S_SubstateSendFileData (CF_Transaction_t *txn)

  Standard state function to send the next file data PDU for active transaction.
- CFE_Status_t CF_CFDP_S_CheckAndRespondNak (CF_Transaction_t *txn)

  Respond to a NAK by sending filedata PDUs as response.
- void CF_CFDP_S2_SubstateSendFileData (CF_Transaction_t *txn)

  Send filedata handling for S2.
- void CF_CFDP_S_SubstateSendMetadata (CF_Transaction_t *txn)

  Send metadata PDU.
- void CF_CFDP_S_SubstateSendFinAck (CF_Transaction_t *txn)

  Send FIN-ACK packet for S2.
- void CF_CFDP_S2_EarlyFin (CF_Transaction_t *txn, CF_Logical_PduBuffer_t *ph)

  A FIN was received before file complete, so abandon the transaction.
- void CF_CFDP_S2_Fin (CF_Transaction_t *txn, CF_Logical_PduBuffer_t *ph)

  S2 received FIN, so set flag to send FIN-ACK.
- void CF_CFDP_S2_Nak (CF_Transaction_t *txn, CF_Logical_PduBuffer_t *ph)

  S2 NAK PDU received handling.
- void CF_CFDP_S2_Nak_Arm (CF_Transaction_t *txn, CF_Logical_PduBuffer_t *ph)

  S2 NAK handling but with arming the NAK timer.
- void CF_CFDP_S2_WaitForEofAck (CF_Transaction_t *txn, CF_Logical_PduBuffer_t *ph)

  S2 received ACK PDU in wait for EOF-ACK state.
- void CF_CFDP_S1_Recv (CF_Transaction_t *txn, CF_Logical_PduBuffer_t *ph)

  S1 receive PDU processing.
- void CF_CFDP_S2_Recv (CF_Transaction_t *txn, CF_Logical_PduBuffer_t *ph)

  S2 receive PDU processing.
- void CF_CFDP_S1_Tx (CF_Transaction_t *txn)

  S1 dispatch function.
- void CF_CFDP_S2_Tx (CF_Transaction_t *txn)

  S2 dispatch function.
- void CF_CFDP_S_Cancel (CF_Transaction_t *txn)

  Cancel an S transaction.
- void CF_CFDP_S_Tick (CF_Transaction_t *txn, int *cont)

  Perform tick (time-based) processing for S transactions.
- void CF_CFDP_S_Tick_Nak (CF_Transaction_t *txn, int *cont)

  Perform NAK response for TX transactions.

12.28.1 Detailed Description

The CF Application CFDP send logic source file
Handles all CFDP engine functionality specific to TX transactions.

12.28.2 Function Documentation

12.28.2.1 CF_CFDP_S1_Recv()

```
void CF_CFDP_S1_Recv (
    CF_Transaction_t * txn,
    CF_Logical_PduBuffer_t * ph )
```

S1 receive PDU processing.

Assumptions, External Events, and Notes:

txn must not be NULL.

Parameters

txn	Pointer to the transaction object
ph	Pointer to the PDU information

Definition at line 587 of file cf_cfdp_s.c.
References CF_CFDP_S_DispatchRecv().
Referenced by CF_CFDP_DispatchRecv().
Here is the call graph for this function:

12.28.2.2 CF_CFDP_S1_SubstateSendEof()

```
void CF_CFDP_S1_SubstateSendEof (
    CF_Transaction_t * txn )
```

Sends an EOF for S1.

Assumptions, External Events, and Notes:

txn must not be NULL.

Parameters

txn	Pointer to the transaction object

Definition at line 76 of file cf_cfdp_s.c.
References CF_CFDP_S_Reset(), CF_CFDP_S_SendEof(), and CF_SEND_PDU_NO_BUF_AVAIL_ERROR.
Referenced by CF_CFDP_S1_Tx().

Here is the call graph for this function:

12.28.2.3 CF_CFDP_S1_Tx()

```
void CF_CFDP_S1_Tx (
    CF_Transaction_t * txn )
```

S1 dispatch function.

Assumptions, External Events, and Notes:

txn must not be NULL.

Parameters

txn	Pointer to the transaction object

Definition at line 636 of file cf_cfdp_s.c.
References CF_CFDP_S1_SubstateSendEof(), CF_CFDP_S_DispatchTransmit(), CF_CFDP_S_SubstateSendFileData(), CF_CFDP_S_SubstateSendMetadata(), CF_TxSubState_EOF, CF_TxSubState_FILEDATA, CF_TxSubState_METADATA, and CF_CFDP_S_SubstateSendDispatchTable_t::substate.
Referenced by CF_CFDP_DispatchTx().

Here is the call graph for this function:

12.28.2.4 CF_CFDP_S2_EarlyFin()

```
void CF_CFDP_S2_EarlyFin (
    CF_Transaction_t * txn,
    CF_Logical_PduBuffer_t * ph )
```

A FIN was received before file complete, so abandon the transaction.

Assumptions, External Events, and Notes:

txn must not be NULL. ph must not be NULL.

Parameters

txn	Pointer to the transaction object
ph	Pointer to the PDU information

Definition at line 448 of file cf_cfdp_s.c.
References CF_CFDP_S_EARLY_FIN_ERR_EID, CF_CFDP_S_Reset(), CF_CFDP_SetTxnStatus(), CF_TxnState↩_S2, CF_TxnStatus_EARLY_FIN, CFE_EVS_EventType_ERROR, CFE_EVS_SendEvent(), CF_Transaction::history, CF_History::seq_num, CF_History::src_eid, and CF_Transaction::state.
Referenced by CF_CFDP_S2_Recv().

Here is the call graph for this function:

12.28.2.5 CF_CFDP_S2_Fin()

```
void CF_CFDP_S2_Fin (
    CF_Transaction_t * txn,
    CF_Logical_PduBuffer_t * ph )
```

S2 received FIN, so set flag to send FIN-ACK.

Assumptions, External Events, and Notes:

txn must not be NULL. ph must not be NULL.

Parameters

txn	Pointer to the transaction object
ph	Pointer to the PDU information

Definition at line 464 of file cf_cfdp_s.c.
References CF_Logical_PduFin::cc, CF_TxSubState_SEND_FIN_ACK, CF_Logical_IntHeader::fin, CF_TxS2_Data↩::fin_cc, CF_Logical_PduBuffer::int_header, CF_TxState_Data::s2, CF_StateData::send, CF_Transaction::state_data, and CF_TxState_Data::sub_state.
Referenced by CF_CFDP_S2_Recv().

12.28.2.6 CF_CFDP_S2_Nak()

```
void CF_CFDP_S2_Nak (
    CF_Transaction_t * txn,
    CF_Logical_PduBuffer_t * ph )
```

S2 NAK PDU received handling.

Description

Stores the segment requests from the NAK packet in the chunks structure. These can be used to generate re-transmit filedata PDUs.

Assumptions, External Events, and Notes:

txn must not be NULL. ph must not be NULL.

Parameters

txn	Pointer to the transaction object
ph	Pointer to the PDU information

Definition at line 476 of file cf_cfdp_s.c.
References CF_AppData, CF_CFDP_RecvNak(), CF_CFDP_S_INVALID_SR_ERR_EID, CF_CFDP_S_PDU_NAK_ERR_EID, CF_ChunkListAdd(), CF_TxnState_S2, CFE_EVS_EventType_ERROR, CFE_EVS_SendEvent(), CFE_SUCCESS, CF_Transaction::chan_num, CF_HkPacket_Payload::channel_hk, CF_ChunkWrapper::chunks, CF_Transaction::chunks, CF_HkChannel_Data::counters, CF_HkRecv::error, CF_Transaction::flags, CF_Transaction::fsize, CF_Transaction::history, CF_AppData_t::hk, CF_Logical_PduBuffer::int_header, CF_Flags_Tx::md_need_send, CF_Logical_IntHeader::nak, CF_HkRecv::nak_segment_requests, CF_Logical_SegmentList::num_segments, CF_Logical_SegmentRequest::offset_end, CF_Logical_SegmentRequest::offset_start, CF_HkPacket::Payload, CF_HkCounters::recv, CF_Logical_PduNak::segment_list, CF_Logical_SegmentList::segments, CF_History::seq_num, CF_History::src_eid, CF_Transaction::state, and CF_StateFlags::tx.
Referenced by CF_CFDP_S2_Nak_Arm(), and CF_CFDP_S2_Recv().
Here is the call graph for this function:

12.28.2.7 CF_CFDP_S2_Nak_Arm()

```
void CF_CFDP_S2_Nak_Arm (
    CF_Transaction_t * txn,
    CF_Logical_PduBuffer_t * ph )
```

S2 NAK handling but with arming the NAK timer.

Assumptions, External Events, and Notes:

txn must not be NULL. ph must not be NULL.

Parameters

txn	Pointer to the transaction object
ph	Pointer to the PDU information

Definition at line 544 of file cf_cfdp_s.c.
References CF_CFDP_ArmAckTimer(), and CF_CFDP_S2_Nak().
Referenced by CF_CFDP_S2_Recv().
Here is the call graph for this function:

12.28.2.8 CF_CFDP_S2_Recv()

```
void CF_CFDP_S2_Recv (
    CF_Transaction_t * txn,
    CF_Logical_PduBuffer_t * ph )
```

S2 receive PDU processing.

Assumptions, External Events, and Notes:

txn must not be NULL.

Parameters

txn	Pointer to the transaction object
ph	Pointer to the PDU information

Definition at line 600 of file cf_cfdp_s.c.
References CF_CFDP_FileDirective_ACK, CF_CFDP_FileDirective_FIN, CF_CFDP_FileDirective_NAK, CF_CFDP↩_S2_EarlyFin(), CF_CFDP_S2_Fin(), CF_CFDP_S2_Nak(), CF_CFDP_S2_Nak_Arm(), CF_CFDP_S2_WaitForEof↩Ack(), CF_CFDP_S_DispatchRecv(), CF_TxSubState_EOF, CF_TxSubState_FILEDATA, CF_TxSubState_METAD↩ATA, CF_TxSubState_SEND_FIN_ACK, CF_TxSubState_WAIT_FOR_EOF_ACK, CF_TxSubState_WAIT_FOR_FIN, CF_CFDP_FileDirectiveDispatchTable_t::fdirective, and CF_CFDP_S_SubstateRecvDispatchTable_t::substate.
Referenced by CF_CFDP_DispatchRecv().

Here is the call graph for this function:

12.28.2.9 CF_CFDP_S2_SubstateSendEof()

```
void CF_CFDP_S2_SubstateSendEof ( CF_Transaction_t * txn )
```

Triggers tick processing to send an EOF and wait for EOF-ACK for S2.

Assumptions, External Events, and Notes:

txn must not be NULL.

Parameters

txn	Pointer to the transaction object

Definition at line 93 of file cf_cfdp_s.c.
References CF_Flags_Common::ack_timer_armed, CF_DequeueTransaction(), CF_InsertSortPrio(), CF_QueueIdx_↩TXW, CF_TxSubState_WAIT_FOR_EOF_ACK, CF_StateFlags::com, CF_Transaction::flags, CF_StateData::send, C↩F_Transaction::state_data, and CF_TxState_Data::sub_state.
Referenced by CF_CFDP_S2_Tx().

Here is the call graph for this function:

12.28.2.10 CF_CFDP_S2_SubstateSendFileData()

```
void CF_CFDP_S2_SubstateSendFileData ( CF_Transaction_t * txn )
```

Send filedata handling for S2.

Description

S2 will either respond to a NAK by sending retransmits, or in absence of a NAK, it will send more of the original file data.

Assumptions, External Events, and Notes:

txn must not be NULL.

Parameters

txn	Pointer to the transaction object

Definition at line 304 of file cf_cfdp_s.c.
References CF_CFDP_S_CheckAndRespondNak(), CF_CFDP_S_Reset(), CF_CFDP_S_SubstateSendFileData(), CF_CFDP_SetTxnStatus(), and CF_TxnStatus_NAK_RESPONSE_ERROR.
Referenced by CF_CFDP_S2_Tx().

Here is the call graph for this function:

12.28.2.11 CF_CFDP_S2_Tx()

```
void CF_CFDP_S2_Tx ( CF_Transaction_t * txn )
```

S2 dispatch function.

Assumptions, External Events, and Notes:

txn must not be NULL.

Parameters

txn	Pointer to the transaction object

Definition at line 654 of file cf_cfdp_s.c.
References CF_CFDP_S2_SubstateSendEof(), CF_CFDP_S2_SubstateSendFileData(), CF_CFDP_S_Dispatch↩Transmit(), CF_CFDP_S_SubstateSendMetadata(), CF_TxSubState_EOF, CF_TxSubState_FILEDATA, CF_TxSub↩State_METADATA, and CF_CFDP_S_SubstateSendDispatchTable_t::substate.
Referenced by CF_CFDP_DispatchTx().

Here is the call graph for this function:

12.28.2.12 CF_CFDP_S2_WaitForEofAck()

```
void CF_CFDP_S2_WaitForEofAck (
    CF_Transaction_t * txn,
    CF_Logical_PduBuffer_t * ph )
```

S2 received ACK PDU in wait for EOF-ACK state.

Description

This function will trigger a state transition to CF_TxSubState_WAIT_FOR_FIN, which waits for a FIN PDU.

Assumptions, External Events, and Notes:

txn must not be NULL. ph must not be NULL.

Parameters

txn	Pointer to the transaction object
ph	Pointer to the PDU information

Definition at line 556 of file cf_cfdp_s.c.

References CF_Flags_Common::ack_timer_armed, CF_AppData, CF_CFDP_RecvAck(), CF_CFDP_S_PDU_EO↩F_ERR_EID, CF_CFDP_S_Reset(), CF_TxnState_S2, CF_TxnStatus_IsError(), CF_TxSubState_WAIT_FOR_F↩IN, CFE_EVS_EventType_ERROR, CFE_EVS_SendEvent(), CF_Transaction::chan_num, CF_HkPacket_Payload↩::channel_hk, CF_StateFlags::com, CF_HkChannel_Data::counters, CF_HkRecv::error, CF_Transaction::flags, CF↩

_Transaction::history, CF_AppData_t::hk, CF_HkPacket::Payload, CF_HkCounters::recv, CF_StateData::send, CF_↩ History::seq_num, CF_History::src_eid, CF_Transaction::state, CF_Transaction::state_data, CF_TxState_Data::sub_↩ state, and CF_History::txn_stat.
Referenced by CF_CFDP_S2_Recv().
Here is the call graph for this function:

12.28.2.13 CF_CFDP_S_Cancel() `void CF_CFDP_S_Cancel (CF_Transaction_t * txn )`

Cancel an S transaction.

Assumptions, External Events, and Notes:

txn must not be NULL.

Parameters

txn	Pointer to the transaction object

Definition at line 672 of file cf_cfdp_s.c.
References CF_TxSubState_EOF, CF_StateData::send, CF_Transaction::state_data, and CF_TxState_Data::sub_↩ state.
Referenced by CF_CFDP_CancelTransaction().

12.28.2.14 CF_CFDP_S_CheckAndRespondNak() `CFE_Status_t CF_CFDP_S_CheckAndRespondNak (CF_Transaction_t * txn )`

Respond to a NAK by sending filedata PDUs as response.

Description

Checks to see if a metadata PDU or filedata re-transmits must occur.

Assumptions, External Events, and Notes:

txn must not be NULL.

Returns

CF_ERROR if error.

Return values

0	if no NAK processed.
1	if NAK processed.

Parameters

txn	Pointer to the transaction object

Definition at line 249 of file cf_cfdp_s.c.
References CF_CFDP_S_SendFileData(), CF_CFDP_SendMd(), CF_ChunkList_GetFirstChunk(), CF_ChunkList_↩ RemoveFromFirst(), CF_ERROR, CF_SEND_PDU_ERROR, CFE_SUCCESS, CF_ChunkWrapper::chunks, CF_↩ Transaction::chunks, CF_Transaction::flags, CF_Flags_Tx::md_need_send, CF_Chunk::offset, CF_Chunk::size, and CF_StateFlags::tx.
Referenced by CF_CFDP_S2_SubstateSendFileData(), and CF_CFDP_S_Tick_Nak().
Here is the call graph for this function:

12.28.2.15 CF_CFDP_S_Reset()

```
static void CF_CFDP_S_Reset (
    CF_Transaction_t * txn ) [inline], [static]
```

Definition at line 49 of file cf_cfdp_s.c.
References CF_CFDP_ResetTransaction().

Referenced by CF_CFDP_S1_SubstateSendEof(), CF_CFDP_S2_EarlyFin(), CF_CFDP_S2_SubstateSendFileData(), CF_CFDP_S2_WaitForEofAck(), CF_CFDP_S_SubstateSendFinAck(), CF_CFDP_S_SubstateSendMetadata(), and CF_CFDP_S_Tick().
Here is the call graph for this function:

12.28.2.16 CF_CFDP_S_SendEof()

```
CFE_Status_t CF_CFDP_S_SendEof (
    CF_Transaction_t * txn )
```

Send an EOF PDU.

Assumptions, External Events, and Notes:

txn must not be NULL.

Return values

CFE_SUCCESS	on success.
CF_SEND_PDU_NO_BUF_AVAIL_ERROR	if message buffer cannot be obtained.
CF_SEND_PDU_ERROR	if an error occurred while building the packet.

Parameters

txn	Pointer to the transaction object

Definition at line 60 of file cf_cfdp_s.c.
References CF_CFDP_SendEof(), CF_CRC_Finalize(), CF_StateFlags::com, CF_Transaction::crc, CF_Flags_↩Common::crc_calc, and CF_Transaction::flags.

Referenced by CF_CFDP_S1_SubstateSendEof(), and CF_CFDP_S_Tick().
Here is the call graph for this function:

12.28.2.17 CF_CFDP_S_SendFileData()

```
CFE_Status_t CF_CFDP_S_SendFileData (
    CF_Transaction_t * txn,
    uint32 foffs,
    uint32 bytes_to_read,
    uint8 calc_crc )
```

Helper function to populate the PDU with file data and send it.

Description

This function checks the file offset cache and if the desired location is where the file offset is, it can skip a seek() call. The file is read into the filedata PDU and then the PDU is sent.

Assumptions, External Events, and Notes:

txn must not be NULL.

Returns

The number of bytes sent in the file data PDU (CFE_SUCCESS, i.e. 0, if no bytes were processed), or CF_ERROR on error

Parameters

txn	Pointer to the transaction object
foffs	Position in file to send data from
bytes_to_read	Number of bytes to send (maximum)
calc_crc	Enable CRC/Checksum calculation

Definition at line 111 of file cf_cfdp_s.c.
References CF_TxState_Data::cached_pos, CF_AppData, CF_Assert, CF_CFDP_ConstructPduHeader(), CF_CF↩DP_DoEncodeChunk(), CF_CFDP_EncodeFileDataHeader(), CF_CFDP_S_READ_ERR_EID, CF_CFDP_S_SEEK↩_FD_ERR_EID, CF_CFDP_SendFd(), CF_CODEC_GET_REMAIN, CF_CRC_Digest(), CF_ERROR, CF_TxnState↩_S2, CF_WrappedLseek(), CF_WrappedRead(), CFE_EVS_EventType_ERROR, CFE_EVS_SendEvent(), CFE_↩SUCCESS, CF_Transaction::chan_num, CF_HkPacket_Payload::channel_hk, CF_AppData_t::config_table, CF_Hk↩

Channel_Data::counters, CF_Transaction::crc, CF_Logical_PduFileDataHeader::data_len, CF_Logical_PduFileDataHeader::data_ptr, CF_HkCounters::fault, CF_Logical_IntHeader::fd, CF_Transaction::fd, CF_HkSent::file_data_bytes, CF_HkFault::file_read, CF_HkFault::file_seek, CF_Transaction::fsize, CF_Transaction::history, CF_AppData_t::hk, CF_Logical_PduBuffer::int_header, CF_ConfigTable::local_eid, CF_Logical_PduFileDataHeader::offset, OS_SEEK_SET, CF_ConfigTable::outgoing_file_chunk_size, CF_HkPacket::Payload, CF_Logical_PduBuffer::pdu_header, CF_History::peer_eid, CF_Logical_PduBuffer::penc, CF_Logical_PduHeader::segment_meta_flag, CF_StateData::send, CF_HkCounters::sent, CF_History::seq_num, CF_History::src_eid, CF_Transaction::state, and CF_Transaction::state_data.
Referenced by CF_CFDP_S_CheckAndRespondNak(), and CF_CFDP_S_SubstateSendFileData().
Here is the call graph for this function:

12.28.2.18 CF_CFDP_S_SubstateSendFileData()

```
void CF_CFDP_S_SubstateSendFileData ( CF_Transaction_t * txn )
```

Standard state function to send the next file data PDU for active transaction.

Description

During the transfer of active transaction file data PDUs, the file offset is saved. This function sends the next chunk of data. If the file offset equals the file size, then transition to the EOF state.

Assumptions, External Events, and Notes:

txn must not be NULL.

Parameters

txn	Pointer to the transaction object

Definition at line 218 of file cf_cfdp_s.c.
References CF_CFDP_S_SendFileData(), CF_CFDP_SetTxnStatus(), CF_TxnStatus_FILESTORE_REJECTION, CF_TxSubState_EOF, CF_Transaction::foffs, CF_Transaction::fsize, CF_StateData::send, CF_Transaction::state_data, and CF_TxState_Data::sub_state.
Referenced by CF_CFDP_S1_Tx(), and CF_CFDP_S2_SubstateSendFileData().

Here is the call graph for this function:

12.28.2.19 CF_CFDP_S_SubstateSendFinAck()

```
void CF_CFDP_S_SubstateSendFinAck ( CF_Transaction_t * txn )
```

Send FIN-ACK packet for S2.

Assumptions, External Events, and Notes:

txn must not be NULL.

Parameters

txn	Pointer to the transaction object

Definition at line 431 of file cf_cfdp_s.c.
References CF_CFDP_AckTxnStatus_ACTIVE, CF_CFDP_FileDirective_FIN, CF_CFDP_S_Reset(), CF_CFDP_SendAck(), CF_CFDP_SetTxnStatus(), CF_SEND_PDU_NO_BUF_AVAIL_ERROR, CF_TxnStatus_NO_ERROR, CF_TxS2_Data::fin_cc, CF_Transaction::history, CF_History::peer_eid, CF_TxState_Data::s2, CF_StateData::send, CF_History::seq_num, and CF_Transaction::state_data.
Referenced by CF_CFDP_S_Tick().

Here is the call graph for this function:

12.28.2.20 CF_CFDP_S_SubstateSendMetadata()

```
void CF_CFDP_S_SubstateSendMetadata ( CF_Transaction_t * txn )
```

Send metadata PDU.

Description

Construct and send a metadata PDU. This function determines the size of the file to put in the metadata PDU.

Assumptions, External Events, and Notes:

txn must not be NULL.

Parameters

txn	Pointer to the transaction object

Definition at line 329 of file cf_cfdp_s.c.

References CF_AppData, CF_CFDP_S_ALREADY_OPEN_ERR_EID, CF_CFDP_S_OPEN_ERR_EID, CF_CF↩DP_S_Reset(), CF_CFDP_S_SEEK_BEG_ERR_EID, CF_CFDP_S_SEEK_END_ERR_EID, CF_CFDP_S_SEN↩D_MD_ERR_EID, CF_CFDP_SendMd(), CF_CFDP_SetTxnStatus(), CF_SEND_PDU_ERROR, CF_TxnState_S2, CF_TxnStatus_FILESTORE_REJECTION, CF_TxSubState_FILEDATA, CF_WrappedLseek(), CF_WrappedOpen↩

Create(), CFE_EVS_EventType_ERROR, CFE_EVS_SendEvent(), CFE_SUCCESS, CF_Transaction::chan_num, CF_HkPacket_Payload::channel_hk, CF_HkChannel_Data::counters, CF_HkCounters::fault, CF_Transaction::fd, CF_HkFault::file_open, CF_HkFault::file_seek, CF_History::fnames, CF_Transaction::fsize, CF_Transaction::history, CF_AppData_t::hk, OS_FILE_FLAG_NONE, OS_FileOpenCheck(), OS_OBJECT_ID_UNDEFINED, OS_ObjectIdDefined(), OS_READ_ONLY, OS_SEEK_END, OS_SEEK_SET, OS_SUCCESS, CF_HkPacket::Payload, CF_StateData::send, CF_History::seq_num, CF_History::src_eid, CF_TxnFilenames::src_filename, CF_Transaction::state, CF_Transaction::state_data, and CF_TxState_Data::sub_state.
Referenced by CF_CFDP_S1_Tx(), and CF_CFDP_S2_Tx().
Here is the call graph for this function:

12.28.2.21 CF_CFDP_S_Tick()

```
void CF_CFDP_S_Tick (
    CF_Transaction_t * txn,
    int * cont )
```

Perform tick (time-based) processing for S transactions.

Description

This function is called on every transaction by the engine on every CF wakeup. This is where flags are checked to send EOF or FIN-ACK. If nothing else is sent, it checks to see if a NAK retransmit must occur.

Assumptions, External Events, and Notes:

txn must not be NULL. cont is unused, so may be NULL

Parameters

txn	Pointer to the transaction object
cont	Unused, exists for compatibility with tick processor

Definition at line 687 of file cf_cfdp_s.c.
References CF_ChannelConfig::ack_limit, CF_HkFault::ack_limit, CF_Transaction::ack_timer, CF_Flags_Common::ack_timer_armed, CF_TxS2_Data::acknak_count, CF_AppData, CF_CFDP_ArmAckTimer(), CF_CFDP_S_ACK_LIMIT_ERR_EID, CF_CFDP_S_INACT_TIMER_ERR_EID, CF_CFDP_S_Reset(), CF_CFDP_S_SendEof(), CF_CFDP_S_SubstateSendFinAck(), CF_CFDP_SetTxnStatus(), CF_SEND_PDU_NO_BUF_AVAIL_ERROR, CF_Timer_Expired(), CF_Timer_Tick(), CF_TxnState_S2, CF_TxnStatus_ACK_LIMIT_NO_EOF, CF_TxnStatus_INACTIVITY_DETECTED, CF_TxSubState_SEND_FIN_ACK, CF_TxSubState_WAIT_FOR_EOF_ACK, CFE_EVS_EventType_ERROR, CFE_EVS_SendEvent(), CF_ConfigTable::chan, CF_Transaction::chan_num, CF_HkPacket_Payload::channel_hk, CF_StateFlags::com, CF_AppData_t::config_table, CF_HkChannel_Data::counters, CF_HkCounters::fault, CF_Transaction::flags, CF_Transaction::history, CF_AppData_t::hk, CF_HkFault::inactivity_timer, CF_Transaction::inactivity_timer, CF_HkPacket::Payload, CF_TxState_Data::s2, CF_StateData::send, CF_History::seq_num, CF_History::src_eid, CF_Transaction::state, CF_Transaction::state_data, and CF_TxState_Data::sub_state.
Referenced by CF_CFDP_TickTransactions().
Here is the call graph for this function:

12.28.2.22 CF_CFDP_S_Tick_Nak()

```
void CF_CFDP_S_Tick_Nak (
    CF_Transaction_t * txn,
    int * cont )
```

Perform NAK response for TX transactions.

Description

This function is called at tick processing time to send pending NAK responses. It indicates "cont" is 1 if there are more responses left to send.

Assumptions, External Events, and Notes:

txn must not be NULL. cont must not be NULL.

Parameters

txn	Pointer to the transaction object
cont	Set to 1 if a NAK was generated

Definition at line 772 of file cf_cfdp_s.c.
References CF_CFDP_S_CheckAndRespondNak().
Referenced by CF_CFDP_TickTransactions().
Here is the call graph for this function:

12.29 apps/cf/fsw/src/cf_cfdp_s.h File Reference

```
#include "cf_cfdp_types.h"
```

Functions

- void CF_CFDP_S1_Recv (CF_Transaction_t ∗txn, CF_Logical_PduBuffer_t ∗ph)

  S1 receive PDU processing.
- void CF_CFDP_S2_Recv (CF_Transaction_t ∗txn, CF_Logical_PduBuffer_t ∗ph)

  S2 receive PDU processing.
- void CF_CFDP_S1_Tx (CF_Transaction_t ∗txn)

  S1 dispatch function.
- void CF_CFDP_S2_Tx (CF_Transaction_t ∗txn)

  S2 dispatch function.
- void CF_CFDP_S_Tick (CF_Transaction_t ∗txn, int ∗cont)

  Perform tick (time-based) processing for S transactions.
- void CF_CFDP_S_Tick_Nak (CF_Transaction_t ∗txn, int ∗cont)

  Perform NAK response for TX transactions.
- void CF_CFDP_S_Cancel (CF_Transaction_t ∗txn)

  Cancel an S transaction.

- CFE_Status_t CF_CFDP_S_SendEof (CF_Transaction_t *txn)

  Send an EOF PDU.
- void CF_CFDP_S1_SubstateSendEof (CF_Transaction_t *txn)

  Sends an EOF for S1.
- void CF_CFDP_S2_SubstateSendEof (CF_Transaction_t *txn)

  Triggers tick processing to send an EOF and wait for EOF-ACK for S2.
- CFE_Status_t CF_CFDP_S_SendFileData (CF_Transaction_t *txn, uint32 foffs, uint32 bytes_to_read, uint8 calc_crc)

  Helper function to populate the PDU with file data and send it.
- void CF_CFDP_S_SubstateSendFileData (CF_Transaction_t *txn)

  Standard state function to send the next file data PDU for active transaction.
- CFE_Status_t CF_CFDP_S_CheckAndRespondNak (CF_Transaction_t *txn)

  Respond to a NAK by sending filedata PDUs as response.
- void CF_CFDP_S2_SubstateSendFileData (CF_Transaction_t *txn)

  Send filedata handling for S2.
- void CF_CFDP_S_SubstateSendMetadata (CF_Transaction_t *txn)

  Send metadata PDU.
- void CF_CFDP_S_SubstateSendFinAck (CF_Transaction_t *txn)

  Send FIN-ACK packet for S2.
- void CF_CFDP_S2_EarlyFin (CF_Transaction_t *txn, CF_Logical_PduBuffer_t *ph)

  A FIN was received before file complete, so abandon the transaction.
- void CF_CFDP_S2_Fin (CF_Transaction_t *txn, CF_Logical_PduBuffer_t *ph)

  S2 received FIN, so set flag to send FIN-ACK.
- void CF_CFDP_S2_Nak (CF_Transaction_t *txn, CF_Logical_PduBuffer_t *ph)

  S2 NAK PDU received handling.
- void CF_CFDP_S2_Nak_Arm (CF_Transaction_t *txn, CF_Logical_PduBuffer_t *ph)

  S2 NAK handling but with arming the NAK timer.
- void CF_CFDP_S2_WaitForEofAck (CF_Transaction_t *txn, CF_Logical_PduBuffer_t *ph)

  S2 received ACK PDU in wait for EOF-ACK state.

12.29.1 Detailed Description

Implementation related to CFDP Send File transactions
This file contains various state handling routines for transactions which are sending a file.

12.29.2 Function Documentation

12.29.2.1 CF_CFDP_S1_Recv()

```
void CF_CFDP_S1_Recv (
    CF_Transaction_t * txn,
    CF_Logical_PduBuffer_t * ph )
```

S1 receive PDU processing.

Assumptions, External Events, and Notes:

txn must not be NULL.

Parameters

txn	Pointer to the transaction object
ph	Pointer to the PDU information

Definition at line 587 of file cf_cfdp_s.c.
References CF_CFDP_S_DispatchRecv().
Referenced by CF_CFDP_DispatchRecv().
Here is the call graph for this function:

12.29.2.2 CF_CFDP_S1_SubstateSendEof()

```
void CF_CFDP_S1_SubstateSendEof (
    CF_Transaction_t * txn )
```

Sends an EOF for S1.

Assumptions, External Events, and Notes:

txn must not be NULL.

Parameters

txn	Pointer to the transaction object

Definition at line 76 of file cf_cfdp_s.c.
References CF_CFDP_S_Reset(), CF_CFDP_S_SendEof(), and CF_SEND_PDU_NO_BUF_AVAIL_ERROR.
Referenced by CF_CFDP_S1_Tx().

Here is the call graph for this function:

12.29.2.3 CF_CFDP_S1_Tx()

```
void CF_CFDP_S1_Tx (
    CF_Transaction_t * txn )
```

S1 dispatch function.

Assumptions, External Events, and Notes:

txn must not be NULL.

Parameters

txn	Pointer to the transaction object

Definition at line 636 of file cf_cfdp_s.c.
References CF_CFDP_S1_SubstateSendEof(), CF_CFDP_S_DispatchTransmit(), CF_CFDP_S_SubstateSendFileData(), CF_CFDP_S_SubstateSendMetadata(), CF_TxSubState_EOF, CF_TxSubState_FILEDATA, CF_TxSubState_METADATA, and CF_CFDP_S_SubstateSendDispatchTable_t::substate.
Referenced by CF_CFDP_DispatchTx().

Here is the call graph for this function:

12.29.2.4 CF_CFDP_S2_EarlyFin()

```
void CF_CFDP_S2_EarlyFin (
    CF_Transaction_t * txn,
    CF_Logical_PduBuffer_t * ph )
```

A FIN was received before file complete, so abandon the transaction.

Assumptions, External Events, and Notes:

txn must not be NULL. ph must not be NULL.

Parameters

txn	Pointer to the transaction object
ph	Pointer to the PDU information

Definition at line 448 of file cf_cfdp_s.c.
References CF_CFDP_S_EARLY_FIN_ERR_EID, CF_CFDP_S_Reset(), CF_CFDP_SetTxnStatus(), CF_TxnState↩_S2, CF_TxnStatus_EARLY_FIN, CFE_EVS_EventType_ERROR, CFE_EVS_SendEvent(), CF_Transaction::history, CF_History::seq_num, CF_History::src_eid, and CF_Transaction::state.
Referenced by CF_CFDP_S2_Recv().

Here is the call graph for this function:

12.29.2.5 CF_CFDP_S2_Fin()

```
void CF_CFDP_S2_Fin (
    CF_Transaction_t * txn,
    CF_Logical_PduBuffer_t * ph )
```

S2 received FIN, so set flag to send FIN-ACK.

Assumptions, External Events, and Notes:

txn must not be NULL. ph must not be NULL.

Parameters

txn	Pointer to the transaction object
ph	Pointer to the PDU information

Definition at line 464 of file cf_cfdp_s.c.
References CF_Logical_PduFin::cc, CF_TxSubState_SEND_FIN_ACK, CF_Logical_IntHeader::fin, CF_TxS2_Data↩::fin_cc, CF_Logical_PduBuffer::int_header, CF_TxState_Data::s2, CF_StateData::send, CF_Transaction::state_data, and CF_TxState_Data::sub_state.
Referenced by CF_CFDP_S2_Recv().

12.29.2.6 CF_CFDP_S2_Nak()

```
void CF_CFDP_S2_Nak (
    CF_Transaction_t * txn,
    CF_Logical_PduBuffer_t * ph )
```

S2 NAK PDU received handling.

Description

Stores the segment requests from the NAK packet in the chunks structure. These can be used to generate re-transmit filedata PDUs.

Assumptions, External Events, and Notes:

txn must not be NULL. ph must not be NULL.

Parameters

txn	Pointer to the transaction object
ph	Pointer to the PDU information

Definition at line 476 of file cf_cfdp_s.c.
References CF_AppData, CF_CFDP_RecvNak(), CF_CFDP_S_INVALID_SR_ERR_EID, CF_CFDP_S_PDU_NAK_ERR_EID, CF_ChunkListAdd(), CF_TxnState_S2, CFE_EVS_EventType_ERROR, CFE_EVS_SendEvent(), CFE_SUCCESS, CF_Transaction::chan_num, CF_HkPacket_Payload::channel_hk, CF_ChunkWrapper::chunks, CF_Transaction::chunks, CF_HkChannel_Data::counters, CF_HkRecv::error, CF_Transaction::flags, CF_Transaction::fsize, CF_Transaction::history, CF_AppData_t::hk, CF_Logical_PduBuffer::int_header, CF_Flags_Tx::md_need_send, CF_Logical_IntHeader::nak, CF_HkRecv::nak_segment_requests, CF_Logical_SegmentList::num_segments, CF_Logical_SegmentRequest::offset_end, CF_Logical_SegmentRequest::offset_start, CF_HkPacket::Payload, CF_HkCounters::recv, CF_Logical_PduNak::segment_list, CF_Logical_SegmentList::segments, CF_History::seq_num, CF_History::src_eid, CF_Transaction::state, and CF_StateFlags::tx.
Referenced by CF_CFDP_S2_Nak_Arm(), and CF_CFDP_S2_Recv().
Here is the call graph for this function:

12.29.2.7 CF_CFDP_S2_Nak_Arm()

```
void CF_CFDP_S2_Nak_Arm (
    CF_Transaction_t * txn,
    CF_Logical_PduBuffer_t * ph )
```

S2 NAK handling but with arming the NAK timer.

Assumptions, External Events, and Notes:

txn must not be NULL. ph must not be NULL.

Parameters

txn	Pointer to the transaction object
ph	Pointer to the PDU information

Definition at line 544 of file cf_cfdp_s.c.
References CF_CFDP_ArmAckTimer(), and CF_CFDP_S2_Nak().
Referenced by CF_CFDP_S2_Recv().
Here is the call graph for this function:

12.29.2.8 CF_CFDP_S2_Recv()

```
void CF_CFDP_S2_Recv (
    CF_Transaction_t * txn,
    CF_Logical_PduBuffer_t * ph )
```

S2 receive PDU processing.

Assumptions, External Events, and Notes:

txn must not be NULL.

Parameters

txn	Pointer to the transaction object
ph	Pointer to the PDU information

Definition at line 600 of file cf_cfdp_s.c.
References CF_CFDP_FileDirective_ACK, CF_CFDP_FileDirective_FIN, CF_CFDP_FileDirective_NAK, CF_CFDP↩_S2_EarlyFin(), CF_CFDP_S2_Fin(), CF_CFDP_S2_Nak(), CF_CFDP_S2_Nak_Arm(), CF_CFDP_S2_WaitForEof↩Ack(), CF_CFDP_S_DispatchRecv(), CF_TxSubState_EOF, CF_TxSubState_FILEDATA, CF_TxSubState_METAD↩ATA, CF_TxSubState_SEND_FIN_ACK, CF_TxSubState_WAIT_FOR_EOF_ACK, CF_TxSubState_WAIT_FOR_FIN, CF_CFDP_FileDirectiveDispatchTable_t::fdirective, and CF_CFDP_S_SubstateRecvDispatchTable_t::substate.
Referenced by CF_CFDP_DispatchRecv().

Here is the call graph for this function:

12.29.2.9 CF_CFDP_S2_SubstateSendEof()

```
void CF_CFDP_S2_SubstateSendEof (
    CF_Transaction_t * txn )
```

Triggers tick processing to send an EOF and wait for EOF-ACK for S2.

Assumptions, External Events, and Notes:

txn must not be NULL.

Parameters

txn	Pointer to the transaction object

Definition at line 93 of file cf_cfdp_s.c.
References CF_Flags_Common::ack_timer_armed, CF_DequeueTransaction(), CF_InsertSortPrio(), CF_QueueIdx_↩TXW, CF_TxSubState_WAIT_FOR_EOF_ACK, CF_StateFlags::com, CF_Transaction::flags, CF_StateData::send, C↩F_Transaction::state_data, and CF_TxState_Data::sub_state.
Referenced by CF_CFDP_S2_Tx().

Here is the call graph for this function:

12.29.2.10 CF_CFDP_S2_SubstateSendFileData()

```
void CF_CFDP_S2_SubstateSendFileData ( CF_Transaction_t * txn )
```

Send filedata handling for S2.

Description

S2 will either respond to a NAK by sending retransmits, or in absence of a NAK, it will send more of the original file data.

Assumptions, External Events, and Notes:

txn must not be NULL.

Parameters

txn	Pointer to the transaction object

Definition at line 304 of file cf_cfdp_s.c.
References CF_CFDP_S_CheckAndRespondNak(), CF_CFDP_S_Reset(), CF_CFDP_S_SubstateSendFileData(), CF_CFDP_SetTxnStatus(), and CF_TxnStatus_NAK_RESPONSE_ERROR.
Referenced by CF_CFDP_S2_Tx().

Here is the call graph for this function:

12.29.2.11 CF_CFDP_S2_Tx()

```
void CF_CFDP_S2_Tx ( CF_Transaction_t * txn )
```

S2 dispatch function.

Assumptions, External Events, and Notes:

txn must not be NULL.

Parameters

txn	Pointer to the transaction object

Definition at line 654 of file cf_cfdp_s.c.
References CF_CFDP_S2_SubstateSendEof(), CF_CFDP_S2_SubstateSendFileData(), CF_CFDP_S_Dispatch↩Transmit(), CF_CFDP_S_SubstateSendMetadata(), CF_TxSubState_EOF, CF_TxSubState_FILEDATA, CF_TxSub↩State_METADATA, and CF_CFDP_S_SubstateSendDispatchTable_t::substate.
Referenced by CF_CFDP_DispatchTx().

Here is the call graph for this function:

12.29.2.12 CF_CFDP_S2_WaitForEofAck()

```
void CF_CFDP_S2_WaitForEofAck (
    CF_Transaction_t * txn,
    CF_Logical_PduBuffer_t * ph )
```

S2 received ACK PDU in wait for EOF-ACK state.

Description

This function will trigger a state transition to CF_TxSubState_WAIT_FOR_FIN, which waits for a FIN PDU.

Assumptions, External Events, and Notes:

txn must not be NULL. ph must not be NULL.

Parameters

txn	Pointer to the transaction object
ph	Pointer to the PDU information

Definition at line 556 of file cf_cfdp_s.c.
References CF_Flags_Common::ack_timer_armed, CF_AppData, CF_CFDP_RecvAck(), CF_CFDP_S_PDU_EO↩F_ERR_EID, CF_CFDP_S_Reset(), CF_TxnState_S2, CF_TxnStatus_IsError(), CF_TxSubState_WAIT_FOR_F↩IN, CFE_EVS_EventType_ERROR, CFE_EVS_SendEvent(), CF_Transaction::chan_num, CF_HkPacket_Payload↩::channel_hk, CF_StateFlags::com, CF_HkChannel_Data::counters, CF_HkRecv::error, CF_Transaction::flags, CF↩

_Transaction::history, CF_AppData_t::hk, CF_HkPacket::Payload, CF_HkCounters::recv, CF_StateData::send, CF_↩ History::seq_num, CF_History::src_eid, CF_Transaction::state, CF_Transaction::state_data, CF_TxState_Data::sub_↩ state, and CF_History::txn_stat.
Referenced by CF_CFDP_S2_Recv().
Here is the call graph for this function:

12.29.2.13 CF_CFDP_S_Cancel() `void CF_CFDP_S_Cancel (CF_Transaction_t * txn )`

Cancel an S transaction.

Assumptions, External Events, and Notes:

txn must not be NULL.

Parameters

txn	Pointer to the transaction object

Definition at line 672 of file cf_cfdp_s.c.
References CF_TxSubState_EOF, CF_StateData::send, CF_Transaction::state_data, and CF_TxState_Data::sub_↩ state.
Referenced by CF_CFDP_CancelTransaction().

12.29.2.14 CF_CFDP_S_CheckAndRespondNak() `CFE_Status_t CF_CFDP_S_CheckAndRespondNak (CF_Transaction_t * txn )`

Respond to a NAK by sending filedata PDUs as response.

Description

Checks to see if a metadata PDU or filedata re-transmits must occur.

Assumptions, External Events, and Notes:

txn must not be NULL.

Returns

CF_ERROR if error.

Return values

0	if no NAK processed.
1	if NAK processed.

Parameters

txn	Pointer to the transaction object

Definition at line 249 of file cf_cfdp_s.c.
References CF_CFDP_S_SendFileData(), CF_CFDP_SendMd(), CF_ChunkList_GetFirstChunk(), CF_ChunkList_↩ RemoveFromFirst(), CF_ERROR, CF_SEND_PDU_ERROR, CFE_SUCCESS, CF_ChunkWrapper::chunks, CF_↩ Transaction::chunks, CF_Transaction::flags, CF_Flags_Tx::md_need_send, CF_Chunk::offset, CF_Chunk::size, and CF_StateFlags::tx.
Referenced by CF_CFDP_S2_SubstateSendFileData(), and CF_CFDP_S_Tick_Nak().
Here is the call graph for this function:

12.29.2.15 CF_CFDP_S_SendEof()

```
CFE_Status_t CF_CFDP_S_SendEof (
    CF_Transaction_t * txn )
```

Send an EOF PDU.

Assumptions, External Events, and Notes:

txn must not be NULL.

Return values

CFE_SUCCESS	on success.
CF_SEND_PDU_NO_BUF_AVAIL_ERROR	if message buffer cannot be obtained.
CF_SEND_PDU_ERROR	if an error occurred while building the packet.

Parameters

txn	Pointer to the transaction object

Definition at line 60 of file cf_cfdp_s.c.
References CF_CFDP_SendEof(), CF_CRC_Finalize(), CF_StateFlags::com, CF_Transaction::crc, CF_Flags_↩ Common::crc_calc, and CF_Transaction::flags.
Referenced by CF_CFDP_S1_SubstateSendEof(), and CF_CFDP_S_Tick().
Here is the call graph for this function:

12.29.2.16 CF_CFDP_S_SendFileData()

```
CFE_Status_t CF_CFDP_S_SendFileData (
    CF_Transaction_t * txn,
    uint32 foffs,
    uint32 bytes_to_read,
    uint8 calc_crc )
```

Helper function to populate the PDU with file data and send it.

Description

This function checks the file offset cache and if the desired location is where the file offset is, it can skip a seek() call. The file is read into the filedata PDU and then the PDU is sent.

Assumptions, External Events, and Notes:

txn must not be NULL.

Returns

The number of bytes sent in the file data PDU (CFE_SUCCESS, i.e. 0, if no bytes were processed), or CF_ERROR on error

Parameters

txn	Pointer to the transaction object
foffs	Position in file to send data from
bytes_to_read	Number of bytes to send (maximum)
calc_crc	Enable CRC/Checksum calculation

Definition at line 111 of file cf_cfdp_s.c.
References CF_TxState_Data::cached_pos, CF_AppData, CF_Assert, CF_CFDP_ConstructPduHeader(), CF_CFDP_DoEncodeChunk(), CF_CFDP_EncodeFileDataHeader(), CF_CFDP_S_READ_ERR_EID, CF_CFDP_S_SEEK_FD_ERR_EID, CF_CFDP_SendFd(), CF_CODEC_GET_REMAIN, CF_CRC_Digest(), CF_ERROR, CF_TxnState_S2, CF_WrappedLseek(), CF_WrappedRead(), CFE_EVS_EventType_ERROR, CFE_EVS_SendEvent(), CFE_SUCCESS, CF_Transaction::chan_num, CF_HkPacket_Payload::channel_hk, CF_AppData_t::config_table, CF_HkChannel_Data::counters, CF_Transaction::crc, CF_Logical_PduFileDataHeader::data_len, CF_Logical_PduFileDataHeader::data_ptr, CF_HkCounters::fault, CF_Logical_IntHeader::fd, CF_Transaction::fd, CF_HkSent::file_data_bytes, CF_HkFault::file_read, CF_HkFault::file_seek, CF_Transaction::fsize, CF_Transaction::history, CF_AppData_t::hk, CF_Logical_PduBuffer::int_header, CF_ConfigTable::local_eid, CF_Logical_PduFileDataHeader::offset, OS_SEEK_SET, CF_ConfigTable::outgoing_file_chunk_size, CF_HkPacket::Payload, CF_Logical_PduBuffer::pdu_header, CF_History::peer_eid, CF_Logical_PduBuffer::penc, CF_Logical_PduHeader::segment_meta_flag, CF_StateData::send, CF_HkCounters::sent, CF_History::seq_num, CF_History::src_eid, CF_Transaction::state, and CF_Transaction::state_data.
Referenced by CF_CFDP_S_CheckAndRespondNak(), and CF_CFDP_S_SubstateSendFileData().
Here is the call graph for this function:

12.29.2.17 CF_CFDP_S_SubstateSendFileData()

```
void CF_CFDP_S_SubstateSendFileData ( CF_Transaction_t * txn )
```

Standard state function to send the next file data PDU for active transaction.

Description

During the transfer of active transaction file data PDUs, the file offset is saved. This function sends the next chunk of data. If the file offset equals the file size, then transition to the EOF state.

Assumptions, External Events, and Notes:

txn must not be NULL.

Parameters

txn	Pointer to the transaction object

Definition at line 218 of file cf_cfdp_s.c.
References CF_CFDP_S_SendFileData(), CF_CFDP_SetTxnStatus(), CF_TxnStatus_FILESTORE_REJECTION, CF_TxSubState_EOF, CF_Transaction::foffs, CF_Transaction::fsize, CF_StateData::send, CF_Transaction::state_data, and CF_TxState_Data::sub_state.
Referenced by CF_CFDP_S1_Tx(), and CF_CFDP_S2_SubstateSendFileData().
Here is the call graph for this function:

12.29.2.18 CF_CFDP_S_SubstateSendFinAck()

```
void CF_CFDP_S_SubstateSendFinAck (
    CF_Transaction_t * txn )
```

Send FIN-ACK packet for S2.

Assumptions, External Events, and Notes:

txn must not be NULL.

Parameters

txn	Pointer to the transaction object

Definition at line 431 of file cf_cfdp_s.c.
References CF_CFDP_AckTxnStatus_ACTIVE, CF_CFDP_FileDirective_FIN, CF_CFDP_S_Reset(), CF_CFDP_SendAck(), CF_CFDP_SetTxnStatus(), CF_SEND_PDU_NO_BUF_AVAIL_ERROR, CF_TxnStatus_NO_ERROR, C

F_TxS2_Data::fin_cc, CF_Transaction::history, CF_History::peer_eid, CF_TxState_Data::s2, CF_StateData::send, C↩
F_History::seq_num, and CF_Transaction::state_data.
Referenced by CF_CFDP_S_Tick().
Here is the call graph for this function:

12.29.2.19 CF_CFDP_S_SubstateSendMetadata()

```
void CF_CFDP_S_SubstateSendMetadata (
    CF_Transaction_t * txn )
```

Send metadata PDU.

Description

Construct and send a metadata PDU. This function determines the size of the file to put in the metadata PDU.

Assumptions, External Events, and Notes:

txn must not be NULL.

Parameters

txn	Pointer to the transaction object

Definition at line 329 of file cf_cfdp_s.c.
References CF_AppData, CF_CFDP_S_ALREADY_OPEN_ERR_EID, CF_CFDP_S_OPEN_ERR_EID, CF_CF↩

DP_S_Reset(), CF_CFDP_S_SEEK_BEG_ERR_EID, CF_CFDP_S_SEEK_END_ERR_EID, CF_CFDP_S_SEN↩ D_MD_ERR_EID, CF_CFDP_SendMd(), CF_CFDP_SetTxnStatus(), CF_SEND_PDU_ERROR, CF_TxnState_S2, CF_TxnStatus_FILESTORE_REJECTION, CF_TxSubState_FILEDATA, CF_WrappedLseek(), CF_WrappedOpen↩ Create(), CFE_EVS_EventType_ERROR, CFE_EVS_SendEvent(), CFE_SUCCESS, CF_Transaction::chan_num, CF_HkPacket_Payload::channel_hk, CF_HkChannel_Data::counters, CF_HkCounters::fault, CF_Transaction::fd, C↩ F_HkFault::file_open, CF_HkFault::file_seek, CF_History::fnames, CF_Transaction::fsize, CF_Transaction::history, CF_AppData_t::hk, OS_FILE_FLAG_NONE, OS_FileOpenCheck(), OS_OBJECT_ID_UNDEFINED, OS_Object↩ IdDefined(), OS_READ_ONLY, OS_SEEK_END, OS_SEEK_SET, OS_SUCCESS, CF_HkPacket::Payload, CF_↩ StateData::send, CF_History::seq_num, CF_History::src_eid, CF_TxnFilenames::src_filename, CF_Transaction::state, CF_Transaction::state_data, and CF_TxState_Data::sub_state.
Referenced by CF_CFDP_S1_Tx(), and CF_CFDP_S2_Tx().
Here is the call graph for this function:

12.29.2.20 CF_CFDP_S_Tick()

```
void CF_CFDP_S_Tick (
    CF_Transaction_t * txn,
    int * cont )
```

Perform tick (time-based) processing for S transactions.

Description

This function is called on every transaction by the engine on every CF wakeup. This is where flags are checked to send EOF or FIN-ACK. If nothing else is sent, it checks to see if a NAK retransmit must occur.

Assumptions, External Events, and Notes:

txn must not be NULL. cont is unused, so may be NULL

Parameters

txn	Pointer to the transaction object
cont	Unused, exists for compatibility with tick processor

Definition at line 687 of file cf_cfdp_s.c.
References CF_ChannelConfig::ack_limit, CF_HkFault::ack_limit, CF_Transaction::ack_timer, CF_Flags_Common::ack_timer_armed, CF_TxS2_Data::acknak_count, CF_AppData, CF_CFDP_ArmAckTimer(), CF_CFDP_S_ACK_LIMIT_ERR_EID, CF_CFDP_S_INACT_TIMER_ERR_EID, CF_CFDP_S_Reset(), CF_CFDP_S_SendEof(), CF_CFDP_S_SubstateSendFinAck(), CF_CFDP_SetTxnStatus(), CF_SEND_PDU_NO_BUF_AVAIL_ERROR, CF_Timer_Expired(), CF_Timer_Tick(), CF_TxnState_S2, CF_TxnStatus_ACK_LIMIT_NO_EOF, CF_TxnStatus_INACTIVITY_DETECTED, CF_TxSubState_SEND_FIN_ACK, CF_TxSubState_WAIT_FOR_EOF_ACK, CFE_EVS_EventType_ERROR, CFE_EVS_SendEvent(), CF_ConfigTable::chan, CF_Transaction::chan_num, CF_HkPacket_Payload::channel_hk, CF_StateFlags::com, CF_AppData_t::config_table, CF_HkChannel_Data::counters, CF_HkCounters::fault, CF_Transaction::flags, CF_Transaction::history, CF_AppData_t::hk, CF_HkFault::inactivity_timer, CF_Transaction::inactivity_timer, CF_HkPacket::Payload, CF_TxState_Data::s2, CF_StateData::send, CF_History::seq_num, CF_History::src_eid, CF_Transaction::state, CF_Transaction::state_data, and CF_TxState_Data::sub_state.
Referenced by CF_CFDP_TickTransactions().
Here is the call graph for this function:

12.29.2.21 CF_CFDP_S_Tick_Nak()

```
void CF_CFDP_S_Tick_Nak (
    CF_Transaction_t * txn,
    int * cont )
```

Perform NAK response for TX transactions.

Description

This function is called at tick processing time to send pending NAK responses. It indicates "cont" is 1 if there are more responses left to send.

Assumptions, External Events, and Notes:

txn must not be NULL. cont must not be NULL.

Parameters

txn	Pointer to the transaction object
cont	Set to 1 if a NAK was generated

Definition at line 772 of file cf_cfdp_s.c.
References CF_CFDP_S_CheckAndRespondNak().
Referenced by CF_CFDP_TickTransactions().
Here is the call graph for this function:

12.30 apps/cf/fsw/src/cf_cfdp_sbintf.c File Reference

```
#include "cfe.h"
#include "cf_verify.h"
#include "cf_app.h"
#include "cf_events.h"
#include "cf_perfids.h"
#include "cf_cfdp.h"
#include "cf_utils.h"
#include "cf_cfdp_r.h"
#include "cf_cfdp_s.h"
#include "cf_cfdp_sbintf.h"
#include <string.h>
#include "cf_assert.h"
```

Functions

- CF_Logical_PduBuffer_t ∗ CF_CFDP_MsgOutGet (const CF_Transaction_t ∗txn, bool silent)

Obtain a message buffer to construct a PDU inside.

- void CF_CFDP_Send (uint8 chan_num, const CF_Logical_PduBuffer_t *ph)

  Sends the current output buffer via the software bus.

- void CF_CFDP_ReceiveMessage (CF_Channel_t *chan)

  Process received message on channel PDU input pipe.

12.30.1 Detailed Description

This is the interface to the CFE Software Bus for CF transmit/recv. Specifically this implements 3 functions used by the CFDP engine:

- CF_CFDP_MsgOutGet() - gets a buffer prior to transmitting
- CF_CFDP_Send() - sends the buffer from CF_CFDP_MsgOutGet
- CF_CFDP_ReceiveMessage() - gets a received message

These functions were originally part of the CFDP engine itself but were split into a separate file, both to improve testability as well as to (potentially) allow interfaces to message/packet services other than the CFE software bus. However, Note that in this version, there is still a fair amount of CFDP engine mixed into these functions that would have to be isolated. Also note that the creation and deletion of SB pipes is not yet moved into this file.

12.30.2 Function Documentation

12.30.2.1 CF_CFDP_MsgOutGet()

```
CF_Logical_PduBuffer_t* CF_CFDP_MsgOutGet (
    const CF_Transaction_t * txn,
    bool silent )
```

Obtain a message buffer to construct a PDU inside.

Description

This performs the handshaking via semaphore with the consumer of the PDU. If the semaphore can be obtained, a software bus buffer is obtained and it is returned. If the semaphore is unavailable, then the current transaction is remembered for next engine cycle. If silent is true, then the event message is not printed in the case of no buffer available.

Assumptions, External Events, and Notes:

txn must not be NULL.

Parameters

txn	Pointer to the transaction object
silent	If true, suppresses error events if no message can be allocated

Returns

Pointer to a CF_Logical_PduBuffer_t on success.

Return values

NULL	on error

Definition at line 61 of file cf_cfdp_sbintf.c.
References CF_AppData, CF_CFDP_EncodeStart(), CF_CFDP_NO_MSG_ERR_EID, CF_MAX_PDU_SIZE, CF_P↩DU_ENCAPSULATION_EXTRA_TRAILING_BYTES, CFE_EVS_EventType_ERROR, CFE_EVS_SendEvent(), CFE↩_MSG_Init(), CFE_SB_AllocateMessageBuffer(), CFE_SB_ReleaseMessageBuffer(), CFE_SB_ValueToMsgId(), C↩F_ConfigTable::chan, CF_Transaction::chan_num, CF_HkPacket_Payload::channel_hk, CF_Engine::channels, CF_↩StateFlags::com, CF_AppData_t::config_table, CF_Channel::cur, CF_Output::encode, CF_AppData_t::engine, CF_↩Transaction::flags, CF_HkChannel_Data::frozen, CF_AppData_t::hk, CF_ChannelConfig::max_outgoing_messages_↩per_wakeup, CF_ChannelConfig::mid_output, CFE_SB_Msg::Msg, CF_Output::msg, OS_CountSemTimedWait(), O↩S_ObjectIdDefined(), OS_SUCCESS, CF_Engine::out, CF_Engine::outgoing_counter, CF_HkPacket::Payload, CF_↩Channel::sem_id, CF_Flags_Common::suspended, and CF_Output::tx_pdudata.
Referenced by CF_CFDP_ConstructPduHeader().
Here is the call graph for this function:

12.30.2.2 CF_CFDP_ReceiveMessage()

```
void CF_CFDP_ReceiveMessage ( CF_Channel_t * chan )
```

Process received message on channel PDU input pipe.

Assumptions, External Events, and Notes:

chan must be a member of the array within the CF_AppData global object

Parameters

chan	Channel to receive message on

Definition at line 175 of file cf_cfdp_sbintf.c.
References CF_Logical_PduFin::cc, CF_AppData, CF_Assert, CF_CFDP_AckTxnStatus_UNRECOGNIZED, CF_↩CFDP_CLASS_2, CF_CFDP_DecodeStart(), CF_CFDP_DispatchRecv(), CF_CFDP_FileDirective_FIN, CF_CFDP↩_FinDeliveryCode_INCOMPLETE, CF_CFDP_FinFileStatus_DISCARDED, CF_CFDP_InitTxnTxFile(), CF_CFDP_↩INVALID_DST_ERR_EID, CF_CFDP_RecvFin(), CF_CFDP_RecvPh(), CF_CFDP_RX_DROPPED_ERR_EID, CF↩

_CFDP_SendAck(), CF_CList_InsertBack_Ex(), CF_Direction_RX, CF_FindTransactionBySequenceNumber(), CF_↩ FindUnusedTransaction(), CF_MAX_SIMULTANEOUS_RX, CF_PDU_ENCAPSULATION_EXTRA_TRAILING_BYT↩ ES, CF_PERF_ID_PDURCVD, CF_QueueIdx_RX, CF_SEND_PDU_NO_BUF_AVAIL_ERROR, CF_TxnState_IDLE, CFE_ES_PerfLogEntry, CFE_ES_PerfLogExit, CFE_EVS_EventType_ERROR, CFE_EVS_SendEvent(), CFE_MS↩ G_GetSize(), CFE_MSG_GetType(), CFE_MSG_Type_Invalid, CFE_MSG_Type_Tlm, CFE_SB_POLL, CFE_SB_↩ ReceiveBuffer(), CFE_SUCCESS, CF_ConfigTable::chan, CF_HkPacket_Payload::channel_hk, CF_Engine::channels, CF_Transaction::cl_node, CF_StateFlags::com, CF_AppData_t::config_table, CF_HkChannel_Data::counters, C↩ F_Channel::cur, CF_RxS2_Data::dc, CF_Input::decode, CF_Logical_PduHeader::destination_eid, CF_History::dir, CF_Logical_PduFileDirectiveHeader::directive_code, CF_AppData_t::engine, CF_Logical_PduBuffer::fdirective, C↩ F_Logical_IntHeader::fin, CF_Transaction::flags, CF_RxS2_Data::fs, CF_Transaction::history, CF_AppData_t::hk, CF_Engine::in, CF_Logical_PduBuffer::int_header, CF_ConfigTable::local_eid, CFE_SB_Msg::Msg, CF_HkPacket↩ ::Payload, CF_Logical_PduBuffer::pdu_header, CF_Channel::pipe, CF_Flags_Common::q_index, CF_HkChannel↩ _Data::q_size, CF_RxState_Data::r2, CF_StateData::receive, CF_HkCounters::recv, CF_ChannelConfig::rx_max_↩ messages_per_wakeup, CF_Input::rx_pdudata, CF_Logical_PduHeader::sequence_num, CF_Logical_PduHeader↩ ::source_eid, CF_HkRecv::spurious, CF_Transaction::state, and CF_Transaction::state_data.
Referenced by CF_CFDP_CycleEngine().
Here is the call graph for this function:

12.30.2.3 CF_CFDP_Send()

```
void CF_CFDP_Send (
    uint8 chan_num,
    const CF_Logical_PduBuffer_t * ph )
```

Sends the current output buffer via the software bus.

Assumptions, External Events, and Notes:

The PDU in the output buffer is ready to transmit.

Parameters

chan_num	Channel number for statistics/accounting purposes
ph	Pointer to PDU buffer to send

Definition at line 147 of file cf_cfdp_sbintf.c.
References CF_AppData, CF_Assert, CF_NUM_CHANNELS, CF_PDU_ENCAPSULATION_EXTRA_TRAILING_B↩YTES, CFE_MSG_SetMsgTime(), CFE_MSG_SetSize(), CFE_SB_TransmitBuffer(), CFE_TIME_GetTime(), CF_Hk↩Packet_Payload::channel_hk, CF_HkChannel_Data::counters, CF_Logical_PduHeader::data_encoded_length, CF_↩AppData_t::engine, CF_Logical_PduHeader::header_encoded_length, CF_AppData_t::hk, CFE_SB_Msg::Msg, CF_↩Output::msg, CF_Engine::out, CF_HkPacket::Payload, CF_HkSent::pdu, CF_Logical_PduBuffer::pdu_header, and C↩F_HkCounters::sent.
Referenced by CF_CFDP_SendAck(), CF_CFDP_SendEof(), CF_CFDP_SendFd(), CF_CFDP_SendFin(), CF_CFD↩P_SendMd(), and CF_CFDP_SendNak().
Here is the call graph for this function:

12.31 apps/cf/fsw/src/cf_cfdp_sbintf.h File Reference

```
#include "cf_cfdp_types.h"
```

Data Structures

- struct CF_PduCmdMsg

  PDU command encapsulation structure.
- struct CF_PduTlmMsg

  PDU send encapsulation structure.

Typedefs

- typedef struct CF_PduCmdMsg CF_PduCmdMsg_t

  PDU command encapsulation structure.
- typedef struct CF_PduTlmMsg CF_PduTlmMsg_t

  PDU send encapsulation structure.

Functions

- CF_Logical_PduBuffer_t ∗ CF_CFDP_MsgOutGet (const CF_Transaction_t ∗txn, bool silent)

  Obtain a message buffer to construct a PDU inside.
- void CF_CFDP_Send (uint8 chan_num, const CF_Logical_PduBuffer_t ∗ph)

  Sends the current output buffer via the software bus.
- void CF_CFDP_ReceiveMessage (CF_Channel_t ∗chan)

  Process received message on channel PDU input pipe.

12.31.1 Detailed Description

This is the interface to the CFE Software Bus for PDU transmit/recv.
It may serve as a future point of abstraction to interface with message passing interfaces other than the CFE software bus, if necessary.

12.31.2 Typedef Documentation

12.31.2.1 CF_PduCmdMsg_t `typedef struct CF_PduCmdMsg CF_PduCmdMsg_t`

PDU command encapsulation structure.
This encapsulates a CFDP PDU into a format that is sent or received over the software bus, adding "command" encapsulation (even though these are not really commands).

Note

this is only the definition of the header. In reality all messages are larger than this, up to CF_MAX_PDU_SIZE.

12.31.2.2 CF_PduTlmMsg_t `typedef struct CF_PduTlmMsg CF_PduTlmMsg_t`

PDU send encapsulation structure.
This encapsulates a CFDP PDU into a format that is sent or received over the software bus, adding "telemetry" encapsulation (even though these are not really telemetry items).

Note

this is only the definition of the header. In reality all messages are larger than this, up to CF_MAX_PDU_SIZE.

12.31.3 Function Documentation

12.31.3.1 CF_CFDP_MsgOutGet()

```
CF_Logical_PduBuffer_t* CF_CFDP_MsgOutGet (
    const CF_Transaction_t * txn,
    bool silent )
```

Obtain a message buffer to construct a PDU inside.

Description

This performs the handshaking via semaphore with the consumer of the PDU. If the semaphore can be obtained, a software bus buffer is obtained and it is returned. If the semaphore is unavailable, then the current transaction is remembered for next engine cycle. If silent is true, then the event message is not printed in the case of no buffer available.

Assumptions, External Events, and Notes:

txn must not be NULL.

Parameters

txn	Pointer to the transaction object
silent	If true, suppresses error events if no message can be allocated

Returns

Pointer to a CF_Logical_PduBuffer_t on success.

Return values

NULL	on error

Definition at line 61 of file cf_cfdp_sbintf.c.
References CF_AppData, CF_CFDP_EncodeStart(), CF_CFDP_NO_MSG_ERR_EID, CF_MAX_PDU_SIZE, CF_P↩DU_ENCAPSULATION_EXTRA_TRAILING_BYTES, CFE_EVS_EventType_ERROR, CFE_EVS_SendEvent(), CFE↩_MSG_Init(), CFE_SB_AllocateMessageBuffer(), CFE_SB_ReleaseMessageBuffer(), CFE_SB_ValueToMsgId(), C↩F_ConfigTable::chan, CF_Transaction::chan_num, CF_HkPacket_Payload::channel_hk, CF_Engine::channels, CF_↩StateFlags::com, CF_AppData_t::config_table, CF_Channel::cur, CF_Output::encode, CF_AppData_t::engine, CF_↩Transaction::flags, CF_HkChannel_Data::frozen, CF_AppData_t::hk, CF_ChannelConfig::max_outgoing_messages_↩per_wakeup, CF_ChannelConfig::mid_output, CFE_SB_Msg::Msg, CF_Output::msg, OS_CountSemTimedWait(), O↩S_ObjectIdDefined(), OS_SUCCESS, CF_Engine::out, CF_Engine::outgoing_counter, CF_HkPacket::Payload, CF_↩Channel::sem_id, CF_Flags_Common::suspended, and CF_Output::tx_pdudata.
Referenced by CF_CFDP_ConstructPduHeader().

Here is the call graph for this function:

12.31.3.2 CF_CFDP_ReceiveMessage()

```
void CF_CFDP_ReceiveMessage ( CF_Channel_t * chan )
```

Process received message on channel PDU input pipe.

Assumptions, External Events, and Notes:

chan must be a member of the array within the CF_AppData global object

Parameters

chan	Channel to receive message on

Definition at line 175 of file cf_cfdp_sbintf.c.

References CF_Logical_PduFin::cc, CF_AppData, CF_Assert, CF_CFDP_AckTxnStatus_UNRECOGNIZED, CF_CFDP_CLASS_2, CF_CFDP_DecodeStart(), CF_CFDP_DispatchRecv(), CF_CFDP_FileDirective_FIN, CF_CFDP_FinDeliveryCode_INCOMPLETE, CF_CFDP_FinFileStatus_DISCARDED, CF_CFDP_InitTxnTxFile(), CF_CFDP_INVALID_DST_ERR_EID, CF_CFDP_RecvFin(), CF_CFDP_RecvPh(), CF_CFDP_RX_DROPPED_ERR_EID, CF_CFDP_SendAck(), CF_CList_InsertBack_Ex(), CF_Direction_RX, CF_FindTransactionBySequenceNumber(), CF_FindUnusedTransaction(), CF_MAX_SIMULTANEOUS_RX, CF_PDU_ENCAPSULATION_EXTRA_TRAILING_BYTES, CF_PERF_ID_PDURCVD, CF_QueueIdx_RX, CF_SEND_PDU_NO_BUF_AVAIL_ERROR, CF_TxnState_IDLE, CFE_ES_PerfLogEntry, CFE_ES_PerfLogExit, CFE_EVS_EventType_ERROR, CFE_EVS_SendEvent(), CFE_MSG_GetSize(), CFE_MSG_GetType(), CFE_MSG_Type_Invalid, CFE_MSG_Type_Tlm, CFE_SB_POLL, CFE_SB_ReceiveBuffer(), CFE_SUCCESS, CF_ConfigTable::chan, CF_HkPacket_Payload::channel_hk, CF_Engine::channels, CF_Transaction::cl_node, CF_StateFlags::com, CF_AppData_t::config_table, CF_HkChannel_Data::counters, CF_Channel::cur, CF_RxS2_Data::dc, CF_Input::decode, CF_Logical_PduHeader::destination_eid, CF_History::dir, CF_Logical_PduFileDirectiveHeader::directive_code, CF_AppData_t::engine, CF_Logical_PduBuffer::fdirective, CF_Logical_IntHeader::fin, CF_Transaction::flags, CF_RxS2_Data::fs, CF_Transaction::history, CF_AppData_t::hk, CF_Engine::in, CF_Logical_PduBuffer::int_header, CF_ConfigTable::local_eid, CFE_SB_Msg::Msg, CF_HkPacket

::Payload, CF_Logical_PduBuffer::pdu_header, CF_Channel::pipe, CF_Flags_Common::q_index, CF_HkChannel↩ _Data::q_size, CF_RxState_Data::r2, CF_StateData::receive, CF_HkCounters::recv, CF_ChannelConfig::rx_max_↩ messages_per_wakeup, CF_Input::rx_pdudata, CF_Logical_PduHeader::sequence_num, CF_Logical_PduHeader↩ ::source_eid, CF_HkRecv::spurious, CF_Transaction::state, and CF_Transaction::state_data.
Referenced by CF_CFDP_CycleEngine().
Here is the call graph for this function:

12.31.3.3 CF_CFDP_Send()

```
void CF_CFDP_Send (
    uint8 chan_num,
    const CF_Logical_PduBuffer_t * ph )
```

Sends the current output buffer via the software bus.

Assumptions, External Events, and Notes:

The PDU in the output buffer is ready to transmit.

Parameters

chan_num	Channel number for statistics/accounting purposes
ph	Pointer to PDU buffer to send

Definition at line 147 of file cf_cfdp_sbintf.c.
References CF_AppData, CF_Assert, CF_NUM_CHANNELS, CF_PDU_ENCAPSULATION_EXTRA_TRAILING_BYTES, CFE_MSG_SetMsgTime(), CFE_MSG_SetSize(), CFE_SB_TransmitBuffer(), CFE_TIME_GetTime(), CF_HkPacket_Payload::channel_hk, CF_HkChannel_Data::counters, CF_Logical_PduHeader::data_encoded_length, CF_AppData_t::engine, CF_Logical_PduHeader::header_encoded_length, CF_AppData_t::hk, CFE_SB_Msg::Msg, CF_Output::msg, CF_Engine::out, CF_HkPacket::Payload, CF_HkSent::pdu, CF_Logical_PduBuffer::pdu_header, and CF_HkCounters::sent.
Referenced by CF_CFDP_SendAck(), CF_CFDP_SendEof(), CF_CFDP_SendFd(), CF_CFDP_SendFin(), CF_CFDP_SendMd(), and CF_CFDP_SendNak().
Here is the call graph for this function:

12.32 apps/cf/fsw/src/cf_cfdp_types.h File Reference

```
#include "common_types.h"
#include "cf_cfdp_pdu.h"
#include "cf_extern_typedefs.h"
#include "cf_platform_cfg.h"
#include "cf_msg.h"
#include "cf_clist.h"
#include "cf_chunk.h"
#include "cf_timer.h"
#include "cf_crc.h"
#include "cf_codec.h"
```

Data Structures

- struct CF_History

  CF History entry.
- struct CF_ChunkWrapper

  Wrapper around a CF_ChunkList_t object.
- struct CF_Playback

  CF Playback entry.
- struct CF_Poll

CF Poll entry.

- struct CF_TxS2_Data

  Data specific to a class 2 send file transaction.
- struct CF_TxState_Data

  Data specific to a send file transaction.
- struct CF_RxS2_Data

  Data specific to a class 2 receive file transaction.
- struct CF_RxState_Data

  Data specific to a receive file transaction.
- struct CF_Flags_Common

  Data that applies to all types of transactions.
- struct CF_Flags_Rx

  Flags that apply to receive transactions.
- struct CF_Flags_Tx

  Flags that apply to send transactions.
- union CF_StateFlags

  Summary of all possible transaction flags (tx and rx)
- union CF_StateData

  Summary of all possible transaction state information (tx and rx)
- struct CF_Transaction

  Transaction state object.
- struct CF_Channel

  Channel state object.
- struct CF_Output

  CF engine output state.
- struct CF_Input

  CF engine input state.
- struct CF_Engine

  An engine represents a pairing to a local EID.

Macros

- #define CF_NUM_TRANSACTIONS_PER_CHANNEL

  Maximum possible number of transactions that may exist on a single CF channel.
- #define CF_NUM_TRANSACTIONS (CF_NUM_CHANNELS ∗ CF_NUM_TRANSACTIONS_PER_CHANNEL)

  Maximum possible number of transactions that may exist in the CF application.
- #define CF_NUM_HISTORIES (CF_NUM_CHANNELS ∗ CF_NUM_HISTORIES_PER_CHANNEL)

  Maximum possible number of history entries that may exist in the CF application.
- #define CF_NUM_CHUNKS_ALL_CHANNELS (CF_TOTAL_CHUNKS ∗ CF_NUM_TRANSACTIONS_PER_CHANNEL)

  Maximum possible number of chunk entries that may exist in the CF application.

Typedefs

- typedef struct CF_History CF_History_t

  CF History entry.
- typedef struct CF_ChunkWrapper CF_ChunkWrapper_t

  Wrapper around a CF_ChunkList_t object.
- typedef struct CF_Playback CF_Playback_t

CF Playback entry.

- typedef struct CF_Poll CF_Poll_t

  CF Poll entry.
- typedef struct CF_TxS2_Data CF_TxS2_Data_t

  Data specific to a class 2 send file transaction.
- typedef struct CF_TxState_Data CF_TxState_Data_t

  Data specific to a send file transaction.
- typedef struct CF_RxS2_Data CF_RxS2_Data_t

  Data specific to a class 2 receive file transaction.
- typedef struct CF_RxState_Data CF_RxState_Data_t

  Data specific to a receive file transaction.
- typedef struct CF_Flags_Common CF_Flags_Common_t

  Data that applies to all types of transactions.
- typedef struct CF_Flags_Rx CF_Flags_Rx_t

  Flags that apply to receive transactions.
- typedef struct CF_Flags_Tx CF_Flags_Tx_t

  Flags that apply to send transactions.
- typedef union CF_StateFlags CF_StateFlags_t

  Summary of all possible transaction flags (tx and rx)
- typedef union CF_StateData CF_StateData_t

  Summary of all possible transaction state information (tx and rx)
- typedef struct CF_Transaction CF_Transaction_t

  Transaction state object.
- typedef struct CF_Channel CF_Channel_t

  Channel state object.
- typedef struct CF_Output CF_Output_t

  CF engine output state.
- typedef struct CF_Input CF_Input_t

  CF engine input state.
- typedef struct CF_Engine CF_Engine_t

  An engine represents a pairing to a local EID.

Enumerations

- enum CF_TxnState_t {
  CF_TxnState_IDLE = 0, CF_TxnState_R1 = 1, CF_TxnState_S1 = 2, CF_TxnState_R2 = 3,
  CF_TxnState_S2 = 4, CF_TxnState_DROP = 5, CF_TxnState_INVALID = 6 }

  High-level state of a transaction.
- enum CF_TxSubState_t {
  CF_TxSubState_METADATA = 0, CF_TxSubState_FILEDATA = 1, CF_TxSubState_EOF = 2, CF_TxSubState_WAIT_FOR_EOF_A
  = 3,
  CF_TxSubState_WAIT_FOR_FIN = 4, CF_TxSubState_SEND_FIN_ACK = 5, CF_TxSubState_NUM_STATES
  = 6 }

  Sub-state of a send file transaction.
- enum CF_RxSubState_t { CF_RxSubState_FILEDATA = 0, CF_RxSubState_EOF = 1, CF_RxSubState_WAIT_FOR_FIN_ACK
  = 2, CF_RxSubState_NUM_STATES = 3 }

  Sub-state of a receive file transaction.
- enum CF_Direction_t { CF_Direction_RX = 0, CF_Direction_TX = 1, CF_Direction_NUM = 2 }

Direction identifier.

- enum CF_TxnStatus_t { CF_TxnStatus_UNDEFINED = -1, CF_TxnStatus_NO_ERROR = CF_CFDP_ConditionCode_NO_ERROR, CF_TxnStatus_POS_ACK_LIMIT_REACHED = CF_CFDP_ConditionCode_POS_ACK_LIMIT_REACHED, CF_TxnStatus_KEEP_ALIVE_LIMIT_REACHED = CF_CFDP_ConditionCode_KEEP_ALIVE_LIMIT_REAC↩HED, CF_TxnStatus_INVALID_TRANSMISSION_MODE = CF_CFDP_ConditionCode_INVALID_TRANSMISSIO↩N_MODE, CF_TxnStatus_FILESTORE_REJECTION = CF_CFDP_ConditionCode_FILESTORE_REJECTI↩ON, CF_TxnStatus_FILE_CHECKSUM_FAILURE = CF_CFDP_ConditionCode_FILE_CHECKSUM_FAILURE, CF_TxnStatus_FILE_SIZE_ERROR = CF_CFDP_ConditionCode_FILE_SIZE_ERROR, CF_TxnStatus_NAK_LIMIT_REACHED = CF_CFDP_ConditionCode_NAK_LIMIT_REACHED, CF_TxnStatus_INACTIVITY_DETE = CF_CFDP_ConditionCode_INACTIVITY_DETECTED, CF_TxnStatus_INVALID_FILE_STRUCTURE = CF_↩CFDP_ConditionCode_INVALID_FILE_STRUCTURE, CF_TxnStatus_CHECK_LIMIT_REACHED = CF_CFD↩P_ConditionCode_CHECK_LIMIT_REACHED, CF_TxnStatus_UNSUPPORTED_CHECKSUM_TYPE = CF_CFDP_ConditionCode_UNSUPPORTED_CHEC↩KSUM_TYPE, CF_TxnStatus_SUSPEND_REQUEST_RECEIVED = CF_CFDP_ConditionCode_SUSPEND_↩REQUEST_RECEIVED, CF_TxnStatus_CANCEL_REQUEST_RECEIVED = CF_CFDP_ConditionCode_CAN↩CEL_REQUEST_RECEIVED, CF_TxnStatus_PROTOCOL_ERROR = 16, CF_TxnStatus_ACK_LIMIT_NO_FIN = 17, CF_TxnStatus_ACK_LIMIT_NO_EOF = 18, CF_TxnStatus_NAK_RESPONSE_ERROR = 19, CF_TxnStatus_SEND_EOF_FAILURE = 20, CF_TxnStatus_EARLY_FIN = 21, CF_TxnStatus_MAX = 22 }

  Values for Transaction Status code.

- enum CF_TickType_t { CF_TickType_RX, CF_TickType_TXW_NORM, CF_TickType_TXW_NAK, CF_TickType_NUM_TYPES }

  Identifies the type of timer tick being processed.

12.32.1 Detailed Description

Macros and data types used across the CF application

Note

Functions should not be declared in this file. This should be limited to shared macros and data types only. For unit testing, functions should be declared only in a header file with the same name as the C file that defines that function.

12.32.2 Macro Definition Documentation

12.32.2.1 CF_NUM_CHUNKS_ALL_CHANNELS `#define CF_NUM_CHUNKS_ALL_CHANNELS (CF_TOTAL_CHUNKS * CF_NUM_TRANSACTIONS_PER_CHANNEL)`

Maximum possible number of chunk entries that may exist in the CF application.
Definition at line 66 of file cf_cfdp_types.h.

12.32.2.2 CF_NUM_HISTORIES `#define CF_NUM_HISTORIES (CF_NUM_CHANNELS * CF_NUM_HISTORIES_PER_CHANNEL)`

Maximum possible number of history entries that may exist in the CF application.
Definition at line 61 of file cf_cfdp_types.h.

12.32.2.3 CF_NUM_TRANSACTIONS `#define CF_NUM_TRANSACTIONS (CF_NUM_CHANNELS * CF_NUM_TRANSACTIONS_PER_CHANNEL`

Maximum possible number of transactions that may exist in the CF application.
Definition at line 56 of file cf_cfdp_types.h.

12.32.2.4 CF_NUM_TRANSACTIONS_PER_CHANNEL `#define CF_NUM_TRANSACTIONS_PER_CHANNEL`

Value:

```
(CF_MAX_COMMANDED_PLAYBACK_FILES_PER_CHAN + CF_MAX_SIMULTANEOUS_RX +                \
 ((CF_MAX_POLLING_DIR_PER_CHAN + CF_MAX_COMMANDED_PLAYBACK_DIRECTORIES_PER_CHAN) * \
  CF_NUM_TRANSACTIONS_PER_PLAYBACK))
```

Maximum possible number of transactions that may exist on a single CF channel.
Definition at line 48 of file cf_cfdp_types.h.

12.32.3 Typedef Documentation

12.32.3.1 CF_Channel_t `typedef struct CF_Channel CF_Channel_t`

Channel state object.
This keeps the state of CF channels
Each CF channel has a separate transaction list, PDU throttle, playback, and poll state, as well as separate addresses on the underlying message transport (e.g. SB).

12.32.3.2 CF_ChunkWrapper_t `typedef struct CF_ChunkWrapper CF_ChunkWrapper_t`

Wrapper around a CF_ChunkList_t object.
This allows a CF_ChunkList_t to be stored within a CList data storage structure

12.32.3.3 CF_Engine_t `typedef struct CF_Engine CF_Engine_t`

An engine represents a pairing to a local EID.
Each engine can have at most CF_MAX_SIMULTANEOUS_TRANSACTIONS

12.32.3.4 CF_Flags_Common_t `typedef struct CF_Flags_Common CF_Flags_Common_t`

Data that applies to all types of transactions.

12.32.3.5 CF_Flags_Rx_t `typedef struct CF_Flags_Rx CF_Flags_Rx_t`

Flags that apply to receive transactions.

12.32.3.6 CF_Flags_Tx_t `typedef struct CF_Flags_Tx CF_Flags_Tx_t`

Flags that apply to send transactions.

12.32.3.7 CF_History_t `typedef struct CF_History CF_History_t`

CF History entry.
Records CF app operations for future reference

12.32.3.8 CF_Input_t `typedef struct CF_Input CF_Input_t`

CF engine input state.
Keeps the state of the current input PDU in the CF engine

12.32.3.9 CF_Output_t `typedef struct CF_Output CF_Output_t`

CF engine output state.
Keeps the state of the current output PDU in the CF engine

12.32.3.10 CF_Playback_t `typedef struct CF_Playback CF_Playback_t`

CF Playback entry.
Keeps the state of CF playback requests

12.32.3.11 CF_Poll_t `typedef struct CF_Poll CF_Poll_t`

CF Poll entry.
Keeps the state of CF directory polling

12.32.3.12 CF_RxS2_Data_t `typedef struct CF_RxS2_Data CF_RxS2_Data_t`

Data specific to a class 2 receive file transaction.

12.32.3.13 CF_RxState_Data_t `typedef struct CF_RxState_Data CF_RxState_Data_t`

Data specific to a receive file transaction.

12.32.3.14 CF_StateData_t `typedef union CF_StateData CF_StateData_t`

Summary of all possible transaction state information (tx and rx)

12.32.3.15 CF_StateFlags_t `typedef union CF_StateFlags CF_StateFlags_t`

Summary of all possible transaction flags (tx and rx)

12.32.3.16 CF_Transaction_t `typedef struct CF_Transaction CF_Transaction_t`

Transaction state object.
This keeps the state of CF file transactions

12.32.3.17 CF_TxS2_Data_t `typedef struct CF_TxS2_Data CF_TxS2_Data_t`

Data specific to a class 2 send file transaction.

12.32.3.18 CF_TxState_Data_t `typedef struct CF_TxState_Data CF_TxState_Data_t`

Data specific to a send file transaction.

12.32.4 Enumeration Type Documentation

12.32.4.1 CF_Direction_t `enum CF_Direction_t`

Direction identifier.
Differentiates between send and receive history entries

Enumerator

CF_Direction_RX	
CF_Direction_TX	
CF_Direction_NUM	

Definition at line 112 of file cf_cfdp_types.h.

12.32.4.2 CF_RxSubState_t `enum CF_RxSubState_t`

Sub-state of a receive file transaction.

Enumerator

CF_RxSubState_FILEDATA	
CF_RxSubState_EOF	
CF_RxSubState_WAIT_FOR_FIN_ACK	
CF_RxSubState_NUM_STATES	

Definition at line 99 of file cf_cfdp_types.h.

12.32.4.3 CF_TickType_t `enum CF_TickType_t`

Identifies the type of timer tick being processed.

Enumerator

CF_TickType_RX	
CF_TickType_TXW_NORM	
CF_TickType_TXW_NAK	
CF_TickType_NUM_TYPES	

Definition at line 375 of file cf_cfdp_types.h.

12.32.4.4 CF_TxnState_t `enum CF_TxnState_t`

High-level state of a transaction.

Enumerator

CF_TxnState_IDLE	State assigned to a newly allocated transaction object.
CF_TxnState_R1	Receive file as class 1.
CF_TxnState_S1	Send file as class 1.
CF_TxnState_R2	Receive file as class 2.
CF_TxnState_S2	Send file as class 2.
CF_TxnState_DROP	State where all PDUs are dropped.
CF_TxnState_INVALID	Marker value for the highest possible state number.

Definition at line 71 of file cf_cfdp_types.h.

12.32.4.5 CF_TxnStatus_t `enum CF_TxnStatus_t`

Values for Transaction Status code.

This enum defines the possible values representing the result of a transaction. This is a superset of the condition codes defined in CCSDS book 727 (condition codes) but with additional values for local conditions that the blue book does not have, such as protocol/state machine or decoding errors.

The values here are designed to not overlap with the condition codes defined in the blue book, but can be translated to one of those codes for the purposes of FIN/ACK/EOF PDUs.

Enumerator

CF_TxnStatus_UNDEFINED	The undefined status is a placeholder for new transactions before a value is set.

Enumerator

CF_TxnStatus_NO_ERROR	
CF_TxnStatus_POS_ACK_LIMIT_REACHED	
CF_TxnStatus_KEEP_ALIVE_LIMIT_REACHED	
CF_TxnStatus_INVALID_TRANSMISSION_MODE	
CF_TxnStatus_FILESTORE_REJECTION	
CF_TxnStatus_FILE_CHECKSUM_FAILURE	
CF_TxnStatus_FILE_SIZE_ERROR	
CF_TxnStatus_NAK_LIMIT_REACHED	
CF_TxnStatus_INACTIVITY_DETECTED	
CF_TxnStatus_INVALID_FILE_STRUCTURE	
CF_TxnStatus_CHECK_LIMIT_REACHED	
CF_TxnStatus_UNSUPPORTED_CHECKSUM_TYPE	
CF_TxnStatus_SUSPEND_REQUEST_RECEIVED	
CF_TxnStatus_CANCEL_REQUEST_RECEIVED	
CF_TxnStatus_PROTOCOL_ERROR	
CF_TxnStatus_ACK_LIMIT_NO_FIN	
CF_TxnStatus_ACK_LIMIT_NO_EOF	
CF_TxnStatus_NAK_RESPONSE_ERROR	
CF_TxnStatus_SEND_EOF_FAILURE	
CF_TxnStatus_EARLY_FIN	
CF_TxnStatus_MAX	

Definition at line 132 of file cf_cfdp_types.h.

12.32.4.6 CF_TxSubState_t `enum CF_TxSubState_t`

Sub-state of a send file transaction.

Enumerator

CF_TxSubState_METADATA	
CF_TxSubState_FILEDATA	
CF_TxSubState_EOF	
CF_TxSubState_WAIT_FOR_EOF_ACK	
CF_TxSubState_WAIT_FOR_FIN	
CF_TxSubState_SEND_FIN_ACK	
CF_TxSubState_NUM_STATES	

Definition at line 85 of file cf_cfdp_types.h.

12.33 apps/cf/fsw/src/cf_chunk.c File Reference

```
#include <string.h>
#include "cf_verify.h"
#include "cf_assert.h"
#include "cf_chunk.h"
```

Functions

- void CF_Chunks_EraseRange (CF_ChunkList_t *chunks, CF_ChunkIdx_t start, CF_ChunkIdx_t end)

  Erase a range of chunks.
- void CF_Chunks_EraseChunk (CF_ChunkList_t *chunks, CF_ChunkIdx_t erase_index)

  Erase a single chunk.
- void CF_Chunks_InsertChunk (CF_ChunkList_t *chunks, CF_ChunkIdx_t index_before, const CF_Chunk_t *chunk)

  Insert a chunk before index_before.
- CF_ChunkIdx_t CF_Chunks_FindInsertPosition (CF_ChunkList_t *chunks, const CF_Chunk_t *chunk)

  Finds where a chunk should be inserted in the chunks.
- int CF_Chunks_CombinePrevious (CF_ChunkList_t *chunks, CF_ChunkIdx_t i, const CF_Chunk_t *chunk)

  Possibly combines the given chunk with the previous chunk.
- CFE_Status_t CF_Chunks_CombineNext (CF_ChunkList_t *chunks, CF_ChunkIdx_t i, const CF_Chunk_t *chunk)

  Possibly combines the given chunk with the next chunk.
- CF_ChunkIdx_t CF_Chunks_FindSmallestSize (const CF_ChunkList_t *chunks)

  Finds the smallest size out of all chunks.
- void CF_Chunks_Insert (CF_ChunkList_t *chunks, CF_ChunkIdx_t i, const CF_Chunk_t *chunk)

  Insert a chunk.
- void CF_ChunkListAdd (CF_ChunkList_t *chunks, CF_ChunkOffset_t offset, CF_ChunkSize_t size)

  Public function to add a chunk.
- void CF_ChunkList_RemoveFromFirst (CF_ChunkList_t *chunks, CF_ChunkSize_t size)

  Public function to remove some amount of size from the first chunk.
- const CF_Chunk_t * CF_ChunkList_GetFirstChunk (const CF_ChunkList_t *chunks)

  Public function to get the entire first chunk from the list.
- void CF_ChunkListInit (CF_ChunkList_t *chunks, CF_ChunkIdx_t max_chunks, CF_Chunk_t *chunks_mem)

  Initialize a CF_ChunkList_t structure.
- void CF_ChunkListReset (CF_ChunkList_t *chunks)

  Resets a chunks structure.
- uint32 CF_ChunkList_ComputeGaps (const CF_ChunkList_t *chunks, CF_ChunkIdx_t max_gaps, CF_ChunkSize_t total, CF_ChunkOffset_t start, CF_ChunkList_ComputeGapFn_t compute_gap_fn, void *opaque)

  Compute gaps between chunks, and call a callback for each.

12.33.1 Detailed Description

The CF Application chunks (sparse gap tracking) logic file
This class handles the complexity of sparse gap tracking so that the CFDP engine doesn't need to worry about it. Information is given to the class and when needed calculations are made internally to help the engine build NAK packets. Received NAK segment requests are stored in this class as well and used for re-transmit processing.
This is intended to be mostly a generic purpose class used by CF.

12.33.2 Function Documentation

12.33.2.1 CF_ChunkList_ComputeGaps()

```
uint32 CF_ChunkList_ComputeGaps (
    const CF_ChunkList_t * chunks,
    CF_ChunkIdx_t max_gaps,
    CF_ChunkSize_t total,
    CF_ChunkOffset_t start,
    CF_ChunkList_ComputeGapFn_t compute_gap_fn,
    void * opaque )
```

Compute gaps between chunks, and call a callback for each.

Description

This function walks over all chunks and computes the gaps between. It can exit early if the calculated gap start is larger than the desired total.

Assumptions, External Events, and Notes:

chunks must not be NULL. compute_gap_fn is a valid function address.

Parameters

chunks	Pointer to CF_ChunkList_t object
max_gaps	Maximum number of gaps to compute
total	Size of the entire file
start	Beginning offset for gap computation
compute_gap↩_fn	Callback function to be invoked for each gap
opaque	Opaque pointer to pass through to callback function

Returns

The number of computed gaps.

Definition at line 362 of file cf_chunk.c.
References CF_Assert, CF_ChunkList::chunks, CF_ChunkList::count, CF_Chunk::offset, and CF_Chunk::size.
Referenced by CF_CFDP_R2_Complete(), and CF_CFDP_R_SubstateSendNak().

12.33.2.2 CF_ChunkList_GetFirstChunk()

```
const CF_Chunk_t* CF_ChunkList_GetFirstChunk (
    const CF_ChunkList_t * chunks )
```

Public function to get the entire first chunk from the list.
This returns the first chunk from the list, or NULL if the list is empty.

Note

The chunk remains on the list - this call does not consume or remove the chunk from the list.

Assumptions, External Events, and Notes:

chunks must not be NULL.

Returns

Pointer to first chunk from the CF_ChunkList_t object

Return values

NULL	if the list was empty

Definition at line 325 of file cf_chunk.c.
References CF_ChunkList::chunks, and CF_ChunkList::count.
Referenced by CF_CFDP_S_CheckAndRespondNak().

12.33.2.3 CF_ChunkList_RemoveFromFirst()

```
void CF_ChunkList_RemoveFromFirst (
    CF_ChunkList_t * chunks,
    CF_ChunkSize_t size )
```

Public function to remove some amount of size from the first chunk.

Description

This may remove the chunk entirely. This function is to satisfy the use-case where data is retrieved from the structure in-order and once consumed should be removed.

Assumptions, External Events, and Notes:

chunks must not be NULL and list must not be empty

Note

Good computer science would have a generic remove function, but that's much more complex than we need for the use case. We aren't trying to make chunks a general purpose reusable module, so just take the simple case that we need.

Parameters

chunks	Pointer to CF_ChunkList_t object
size	Size to remove

Definition at line 299 of file cf_chunk.c.
References CF_Chunks_EraseChunk(), CF_ChunkList::chunks, CF_Chunk::offset, and CF_Chunk::size.
Referenced by CF_CFDP_S_CheckAndRespondNak().
Here is the call graph for this function:

12.33.2.4 CF_ChunkListAdd()

```
void CF_ChunkListAdd (
    CF_ChunkList_t * chunks,
    CF_ChunkOffset_t offset,
    CF_ChunkSize_t size )
```

Public function to add a chunk.

Assumptions, External Events, and Notes:

chunks must not be NULL.

Parameters

chunks	Pointer to CF_ChunkList_t object
offset	Offset of chunk to add
size	Size of chunk to add

Definition at line 280 of file cf_chunk.c.
References CF_Assert, CF_Chunks_FindInsertPosition(), and CF_Chunks_Insert().
Referenced by CF_CFDP_R2_SubstateRecvFileData(), and CF_CFDP_S2_Nak().
Here is the call graph for this function:

12.33.2.5 CF_ChunkListInit()

```
void CF_ChunkListInit (
    CF_ChunkList_t * chunks,
    CF_ChunkIdx_t max_chunks,
    CF_Chunk_t * chunks_mem )
```

Initialize a CF_ChunkList_t structure.

Assumptions, External Events, and Notes:

chunks must not be NULL. chunks_mem must not be NULL.

Parameters

chunks	Pointer to CF_ChunkList_t object to initialize
max_chunks	Maximum number of entries in the chunks_mem array
chunks_mem	Array of CF_Chunk_t objects with length of max_chunks

Definition at line 336 of file cf_chunk.c.
References CF_Assert, CF_ChunkListReset(), CF_ChunkList::chunks, and CF_ChunkList::max_chunks.
Referenced by CF_CFDP_InitEngine().

Here is the call graph for this function:

12.33.2.6 CF_ChunkListReset()

```
void CF_ChunkListReset (
    CF_ChunkList_t * chunks )
```

Resets a chunks structure.

All chunks are removed from the list, but the max_chunks and chunk memory pointers are retained. This returns the chunk list to the same state as it was after the initial call to CF_ChunkListInit().

Assumptions, External Events, and Notes:

chunks must not be NULL.

Parameters

chunks	Pointer to CF_ChunkList_t object

Definition at line 350 of file cf_chunk.c.

References CF_ChunkList::chunks, CF_ChunkList::count, and CF_ChunkList::max_chunks.

Referenced by CF_ChunkListInit().

12.33.2.7 CF_Chunks_CombineNext()

```
CFE_Status_t CF_Chunks_CombineNext (
    CF_ChunkList_t * chunks,
    CF_ChunkIdx_t i,
    const CF_Chunk_t * chunk )
```

Possibly combines the given chunk with the next chunk.

Assumptions, External Events, and Notes:

chunks must not be NULL, chunk must not be NULL.

Parameters

chunks	Pointer to CF_ChunkList_t object
i	Index of chunk to combine
chunk	Chunk data to combine

Returns

boolean code indicating if chunks were combined

Return values

1	if combined with another chunk
0	if not combined

Definition at line 170 of file cf_chunk.c.
References CF_Assert, CF_Chunk_MAX(), CF_Chunks_EraseRange(), CF_ChunkList::chunks, CF_ChunkList::count, CF_Chunk::offset, and CF_Chunk::size.
Referenced by CF_Chunks_Insert().
Here is the call graph for this function:

12.33.2.8 CF_Chunks_CombinePrevious()

```
int CF_Chunks_CombinePrevious (
    CF_ChunkList_t * chunks,
    CF_ChunkIdx_t i,
    const CF_Chunk_t * chunk )
```

Possibly combines the given chunk with the previous chunk.

Assumptions, External Events, and Notes:

chunks must not be NULL, chunk must not be NULL.

Parameters

chunks	Pointer to CF_ChunkList_t object
i	Index of chunk to combine
chunk	Chunk data to combine

Returns

boolean code indicating if chunks were combined

Return values

1	if combined with another chunk
0	if not combined

Definition at line 133 of file cf_chunk.c.
References CF_Assert, CF_ChunkList::chunks, CF_Chunk::offset, and CF_Chunk::size.
Referenced by CF_Chunks_Insert().

12.33.2.9 CF_Chunks_EraseChunk()

```
void CF_Chunks_EraseChunk (
    CF_ChunkList_t * chunks,
    CF_ChunkIdx_t erase_index )
```

Erase a single chunk.

Note

This changes the chunk IDs of all chunks that follow Items in the list after the erase_index will be shifted/moved to close the gap.

Assumptions, External Events, and Notes:

chunks must not be NULL.

Parameters

chunks	Pointer to CF_ChunkList_t object
erase_index	chunk ID to erase

Definition at line 63 of file cf_chunk.c.
References CF_Assert, CF_ChunkList::chunks, and CF_ChunkList::count.
Referenced by CF_ChunkList_RemoveFromFirst(), and CF_Chunks_Insert().

12.33.2.10 CF_Chunks_EraseRange()

```
void CF_Chunks_EraseRange (
    CF_ChunkList_t * chunks,
    CF_ChunkIdx_t start,
    CF_ChunkIdx_t end )
```

Erase a range of chunks.
Items in the list starting at the end index will be shifted/moved to close the gap. If end <= start nothing will be done (OK to pass matching start/end as a no-op) If end == list size, list from start on will be erased (nothing moved)
Example: list = {a, b, c, d, e} EraseRange index start 1, end 3 list = {a, d, e}

Assumptions, External Events, and Notes:

chunks must not be NULL.

Parameters

chunks	Pointer to CF_ChunkList_t object
start	Starting chunk ID to erase (inclusive)
end	Ending chunk ID (exclusive, this chunk will not be erased)

Definition at line 45 of file cf_chunk.c.
References CF_Assert, CF_ChunkList::chunks, and CF_ChunkList::count.
Referenced by CF_Chunks_CombineNext().

12.33.2.11 CF_Chunks_FindInsertPosition()

```
CF_ChunkIdx_t CF_Chunks_FindInsertPosition (
    CF_ChunkList_t * chunks,
    const CF_Chunk_t * chunk )
```

Finds where a chunk should be inserted in the chunks.

Description

This is a C version of std::lower_bound from C++ algorithms.

Assumptions, External Events, and Notes:

chunks must not be NULL, chunk must not be NULL.

Parameters

chunks	Pointer to CF_ChunkList_t object
chunk	Chunk data to insert

Returns

an index to the first chunk that is greater than or equal to the requested's offset.

Definition at line 101 of file cf_chunk.c.
References CF_ChunkList::chunks, CF_ChunkList::count, and CF_Chunk::offset.
Referenced by CF_ChunkListAdd(), and CF_Chunks_Insert().

12.33.2.12 CF_Chunks_FindSmallestSize()

```
CF_ChunkIdx_t CF_Chunks_FindSmallestSize (
    const CF_ChunkList_t * chunks )
```

Finds the smallest size out of all chunks.

Assumptions, External Events, and Notes:

chunks must not be NULL.

Parameters

chunks	Pointer to CF_ChunkList_t object

Returns

The chunk index with the smallest size.

Return values

0	if the chunk list is empty

Definition at line 214 of file cf_chunk.c.
References CF_ChunkList::chunks, CF_ChunkList::count, and CF_Chunk::size.
Referenced by CF_Chunks_Insert().

12.33.2.13 CF_Chunks_Insert()

```
void CF_Chunks_Insert (
    CF_ChunkList_t * chunks,
    CF_ChunkIdx_t i,
    const CF_Chunk_t * chunk )
```

Insert a chunk.

Description

Inserts the chunk at the specified location. May combine with an existing chunk if contiguous.

Assumptions, External Events, and Notes:

chunks must not be NULL, chunk must not be NULL.

Parameters

chunks	Pointer to CF_ChunkList_t object
i	Position to insert chunk at
chunk	Chunk data to insert

Definition at line 236 of file cf_chunk.c.
References CF_Chunks_CombineNext(), CF_Chunks_CombinePrevious(), CF_Chunks_EraseChunk(), CF_Chunks↩_FindInsertPosition(), CF_Chunks_FindSmallestSize(), CF_Chunks_InsertChunk(), CF_ChunkList::chunks, CF_↩ChunkList::count, CF_ChunkList::max_chunks, and CF_Chunk::size.
Referenced by CF_ChunkListAdd().
Here is the call graph for this function:

12.33.2.14 CF_Chunks_InsertChunk()

```
void CF_Chunks_InsertChunk (
    CF_ChunkList_t * chunks,
    CF_ChunkIdx_t index_before,
    const CF_Chunk_t * chunk )
```

Insert a chunk before index_before.

Note

This changes the chunk IDs of all chunks that follow Items in the list after the index_before will be shifted/moved to open a gap.

Assumptions, External Events, and Notes:

chunks must not be NULL, chunk must not be NULL.

Parameters

chunks	Pointer to CF_ChunkList_t object
index_before	position to insert at - this becomes the ID of the inserted chunk
chunk	Chunk data to insert (copied)

Definition at line 80 of file cf_chunk.c.
References CF_Assert, CF_ChunkList::chunks, CF_ChunkList::count, and CF_ChunkList::max_chunks.
Referenced by CF_Chunks_Insert().

12.34 apps/cf/fsw/src/cf_chunk.h File Reference

```
#include "cfe.h"
```

Data Structures

- struct CF_Chunk

  Pairs an offset with a size to identify a specific piece of a file.
- struct CF_ChunkList

  A list of CF_Chunk_t pairs.

Typedefs

- typedef uint32 CF_ChunkIdx_t
- typedef uint32 CF_ChunkOffset_t
- typedef uint32 CF_ChunkSize_t
- typedef struct CF_Chunk CF_Chunk_t

  Pairs an offset with a size to identify a specific piece of a file.
- typedef struct CF_ChunkList CF_ChunkList_t

  A list of CF_Chunk_t pairs.
- typedef void(∗ CF_ChunkList_ComputeGapFn_t) (const CF_ChunkList_t ∗cs, const CF_Chunk_t ∗chunk, void ∗opaque)

  Function for use with CF_ChunkList_ComputeGaps()

Functions

- static CF_ChunkOffset_t CF_Chunk_MAX (CF_ChunkOffset_t a, CF_ChunkOffset_t b)

  Selects the larger of the two passed-in offsets.
- void CF_ChunkListInit (CF_ChunkList_t ∗chunks, CF_ChunkIdx_t max_chunks, CF_Chunk_t ∗chunks_mem)

  Initialize a CF_ChunkList_t structure.
- void CF_ChunkListAdd (CF_ChunkList_t ∗chunks, CF_ChunkOffset_t offset, CF_ChunkSize_t size)

Public function to add a chunk.

- void CF_ChunkListReset (CF_ChunkList_t *chunks)

  Resets a chunks structure.
- void CF_ChunkList_RemoveFromFirst (CF_ChunkList_t *chunks, CF_ChunkSize_t size)

  Public function to remove some amount of size from the first chunk.
- const CF_Chunk_t * CF_ChunkList_GetFirstChunk (const CF_ChunkList_t *chunks)

  Public function to get the entire first chunk from the list.
- uint32 CF_ChunkList_ComputeGaps (const CF_ChunkList_t *chunks, CF_ChunkIdx_t max_gaps, CF_ChunkSize_t total, CF_ChunkOffset_t start, CF_ChunkList_ComputeGapFn_t compute_gap_fn, void *opaque)

  Compute gaps between chunks, and call a callback for each.
- void CF_Chunks_EraseRange (CF_ChunkList_t *chunks, CF_ChunkIdx_t start, CF_ChunkIdx_t end)

  Erase a range of chunks.
- void CF_Chunks_EraseChunk (CF_ChunkList_t *chunks, CF_ChunkIdx_t erase_index)

  Erase a single chunk.
- void CF_Chunks_InsertChunk (CF_ChunkList_t *chunks, CF_ChunkIdx_t index_before, const CF_Chunk_t *chunk)

  Insert a chunk before index_before.
- CF_ChunkIdx_t CF_Chunks_FindInsertPosition (CF_ChunkList_t *chunks, const CF_Chunk_t *chunk)

  Finds where a chunk should be inserted in the chunks.
- int CF_Chunks_CombinePrevious (CF_ChunkList_t *chunks, CF_ChunkIdx_t i, const CF_Chunk_t *chunk)

  Possibly combines the given chunk with the previous chunk.
- CFE_Status_t CF_Chunks_CombineNext (CF_ChunkList_t *chunks, CF_ChunkIdx_t i, const CF_Chunk_t *chunk)

  Possibly combines the given chunk with the next chunk.
- CF_ChunkIdx_t CF_Chunks_FindSmallestSize (const CF_ChunkList_t *chunks)

  Finds the smallest size out of all chunks.
- void CF_Chunks_Insert (CF_ChunkList_t *chunks, CF_ChunkIdx_t i, const CF_Chunk_t *chunk)

  Insert a chunk.

12.34.1 Detailed Description

The CF Application chunks (spare gap tracking) header file

12.34.2 Typedef Documentation

12.34.2.1 CF_Chunk_t `typedef struct CF_Chunk CF_Chunk_t`

Pairs an offset with a size to identify a specific piece of a file.

12.34.2.2 CF_ChunkIdx_t `typedef uint32 CF_ChunkIdx_t`

Definition at line 31 of file cf_chunk.h.

12.34.2.3 CF_ChunkList_ComputeGapFn_t `typedef void(* CF_ChunkList_ComputeGapFn_t) (const CF_ChunkList_t *cs, const CF_Chunk_t *chunk, void *opaque)`

Function for use with CF_ChunkList_ComputeGaps()

Parameters

cs	Pointer to the CF_ChunkList_t object
chunk	Pointer to the chunk being currently processed
opaque	Opaque pointer passed through from initial call

Definition at line 63 of file cf_chunk.h.

12.34.2.4 CF_ChunkList_t `typedef struct CF_ChunkList CF_ChunkList_t`

A list of CF_Chunk_t pairs.
This list is ordered by chunk offset, from lowest to highest

12.34.2.5 CF_ChunkOffset_t `typedef uint32 CF_ChunkOffset_t`

Definition at line 32 of file cf_chunk.h.

12.34.2.6 CF_ChunkSize_t `typedef uint32 CF_ChunkSize_t`

Definition at line 33 of file cf_chunk.h.

12.34.3 Function Documentation

12.34.3.1 CF_Chunk_MAX()

```
static CF_ChunkOffset_t CF_Chunk_MAX (
    CF_ChunkOffset_t a,
    CF_ChunkOffset_t b ) [inline], [static]
```

Selects the larger of the two passed-in offsets.

Parameters

a	First chunk offset
b	Second chunk offset

Returns

the larger CF_ChunkOffset_t value

Definition at line 72 of file cf_chunk.h.
Referenced by CF_Chunks_CombineNext().

12.34.3.2 CF_ChunkList_ComputeGaps()

```
uint32 CF_ChunkList_ComputeGaps (
    const CF_ChunkList_t * chunks,
    CF_ChunkIdx_t max_gaps,
    CF_ChunkSize_t total,
    CF_ChunkOffset_t start,
    CF_ChunkList_ComputeGapFn_t compute_gap_fn,
    void * opaque )
```

Compute gaps between chunks, and call a callback for each.

Description

This function walks over all chunks and computes the gaps between. It can exit early if the calculated gap start is larger than the desired total.

Assumptions, External Events, and Notes:

chunks must not be NULL. compute_gap_fn is a valid function address.

Parameters

chunks	Pointer to CF_ChunkList_t object
max_gaps	Maximum number of gaps to compute
total	Size of the entire file
start	Beginning offset for gap computation
compute_gap↩_fn	Callback function to be invoked for each gap
opaque	Opaque pointer to pass through to callback function

Returns

The number of computed gaps.

Definition at line 362 of file cf_chunk.c.
References CF_Assert, CF_ChunkList::chunks, CF_ChunkList::count, CF_Chunk::offset, and CF_Chunk::size.
Referenced by CF_CFDP_R2_Complete(), and CF_CFDP_R_SubstateSendNak().

12.34.3.3 CF_ChunkList_GetFirstChunk()

```
const CF_Chunk_t* CF_ChunkList_GetFirstChunk (
    const CF_ChunkList_t * chunks )
```

Public function to get the entire first chunk from the list.
This returns the first chunk from the list, or NULL if the list is empty.

Note

The chunk remains on the list - this call does not consume or remove the chunk from the list.

Assumptions, External Events, and Notes:

chunks must not be NULL.

Returns

Pointer to first chunk from the CF_ChunkList_t object

Return values

NULL	if the list was empty

Definition at line 325 of file cf_chunk.c.
References CF_ChunkList::chunks, and CF_ChunkList::count.
Referenced by CF_CFDP_S_CheckAndRespondNak().

12.34.3.4 CF_ChunkList_RemoveFromFirst()

```
void CF_ChunkList_RemoveFromFirst (
    CF_ChunkList_t * chunks,
    CF_ChunkSize_t size )
```

Public function to remove some amount of size from the first chunk.

Description

This may remove the chunk entirely. This function is to satisfy the use-case where data is retrieved from the structure in-order and once consumed should be removed.

Assumptions, External Events, and Notes:

chunks must not be NULL and list must not be empty

Note

Good computer science would have a generic remove function, but that's much more complex than we need for the use case. We aren't trying to make chunks a general purpose reusable module, so just take the simple case that we need.

Parameters

chunks	Pointer to CF_ChunkList_t object
size	Size to remove

Definition at line 299 of file cf_chunk.c.
References CF_Chunks_EraseChunk(), CF_ChunkList::chunks, CF_Chunk::offset, and CF_Chunk::size.
Referenced by CF_CFDP_S_CheckAndRespondNak().
Here is the call graph for this function:

12.34.3.5 CF_ChunkListAdd()

```
void CF_ChunkListAdd (
    CF_ChunkList_t * chunks,
    CF_ChunkOffset_t offset,
    CF_ChunkSize_t size )
```

Public function to add a chunk.

Assumptions, External Events, and Notes:

chunks must not be NULL.

Parameters

chunks	Pointer to CF_ChunkList_t object
offset	Offset of chunk to add
size	Size of chunk to add

Definition at line 280 of file cf_chunk.c.
References CF_Assert, CF_Chunks_FindInsertPosition(), and CF_Chunks_Insert().
Referenced by CF_CFDP_R2_SubstateRecvFileData(), and CF_CFDP_S2_Nak().
Here is the call graph for this function:

12.34.3.6 CF_ChunkListInit()

```
void CF_ChunkListInit (
    CF_ChunkList_t * chunks,
    CF_ChunkIdx_t max_chunks,
    CF_Chunk_t * chunks_mem )
```

Initialize a CF_ChunkList_t structure.

Assumptions, External Events, and Notes:

chunks must not be NULL. chunks_mem must not be NULL.

Parameters

chunks	Pointer to CF_ChunkList_t object to initialize
max_chunks	Maximum number of entries in the chunks_mem array
chunks_mem	Array of CF_Chunk_t objects with length of max_chunks

Definition at line 336 of file cf_chunk.c.
References CF_Assert, CF_ChunkListReset(), CF_ChunkList::chunks, and CF_ChunkList::max_chunks.
Referenced by CF_CFDP_InitEngine().
Here is the call graph for this function:

12.34.3.7 CF_ChunkListReset()

```
void CF_ChunkListReset (
    CF_ChunkList_t * chunks )
```

Resets a chunks structure.

All chunks are removed from the list, but the max_chunks and chunk memory pointers are retained. This returns the chunk list to the same state as it was after the initial call to CF_ChunkListInit().

Assumptions, External Events, and Notes:

chunks must not be NULL.

Parameters

chunks	Pointer to CF_ChunkList_t object

Definition at line 350 of file cf_chunk.c.
References CF_ChunkList::chunks, CF_ChunkList::count, and CF_ChunkList::max_chunks.
Referenced by CF_ChunkListInit().

12.34.3.8 CF_Chunks_CombineNext()

```
CFE_Status_t CF_Chunks_CombineNext (
    CF_ChunkList_t * chunks,
    CF_ChunkIdx_t i,
    const CF_Chunk_t * chunk )
```

Possibly combines the given chunk with the next chunk.

Assumptions, External Events, and Notes:

chunks must not be NULL, chunk must not be NULL.

Parameters

chunks	Pointer to CF_ChunkList_t object
i	Index of chunk to combine
chunk	Chunk data to combine

Returns

boolean code indicating if chunks were combined

Return values

1	if combined with another chunk
0	if not combined

Definition at line 170 of file cf_chunk.c.
References CF_Assert, CF_Chunk_MAX(), CF_Chunks_EraseRange(), CF_ChunkList::chunks, CF_ChunkList::count, CF_Chunk::offset, and CF_Chunk::size.
Referenced by CF_Chunks_Insert().

Here is the call graph for this function:

12.34.3.9 CF_Chunks_CombinePrevious()

```
int CF_Chunks_CombinePrevious (
    CF_ChunkList_t * chunks,
    CF_ChunkIdx_t i,
    const CF_Chunk_t * chunk )
```

Possibly combines the given chunk with the previous chunk.

Assumptions, External Events, and Notes:

chunks must not be NULL, chunk must not be NULL.

Parameters

chunks	Pointer to CF_ChunkList_t object
i	Index of chunk to combine
chunk	Chunk data to combine

Returns

boolean code indicating if chunks were combined

Return values

1	if combined with another chunk
0	if not combined

Definition at line 133 of file cf_chunk.c.
References CF_Assert, CF_ChunkList::chunks, CF_Chunk::offset, and CF_Chunk::size.
Referenced by CF_Chunks_Insert().

12.34.3.10 CF_Chunks_EraseChunk()

```
void CF_Chunks_EraseChunk (
    CF_ChunkList_t * chunks,
    CF_ChunkIdx_t erase_index )
```

Erase a single chunk.

Note

This changes the chunk IDs of all chunks that follow Items in the list after the erase_index will be shifted/moved to close the gap.

Assumptions, External Events, and Notes:

chunks must not be NULL.

Parameters

chunks	Pointer to CF_ChunkList_t object
erase_index	chunk ID to erase

Definition at line 63 of file cf_chunk.c.
References CF_Assert, CF_ChunkList::chunks, and CF_ChunkList::count.
Referenced by CF_ChunkList_RemoveFromFirst(), and CF_Chunks_Insert().

12.34.3.11 CF_Chunks_EraseRange()

```
void CF_Chunks_EraseRange (
    CF_ChunkList_t * chunks,
    CF_ChunkIdx_t start,
    CF_ChunkIdx_t end )
```

Erase a range of chunks.
Items in the list starting at the end index will be shifted/moved to close the gap. If end <= start nothing will be done (OK to pass matching start/end as a no-op) If end == list size, list from start on will be erased (nothing moved)
Example: list = {a, b, c, d, e} EraseRange index start 1, end 3 list = {a, d, e}

Assumptions, External Events, and Notes:

chunks must not be NULL.

Parameters

chunks	Pointer to CF_ChunkList_t object
start	Starting chunk ID to erase (inclusive)
end	Ending chunk ID (exclusive, this chunk will not be erased)

Definition at line 45 of file cf_chunk.c.
References CF_Assert, CF_ChunkList::chunks, and CF_ChunkList::count.
Referenced by CF_Chunks_CombineNext().

12.34.3.12 CF_Chunks_FindInsertPosition()

```
CF_ChunkIdx_t CF_Chunks_FindInsertPosition (
    CF_ChunkList_t * chunks,
    const CF_Chunk_t * chunk )
```

Finds where a chunk should be inserted in the chunks.

Description

This is a C version of std::lower_bound from C++ algorithms.

Assumptions, External Events, and Notes:

chunks must not be NULL, chunk must not be NULL.

Parameters

chunks	Pointer to CF_ChunkList_t object
chunk	Chunk data to insert

Returns

an index to the first chunk that is greater than or equal to the requested's offset.

Definition at line 101 of file cf_chunk.c.
References CF_ChunkList::chunks, CF_ChunkList::count, and CF_Chunk::offset.
Referenced by CF_ChunkListAdd(), and CF_Chunks_Insert().

12.34.3.13 CF_Chunks_FindSmallestSize()

```
CF_ChunkIdx_t CF_Chunks_FindSmallestSize (
    const CF_ChunkList_t * chunks )
```

Finds the smallest size out of all chunks.

Assumptions, External Events, and Notes:

chunks must not be NULL.

Parameters

chunks	Pointer to CF_ChunkList_t object

Returns

The chunk index with the smallest size.

Return values

0	if the chunk list is empty

Definition at line 214 of file cf_chunk.c.
References CF_ChunkList::chunks, CF_ChunkList::count, and CF_Chunk::size.
Referenced by CF_Chunks_Insert().

12.34.3.14 CF_Chunks_Insert()

```
void CF_Chunks_Insert (
    CF_ChunkList_t * chunks,
    CF_ChunkIdx_t i,
    const CF_Chunk_t * chunk )
```

Insert a chunk.

Description

Inserts the chunk at the specified location. May combine with an existing chunk if contiguous.

Assumptions, External Events, and Notes:

chunks must not be NULL, chunk must not be NULL.

Parameters

chunks	Pointer to CF_ChunkList_t object
i	Position to insert chunk at
chunk	Chunk data to insert

Definition at line 236 of file cf_chunk.c.
References CF_Chunks_CombineNext(), CF_Chunks_CombinePrevious(), CF_Chunks_EraseChunk(), CF_Chunks↩_FindInsertPosition(), CF_Chunks_FindSmallestSize(), CF_Chunks_InsertChunk(), CF_ChunkList::chunks, CF_↩ChunkList::count, CF_ChunkList::max_chunks, and CF_Chunk::size.
Referenced by CF_ChunkListAdd().
Here is the call graph for this function:

12.34.3.15 CF_Chunks_InsertChunk()

```
void CF_Chunks_InsertChunk (
    CF_ChunkList_t * chunks,
    CF_ChunkIdx_t index_before,
    const CF_Chunk_t * chunk )
```

Insert a chunk before index_before.

Note

This changes the chunk IDs of all chunks that follow Items in the list after the index_before will be shifted/moved to open a gap.

Assumptions, External Events, and Notes:

chunks must not be NULL, chunk must not be NULL.

Parameters

chunks	Pointer to CF_ChunkList_t object
index_before	position to insert at - this becomes the ID of the inserted chunk
chunk	Chunk data to insert (copied)

Definition at line 80 of file cf_chunk.c.
References CF_Assert, CF_ChunkList::chunks, CF_ChunkList::count, and CF_ChunkList::max_chunks.
Referenced by CF_Chunks_Insert().

12.35 apps/cf/fsw/src/cf_clist.c File Reference

```
#include "cf_verify.h"
#include "cf_clist.h"
#include "cf_assert.h"
```

Functions

- void CF_CList_InitNode (CF_CListNode_t ∗node)

  Initialize a clist node.
- void CF_CList_InsertFront (CF_CListNode_t ∗∗head, CF_CListNode_t ∗node)

  Insert the given node into the front of a list.
- void CF_CList_InsertBack (CF_CListNode_t ∗∗head, CF_CListNode_t ∗node)

  Insert the given node into the back of a list.
- CF_CListNode_t ∗ CF_CList_Pop (CF_CListNode_t ∗∗head)

  Remove the first node from a list and return it.
- void CF_CList_Remove (CF_CListNode_t ∗∗head, CF_CListNode_t ∗node)

  Remove the given node from the list.
- void CF_CList_InsertAfter (CF_CListNode_t ∗∗head, CF_CListNode_t ∗start, CF_CListNode_t ∗after)

  Insert the given node into the last after the given start node.
- void CF_CList_Traverse (CF_CListNode_t ∗start, CF_CListFn_t fn, void ∗context)

  Traverse the entire list, calling the given function on all nodes.
- void CF_CList_Traverse_R (CF_CListNode_t ∗end, CF_CListFn_t fn, void ∗context)

  Reverse list traversal, starting from end, calling given function on all nodes.

12.35.1 Detailed Description

The CF Application circular list definition source file
This is a circular doubly-linked list implementation. It is used for all data structures in CF.
This file is intended to be a generic class that can be used in other apps.

12.35.2 Function Documentation

12.35.2.1 CF_CList_InitNode() `void CF_CList_InitNode ( CF_CListNode_t * node )`

Initialize a clist node.

Assumptions, External Events, and Notes:

node must not be NULL.

Parameters

node	Pointer to node structure to be initialized

Definition at line 41 of file cf_clist.c.
References CF_CListNode::next, and CF_CListNode::prev.
Referenced by CF_CFDP_InitEngine(), CF_CList_Remove(), and CF_FreeTransaction().

12.35.2.2 CF_CList_InsertAfter()

```
void CF_CList_InsertAfter (
    CF_CListNode_t ** head,
    CF_CListNode_t * start,
    CF_CListNode_t * after )
```

Insert the given node into the last after the given start node.

Assumptions, External Events, and Notes:

head must not be NULL, node must not be NULL.

Parameters

head	Pointer to head of list to remove from
start	Pointer to node to insert
after	Pointer to position to insert after

Definition at line 168 of file cf_clist.c.
References CF_Assert, CF_CListNode::next, and CF_CListNode::prev.
Referenced by CF_CList_InsertAfter_Ex().

12.35.2.3 CF_CList_InsertBack()

```
void CF_CList_InsertBack (
    CF_CListNode_t ** head,
    CF_CListNode_t * node )
```

Insert the given node into the back of a list.

Assumptions, External Events, and Notes:

head must not be NULL, node must not be NULL.

Parameters

head	Pointer to head of list to insert into
node	Pointer to node to insert

Definition at line 82 of file cf_clist.c.
References CF_Assert, CF_CListNode::next, and CF_CListNode::prev.
Referenced by CF_CFDP_InitEngine(), CF_CFDP_ResetTransaction(), CF_CList_InsertBack_Ex(), and CF_Move↩Transaction().

12.35.2.4 CF_CList_InsertFront()

```
void CF_CList_InsertFront (
    CF_CListNode_t ** head,
```

```
CF_CListNode_t * node )
```

Insert the given node into the front of a list.

Assumptions, External Events, and Notes:

head must not be NULL, node must not be NULL.

Parameters

head	Pointer to head of list to insert into
node	Pointer to node to insert

Definition at line 53 of file cf_clist.c.
References CF_Assert, CF_CListNode::next, and CF_CListNode::prev.

12.35.2.5 CF_CList_Pop()

```
CF_CListNode_t* CF_CList_Pop (
    CF_CListNode_t ** head )
```

Remove the first node from a list and return it.

Assumptions, External Events, and Notes:

head must not be NULL.

Parameters

head	Pointer to head of list to remove from

Returns

The first node (now removed) in the list

Return values

NULL	if list was empty.

Definition at line 112 of file cf_clist.c.
References CF_Assert, and CF_CList_Remove().
Referenced by CF_CFDP_FindUnusedChunks().
Here is the call graph for this function:

12.35.2.6 CF_CList_Remove()

```
void CF_CList_Remove (
```

```
CF_CListNode_t ** head,
CF_CListNode_t * node )
```

Remove the given node from the list.

Assumptions, External Events, and Notes:

head must not be NULL, node must not be NULL.

Parameters

head	Pointer to head of list to remove from
node	Pointer to node to remove

Definition at line 133 of file cf_clist.c.
References CF_Assert, CF_CList_InitNode(), CF_CListNode::next, and CF_CListNode::prev.
Referenced by CF_CList_Pop(), CF_CList_Remove_Ex(), CF_DequeueTransaction(), and CF_MoveTransaction().
Here is the call graph for this function:

12.35.2.7 CF_CList_Traverse()

```
void CF_CList_Traverse (
CF_CListNode_t * start,
CF_CListFn_t fn,
void * context )
```

Traverse the entire list, calling the given function on all nodes.

Assumptions, External Events, and Notes:

start may be NULL, fn must be a valid function, context may be NULL.

Note

on traversal it's ok to delete the current node, but do not delete other nodes in the same list!!

Parameters

start	List to traverse (first node)
fn	Callback function to invoke for each node
context	Opaque pointer to pass to callback

Definition at line 189 of file cf_clist.c.
References CF_CListTraverse_Status_IS_CONTINUE(), and CF_CListNode::next.
Referenced by CF_CFDP_CycleTx(), CF_CFDP_DisableEngine(), CF_CFDP_TickTransactions(), CF_DoPurge↩

Queue(), CF_FindTransactionBySequenceNumber(), CF_TraverseAllTransactions(), CF_WriteHistoryQueueDataTo↩ File(), and CF_WriteTxnQueueDataToFile().
Here is the call graph for this function:

12.35.2.8 CF_CList_Traverse_R()

```
void CF_CList_Traverse_R (
    CF_CListNode_t * end,
    CF_CListFn_t fn,
    void * context )
```

Reverse list traversal, starting from end, calling given function on all nodes.

Assumptions, External Events, and Notes:

end may be NULL. fn must be a valid function, context may be NULL.

Note

traverse_R will work backwards from the parameter's prev, and end on param

Parameters

end	List to traverse (last node)
fn	Callback function to invoke for each node
context	Opaque pointer to pass to callback

Definition at line 228 of file cf_clist.c.
References CF_CListTraverse_Status_IS_CONTINUE(), and CF_CListNode::prev.
Referenced by CF_InsertSortPrio().
Here is the call graph for this function:

12.36 apps/cf/fsw/src/cf_clist.h File Reference

```
#include <stddef.h>
#include <stdbool.h>
```

Data Structures

- struct CF_CListNode

  Node link structure.

Macros

- #define CF_CLIST_CONT CF_CListTraverse_Status_CONTINUE

  Constant indicating to continue traversal.
- #define CF_CLIST_EXIT CF_CListTraverse_Status_EXIT

  Constant indicating to stop traversal.
- #define container_of(ptr, type, member) ((type ∗)((char ∗)(ptr) - (char ∗)offsetof(type, member)))

  Obtains a pointer to the parent structure.

Typedefs

- typedef struct CF_CListNode CF_CListNode_t

  Circular linked list node links.
- typedef CF_CListTraverse_Status_t(∗ CF_CListFn_t) (CF_CListNode_t ∗node, void ∗context)

  Callback function type for use with CF_CList_Traverse()

Enumerations

- enum CF_CListTraverse_Status_t { CF_CListTraverse_Status_CONTINUE = 0, CF_CListTraverse_Status_EXIT = 1 }

Functions

- static bool CF_CListTraverse_Status_IS_CONTINUE (CF_CListTraverse_Status_t stat)
- void CF_CList_InitNode (CF_CListNode_t ∗node)

  Initialize a clist node.
- void CF_CList_InsertFront (CF_CListNode_t ∗∗head, CF_CListNode_t ∗node)

  Insert the given node into the front of a list.
- void CF_CList_InsertBack (CF_CListNode_t ∗∗head, CF_CListNode_t ∗node)

  Insert the given node into the back of a list.
- void CF_CList_Remove (CF_CListNode_t ∗∗head, CF_CListNode_t ∗node)

  Remove the given node from the list.
- CF_CListNode_t ∗ CF_CList_Pop (CF_CListNode_t ∗∗head)

  Remove the first node from a list and return it.
- void CF_CList_InsertAfter (CF_CListNode_t ∗∗head, CF_CListNode_t ∗start, CF_CListNode_t ∗after)

  Insert the given node into the last after the given start node.
- void CF_CList_Traverse (CF_CListNode_t ∗start, CF_CListFn_t fn, void ∗context)

  Traverse the entire list, calling the given function on all nodes.
- void CF_CList_Traverse_R (CF_CListNode_t ∗end, CF_CListFn_t fn, void ∗context)

  Reverse list traversal, starting from end, calling given function on all nodes.

12.36.1 Detailed Description

The CF Application circular list header file

12.36.2 Macro Definition Documentation

12.36.2.1 CF_CLIST_CONT `#define CF_CLIST_CONT CF_CListTraverse_Status_CONTINUE`

Constant indicating to continue traversal.
Definition at line 38 of file cf_clist.h.

12.36.2.2 CF_CLIST_EXIT `#define CF_CLIST_EXIT CF_CListTraverse_Status_EXIT`

Constant indicating to stop traversal.
Definition at line 39 of file cf_clist.h.

12.36.2.3 container_of

```
#define container_of(
        ptr,
        type,
        member ) ((type *)((char *)(ptr) - (char *)offsetof(type, member)))
```

Obtains a pointer to the parent structure.
Given a pointer to a CF_CListNode_t object which is known to be a member of a larger container, this converts the pointer to that of the parent.
Definition at line 69 of file cf_clist.h.

12.36.3 Typedef Documentation

12.36.3.1 CF_CListFn_t `typedef CF_CListTraverse_Status_t(* CF_CListFn_t) (CF_CListNode_t *node, void *context)`

Callback function type for use with CF_CList_Traverse()

Parameters

node	Current node being traversed
context	Opaque pointer passed through from initial call

Returns

integer status code indicating whether to continue traversal

Return values

CF_CLIST_CONT	Indicates to continue traversing the list
CF_CLIST_EXIT	Indicates to stop traversing the list

Definition at line 81 of file cf_clist.h.

12.36.3.2 CF_CListNode_t `typedef struct CF_CListNode CF_CListNode_t`

Circular linked list node links.
Definition at line 61 of file cf_clist.h.

12.36.4 Enumeration Type Documentation

12.36.4.1 CF_CListTraverse_Status_t `enum CF_CListTraverse_Status_t`

Enumerator

CF_CListTraverse_Status_CONTINUE	
CF_CListTraverse_Status_EXIT	

Definition at line 32 of file cf_clist.h.

12.36.5 Function Documentation

12.36.5.1 CF_CList_InitNode() `void CF_CList_InitNode ( CF_CListNode_t * node )`

Initialize a clist node.

Assumptions, External Events, and Notes:

node must not be NULL.

Parameters

node	Pointer to node structure to be initialized

Definition at line 41 of file cf_clist.c.
References CF_CListNode::next, and CF_CListNode::prev.
Referenced by CF_CFDP_InitEngine(), CF_CList_Remove(), and CF_FreeTransaction().

12.36.5.2 CF_CList_InsertAfter() `void CF_CList_InsertAfter ( CF_CListNode_t ** head, CF_CListNode_t * start, CF_CListNode_t * after )`

Insert the given node into the last after the given start node.

Assumptions, External Events, and Notes:

head must not be NULL, node must not be NULL.

Parameters

head	Pointer to head of list to remove from
start	Pointer to node to insert
after	Pointer to position to insert after

Definition at line 168 of file cf_clist.c.
References CF_Assert, CF_CListNode::next, and CF_CListNode::prev.
Referenced by CF_CList_InsertAfter_Ex().

12.36.5.3 CF_CList_InsertBack()

```
void CF_CList_InsertBack (
    CF_CListNode_t ** head,
    CF_CListNode_t * node )
```

Insert the given node into the back of a list.

Assumptions, External Events, and Notes:

head must not be NULL, node must not be NULL.

Parameters

head	Pointer to head of list to insert into
node	Pointer to node to insert

Definition at line 82 of file cf_clist.c.
References CF_Assert, CF_CListNode::next, and CF_CListNode::prev.
Referenced by CF_CFDP_InitEngine(), CF_CFDP_ResetTransaction(), CF_CList_InsertBack_Ex(), and CF_Move↩Transaction().

12.36.5.4 CF_CList_InsertFront()

```
void CF_CList_InsertFront (
    CF_CListNode_t ** head,
    CF_CListNode_t * node )
```

Insert the given node into the front of a list.

Assumptions, External Events, and Notes:

head must not be NULL, node must not be NULL.

Parameters

head	Pointer to head of list to insert into
node	Pointer to node to insert

Definition at line 53 of file cf_clist.c.
References CF_Assert, CF_CListNode::next, and CF_CListNode::prev.

12.36.5.5 CF_CList_Pop()

```
CF_CListNode_t* CF_CList_Pop (
    CF_CListNode_t ** head )
```

Remove the first node from a list and return it.

Assumptions, External Events, and Notes:

head must not be NULL.

Parameters

head	Pointer to head of list to remove from

Returns

The first node (now removed) in the list

Return values

NULL	if list was empty.

Definition at line 112 of file cf_clist.c.
References CF_Assert, and CF_CList_Remove().
Referenced by CF_CFDP_FindUnusedChunks().
Here is the call graph for this function:

12.36.5.6 CF_CList_Remove()

```
void CF_CList_Remove (
    CF_CListNode_t ** head,
    CF_CListNode_t * node )
```

Remove the given node from the list.

Assumptions, External Events, and Notes:

head must not be NULL, node must not be NULL.

Parameters

head	Pointer to head of list to remove from
node	Pointer to node to remove

Definition at line 133 of file cf_clist.c.
References CF_Assert, CF_CList_InitNode(), CF_CListNode::next, and CF_CListNode::prev.
Referenced by CF_CList_Pop(), CF_CList_Remove_Ex(), CF_DequeueTransaction(), and CF_MoveTransaction().

Here is the call graph for this function:

12.36.5.7 CF_CList_Traverse()

```
void CF_CList_Traverse (
    CF_CListNode_t * start,
    CF_CListFn_t fn,
    void * context )
```

Traverse the entire list, calling the given function on all nodes.

Assumptions, External Events, and Notes:

start may be NULL, fn must be a valid function, context may be NULL.

Note

on traversal it's ok to delete the current node, but do not delete other nodes in the same list!!

Parameters

start	List to traverse (first node)
fn	Callback function to invoke for each node
context	Opaque pointer to pass to callback

Definition at line 189 of file cf_clist.c.
References CF_CListTraverse_Status_IS_CONTINUE(), and CF_CListNode::next.
Referenced by CF_CFDP_CycleTx(), CF_CFDP_DisableEngine(), CF_CFDP_TickTransactions(), CF_DoPurge↩Queue(), CF_FindTransactionBySequenceNumber(), CF_TraverseAllTransactions(), CF_WriteHistoryQueueDataTo↩File(), and CF_WriteTxnQueueDataToFile().
Here is the call graph for this function:

12.36.5.8 CF_CList_Traverse_R()

```
void CF_CList_Traverse_R (
    CF_CListNode_t * end,
    CF_CListFn_t fn,
    void * context )
```

Reverse list traversal, starting from end, calling given function on all nodes.

Assumptions, External Events, and Notes:

end may be NULL. fn must be a valid function, context may be NULL.

Note

traverse_R will work backwards from the parameter's prev, and end on param

Parameters

end	List to traverse (last node)
fn	Callback function to invoke for each node
context	Opaque pointer to pass to callback

Definition at line 228 of file cf_clist.c.
References CF_CListTraverse_Status_IS_CONTINUE(), and CF_CListNode::prev.
Referenced by CF_InsertSortPrio().
Here is the call graph for this function:

12.36.5.9 CF_CListTraverse_Status_IS_CONTINUE()

```
static bool CF_CListTraverse_Status_IS_CONTINUE (
    CF_CListTraverse_Status_t stat ) [inline], [static]
```

Checks if the list traversal should continue
Definition at line 44 of file cf_clist.h.
References CF_CListTraverse_Status_CONTINUE.
Referenced by CF_CList_Traverse(), and CF_CList_Traverse_R().

12.37 apps/cf/fsw/src/cf_cmd.c File Reference

```
#include "cf_app.h"
#include "cf_verify.h"
#include "cf_events.h"
#include "cf_perfids.h"
#include "cf_utils.h"
#include "cf_version.h"
```

```
#include "cf_platform_cfg.h"
#include "cf_cfdp.h"
#include "cf_cmd.h"
#include <string.h>
```

Functions

- CFE_Status_t CF_NoopCmd (const CF_NoopCmd_t *msg)

  The no-operation command.
- CFE_Status_t CF_ResetCmd (const CF_ResetCmd_t *msg)

  The reset counters command.
- CFE_Status_t CF_TxFileCmd (const CF_TxFileCmd_t *msg)

  Ground command to start a file transfer.
- CFE_Status_t CF_PlaybackDirCmd (const CF_PlaybackDirCmd_t *msg)

  Ground command to start directory playback.
- CF_ChanAction_Status_t CF_DoChanAction (const CF_UnionArgs_Payload_t *data, const char *errstr, CF_ChanActionFn_t fn, void *context)

  Common logic for all channel-based commands.
- CF_ChanAction_Status_t CF_DoFreezeThaw (uint8 chan_num, void *arg)

  Channel action to set the frozen bit for a channel.
- CFE_Status_t CF_FreezeCmd (const CF_FreezeCmd_t *msg)

  Freeze a channel.
- CFE_Status_t CF_ThawCmd (const CF_ThawCmd_t *msg)

  Thaw a channel.
- CF_Transaction_t * CF_FindTransactionBySequenceNumberAllChannels (CF_TransactionSeq_t ts, CF_EntityId_t eid)

  Search for a transaction across all channels.
- int32 CF_TsnChanAction (const CF_Transaction_Payload_t *data, const char *cmdstr, CF_TsnChanAction_fn_t fn, void *context)

  Common logic for all transaction sequence number and channel commands.
- void CF_DoSuspRes_Txn (CF_Transaction_t *txn, CF_ChanAction_SuspResArg_t *context)

  Set the suspended bit in a transaction.
- void CF_DoSuspRes (const CF_Transaction_Payload_t *payload, uint8 action)

  Handle transaction suspend and resume commands.
- CFE_Status_t CF_SuspendCmd (const CF_SuspendCmd_t *msg)

  Handle transaction suspend command.
- CFE_Status_t CF_ResumeCmd (const CF_ResumeCmd_t *msg)

  Handle transaction resume command.
- void CF_CmdCancel_Txn (CF_Transaction_t *txn, void *ignored)

  tsn chan action to cancel a transaction.
- CFE_Status_t CF_CancelCmd (const CF_CancelCmd_t *msg)

  Handle a cancel ground command.
- void CF_CmdAbandon_Txn (CF_Transaction_t *txn, void *ignored)

  tsn chan action to abandon a transaction.
- CFE_Status_t CF_AbandonCmd (const CF_AbandonCmd_t *msg)

  Handle an abandon ground command.
- CF_ChanAction_Status_t CF_DoEnableDisableDequeue (uint8 chan_num, void *arg)

Sets the dequeue enable/disable flag for a channel.

- CFE_Status_t CF_EnableDequeueCmd (const CF_EnableDequeueCmd_t ∗msg)

  Handle an enable dequeue ground command.
- CFE_Status_t CF_DisableDequeueCmd (const CF_DisableDequeueCmd_t ∗msg)

  Handle a disable dequeue ground command.
- CF_ChanAction_Status_t CF_DoEnableDisablePolldir (uint8 chan_num, void ∗arg)

  Sets the enable/disable flag for the specified polling directory.
- CFE_Status_t CF_EnableDirPollingCmd (const CF_EnableDirPollingCmd_t ∗msg)

  Enable a polling dir ground command.
- CFE_Status_t CF_DisableDirPollingCmd (const CF_DisableDirPollingCmd_t ∗msg)

  Disable a polling dir ground command.
- CF_CListTraverse_Status_t CF_PurgeHistory (CF_CListNode_t ∗node, void ∗arg)

  Purge the history queue for the given channel.
- CF_CListTraverse_Status_t CF_PurgeTransaction (CF_CListNode_t ∗node, void ∗ignored)

  Purge the pending transaction queue.
- CF_ChanAction_Status_t CF_DoPurgeQueue (uint8 chan_num, void ∗arg)

  Channel action command to perform purge queue operations.
- CFE_Status_t CF_PurgeQueueCmd (const CF_PurgeQueueCmd_t ∗msg)

  Ground command to purge either the history or pending queues.
- CFE_Status_t CF_WriteQueueCmd (const CF_WriteQueueCmd_t ∗msg)

  Ground command to write a file with queue information.
- CF_ChanAction_Status_t CF_CmdValidateChunkSize (CF_ChunkSize_t val, uint8 chan_num)

  Checks if the value is less than or equal to the max PDU size.
- CF_ChanAction_Status_t CF_CmdValidateMaxOutgoing (uint32 val, uint8 chan_num)

  Checks if the value is within allowable range as outgoing packets per wakeup.
- void CF_GetSetParamCmd (uint8 is_set, CF_GetSet_ValueID_t param_id, uint32 value, uint8 chan_num)

  Perform a configuration get/set operation.
- CFE_Status_t CF_SetParamCmd (const CF_SetParamCmd_t ∗msg)

  Ground command to set a configuration parameter.
- CFE_Status_t CF_GetParamCmd (const CF_GetParamCmd_t ∗msg)

  Ground command to set a configuration parameter.
- CFE_Status_t CF_EnableEngineCmd (const CF_EnableEngineCmd_t ∗msg)

  Ground command enable engine.
- CFE_Status_t CF_DisableEngineCmd (const CF_DisableEngineCmd_t ∗msg)

  Ground command disable engine.
- CFE_Status_t CF_SendHkCmd (const CF_SendHkCmd_t ∗msg)

  Send CF housekeeping packet.
- CFE_Status_t CF_WakeupCmd (const CF_WakeupCmd_t ∗msg)

  CF wakeup function.

12.37.1 Detailed Description

The CF Application command handling source file
All ground commands are processed in this file. All supporting functions necessary to process the commands are also here.

12.37.2 Function Documentation

12.37.2.1 CF_AbandonCmd() `CFE_Status_t CF_AbandonCmd ( const CF_AbandonCmd_t * msg )`

Handle an abandon ground command.

Assumptions, External Events, and Notes:

msg must not be NULL.

Parameters

msg	Pointer to command message

Definition at line 537 of file cf_cmd.c.
References CF_AppData, CF_CMD_ABANDON_CHAN_ERR_EID, CF_CMD_ABANDON_INF_EID, CF_Cmd↩Abandon_Txn(), CF_TsnChanAction(), CFE_EVS_EventType_ERROR, CFE_EVS_EventType_INFORMATION, CF↩E_EVS_SendEvent(), CFE_SUCCESS, CF_HkCmdCounters::cmd, CF_HkPacket_Payload::counters, CF_HkCmd↩Counters::err, CF_AppData_t::hk, CF_HkPacket::Payload, and CF_AbandonCmd::Payload.
Referenced by CF_ProcessGroundCommand().
Here is the call graph for this function:

12.37.2.2 CF_CancelCmd() `CFE_Status_t CF_CancelCmd ( const CF_CancelCmd_t * msg )`

Handle a cancel ground command.

Assumptions, External Events, and Notes:

msg must not be NULL.

Parameters

msg	Pointer to command message

Definition at line 502 of file cf_cmd.c.
References CF_AppData, CF_CMD_CANCEL_CHAN_ERR_EID, CF_CMD_CANCEL_INF_EID, CF_CmdCancel_↩Txn(), CF_TsnChanAction(), CFE_EVS_EventType_ERROR, CFE_EVS_EventType_INFORMATION, CFE_EVS_↩SendEvent(), CFE_SUCCESS, CF_HkCmdCounters::cmd, CF_HkPacket_Payload::counters, CF_HkCmdCounters↩::err, CF_AppData_t::hk, CF_HkPacket::Payload, and CF_CancelCmd::Payload.
Here is the call graph for this function:

12.37.2.3 CF_CmdAbandon_Txn()

```
void CF_CmdAbandon_Txn (
    CF_Transaction_t * txn,
    void * ignored )
```

tsn chan action to abandon a transaction.
This helper function is used with CF_TsnChanAction() to abandon matched transactions

Assumptions, External Events, and Notes:

msg must not be NULL.

Parameters

txn	Pointer to transaction object
ignored	Not used by this function

Definition at line 526 of file cf_cmd.c.
References CF_CFDP_ResetTransaction().
Referenced by CF_AbandonCmd().

Here is the call graph for this function:

12.37.2.4 CF_CmdCancel_Txn()

```
void CF_CmdCancel_Txn (
    CF_Transaction_t * txn,
    void * ignored )
```

tsn chan action to cancel a transaction.
This helper function is used with CF_TsnChanAction() to cancel matched transactions

Assumptions, External Events, and Notes:

txn must not be NULL.

Parameters

txn	Pointer to transaction object
ignored	Not used by this function

Definition at line 491 of file cf_cmd.c.
References CF_CFDP_CancelTransaction().
Referenced by CF_CancelCmd().

Here is the call graph for this function:

12.37.2.5 CF_CmdValidateChunkSize()

```
CF_ChanAction_Status_t CF_CmdValidateChunkSize (
    CF_ChunkSize_t val,
    uint8 chan_num )
```

Checks if the value is less than or equal to the max PDU size.

Assumptions, External Events, and Notes:

None

Parameters

val	Size of chunk to test
chan_num	Ignored by this implementation

Returns

status code indicating if check passed

Return values

CF_ChanAction_Status_SUCCESS	if successful (val is less than or equal to max PDU)
CF_ChanAction_Status_ERROR	if failed (val is greater than max PDU)

Definition at line 949 of file cf_cmd.c.
References CF_ChanAction_Status_ERROR, and CF_ChanAction_Status_SUCCESS.
Referenced by CF_GetSetParamCmd().

12.37.2.6 CF_CmdValidateMaxOutgoing()

```
CF_ChanAction_Status_t CF_CmdValidateMaxOutgoing (
    uint32 val,
    uint8 chan_num )
```

Checks if the value is within allowable range as outgoing packets per wakeup.

Assumptions, External Events, and Notes:

None

Parameters

val	Number to test
chan_num	CF channel number

Returns

status code indicating if check passed

Return values

CF_ChanAction_Status_SUCCESS	if successful (val is allowable as max packets per wakeup)
CF_ChanAction_Status_ERROR	if failed (val is not allowed)

Definition at line 965 of file cf_cmd.c.
References CF_AppData, CF_ChanAction_Status_ERROR, CF_ChanAction_Status_SUCCESS, CF_ConfigTable↩::chan, CF_AppData_t::config_table, and CF_ChannelConfig::sem_name.
Referenced by CF_GetSetParamCmd().

12.37.2.7 CF_DisableDequeueCmd()

```
CFE_Status_t CF_DisableDequeueCmd (
    const CF_DisableDequeueCmd_t * msg )
```

Handle a disable dequeue ground command.

Assumptions, External Events, and Notes:

msg must not be NULL.

Parameters

msg	Pointer to command message

Definition at line 600 of file cf_cmd.c.
References CF_AppData, CF_ChanAction_Status_IS_SUCCESS(), CF_CMD_DISABLE_DEQUEUE_ERR_EID, CF↩_CMD_DISABLE_DEQUEUE_INF_EID, CF_DoChanAction(), CF_DoEnableDisableDequeue(), CFE_EVS_Event↩Type_ERROR, CFE_EVS_EventType_INFORMATION, CFE_EVS_SendEvent(), CFE_SUCCESS, CF_HkCmd↩Counters::cmd, CF_HkPacket_Payload::counters, CF_HkCmdCounters::err, CF_AppData_t::hk, CF_HkPacket::↩Payload, and CF_DisableDequeueCmd::Payload.

Here is the call graph for this function:

12.37.2.8 CF_DisableDirPollingCmd() `CFE_Status_t CF_DisableDirPollingCmd ( const CF_DisableDirPollingCmd_t * msg )`

Disable a polling dir ground command.

Assumptions, External Events, and Notes:

msg must not be NULL.

Parameters

msg	Pointer to command message

Definition at line 685 of file cf_cmd.c.
References CF_AppData, CF_ChanAction_Status_IS_SUCCESS(), CF_CMD_DISABLE_POLLDIR_ERR_EID, CF↩_CMD_DISABLE_POLLDIR_INF_EID, CF_DoChanAction(), CF_DoEnableDisablePolldir(), CFE_EVS_EventType_E↩RROR, CFE_EVS_EventType_INFORMATION, CFE_EVS_SendEvent(), CFE_SUCCESS, CF_HkCmdCounters::cmd, CF_HkPacket_Payload::counters, CF_HkCmdCounters::err, CF_AppData_t::hk, CF_HkPacket::Payload, and CF_↩DisableDirPollingCmd::Payload.
Here is the call graph for this function:

12.37.2.9 CF_DisableEngineCmd()

```
CFE_Status_t CF_DisableEngineCmd (
    const CF_DisableEngineCmd_t * msg )
```

Ground command disable engine.

Assumptions, External Events, and Notes:

msg must not be NULL.

Parameters

msg	Pointer to command message

Definition at line 1201 of file cf_cmd.c.
References CF_AppData, CF_CFDP_DisableEngine(), CF_CMD_DISABLE_ENGINE_INF_EID, CF_CMD_ENG_A↩LREADY_DIS_INF_EID, CFE_EVS_EventType_INFORMATION, CFE_EVS_SendEvent(), CFE_SUCCESS, CF_Hk↩CmdCounters::cmd, CF_HkPacket_Payload::counters, CF_Engine::enabled, CF_AppData_t::engine, CF_AppData_t↩::hk, and CF_HkPacket::Payload.
Referenced by CF_ProcessGroundCommand().
Here is the call graph for this function:

12.37.2.10 CF_DoChanAction()

```
CF_ChanAction_Status_t CF_DoChanAction (
    const CF_UnionArgs_Payload_t * data,
    const char * errstr,
    CF_ChanActionFn_t fn,
    void * context )
```

Common logic for all channel-based commands.

Description

All the commands that act on channels or have the special "all channels" parameter come through this function. This puts all common logic in one place. It does not handle the command accept or reject counters.

Assumptions, External Events, and Notes:

cmd must not be NULL, errstr must not be NULL, fn must be a valid function, context may be NULL.

Parameters

data	Pointer to payload being processed
errstr	String to be included in the EVS event if command should fail
fn	Callback action function to invoke for each affected channel
context	Opaque pointer to pass through to callback (not used in this function)

Returns

The return value from the given action function.

Return values

CF_ChanAction_Status_ERROR	on error

Definition at line 233 of file cf_cmd.c.
References CF_UnionArgs_Payload::byte, CF_ALL_CHANNELS, CF_ChanAction_Status_ERROR, CF_ChanAction↩_Status_SUCCESS, CF_CMD_CHAN_PARAM_ERR_EID, CF_NUM_CHANNELS, CFE_EVS_EventType_ERROR, and CFE_EVS_SendEvent().
Referenced by CF_DisableDequeueCmd(), CF_DisableDirPollingCmd(), CF_EnableDequeueCmd(), CF_EnableDir↩PollingCmd(), CF_FreezeCmd(), CF_PurgeQueueCmd(), and CF_ThawCmd().
Here is the call graph for this function:

12.37.2.11 CF_DoEnableDisableDequeue()

```
CF_ChanAction_Status_t CF_DoEnableDisableDequeue (
    uint8 chan_num,
    void * arg )
```

Sets the dequeue enable/disable flag for a channel.

Assumptions, External Events, and Notes:

context must not be NULL.

Parameters

chan_num	channel number
arg	context pointer to object, must be CF_ChanAction_BoolArg_t∗

Returns

Always succeeds, so returns CF_ChanAction_Status_SUCCESS.

Definition at line 561 of file cf_cmd.c.
References CF_ChanAction_BoolArg::barg, CF_AppData, CF_ChanAction_Status_SUCCESS, CF_ConfigTable::chan, CF_AppData_t::config_table, and CF_ChannelConfig::dequeue_enabled.
Referenced by CF_DisableDequeueCmd(), and CF_EnableDequeueCmd().

12.37.2.12 CF_DoEnableDisablePolldir()

```
CF_ChanAction_Status_t CF_DoEnableDisablePolldir (
```

```
uint8 chan_num,
void * arg )
```

Sets the enable/disable flag for the specified polling directory.

Assumptions, External Events, and Notes:

context must not be NULL.

Parameters

chan_num	channel number
arg	context pointer to object, must be CF_ChanAction_BoolMsgArg_t*

Returns

success/fail status code

Return values

CF_ChanAction_Status_SUCCESS	if successful
CF_ChanAction_Status_ERROR	if failed

Definition at line 625 of file cf_cmd.c.
References CF_ChanAction_BoolMsgArg::barg, CF_UnionArgs_Payload::byte, CF_ALL_POLLDIRS, CF_AppData, CF_ChanAction_Status_ERROR, CF_ChanAction_Status_SUCCESS, CF_CMD_POLLDIR_INVALID_ERR_EID, CF_MAX_POLLING_DIR_PER_CHAN, CFE_EVS_EventType_ERROR, CFE_EVS_SendEvent(), CF_ConfigTable::chan, CF_AppData_t::config_table, CF_ChanAction_BoolMsgArg::data, CF_PollDir::enabled, and CF_ChannelConfig::polldir.
Referenced by CF_DisableDirPollingCmd(), and CF_EnableDirPollingCmd().
Here is the call graph for this function:

12.37.2.13 CF_DoFreezeThaw()

```
CF_ChanAction_Status_t CF_DoFreezeThaw (
uint8 chan_num,
void * arg )
```

Channel action to set the frozen bit for a channel.

Assumptions, External Events, and Notes:

context must not be NULL.

Parameters

chan_num	channel number
arg	context pointer to object, must be CF_ChanAction_BoolArg_t*

Returns

Always succeeds, so returns CF_ChanAction_Status_SUCCESS.

Definition at line 269 of file cf_cmd.c.
References CF_ChanAction_BoolArg::barg, CF_AppData, CF_ChanAction_Status_SUCCESS, CF_HkPacket_↩Payload::channel_hk, CF_HkChannel_Data::frozen, CF_AppData_t::hk, and CF_HkPacket::Payload.
Referenced by CF_FreezeCmd(), and CF_ThawCmd().

12.37.2.14 CF_DoPurgeQueue()

```
CF_ChanAction_Status_t CF_DoPurgeQueue (
    uint8 chan_num,
    void * arg )
```

Channel action command to perform purge queue operations.

Description

Determines from the command parameters which queues to traverse and purge state.

Assumptions, External Events, and Notes:

None

Parameters

chan_num	CF channel number
arg	Pointer to purge queue command

Returns

integer status code indicating success or failure

Return values

CF_ChanAction_Status_SUCCESS	if successful
CF_ChanAction_Status_ERROR	on error

Definition at line 739 of file cf_cmd.c.
References CF_UnionArgs_Payload::byte, CF_AppData, CF_ChanAction_Status_ERROR, CF_ChanAction_Status↩_SUCCESS, CF_CList_Traverse(), CF_CMD_PURGE_ARG_ERR_EID, CF_PurgeHistory(), CF_PurgeTransaction(), CF_QueueIdx_HIST, CF_QueueIdx_PEND, CFE_EVS_EventType_ERROR, CFE_EVS_SendEvent(), CF_Engine↩::channels, CF_AppData_t::engine, and CF_Channel::qs.
Referenced by CF_PurgeQueueCmd().

Here is the call graph for this function:

12.37.2.15 CF_DoSuspRes()

```
void CF_DoSuspRes (
    const CF_Transaction_Payload_t * payload,
    uint8 action )
```

Handle transaction suspend and resume commands.

Description

This is called for both suspend and resume ground commands. It uses the CF_TsnChanAction() function to perform the command.

Assumptions, External Events, and Notes:

payload must not be NULL.

Parameters

payload	Pointer to the command message
action	Action to take (suspend or resume)

Definition at line 426 of file cf_cmd.c.
References CF_AppData, CF_CMD_SUSPRES_CHAN_ERR_EID, CF_CMD_SUSPRES_INF_EID, CF_CMD_SU↩SPRES_SAME_INF_EID, CF_DoSuspRes_Txn(), CF_TsnChanAction(), CFE_EVS_EventType_ERROR, CFE_EV↩S_EventType_INFORMATION, CFE_EVS_SendEvent(), CF_HkCmdCounters::cmd, CF_HkPacket_Payload::counters, CF_HkCmdCounters::err, CF_AppData_t::hk, CF_HkPacket::Payload, and CF_ChanAction_SuspResArg::same.
Referenced by CF_ResumeCmd(), and CF_SuspendCmd().

Here is the call graph for this function:

12.37.2.16 CF_DoSuspRes_Txn()

```
void CF_DoSuspRes_Txn (
    CF_Transaction_t * txn,
    CF_ChanAction_SuspResArg_t * context )
```

Set the suspended bit in a transaction.

Assumptions, External Events, and Notes:

txn must not be NULL. context must not be NULL.

Parameters

txn	Pointer to the transaction object
context	Pointer to CF_ChanAction_SuspResArg_t structure from initial call

Definition at line 407 of file cf_cmd.c.
References CF_ChanAction_SuspResArg::action, CF_Assert, CF_StateFlags::com, CF_Transaction::flags, CF_↩ ChanAction_SuspResArg::same, and CF_Flags_Common::suspended.
Referenced by CF_DoSuspRes().

12.37.2.17 CF_EnableDequeueCmd()

```
CFE_Status_t CF_EnableDequeueCmd (
    const CF_EnableDequeueCmd_t * msg )
```

Handle an enable dequeue ground command.

Assumptions, External Events, and Notes:

msg must not be NULL.

Parameters

msg	Pointer to command message

Definition at line 575 of file cf_cmd.c.
References CF_AppData, CF_ChanAction_Status_IS_SUCCESS(), CF_CMD_ENABLE_DEQUEUE_ERR_EID, CF↩ _CMD_ENABLE_DEQUEUE_INF_EID, CF_DoChanAction(), CF_DoEnableDisableDequeue(), CFE_EVS_Event↩ Type_ERROR, CFE_EVS_EventType_INFORMATION, CFE_EVS_SendEvent(), CFE_SUCCESS, CF_HkCmd↩ Counters::cmd, CF_HkPacket_Payload::counters, CF_HkCmdCounters::err, CF_AppData_t::hk, CF_HkPacket::↩ Payload, and CF_EnableDequeueCmd::Payload.
Referenced by CF_ProcessGroundCommand().

Here is the call graph for this function:

12.37.2.18 CF_EnableDirPollingCmd()

```
CFE_Status_t CF_EnableDirPollingCmd (
    const CF_EnableDirPollingCmd_t * msg )
```

Enable a polling dir ground command.

Assumptions, External Events, and Notes:

msg must not be NULL.

Parameters

msg	Pointer to command message

Definition at line 658 of file cf_cmd.c.
References CF_AppData, CF_ChanAction_Status_IS_SUCCESS(), CF_CMD_ENABLE_POLLDIR_ERR_EID, CF_↩CMD_ENABLE_POLLDIR_INF_EID, CF_DoChanAction(), CF_DoEnableDisablePolldir(), CFE_EVS_EventType_ER↩ROR, CFE_EVS_EventType_INFORMATION, CFE_EVS_SendEvent(), CFE_SUCCESS, CF_HkCmdCounters::cmd, CF_HkPacket_Payload::counters, CF_HkCmdCounters::err, CF_AppData_t::hk, CF_HkPacket::Payload, and CF_↩EnableDirPollingCmd::Payload.
Referenced by CF_ProcessGroundCommand().
Here is the call graph for this function:

12.37.2.19 CF_EnableEngineCmd()

```
CFE_Status_t CF_EnableEngineCmd (
    const CF_EnableEngineCmd_t * msg )
```

Ground command enable engine.

Assumptions, External Events, and Notes:

msg must not be NULL.

Parameters

msg	Pointer to command message

Definition at line 1169 of file cf_cmd.c.
References CF_AppData, CF_CFDP_InitEngine(), CF_CMD_ENABLE_ENGINE_ERR_EID, CF_CMD_ENABLE_EN↩GINE_INF_EID, CF_CMD_ENG_ALREADY_ENA_INF_EID, CFE_EVS_EventType_ERROR, CFE_EVS_EventType↩_INFORMATION, CFE_EVS_SendEvent(), CFE_SUCCESS, CF_HkCmdCounters::cmd, CF_HkPacket_Payload↩::counters, CF_Engine::enabled, CF_AppData_t::engine, CF_HkCmdCounters::err, CF_AppData_t::hk, and CF_Hk↩Packet::Payload.
Here is the call graph for this function:

12.37.2.20 CF_FindTransactionBySequenceNumberAllChannels()

```
CF_Transaction_t* CF_FindTransaction↩
BySequenceNumberAllChannels (
    CF_TransactionSeq_t ts,
    CF_EntityId_t eid )
```

Search for a transaction across all channels.

Assumptions, External Events, and Notes:

None

Parameters

ts	Transaction sequence number to find
eid	Entity ID of the transaction

Returns

Pointer to the transaction, if found

Return values

NULL	if transaction not found

Definition at line 331 of file cf_cmd.c.
References CF_AppData, CF_FindTransactionBySequenceNumber(), CF_NUM_CHANNELS, CF_Engine::channels, and CF_AppData_t::engine.
Referenced by CF_TsnChanAction().
Here is the call graph for this function:

12.37.2.21 CF_FreezeCmd()

```
CFE_Status_t CF_FreezeCmd (
    const CF_FreezeCmd_t * msg )
```

Freeze a channel.

Assumptions, External Events, and Notes:

msg must not be NULL.

Parameters

msg	Pointer to command message

Definition at line 283 of file cf_cmd.c.
References CF_AppData, CF_ChanAction_Status_IS_SUCCESS(), CF_CMD_FREEZE_ERR_EID, CF_CMD_FREEZE_INF_EID, CF_DoChanAction(), CF_DoFreezeThaw(), CFE_EVS_EventType_ERROR, CFE_EVS_EventType_INFORMATION, CFE_EVS_SendEvent(), CFE_SUCCESS, CF_HkCmdCounters::cmd, CF_HkPacket_Payload::counters, CF_HkCmdCounters::err, CF_AppData_t::hk, CF_HkPacket::Payload, and CF_FreezeCmd::Payload.

Here is the call graph for this function:

12.37.2.22 CF_GetParamCmd() `CFE_Status_t CF_GetParamCmd ( const CF_GetParamCmd_t * msg )`

Ground command to set a configuration parameter.

Assumptions, External Events, and Notes:

msg must not be NULL.

Parameters

msg	Pointer to command message

Definition at line 1154 of file cf_cmd.c.
References CF_GetSetParamCmd(), CFE_SUCCESS, CF_GetParam_Payload::chan_num, CF_GetParam_Payload↩ ::key, and CF_GetParamCmd::Payload.
Referenced by CF_ProcessGroundCommand().
Here is the call graph for this function:

12.37.2.23 CF_GetSetParamCmd()

```
void CF_GetSetParamCmd (
    uint8 is_set,
    CF_GetSet_ValueID_t param_id,
    uint32 value,
    uint8 chan_num )
```

Perform a configuration get/set operation.

For a set, this sets the value within the CF configuration For a get, this generates an EVS event with the requested information

Description

Combine get and set in one function with common logic.

Assumptions, External Events, and Notes:

None

Parameters

is_set	Whether to get (0) or set (1)
param_id	Parameter ID
value	Value to get/set
chan_num	Channel number to operate on

Definition at line 984 of file cf_cmd.c.

References CF_ChannelConfig::ack_limit, CF_ChannelConfig::ack_timer_s, CF_AppData, CF_ChanAction_Status_I↩S_SUCCESS(), CF_CMD_GETSET1_INF_EID, CF_CMD_GETSET2_INF_EID, CF_CMD_GETSET_CHAN_ERR_E↩ID, CF_CMD_GETSET_PARAM_ERR_EID, CF_CMD_GETSET_VALIDATE_ERR_EID, CF_CmdValidateChunkSize(), CF_CmdValidateMaxOutgoing(), CF_ERROR, CF_GetSet_ValueID_ack_limit, CF_GetSet_ValueID_ack_timer_s, C↩F_GetSet_ValueID_chan_max_outgoing_messages_per_wakeup, CF_GetSet_ValueID_inactivity_timer_s, CF_Get↩Set_ValueID_local_eid, CF_GetSet_ValueID_nak_limit, CF_GetSet_ValueID_nak_timer_s, CF_GetSet_ValueID_↩outgoing_file_chunk_size, CF_GetSet_ValueID_rx_crc_calc_bytes_per_wakeup, CF_GetSet_ValueID_ticks_per_↩second, CF_NUM_CHANNELS, CFE_EVS_EventType_ERROR, CFE_EVS_EventType_INFORMATION, CFE_EVS↩_SendEvent(), CFE_SUCCESS, CF_ConfigTable::chan, CF_HkCmdCounters::cmd, CF_AppData_t::config_table, C↩F_HkPacket_Payload::counters, CF_HkCmdCounters::err, CF_AppData_t::hk, CF_ChannelConfig::inactivity_timer_s, CF_ConfigTable::local_eid, CF_ChannelConfig::max_outgoing_messages_per_wakeup, CF_ChannelConfig::nak_limit, CF_ChannelConfig::nak_timer_s, CF_ConfigTable::outgoing_file_chunk_size, CF_HkPacket::Payload, CF_Config↩Table::rx_crc_calc_bytes_per_wakeup, and CF_ConfigTable::ticks_per_second.

Referenced by CF_GetParamCmd(), and CF_SetParamCmd().

Here is the call graph for this function:

12.37.2.24 CF_NoopCmd()

```
CFE_Status_t CF_NoopCmd (
    const CF_NoopCmd_t * msg )
```

The no-operation command.

Description

This function has a signature the same of all cmd_ functions. This function simply prints an event message. Increments the command accept counter. The msg parameter is ignored in this one.

Assumptions, External Events, and Notes:

None

Parameters

msg	Pointer to command message

Definition at line 48 of file cf_cmd.c.
References CF_AppData, CF_MAJOR_VERSION, CF_MINOR_VERSION, CF_MISSION_REV, CF_NOOP_INF_E↩ID, CF_REVISION, CFE_EVS_EventType_INFORMATION, CFE_EVS_SendEvent(), CFE_SUCCESS, CF_HkCmd↩Counters::cmd, CF_HkPacket_Payload::counters, CF_AppData_t::hk, and CF_HkPacket::Payload.

Here is the call graph for this function:

12.37.2.25 CF_PlaybackDirCmd() `CFE_Status_t CF_PlaybackDirCmd ( const CF_PlaybackDirCmd_t * msg )`

Ground command to start directory playback.

Description

This function has a signature the same of all cmd_ functions. Increments the command accept or reject counter.

Assumptions, External Events, and Notes:

msg must not be NULL.

Parameters

msg	Pointer to command message

Definition at line 183 of file cf_cmd.c.
References CF_AppData, CF_CFDP_CLASS_1, CF_CFDP_CLASS_2, CF_CFDP_PlaybackDir(), CF_CMD_BAD_PARAM_ERR_EID, CF_CMD_PLAYBACK_DIR_ERR_EID, CF_CMD_PLAYBACK_DIR_INF_EID, CF_NUM_CHANNELS, CF_TxFile_Payload::cfdp_class, CFE_EVS_EventType_ERROR, CFE_EVS_EventType_INFORMATION, CFE_EVS_SendEvent(), CFE_SUCCESS, CF_TxFile_Payload::chan_num, CF_HkCmdCounters::cmd, CF_HkPacket_Payload::counters, CF_TxFile_Payload::dest_id, CF_TxFile_Payload::dst_filename, CF_HkCmdCounters::err, CF_AppData_t::hk, CF_TxFile_Payload::keep, CF_HkPacket::Payload, CF_PlaybackDirCmd::Payload, CF_TxFile_Payload::priority, and CF_TxFile_Payload::src_filename.
Referenced by CF_ProcessGroundCommand().
Here is the call graph for this function:

12.37.2.26 CF_PurgeHistory() `CF_CListTraverse_Status_t CF_PurgeHistory (`

```
CF_CListNode_t * node,
void * arg )
```

Purge the history queue for the given channel.
This helper function is used in conjunction with CF_CList_Traverse()

Assumptions, External Events, and Notes:

node must not be NULL. chan must not be NULL.

Parameters

node	Current list node being traversed
arg	Channel pointer passed through as opaque object, must be CF_Channel_t*

Returns

Always CF_CLIST_CONT to process all entries

Definition at line 712 of file cf_cmd.c.
References CF_CLIST_CONT, CF_ResetHistory(), and container_of.
Referenced by CF_DoPurgeQueue().
Here is the call graph for this function:

12.37.2.27 CF_PurgeQueueCmd()

```
CFE_Status_t CF_PurgeQueueCmd (
    const CF_PurgeQueueCmd_t * msg )
```

Ground command to purge either the history or pending queues.

Assumptions, External Events, and Notes:

msg must not be NULL.

Parameters

msg	Pointer to command message

Definition at line 790 of file cf_cmd.c.
References CF_AppData, CF_ChanAction_Status_IS_SUCCESS(), CF_CMD_PURGE_QUEUE_ERR_EID, CF_CMD_PURGE_QUEUE_INF_EID, CF_DoChanAction(), CF_DoPurgeQueue(), CFE_EVS_EventType_ERROR, CFE_EVS_EventType_INFORMATION, CFE_EVS_SendEvent(), CFE_SUCCESS, CF_HkCmdCounters::cmd, CF_HkPacket_Payload::counters, CF_HkCmdCounters::err, CF_AppData_t::hk, CF_HkPacket::Payload, and CF_PurgeQueueCmd::Payload.
Referenced by CF_ProcessGroundCommand().

Here is the call graph for this function:

12.37.2.28 CF_PurgeTransaction()

```
CF_CListTraverse_Status_t CF_PurgeTransaction (
    CF_CListNode_t * node,
    void * ignored )
```

Purge the pending transaction queue.

This helper function is used in conjunction with CF_CList_Traverse()

Assumptions, External Events, and Notes:

node must not be NULL.

Parameters

node	Current list node being traversed
ignored	Not used by this implementation

Returns

Always CF_CLIST_CONT to process all entries

Definition at line 726 of file cf_cmd.c.
References CF_CFDP_ResetTransaction(), CF_CLIST_CONT, and container_of.
Referenced by CF_DoPurgeQueue().
Here is the call graph for this function:

12.37.2.29 CF_ResetCmd()

```
CFE_Status_t CF_ResetCmd (
    const CF_ResetCmd_t * msg )
```

The reset counters command.

Description

This function has a signature the same of all cmd_ functions. Resets the given counter, or all. Increments the command accept or reject counter. If the command counters are reset, then there is no increment.

Assumptions, External Events, and Notes:

msg must not be NULL.

Parameters

msg	Pointer to command message

Definition at line 64 of file cf_cmd.c.
References CF_UnionArgs_Payload::byte, CF_AppData, CF_CMD_RESET_INVALID_ERR_EID, CF_NUM_CHAN↩NELS, CF_Reset_all, CF_Reset_command, CF_Reset_down, CF_Reset_fault, CF_RESET_INF_EID, CF_Reset_↩

up, CFE_EVS_EventType_ERROR, CFE_EVS_EventType_INFORMATION, CFE_EVS_SendEvent(), CFE_SUCCE↩SS, CF_HkPacket_Payload::channel_hk, CF_HkCmdCounters::cmd, CF_HkChannel_Data::counters, CF_HkPacket↩_Payload::counters, CF_HkCmdCounters::err, CF_HkCounters::fault, CF_AppData_t::hk, CF_HkPacket::Payload, C↩F_ResetCmd::Payload, CF_HkCounters::recv, and CF_HkCounters::sent.
Referenced by CF_ProcessGroundCommand().
Here is the call graph for this function:

12.37.2.30 CF_ResumeCmd() `CFE_Status_t CF_ResumeCmd ( const CF_ResumeCmd_t * msg )`

Handle transaction resume command.

Assumptions, External Events, and Notes:

msg must not be NULL.

Parameters

msg	Pointer to command message

Definition at line 479 of file cf_cmd.c.
References CF_DoSuspRes(), CFE_SUCCESS, and CF_ResumeCmd::Payload.
Referenced by CF_ProcessGroundCommand().
Here is the call graph for this function:

12.37.2.31 CF_SendHkCmd() `CFE_Status_t CF_SendHkCmd ( const CF_SendHkCmd_t * msg )`

Send CF housekeeping packet.

Description

The command to send the CF housekeeping packet

Assumptions, External Events, and Notes:

None

Parameters

msg	Pointer to command message

Definition at line 1225 of file cf_cmd.c.
References CF_AppData, CF_CheckTables(), CFE_MSG_SetMsgTime(), CFE_SB_TransmitMsg(), CFE_SUCCESS, CFE_TIME_GetTime(), CF_AppData_t::hk, and CF_HkPacket::TelemetryHeader.
Referenced by CF_AppPipe().
Here is the call graph for this function:

12.37.2.32 CF_SetParamCmd()

```
CFE_Status_t CF_SetParamCmd (
    const CF_SetParamCmd_t * msg )
```

Ground command to set a configuration parameter.

Assumptions, External Events, and Notes:

msg must not be NULL.

Parameters

msg	Pointer to command message

Definition at line 1139 of file cf_cmd.c.
References CF_GetSetParamCmd(), CFE_SUCCESS, CF_SetParam_Payload::chan_num, CF_SetParam_Payload↩::key, CF_SetParamCmd::Payload, and CF_SetParam_Payload::value.

Here is the call graph for this function:

12.37.2.33 CF_SuspendCmd() `CFE_Status_t CF_SuspendCmd ( const CF_SuspendCmd_t * msg )`

Handle transaction suspend command.

Assumptions, External Events, and Notes:

msg must not be NULL.

Parameters

msg	Pointer to command message

Definition at line 467 of file cf_cmd.c.
References CF_DoSuspRes(), CFE_SUCCESS, and CF_SuspendCmd::Payload.
Here is the call graph for this function:

12.37.2.34 CF_ThawCmd() `CFE_Status_t CF_ThawCmd ( const CF_ThawCmd_t * msg )`

Thaw a channel.

Assumptions, External Events, and Notes:

msg must not be NULL.

Parameters

msg	Pointer to command message

Definition at line 307 of file cf_cmd.c.
References CF_AppData, CF_ChanAction_Status_IS_SUCCESS(), CF_CMD_THAW_ERR_EID, CF_CMD_THAW_↩INF_EID, CF_DoChanAction(), CF_DoFreezeThaw(), CFE_EVS_EventType_ERROR, CFE_EVS_EventType_INFOR↩MATION, CFE_EVS_SendEvent(), CFE_SUCCESS, CF_HkCmdCounters::cmd, CF_HkPacket_Payload::counters, C↩F_HkCmdCounters::err, CF_AppData_t::hk, CF_HkPacket::Payload, and CF_ThawCmd::Payload.
Referenced by CF_ProcessGroundCommand().
Here is the call graph for this function:

12.37.2.35 CF_TsnChanAction()

```
int32 CF_TsnChanAction (
    const CF_Transaction_Payload_t * data,
    const char * cmdstr,
    CF_TsnChanAction_fn_t fn,
    void * context )
```

Common logic for all transaction sequence number and channel commands.

Description

All the commands that on a transaction on a particular channel come through this function. This puts all common logic in one place. It does handle the command accept or reject counters.

Assumptions, External Events, and Notes:

cmd must not be NULL, fn must be a valid function, context may be NULL.

Parameters

data	Pointer to payload being processed
cmdstr	String to include in any generated EVS events
fn	Callback function to invoke for each matched transaction
context	Opaque object to pass through to the callback

Returns

returns the number of transactions acted upon

Definition at line 359 of file cf_cmd.c.
References CF_ALL_CHANNELS, CF_AppData, CF_CMD_TRANS_NOT_FOUND_ERR_EID, CF_CMD_TSN_CH↩AN_INVALID_ERR_EID, CF_COMPOUND_KEY, CF_FindTransactionBySequenceNumberAllChannels(), CF_NUM_↩CHANNELS, CF_TraverseAllTransactions(), CF_TraverseAllTransactions_All_Channels(), CFE_EVS_EventType_ER↩ROR, CFE_EVS_SendEvent(), CF_Transaction_Payload::chan, CF_Engine::channels, CF_Transaction_Payload::eid, CF_AppData_t::engine, and CF_Transaction_Payload::ts.
Referenced by CF_AbandonCmd(), CF_CancelCmd(), and CF_DoSuspRes().
Here is the call graph for this function:

12.37.2.36 CF_TxFileCmd()

```
CFE_Status_t CF_TxFileCmd (
    const CF_TxFileCmd_t * msg )
```

Ground command to start a file transfer.

Description

This function has a signature the same of all cmd_ functions. Increments the command accept or reject counter.

Assumptions, External Events, and Notes:

msg must not be NULL.

Parameters

msg	Pointer to command message

Definition at line 134 of file cf_cmd.c.
References CF_AppData, CF_CFDP_CLASS_1, CF_CFDP_CLASS_2, CF_CFDP_TxFile(), CF_CMD_BAD_PAR↩AM_ERR_EID, CF_CMD_TX_FILE_ERR_EID, CF_CMD_TX_FILE_INF_EID, CF_NUM_CHANNELS, CF_TxFile_↩Payload::cfdp_class, CFE_EVS_EventType_ERROR, CFE_EVS_EventType_INFORMATION, CFE_EVS_SendEvent(), CFE_SUCCESS, CF_TxFile_Payload::chan_num, CF_HkCmdCounters::cmd, CF_HkPacket_Payload::counters, CF↩_TxFile_Payload::dest_id, CF_TxFile_Payload::dst_filename, CF_HkCmdCounters::err, CF_AppData_t::hk, CF_Tx↩File_Payload::keep, CF_HkPacket::Payload, CF_TxFileCmd::Payload, CF_TxFile_Payload::priority, and CF_TxFile_↩Payload::src_filename.

Here is the call graph for this function:

12.37.2.37 CF_WakeupCmd()

```
CFE_Status_t CF_WakeupCmd (
    const CF_WakeupCmd_t * msg )
```

CF wakeup function.

Description

Performs a single engine cycle for each wakeup

Assumptions, External Events, and Notes:

None

Parameters

msg	Pointer to command message

Definition at line 1242 of file cf_cmd.c.
References CF_CFDP_CycleEngine(), CF_PERF_ID_CYCLE_ENG, CFE_ES_PerfLogEntry, CFE_ES_PerfLogExit, and CFE_SUCCESS.
Referenced by CF_AppPipe().

Here is the call graph for this function:

12.37.2.38 CF_WriteQueueCmd()

```
CFE_Status_t CF_WriteQueueCmd (
    const CF_WriteQueueCmd_t * msg )
```

Ground command to write a file with queue information.

Assumptions, External Events, and Notes:

msg must not be NULL.

Parameters

msg	Pointer to command message

Definition at line 813 of file cf_cmd.c.

References CF_AppData, CF_CMD_WQ_ARGS_ERR_EID, CF_CMD_WQ_CHAN_ERR_EID, CF_CMD_WQ_INF_↩ EID, CF_CMD_WQ_OPEN_ERR_EID, CF_CMD_WQ_WRITEHIST_RX_ERR_EID, CF_CMD_WQ_WRITEHIST_TX↩ _ERR_EID, CF_CMD_WQ_WRITEQ_PEND_ERR_EID, CF_CMD_WQ_WRITEQ_RX_ERR_EID, CF_CMD_WQ_W↩ RITEQ_TX_ERR_EID, CF_Direction_RX, CF_Direction_TX, CF_NUM_CHANNELS, CF_Queue_active, CF_Queue_↩ all, CF_Queue_history, CF_Queue_pend, CF_QueueIdx_PEND, CF_QueueIdx_RX, CF_QueueIdx_TXA, CF_Queue↩ Idx_TXW, CF_Type_all, CF_Type_down, CF_Type_up, CF_WrappedClose(), CF_WrappedOpenCreate(), CF_Write↩ HistoryQueueDataToFile(), CF_WriteTxnQueueDataToFile(), CFE_EVS_EventType_ERROR, CFE_EVS_EventType↩

_INFORMATION, CFE_EVS_SendEvent(), CFE_SUCCESS, CF_WriteQueue_Payload::chan, CF_Engine::channels, CF_HkCmdCounters::cmd, CF_HkPacket_Payload::counters, CF_AppData_t::engine, CF_HkCmdCounters::err, CF↩_WriteQueue_Payload::filename, CF_AppData_t::hk, OS_FILE_FLAG_CREATE, OS_FILE_FLAG_TRUNCATE, O↩S_OBJECT_ID_UNDEFINED, OS_WRITE_ONLY, CF_HkPacket::Payload, CF_WriteQueueCmd::Payload, CF_Write↩Queue_Payload::queue, and CF_WriteQueue_Payload::type.
Here is the call graph for this function:

12.38 apps/cf/fsw/src/cf_cmd.h File Reference

```
#include "cfe.h"
#include "cf_app.h"
#include "cf_utils.h"
```

Data Structures

- struct CF_ChanAction_BoolArg

  An object to use with channel-scope actions requiring only a boolean argument.
- struct CF_ChanAction_SuspResArg

  An object to use with channel-scope actions for suspend/resume.
- struct CF_ChanAction_BoolMsgArg

  An object to use with channel-scope actions that require the message value.
- struct CF_ChanAction_MsgArg

  An object to use with channel-scope actions that require the message value.

Typedefs

- typedef CF_ChanAction_Status_t(∗ CF_ChanActionFn_t) (uint8 chan_num, void ∗context)

  A callback function for use with CF_DoChanAction()
- typedef struct CF_ChanAction_BoolArg CF_ChanAction_BoolArg_t

  An object to use with channel-scope actions requiring only a boolean argument.
- typedef CF_TraverseAllTransactions_fn_t CF_TsnChanAction_fn_t

  A callback to use with transaction actions.
- typedef struct CF_ChanAction_SuspResArg CF_ChanAction_SuspResArg_t

  An object to use with channel-scope actions for suspend/resume.
- typedef struct CF_ChanAction_BoolMsgArg CF_ChanAction_BoolMsgArg_t

  An object to use with channel-scope actions that require the message value.
- typedef struct CF_ChanAction_MsgArg CF_ChanAction_MsgArg_t

  An object to use with channel-scope actions that require the message value.

Enumerations

- enum CF_ChanAction_Status_t { CF_ChanAction_Status_SUCCESS = 0, CF_ChanAction_Status_ERROR = -1 }

Functions

- static bool CF_ChanAction_Status_IS_SUCCESS (CF_ChanAction_Status_t stat)
- CFE_Status_t CF_SendHkCmd (const CF_SendHkCmd_t *msg)

  Send CF housekeeping packet.
- CFE_Status_t CF_WakeupCmd (const CF_WakeupCmd_t *msg)

  CF wakeup function.
- CFE_Status_t CF_NoopCmd (const CF_NoopCmd_t *msg)

  The no-operation command.
- CFE_Status_t CF_ResetCmd (const CF_ResetCmd_t *msg)

  The reset counters command.
- CFE_Status_t CF_TxFileCmd (const CF_TxFileCmd_t *msg)

  Ground command to start a file transfer.
- CFE_Status_t CF_PlaybackDirCmd (const CF_PlaybackDirCmd_t *msg)

  Ground command to start directory playback.
- CF_ChanAction_Status_t CF_DoChanAction (const CF_UnionArgs_Payload_t *data, const char *errstr, CF_ChanActionFn_t fn, void *context)

  Common logic for all channel-based commands.
- CF_ChanAction_Status_t CF_DoFreezeThaw (uint8 chan_num, void *arg)

  Channel action to set the frozen bit for a channel.
- CFE_Status_t CF_FreezeCmd (const CF_FreezeCmd_t *msg)

  Freeze a channel.
- CFE_Status_t CF_ThawCmd (const CF_ThawCmd_t *msg)

  Thaw a channel.
- CF_Transaction_t * CF_FindTransactionBySequenceNumberAllChannels (CF_TransactionSeq_t ts, CF_EntityId_t eid)

  Search for a transaction across all channels.
- int32 CF_TsnChanAction (const CF_Transaction_Payload_t *data, const char *cmdstr, CF_TsnChanAction_fn_t fn, void *context)

  Common logic for all transaction sequence number and channel commands.
- void CF_DoSuspRes_Txn (CF_Transaction_t *txn, CF_ChanAction_SuspResArg_t *context)

  Set the suspended bit in a transaction.
- void CF_DoSuspRes (const CF_Transaction_Payload_t *payload, uint8 action)

  Handle transaction suspend and resume commands.
- CFE_Status_t CF_SuspendCmd (const CF_SuspendCmd_t *msg)

  Handle transaction suspend command.
- CFE_Status_t CF_ResumeCmd (const CF_ResumeCmd_t *msg)

  Handle transaction resume command.
- void CF_CmdCancel_Txn (CF_Transaction_t *txn, void *ignored)

  tsn chan action to cancel a transaction.
- CFE_Status_t CF_CancelCmd (const CF_CancelCmd_t *msg)

  Handle a cancel ground command.
- void CF_CmdAbandon_Txn (CF_Transaction_t *txn, void *ignored)

  tsn chan action to abandon a transaction.

- CFE_Status_t CF_AbandonCmd (const CF_AbandonCmd_t ∗msg)

  Handle an abandon ground command.
- CF_ChanAction_Status_t CF_DoEnableDisableDequeue (uint8 chan_num, void ∗arg)

  Sets the dequeue enable/disable flag for a channel.
- CFE_Status_t CF_EnableDequeueCmd (const CF_EnableDequeueCmd_t ∗msg)

  Handle an enable dequeue ground command.
- CFE_Status_t CF_DisableDequeueCmd (const CF_DisableDequeueCmd_t ∗msg)

  Handle a disable dequeue ground command.
- CF_ChanAction_Status_t CF_DoEnableDisablePolldir (uint8 chan_num, void ∗arg)

  Sets the enable/disable flag for the specified polling directory.
- CFE_Status_t CF_EnableDirPollingCmd (const CF_EnableDirPollingCmd_t ∗msg)

  Enable a polling dir ground command.
- CFE_Status_t CF_DisableDirPollingCmd (const CF_DisableDirPollingCmd_t ∗msg)

  Disable a polling dir ground command.
- CF_CListTraverse_Status_t CF_PurgeHistory (CF_CListNode_t ∗node, void ∗arg)

  Purge the history queue for the given channel.
- CF_CListTraverse_Status_t CF_PurgeTransaction (CF_CListNode_t ∗node, void ∗ignored)

  Purge the pending transaction queue.
- CF_ChanAction_Status_t CF_DoPurgeQueue (uint8 chan_num, void ∗arg)

  Channel action command to perform purge queue operations.
- CFE_Status_t CF_PurgeQueueCmd (const CF_PurgeQueueCmd_t ∗msg)

  Ground command to purge either the history or pending queues.
- CFE_Status_t CF_WriteQueueCmd (const CF_WriteQueueCmd_t ∗msg)

  Ground command to write a file with queue information.
- CF_ChanAction_Status_t CF_CmdValidateChunkSize (CF_ChunkSize_t val, uint8 chan_num)

  Checks if the value is less than or equal to the max PDU size.
- CF_ChanAction_Status_t CF_CmdValidateMaxOutgoing (uint32 val, uint8 chan_num)

  Checks if the value is within allowable range as outgoing packets per wakeup.
- void CF_GetSetParamCmd (uint8 is_set, CF_GetSet_ValueID_t param_id, uint32 value, uint8 chan_num)

  Perform a configuration get/set operation.
- CFE_Status_t CF_SetParamCmd (const CF_SetParamCmd_t ∗msg)

  Ground command to set a configuration parameter.
- CFE_Status_t CF_GetParamCmd (const CF_GetParamCmd_t ∗msg)

  Ground command to set a configuration parameter.
- CFE_Status_t CF_EnableEngineCmd (const CF_EnableEngineCmd_t ∗msg)

  Ground command enable engine.
- CFE_Status_t CF_DisableEngineCmd (const CF_DisableEngineCmd_t ∗msg)

  Ground command disable engine.

12.38.1 Detailed Description

CF command processing function declarations

12.38.2 Typedef Documentation

12.38.2.1 CF_ChanAction_BoolArg_t `typedef struct CF_ChanAction_BoolArg CF_ChanAction_BoolArg_t`

An object to use with channel-scope actions requiring only a boolean argument.

12.38.2.2 CF_ChanAction_BoolMsgArg_t `typedef struct CF_ChanAction_BoolMsgArg CF_ChanAction_BoolMsgArg_t`

An object to use with channel-scope actions that require the message value.
This combines a boolean action arg with the command message value

12.38.2.3 CF_ChanAction_MsgArg_t `typedef struct CF_ChanAction_MsgArg CF_ChanAction_MsgArg_t`

An object to use with channel-scope actions that require the message value.
This combines a boolean action arg with the command message value

12.38.2.4 CF_ChanAction_SuspResArg_t `typedef struct CF_ChanAction_SuspResArg CF_ChanAction_SuspResArg_t`

An object to use with channel-scope actions for suspend/resume.
This combines a boolean action arg with an output that indicates if it was a change or not.

12.38.2.5 CF_ChanActionFn_t `typedef CF_ChanAction_Status_t(* CF_ChanActionFn_t) (uint8 chan_num, void *context)`

A callback function for use with CF_DoChanAction()

Parameters

chan_num	The CF channel number, for statistics purposes
context	Opaque object passed through from initial call

Definition at line 53 of file cf_cmd.h.

12.38.2.6 CF_TsnChanAction_fn_t `typedef CF_TraverseAllTransactions_fn_t CF_TsnChanAction_fn_t`

A callback to use with transaction actions.
For now this is the same as CF_TraverseAllTransactions_fn_t
Definition at line 68 of file cf_cmd.h.

12.38.3 Enumeration Type Documentation

12.38.3.1 CF_ChanAction_Status_t `enum CF_ChanAction_Status_t`

Enumerator

CF_ChanAction_Status_SUCCESS	
CF_ChanAction_Status_ERROR	

Definition at line 33 of file cf_cmd.h.

12.38.4 Function Documentation

12.38.4.1 CF_AbandonCmd() `CFE_Status_t CF_AbandonCmd ( const CF_AbandonCmd_t * msg )`

Handle an abandon ground command.

Assumptions, External Events, and Notes:

msg must not be NULL.

Parameters

msg	Pointer to command message

Definition at line 537 of file cf_cmd.c.
References CF_AppData, CF_CMD_ABANDON_CHAN_ERR_EID, CF_CMD_ABANDON_INF_EID, CF_Cmd↩Abandon_Txn(), CF_TsnChanAction(), CFE_EVS_EventType_ERROR, CFE_EVS_EventType_INFORMATION, CF↩E_EVS_SendEvent(), CFE_SUCCESS, CF_HkCmdCounters::cmd, CF_HkPacket_Payload::counters, CF_HkCmd↩Counters::err, CF_AppData_t::hk, CF_HkPacket::Payload, and CF_AbandonCmd::Payload.
Referenced by CF_ProcessGroundCommand().
Here is the call graph for this function:

12.38.4.2 CF_CancelCmd()

```
CFE_Status_t CF_CancelCmd (
    const CF_CancelCmd_t * msg )
```

Handle a cancel ground command.

Assumptions, External Events, and Notes:

msg must not be NULL.

Parameters

msg	Pointer to command message

Definition at line 502 of file cf_cmd.c.
References CF_AppData, CF_CMD_CANCEL_CHAN_ERR_EID, CF_CMD_CANCEL_INF_EID, CF_CmdCancel_↩Txn(), CF_TsnChanAction(), CFE_EVS_EventType_ERROR, CFE_EVS_EventType_INFORMATION, CFE_EVS_↩SendEvent(), CFE_SUCCESS, CF_HkCmdCounters::cmd, CF_HkPacket_Payload::counters, CF_HkCmdCounters↩::err, CF_AppData_t::hk, CF_HkPacket::Payload, and CF_CancelCmd::Payload.
Here is the call graph for this function:

12.38.4.3 CF_ChanAction_Status_IS_SUCCESS()

```
static bool CF_ChanAction_Status_IS_SUCCESS (
    CF_ChanAction_Status_t stat ) [inline], [static]
```

Checks if the channel action was successful
Definition at line 42 of file cf_cmd.h.
References CF_ChanAction_Status_SUCCESS.
Referenced by CF_DisableDequeueCmd(), CF_DisableDirPollingCmd(), CF_EnableDequeueCmd(), CF_EnableDir↩PollingCmd(), CF_FreezeCmd(), CF_GetSetParamCmd(), CF_PurgeQueueCmd(), and CF_ThawCmd().

12.38.4.4 CF_CmdAbandon_Txn()

```
void CF_CmdAbandon_Txn (
    CF_Transaction_t * txn,
    void * ignored )
```

tsn chan action to abandon a transaction.
This helper function is used with CF_TsnChanAction() to abandon matched transactions

Assumptions, External Events, and Notes:

msg must not be NULL.

Parameters

txn	Pointer to transaction object
ignored	Not used by this function

Definition at line 526 of file cf_cmd.c.
References CF_CFDP_ResetTransaction().
Referenced by CF_AbandonCmd().
Here is the call graph for this function:

12.38.4.5 CF_CmdCancel_Txn()

```
void CF_CmdCancel_Txn (
    CF_Transaction_t * txn,
    void * ignored )
```

tsn chan action to cancel a transaction.
This helper function is used with CF_TsnChanAction() to cancel matched transactions

Assumptions, External Events, and Notes:

txn must not be NULL.

Parameters

txn	Pointer to transaction object
ignored	Not used by this function

Definition at line 491 of file cf_cmd.c.
References CF_CFDP_CancelTransaction().
Referenced by CF_CancelCmd().

Here is the call graph for this function:

12.38.4.6 CF_CmdValidateChunkSize()

```
CF_ChanAction_Status_t CF_CmdValidateChunkSize (
    CF_ChunkSize_t val,
    uint8 chan_num )
```

Checks if the value is less than or equal to the max PDU size.

Assumptions, External Events, and Notes:

None

Parameters

val	Size of chunk to test
chan_num	Ignored by this implementation

Returns

status code indicating if check passed

Return values

CF_ChanAction_Status_SUCCESS	if successful (val is less than or equal to max PDU)
CF_ChanAction_Status_ERROR	if failed (val is greater than max PDU)

Definition at line 949 of file cf_cmd.c.
References CF_ChanAction_Status_ERROR, and CF_ChanAction_Status_SUCCESS.
Referenced by CF_GetSetParamCmd().

12.38.4.7 CF_CmdValidateMaxOutgoing()

```
CF_ChanAction_Status_t CF_CmdValidateMaxOutgoing (
    uint32 val,
    uint8 chan_num )
```

Checks if the value is within allowable range as outgoing packets per wakeup.

Assumptions, External Events, and Notes:

None

Parameters

val	Number to test
chan_num	CF channel number

Returns

status code indicating if check passed

Return values

CF_ChanAction_Status_SUCCESS	if successful (val is allowable as max packets per wakeup)
CF_ChanAction_Status_ERROR	if failed (val is not allowed)

Definition at line 965 of file cf_cmd.c.
References CF_AppData, CF_ChanAction_Status_ERROR, CF_ChanAction_Status_SUCCESS, CF_ConfigTable↩ ::chan, CF_AppData_t::config_table, and CF_ChannelConfig::sem_name.
Referenced by CF_GetSetParamCmd().

12.38.4.8 CF_DisableDequeueCmd()

```
CFE_Status_t CF_DisableDequeueCmd (
    const CF_DisableDequeueCmd_t * msg )
```

Handle a disable dequeue ground command.

Assumptions, External Events, and Notes:

msg must not be NULL.

Parameters

msg	Pointer to command message

Definition at line 600 of file cf_cmd.c.
References CF_AppData, CF_ChanAction_Status_IS_SUCCESS(), CF_CMD_DISABLE_DEQUEUE_ERR_EID, CF↩ _CMD_DISABLE_DEQUEUE_INF_EID, CF_DoChanAction(), CF_DoEnableDisableDequeue(), CFE_EVS_Event↩ Type_ERROR, CFE_EVS_EventType_INFORMATION, CFE_EVS_SendEvent(), CFE_SUCCESS, CF_HkCmd↩ Counters::cmd, CF_HkPacket_Payload::counters, CF_HkCmdCounters::err, CF_AppData_t::hk, CF_HkPacket::↩ Payload, and CF_DisableDequeueCmd::Payload.

Here is the call graph for this function:

12.38.4.9 CF_DisableDirPollingCmd()

```
CFE_Status_t CF_DisableDirPollingCmd (
    const CF_DisableDirPollingCmd_t * msg )
```

Disable a polling dir ground command.

Assumptions, External Events, and Notes:

msg must not be NULL.

Parameters

msg	Pointer to command message

Definition at line 685 of file cf_cmd.c.
References CF_AppData, CF_ChanAction_Status_IS_SUCCESS(), CF_CMD_DISABLE_POLLDIR_ERR_EID, CF_CMD_DISABLE_POLLDIR_INF_EID, CF_DoChanAction(), CF_DoEnableDisablePolldir(), CFE_EVS_EventType_ERROR, CFE_EVS_EventType_INFORMATION, CFE_EVS_SendEvent(), CFE_SUCCESS, CF_HkCmdCounters::cmd, CF_HkPacket_Payload::counters, CF_HkCmdCounters::err, CF_AppData_t::hk, CF_HkPacket::Payload, and CF_DisableDirPollingCmd::Payload.
Here is the call graph for this function:

12.38.4.10 CF_DisableEngineCmd()

```
CFE_Status_t CF_DisableEngineCmd (
    const CF_DisableEngineCmd_t * msg )
```

Ground command disable engine.

Assumptions, External Events, and Notes:

msg must not be NULL.

Parameters

msg	Pointer to command message

Definition at line 1201 of file cf_cmd.c.
References CF_AppData, CF_CFDP_DisableEngine(), CF_CMD_DISABLE_ENGINE_INF_EID, CF_CMD_ENG_A↩LREADY_DIS_INF_EID, CFE_EVS_EventType_INFORMATION, CFE_EVS_SendEvent(), CFE_SUCCESS, CF_Hk↩CmdCounters::cmd, CF_HkPacket_Payload::counters, CF_Engine::enabled, CF_AppData_t::engine, CF_AppData_t↩::hk, and CF_HkPacket::Payload.
Referenced by CF_ProcessGroundCommand().
Here is the call graph for this function:

12.38.4.11 CF_DoChanAction()

```
CF_ChanAction_Status_t CF_DoChanAction (
    const CF_UnionArgs_Payload_t * data,
    const char * errstr,
    CF_ChanActionFn_t fn,
    void * context )
```

Common logic for all channel-based commands.

Description

All the commands that act on channels or have the special "all channels" parameter come through this function. This puts all common logic in one place. It does not handle the command accept or reject counters.

Assumptions, External Events, and Notes:

cmd must not be NULL, errstr must not be NULL, fn must be a valid function, context may be NULL.

Parameters

data	Pointer to payload being processed
errstr	String to be included in the EVS event if command should fail
fn	Callback action function to invoke for each affected channel
context	Opaque pointer to pass through to callback (not used in this function)

Returns

The return value from the given action function.

Return values

CF_ChanAction_Status_ERROR	on error

Definition at line 233 of file cf_cmd.c.
References CF_UnionArgs_Payload::byte, CF_ALL_CHANNELS, CF_ChanAction_Status_ERROR, CF_ChanAction↩_Status_SUCCESS, CF_CMD_CHAN_PARAM_ERR_EID, CF_NUM_CHANNELS, CFE_EVS_EventType_ERROR, and CFE_EVS_SendEvent().
Referenced by CF_DisableDequeueCmd(), CF_DisableDirPollingCmd(), CF_EnableDequeueCmd(), CF_EnableDir↩PollingCmd(), CF_FreezeCmd(), CF_PurgeQueueCmd(), and CF_ThawCmd().
Here is the call graph for this function:

12.38.4.12 CF_DoEnableDisableDequeue()

```
CF_ChanAction_Status_t CF_DoEnableDisableDequeue (
    uint8 chan_num,
    void * arg )
```

Sets the dequeue enable/disable flag for a channel.

Assumptions, External Events, and Notes:

context must not be NULL.

Parameters

chan_num	channel number
arg	context pointer to object, must be CF_ChanAction_BoolArg_t∗

Returns

Always succeeds, so returns CF_ChanAction_Status_SUCCESS.

Definition at line 561 of file cf_cmd.c.
References CF_ChanAction_BoolArg::barg, CF_AppData, CF_ChanAction_Status_SUCCESS, CF_ConfigTable::chan, CF_AppData_t::config_table, and CF_ChannelConfig::dequeue_enabled.
Referenced by CF_DisableDequeueCmd(), and CF_EnableDequeueCmd().

12.38.4.13 CF_DoEnableDisablePolldir()

```
CF_ChanAction_Status_t CF_DoEnableDisablePolldir (
```

```
uint8 chan_num,
void * arg )
```

Sets the enable/disable flag for the specified polling directory.

Assumptions, External Events, and Notes:

context must not be NULL.

Parameters

chan_num	channel number
arg	context pointer to object, must be CF_ChanAction_BoolMsgArg_t*

Returns

success/fail status code

Return values

CF_ChanAction_Status_SUCCESS	if successful
CF_ChanAction_Status_ERROR	if failed

Definition at line 625 of file cf_cmd.c.
References CF_ChanAction_BoolMsgArg::barg, CF_UnionArgs_Payload::byte, CF_ALL_POLLDIRS, CF_AppData, CF_ChanAction_Status_ERROR, CF_ChanAction_Status_SUCCESS, CF_CMD_POLLDIR_INVALID_ERR_EID, CF_MAX_POLLING_DIR_PER_CHAN, CFE_EVS_EventType_ERROR, CFE_EVS_SendEvent(), CF_ConfigTable::chan, CF_AppData_t::config_table, CF_ChanAction_BoolMsgArg::data, CF_PollDir::enabled, and CF_ChannelConfig::polldir.
Referenced by CF_DisableDirPollingCmd(), and CF_EnableDirPollingCmd().
Here is the call graph for this function:

12.38.4.14 CF_DoFreezeThaw()

```
CF_ChanAction_Status_t CF_DoFreezeThaw (
uint8 chan_num,
void * arg )
```

Channel action to set the frozen bit for a channel.

Assumptions, External Events, and Notes:

context must not be NULL.

Parameters

chan_num	channel number
arg	context pointer to object, must be CF_ChanAction_BoolArg_t*

Returns

Always succeeds, so returns CF_ChanAction_Status_SUCCESS.

Definition at line 269 of file cf_cmd.c.
References CF_ChanAction_BoolArg::barg, CF_AppData, CF_ChanAction_Status_SUCCESS, CF_HkPacket_↩Payload::channel_hk, CF_HkChannel_Data::frozen, CF_AppData_t::hk, and CF_HkPacket::Payload.
Referenced by CF_FreezeCmd(), and CF_ThawCmd().

12.38.4.15 CF_DoPurgeQueue()

```
CF_ChanAction_Status_t CF_DoPurgeQueue (
    uint8 chan_num,
    void * arg )
```

Channel action command to perform purge queue operations.

Description

Determines from the command parameters which queues to traverse and purge state.

Assumptions, External Events, and Notes:

None

Parameters

chan_num	CF channel number
arg	Pointer to purge queue command

Returns

integer status code indicating success or failure

Return values

CF_ChanAction_Status_SUCCESS	if successful
CF_ChanAction_Status_ERROR	on error

Definition at line 739 of file cf_cmd.c.
References CF_UnionArgs_Payload::byte, CF_AppData, CF_ChanAction_Status_ERROR, CF_ChanAction_Status↩_SUCCESS, CF_CList_Traverse(), CF_CMD_PURGE_ARG_ERR_EID, CF_PurgeHistory(), CF_PurgeTransaction(), CF_QueueIdx_HIST, CF_QueueIdx_PEND, CFE_EVS_EventType_ERROR, CFE_EVS_SendEvent(), CF_Engine↩::channels, CF_AppData_t::engine, and CF_Channel::qs.
Referenced by CF_PurgeQueueCmd().

Here is the call graph for this function:

12.38.4.16 CF_DoSuspRes()

```
void CF_DoSuspRes (
    const CF_Transaction_Payload_t * payload,
    uint8 action )
```

Handle transaction suspend and resume commands.

Description

This is called for both suspend and resume ground commands. It uses the CF_TsnChanAction() function to perform the command.

Assumptions, External Events, and Notes:

payload must not be NULL.

Parameters

payload	Pointer to the command message
action	Action to take (suspend or resume)

Definition at line 426 of file cf_cmd.c.
References CF_AppData, CF_CMD_SUSPRES_CHAN_ERR_EID, CF_CMD_SUSPRES_INF_EID, CF_CMD_SU↩SPRES_SAME_INF_EID, CF_DoSuspRes_Txn(), CF_TsnChanAction(), CFE_EVS_EventType_ERROR, CFE_EV↩S_EventType_INFORMATION, CFE_EVS_SendEvent(), CF_HkCmdCounters::cmd, CF_HkPacket_Payload::counters, CF_HkCmdCounters::err, CF_AppData_t::hk, CF_HkPacket::Payload, and CF_ChanAction_SuspResArg::same.
Referenced by CF_ResumeCmd(), and CF_SuspendCmd().

Here is the call graph for this function:

12.38.4.17 CF_DoSuspRes_Txn()

```
void CF_DoSuspRes_Txn (
    CF_Transaction_t * txn,
    CF_ChanAction_SuspResArg_t * context )
```

Set the suspended bit in a transaction.

Assumptions, External Events, and Notes:

txn must not be NULL. context must not be NULL.

Parameters

txn	Pointer to the transaction object
context	Pointer to CF_ChanAction_SuspResArg_t structure from initial call

Definition at line 407 of file cf_cmd.c.
References CF_ChanAction_SuspResArg::action, CF_Assert, CF_StateFlags::com, CF_Transaction::flags, CF_↩ ChanAction_SuspResArg::same, and CF_Flags_Common::suspended.
Referenced by CF_DoSuspRes().

12.38.4.18 CF_EnableDequeueCmd()

```
CFE_Status_t CF_EnableDequeueCmd (
    const CF_EnableDequeueCmd_t * msg )
```

Handle an enable dequeue ground command.

Assumptions, External Events, and Notes:

msg must not be NULL.

Parameters

msg	Pointer to command message

Definition at line 575 of file cf_cmd.c.
References CF_AppData, CF_ChanAction_Status_IS_SUCCESS(), CF_CMD_ENABLE_DEQUEUE_ERR_EID, CF↩ _CMD_ENABLE_DEQUEUE_INF_EID, CF_DoChanAction(), CF_DoEnableDisableDequeue(), CFE_EVS_Event↩ Type_ERROR, CFE_EVS_EventType_INFORMATION, CFE_EVS_SendEvent(), CFE_SUCCESS, CF_HkCmd↩ Counters::cmd, CF_HkPacket_Payload::counters, CF_HkCmdCounters::err, CF_AppData_t::hk, CF_HkPacket::↩ Payload, and CF_EnableDequeueCmd::Payload.
Referenced by CF_ProcessGroundCommand().

Here is the call graph for this function:

12.38.4.19 CF_EnableDirPollingCmd()

```
CFE_Status_t CF_EnableDirPollingCmd (
    const CF_EnableDirPollingCmd_t * msg )
```

Enable a polling dir ground command.

Assumptions, External Events, and Notes:

msg must not be NULL.

Parameters

msg	Pointer to command message

Definition at line 658 of file cf_cmd.c.
References CF_AppData, CF_ChanAction_Status_IS_SUCCESS(), CF_CMD_ENABLE_POLLDIR_ERR_EID, CF_↩CMD_ENABLE_POLLDIR_INF_EID, CF_DoChanAction(), CF_DoEnableDisablePolldir(), CFE_EVS_EventType_ER↩ROR, CFE_EVS_EventType_INFORMATION, CFE_EVS_SendEvent(), CFE_SUCCESS, CF_HkCmdCounters::cmd, CF_HkPacket_Payload::counters, CF_HkCmdCounters::err, CF_AppData_t::hk, CF_HkPacket::Payload, and CF_↩EnableDirPollingCmd::Payload.
Referenced by CF_ProcessGroundCommand().
Here is the call graph for this function:

12.38.4.20 CF_EnableEngineCmd()

```
CFE_Status_t CF_EnableEngineCmd (
    const CF_EnableEngineCmd_t * msg )
```

Ground command enable engine.

Assumptions, External Events, and Notes:

msg must not be NULL.

Parameters

msg	Pointer to command message

Definition at line 1169 of file cf_cmd.c.
References CF_AppData, CF_CFDP_InitEngine(), CF_CMD_ENABLE_ENGINE_ERR_EID, CF_CMD_ENABLE_EN↩GINE_INF_EID, CF_CMD_ENG_ALREADY_ENA_INF_EID, CFE_EVS_EventType_ERROR, CFE_EVS_EventType↩_INFORMATION, CFE_EVS_SendEvent(), CFE_SUCCESS, CF_HkCmdCounters::cmd, CF_HkPacket_Payload↩::counters, CF_Engine::enabled, CF_AppData_t::engine, CF_HkCmdCounters::err, CF_AppData_t::hk, and CF_Hk↩Packet::Payload.
Here is the call graph for this function:

12.38.4.21 CF_FindTransactionBySequenceNumberAllChannels()

```
CF_Transaction_t* CF_FindTransaction↩
BySequenceNumberAllChannels (
    CF_TransactionSeq_t ts,
    CF_EntityId_t eid )
```

Search for a transaction across all channels.

Assumptions, External Events, and Notes:

None

Parameters

ts	Transaction sequence number to find
eid	Entity ID of the transaction

Returns

Pointer to the transaction, if found

Return values

NULL	if transaction not found

Definition at line 331 of file cf_cmd.c.
References CF_AppData, CF_FindTransactionBySequenceNumber(), CF_NUM_CHANNELS, CF_Engine::channels, and CF_AppData_t::engine.
Referenced by CF_TsnChanAction().
Here is the call graph for this function:

12.38.4.22 CF_FreezeCmd()

```
CFE_Status_t CF_FreezeCmd (
    const CF_FreezeCmd_t * msg )
```

Freeze a channel.

Assumptions, External Events, and Notes:

msg must not be NULL.

Parameters

msg	Pointer to command message

Definition at line 283 of file cf_cmd.c.
References CF_AppData, CF_ChanAction_Status_IS_SUCCESS(), CF_CMD_FREEZE_ERR_EID, CF_CMD_FREEZE_INF_EID, CF_DoChanAction(), CF_DoFreezeThaw(), CFE_EVS_EventType_ERROR, CFE_EVS_EventType_INFORMATION, CFE_EVS_SendEvent(), CFE_SUCCESS, CF_HkCmdCounters::cmd, CF_HkPacket_Payload::counters, CF_HkCmdCounters::err, CF_AppData_t::hk, CF_HkPacket::Payload, and CF_FreezeCmd::Payload.

Here is the call graph for this function:

12.38.4.23 CF_GetParamCmd() `CFE_Status_t CF_GetParamCmd ( const CF_GetParamCmd_t * msg )`

Ground command to set a configuration parameter.

Assumptions, External Events, and Notes:

msg must not be NULL.

Parameters

msg	Pointer to command message

Definition at line 1154 of file cf_cmd.c.
References CF_GetSetParamCmd(), CFE_SUCCESS, CF_GetParam_Payload::chan_num, CF_GetParam_Payload↩::key, and CF_GetParamCmd::Payload.
Referenced by CF_ProcessGroundCommand().
Here is the call graph for this function:

12.38.4.24 CF_GetSetParamCmd()

```
void CF_GetSetParamCmd (
    uint8 is_set,
    CF_GetSet_ValueID_t param_id,
    uint32 value,
    uint8 chan_num )
```

Perform a configuration get/set operation.

For a set, this sets the value within the CF configuration For a get, this generates an EVS event with the requested information

Description

Combine get and set in one function with common logic.

Assumptions, External Events, and Notes:

None

Parameters

is_set	Whether to get (0) or set (1)
param_id	Parameter ID
value	Value to get/set
chan_num	Channel number to operate on

Definition at line 984 of file cf_cmd.c.

References CF_ChannelConfig::ack_limit, CF_ChannelConfig::ack_timer_s, CF_AppData, CF_ChanAction_Status_I↩S_SUCCESS(), CF_CMD_GETSET1_INF_EID, CF_CMD_GETSET2_INF_EID, CF_CMD_GETSET_CHAN_ERR_E↩ID, CF_CMD_GETSET_PARAM_ERR_EID, CF_CMD_GETSET_VALIDATE_ERR_EID, CF_CmdValidateChunkSize(), CF_CmdValidateMaxOutgoing(), CF_ERROR, CF_GetSet_ValueID_ack_limit, CF_GetSet_ValueID_ack_timer_s, C↩F_GetSet_ValueID_chan_max_outgoing_messages_per_wakeup, CF_GetSet_ValueID_inactivity_timer_s, CF_Get↩Set_ValueID_local_eid, CF_GetSet_ValueID_nak_limit, CF_GetSet_ValueID_nak_timer_s, CF_GetSet_ValueID_↩outgoing_file_chunk_size, CF_GetSet_ValueID_rx_crc_calc_bytes_per_wakeup, CF_GetSet_ValueID_ticks_per_↩second, CF_NUM_CHANNELS, CFE_EVS_EventType_ERROR, CFE_EVS_EventType_INFORMATION, CFE_EVS↩_SendEvent(), CFE_SUCCESS, CF_ConfigTable::chan, CF_HkCmdCounters::cmd, CF_AppData_t::config_table, C↩F_HkPacket_Payload::counters, CF_HkCmdCounters::err, CF_AppData_t::hk, CF_ChannelConfig::inactivity_timer_s, CF_ConfigTable::local_eid, CF_ChannelConfig::max_outgoing_messages_per_wakeup, CF_ChannelConfig::nak_limit, CF_ChannelConfig::nak_timer_s, CF_ConfigTable::outgoing_file_chunk_size, CF_HkPacket::Payload, CF_Config↩Table::rx_crc_calc_bytes_per_wakeup, and CF_ConfigTable::ticks_per_second.

Referenced by CF_GetParamCmd(), and CF_SetParamCmd().

Here is the call graph for this function:

12.38.4.25 CF_NoopCmd()

```
CFE_Status_t CF_NoopCmd (
    const CF_NoopCmd_t * msg )
```

The no-operation command.

Description

This function has a signature the same of all cmd_ functions. This function simply prints an event message. Increments the command accept counter. The msg parameter is ignored in this one.

Assumptions, External Events, and Notes:

None

Parameters

msg	Pointer to command message

Definition at line 48 of file cf_cmd.c.
References CF_AppData, CF_MAJOR_VERSION, CF_MINOR_VERSION, CF_MISSION_REV, CF_NOOP_INF_E↩ID, CF_REVISION, CFE_EVS_EventType_INFORMATION, CFE_EVS_SendEvent(), CFE_SUCCESS, CF_HkCmd↩Counters::cmd, CF_HkPacket_Payload::counters, CF_AppData_t::hk, and CF_HkPacket::Payload.

Here is the call graph for this function:

12.38.4.26 CF_PlaybackDirCmd() `CFE_Status_t CF_PlaybackDirCmd ( const CF_PlaybackDirCmd_t * msg )`

Ground command to start directory playback.

Description

This function has a signature the same of all cmd_ functions. Increments the command accept or reject counter.

Assumptions, External Events, and Notes:

msg must not be NULL.

Parameters

msg	Pointer to command message

Definition at line 183 of file cf_cmd.c.
References CF_AppData, CF_CFDP_CLASS_1, CF_CFDP_CLASS_2, CF_CFDP_PlaybackDir(), CF_CMD_BAD_PARAM_ERR_EID, CF_CMD_PLAYBACK_DIR_ERR_EID, CF_CMD_PLAYBACK_DIR_INF_EID, CF_NUM_CHANNELS, CF_TxFile_Payload::cfdp_class, CFE_EVS_EventType_ERROR, CFE_EVS_EventType_INFORMATION, CFE_EVS_SendEvent(), CFE_SUCCESS, CF_TxFile_Payload::chan_num, CF_HkCmdCounters::cmd, CF_HkPacket_Payload::counters, CF_TxFile_Payload::dest_id, CF_TxFile_Payload::dst_filename, CF_HkCmdCounters::err, CF_AppData_t::hk, CF_TxFile_Payload::keep, CF_HkPacket::Payload, CF_PlaybackDirCmd::Payload, CF_TxFile_Payload::priority, and CF_TxFile_Payload::src_filename.
Referenced by CF_ProcessGroundCommand().
Here is the call graph for this function:

12.38.4.27 CF_PurgeHistory() `CF_CListTraverse_Status_t CF_PurgeHistory (`

```
CF_CListNode_t * node,
void * arg )
```

Purge the history queue for the given channel.
This helper function is used in conjunction with CF_CList_Traverse()

Assumptions, External Events, and Notes:

node must not be NULL. chan must not be NULL.

Parameters

node	Current list node being traversed
arg	Channel pointer passed through as opaque object, must be CF_Channel_t*

Returns

Always CF_CLIST_CONT to process all entries

Definition at line 712 of file cf_cmd.c.
References CF_CLIST_CONT, CF_ResetHistory(), and container_of.
Referenced by CF_DoPurgeQueue().
Here is the call graph for this function:

12.38.4.28 CF_PurgeQueueCmd()

```
CFE_Status_t CF_PurgeQueueCmd (
const CF_PurgeQueueCmd_t * msg )
```

Ground command to purge either the history or pending queues.

Assumptions, External Events, and Notes:

msg must not be NULL.

Parameters

msg	Pointer to command message

Definition at line 790 of file cf_cmd.c.
References CF_AppData, CF_ChanAction_Status_IS_SUCCESS(), CF_CMD_PURGE_QUEUE_ERR_EID, CF_C↩MD_PURGE_QUEUE_INF_EID, CF_DoChanAction(), CF_DoPurgeQueue(), CFE_EVS_EventType_ERROR, CFE↩_EVS_EventType_INFORMATION, CFE_EVS_SendEvent(), CFE_SUCCESS, CF_HkCmdCounters::cmd, CF_Hk↩Packet_Payload::counters, CF_HkCmdCounters::err, CF_AppData_t::hk, CF_HkPacket::Payload, and CF_Purge↩QueueCmd::Payload.
Referenced by CF_ProcessGroundCommand().

Here is the call graph for this function:

12.38.4.29 CF_PurgeTransaction()

```
CF_CListTraverse_Status_t CF_PurgeTransaction (
    CF_CListNode_t * node,
    void * ignored )
```

Purge the pending transaction queue.

This helper function is used in conjunction with CF_CList_Traverse()

Assumptions, External Events, and Notes:

node must not be NULL.

Parameters

node	Current list node being traversed
ignored	Not used by this implementation

Returns

Always CF_CLIST_CONT to process all entries

Definition at line 726 of file cf_cmd.c.
References CF_CFDP_ResetTransaction(), CF_CLIST_CONT, and container_of.
Referenced by CF_DoPurgeQueue().
Here is the call graph for this function:

12.38.4.30 CF_ResetCmd()

```
CFE_Status_t CF_ResetCmd (
    const CF_ResetCmd_t * msg )
```

The reset counters command.

Description

This function has a signature the same of all cmd_ functions. Resets the given counter, or all. Increments the command accept or reject counter. If the command counters are reset, then there is no increment.

Assumptions, External Events, and Notes:

msg must not be NULL.

Parameters

msg	Pointer to command message

Definition at line 64 of file cf_cmd.c.
References CF_UnionArgs_Payload::byte, CF_AppData, CF_CMD_RESET_INVALID_ERR_EID, CF_NUM_CHAN↩NELS, CF_Reset_all, CF_Reset_command, CF_Reset_down, CF_Reset_fault, CF_RESET_INF_EID, CF_Reset_↩

up, CFE_EVS_EventType_ERROR, CFE_EVS_EventType_INFORMATION, CFE_EVS_SendEvent(), CFE_SUCCE↩SS, CF_HkPacket_Payload::channel_hk, CF_HkCmdCounters::cmd, CF_HkChannel_Data::counters, CF_HkPacket↩_Payload::counters, CF_HkCmdCounters::err, CF_HkCounters::fault, CF_AppData_t::hk, CF_HkPacket::Payload, C↩F_ResetCmd::Payload, CF_HkCounters::recv, and CF_HkCounters::sent.
Referenced by CF_ProcessGroundCommand().
Here is the call graph for this function:

12.38.4.31 CF_ResumeCmd()

```
CFE_Status_t CF_ResumeCmd (
    const CF_ResumeCmd_t * msg )
```

Handle transaction resume command.

Assumptions, External Events, and Notes:

msg must not be NULL.

Parameters

msg	Pointer to command message

Definition at line 479 of file cf_cmd.c.
References CF_DoSuspRes(), CFE_SUCCESS, and CF_ResumeCmd::Payload.
Referenced by CF_ProcessGroundCommand().
Here is the call graph for this function:

12.38.4.32 CF_SendHkCmd()

```
CFE_Status_t CF_SendHkCmd (
    const CF_SendHkCmd_t * msg )
```

Send CF housekeeping packet.

Description

The command to send the CF housekeeping packet

Assumptions, External Events, and Notes:

None

Parameters

msg	Pointer to command message

Definition at line 1225 of file cf_cmd.c.
References CF_AppData, CF_CheckTables(), CFE_MSG_SetMsgTime(), CFE_SB_TransmitMsg(), CFE_SUCCESS, CFE_TIME_GetTime(), CF_AppData_t::hk, and CF_HkPacket::TelemetryHeader.
Referenced by CF_AppPipe().
Here is the call graph for this function:

12.38.4.33 CF_SetParamCmd()

```
CFE_Status_t CF_SetParamCmd (
    const CF_SetParamCmd_t * msg )
```

Ground command to set a configuration parameter.

Assumptions, External Events, and Notes:

msg must not be NULL.

Parameters

msg	Pointer to command message

Definition at line 1139 of file cf_cmd.c.
References CF_GetSetParamCmd(), CFE_SUCCESS, CF_SetParam_Payload::chan_num, CF_SetParam_Payload↩::key, CF_SetParamCmd::Payload, and CF_SetParam_Payload::value.

Here is the call graph for this function:

12.38.4.34 CF_SuspendCmd()

```
CFE_Status_t CF_SuspendCmd (
    const CF_SuspendCmd_t * msg )
```

Handle transaction suspend command.

Assumptions, External Events, and Notes:

msg must not be NULL.

Parameters

msg	Pointer to command message

Definition at line 467 of file cf_cmd.c.
References CF_DoSuspRes(), CFE_SUCCESS, and CF_SuspendCmd::Payload.
Here is the call graph for this function:

12.38.4.35 CF_ThawCmd()

```
CFE_Status_t CF_ThawCmd (
    const CF_ThawCmd_t * msg )
```

Thaw a channel.

Assumptions, External Events, and Notes:

msg must not be NULL.

Parameters

msg	Pointer to command message

Definition at line 307 of file cf_cmd.c.
References CF_AppData, CF_ChanAction_Status_IS_SUCCESS(), CF_CMD_THAW_ERR_EID, CF_CMD_THAW_INF_EID, CF_DoChanAction(), CF_DoFreezeThaw(), CFE_EVS_EventType_ERROR, CFE_EVS_EventType_INFORMATION, CFE_EVS_SendEvent(), CFE_SUCCESS, CF_HkCmdCounters::cmd, CF_HkPacket_Payload::counters, CF_HkCmdCounters::err, CF_AppData_t::hk, CF_HkPacket::Payload, and CF_ThawCmd::Payload.
Referenced by CF_ProcessGroundCommand().
Here is the call graph for this function:

12.38.4.36 CF_TsnChanAction()

```
int32 CF_TsnChanAction (
    const CF_Transaction_Payload_t * data,
    const char * cmdstr,
    CF_TsnChanAction_fn_t fn,
    void * context )
```

Common logic for all transaction sequence number and channel commands.

Description

All the commands that on a transaction on a particular channel come through this function. This puts all common logic in one place. It does handle the command accept or reject counters.

Assumptions, External Events, and Notes:

cmd must not be NULL, fn must be a valid function, context may be NULL.

Parameters

data	Pointer to payload being processed
cmdstr	String to include in any generated EVS events
fn	Callback function to invoke for each matched transaction
context	Opaque object to pass through to the callback

Returns

returns the number of transactions acted upon

Definition at line 359 of file cf_cmd.c.
References CF_ALL_CHANNELS, CF_AppData, CF_CMD_TRANS_NOT_FOUND_ERR_EID, CF_CMD_TSN_CH↩AN_INVALID_ERR_EID, CF_COMPOUND_KEY, CF_FindTransactionBySequenceNumberAllChannels(), CF_NUM_↩CHANNELS, CF_TraverseAllTransactions(), CF_TraverseAllTransactions_All_Channels(), CFE_EVS_EventType_ER↩ROR, CFE_EVS_SendEvent(), CF_Transaction_Payload::chan, CF_Engine::channels, CF_Transaction_Payload::eid, CF_AppData_t::engine, and CF_Transaction_Payload::ts.
Referenced by CF_AbandonCmd(), CF_CancelCmd(), and CF_DoSuspRes().
Here is the call graph for this function:

12.38.4.37 CF_TxFileCmd()

```
CFE_Status_t CF_TxFileCmd (
    const CF_TxFileCmd_t * msg )
```

Ground command to start a file transfer.

Description

This function has a signature the same of all cmd_ functions. Increments the command accept or reject counter.

Assumptions, External Events, and Notes:

msg must not be NULL.

Parameters

msg	Pointer to command message

Definition at line 134 of file cf_cmd.c.
References CF_AppData, CF_CFDP_CLASS_1, CF_CFDP_CLASS_2, CF_CFDP_TxFile(), CF_CMD_BAD_PAR↩AM_ERR_EID, CF_CMD_TX_FILE_ERR_EID, CF_CMD_TX_FILE_INF_EID, CF_NUM_CHANNELS, CF_TxFile_↩Payload::cfdp_class, CFE_EVS_EventType_ERROR, CFE_EVS_EventType_INFORMATION, CFE_EVS_SendEvent(), CFE_SUCCESS, CF_TxFile_Payload::chan_num, CF_HkCmdCounters::cmd, CF_HkPacket_Payload::counters, CF↩_TxFile_Payload::dest_id, CF_TxFile_Payload::dst_filename, CF_HkCmdCounters::err, CF_AppData_t::hk, CF_Tx↩File_Payload::keep, CF_HkPacket::Payload, CF_TxFileCmd::Payload, CF_TxFile_Payload::priority, and CF_TxFile_↩Payload::src_filename.

Here is the call graph for this function:

12.38.4.38 CF_WakeupCmd()

```
CFE_Status_t CF_WakeupCmd (
    const CF_WakeupCmd_t * msg )
```

CF wakeup function.

Description

Performs a single engine cycle for each wakeup

Assumptions, External Events, and Notes:

None

Parameters

msg	Pointer to command message

Definition at line 1242 of file cf_cmd.c.
References CF_CFDP_CycleEngine(), CF_PERF_ID_CYCLE_ENG, CFE_ES_PerfLogEntry, CFE_ES_PerfLogExit, and CFE_SUCCESS.
Referenced by CF_AppPipe().

Here is the call graph for this function:

12.38.4.39 CF_WriteQueueCmd()

```
CFE_Status_t CF_WriteQueueCmd (
    const CF_WriteQueueCmd_t * msg )
```

Ground command to write a file with queue information.

Assumptions, External Events, and Notes:

msg must not be NULL.

Parameters

msg	Pointer to command message

Definition at line 813 of file cf_cmd.c.

References CF_AppData, CF_CMD_WQ_ARGS_ERR_EID, CF_CMD_WQ_CHAN_ERR_EID, CF_CMD_WQ_INF_↩ EID, CF_CMD_WQ_OPEN_ERR_EID, CF_CMD_WQ_WRITEHIST_RX_ERR_EID, CF_CMD_WQ_WRITEHIST_TX↩ _ERR_EID, CF_CMD_WQ_WRITEQ_PEND_ERR_EID, CF_CMD_WQ_WRITEQ_RX_ERR_EID, CF_CMD_WQ_W↩ RITEQ_TX_ERR_EID, CF_Direction_RX, CF_Direction_TX, CF_NUM_CHANNELS, CF_Queue_active, CF_Queue_↩ all, CF_Queue_history, CF_Queue_pend, CF_QueueIdx_PEND, CF_QueueIdx_RX, CF_QueueIdx_TXA, CF_Queue↩ Idx_TXW, CF_Type_all, CF_Type_down, CF_Type_up, CF_WrappedClose(), CF_WrappedOpenCreate(), CF_Write↩ HistoryQueueDataToFile(), CF_WriteTxnQueueDataToFile(), CFE_EVS_EventType_ERROR, CFE_EVS_EventType↩

_INFORMATION, CFE_EVS_SendEvent(), CFE_SUCCESS, CF_WriteQueue_Payload::chan, CF_Engine::channels, CF_HkCmdCounters::cmd, CF_HkPacket_Payload::counters, CF_AppData_t::engine, CF_HkCmdCounters::err, CF↩_WriteQueue_Payload::filename, CF_AppData_t::hk, OS_FILE_FLAG_CREATE, OS_FILE_FLAG_TRUNCATE, O↩S_OBJECT_ID_UNDEFINED, OS_WRITE_ONLY, CF_HkPacket::Payload, CF_WriteQueueCmd::Payload, CF_Write↩Queue_Payload::queue, and CF_WriteQueue_Payload::type.
Here is the call graph for this function:

12.39 apps/cf/fsw/src/cf_codec.c File Reference

```
#include "cf_app.h"
#include "cf_cfdp_pdu.h"
#include "cf_codec.h"
#include "cf_events.h"
#include <stdint.h>
```

Data Structures

- struct CF_Codec_BitField

Macros

- #define CF_INIT_FIELD(NBITS, SHIFT)
- #define FGV(SRC, NAME) (CF_FieldGetVal((SRC).octets, (NAME).shift, (NAME).mask))
- #define FSV(DEST, NAME, VAL) (CF_FieldSetVal((DEST).octets, (NAME).shift, (NAME).mask, VAL))

Typedefs

- typedef struct CF_Codec_BitField CF_Codec_BitField_t

Functions

- static uint8 CF_FieldGetVal (const uint8 ∗src, uint8 shift, uint8 mask)
- static void CF_FieldSetVal (uint8 ∗dest, uint8 shift, uint8 mask, uint8 val)
- static void CF_Codec_Store_uint8 (CF_CFDP_uint8_t ∗pdst, uint8 val)
- static void CF_Codec_Store_uint16 (CF_CFDP_uint16_t ∗pdst, uint16 val)
- static void CF_Codec_Store_uint32 (CF_CFDP_uint32_t ∗pdst, uint32 val)
- static void CF_Codec_Store_uint64 (CF_CFDP_uint64_t ∗pdst, uint64 val)
- static void CF_Codec_Load_uint8 (uint8 ∗pdst, const CF_CFDP_uint8_t ∗psrc)
- static void CF_Codec_Load_uint16 (uint16 ∗pdst, const CF_CFDP_uint16_t ∗psrc)
- static void CF_Codec_Load_uint32 (uint32 ∗pdst, const CF_CFDP_uint32_t ∗psrc)

- static void CF_Codec_Load_uint64 (uint64 *pdst, const CF_CFDP_uint64_t *psrc)
- bool CF_CFDP_CodecCheckSize (CF_CodecState_t *state, size_t chunksize)

  Advances the position by the indicated size, confirming the block will fit into the PDU.
- void * CF_CFDP_DoEncodeChunk (CF_EncoderState_t *state, size_t chunksize)

  Encode a block of data into the PDU.
- const void * CF_CFDP_DoDecodeChunk (CF_DecoderState_t *state, size_t chunksize)

  Decode a block of data from the PDU.
- uint8 CF_CFDP_GetValueEncodedSize (uint64 Value)

  Gets the minimum number of octets that the given integer may be encoded in.
- void CF_EncodeIntegerInSize (CF_EncoderState_t *state, uint64 value, uint8 encode_size)

  Encodes the given integer value in the given number of octets.
- void CF_CFDP_EncodeHeaderWithoutSize (CF_EncoderState_t *state, CF_Logical_PduHeader_t *plh)

  Encodes a CFDP PDU base header block, bypassing the size field.
- void CF_CFDP_EncodeHeaderFinalSize (CF_EncoderState_t *state, CF_Logical_PduHeader_t *plh)

  Updates an already-encoded PDU base header block with the final PDU size.
- void CF_CFDP_EncodeFileDirectiveHeader (CF_EncoderState_t *state, CF_Logical_PduFileDirectiveHeader_t *pfdir)

  Encodes a CFDP file directive header block.
- void CF_CFDP_EncodeLV (CF_EncoderState_t *state, CF_Logical_Lv_t *pllv)

  Encodes a single CFDP Length+Value (LV) pair.
- void CF_CFDP_EncodeTLV (CF_EncoderState_t *state, CF_Logical_Tlv_t *pltlv)

  Encodes a single CFDP Type+Length+Value (TLV) tuple.
- void CF_CFDP_EncodeSegmentRequest (CF_EncoderState_t *state, CF_Logical_SegmentRequest_t *plseg)

  Encodes a single CFDP Segment Request block.
- void CF_CFDP_EncodeAllTlv (CF_EncoderState_t *state, CF_Logical_TlvList_t *pltlv)

  Encodes a list of CFDP Type+Length+Value tuples.
- void CF_CFDP_EncodeAllSegments (CF_EncoderState_t *state, CF_Logical_SegmentList_t *plseg)

  Encodes a list of CFDP Segment Request blocks.
- void CF_CFDP_EncodeMd (CF_EncoderState_t *state, CF_Logical_PduMd_t *plmd)

  Encodes a CFDP Metadata (MD) header block.
- void CF_CFDP_EncodeFileDataHeader (CF_EncoderState_t *state, bool with_meta, CF_Logical_PduFileDataHeader_t *plfd)

  Encodes a CFDP File Data (FD) header block.
- void CF_CFDP_EncodeEof (CF_EncoderState_t *state, CF_Logical_PduEof_t *pleof)

  Encodes a CFDP End-of-File (EOF) header block.
- void CF_CFDP_EncodeFin (CF_EncoderState_t *state, CF_Logical_PduFin_t *plfin)

  Encodes a CFDP Final (FIN) header block.
- void CF_CFDP_EncodeAck (CF_EncoderState_t *state, CF_Logical_PduAck_t *plack)

  Encodes a CFDP Acknowledge (ACK) header block.
- void CF_CFDP_EncodeNak (CF_EncoderState_t *state, CF_Logical_PduNak_t *plnak)

  Encodes a CFDP Non-Acknowledge (NAK) header block.
- void CF_CFDP_EncodeCrc (CF_EncoderState_t *state, uint32 *plcrc)

  Encodes a CFDP CRC/Checksum.
- uint64 CF_DecodeIntegerInSize (CF_DecoderState_t *state, uint8 decode_size)

  Decodes an integer value from the specified number of octets.
- CFE_Status_t CF_CFDP_DecodeHeader (CF_DecoderState_t *state, CF_Logical_PduHeader_t *plh)

  Decodes a CFDP base PDU header.

- void CF_CFDP_DecodeFileDirectiveHeader (CF_DecoderState_t *state, CF_Logical_PduFileDirectiveHeader_t *pfdir)

  Decodes a CFDP file directive header block.
- void CF_CFDP_DecodeLV (CF_DecoderState_t *state, CF_Logical_Lv_t *pllv)

  Decodes a single CFDP Length+Value (LV) pair.
- void CF_CFDP_DecodeTLV (CF_DecoderState_t *state, CF_Logical_Tlv_t *pltlv)

  Decodes a single CFDP Type+Length+Value (TLV) tuple.
- void CF_CFDP_DecodeSegmentRequest (CF_DecoderState_t *state, CF_Logical_SegmentRequest_t *plseg)

  Decodes a single CFDP Segment Request block.
- void CF_CFDP_DecodeMd (CF_DecoderState_t *state, CF_Logical_PduMd_t *plmd)

  Decodes a CFDP Metadata (MD) header block.
- void CF_CFDP_DecodeFileDataHeader (CF_DecoderState_t *state, bool with_meta, CF_Logical_PduFileDataHeader_t *plfd)

  Decodes a CFDP File Data (FD) header block.
- void CF_CFDP_DecodeCrc (CF_DecoderState_t *state, uint32 *plcrc)

  Decodes a CFDP CRC/Checksum.
- void CF_CFDP_DecodeEof (CF_DecoderState_t *state, CF_Logical_PduEof_t *pleof)

  Decodes a CFDP End-of-File (EOF) header block.
- void CF_CFDP_DecodeFin (CF_DecoderState_t *state, CF_Logical_PduFin_t *plfin)

  Decodes a CFDP Final (FIN) header block.
- void CF_CFDP_DecodeAck (CF_DecoderState_t *state, CF_Logical_PduAck_t *plack)

  Decodes a CFDP Acknowledge (ACK) header block.
- void CF_CFDP_DecodeNak (CF_DecoderState_t *state, CF_Logical_PduNak_t *plnak)

  Decodes a CFDP Non-Acknowledge (NAK) header block.
- void CF_CFDP_DecodeAllTlv (CF_DecoderState_t *state, CF_Logical_TlvList_t *pltlv, uint8 limit)

  Decodes a list of CFDP Type+Length+Value tuples.
- void CF_CFDP_DecodeAllSegments (CF_DecoderState_t *state, CF_Logical_SegmentList_t *plseg, uint8 limit)

  Decodes a list of CFDP Segment Request blocks.

Variables

- static const CF_Codec_BitField_t CF_CFDP_PduHeader_FLAGS_VERSION = CF_INIT_FIELD(3, 5)
- static const CF_Codec_BitField_t CF_CFDP_PduHeader_FLAGS_TYPE = CF_INIT_FIELD(1, 4)
- static const CF_Codec_BitField_t CF_CFDP_PduHeader_FLAGS_DIR = CF_INIT_FIELD(1, 3)
- static const CF_Codec_BitField_t CF_CFDP_PduHeader_FLAGS_MODE = CF_INIT_FIELD(1, 2)
- static const CF_Codec_BitField_t CF_CFDP_PduHeader_FLAGS_CRC = CF_INIT_FIELD(1, 1)
- static const CF_Codec_BitField_t CF_CFDP_PduHeader_FLAGS_LARGEFILE = CF_INIT_FIELD(1, 0)
- static const CF_Codec_BitField_t CF_CFDP_PduHeader_LENGTHS_ENTITY = CF_INIT_FIELD(3, 4)
- static const CF_Codec_BitField_t CF_CFDP_PduHeader_LENGTHS_TRANSACTION_SEQUENCE = CF_INIT_FIELD(3, 0)
- static const CF_Codec_BitField_t CF_CFDP_PduEof_FLAGS_CC = CF_INIT_FIELD(4, 4)
- static const CF_Codec_BitField_t CF_CFDP_PduFin_FLAGS_CC = CF_INIT_FIELD(4, 4)
- static const CF_Codec_BitField_t CF_CFDP_PduFin_FLAGS_DELIVERY_CODE = CF_INIT_FIELD(1, 2)
- static const CF_Codec_BitField_t CF_CFDP_PduFin_FLAGS_FILE_STATUS = CF_INIT_FIELD(2, 0)
- static const CF_Codec_BitField_t CF_CFDP_PduAck_DIR_CODE = CF_INIT_FIELD(4, 4)
- static const CF_Codec_BitField_t CF_CFDP_PduAck_DIR_SUBTYPE_CODE = CF_INIT_FIELD(4, 0)
- static const CF_Codec_BitField_t CF_CFDP_PduAck_CC = CF_INIT_FIELD(4, 4)
- static const CF_Codec_BitField_t CF_CFDP_PduAck_TRANSACTION_STATUS = CF_INIT_FIELD(2, 0)
- static const CF_Codec_BitField_t CF_CFDP_PduMd_CLOSURE_REQUESTED = CF_INIT_FIELD(1, 7)

- static const CF_Codec_BitField_t CF_CFDP_PduMd_CHECKSUM_TYPE = CF_INIT_FIELD(4, 0)
- static const CF_Codec_BitField_t CF_CFDP_PduFileData_RECORD_CONTINUATION_STATE = CF_INIT_FIELD(2, 6)
- static const CF_Codec_BitField_t CF_CFDP_PduFileData_SEGMENT_METADATA_LENGTH = CF_INIT_FIELD(6, 0)

12.39.1 Detailed Description

CFDP protocol data structure encode/decode implementation

12.39.2 Macro Definition Documentation

12.39.2.1 CF_INIT_FIELD

```
#define CF_INIT_FIELD(
    NBITS,
    SHIFT )
```

Value:

```
{                                                   \
    .shift = (SHIFT), .mask = ((1 « NBITS) - 1) \
}
```

Definition at line 40 of file cf_codec.c.

12.39.2.2 FGV

```
#define FGV(
    SRC,
    NAME ) (CF_FieldGetVal((SRC).octets, (NAME).shift, (NAME).mask))
```

Definition at line 65 of file cf_codec.c.

12.39.2.3 FSV

```
#define FSV(
    DEST,
    NAME,
    VAL ) (CF_FieldSetVal((DEST).octets, (NAME).shift, (NAME).mask, VAL))
```

Definition at line 66 of file cf_codec.c.

12.39.3 Typedef Documentation

12.39.3.1 CF_Codec_BitField_t

```
typedef struct CF_Codec_BitField CF_Codec_BitField_t
```

12.39.4 Function Documentation

12.39.4.1 CF_CFDP_CodecCheckSize()

```
bool CF_CFDP_CodecCheckSize (
    CF_CodecState_t * state,
    size_t chunksize )
```

Advances the position by the indicated size, confirming the block will fit into the PDU.
On encode, this confirms there is enough available space to hold a block of the indicated size. On decode, this confirms that decoding the indicated number of bytes will not read beyond the end of data.
If true, then the current position/offset is advanced by the indicated number of bytes If false, then the error flag is set, so that future calls to CF_CFDP_CodecIsOK will also return false.

Note

The error flag is sticky, meaning that if any encode/decode operation fails, all future encode/decode requests on the same state will also fail. Each encode/decode step must check the flag, and skip the operation if it is false. Reporting the error can be deferred to the final stage, and only done once.

Parameters

state	Encoder/Decoder common state
chunksize	Size of next block to encode/decode

Return values

true	If encode/decode is possible, enough space exists
false	If encode/decode is not possible, not enough space or prior error occurred

Definition at line 269 of file cf_codec.c.
References CF_CFDP_CodecIsOK(), CF_CFDP_CodecSetDone(), CF_CodecState::max_size, and CF_CodecState↩ ::next_offset.
Referenced by CF_CFDP_DoDecodeChunk(), and CF_CFDP_DoEncodeChunk().
Here is the call graph for this function:

12.39.4.2 CF_CFDP_DecodeAck()

```
void CF_CFDP_DecodeAck (
    CF_DecoderState_t * state,
    CF_Logical_PduAck_t * plack )
```

Decodes a CFDP Acknowledge (ACK) header block.
The data will be decoded from the encoded PDU at the current position and the logical fields will be saved to the given data structure
If the encoder is in an error state, nothing is decoded, and the state of the decoder is not changed.

Parameters

state	Decoder state object
plack	Pointer to logical PDU ACK header data

Definition at line 1043 of file cf_codec.c.
References CF_Logical_PduAck::ack_directive_code, CF_Logical_PduAck::ack_subtype_code, CF_Logical_PduAck↩

::cc, CF_CFDP_PduAck::cc_and_transaction_status, CF_CFDP_PduAck_CC, CF_CFDP_PduAck_DIR_CODE, CF_↩ CFDP_PduAck_DIR_SUBTYPE_CODE, CF_CFDP_PduAck_TRANSACTION_STATUS, CF_DECODE_FIXED_CH↩ UNK, CF_CFDP_PduAck::directive_and_subtype_code, FGV, and CF_Logical_PduAck::txn_status.
Referenced by CF_CFDP_RecvAck().

12.39.4.3 CF_CFDP_DecodeAllSegments()

```
void CF_CFDP_DecodeAllSegments (
    CF_DecoderState_t * state,
    CF_Logical_SegmentList_t * plseg,
    uint8 limit )
```

Decodes a list of CFDP Segment Request blocks.
The data will be decoded from the encoded PDU at the current position and the logical fields will be saved to the given data structure
If the encoder is in an error state, nothing is decoded, and the state of the decoder is not changed.

Parameters

state	Decoder state object
plseg	Pointer to logical PDU segment request header data
limit	Maximum number of Segment Request objects to decode

Definition at line 1119 of file cf_codec.c.
References CF_CFDP_DecodeSegmentRequest(), CF_CODEC_GET_REMAIN, CF_CODEC_IS_OK, CF_CODEC_↩ SET_DONE, CF_PDU_MAX_SEGMENTS, CF_Logical_SegmentList::num_segments, and CF_Logical_SegmentList↩ ::segments.
Referenced by CF_CFDP_DecodeNak().
Here is the call graph for this function:

12.39.4.4 CF_CFDP_DecodeAllTlv()

```
void CF_CFDP_DecodeAllTlv (
    CF_DecoderState_t * state,
    CF_Logical_TlvList_t * pltlv,
    uint8 limit )
```

Decodes a list of CFDP Type+Length+Value tuples.
The data will be decoded from the encoded PDU at the current position and the logical fields will be saved to the given data structure
If the encoder is in an error state, nothing is decoded, and the state of the decoder is not changed.

Parameters

state	Decoder state object
pltlv	Pointer to logical PDU TLV header data
limit	Maximum number of TLV objects to decode

Definition at line 1084 of file cf_codec.c.

References CF_CFDP_DecodeTLV(), CF_CODEC_GET_REMAIN, CF_CODEC_IS_OK, CF_CODEC_SET_DONE, CF_PDU_MAX_TLV, CF_Logical_TlvList::num_tlv, and CF_Logical_TlvList::tlv.
Referenced by CF_CFDP_DecodeEof(), and CF_CFDP_DecodeFin().
Here is the call graph for this function:

12.39.4.5 CF_CFDP_DecodeCrc()

```
void CF_CFDP_DecodeCrc (
    CF_DecoderState_t * state,
    uint32 * plcrc )
```

Decodes a CFDP CRC/Checksum.
The data will be decoded from the encoded PDU at the current position and the logical fields will be saved to the given data structure
If the encoder is in an error state, nothing is decoded, and the state of the decoder is not changed.

Parameters

state	Decoder state object
plcrc	Pointer to logical CRC value

Definition at line 984 of file cf_codec.c.
References CF_Codec_Load_uint32(), and CF_DECODE_FIXED_CHUNK.
Here is the call graph for this function:

12.39.4.6 CF_CFDP_DecodeEof()

```
void CF_CFDP_DecodeEof (
    CF_DecoderState_t * state,
    CF_Logical_PduEof_t * pleof )
```

Decodes a CFDP End-of-File (EOF) header block.
The data will be decoded from the encoded PDU at the current position and the logical fields will be saved to the given data structure
If the encoder is in an error state, nothing is decoded, and the state of the decoder is not changed.

Parameters

state	Decoder state object

Parameters

pleof	Pointer to logical PDU EOF header data

Definition at line 1001 of file cf_codec.c.
References CF_Logical_PduEof::cc, CF_CFDP_PduEof::cc, CF_CFDP_DecodeAllTlv(), CF_CFDP_PduEof_FLAGS↩_CC, CF_Codec_Load_uint32(), CF_DECODE_FIXED_CHUNK, CF_PDU_MAX_TLV, CF_Logical_PduEof::crc, CF_↩CFDP_PduEof::crc, FGV, CF_Logical_PduEof::size, CF_CFDP_PduEof::size, and CF_Logical_PduEof::tlv_list.
Referenced by CF_CFDP_RecvEof().
Here is the call graph for this function:

12.39.4.7 CF_CFDP_DecodeFileDataHeader()

```
void CF_CFDP_DecodeFileDataHeader (
    CF_DecoderState_t * state,
    bool with_meta,
    CF_Logical_PduFileDataHeader_t * plfd )
```

Decodes a CFDP File Data (FD) header block.
The data will be decoded from the encoded PDU at the current position and the logical fields will be saved to the given data structure
If the encoder is in an error state, nothing is decoded, and the state of the decoder is not changed.

Parameters

state	Decoder state object
with_meta	Whether to include optional continuation and segment request fields (always false currently)
plfd	Pointer to logical PDU file header data

Definition at line 922 of file cf_codec.c.
References CF_CFDP_DecodeSegmentRequest(), CF_CFDP_DoDecodeChunk(), CF_CFDP_PduFileData_RECO↩RD_CONTINUATION_STATE, CF_CFDP_PduFileData_SEGMENT_METADATA_LENGTH, CF_CODEC_GET_R↩EMAIN, CF_CODEC_IS_OK, CF_Codec_Load_uint32(), CF_CODEC_SET_DONE, CF_DECODE_FIXED_CHUNK, CF_PDU_MAX_SEGMENTS, CF_Logical_PduFileDataHeader::continuation_state, CF_Logical_PduFileDataHeader↩::data_len, CF_Logical_PduFileDataHeader::data_ptr, FGV, CF_Logical_SegmentList::num_segments, CF_Logical↩_PduFileDataHeader::offset, CF_CFDP_PduFileDataHeader::offset, CF_Logical_PduFileDataHeader::segment_list, and CF_Logical_SegmentList::segments.
Referenced by CF_CFDP_RecvFd().
Here is the call graph for this function:

12.39.4.8 CF_CFDP_DecodeFileDirectiveHeader()

```
void CF_CFDP_DecodeFileDirectiveHeader (
    CF_DecoderState_t * state,
    CF_Logical_PduFileDirectiveHeader_t * pfdir )
```

Decodes a CFDP file directive header block.
The data will be decoded from the encoded PDU at the current position and the logical fields will be saved to the given data structure
If the encoder is in an error state, nothing is decoded, and the state of the decoder is not changed.

Parameters

state	Decoder state object
pfdir	Pointer to logical PDU file directive header data

Definition at line 812 of file cf_codec.c.
References CF_Codec_Load_uint8(), CF_DECODE_FIXED_CHUNK, CF_Logical_PduFileDirectiveHeader::directive↩_code, and CF_CFDP_PduFileDirectiveHeader::directive_code.
Referenced by CF_CFDP_RecvPh().
Here is the call graph for this function:

12.39.4.9 CF_CFDP_DecodeFin()

```
void CF_CFDP_DecodeFin (
    CF_DecoderState_t * state,
    CF_Logical_PduFin_t * plfin )
```

Decodes a CFDP Final (FIN) header block.
The data will be decoded from the encoded PDU at the current position and the logical fields will be saved to the given data structure
If the encoder is in an error state, nothing is decoded, and the state of the decoder is not changed.

Parameters

state	Decoder state object
plfin	Pointer to logical PDU FIN header data

Definition at line 1022 of file cf_codec.c.
References CF_Logical_PduFin::cc, CF_CFDP_DecodeAllTlv(), CF_CFDP_PduFin_FLAGS_CC, CF_CFDP_PduFin↩_FLAGS_DELIVERY_CODE, CF_CFDP_PduFin_FLAGS_FILE_STATUS, CF_DECODE_FIXED_CHUNK, CF_PDU↩_MAX_TLV, CF_Logical_PduFin::delivery_code, FGV, CF_Logical_PduFin::file_status, CF_CFDP_PduFin::flags, and CF_Logical_PduFin::tlv_list.
Referenced by CF_CFDP_RecvFin().

Here is the call graph for this function:

12.39.4.10 CF_CFDP_DecodeHeader()

```
CFE_Status_t CF_CFDP_DecodeHeader (
    CF_DecoderState_t * state,
    CF_Logical_PduHeader_t * plh )
```

Decodes a CFDP base PDU header.

The data will be decoded from the encoded PDU at the current position and the logical fields will be saved to the given data structure

If the encoder is in an error state, nothing is decoded, and the state of the decoder is not changed.

Note

On decode the entire base header is decoded in a single call, the size will be decoded like any other field.

Parameters

state	Decoder state object
plh	Pointer to logical PDU base header data

Return values

CFE_SUCCESS	Successful execution. Operation was performed successfully
CF_ERROR	on error.

Definition at line 766 of file cf_codec.c.

References CF_CFDP_PduHeader_FLAGS_CRC, CF_CFDP_PduHeader_FLAGS_DIR, CF_CFDP_PduHeader_FL↩AGS_LARGEFILE, CF_CFDP_PduHeader_FLAGS_MODE, CF_CFDP_PduHeader_FLAGS_TYPE, CF_CFDP_Pdu↩Header_FLAGS_VERSION, CF_CFDP_PduHeader_LENGTHS_ENTITY, CF_CFDP_PduHeader_LENGTHS_TRA↩NSACTION_SEQUENCE, CF_CODEC_GET_POSITION, CF_Codec_Load_uint16(), CF_DECODE_FIXED_CHUNK, CF_DecodeIntegerInSize(), CF_ERROR, CFE_SUCCESS, CF_Logical_PduHeader::crc_flag, CF_Logical_Pdu↩Header::data_encoded_length, CF_Logical_PduHeader::destination_eid, CF_Logical_PduHeader::direction, CF_↩Logical_PduHeader::eid_length, CF_CFDP_PduHeader::eid_tsn_lengths, FGV, CF_CFDP_PduHeader::flags, CF↩_Logical_PduHeader::header_encoded_length, CF_Logical_PduHeader::large_flag, CF_CFDP_PduHeader::length, CF_Logical_PduHeader::pdu_type, CF_Logical_PduHeader::sequence_num, CF_Logical_PduHeader::source_eid, CF_Logical_PduHeader::txm_mode, CF_Logical_PduHeader::txn_seq_length, and CF_Logical_PduHeader::version.

Referenced by CF_CFDP_RecvPh().

Here is the call graph for this function:

12.39.4.11 CF_CFDP_DecodeLV()

```
void CF_CFDP_DecodeLV (
    CF_DecoderState_t * state,
    CF_Logical_Lv_t * pllv )
```

Decodes a single CFDP Length+Value (LV) pair.
The data will be decoded from the encoded PDU at the current position and the logical fields will be saved to the given data structure
If the encoder is in an error state, nothing is decoded, and the state of the decoder is not changed.

Parameters

state	Decoder state object
pllv	Pointer to single logical PDU LV data

Definition at line 832 of file cf_codec.c.
References CF_CFDP_DoDecodeChunk(), CF_Codec_Load_uint8(), CF_DECODE_FIXED_CHUNK, CF_Logical_↩Lv::data_ptr, CF_Logical_Lv::length, and CF_CFDP_lv::length.
Referenced by CF_CFDP_DecodeMd().
Here is the call graph for this function:

12.39.4.12 CF_CFDP_DecodeMd()

```
void CF_CFDP_DecodeMd (
    CF_DecoderState_t * state,
    CF_Logical_PduMd_t * plmd )
```

Decodes a CFDP Metadata (MD) header block.
The data will be decoded from the encoded PDU at the current position and the logical fields will be saved to the given data structure
If the encoder is in an error state, nothing is decoded, and the state of the decoder is not changed.

Parameters

state	Decoder state object
plmd	Pointer to logical PDU metadata header data

Definition at line 899 of file cf_codec.c.
References CF_CFDP_DecodeLV(), CF_CFDP_PduMd_CHECKSUM_TYPE, CF_CFDP_PduMd_CLOSURE_RE↩QUESTED, CF_Codec_Load_uint32(), CF_DECODE_FIXED_CHUNK, CF_Logical_PduMd::checksum_type, CF_↩Logical_PduMd::close_req, CF_Logical_PduMd::dest_filename, FGV, CF_CFDP_PduMd::segmentation_control, CF↩_Logical_PduMd::size, CF_CFDP_PduMd::size, and CF_Logical_PduMd::source_filename.
Referenced by CF_CFDP_RecvMd().

Here is the call graph for this function:

12.39.4.13 CF_CFDP_DecodeNak()

```
void CF_CFDP_DecodeNak (
    CF_DecoderState_t * state,
    CF_Logical_PduNak_t * plnak )
```

Decodes a CFDP Non-Acknowledge (NAK) header block.

The data will be decoded from the encoded PDU at the current position and the logical fields will be saved to the given data structure

If the encoder is in an error state, nothing is decoded, and the state of the decoder is not changed.

Parameters

state	Decoder state object
plnak	Pointer to logical PDU NAK header data

Definition at line 1064 of file cf_codec.c.

References CF_CFDP_DecodeAllSegments(), CF_Codec_Load_uint32(), CF_DECODE_FIXED_CHUNK, CF_P↩DU_MAX_SEGMENTS, CF_Logical_PduNak::scope_end, CF_CFDP_PduNak::scope_end, CF_Logical_PduNak↩::scope_start, CF_CFDP_PduNak::scope_start, and CF_Logical_PduNak::segment_list.

Referenced by CF_CFDP_RecvNak().

Here is the call graph for this function:

12.39.4.14 CF_CFDP_DecodeSegmentRequest()

```
void CF_CFDP_DecodeSegmentRequest (
    CF_DecoderState_t * state,
    CF_Logical_SegmentRequest_t * plseg )
```

Decodes a single CFDP Segment Request block.

The data will be decoded from the encoded PDU at the current position and the logical fields will be saved to the given data structure

If the encoder is in an error state, nothing is decoded, and the state of the decoder is not changed.

Parameters

state	Decoder state object
plseg	Pointer to single logical PDU segment request header data

Definition at line 881 of file cf_codec.c.
References CF_Codec_Load_uint32(), CF_DECODE_FIXED_CHUNK, CF_Logical_SegmentRequest::offset_end, CF_CFDP_SegmentRequest::offset_end, CF_Logical_SegmentRequest::offset_start, and CF_CFDP_Segment↩Request::offset_start.
Referenced by CF_CFDP_DecodeAllSegments(), and CF_CFDP_DecodeFileDataHeader().
Here is the call graph for this function:

12.39.4.15 CF_CFDP_DecodeTLV()

```
void CF_CFDP_DecodeTLV (
    CF_DecoderState_t * state,
    CF_Logical_Tlv_t * pltlv )
```

Decodes a single CFDP Type+Length+Value (TLV) tuple.
The data will be decoded from the encoded PDU at the current position and the logical fields will be saved to the given data structure
If the encoder is in an error state, nothing is decoded, and the state of the decoder is not changed.

Parameters

state	Decoder state object
pltlv	Pointer to single logical PDU TLV data

Definition at line 850 of file cf_codec.c.
References CF_CFDP_DoDecodeChunk(), CF_CFDP_TLV_TYPE_ENTITY_ID, CF_Codec_Load_uint8(), CF_DEC↩ODE_FIXED_CHUNK, CF_DecodeIntegerInSize(), CF_Logical_Tlv::data, CF_Logical_TlvData::data_ptr, CF_Logical↩_TlvData::eid, CF_Logical_Tlv::length, CF_CFDP_tlv::length, CF_Logical_Tlv::type, and CF_CFDP_tlv::type.
Referenced by CF_CFDP_DecodeAllTlv().
Here is the call graph for this function:

12.39.4.16 CF_CFDP_DoDecodeChunk()

```
const void* CF_CFDP_DoDecodeChunk (
    CF_DecoderState_t * state,
    size_t chunksize )
```

Decode a block of data from the PDU.
Deducts space for a block of the given size from the current PDU

Parameters

state	Decoder state object
chunksize	Size of block to decode

Returns

Pointer to block, if successful

Return values

NULL	if not successful (no space or other error).

Definition at line 309 of file cf_codec.c.
References CF_DecoderState::base, CF_CFDP_CodecCheckSize(), CF_CFDP_CodecGetPosition(), and CF_↩ DecoderState::codec_state.
Referenced by CF_CFDP_DecodeFileDataHeader(), CF_CFDP_DecodeLV(), CF_CFDP_DecodeTLV(), and CF_↩ DecodeIntegerInSize().
Here is the call graph for this function:

12.39.4.17 CF_CFDP_DoEncodeChunk()

```
void* CF_CFDP_DoEncodeChunk (
    CF_EncoderState_t * state,
    size_t chunksize )
```

Encode a block of data into the PDU.
Adds/Reserves space for a block of the given size in the current PDU

Parameters

state	Encoder state object
chunksize	Size of block to encode

Returns

Pointer to block, if successful

Return values

NULL	if not successful (no space or other error).

Definition at line 291 of file cf_codec.c.
References CF_EncoderState::base, CF_CFDP_CodecCheckSize(), CF_CFDP_CodecGetPosition(), and CF_EncoderState::codec_state.
Referenced by CF_CFDP_EncodeLV(), CF_CFDP_EncodeTLV(), CF_CFDP_S_SendFileData(), and CF_EncodeIntegerInSize().
Here is the call graph for this function:

12.39.4.18 CF_CFDP_EncodeAck()

```
void CF_CFDP_EncodeAck (
    CF_EncoderState_t * state,
    CF_Logical_PduAck_t * plack )
```

Encodes a CFDP Acknowledge (ACK) header block.
The data in the logical header will be appended to the encoded PDU at the current position
If the encoder is in an error state, nothing is encoded, and the state of the encoder is not changed.

Parameters

state	Encoder state object
plack	Pointer to logical PDU ACK header data

Definition at line 678 of file cf_codec.c.
References CF_Logical_PduAck::ack_directive_code, CF_Logical_PduAck::ack_subtype_code, CF_Logical_PduAck::cc, CF_CFDP_PduAck::cc_and_transaction_status, CF_CFDP_PduAck_CC, CF_CFDP_PduAck_DIR_CODE, CF_CFDP_PduAck_DIR_SUBTYPE_CODE, CF_CFDP_PduAck_TRANSACTION_STATUS, CF_Codec_Store_uint8(), CF_ENCODE_FIXED_CHUNK, CF_CFDP_PduAck::directive_and_subtype_code, FSV, and CF_Logical_PduAck::txn_status.
Referenced by CF_CFDP_SendAck().
Here is the call graph for this function:

12.39.4.19 CF_CFDP_EncodeAllSegments()

```
void CF_CFDP_EncodeAllSegments (
```

```
CF_EncoderState_t * state,
CF_Logical_SegmentList_t * plseg )
```

Encodes a list of CFDP Segment Request blocks.
This invokes CF_CFDP_EncodeSegmentRequest() for all segments in the given list.
The data in the logical header will be appended to the encoded PDU at the current position
If the encoder is in an error state, nothing is encoded, and the state of the encoder is not changed.

Parameters

state	Encoder state object
plseg	Pointer to logical PDU segment request header data

Definition at line 557 of file cf_codec.c.
References CF_CFDP_EncodeSegmentRequest(), CF_CODEC_IS_OK, CF_Logical_SegmentList::num_segments, and CF_Logical_SegmentList::segments.
Referenced by CF_CFDP_EncodeFileDataHeader(), and CF_CFDP_EncodeNak().
Here is the call graph for this function:

12.39.4.20 CF_CFDP_EncodeAllTlv()

```
void CF_CFDP_EncodeAllTlv (
CF_EncoderState_t * state,
CF_Logical_TlvList_t * pltlv )
```

Encodes a list of CFDP Type+Length+Value tuples.
This invokes CF_CFDP_EncodeTLV() for all TLV values in the given list.
The data in the logical header will be appended to the encoded PDU at the current position
If the encoder is in an error state, nothing is encoded, and the state of the encoder is not changed.

Parameters

state	Encoder state object
pltlv	Pointer to logical PDU TLV header data

Definition at line 541 of file cf_codec.c.
References CF_CFDP_EncodeTLV(), CF_CODEC_IS_OK, CF_Logical_TlvList::num_tlv, and CF_Logical_TlvList::tlv.
Referenced by CF_CFDP_EncodeEof(), and CF_CFDP_EncodeFin().
Here is the call graph for this function:

12.39.4.21 CF_CFDP_EncodeCrc()

```
void CF_CFDP_EncodeCrc (
    CF_EncoderState_t * state,
    uint32 * plcrc )
```

Encodes a CFDP CRC/Checksum.
The data in the logical header will be appended to the encoded PDU at the current position
If the encoder is in an error state, nothing is encoded, and the state of the encoder is not changed.

Parameters

state	Encoder state object
plcrc	Pointer to logical CRC value

Definition at line 721 of file cf_codec.c.
References CF_Codec_Store_uint32(), and CF_ENCODE_FIXED_CHUNK.
Here is the call graph for this function:

12.39.4.22 CF_CFDP_EncodeEof()

```
void CF_CFDP_EncodeEof (
    CF_EncoderState_t * state,
    CF_Logical_PduEof_t * pleof )
```

Encodes a CFDP End-of-File (EOF) header block.
The data in the logical header will be appended to the encoded PDU at the current position
If the encoder is in an error state, nothing is encoded, and the state of the encoder is not changed.

Note

this encode includes any TLV values which are indicated in the logical data structure

Parameters

state	Encoder state object
pleof	Pointer to logical PDU EOF header data

Definition at line 634 of file cf_codec.c.
References CF_Logical_PduEof::cc, CF_CFDP_PduEof::cc, CF_CFDP_EncodeAllTlv(), CF_CFDP_PduEof_FLAGS↩_CC, CF_Codec_Store_uint32(), CF_Codec_Store_uint8(), CF_ENCODE_FIXED_CHUNK, CF_Logical_PduEof::crc, CF_CFDP_PduEof::crc, FSV, CF_Logical_PduEof::size, CF_CFDP_PduEof::size, and CF_Logical_PduEof::tlv_list.
Referenced by CF_CFDP_SendEof().

Here is the call graph for this function:

12.39.4.23 CF_CFDP_EncodeFileDataHeader()

```
void CF_CFDP_EncodeFileDataHeader (
    CF_EncoderState_t * state,
    bool with_meta,
    CF_Logical_PduFileDataHeader_t * plfd )
```

Encodes a CFDP File Data (FD) header block.

This only encodes the FD header fields, specifically the data offset (required) and any metadata fields, if indicated. This does *not* encode any actual file data.

The data in the logical header will be appended to the encoded PDU at the current position

If the encoder is in an error state, nothing is encoded, and the state of the encoder is not changed.

Parameters

state	Encoder state object
with_meta	Whether to include optional continuation and segment request fields (always false currently)
plfd	Pointer to logical PDU file header data

Definition at line 597 of file cf_codec.c.

References CF_CFDP_EncodeAllSegments(), CF_CFDP_PduFileData_RECORD_CONTINUATION_STATE, CF_CFDP_PduFileData_SEGMENT_METADATA_LENGTH, CF_Codec_Store_uint32(), CF_Codec_Store_uint8(), CF_ENCODE_FIXED_CHUNK, CF_Logical_PduFileDataHeader::continuation_state, FSV, CF_Logical_SegmentList::num_segments, CF_Logical_PduFileDataHeader::offset, CF_CFDP_PduFileDataHeader::offset, and CF_Logical_PduFileDataHeader::segment_list.

Referenced by CF_CFDP_S_SendFileData().

Here is the call graph for this function:

12.39.4.24 CF_CFDP_EncodeFileDirectiveHeader()

```
void CF_CFDP_EncodeFileDirectiveHeader (
    CF_EncoderState_t * state,
    CF_Logical_PduFileDirectiveHeader_t * pfdir )
```

Encodes a CFDP file directive header block.

The data in the logical header will be appended to the encoded PDU at the current position

If the encoder is in an error state, nothing is encoded, and the state of the encoder is not changed.

Parameters

state	Encoder state object
pfdir	Pointer to logical PDU file directive header data

Definition at line 437 of file cf_codec.c.
References CF_Codec_Store_uint8(), CF_ENCODE_FIXED_CHUNK, CF_Logical_PduFileDirectiveHeader↩::directive_code, and CF_CFDP_PduFileDirectiveHeader::directive_code.
Referenced by CF_CFDP_ConstructPduHeader().
Here is the call graph for this function:

12.39.4.25 CF_CFDP_EncodeFin()

```
void CF_CFDP_EncodeFin (
    CF_EncoderState_t * state,
    CF_Logical_PduFin_t * plfin )
```

Encodes a CFDP Final (FIN) header block.
The data in the logical header will be appended to the encoded PDU at the current position
If the encoder is in an error state, nothing is encoded, and the state of the encoder is not changed.

Note

this encode includes any TLV values which are indicated in the logical data structure

Parameters

state	Encoder state object
plfin	Pointer to logical PDU FIN header data

Definition at line 656 of file cf_codec.c.
References CF_Logical_PduFin::cc, CF_CFDP_EncodeAllTlv(), CF_CFDP_PduFin_FLAGS_CC, CF_CFDP_PduFin↩_FLAGS_DELIVERY_CODE, CF_CFDP_PduFin_FLAGS_FILE_STATUS, CF_Codec_Store_uint8(), CF_ENCODE↩_FIXED_CHUNK, CF_Logical_PduFin::delivery_code, CF_Logical_PduFin::file_status, CF_CFDP_PduFin::flags, FSV, and CF_Logical_PduFin::tlv_list.
Referenced by CF_CFDP_SendFin().
Here is the call graph for this function:

12.39.4.26 CF_CFDP_EncodeHeaderFinalSize()

```
void CF_CFDP_EncodeHeaderFinalSize (
    CF_EncoderState_t * state,
    CF_Logical_PduHeader_t * plh )
```

Updates an already-encoded PDU base header block with the final PDU size.
This function encodes the "data_encoded_length" field from the logical PDU structure into the encoded header block. The PDU will also be closed (set done) to indicate that no more data should be added.

Note

Unlike other encode operations, this function does not add any new blocks to the PDU. It only updates the already-encoded block at the beginning of the PDU, which must have been done by a prior call to CF_CFDP_EncodeHeaderWithoutSize().

See also

CF_CFDP_EncodeHeaderWithoutSize() for initially encoding the PDU header block

Parameters

state	Encoder state object
plh	Pointer to logical PDU header data

Definition at line 407 of file cf_codec.c.
References CF_EncoderState::base, CF_CODEC_GET_POSITION, CF_CODEC_IS_OK, CF_CODEC_SET_DONE, CF_Codec_Store_uint16(), CF_Logical_PduHeader::data_encoded_length, and CF_CFDP_PduHeader::length.
Referenced by CF_CFDP_SetPduLength().
Here is the call graph for this function:

12.39.4.27 CF_CFDP_EncodeHeaderWithoutSize()

```
void CF_CFDP_EncodeHeaderWithoutSize (
    CF_EncoderState_t * state,
    CF_Logical_PduHeader_t * plh )
```

Encodes a CFDP PDU base header block, bypassing the size field.
On transmit side, the common/base header must be encoded in two parts, to deal with the "total_size" field. The initial encoding of the basic fields is done as soon as it is known that a PDU of this type needs to be sent, but the total size may not be yet known, as it depends on the remainder of encoding and any additional data that might get added to the variable length sections.
This function encodes all base header fields *except* total length. There is a separate function later to update the total↩_length to the correct value once the remainder of encoding is done. Luckily, the total_length is in the first fixed position binary blob so it is easy to update later.
If the encoder is in an error state, nothing is encoded, and the state of the encoder is not changed.

See also

CF_CFDP_EncodeHeaderFinalSize() for updating the length field once it is known

Parameters

state	Encoder state object
plh	Pointer to logical PDU header data

Definition at line 371 of file cf_codec.c.
References CF_CFDP_PduHeader_FLAGS_DIR, CF_CFDP_PduHeader_FLAGS_MODE, CF_CFDP_PduHeader↩_FLAGS_TYPE, CF_CFDP_PduHeader_FLAGS_VERSION, CF_CFDP_PduHeader_LENGTHS_ENTITY, CF_CF↩DP_PduHeader_LENGTHS_TRANSACTION_SEQUENCE, CF_CODEC_GET_POSITION, CF_Codec_Store_uint8(), CF_ENCODE_FIXED_CHUNK, CF_EncodeIntegerInSize(), CF_Logical_PduHeader::destination_eid, CF_Logical↩_PduHeader::direction, CF_Logical_PduHeader::eid_length, CF_CFDP_PduHeader::eid_tsn_lengths, CF_CFDP_↩PduHeader::flags, FSV, CF_Logical_PduHeader::header_encoded_length, CF_Logical_PduHeader::pdu_type, C↩F_Logical_PduHeader::sequence_num, CF_Logical_PduHeader::source_eid, CF_Logical_PduHeader::txm_mode, CF_Logical_PduHeader::txn_seq_length, and CF_Logical_PduHeader::version.
Referenced by CF_CFDP_ConstructPduHeader().
Here is the call graph for this function:

12.39.4.28 CF_CFDP_EncodeLV()

```
void CF_CFDP_EncodeLV (
    CF_EncoderState_t * state,
    CF_Logical_Lv_t * pllv )
```

Encodes a single CFDP Length+Value (LV) pair.
The data in the logical header will be appended to the encoded PDU at the current position
If the encoder is in an error state, nothing is encoded, and the state of the encoder is not changed.

Parameters

state	Encoder state object
pllv	Pointer to logical PDU LV header data

Definition at line 455 of file cf_codec.c.
References CF_CFDP_DoEncodeChunk(), CF_CODEC_SET_DONE, CF_Codec_Store_uint8(), CF_ENCODE_FIX↩ED_CHUNK, CF_Logical_Lv::data_ptr, CF_Logical_Lv::length, and CF_CFDP_lv::length.
Referenced by CF_CFDP_EncodeMd().

Here is the call graph for this function:

12.39.4.29 CF_CFDP_EncodeMd()

```
void CF_CFDP_EncodeMd (
    CF_EncoderState_t * state,
    CF_Logical_PduMd_t * plmd )
```

Encodes a CFDP Metadata (MD) header block.
The data in the logical header will be appended to the encoded PDU at the current position
If the encoder is in an error state, nothing is encoded, and the state of the encoder is not changed.

Note

this encode includes the LV pairs for source and destination file names, which are logically part of the overall MD block.

Parameters

state	Encoder state object
plmd	Pointer to logical PDU metadata header data

Definition at line 573 of file cf_codec.c.
References CF_CFDP_EncodeLV(), CF_CFDP_PduMd_CHECKSUM_TYPE, CF_CFDP_PduMd_CLOSURE_REQ↩UESTED, CF_Codec_Store_uint32(), CF_Codec_Store_uint8(), CF_ENCODE_FIXED_CHUNK, CF_Logical_Pdu↩Md::checksum_type, CF_Logical_PduMd::close_req, CF_Logical_PduMd::dest_filename, FSV, CF_CFDP_PduMd↩::segmentation_control, CF_Logical_PduMd::size, CF_CFDP_PduMd::size, and CF_Logical_PduMd::source_filename.
Referenced by CF_CFDP_SendMd().
Here is the call graph for this function:

12.39.4.30 CF_CFDP_EncodeNak()

```
void CF_CFDP_EncodeNak (
    CF_EncoderState_t * state,
    CF_Logical_PduNak_t * plnak )
```

Encodes a CFDP Non-Acknowledge (NAK) header block.
The data in the logical header will be appended to the encoded PDU at the current position

If the encoder is in an error state, nothing is encoded, and the state of the encoder is not changed.

Note

this encode includes any Segment Request values which are indicated in the logical data structure

Parameters

state	Encoder state object
plnak	Pointer to logical PDU NAK header data

Definition at line 701 of file cf_codec.c.
References CF_CFDP_EncodeAllSegments(), CF_Codec_Store_uint32(), CF_ENCODE_FIXED_CHUNK, CF_Logical_PduNak::scope_end, CF_CFDP_PduNak::scope_end, CF_Logical_PduNak::scope_start, CF_CFDP_PduNak::scope_start, and CF_Logical_PduNak::segment_list.
Referenced by CF_CFDP_SendNak().
Here is the call graph for this function:

12.39.4.31 CF_CFDP_EncodeSegmentRequest()

```
void CF_CFDP_EncodeSegmentRequest (
    CF_EncoderState_t * state,
    CF_Logical_SegmentRequest_t * plseg )
```

Encodes a single CFDP Segment Request block.
The data in the logical header will be appended to the encoded PDU at the current position
If the encoder is in an error state, nothing is encoded, and the state of the encoder is not changed.

Parameters

state	Encoder state object
plseg	Pointer to single logical PDU segment request header data

Definition at line 523 of file cf_codec.c.
References CF_Codec_Store_uint32(), CF_ENCODE_FIXED_CHUNK, CF_Logical_SegmentRequest::offset_end, CF_CFDP_SegmentRequest::offset_end, CF_Logical_SegmentRequest::offset_start, and CF_CFDP_SegmentRequest::offset_start.
Referenced by CF_CFDP_EncodeAllSegments().
Here is the call graph for this function:

12.39.4.32 CF_CFDP_EncodeTLV()

```
void CF_CFDP_EncodeTLV (
    CF_EncoderState_t * state,
    CF_Logical_Tlv_t * pltlv )
```

Encodes a single CFDP Type+Length+Value (TLV) tuple.
The data in the logical header will be appended to the encoded PDU at the current position
If the encoder is in an error state, nothing is encoded, and the state of the encoder is not changed.

Note

Only the CF_CFDP_TLV_TYPE_ENTITY_ID TLV type is currently supported by this function, but other TLV types may be added in future versions as needed.

Parameters

state	Encoder state object
pltlv	Pointer to single logical PDU TLV header data

Definition at line 485 of file cf_codec.c.
References CF_CFDP_DoEncodeChunk(), CF_CFDP_TLV_TYPE_ENTITY_ID, CF_CODEC_SET_DONE, CF_Codec_Store_uint8(), CF_ENCODE_FIXED_CHUNK, CF_EncodeIntegerInSize(), CF_Logical_Tlv::data, CF_Logical_TlvData::data_ptr, CF_Logical_TlvData::eid, CF_Logical_Tlv::length, CF_CFDP_tlv::length, CF_CFDP_tlv::type, and CF_Logical_Tlv::type.
Referenced by CF_CFDP_EncodeAllTlv().
Here is the call graph for this function:

12.39.4.33 CF_CFDP_GetValueEncodedSize()

```
uint8 CF_CFDP_GetValueEncodedSize (
    uint64 Value )
```

Gets the minimum number of octets that the given integer may be encoded in.
Based on the integer value, this computes the minimum number of bytes that must be allocated to that integer within a CFDP PDU. This is typically used for entity IDs and sequence numbers, where CFDP does not specify a specific size for these items. They may be encoded between 1 and 8 bytes, depending on the actual value is.

Parameters

Value	Integer value that needs to be encoded

Returns

Minimum number of bytes that the value requires (between 1 and 8, inclusive)

Definition at line 327 of file cf_codec.c.
Referenced by CF_CFDP_AppendTlv(), and CF_CFDP_ConstructPduHeader().

12.39.4.34 CF_Codec_Load_uint16()

```
static void CF_Codec_Load_uint16 (
    uint16 * pdst,
    const CF_CFDP_uint16_t * psrc ) [inline], [static]
```

Definition at line 204 of file cf_codec.c.
References CF_CFDP_uint16_t::octets.
Referenced by CF_CFDP_DecodeHeader().

12.39.4.35 CF_Codec_Load_uint32()

```
static void CF_Codec_Load_uint32 (
    uint32 * pdst,
    const CF_CFDP_uint32_t * psrc ) [inline], [static]
```

Definition at line 220 of file cf_codec.c.
References CF_CFDP_uint32_t::octets.
Referenced by CF_CFDP_DecodeCrc(), CF_CFDP_DecodeEof(), CF_CFDP_DecodeFileDataHeader(), CF_CFDP_↩DecodeMd(), CF_CFDP_DecodeNak(), and CF_CFDP_DecodeSegmentRequest().

12.39.4.36 CF_Codec_Load_uint64()

```
static void CF_Codec_Load_uint64 (
    uint64 * pdst,
    const CF_CFDP_uint64_t * psrc ) [inline], [static]
```

Definition at line 240 of file cf_codec.c.
References CF_CFDP_uint64_t::octets.

12.39.4.37 CF_Codec_Load_uint8()

```
static void CF_Codec_Load_uint8 (
    uint8 * pdst,
    const CF_CFDP_uint8_t * psrc ) [inline], [static]
```

Definition at line 194 of file cf_codec.c.
References CF_CFDP_uint8_t::octets.
Referenced by CF_CFDP_DecodeFileDirectiveHeader(), CF_CFDP_DecodeLV(), and CF_CFDP_DecodeTLV().

12.39.4.38 CF_Codec_Store_uint16()

```
static void CF_Codec_Store_uint16 (
    CF_CFDP_uint16_t * pdst,
    uint16 val ) [inline], [static]
```

Definition at line 142 of file cf_codec.c.
References CF_CFDP_uint16_t::octets.
Referenced by CF_CFDP_EncodeHeaderFinalSize().

12.39.4.39 CF_Codec_Store_uint32()

```
static void CF_Codec_Store_uint32 (
    CF_CFDP_uint32_t * pdst,
    uint32 val ) [inline], [static]
```

Definition at line 154 of file cf_codec.c.
References CF_CFDP_uint32_t::octets.
Referenced by CF_CFDP_EncodeCrc(), CF_CFDP_EncodeEof(), CF_CFDP_EncodeFileDataHeader(), CF_CFDP_↩EncodeMd(), CF_CFDP_EncodeNak(), and CF_CFDP_EncodeSegmentRequest().

12.39.4.40 CF_Codec_Store_uint64()

```
static void CF_Codec_Store_uint64 (
    CF_CFDP_uint64_t * pdst,
    uint64 val ) [inline], [static]
```

Definition at line 170 of file cf_codec.c.
References CF_CFDP_uint64_t::octets.

12.39.4.41 CF_Codec_Store_uint8()

```
static void CF_Codec_Store_uint8 (
    CF_CFDP_uint8_t * pdst,
    uint8 val ) [inline], [static]
```

Definition at line 132 of file cf_codec.c.
References CF_CFDP_uint8_t::octets.
Referenced by CF_CFDP_EncodeAck(), CF_CFDP_EncodeEof(), CF_CFDP_EncodeFileDataHeader(), CF_CFDP_↩EncodeFileDirectiveHeader(), CF_CFDP_EncodeFin(), CF_CFDP_EncodeHeaderWithoutSize(), CF_CFDP_Encode↩LV(), CF_CFDP_EncodeMd(), and CF_CFDP_EncodeTLV().

12.39.4.42 CF_DecodeIntegerInSize()

```
uint64 CF_DecodeIntegerInSize (
    CF_DecoderState_t * state,
    uint8 decode_size )
```

Decodes an integer value from the specified number of octets.
This decodes an integer value in the specified number of octets. The actual number of octets must be determined using another field in the PDU before calling this function.

Warning

This function will decode exactly the given number of octets. If this does not match actual encoded size, the return value will be wrong, and it will likely also throw off the decoding of any fields that follow this one.

See also

CF_EncodeIntegerInSize() for the inverse operation

Parameters

state	Encoder state object
decode_size	Number of octets that the value is encoded in (between 1 and 8, inclusive)

Returns

Decoded value

Definition at line 738 of file cf_codec.c.
References CF_CFDP_DoDecodeChunk().
Referenced by CF_CFDP_DecodeHeader(), and CF_CFDP_DecodeTLV().
Here is the call graph for this function:

12.39.4.43 CF_EncodeIntegerInSize()

```
void CF_EncodeIntegerInSize (
    CF_EncoderState_t * state,
    uint64 value,
    uint8 encode_size )
```

Encodes the given integer value in the given number of octets.

This encodes an integer value in the specified number of octets. Use CF_CFDP_GetValueEncodedSize() to determine the minimum number of octets required for a given value. Using more than the minimum is OK, but will consume extra bytes.

Warning

This function does not error check the encode_size parameter, and will encode the size given, even if it results in an invalid value. Using fewer octets than the minimum reported by CF_CFDP_GetValueEncodedSize() will likely result in incorrect decoding at the receiver.

See also

CF_DecodeIntegerInSize() for the inverse operation

Parameters

state	Encoder state object
value	Integer value that needs to be encoded
encode_size	Number of octets to encode the value in (between 1 and 8, inclusive)

Definition at line 346 of file cf_codec.c.

References CF_CFDP_DoEncodeChunk().

Referenced by CF_CFDP_EncodeHeaderWithoutSize(), and CF_CFDP_EncodeTLV().

Here is the call graph for this function:

12.39.4.44 CF_FieldGetVal()

```
static uint8 CF_FieldGetVal (
    const uint8 * src,
    uint8 shift,
    uint8 mask )  [inline], [static]
```

Definition at line 48 of file cf_codec.c.

12.39.4.45 CF_FieldSetVal()

```
static void CF_FieldSetVal (
    uint8 * dest,
    uint8 shift,
```

```
uint8 mask,
uint8 val )  [inline], [static]
```

Definition at line 53 of file cf_codec.c.

12.39.5 Variable Documentation

12.39.5.1 CF_CFDP_PduAck_CC

`const CF_Codec_BitField_t CF_CFDP_PduAck_CC = CF_INIT_FIELD(4, 4) [static]`

Definition at line 102 of file cf_codec.c.
Referenced by CF_CFDP_DecodeAck(), and CF_CFDP_EncodeAck().

12.39.5.2 CF_CFDP_PduAck_DIR_CODE

`const CF_Codec_BitField_t CF_CFDP_PduAck_DIR_CODE = CF_INIT_FIELD(4, 4) [static]`

Definition at line 100 of file cf_codec.c.
Referenced by CF_CFDP_DecodeAck(), and CF_CFDP_EncodeAck().

12.39.5.3 CF_CFDP_PduAck_DIR_SUBTYPE_CODE

`const CF_Codec_BitField_t CF_CFDP_PduAck_DIR_SUBTYPE_CODE = CF_INIT_FIELD(4, 0) [static]`

Definition at line 101 of file cf_codec.c.
Referenced by CF_CFDP_DecodeAck(), and CF_CFDP_EncodeAck().

12.39.5.4 CF_CFDP_PduAck_TRANSACTION_STATUS

`const CF_Codec_BitField_t CF_CFDP_PduAck_TRANSACTION_STATUS = CF_INIT_FIELD(2, 0) [static]`

Definition at line 103 of file cf_codec.c.
Referenced by CF_CFDP_DecodeAck(), and CF_CFDP_EncodeAck().

12.39.5.5 CF_CFDP_PduEof_FLAGS_CC

`const CF_Codec_BitField_t CF_CFDP_PduEof_FLAGS_CC = CF_INIT_FIELD(4, 4) [static]`

Definition at line 87 of file cf_codec.c.
Referenced by CF_CFDP_DecodeEof(), and CF_CFDP_EncodeEof().

12.39.5.6 CF_CFDP_PduFileData_RECORD_CONTINUATION_STATE

`const CF_Codec_BitField_t CF_CFDP_PduFileData_RECORD_CONTINUATION_STATE = CF_INIT_FIELD(2, 6) [static]`

Definition at line 117 of file cf_codec.c.
Referenced by CF_CFDP_DecodeFileDataHeader(), and CF_CFDP_EncodeFileDataHeader().

12.39.5.7 CF_CFDP_PduFileData_SEGMENT_METADATA_LENGTH

`const CF_Codec_BitField_t CF_CFDP_PduFileData_SEGMENT_METADATA_LENGTH = CF_INIT_FIELD(6, 0) [static]`

Definition at line 118 of file cf_codec.c.
Referenced by CF_CFDP_DecodeFileDataHeader(), and CF_CFDP_EncodeFileDataHeader().

12.39.5.8 CF_CFDP_PduFin_FLAGS_CC

`const CF_Codec_BitField_t CF_CFDP_PduFin_FLAGS_CC = CF_INIT_FIELD(4, 4) [static]`

Definition at line 92 of file cf_codec.c.
Referenced by CF_CFDP_DecodeFin(), and CF_CFDP_EncodeFin().

12.39.5.9 CF_CFDP_PduFin_FLAGS_DELIVERY_CODE

`const CF_Codec_BitField_t CF_CFDP_PduFin_FLAGS_DELIVERY_CODE = CF_INIT_FIELD(1, 2) [static]`

Definition at line 93 of file cf_codec.c.
Referenced by CF_CFDP_DecodeFin(), and CF_CFDP_EncodeFin().

12.39.5.10 CF_CFDP_PduFin_FLAGS_FILE_STATUS

`const CF_Codec_BitField_t CF_CFDP_PduFin_FLAGS_FILE_STATUS = CF_INIT_FIELD(2, 0) [static]`

Definition at line 94 of file cf_codec.c.
Referenced by CF_CFDP_DecodeFin(), and CF_CFDP_EncodeFin().

12.39.5.11 CF_CFDP_PduHeader_FLAGS_CRC

`const CF_Codec_BitField_t CF_CFDP_PduHeader_FLAGS_CRC = CF_INIT_FIELD(1, 1) [static]`

Definition at line 75 of file cf_codec.c.
Referenced by CF_CFDP_DecodeHeader().

12.39.5.12 CF_CFDP_PduHeader_FLAGS_DIR

`const CF_Codec_BitField_t CF_CFDP_PduHeader_FLAGS_DIR = CF_INIT_FIELD(1, 3) [static]`

Definition at line 73 of file cf_codec.c.
Referenced by CF_CFDP_DecodeHeader(), and CF_CFDP_EncodeHeaderWithoutSize().

12.39.5.13 CF_CFDP_PduHeader_FLAGS_LARGEFILE

`const CF_Codec_BitField_t CF_CFDP_PduHeader_FLAGS_LARGEFILE = CF_INIT_FIELD(1, 0) [static]`

Definition at line 76 of file cf_codec.c.
Referenced by CF_CFDP_DecodeHeader().

12.39.5.14 CF_CFDP_PduHeader_FLAGS_MODE

`const CF_Codec_BitField_t CF_CFDP_PduHeader_FLAGS_MODE = CF_INIT_FIELD(1, 2) [static]`

Definition at line 74 of file cf_codec.c.
Referenced by CF_CFDP_DecodeHeader(), and CF_CFDP_EncodeHeaderWithoutSize().

12.39.5.15 CF_CFDP_PduHeader_FLAGS_TYPE

`const CF_Codec_BitField_t CF_CFDP_PduHeader_FLAGS_TYPE = CF_INIT_FIELD(1, 4) [static]`

Definition at line 72 of file cf_codec.c.
Referenced by CF_CFDP_DecodeHeader(), and CF_CFDP_EncodeHeaderWithoutSize().

12.39.5.16 CF_CFDP_PduHeader_FLAGS_VERSION

`const CF_Codec_BitField_t CF_CFDP_PduHeader_FLAGS_VERSION = CF_INIT_FIELD(3, 5) [static]`

Definition at line 71 of file cf_codec.c.
Referenced by CF_CFDP_DecodeHeader(), and CF_CFDP_EncodeHeaderWithoutSize().

12.39.5.17 CF_CFDP_PduHeader_LENGTHS_ENTITY

`const CF_Codec_BitField_t CF_CFDP_PduHeader_LENGTHS_ENTITY = CF_INIT_FIELD(3, 4) [static]`

Definition at line 81 of file cf_codec.c.

Referenced by CF_CFDP_DecodeHeader(), and CF_CFDP_EncodeHeaderWithoutSize().

12.39.5.18 CF_CFDP_PduHeader_LENGTHS_TRANSACTION_SEQUENCE

`const CF_Codec_BitField_t CF_CFDP_PduHeader_LENGTHS_TRANSACTION_SEQUENCE = CF_INIT_FIELD(3, 0) [static]`

Definition at line 82 of file cf_codec.c.

Referenced by CF_CFDP_DecodeHeader(), and CF_CFDP_EncodeHeaderWithoutSize().

12.39.5.19 CF_CFDP_PduMd_CHECKSUM_TYPE

`const CF_Codec_BitField_t CF_CFDP_PduMd_CHECKSUM_TYPE = CF_INIT_FIELD(4, 0) [static]`

Definition at line 110 of file cf_codec.c.

Referenced by CF_CFDP_DecodeMd(), and CF_CFDP_EncodeMd().

12.39.5.20 CF_CFDP_PduMd_CLOSURE_REQUESTED

`const CF_Codec_BitField_t CF_CFDP_PduMd_CLOSURE_REQUESTED = CF_INIT_FIELD(1, 7) [static]`

Definition at line 109 of file cf_codec.c.

Referenced by CF_CFDP_DecodeMd(), and CF_CFDP_EncodeMd().

12.40 apps/cf/fsw/src/cf_codec.h File Reference

```
#include "cfe.h"
#include "cf_cfdp_pdu.h"
#include "cf_logical_pdu.h"
```

Data Structures

- struct CF_CodecState

  Tracks the current state of an encode or decode operation.
- struct CF_EncoderState

  Current state of an encode operation.
- struct CF_DecoderState

  Current state of a decode operation.

Macros

- #define CF_ENCODE_FIXED_CHUNK(state, type) ((type ∗)CF_CFDP_DoEncodeChunk(state, sizeof(type)))

  Macro to encode a block of a given CFDP type into a PDU.
- #define CF_DECODE_FIXED_CHUNK(state, type) ((const type ∗)CF_CFDP_DoDecodeChunk(state, sizeof(type)))

  Macro to decode a block of a given CFDP type into a PDU.
- #define CF_CODEC_IS_OK(s) (CF_CFDP_CodecIsOK(&((s)->codec_state)))

  Macro wrapper around CF_CFDP_CodecIsOK()
- #define CF_CODEC_SET_DONE(s) (CF_CFDP_CodecSetDone(&((s)->codec_state)))

Macro wrapper around CF_CFDP_CodecSetDone()

- #define CF_CODEC_GET_POSITION(s) (CF_CFDP_CodecGetPosition(&((s)->codec_state)))

  Macro wrapper around CF_CFDP_CodecGetPosition()

- #define CF_CODEC_GET_REMAIN(s) (CF_CFDP_CodecGetRemain(&((s)->codec_state)))

  Macro wrapper around CF_CFDP_CodecGetRemain()

- #define CF_CODEC_GET_SIZE(s) (CF_CFDP_CodecGetSize(&((s)->codec_state)))

  Macro wrapper around CF_CFDP_CodecGetSize()

Typedefs

- typedef struct CF_CodecState CF_CodecState_t

  Tracks the current state of an encode or decode operation.

- typedef struct CF_EncoderState CF_EncoderState_t

  Current state of an encode operation.

- typedef struct CF_DecoderState CF_DecoderState_t

  Current state of a decode operation.

Functions

- static bool CF_CFDP_CodecIsOK (const CF_CodecState_t *state)

  Checks if the codec is currently valid or not.

- static void CF_CFDP_CodecSetDone (CF_CodecState_t *state)

  Sets a codec to the "done" state.

- static size_t CF_CFDP_CodecGetPosition (const CF_CodecState_t *state)

  Obtains the current position/offset within the PDU.

- static size_t CF_CFDP_CodecGetSize (const CF_CodecState_t *state)

  Obtains the maximum size of the PDU being encoded/decoded.

- static size_t CF_CFDP_CodecGetRemain (const CF_CodecState_t *state)

  Obtains the remaining size of the PDU being encoded/decoded.

- static void CF_CFDP_CodecReset (CF_CodecState_t *state, size_t max_size)

  Resets a codec state.

- bool CF_CFDP_CodecCheckSize (CF_CodecState_t *state, size_t chunksize)

  Advances the position by the indicated size, confirming the block will fit into the PDU.

- void * CF_CFDP_DoEncodeChunk (CF_EncoderState_t *state, size_t chunksize)

  Encode a block of data into the PDU.

- const void * CF_CFDP_DoDecodeChunk (CF_DecoderState_t *state, size_t chunksize)

  Decode a block of data from the PDU.

- uint8 CF_CFDP_GetValueEncodedSize (uint64 Value)

  Gets the minimum number of octets that the given integer may be encoded in.

- void CF_EncodeIntegerInSize (CF_EncoderState_t *state, uint64 value, uint8 encode_size)

  Encodes the given integer value in the given number of octets.

- uint64 CF_DecodeIntegerInSize (CF_DecoderState_t *state, uint8 decode_size)

  Decodes an integer value from the specified number of octets.

- void CF_CFDP_EncodeHeaderWithoutSize (CF_EncoderState_t *state, CF_Logical_PduHeader_t *plh)

  Encodes a CFDP PDU base header block, bypassing the size field.

- void CF_CFDP_EncodeHeaderFinalSize (CF_EncoderState_t *state, CF_Logical_PduHeader_t *plh)

  Updates an already-encoded PDU base header block with the final PDU size.

- void CF_CFDP_EncodeFileDirectiveHeader (CF_EncoderState_t *state, CF_Logical_PduFileDirectiveHeader_t *pfdir)

  Encodes a CFDP file directive header block.
- void CF_CFDP_EncodeLV (CF_EncoderState_t *state, CF_Logical_Lv_t *pllv)

  Encodes a single CFDP Length+Value (LV) pair.
- void CF_CFDP_EncodeTLV (CF_EncoderState_t *state, CF_Logical_Tlv_t *pltlv)

  Encodes a single CFDP Type+Length+Value (TLV) tuple.
- void CF_CFDP_EncodeSegmentRequest (CF_EncoderState_t *state, CF_Logical_SegmentRequest_t *plseg)

  Encodes a single CFDP Segment Request block.
- void CF_CFDP_EncodeAllTlv (CF_EncoderState_t *state, CF_Logical_TlvList_t *pltlv)

  Encodes a list of CFDP Type+Length+Value tuples.
- void CF_CFDP_EncodeAllSegments (CF_EncoderState_t *state, CF_Logical_SegmentList_t *plseg)

  Encodes a list of CFDP Segment Request blocks.
- void CF_CFDP_EncodeMd (CF_EncoderState_t *state, CF_Logical_PduMd_t *plmd)

  Encodes a CFDP Metadata (MD) header block.
- void CF_CFDP_EncodeFileDataHeader (CF_EncoderState_t *state, bool with_meta, CF_Logical_PduFileDataHeader_t *plfd)

  Encodes a CFDP File Data (FD) header block.
- void CF_CFDP_EncodeEof (CF_EncoderState_t *state, CF_Logical_PduEof_t *pleof)

  Encodes a CFDP End-of-File (EOF) header block.
- void CF_CFDP_EncodeFin (CF_EncoderState_t *state, CF_Logical_PduFin_t *plfin)

  Encodes a CFDP Final (FIN) header block.
- void CF_CFDP_EncodeAck (CF_EncoderState_t *state, CF_Logical_PduAck_t *plack)

  Encodes a CFDP Acknowledge (ACK) header block.
- void CF_CFDP_EncodeNak (CF_EncoderState_t *state, CF_Logical_PduNak_t *plnak)

  Encodes a CFDP Non-Acknowledge (NAK) header block.
- void CF_CFDP_EncodeCrc (CF_EncoderState_t *state, uint32 *plcrc)

  Encodes a CFDP CRC/Checksum.
- CFE_Status_t CF_CFDP_DecodeHeader (CF_DecoderState_t *state, CF_Logical_PduHeader_t *plh)

  Decodes a CFDP base PDU header.
- void CF_CFDP_DecodeFileDirectiveHeader (CF_DecoderState_t *state, CF_Logical_PduFileDirectiveHeader_t *pfdir)

  Decodes a CFDP file directive header block.
- void CF_CFDP_DecodeLV (CF_DecoderState_t *state, CF_Logical_Lv_t *pllv)

  Decodes a single CFDP Length+Value (LV) pair.
- void CF_CFDP_DecodeTLV (CF_DecoderState_t *state, CF_Logical_Tlv_t *pltlv)

  Decodes a single CFDP Type+Length+Value (TLV) tuple.
- void CF_CFDP_DecodeSegmentRequest (CF_DecoderState_t *state, CF_Logical_SegmentRequest_t *plseg)

  Decodes a single CFDP Segment Request block.
- void CF_CFDP_DecodeAllTlv (CF_DecoderState_t *state, CF_Logical_TlvList_t *pltlv, uint8 limit)

  Decodes a list of CFDP Type+Length+Value tuples.
- void CF_CFDP_DecodeAllSegments (CF_DecoderState_t *state, CF_Logical_SegmentList_t *plseg, uint8 limit)

  Decodes a list of CFDP Segment Request blocks.
- void CF_CFDP_DecodeMd (CF_DecoderState_t *state, CF_Logical_PduMd_t *plmd)

  Decodes a CFDP Metadata (MD) header block.
- void CF_CFDP_DecodeFileDataHeader (CF_DecoderState_t *state, bool with_meta, CF_Logical_PduFileDataHeader_t *plfd)

Decodes a CFDP File Data (FD) header block.

- void CF_CFDP_DecodeEof (CF_DecoderState_t *state, CF_Logical_PduEof_t *pleof)

  Decodes a CFDP End-of-File (EOF) header block.
- void CF_CFDP_DecodeFin (CF_DecoderState_t *state, CF_Logical_PduFin_t *plfin)

  Decodes a CFDP Final (FIN) header block.
- void CF_CFDP_DecodeAck (CF_DecoderState_t *state, CF_Logical_PduAck_t *plack)

  Decodes a CFDP Acknowledge (ACK) header block.
- void CF_CFDP_DecodeNak (CF_DecoderState_t *state, CF_Logical_PduNak_t *plnak)

  Decodes a CFDP Non-Acknowledge (NAK) header block.
- void CF_CFDP_DecodeCrc (CF_DecoderState_t *state, uint32 *plcrc)

  Decodes a CFDP CRC/Checksum.

12.40.1 Detailed Description

CFDP protocol data structure encode/decode API declarations

12.40.2 Macro Definition Documentation

12.40.2.1 CF_CODEC_GET_POSITION

```
#define CF_CODEC_GET_POSITION(
    s ) (CF_CFDP_CodecGetPosition(&((s)->codec_state)))
```

Macro wrapper around CF_CFDP_CodecGetPosition()

Checks the position of either an encoder or decoder object This just simplifies the code, as same macro may be used with either an CF_EncoderState_t or CF_DecoderState_t object.

Parameters

s	Encoder or Decoder state

Definition at line 268 of file cf_codec.h.

12.40.2.2 CF_CODEC_GET_REMAIN

```
#define CF_CODEC_GET_REMAIN(
    s ) (CF_CFDP_CodecGetRemain(&((s)->codec_state)))
```

Macro wrapper around CF_CFDP_CodecGetRemain()

Checks the remainder of either an encoder or decoder object This just simplifies the code, as same macro may be used with either an CF_EncoderState_t or CF_DecoderState_t object.

Parameters

s	Encoder or Decoder state

Definition at line 280 of file cf_codec.h.

12.40.2.3 CF_CODEC_GET_SIZE

```
#define CF_CODEC_GET_SIZE(
    s ) (CF_CFDP_CodecGetSize(&((s)->codec_state)))
```

Macro wrapper around CF_CFDP_CodecGetSize()

Checks the size of either an encoder or decoder object This just simplifies the code, as same macro may be used with either an CF_EncoderState_t or CF_DecoderState_t object.

Parameters

s	Encoder or Decoder state

Definition at line 292 of file cf_codec.h.

12.40.2.4 CF_CODEC_IS_OK

```
#define CF_CODEC_IS_OK(
    s ) (CF_CFDP_CodecIsOK(&((s)->codec_state)))
```

Macro wrapper around CF_CFDP_CodecIsOK()
Checks the state of either an encoder or decoder object This just simplifies the code, as same macro may be used with either an CF_EncoderState_t or CF_DecoderState_t object.

Parameters

s	Encoder or Decoder state

Definition at line 244 of file cf_codec.h.

12.40.2.5 CF_CODEC_SET_DONE

```
#define CF_CODEC_SET_DONE(
    s ) (CF_CFDP_CodecSetDone(&((s)->codec_state)))
```

Macro wrapper around CF_CFDP_CodecSetDone()
Sets the state of either an encoder or decoder object This just simplifies the code, as same macro may be used with either an CF_EncoderState_t or CF_DecoderState_t object.

Parameters

s	Encoder or Decoder state

Definition at line 256 of file cf_codec.h.

12.40.2.6 CF_DECODE_FIXED_CHUNK

```
#define CF_DECODE_FIXED_CHUNK(
    state,
    type ) ((const type *)CF_CFDP_DoDecodeChunk(state, sizeof(type)))
```

Macro to decode a block of a given CFDP type into a PDU.
This is a wrapper around CF_CFDP_DoDecodeChunk() to encode the given data type, rather than a generic size. The sizeof() the type should reflect the *encoded* size within the PDU. Specifically, this must only be used with the "CFDP" data types which are specifically designed to match the binary layout of the CFDP-defined header structures.

Parameters

state	Decoder state object
type	Data type to decode, from cf_cfdp_pdu.h

Returns

Pointer to block, if successful

Return values

NULL	if not successful (no space or other error).

Definition at line 232 of file cf_codec.h.

12.40.2.7 CF_ENCODE_FIXED_CHUNK

```
#define CF_ENCODE_FIXED_CHUNK(
    state,
    type ) ((type *)CF_CFDP_DoEncodeChunk(state, sizeof(type)))
```

Macro to encode a block of a given CFDP type into a PDU.
This is a wrapper around CF_CFDP_DoEncodeChunk() to encode the given data type, rather than a generic size. The sizeof() the type should reflect the *encoded* size within the PDU. Specifically, this must only be used with the "CFDP" data types which are specifically designed to match the binary layout of the CFDP-defined header structures.

Parameters

state	Encoder state object
type	Data type to encode, from cf_cfdp_pdu.h

Returns

Pointer to block, if successful

Return values

NULL	if not successful (no space or other error).

Definition at line 215 of file cf_codec.h.

12.40.3 Typedef Documentation

12.40.3.1 CF_CodecState_t

```
typedef struct CF_CodecState CF_CodecState_t
```

Tracks the current state of an encode or decode operation.
This encapsulates the common state between encode and decode

12.40.3.2 CF_DecoderState_t

```
typedef struct CF_DecoderState CF_DecoderState_t
```

Current state of a decode operation.
State structure for decodes

12.40.3.3 CF_EncoderState_t

```
typedef struct CF_EncoderState CF_EncoderState_t
```

Current state of an encode operation.
State structure for encodes

12.40.4 Function Documentation

12.40.4.1 CF_CFDP_CodecCheckSize()

```
bool CF_CFDP_CodecCheckSize (
    CF_CodecState_t * state,
    size_t chunksize )
```

Advances the position by the indicated size, confirming the block will fit into the PDU.
On encode, this confirms there is enough available space to hold a block of the indicated size. On decode, this confirms that decoding the indicated number of bytes will not read beyond the end of data.
If true, then the current position/offset is advanced by the indicated number of bytes If false, then the error flag is set, so that future calls to CF_CFDP_CodecIsOK will also return false.

Note

The error flag is sticky, meaning that if any encode/decode operation fails, all future encode/decode requests on the same state will also fail. Each encode/decode step must check the flag, and skip the operation if it is false. Reporting the error can be deferred to the final stage, and only done once.

Parameters

state	Encoder/Decoder common state
chunksize	Size of next block to encode/decode

Return values

true	If encode/decode is possible, enough space exists
false	If encode/decode is not possible, not enough space or prior error occurred

Definition at line 269 of file cf_codec.c.
References CF_CFDP_CodecIsOK(), CF_CFDP_CodecSetDone(), CF_CodecState::max_size, and CF_CodecState↩::next_offset.
Referenced by CF_CFDP_DoDecodeChunk(), and CF_CFDP_DoEncodeChunk().
Here is the call graph for this function:

12.40.4.2 CF_CFDP_CodecGetPosition()

```
static size_t CF_CFDP_CodecGetPosition (
    const CF_CodecState_t * state ) [inline], [static]
```

Obtains the current position/offset within the PDU.

Parameters

state	Encoder/Decoder common state

Returns

Current offset in PDU

Definition at line 107 of file cf_codec.h.
References CF_CodecState::next_offset.
Referenced by CF_CFDP_DoDecodeChunk(), and CF_CFDP_DoEncodeChunk().

12.40.4.3 CF_CFDP_CodecGetRemain()

```
static size_t CF_CFDP_CodecGetRemain (
    const CF_CodecState_t * state ) [inline], [static]
```

Obtains the remaining size of the PDU being encoded/decoded.

Parameters

state	Encoder/Decoder common state

Returns

Remaining size of PDU

Definition at line 131 of file cf_codec.h.
References CF_CodecState::max_size, and CF_CodecState::next_offset.

12.40.4.4 CF_CFDP_CodecGetSize()

```
static size_t CF_CFDP_CodecGetSize (
    const CF_CodecState_t * state ) [inline], [static]
```

Obtains the maximum size of the PDU being encoded/decoded.

Parameters

state	Encoder/Decoder common state

Returns

Maximum size of PDU

Definition at line 119 of file cf_codec.h.
References CF_CodecState::max_size.

12.40.4.5 CF_CFDP_CodecIsOK()

```
static bool CF_CFDP_CodecIsOK (
    const CF_CodecState_t * state ) [inline], [static]
```

Checks if the codec is currently valid or not.

Parameters

state	Encoder/Decoder common state

Return values

true	If encoder/decoder is still valid, has not reached end of PDU
false	If encoder/decoder is not valid, has reached end of PDU or an error occurred

Definition at line 82 of file cf_codec.h.
References CF_CodecState::is_valid.
Referenced by CF_CFDP_CodecCheckSize().

12.40.4.6 CF_CFDP_CodecReset()

```
static void CF_CFDP_CodecReset (
    CF_CodecState_t * state,
    size_t max_size ) [inline], [static]
```

Resets a codec state.

Parameters

state	Encoder/Decoder common state
max_size	Maximum size of PDU

Definition at line 143 of file cf_codec.h.
References CF_CodecState::is_valid, CF_CodecState::max_size, and CF_CodecState::next_offset.
Referenced by CF_CFDP_DecodeStart(), and CF_CFDP_EncodeStart().

12.40.4.7 CF_CFDP_CodecSetDone()

```
static void CF_CFDP_CodecSetDone (
    CF_CodecState_t * state ) [inline], [static]
```

Sets a codec to the "done" state.
This may mean end of PDU data is reached, or that an error occurred

Parameters

state	Encoder/Decoder common state

Definition at line 95 of file cf_codec.h.
References CF_CodecState::is_valid.
Referenced by CF_CFDP_CodecCheckSize(), CF_CFDP_DecodeStart(), and CF_CFDP_EncodeStart().

12.40.4.8 CF_CFDP_DecodeAck()

```
void CF_CFDP_DecodeAck (
    CF_DecoderState_t * state,
    CF_Logical_PduAck_t * plack )
```

Decodes a CFDP Acknowledge (ACK) header block.
The data will be decoded from the encoded PDU at the current position and the logical fields will be saved to the given data structure
If the encoder is in an error state, nothing is decoded, and the state of the decoder is not changed.

Parameters

state	Decoder state object
plack	Pointer to logical PDU ACK header data

Definition at line 1043 of file cf_codec.c.
References CF_Logical_PduAck::ack_directive_code, CF_Logical_PduAck::ack_subtype_code, CF_Logical_PduAck↩::cc, CF_CFDP_PduAck::cc_and_transaction_status, CF_CFDP_PduAck_CC, CF_CFDP_PduAck_DIR_CODE, CF_↩CFDP_PduAck_DIR_SUBTYPE_CODE, CF_CFDP_PduAck_TRANSACTION_STATUS, CF_DECODE_FIXED_CH↩UNK, CF_CFDP_PduAck::directive_and_subtype_code, FGV, and CF_Logical_PduAck::txn_status.

Referenced by CF_CFDP_RecvAck().

12.40.4.9 CF_CFDP_DecodeAllSegments()

```
void CF_CFDP_DecodeAllSegments (
    CF_DecoderState_t * state,
    CF_Logical_SegmentList_t * plseg,
    uint8 limit )
```

Decodes a list of CFDP Segment Request blocks.
The data will be decoded from the encoded PDU at the current position and the logical fields will be saved to the given data structure
If the encoder is in an error state, nothing is decoded, and the state of the decoder is not changed.

Parameters

state	Decoder state object
plseg	Pointer to logical PDU segment request header data
limit	Maximum number of Segment Request objects to decode

Definition at line 1119 of file cf_codec.c.
References CF_CFDP_DecodeSegmentRequest(), CF_CODEC_GET_REMAIN, CF_CODEC_IS_OK, CF_CODEC_↩SET_DONE, CF_PDU_MAX_SEGMENTS, CF_Logical_SegmentList::num_segments, and CF_Logical_SegmentList↩::segments.
Referenced by CF_CFDP_DecodeNak().
Here is the call graph for this function:

12.40.4.10 CF_CFDP_DecodeAllTlv()

```
void CF_CFDP_DecodeAllTlv (
    CF_DecoderState_t * state,
    CF_Logical_TlvList_t * pltlv,
    uint8 limit )
```

Decodes a list of CFDP Type+Length+Value tuples.
The data will be decoded from the encoded PDU at the current position and the logical fields will be saved to the given data structure
If the encoder is in an error state, nothing is decoded, and the state of the decoder is not changed.

Parameters

state	Decoder state object
pltlv	Pointer to logical PDU TLV header data
limit	Maximum number of TLV objects to decode

Definition at line 1084 of file cf_codec.c.
References CF_CFDP_DecodeTLV(), CF_CODEC_GET_REMAIN, CF_CODEC_IS_OK, CF_CODEC_SET_DONE, CF_PDU_MAX_TLV, CF_Logical_TlvList::num_tlv, and CF_Logical_TlvList::tlv.
Referenced by CF_CFDP_DecodeEof(), and CF_CFDP_DecodeFin().

Here is the call graph for this function:

12.40.4.11 CF_CFDP_DecodeCrc()

```
void CF_CFDP_DecodeCrc (
    CF_DecoderState_t * state,
    uint32 * plcrc )
```

Decodes a CFDP CRC/Checksum.
The data will be decoded from the encoded PDU at the current position and the logical fields will be saved to the given data structure
If the encoder is in an error state, nothing is decoded, and the state of the decoder is not changed.

Parameters

state	Decoder state object
plcrc	Pointer to logical CRC value

Definition at line 984 of file cf_codec.c.
References CF_Codec_Load_uint32(), and CF_DECODE_FIXED_CHUNK.
Here is the call graph for this function:

12.40.4.12 CF_CFDP_DecodeEof()

```
void CF_CFDP_DecodeEof (
    CF_DecoderState_t * state,
    CF_Logical_PduEof_t * pleof )
```

Decodes a CFDP End-of-File (EOF) header block.
The data will be decoded from the encoded PDU at the current position and the logical fields will be saved to the given data structure
If the encoder is in an error state, nothing is decoded, and the state of the decoder is not changed.

Parameters

state	Decoder state object
pleof	Pointer to logical PDU EOF header data

Definition at line 1001 of file cf_codec.c.
References CF_Logical_PduEof::cc, CF_CFDP_PduEof::cc, CF_CFDP_DecodeAllTlv(), CF_CFDP_PduEof_FLAGS↩_CC, CF_Codec_Load_uint32(), CF_DECODE_FIXED_CHUNK, CF_PDU_MAX_TLV, CF_Logical_PduEof::crc, CF_↩CFDP_PduEof::crc, FGV, CF_Logical_PduEof::size, CF_CFDP_PduEof::size, and CF_Logical_PduEof::tlv_list.
Referenced by CF_CFDP_RecvEof().
Here is the call graph for this function:

12.40.4.13 CF_CFDP_DecodeFileDataHeader()

```
void CF_CFDP_DecodeFileDataHeader (
    CF_DecoderState_t * state,
    bool with_meta,
    CF_Logical_PduFileDataHeader_t * plfd )
```

Decodes a CFDP File Data (FD) header block.
The data will be decoded from the encoded PDU at the current position and the logical fields will be saved to the given data structure
If the encoder is in an error state, nothing is decoded, and the state of the decoder is not changed.

Parameters

state	Decoder state object
with_meta	Whether to include optional continuation and segment request fields (always false currently)
plfd	Pointer to logical PDU file header data

Definition at line 922 of file cf_codec.c.
References CF_CFDP_DecodeSegmentRequest(), CF_CFDP_DoDecodeChunk(), CF_CFDP_PduFileData_RECO↩RD_CONTINUATION_STATE, CF_CFDP_PduFileData_SEGMENT_METADATA_LENGTH, CF_CODEC_GET_R↩EMAIN, CF_CODEC_IS_OK, CF_Codec_Load_uint32(), CF_CODEC_SET_DONE, CF_DECODE_FIXED_CHUNK, CF_PDU_MAX_SEGMENTS, CF_Logical_PduFileDataHeader::continuation_state, CF_Logical_PduFileDataHeader↩::data_len, CF_Logical_PduFileDataHeader::data_ptr, FGV, CF_Logical_SegmentList::num_segments, CF_Logical↩_PduFileDataHeader::offset, CF_CFDP_PduFileDataHeader::offset, CF_Logical_PduFileDataHeader::segment_list, and CF_Logical_SegmentList::segments.
Referenced by CF_CFDP_RecvFd().
Here is the call graph for this function:

12.40.4.14 CF_CFDP_DecodeFileDirectiveHeader()

```
void CF_CFDP_DecodeFileDirectiveHeader (
```

```
CF_DecoderState_t * state,
CF_Logical_PduFileDirectiveHeader_t * pfdir )
```

Decodes a CFDP file directive header block.
The data will be decoded from the encoded PDU at the current position and the logical fields will be saved to the given data structure
If the encoder is in an error state, nothing is decoded, and the state of the decoder is not changed.

Parameters

state	Decoder state object
pfdir	Pointer to logical PDU file directive header data

Definition at line 812 of file cf_codec.c.
References CF_Codec_Load_uint8(), CF_DECODE_FIXED_CHUNK, CF_Logical_PduFileDirectiveHeader::directive↩_code, and CF_CFDP_PduFileDirectiveHeader::directive_code.
Referenced by CF_CFDP_RecvPh().
Here is the call graph for this function:

12.40.4.15 CF_CFDP_DecodeFin()

```
void CF_CFDP_DecodeFin (
CF_DecoderState_t * state,
CF_Logical_PduFin_t * plfin )
```

Decodes a CFDP Final (FIN) header block.
The data will be decoded from the encoded PDU at the current position and the logical fields will be saved to the given data structure
If the encoder is in an error state, nothing is decoded, and the state of the decoder is not changed.

Parameters

state	Decoder state object
plfin	Pointer to logical PDU FIN header data

Definition at line 1022 of file cf_codec.c.
References CF_Logical_PduFin::cc, CF_CFDP_DecodeAllTlv(), CF_CFDP_PduFin_FLAGS_CC, CF_CFDP_PduFin↩_FLAGS_DELIVERY_CODE, CF_CFDP_PduFin_FLAGS_FILE_STATUS, CF_DECODE_FIXED_CHUNK, CF_PDU↩_MAX_TLV, CF_Logical_PduFin::delivery_code, FGV, CF_Logical_PduFin::file_status, CF_CFDP_PduFin::flags, and CF_Logical_PduFin::tlv_list.
Referenced by CF_CFDP_RecvFin().

Here is the call graph for this function:

12.40.4.16 CF_CFDP_DecodeHeader()

```
CFE_Status_t CF_CFDP_DecodeHeader (
    CF_DecoderState_t * state,
    CF_Logical_PduHeader_t * plh )
```

Decodes a CFDP base PDU header.

The data will be decoded from the encoded PDU at the current position and the logical fields will be saved to the given data structure

If the encoder is in an error state, nothing is decoded, and the state of the decoder is not changed.

Note

On decode the entire base header is decoded in a single call, the size will be decoded like any other field.

Parameters

state	Decoder state object
plh	Pointer to logical PDU base header data

Return values

CFE_SUCCESS	Successful execution. Operation was performed successfully
CF_ERROR	on error.

Definition at line 766 of file cf_codec.c.

References CF_CFDP_PduHeader_FLAGS_CRC, CF_CFDP_PduHeader_FLAGS_DIR, CF_CFDP_PduHeader_FL↩AGS_LARGEFILE, CF_CFDP_PduHeader_FLAGS_MODE, CF_CFDP_PduHeader_FLAGS_TYPE, CF_CFDP_Pdu↩Header_FLAGS_VERSION, CF_CFDP_PduHeader_LENGTHS_ENTITY, CF_CFDP_PduHeader_LENGTHS_TRA↩NSACTION_SEQUENCE, CF_CODEC_GET_POSITION, CF_Codec_Load_uint16(), CF_DECODE_FIXED_CHUNK, CF_DecodeIntegerInSize(), CF_ERROR, CFE_SUCCESS, CF_Logical_PduHeader::crc_flag, CF_Logical_Pdu↩Header::data_encoded_length, CF_Logical_PduHeader::destination_eid, CF_Logical_PduHeader::direction, CF_↩Logical_PduHeader::eid_length, CF_CFDP_PduHeader::eid_tsn_lengths, FGV, CF_CFDP_PduHeader::flags, CF↩_Logical_PduHeader::header_encoded_length, CF_Logical_PduHeader::large_flag, CF_CFDP_PduHeader::length, CF_Logical_PduHeader::pdu_type, CF_Logical_PduHeader::sequence_num, CF_Logical_PduHeader::source_eid, CF_Logical_PduHeader::txm_mode, CF_Logical_PduHeader::txn_seq_length, and CF_Logical_PduHeader::version.

Referenced by CF_CFDP_RecvPh().

Here is the call graph for this function:

12.40.4.17 CF_CFDP_DecodeLV()

```
void CF_CFDP_DecodeLV (
    CF_DecoderState_t * state,
    CF_Logical_Lv_t * pllv )
```

Decodes a single CFDP Length+Value (LV) pair.
The data will be decoded from the encoded PDU at the current position and the logical fields will be saved to the given data structure
If the encoder is in an error state, nothing is decoded, and the state of the decoder is not changed.

Parameters

state	Decoder state object
pllv	Pointer to single logical PDU LV data

Definition at line 832 of file cf_codec.c.
References CF_CFDP_DoDecodeChunk(), CF_Codec_Load_uint8(), CF_DECODE_FIXED_CHUNK, CF_Logical_↩Lv::data_ptr, CF_Logical_Lv::length, and CF_CFDP_lv::length.
Referenced by CF_CFDP_DecodeMd().
Here is the call graph for this function:

12.40.4.18 CF_CFDP_DecodeMd()

```
void CF_CFDP_DecodeMd (
    CF_DecoderState_t * state,
    CF_Logical_PduMd_t * plmd )
```

Decodes a CFDP Metadata (MD) header block.
The data will be decoded from the encoded PDU at the current position and the logical fields will be saved to the given data structure
If the encoder is in an error state, nothing is decoded, and the state of the decoder is not changed.

Parameters

state	Decoder state object
plmd	Pointer to logical PDU metadata header data

Definition at line 899 of file cf_codec.c.
References CF_CFDP_DecodeLV(), CF_CFDP_PduMd_CHECKSUM_TYPE, CF_CFDP_PduMd_CLOSURE_RE↩QUESTED, CF_Codec_Load_uint32(), CF_DECODE_FIXED_CHUNK, CF_Logical_PduMd::checksum_type, CF_↩Logical_PduMd::close_req, CF_Logical_PduMd::dest_filename, FGV, CF_CFDP_PduMd::segmentation_control, CF↩_Logical_PduMd::size, CF_CFDP_PduMd::size, and CF_Logical_PduMd::source_filename.
Referenced by CF_CFDP_RecvMd().

Here is the call graph for this function:

12.40.4.19 CF_CFDP_DecodeNak()

```
void CF_CFDP_DecodeNak (
    CF_DecoderState_t * state,
    CF_Logical_PduNak_t * plnak )
```

Decodes a CFDP Non-Acknowledge (NAK) header block.

The data will be decoded from the encoded PDU at the current position and the logical fields will be saved to the given data structure

If the encoder is in an error state, nothing is decoded, and the state of the decoder is not changed.

Parameters

state	Decoder state object
plnak	Pointer to logical PDU NAK header data

Definition at line 1064 of file cf_codec.c.

References CF_CFDP_DecodeAllSegments(), CF_Codec_Load_uint32(), CF_DECODE_FIXED_CHUNK, CF_P↩DU_MAX_SEGMENTS, CF_Logical_PduNak::scope_end, CF_CFDP_PduNak::scope_end, CF_Logical_PduNak↩::scope_start, CF_CFDP_PduNak::scope_start, and CF_Logical_PduNak::segment_list.

Referenced by CF_CFDP_RecvNak().

Here is the call graph for this function:

12.40.4.20 CF_CFDP_DecodeSegmentRequest()

```
void CF_CFDP_DecodeSegmentRequest (
    CF_DecoderState_t * state,
    CF_Logical_SegmentRequest_t * plseg )
```

Decodes a single CFDP Segment Request block.

The data will be decoded from the encoded PDU at the current position and the logical fields will be saved to the given data structure

If the encoder is in an error state, nothing is decoded, and the state of the decoder is not changed.

Parameters

state	Decoder state object
plseg	Pointer to single logical PDU segment request header data

Definition at line 881 of file cf_codec.c.
References CF_Codec_Load_uint32(), CF_DECODE_FIXED_CHUNK, CF_Logical_SegmentRequest::offset_end, CF_CFDP_SegmentRequest::offset_end, CF_Logical_SegmentRequest::offset_start, and CF_CFDP_Segment↩Request::offset_start.
Referenced by CF_CFDP_DecodeAllSegments(), and CF_CFDP_DecodeFileDataHeader().
Here is the call graph for this function:

12.40.4.21 CF_CFDP_DecodeTLV()

```
void CF_CFDP_DecodeTLV (
    CF_DecoderState_t * state,
    CF_Logical_Tlv_t * pltlv )
```

Decodes a single CFDP Type+Length+Value (TLV) tuple.
The data will be decoded from the encoded PDU at the current position and the logical fields will be saved to the given data structure
If the encoder is in an error state, nothing is decoded, and the state of the decoder is not changed.

Parameters

state	Decoder state object
pltlv	Pointer to single logical PDU TLV data

Definition at line 850 of file cf_codec.c.
References CF_CFDP_DoDecodeChunk(), CF_CFDP_TLV_TYPE_ENTITY_ID, CF_Codec_Load_uint8(), CF_DEC↩ODE_FIXED_CHUNK, CF_DecodeIntegerInSize(), CF_Logical_Tlv::data, CF_Logical_TlvData::data_ptr, CF_Logical↩_TlvData::eid, CF_CFDP_tlv::length, CF_Logical_Tlv::length, CF_CFDP_tlv::type, and CF_Logical_Tlv::type.
Referenced by CF_CFDP_DecodeAllTlv().
Here is the call graph for this function:

12.40.4.22 CF_CFDP_DoDecodeChunk()

```
const void* CF_CFDP_DoDecodeChunk (
    CF_DecoderState_t * state,
    size_t chunksize )
```

Decode a block of data from the PDU.
Deducts space for a block of the given size from the current PDU

Parameters

state	Decoder state object
chunksize	Size of block to decode

Returns

Pointer to block, if successful

Return values

NULL	if not successful (no space or other error).

Definition at line 309 of file cf_codec.c.
References CF_DecoderState::base, CF_CFDP_CodecCheckSize(), CF_CFDP_CodecGetPosition(), and CF_↩ DecoderState::codec_state.
Referenced by CF_CFDP_DecodeFileDataHeader(), CF_CFDP_DecodeLV(), CF_CFDP_DecodeTLV(), and CF_↩ DecodeIntegerInSize().
Here is the call graph for this function:

12.40.4.23 CF_CFDP_DoEncodeChunk()

```
void* CF_CFDP_DoEncodeChunk (
    CF_EncoderState_t * state,
    size_t chunksize )
```

Encode a block of data into the PDU.
Adds/Reserves space for a block of the given size in the current PDU

Parameters

state	Encoder state object
chunksize	Size of block to encode

Returns

Pointer to block, if successful

Return values

NULL	if not successful (no space or other error).

Definition at line 291 of file cf_codec.c.
References CF_EncoderState::base, CF_CFDP_CodecCheckSize(), CF_CFDP_CodecGetPosition(), and CF_↩ EncoderState::codec_state.
Referenced by CF_CFDP_EncodeLV(), CF_CFDP_EncodeTLV(), CF_CFDP_S_SendFileData(), and CF_Encode↩ IntegerInSize().
Here is the call graph for this function:

12.40.4.24 CF_CFDP_EncodeAck()

```
void CF_CFDP_EncodeAck (
    CF_EncoderState_t * state,
    CF_Logical_PduAck_t * plack )
```

Encodes a CFDP Acknowledge (ACK) header block.
The data in the logical header will be appended to the encoded PDU at the current position
If the encoder is in an error state, nothing is encoded, and the state of the encoder is not changed.

Parameters

state	Encoder state object
plack	Pointer to logical PDU ACK header data

Definition at line 678 of file cf_codec.c.
References CF_Logical_PduAck::ack_directive_code, CF_Logical_PduAck::ack_subtype_code, CF_Logical_PduAck↩ ::cc, CF_CFDP_PduAck::cc_and_transaction_status, CF_CFDP_PduAck_CC, CF_CFDP_PduAck_DIR_CODE, C↩ F_CFDP_PduAck_DIR_SUBTYPE_CODE, CF_CFDP_PduAck_TRANSACTION_STATUS, CF_Codec_Store_uint8(), CF_ENCODE_FIXED_CHUNK, CF_CFDP_PduAck::directive_and_subtype_code, FSV, and CF_Logical_PduAck↩ ::txn_status.
Referenced by CF_CFDP_SendAck().
Here is the call graph for this function:

12.40.4.25 CF_CFDP_EncodeAllSegments()

```
void CF_CFDP_EncodeAllSegments (
```

```
CF_EncoderState_t * state,
CF_Logical_SegmentList_t * plseg )
```

Encodes a list of CFDP Segment Request blocks.
This invokes CF_CFDP_EncodeSegmentRequest() for all segments in the given list.
The data in the logical header will be appended to the encoded PDU at the current position
If the encoder is in an error state, nothing is encoded, and the state of the encoder is not changed.

Parameters

state	Encoder state object
plseg	Pointer to logical PDU segment request header data

Definition at line 557 of file cf_codec.c.
References CF_CFDP_EncodeSegmentRequest(), CF_CODEC_IS_OK, CF_Logical_SegmentList::num_segments, and CF_Logical_SegmentList::segments.
Referenced by CF_CFDP_EncodeFileDataHeader(), and CF_CFDP_EncodeNak().
Here is the call graph for this function:

12.40.4.26 CF_CFDP_EncodeAllTlv()

```
void CF_CFDP_EncodeAllTlv (
CF_EncoderState_t * state,
CF_Logical_TlvList_t * pltlv )
```

Encodes a list of CFDP Type+Length+Value tuples.
This invokes CF_CFDP_EncodeTLV() for all TLV values in the given list.
The data in the logical header will be appended to the encoded PDU at the current position
If the encoder is in an error state, nothing is encoded, and the state of the encoder is not changed.

Parameters

state	Encoder state object
pltlv	Pointer to logical PDU TLV header data

Definition at line 541 of file cf_codec.c.
References CF_CFDP_EncodeTLV(), CF_CODEC_IS_OK, CF_Logical_TlvList::num_tlv, and CF_Logical_TlvList::tlv.
Referenced by CF_CFDP_EncodeEof(), and CF_CFDP_EncodeFin().
Here is the call graph for this function:

12.40.4.27 CF_CFDP_EncodeCrc()

```
void CF_CFDP_EncodeCrc (
    CF_EncoderState_t * state,
    uint32 * plcrc )
```

Encodes a CFDP CRC/Checksum.
The data in the logical header will be appended to the encoded PDU at the current position
If the encoder is in an error state, nothing is encoded, and the state of the encoder is not changed.

Parameters

state	Encoder state object
plcrc	Pointer to logical CRC value

Definition at line 721 of file cf_codec.c.
References CF_Codec_Store_uint32(), and CF_ENCODE_FIXED_CHUNK.
Here is the call graph for this function:

12.40.4.28 CF_CFDP_EncodeEof()

```
void CF_CFDP_EncodeEof (
    CF_EncoderState_t * state,
    CF_Logical_PduEof_t * pleof )
```

Encodes a CFDP End-of-File (EOF) header block.
The data in the logical header will be appended to the encoded PDU at the current position
If the encoder is in an error state, nothing is encoded, and the state of the encoder is not changed.

Note

this encode includes any TLV values which are indicated in the logical data structure

Parameters

state	Encoder state object
pleof	Pointer to logical PDU EOF header data

Definition at line 634 of file cf_codec.c.
References CF_Logical_PduEof::cc, CF_CFDP_PduEof::cc, CF_CFDP_EncodeAllTlv(), CF_CFDP_PduEof_FLAGS↩_CC, CF_Codec_Store_uint32(), CF_Codec_Store_uint8(), CF_ENCODE_FIXED_CHUNK, CF_Logical_PduEof::crc, CF_CFDP_PduEof::crc, FSV, CF_Logical_PduEof::size, CF_CFDP_PduEof::size, and CF_Logical_PduEof::tlv_list.
Referenced by CF_CFDP_SendEof().

Here is the call graph for this function:

12.40.4.29 CF_CFDP_EncodeFileDataHeader()

```
void CF_CFDP_EncodeFileDataHeader (
    CF_EncoderState_t * state,
    bool with_meta,
    CF_Logical_PduFileDataHeader_t * plfd )
```

Encodes a CFDP File Data (FD) header block.

This only encodes the FD header fields, specifically the data offset (required) and any metadata fields, if indicated. This does *not* encode any actual file data.

The data in the logical header will be appended to the encoded PDU at the current position

If the encoder is in an error state, nothing is encoded, and the state of the encoder is not changed.

Parameters

state	Encoder state object
with_meta	Whether to include optional continuation and segment request fields (always false currently)
plfd	Pointer to logical PDU file header data

Definition at line 597 of file cf_codec.c.

References CF_CFDP_EncodeAllSegments(), CF_CFDP_PduFileData_RECORD_CONTINUATION_STATE, CF_CFDP_PduFileData_SEGMENT_METADATA_LENGTH, CF_Codec_Store_uint32(), CF_Codec_Store_uint8(), CF_ENCODE_FIXED_CHUNK, CF_Logical_PduFileDataHeader::continuation_state, FSV, CF_Logical_SegmentList::num_segments, CF_Logical_PduFileDataHeader::offset, CF_CFDP_PduFileDataHeader::offset, and CF_Logical_PduFileDataHeader::segment_list.

Referenced by CF_CFDP_S_SendFileData().

Here is the call graph for this function:

12.40.4.30 CF_CFDP_EncodeFileDirectiveHeader()

```
void CF_CFDP_EncodeFileDirectiveHeader (
    CF_EncoderState_t * state,
    CF_Logical_PduFileDirectiveHeader_t * pfdir )
```

Encodes a CFDP file directive header block.

The data in the logical header will be appended to the encoded PDU at the current position

If the encoder is in an error state, nothing is encoded, and the state of the encoder is not changed.

Parameters

state	Encoder state object
pfdir	Pointer to logical PDU file directive header data

Definition at line 437 of file cf_codec.c.
References CF_Codec_Store_uint8(), CF_ENCODE_FIXED_CHUNK, CF_Logical_PduFileDirectiveHeader↩ ::directive_code, and CF_CFDP_PduFileDirectiveHeader::directive_code.
Referenced by CF_CFDP_ConstructPduHeader().
Here is the call graph for this function:

12.40.4.31 CF_CFDP_EncodeFin()

```
void CF_CFDP_EncodeFin (
    CF_EncoderState_t * state,
    CF_Logical_PduFin_t * plfin )
```

Encodes a CFDP Final (FIN) header block.
The data in the logical header will be appended to the encoded PDU at the current position
If the encoder is in an error state, nothing is encoded, and the state of the encoder is not changed.

Note

this encode includes any TLV values which are indicated in the logical data structure

Parameters

state	Encoder state object
plfin	Pointer to logical PDU FIN header data

Definition at line 656 of file cf_codec.c.
References CF_Logical_PduFin::cc, CF_CFDP_EncodeAllTlv(), CF_CFDP_PduFin_FLAGS_CC, CF_CFDP_PduFin↩ _FLAGS_DELIVERY_CODE, CF_CFDP_PduFin_FLAGS_FILE_STATUS, CF_Codec_Store_uint8(), CF_ENCODE↩ _FIXED_CHUNK, CF_Logical_PduFin::delivery_code, CF_Logical_PduFin::file_status, CF_CFDP_PduFin::flags, FSV, and CF_Logical_PduFin::tlv_list.
Referenced by CF_CFDP_SendFin().
Here is the call graph for this function:

12.40.4.32 CF_CFDP_EncodeHeaderFinalSize()

```
void CF_CFDP_EncodeHeaderFinalSize (
    CF_EncoderState_t * state,
    CF_Logical_PduHeader_t * plh )
```

Updates an already-encoded PDU base header block with the final PDU size.
This function encodes the "data_encoded_length" field from the logical PDU structure into the encoded header block. The PDU will also be closed (set done) to indicate that no more data should be added.

Note

Unlike other encode operations, this function does not add any new blocks to the PDU. It only updates the already-encoded block at the beginning of the PDU, which must have been done by a prior call to CF_CFDP_EncodeHeaderWithoutSize().

See also

CF_CFDP_EncodeHeaderWithoutSize() for initially encoding the PDU header block

Parameters

state	Encoder state object
plh	Pointer to logical PDU header data

Definition at line 407 of file cf_codec.c.
References CF_EncoderState::base, CF_CODEC_GET_POSITION, CF_CODEC_IS_OK, CF_CODEC_SET_DONE, CF_Codec_Store_uint16(), CF_Logical_PduHeader::data_encoded_length, and CF_CFDP_PduHeader::length.
Referenced by CF_CFDP_SetPduLength().
Here is the call graph for this function:

12.40.4.33 CF_CFDP_EncodeHeaderWithoutSize()

```
void CF_CFDP_EncodeHeaderWithoutSize (
    CF_EncoderState_t * state,
    CF_Logical_PduHeader_t * plh )
```

Encodes a CFDP PDU base header block, bypassing the size field.
On transmit side, the common/base header must be encoded in two parts, to deal with the "total_size" field. The initial encoding of the basic fields is done as soon as it is known that a PDU of this type needs to be sent, but the total size may not be yet known, as it depends on the remainder of encoding and any additional data that might get added to the variable length sections.
This function encodes all base header fields *except* total length. There is a separate function later to update the total↩_length to the correct value once the remainder of encoding is done. Luckily, the total_length is in the first fixed position binary blob so it is easy to update later.
If the encoder is in an error state, nothing is encoded, and the state of the encoder is not changed.

See also

CF_CFDP_EncodeHeaderFinalSize() for updating the length field once it is known

Parameters

state	Encoder state object
plh	Pointer to logical PDU header data

Definition at line 371 of file cf_codec.c.
References CF_CFDP_PduHeader_FLAGS_DIR, CF_CFDP_PduHeader_FLAGS_MODE, CF_CFDP_PduHeader↩_FLAGS_TYPE, CF_CFDP_PduHeader_FLAGS_VERSION, CF_CFDP_PduHeader_LENGTHS_ENTITY, CF_CF↩DP_PduHeader_LENGTHS_TRANSACTION_SEQUENCE, CF_CODEC_GET_POSITION, CF_Codec_Store_uint8(), CF_ENCODE_FIXED_CHUNK, CF_EncodeIntegerInSize(), CF_Logical_PduHeader::destination_eid, CF_Logical↩_PduHeader::direction, CF_Logical_PduHeader::eid_length, CF_CFDP_PduHeader::eid_tsn_lengths, CF_CFDP_↩PduHeader::flags, FSV, CF_Logical_PduHeader::header_encoded_length, CF_Logical_PduHeader::pdu_type, C↩F_Logical_PduHeader::sequence_num, CF_Logical_PduHeader::source_eid, CF_Logical_PduHeader::txm_mode, CF_Logical_PduHeader::txn_seq_length, and CF_Logical_PduHeader::version.
Referenced by CF_CFDP_ConstructPduHeader().
Here is the call graph for this function:

12.40.4.34 CF_CFDP_EncodeLV()

```
void CF_CFDP_EncodeLV (
    CF_EncoderState_t * state,
    CF_Logical_Lv_t * pllv )
```

Encodes a single CFDP Length+Value (LV) pair.
The data in the logical header will be appended to the encoded PDU at the current position
If the encoder is in an error state, nothing is encoded, and the state of the encoder is not changed.

Parameters

state	Encoder state object
pllv	Pointer to logical PDU LV header data

Definition at line 455 of file cf_codec.c.
References CF_CFDP_DoEncodeChunk(), CF_CODEC_SET_DONE, CF_Codec_Store_uint8(), CF_ENCODE_FIX↩ED_CHUNK, CF_Logical_Lv::data_ptr, CF_Logical_Lv::length, and CF_CFDP_lv::length.
Referenced by CF_CFDP_EncodeMd().

Here is the call graph for this function:

12.40.4.35 CF_CFDP_EncodeMd()

```
void CF_CFDP_EncodeMd (
    CF_EncoderState_t * state,
    CF_Logical_PduMd_t * plmd )
```

Encodes a CFDP Metadata (MD) header block.
The data in the logical header will be appended to the encoded PDU at the current position
If the encoder is in an error state, nothing is encoded, and the state of the encoder is not changed.

Note

this encode includes the LV pairs for source and destination file names, which are logically part of the overall MD block.

Parameters

state	Encoder state object
plmd	Pointer to logical PDU metadata header data

Definition at line 573 of file cf_codec.c.
References CF_CFDP_EncodeLV(), CF_CFDP_PduMd_CHECKSUM_TYPE, CF_CFDP_PduMd_CLOSURE_REQ↩UESTED, CF_Codec_Store_uint32(), CF_Codec_Store_uint8(), CF_ENCODE_FIXED_CHUNK, CF_Logical_Pdu↩Md::checksum_type, CF_Logical_PduMd::close_req, CF_Logical_PduMd::dest_filename, FSV, CF_CFDP_PduMd↩::segmentation_control, CF_Logical_PduMd::size, CF_CFDP_PduMd::size, and CF_Logical_PduMd::source_filename.
Referenced by CF_CFDP_SendMd().
Here is the call graph for this function:

12.40.4.36 CF_CFDP_EncodeNak()

```
void CF_CFDP_EncodeNak (
    CF_EncoderState_t * state,
    CF_Logical_PduNak_t * plnak )
```

Encodes a CFDP Non-Acknowledge (NAK) header block.
The data in the logical header will be appended to the encoded PDU at the current position

If the encoder is in an error state, nothing is encoded, and the state of the encoder is not changed.

Note

this encode includes any Segment Request values which are indicated in the logical data structure

Parameters

state	Encoder state object
plnak	Pointer to logical PDU NAK header data

Definition at line 701 of file cf_codec.c.
References CF_CFDP_EncodeAllSegments(), CF_Codec_Store_uint32(), CF_ENCODE_FIXED_CHUNK, CF_Logical_PduNak::scope_end, CF_CFDP_PduNak::scope_end, CF_Logical_PduNak::scope_start, CF_CFDP_PduNak::scope_start, and CF_Logical_PduNak::segment_list.
Referenced by CF_CFDP_SendNak().
Here is the call graph for this function:

12.40.4.37 CF_CFDP_EncodeSegmentRequest()

```
void CF_CFDP_EncodeSegmentRequest (
    CF_EncoderState_t * state,
    CF_Logical_SegmentRequest_t * plseg )
```

Encodes a single CFDP Segment Request block.
The data in the logical header will be appended to the encoded PDU at the current position
If the encoder is in an error state, nothing is encoded, and the state of the encoder is not changed.

Parameters

state	Encoder state object
plseg	Pointer to single logical PDU segment request header data

Definition at line 523 of file cf_codec.c.
References CF_Codec_Store_uint32(), CF_ENCODE_FIXED_CHUNK, CF_Logical_SegmentRequest::offset_end, CF_CFDP_SegmentRequest::offset_end, CF_Logical_SegmentRequest::offset_start, and CF_CFDP_SegmentRequest::offset_start.
Referenced by CF_CFDP_EncodeAllSegments().
Here is the call graph for this function:

12.40.4.38 CF_CFDP_EncodeTLV()

```
void CF_CFDP_EncodeTLV (
    CF_EncoderState_t * state,
    CF_Logical_Tlv_t * pltlv )
```

Encodes a single CFDP Type+Length+Value (TLV) tuple.
The data in the logical header will be appended to the encoded PDU at the current position
If the encoder is in an error state, nothing is encoded, and the state of the encoder is not changed.

Note

Only the CF_CFDP_TLV_TYPE_ENTITY_ID TLV type is currently supported by this function, but other TLV types may be added in future versions as needed.

Parameters

state	Encoder state object
pltlv	Pointer to single logical PDU TLV header data

Definition at line 485 of file cf_codec.c.
References CF_CFDP_DoEncodeChunk(), CF_CFDP_TLV_TYPE_ENTITY_ID, CF_CODEC_SET_DONE, CF_Codec_Store_uint8(), CF_ENCODE_FIXED_CHUNK, CF_EncodeIntegerInSize(), CF_Logical_Tlv::data, CF_Logical_TlvData::data_ptr, CF_Logical_TlvData::eid, CF_Logical_Tlv::length, CF_CFDP_tlv::length, CF_CFDP_tlv::type, and CF_Logical_Tlv::type.
Referenced by CF_CFDP_EncodeAllTlv().
Here is the call graph for this function:

12.40.4.39 CF_CFDP_GetValueEncodedSize()

```
uint8 CF_CFDP_GetValueEncodedSize (
    uint64 Value )
```

Gets the minimum number of octets that the given integer may be encoded in.
Based on the integer value, this computes the minimum number of bytes that must be allocated to that integer within a CFDP PDU. This is typically used for entity IDs and sequence numbers, where CFDP does not specify a specific size for these items. They may be encoded between 1 and 8 bytes, depending on the actual value is.

Parameters

Value	Integer value that needs to be encoded

Returns

Minimum number of bytes that the value requires (between 1 and 8, inclusive)

Definition at line 327 of file cf_codec.c.
Referenced by CF_CFDP_AppendTlv(), and CF_CFDP_ConstructPduHeader().

12.40.4.40 CF_DecodeIntegerInSize()

```
uint64 CF_DecodeIntegerInSize (
    CF_DecoderState_t * state,
    uint8 decode_size )
```

Decodes an integer value from the specified number of octets.
This decodes an integer value in the specified number of octets. The actual number of octets must be determined using another field in the PDU before calling this function.

Warning

This function will decode exactly the given number of octets. If this does not match actual encoded size, the return value will be wrong, and it will likely also throw off the decoding of any fields that follow this one.

See also

CF_EncodeIntegerInSize() for the inverse operation

Parameters

state	Encoder state object
decode_size	Number of octets that the value is encoded in (between 1 and 8, inclusive)

Returns

Decoded value

Definition at line 738 of file cf_codec.c.
References CF_CFDP_DoDecodeChunk().
Referenced by CF_CFDP_DecodeHeader(), and CF_CFDP_DecodeTLV().
Here is the call graph for this function:

12.40.4.41 CF_EncodeIntegerInSize()

```
void CF_EncodeIntegerInSize (
    CF_EncoderState_t * state,
    uint64 value,
    uint8 encode_size )
```

Encodes the given integer value in the given number of octets.
This encodes an integer value in the specified number of octets. Use CF_CFDP_GetValueEncodedSize() to determine the minimum number of octets required for a given value. Using more than the minimum is OK, but will consume extra bytes.

Warning

This function does not error check the encode_size parameter, and will encode the size given, even if it results in an invalid value. Using fewer octets than the minimum reported by CF_CFDP_GetValueEncodedSize() will likely result in incorrect decoding at the receiver.

See also

CF_DecodeIntegerInSize() for the inverse operation

Parameters

state	Encoder state object
value	Integer value that needs to be encoded
encode_size	Number of octets to encode the value in (between 1 and 8, inclusive)

Definition at line 346 of file cf_codec.c.
References CF_CFDP_DoEncodeChunk().
Referenced by CF_CFDP_EncodeHeaderWithoutSize(), and CF_CFDP_EncodeTLV().
Here is the call graph for this function:

12.41 apps/cf/fsw/src/cf_crc.c File Reference

```
#include "cfe.h"
#include "cf_verify.h"
#include "cf_crc.h"
#include <string.h>
```

Functions

- void CF_CRC_Start (CF_Crc_t *crc)

  Start a CRC streamable digest.
- void CF_CRC_Digest (CF_Crc_t *crc, const uint8 *data, size_t len)

  Digest a chunk for CRC calculation.
- void CF_CRC_Finalize (CF_Crc_t *crc)

  Finalize a CRC calculation.

12.41.1 Detailed Description

The CF Application CRC calculation source file
This is a streaming CRC calculator. Data can all be given at once for a result or it can trickle in.
This file is intended to be generic and usable by other apps.

12.41.2 Function Documentation

12.41.2.1 CF_CRC_Digest()

```
void CF_CRC_Digest (
    CF_Crc_t * crc,
    const uint8 * data,
    size_t len )
```

Digest a chunk for CRC calculation.

Description

Does the CRC calculation, and stores an index into the given 4-byte word in case the input was not evenly divisible for 4.

Assumptions, External Events, and Notes:

crc must not be NULL.

Parameters

crc	CRC object to operate on
data	Pointer to data to digest
len	Length of data to digest

Definition at line 53 of file cf_crc.c.
References CF_Crc::index, CF_Crc::result, and CF_Crc::working.
Referenced by CF_CFDP_R1_SubstateRecvFileData(), CF_CFDP_R2_CalcCrcChunk(), and CF_CFDP_S_Send↩FileData().

12.41.2.2 CF_CRC_Finalize()

```
void CF_CRC_Finalize (
    CF_Crc_t * crc )
```

Finalize a CRC calculation.

Description

Checks the index and if it isn't 0, does the final calculations on the bytes in the shift register. After this call is made, the result field of the structure holds the result.

Assumptions, External Events, and Notes:

crc must not be NULL.

Parameters

crc	CRC object to operate on

Definition at line 78 of file cf_crc.c.
References CF_Crc::index, CF_Crc::result, and CF_Crc::working.
Referenced by CF_CFDP_R_CheckCrc(), and CF_CFDP_S_SendEof().

12.41.2.3 CF_CRC_Start() `void CF_CRC_Start ( CF_Crc_t * crc )`

Start a CRC streamable digest.

Assumptions, External Events, and Notes:

crc must not be NULL.

Parameters

crc	CRC object to operate on

Definition at line 42 of file cf_crc.c.
Referenced by CF_CFDP_R2_CalcCrcChunk().

12.42 apps/cf/fsw/src/cf_crc.h File Reference

`#include "cfe.h"`

Data Structures

- struct CF_Crc

  CRC state object.

Typedefs

- typedef struct CF_Crc CF_Crc_t

  CRC state object.

Functions

- void CF_CRC_Start (CF_Crc_t *crc)

  Start a CRC streamable digest.
- void CF_CRC_Digest (CF_Crc_t *crc, const uint8 *data, size_t len)

  Digest a chunk for CRC calculation.
- void CF_CRC_Finalize (CF_Crc_t *crc)

  Finalize a CRC calculation.

12.42.1 Detailed Description

The CF Application CRC calculation header file

12.42.2 Typedef Documentation

12.42.2.1 CF_Crc_t `typedef struct CF_Crc CF_Crc_t`

CRC state object.

12.42.3 Function Documentation

12.42.3.1 CF_CRC_Digest()

```
void CF_CRC_Digest (
    CF_Crc_t * crc,
    const uint8 * data,
    size_t len )
```

Digest a chunk for CRC calculation.

Description

Does the CRC calculation, and stores an index into the given 4-byte word in case the input was not evenly divisible for 4.

Assumptions, External Events, and Notes:

crc must not be NULL.

Parameters

crc	CRC object to operate on
data	Pointer to data to digest
len	Length of data to digest

Definition at line 53 of file cf_crc.c.
References CF_Crc::index, CF_Crc::result, and CF_Crc::working.
Referenced by CF_CFDP_R1_SubstateRecvFileData(), CF_CFDP_R2_CalcCrcChunk(), and CF_CFDP_S_Send↩FileData().

12.42.3.2 CF_CRC_Finalize()

```
void CF_CRC_Finalize (
    CF_Crc_t * crc )
```

Finalize a CRC calculation.

Description

Checks the index and if it isn't 0, does the final calculations on the bytes in the shift register. After this call is made, the result field of the structure holds the result.

Assumptions, External Events, and Notes:

crc must not be NULL.

Parameters

crc	CRC object to operate on

Definition at line 78 of file cf_crc.c.
References CF_Crc::index, CF_Crc::result, and CF_Crc::working.
Referenced by CF_CFDP_R_CheckCrc(), and CF_CFDP_S_SendEof().

12.42.3.3 CF_CRC_Start()

```
void CF_CRC_Start (
    CF_Crc_t * crc )
```

Start a CRC streamable digest.

Assumptions, External Events, and Notes:

crc must not be NULL.

Parameters

crc	CRC object to operate on

Definition at line 42 of file cf_crc.c.
Referenced by CF_CFDP_R2_CalcCrcChunk().

12.43 apps/cf/fsw/src/cf_dispatch.c File Reference

```
#include "cf_dispatch.h"
#include "cf_app.h"
#include "cf_events.h"
#include "cf_cmd.h"
#include "cfe.h"
#include <string.h>
```

Functions

- void CF_ProcessGroundCommand (const CFE_SB_Buffer_t *msg)

  Process any ground command contained in the given message.
- void CF_AppPipe (const CFE_SB_Buffer_t *msg)

  CF message processing function.

12.43.1 Detailed Description

The CF Application main application source file
This file contains the functions that initialize the application and link all logic and functionality to the CFS.

12.43.2 Function Documentation

12.43.2.1 CF_AppPipe()

```
void CF_AppPipe (
    const CFE_SB_Buffer_t * msg )
```

CF message processing function.

Description

Process message packets received via the Software Bus command pipe

Assumptions, External Events, and Notes:

msg must not be NULL.

Parameters

in	*msg*	Software Bus message pointer

Definition at line 132 of file cf_dispatch.c.
Referenced by CF_AppMain().

12.43.2.2 CF_ProcessGroundCommand()

```
void CF_ProcessGroundCommand (
    const CFE_SB_Buffer_t * msg )
```

Process any ground command contained in the given message.

Assumptions, External Events, and Notes:

msg must not be NULL.

Parameters

msg	Pointer to command message

Definition at line 42 of file cf_dispatch.c.
References CF_ABANDON_CC, CF_AbandonCmd(), CF_AppData, CF_CANCEL_CC, CF_CC_ERR_EID, CF_C↩MD_LEN_ERR_EID, CF_DISABLE_DEQUEUE_CC, CF_DISABLE_DIR_POLLING_CC, CF_DISABLE_ENGINE_CC, CF_DisableEngineCmd(), CF_ENABLE_DEQUEUE_CC, CF_ENABLE_DIR_POLLING_CC, CF_ENABLE_ENGIN↩E_CC, CF_EnableDequeueCmd(), CF_EnableDirPollingCmd(), CF_FREEZE_CC, CF_GET_PARAM_CC, CF_Get↩ParamCmd(), CF_NOOP_CC, CF_PLAYBACK_DIR_CC, CF_PlaybackDirCmd(), CF_PURGE_QUEUE_CC, CF_↩PurgeQueueCmd(), CF_RESET_CC, CF_ResetCmd(), CF_RESUME_CC, CF_ResumeCmd(), CF_SET_PARAM_↩CC, CF_SUSPEND_CC, CF_THAW_CC, CF_ThawCmd(), CF_TX_FILE_CC, CF_WRITE_QUEUE_CC, CFE_EV↩S_EventType_ERROR, CFE_EVS_SendEvent(), CFE_MSG_GetFcnCode(), CFE_MSG_GetSize(), CF_HkPacket_↩Payload::counters, CF_HkCmdCounters::err, CF_AppData_t::hk, CFE_SB_Msg::Msg, and CF_HkPacket::Payload.
Referenced by CF_AppPipe().

Here is the call graph for this function:

12.44 apps/cf/fsw/src/cf_dispatch.h File Reference

```
#include "cfe.h"
```

Functions

- void CF_ProcessGroundCommand (const CFE_SB_Buffer_t *msg)

  Process any ground command contained in the given message.
- void CF_AppPipe (const CFE_SB_Buffer_t *msg)

  CF message processing function.

12.44.1 Detailed Description

The CF Application main application header file

12.44.2 Function Documentation

12.44.2.1 CF_AppPipe()

```
void CF_AppPipe (
    const CFE_SB_Buffer_t * msg )
```

CF message processing function.

Description

Process message packets received via the Software Bus command pipe

Assumptions, External Events, and Notes:

msg must not be NULL.

Parameters

in	*msg*	Software Bus message pointer

Definition at line 132 of file cf_dispatch.c.
References CF_AppData, CF_CC_ERR_EID, CF_CMD_LEN_ERR_EID, CF_CMD_MID, CF_MID_ERR_EID, CF_↩ ProcessGroundCommand(), CF_SEND_HK_MID, CF_SendHkCmd(), CF_TC_DISPATCH_TABLE, CF_WAKE_UP↩ _MID, CF_WakeupCmd(), CFE_EVS_EventType_ERROR, CFE_EVS_SendEvent(), CFE_MSG_GetFcnCode(), CF↩ E_MSG_GetMsgId(), CFE_MSG_GetSize(), CFE_SB_INVALID_MSG_ID, CFE_SB_MsgIdToValue(), CFE_STATUS↩ _UNKNOWN_MSG_ID, CFE_STATUS_WRONG_MSG_LENGTH, CFE_SUCCESS, CF_HkPacket_Payload::counters, CF_HkCmdCounters::err, CF_AppData_t::hk, CFE_SB_Msg::Msg, and CF_HkPacket::Payload.
Referenced by CF_AppMain().
Here is the call graph for this function:

12.44.2.2 CF_ProcessGroundCommand()

```
void CF_ProcessGroundCommand (
    const CFE_SB_Buffer_t * msg )
```

Process any ground command contained in the given message.

Assumptions, External Events, and Notes:

msg must not be NULL.

Parameters

msg	Pointer to command message

Definition at line 42 of file cf_dispatch.c.
References CF_ABANDON_CC, CF_AbandonCmd(), CF_AppData, CF_CANCEL_CC, CF_CC_ERR_EID, CF_CMD_LEN_ERR_EID, CF_DISABLE_DEQUEUE_CC, CF_DISABLE_DIR_POLLING_CC, CF_DISABLE_ENGINE_CC, CF_DisableEngineCmd(), CF_ENABLE_DEQUEUE_CC, CF_ENABLE_DIR_POLLING_CC, CF_ENABLE_ENGINE_CC, CF_EnableDequeueCmd(), CF_EnableDirPollingCmd(), CF_FREEZE_CC, CF_GET_PARAM_CC, CF_GetParamCmd(), CF_NOOP_CC, CF_PLAYBACK_DIR_CC, CF_PlaybackDirCmd(), CF_PURGE_QUEUE_CC, CF_PurgeQueueCmd(), CF_RESET_CC, CF_ResetCmd(), CF_RESUME_CC, CF_ResumeCmd(), CF_SET_PARAM_CC, CF_SUSPEND_CC, CF_THAW_CC, CF_ThawCmd(), CF_TX_FILE_CC, CF_WRITE_QUEUE_CC, CFE_EVS_EventType_ERROR, CFE_EVS_SendEvent(), CFE_MSG_GetFcnCode(), CFE_MSG_GetSize(), CF_HkPacket_Payload::counters, CF_HkCmdCounters::err, CF_AppData_t::hk, CFE_SB_Msg::Msg, and CF_HkPacket::Payload.
Referenced by CF_AppPipe().
Here is the call graph for this function:

12.45 apps/cf/fsw/src/cf_eds_dispatch.c File Reference

```
#include "cf_app.h"
#include "cf_events.h"
```

```
#include "cf_dispatch.h"
#include "cf_cmd.h"
#include "cf_eds_dictionary.h"
#include "cf_eds_dispatcher.h"
#include "cfe_msg.h"
```

Functions

- void CF_AppPipe (const CFE_SB_Buffer_t *msg)

  CF message processing function.

Variables

- static const EdsDispatchTable_CF_Application_CFE_SB_Telecommand_t CF_TC_DISPATCH_TABLE

12.45.1 Function Documentation

12.45.1.1 CF_AppPipe()

```
void CF_AppPipe (
    const CFE_SB_Buffer_t * msg )
```

CF message processing function.

Description

Process message packets received via the Software Bus command pipe

Assumptions, External Events, and Notes:

msg must not be NULL.

Parameters

in	*msg*	Software Bus message pointer

Definition at line 44 of file cf_eds_dispatch.c.

References CF_AppData, CF_CC_ERR_EID, CF_CMD_LEN_ERR_EID, CF_CMD_MID, CF_MID_ERR_EID, CF_ProcessGroundCommand(), CF_SEND_HK_MID, CF_SendHkCmd(), CF_TC_DISPATCH_TABLE, CF_WAKE_UP_MID, CF_WakeupCmd(), CFE_EVS_EventType_ERROR, CFE_EVS_SendEvent(), CFE_MSG_GetFcnCode(), CFE_MSG_GetMsgId(), CFE_MSG_GetSize(), CFE_SB_INVALID_MSG_ID, CFE_SB_MsgIdToValue(), CFE_STATUS_UNKNOWN_MSG_ID, CFE_STATUS_WRONG_MSG_LENGTH, CFE_SUCCESS, CF_HkPacket_Payload::counters, CF_HkCmdCounters::err, CF_AppData_t::hk, CFE_SB_Msg::Msg, and CF_HkPacket::Payload.

Here is the call graph for this function:

12.45.2 Variable Documentation

12.45.2.1 CF_TC_DISPATCH_TABLE `const EdsDispatchTable_CF_Application_CFE_SB_Telecommand_t CF_TC_DISPATCH_TABLE [static]`

Initial value:

```
= {
    .CMD =
        {
            .AbandonCmd_indication           = CF_AbandonCmd,
            .CancelCmd_indication            = CF_CancelCmd,
            .DisableDequeueCmd_indication    = CF_DisableDequeueCmd,
            .DisableDirPollingCmd_indication = CF_DisableDirPollingCmd,
            .DisableEngineCmd_indication     = CF_DisableEngineCmd,
            .EnableDequeueCmd_indication     = CF_EnableDequeueCmd,
            .EnableDirPollingCmd_indication  = CF_EnableDirPollingCmd,
            .EnableEngineCmd_indication      = CF_EnableEngineCmd,
            .FreezeCmd_indication            = CF_FreezeCmd,
            .GetParamCmd_indication          = CF_GetParamCmd,
            .NoopCmd_indication              = CF_NoopCmd,
            .PlaybackDirCmd_indication       = CF_PlaybackDirCmd,
            .PurgeQueueCmd_indication        = CF_PurgeQueueCmd,
            .ResetCmd_indication             = CF_ResetCmd,
            .ResumeCmd_indication            = CF_ResumeCmd,
            .SetParamCmd_indication          = CF_SetParamCmd,
            .SuspendCmd_indication           = CF_SuspendCmd,
            .ThawCmd_indication              = CF_ThawCmd,
            .TxFileCmd_indication            = CF_TxFileCmd,
            .WriteQueueCmd_indication        = CF_WriteQueueCmd,
        },
    .SEND_HK = {.indication = CF_SendHkCmd},
    .WAKE_UP = {.indication = CF_WakeupCmd}}
```

Definition at line 11 of file cf_eds_dispatch.c.

Referenced by CF_AppPipe().

12.46 apps/cf/fsw/src/cf_logical_pdu.h File Reference

```
#include "common_types.h"
#include "cf_extern_typedefs.h"
#include "cf_cfdp_pdu.h"
```

Data Structures

- struct CF_Logical_PduHeader

  Structure representing base CFDP PDU header.
- struct CF_Logical_PduFileDirectiveHeader

  Structure representing logical File Directive header.
- struct CF_Logical_Lv

  Structure representing logical LV Object format.
- union CF_Logical_TlvData

  Union of various data items that may occur in a TLV item.
- struct CF_Logical_Tlv

  Structure representing logical TLV Object format.
- struct CF_Logical_SegmentRequest

  Structure representing logical Segment Request data.
- struct CF_Logical_SegmentList
- struct CF_Logical_TlvList
- struct CF_Logical_PduEof

  Structure representing logical End of file PDU.
- struct CF_Logical_PduFin

  Structure representing logical Finished PDU.
- struct CF_Logical_PduAck

  Structure representing CFDP Acknowledge PDU.
- struct CF_Logical_PduMd

  Structure representing CFDP Metadata PDU.
- struct CF_Logical_PduNak

  Structure representing logical Non-Acknowledge PDU.
- struct CF_Logical_PduFileDataHeader
- union CF_Logical_IntHeader

  A union of all possible internal header types in a PDU.
- struct CF_Logical_PduBuffer

  Encapsulates the entire PDU information.

Macros

- #define CF_PDU_MAX_TLV (4)

  Maximum number of TLV values in a single PDU.
- #define CF_PDU_MAX_SEGMENTS (CF_NAK_MAX_SEGMENTS)

  Maximum number of segment requests in a single PDU.

Typedefs

- typedef uint32 CF_FileSize_t

  Type for logical file size/offset value.
- typedef struct CF_Logical_PduHeader CF_Logical_PduHeader_t

  Structure representing base CFDP PDU header.
- typedef struct CF_Logical_PduFileDirectiveHeader CF_Logical_PduFileDirectiveHeader_t

  Structure representing logical File Directive header.
- typedef struct CF_Logical_Lv CF_Logical_Lv_t

  Structure representing logical LV Object format.
- typedef union CF_Logical_TlvData CF_Logical_TlvData_t

  Union of various data items that may occur in a TLV item.
- typedef struct CF_Logical_Tlv CF_Logical_Tlv_t

  Structure representing logical TLV Object format.
- typedef struct CF_Logical_SegmentRequest CF_Logical_SegmentRequest_t

  Structure representing logical Segment Request data.
- typedef struct CF_Logical_SegmentList CF_Logical_SegmentList_t
- typedef struct CF_Logical_TlvList CF_Logical_TlvList_t
- typedef struct CF_Logical_PduEof CF_Logical_PduEof_t

  Structure representing logical End of file PDU.
- typedef struct CF_Logical_PduFin CF_Logical_PduFin_t

  Structure representing logical Finished PDU.
- typedef struct CF_Logical_PduAck CF_Logical_PduAck_t

  Structure representing CFDP Acknowledge PDU.
- typedef struct CF_Logical_PduMd CF_Logical_PduMd_t

  Structure representing CFDP Metadata PDU.
- typedef struct CF_Logical_PduNak CF_Logical_PduNak_t

  Structure representing logical Non-Acknowledge PDU.
- typedef struct CF_Logical_PduFileDataHeader CF_Logical_PduFileDataHeader_t
- typedef union CF_Logical_IntHeader CF_Logical_IntHeader_t

  A union of all possible internal header types in a PDU.
- typedef struct CF_Logical_PduBuffer CF_Logical_PduBuffer_t

  Encapsulates the entire PDU information.

12.46.1 Detailed Description

Structures defining logical CFDP PDUs
These are CF-specific data structures that reflect the logical content of the CFDP PDUs defined in cf_cfdp_pdu.h. Note these are *NOT* intended to reflect the bitwise structures defined in the CCSDS blue book, but rather the values contained within those structures, in a form that can be used by software.
Specifically, this intent differs in the following ways:

- All numeric fields are in native byte order
- All structures are padded/aligned according to native CPU (i.e. not packed)
- All bit-fields are exploded, where each field/group is a separate member
- Variable-size content is normalized, allocated as the maximum possible size

12.46.2 Macro Definition Documentation

12.46.2.1 CF_PDU_MAX_SEGMENTS `#define CF_PDU_MAX_SEGMENTS (CF_NAK_MAX_SEGMENTS)`

Maximum number of segment requests in a single PDU.
Sets an upper bound on the logical structures for the most possible segment structures in a single PDU.
Definition at line 66 of file cf_logical_pdu.h.

12.46.2.2 CF_PDU_MAX_TLV `#define CF_PDU_MAX_TLV (4)`

Maximum number of TLV values in a single PDU.
This just serves to set an upper bound on the logical structures, to keep things simple. The real limit varies depending on the specific PDU type being processed. This caps the amount of storage memory for the worst case, the actual number present is always part of the run-time state.
Without filestore requests, use of TLV is pretty limited.
Definition at line 58 of file cf_logical_pdu.h.

12.46.3 Typedef Documentation

12.46.3.1 CF_FileSize_t `typedef uint32 CF_FileSize_t`

Type for logical file size/offset value.
The CFDP protocol permits use of 64-bit values for file size/offsets Although the CF application only supports 32-bit legacy file size type at this point, the logical structures should use this type in case future support for large files is added.
Definition at line 76 of file cf_logical_pdu.h.

12.46.3.2 CF_Logical_IntHeader_t `typedef union CF_Logical_IntHeader CF_Logical_IntHeader_t`

A union of all possible internal header types in a PDU.
The specific entry which applies depends on the combination of pdu type and directive code.

12.46.3.3 CF_Logical_Lv_t `typedef struct CF_Logical_Lv CF_Logical_Lv_t`

Structure representing logical LV Object format.
These Length + Value pairs used in several CFDP PDU types, typically for storage of strings such as file names.
These are only used for string data (mostly filenames) so the data can refer directly to the encoded bits, it does not necessarily need to be duplicated here.

12.46.3.4 CF_Logical_PduAck_t `typedef struct CF_Logical_PduAck CF_Logical_PduAck_t`

Structure representing CFDP Acknowledge PDU.
Defined per section 5.2.4 / table 5-8 of CCSDS 727.0-B-5

12.46.3.5 CF_Logical_PduBuffer_t `typedef struct CF_Logical_PduBuffer CF_Logical_PduBuffer_t`

Encapsulates the entire PDU information.

12.46.3.6 CF_Logical_PduEof_t `typedef struct CF_Logical_PduEof CF_Logical_PduEof_t`

Structure representing logical End of file PDU.

See also

CF_CFDP_PduEof_t for encoded form

12.46.3.7 CF_Logical_PduFileDataHeader_t `typedef struct CF_Logical_PduFileDataHeader CF_Logical_PduFileDataHeader`

12.46.3.8 CF_Logical_PduFileDirectiveHeader_t

`typedef struct CF_Logical_PduFileDirectiveHeader CF_Logical_PduFileDirectiveHeader_t`

Structure representing logical File Directive header.

This contains the file directive code from the PDUs for which it applies. The codes are mapped directly to the CFDP protocol values, but converted to a native value (enum) for direct use by software.

12.46.3.9 CF_Logical_PduFin_t

`typedef struct CF_Logical_PduFin CF_Logical_PduFin_t`

Structure representing logical Finished PDU.

See also

CF_CFDP_PduFin_t for encoded form

12.46.3.10 CF_Logical_PduHeader_t

`typedef struct CF_Logical_PduHeader CF_Logical_PduHeader_t`

Structure representing base CFDP PDU header.

Reflects the common content at the beginning of all CFDP PDUs, of all types.

See also

CF_CFDP_PduHeader_t for encoded form

12.46.3.11 CF_Logical_PduMd_t

`typedef struct CF_Logical_PduMd CF_Logical_PduMd_t`

Structure representing CFDP Metadata PDU.

Defined per section 5.2.5 / table 5-9 of CCSDS 727.0-B-5

12.46.3.12 CF_Logical_PduNak_t

`typedef struct CF_Logical_PduNak CF_Logical_PduNak_t`

Structure representing logical Non-Acknowledge PDU.

12.46.3.13 CF_Logical_SegmentList_t

`typedef struct CF_Logical_SegmentList CF_Logical_SegmentList_t`

12.46.3.14 CF_Logical_SegmentRequest_t

`typedef struct CF_Logical_SegmentRequest CF_Logical_SegmentRequest_t`

Structure representing logical Segment Request data.

12.46.3.15 CF_Logical_Tlv_t

`typedef struct CF_Logical_Tlv CF_Logical_Tlv_t`

Structure representing logical TLV Object format.

In the current implementation of CF, only entity IDs are currently encoded in this form where indicated in the spec. This may change in a future version.

See also

CF_CFDP_tlv_t for encoded form

12.46.3.16 CF_Logical_TlvData_t

`typedef union CF_Logical_TlvData CF_Logical_TlvData_t`

Union of various data items that may occur in a TLV item.

The actual type is identified by the "type" field in the enclosing TLV

Currently filestore requests are not implemented in CF, so the TLV use is limited. This may change in the future.

Numeric data needs to actually be copied to this buffer, because it needs to be normalized in length and byte-order. But string data (e.g. filenames, messages) can reside in the original encoded form.

12.46.3.17 CF_Logical_TlvList_t `typedef struct CF_Logical_TlvList CF_Logical_TlvList_t`

12.47 apps/cf/fsw/src/cf_timer.c File Reference

```
#include "cfe.h"
#include "cf_verify.h"
#include "cf_timer.h"
#include "cf_app.h"
#include "cf_assert.h"
```

Functions

- uint32 CF_Timer_Sec2Ticks (CF_Timer_Seconds_t sec)

  Converts seconds into scheduler ticks.
- void CF_Timer_InitRelSec (CF_Timer_t *txn, uint32 rel_sec)

  Initialize a timer with a relative number of seconds.
- bool CF_Timer_Expired (const CF_Timer_t *txn)

  Check if a timer has expired.
- void CF_Timer_Tick (CF_Timer_t *txn)

  Notify a timer object a tick has occurred.

12.47.1 Detailed Description

The CF Application timer source file
A timer in CF is really just a structure that holds a counter that indicates the timer expired when it reaches 0. The goal is that any timer is driven by the scheduler ticks. There is no reason we need any finer grained resolution than this for CF.

12.47.2 Function Documentation

12.47.2.1 CF_Timer_Expired() `bool CF_Timer_Expired ( const CF_Timer_t * txn )`

Check if a timer has expired.

Assumptions, External Events, and Notes:

txn must not be NULL.

Parameters

txn	Timer object to check

Returns

status code indicating whether timer has expired

Return values

1	if expired
0	if not expired

Definition at line 65 of file cf_timer.c.
References CF_Timer::tick.
Referenced by CF_CFDP_ProcessPollingDirectories(), CF_CFDP_R_Tick(), and CF_CFDP_S_Tick().

12.47.2.2 CF_Timer_InitRelSec()

```
void CF_Timer_InitRelSec (
    CF_Timer_t * txn,
    CF_Timer_Seconds_t rel_sec )
```

Initialize a timer with a relative number of seconds.

Assumptions, External Events, and Notes:

txn must not be NULL.

Parameters

txn	Timer object to initialize
rel_sec	Relative number of seconds

Definition at line 54 of file cf_timer.c.
References CF_Timer_Sec2Ticks(), and CF_Timer::tick.
Referenced by CF_CFDP_ArmAckTimer(), CF_CFDP_ArmInactTimer(), and CF_CFDP_ProcessPollingDirectories().
Here is the call graph for this function:

12.47.2.3 CF_Timer_Sec2Ticks()

```
uint32 CF_Timer_Sec2Ticks (
    CF_Timer_Seconds_t sec )
```

Converts seconds into scheduler ticks.

Assumptions, External Events, and Notes:

sub-second resolution is not required

Parameters

sec	Number of seconds

Returns

Number of ticks for the given seconds.

Definition at line 43 of file cf_timer.c.

References CF_AppData, CF_AppData_t::config_table, and CF_ConfigTable::ticks_per_second.
Referenced by CF_Timer_InitRelSec().

12.47.2.4 CF_Timer_Tick()

```
void CF_Timer_Tick (
    CF_Timer_t * txn )
```

Notify a timer object a tick has occurred.

Assumptions, External Events, and Notes:

txn must not be NULL.

Parameters

txn	Timer object to tick

Definition at line 76 of file cf_timer.c.
References CF_Assert, and CF_Timer::tick.
Referenced by CF_CFDP_ProcessPollingDirectories(), CF_CFDP_R_Tick(), and CF_CFDP_S_Tick().

12.48 apps/cf/fsw/src/cf_timer.h File Reference

```
#include "cfe.h"
```

Data Structures

- struct CF_Timer

  Basic CF timer object.

Typedefs

- typedef uint32 CF_Timer_Ticks_t

  Type for a timer tick count.
- typedef uint32 CF_Timer_Seconds_t

  Type for a timer number of seconds.
- typedef struct CF_Timer CF_Timer_t

  Basic CF timer object.

Functions

- void CF_Timer_InitRelSec (CF_Timer_t *txn, CF_Timer_Seconds_t rel_sec)

  Initialize a timer with a relative number of seconds.
- bool CF_Timer_Expired (const CF_Timer_t *txn)

  Check if a timer has expired.
- void CF_Timer_Tick (CF_Timer_t *txn)

  Notify a timer object a tick has occurred.
- uint32 CF_Timer_Sec2Ticks (CF_Timer_Seconds_t sec)

  Converts seconds into scheduler ticks.

12.48.1 Detailed Description

The CF Application timer header file

12.48.2 Typedef Documentation

12.48.2.1 CF_Timer_Seconds_t `typedef uint32 CF_Timer_Seconds_t`

Type for a timer number of seconds.
Definition at line 43 of file cf_timer.h.

12.48.2.2 CF_Timer_t `typedef struct CF_Timer CF_Timer_t`

Basic CF timer object.

12.48.2.3 CF_Timer_Ticks_t `typedef uint32 CF_Timer_Ticks_t`

Type for a timer tick count.

Note

We expect ticks to be 100/sec, so using uint32 for sec could have a bounds condition with uint32. But, we don't expect to use more than 400,000,000 seconds for any reason so let's just live with it.

Definition at line 38 of file cf_timer.h.

12.48.3 Function Documentation

12.48.3.1 CF_Timer_Expired()

```
bool CF_Timer_Expired (
    const CF_Timer_t * txn )
```

Check if a timer has expired.

Assumptions, External Events, and Notes:

txn must not be NULL.

Parameters

txn	Timer object to check

Returns

status code indicating whether timer has expired

Return values

1	if expired
0	if not expired

Definition at line 65 of file cf_timer.c.
References CF_Timer::tick.
Referenced by CF_CFDP_ProcessPollingDirectories(), CF_CFDP_R_Tick(), and CF_CFDP_S_Tick().

12.48.3.2 CF_Timer_InitRelSec()

```
void CF_Timer_InitRelSec (
    CF_Timer_t * txn,
    CF_Timer_Seconds_t rel_sec )
```

Initialize a timer with a relative number of seconds.

Assumptions, External Events, and Notes:

txn must not be NULL.

Parameters

txn	Timer object to initialize
rel_sec	Relative number of seconds

Definition at line 54 of file cf_timer.c.
References CF_Timer_Sec2Ticks(), and CF_Timer::tick.
Referenced by CF_CFDP_ArmAckTimer(), CF_CFDP_ArmInactTimer(), and CF_CFDP_ProcessPollingDirectories().
Here is the call graph for this function:

12.48.3.3 CF_Timer_Sec2Ticks()

```
uint32 CF_Timer_Sec2Ticks (
    CF_Timer_Seconds_t sec )
```

Converts seconds into scheduler ticks.

Assumptions, External Events, and Notes:

sub-second resolution is not required

Parameters

sec	Number of seconds

Returns

Number of ticks for the given seconds.

Definition at line 43 of file cf_timer.c.
References CF_AppData, CF_AppData_t::config_table, and CF_ConfigTable::ticks_per_second.
Referenced by CF_Timer_InitRelSec().

12.48.3.4 CF_Timer_Tick()

```
void CF_Timer_Tick (
    CF_Timer_t * txn )
```

Notify a timer object a tick has occurred.

Assumptions, External Events, and Notes:

txn must not be NULL.

Parameters

txn	Timer object to tick

Definition at line 76 of file cf_timer.c.
References CF_Assert, and CF_Timer::tick.
Referenced by CF_CFDP_ProcessPollingDirectories(), CF_CFDP_R_Tick(), and CF_CFDP_S_Tick().

12.49 apps/cf/fsw/src/cf_utils.c File Reference

```
#include "cf_app.h"
#include "cf_verify.h"
#include "cf_cfdp.h"
#include "cf_utils.h"
#include "cf_events.h"
#include "cf_perfids.h"
#include "cf_assert.h"
```

Functions

- CF_Transaction_t ∗ CF_FindUnusedTransaction (CF_Channel_t ∗chan)

  Find an unused transaction on a channel.
- void CF_ResetHistory (CF_Channel_t ∗chan, CF_History_t ∗history)

  Returns a history structure back to its unused state.
- void CF_FreeTransaction (CF_Transaction_t ∗txn)

  Frees and resets a transaction and returns it for later use.
- CFE_Status_t CF_FindTransactionBySequenceNumber_Impl (CF_CListNode_t ∗node, CF_Traverse_TransSeqArg_t ∗context)

  List traversal function to check if the desired sequence number matches.
- CF_Transaction_t ∗ CF_FindTransactionBySequenceNumber (CF_Channel_t ∗chan, CF_TransactionSeq_t transaction_sequence_number, CF_EntityId_t src_eid)

  Finds an active transaction by sequence number.
- CFE_Status_t CF_WriteHistoryEntryToFile (osal_id_t fd, const CF_History_t ∗history)

  Write a single history to a file.
- CF_CListTraverse_Status_t CF_Traverse_WriteHistoryQueueEntryToFile (CF_CListNode_t ∗node, void ∗arg)

  Writes a human readable representation of a history queue entry to a file.
- CF_CListTraverse_Status_t CF_Traverse_WriteTxnQueueEntryToFile (CF_CListNode_t ∗node, void ∗arg)

  Writes a human readable representation of a transaction history entry to a file.
- CFE_Status_t CF_WriteTxnQueueDataToFile (osal_id_t fd, CF_Channel_t ∗chan, CF_QueueIdx_t queue)

  Write a transaction-based queue's transaction history to a file.
- CFE_Status_t CF_WriteHistoryQueueDataToFile (osal_id_t fd, CF_Channel_t ∗chan, CF_Direction_t dir)

  Write a history-based queue's entries to a file.
- CF_CListTraverse_Status_t CF_PrioSearch (CF_CListNode_t ∗node, void ∗context)

  Searches for the first transaction with a lower priority than given.

- void CF_InsertSortPrio (CF_Transaction_t *txn, CF_QueueIdx_t queue)

  Insert a transaction into a priority sorted transaction queue.
- CF_CListTraverse_Status_t CF_TraverseAllTransactions_Impl (CF_CListNode_t *node, void *arg)

  List traversal function performs operation on every active transaction.
- int32 CF_TraverseAllTransactions (CF_Channel_t *chan, CF_TraverseAllTransactions_fn_t fn, void *context)

  Traverses all transactions on all active queues and performs an operation on them.
- int32 CF_TraverseAllTransactions_All_Channels (CF_TraverseAllTransactions_fn_t fn, void *context)

  Traverses all transactions on all channels and performs an operation on them.
- CFE_Status_t CF_WrappedOpenCreate (osal_id_t *fd, const char *fname, int32 flags, int32 access)

  Wrap the filesystem open call with a perf counter.
- void CF_WrappedClose (osal_id_t fd)

  Wrap the filesystem close call with a perf counter.
- CFE_Status_t CF_WrappedRead (osal_id_t fd, void *buf, size_t read_size)

  Wrap the filesystem read call with a perf counter.
- CFE_Status_t CF_WrappedWrite (osal_id_t fd, const void *buf, size_t write_size)

  Wrap the filesystem write call with a perf counter.
- CFE_Status_t CF_WrappedLseek (osal_id_t fd, off_t offset, int mode)

  Wrap the filesystem lseek call with a perf counter.
- bool CF_TxnStatus_IsError (CF_TxnStatus_t txn_stat)

  Check if the internal transaction status represents an error.
- CF_CFDP_ConditionCode_t CF_TxnStatus_To_ConditionCode (CF_TxnStatus_t txn_stat)

  Converts the internal transaction status to a CFDP condition code.
- CF_TxnStatus_t CF_TxnStatus_From_ConditionCode (CF_CFDP_ConditionCode_t cc)

  Converts a CFDP condition code to an internal transaction status.

12.49.1 Detailed Description

The CF Application general utility functions source file
Various odds and ends are put here.

12.49.2 Function Documentation

12.49.2.1 CF_FindTransactionBySequenceNumber()

```
CF_Transaction_t* CF_FindTransactionBySequence↩
Number (
            CF_Channel_t * chan,
            CF_TransactionSeq_t transaction_sequence_number,
            CF_EntityId_t src_eid )
```

Finds an active transaction by sequence number.

Description

This function traverses the active rx, pending, txa, and txw transaction and looks for the requested transaction.

Assumptions, External Events, and Notes:

chan must not be NULL.

Parameters

chan	Pointer to the CF channel
transaction_sequence_number	Sequence number to find
src_eid	Entity ID associated with sequence number

Returns

Pointer to the given transaction if found

Return values

NULL	if the transaction is not found

Definition at line 139 of file cf_utils.c.
References CF_CList_Traverse(), CF_FindTransactionBySequenceNumber_Impl(), CF_QueueIdx_PEND, CF_QueueIdx_RX, CF_QueueIdx_TXA, CF_QueueIdx_TXW, CF_Channel::qs, and CF_Traverse_TransSeqArg::txn.
Referenced by CF_CFDP_ReceiveMessage(), and CF_FindTransactionBySequenceNumberAllChannels().
Here is the call graph for this function:

12.49.2.2 CF_FindTransactionBySequenceNumber_Impl()

```
CFE_Status_t CF_FindTransactionBySequence↩
Number_Impl (
            CF_CListNode_t * node,
            CF_Traverse_TransSeqArg_t * context )
```

List traversal function to check if the desired sequence number matches.

Assumptions, External Events, and Notes:

context must not be NULL. node must not be NULL.

Parameters

node	Pointer to node currently being traversed
context	Pointer to state object passed through from initial call

Return values

1	when it's found, which terminates list traversal
0	when it isn't found, which causes list traversal to continue

Definition at line 119 of file cf_utils.c.
References container_of, CF_Transaction::history, CF_History::seq_num, CF_Traverse_TransSeqArg::src_eid, CF_History::src_eid, CF_Traverse_TransSeqArg::transaction_sequence_number, and CF_Traverse_TransSeqArg::txn.
Referenced by CF_FindTransactionBySequenceNumber().

12.49.2.3 CF_FindUnusedTransaction()

```
CF_Transaction_t* CF_FindUnusedTransaction (
    CF_Channel_t * chan )
```

Find an unused transaction on a channel.

Assumptions, External Events, and Notes:

chan must not be NULL.

Parameters

chan	Pointer to the CF channel

Returns

Pointer to a free transaction

Return values

NULL	if no free transactions available.

Definition at line 43 of file cf_utils.c.
References CF_Assert, CF_CList_Remove_Ex(), CF_Direction_NUM, CF_QueueIdx_FREE, CF_QueueIdx_HIST, CF_QueueIdx_HIST_FREE, CF_History::cl_node, CF_Transaction::cl_node, container_of, CF_History::dir, CF_Transaction::history, and CF_Channel::qs.
Referenced by CF_CFDP_ProcessPlaybackDirectory(), CF_CFDP_ReceiveMessage(), and CF_CFDP_TxFile().
Here is the call graph for this function:

12.49.2.4 CF_FreeTransaction()

```
void CF_FreeTransaction (
    CF_Transaction_t * txn )
```

Frees and resets a transaction and returns it for later use.

Assumptions, External Events, and Notes:

txn must not be NULL.

Parameters

txn	Pointer to the transaction object

Definition at line 101 of file cf_utils.c.
References CF_AppData, CF_CList_InitNode(), CF_CList_InsertBack_Ex(), CF_QueueIdx_FREE, CF_TxnState_IDLE, CF_Transaction::chan_num, CF_Engine::channels, CF_Transaction::cl_node, CF_StateFlags::com, CF_AppData_t::engine, CF_Transaction::fd, CF_Transaction::flags, OS_OBJECT_ID_UNDEFINED, CF_Flags_Common::q_index, and CF_Transaction::state.
Referenced by CF_CFDP_InitEngine(), and CF_CFDP_ResetTransaction().
Here is the call graph for this function:

12.49.2.5 CF_InsertSortPrio()

```
void CF_InsertSortPrio (
    CF_Transaction_t * txn,
    CF_QueueIdx_t queue )
```

Insert a transaction into a priority sorted transaction queue.

Description

This function works by walking the queue in reverse to find a transaction with a higher priority than the given transaction. The given transaction is then inserted after that one, since it would be the next lower priority.

Assumptions, External Events, and Notes:

txn must not be NULL.

Parameters

txn	Pointer to the transaction object
queue	Index of queue to insert into

Definition at line 332 of file cf_utils.c.
References CF_AppData, CF_Assert, CF_CList_InsertAfter_Ex(), CF_CList_InsertBack_Ex(), CF_CList_Traverse_R(), CF_NUM_CHANNELS, CF_PrioSearch(), CF_TxnState_IDLE, CF_Transaction::chan_num, CF_Engine::channels, CF_Transaction::cl_node, CF_StateFlags::com, CF_AppData_t::engine, CF_Transaction::flags, CF_Transaction::priority, CF_Flags_Common::q_index, CF_Channel::qs, CF_Transaction::state, and CF_Traverse_PriorityArg::txn.
Referenced by CF_CFDP_S2_SubstateSendEof(), and CF_CFDP_TxFile_Initiate().

Here is the call graph for this function:

12.49.2.6 CF_PrioSearch()

```
CF_CListTraverse_Status_t CF_PrioSearch (
    CF_CListNode_t * node,
    void * context )
```

Searches for the first transaction with a lower priority than given.

Assumptions, External Events, and Notes:

node must not be NULL. context must not be NULL.

Parameters

node	Node being currently traversed
context	Pointer to CF_Traverse_PriorityArg_t object indicating the priority to search for

Return values

CF_CLIST_EXIT	when it's found, which terminates list traversal
CF_CLIST_CONT	when it isn't found, which causes list traversal to continue

Definition at line 308 of file cf_utils.c.
References CF_CLIST_CONT, CF_CLIST_EXIT, container_of, CF_Traverse_PriorityArg::priority, CF_Transaction↩ ::priority, and CF_Traverse_PriorityArg::txn.
Referenced by CF_InsertSortPrio().

12.49.2.7 CF_ResetHistory()

```
void CF_ResetHistory (
    CF_Channel_t * chan,
    CF_History_t * history )
```

Returns a history structure back to its unused state.

Description

There's nothing to do currently other than remove the history from its current queue and put it back on CF_↩ QueueIdx_HIST_FREE.

Assumptions, External Events, and Notes:

chan must not be NULL. history must not be NULL.

Parameters

chan	Pointer to the CF channel
history	Pointer to the history entry

Definition at line 89 of file cf_utils.c.
References CF_CList_InsertBack_Ex(), CF_CList_Remove_Ex(), CF_QueueIdx_HIST, CF_QueueIdx_HIST_FREE, and CF_History::cl_node.
Referenced by CF_PurgeHistory().
Here is the call graph for this function:

12.49.2.8 CF_Traverse_WriteHistoryQueueEntryToFile()

```
CF_CListTraverse_Status_t CF_Traverse_WriteHistoryQueueEntryToFile (
            CF_CListNode_t * node,
            void * arg )
```

Writes a human readable representation of a history queue entry to a file.
This function is a wrapper around CF_WriteHistoryEntryToFile() that can be used with CF_Traverse() to write history queue entries to the file.
This also implements a direction filter, so only matching entries are actually written to the file.

Assumptions, External Events, and Notes:

node must not be NULL. arg must not be NULL.

Parameters

node	Node being currently traversed
arg	Pointer to CF_Traverse_WriteHistoryFileArg_t indicating the file information

Return values

CF_CLIST_CONT	if everything is going well
CF_CLIST_EXIT	if a write error occurred, which means traversal should stop

Definition at line 222 of file cf_utils.c.
References CF_CLIST_CONT, CF_CLIST_EXIT, CF_Direction_NUM, CF_WriteHistoryEntryToFile(), container_of, CF_Traverse_WriteHistoryFileArg::counter, CF_History::dir, CF_Traverse_WriteHistoryFileArg::error, CF_Traverse_↩

WriteHistoryFileArg::fd, and CF_Traverse_WriteHistoryFileArg::filter_dir.
Referenced by CF_WriteHistoryQueueDataToFile().
Here is the call graph for this function:

12.49.2.9 CF_Traverse_WriteTxnQueueEntryToFile()

```
CF_CListTraverse_Status_t CF_Traverse_WriteTxn↩
QueueEntryToFile (
            CF_CListNode_t * node,
            void * arg )
```

Writes a human readable representation of a transaction history entry to a file.
This function is a wrapper around CF_WriteHistoryEntryToFile() that can be used with CF_Traverse() to write transaction queue entries to the file.

Assumptions, External Events, and Notes:

node must not be NULL. arg must not be NULL.

Parameters

node	Node being currently traversed
arg	Pointer to CF_Traverse_WriteTxnFileArg_t indicating the file information

Return values

CF_CLIST_CONT	if everything is going well
CF_CLIST_EXIT	if a write error occurred, which means traversal should stop

Definition at line 249 of file cf_utils.c.
References CF_CLIST_CONT, CF_CLIST_EXIT, CF_WriteHistoryEntryToFile(), container_of, CF_Traverse_WriteTxn↩FileArg::counter, CF_Traverse_WriteTxnFileArg::error, CF_Traverse_WriteTxnFileArg::fd, and CF_Transaction::history.
Referenced by CF_WriteTxnQueueDataToFile().

Here is the call graph for this function:

12.49.2.10 CF_TraverseAllTransactions()

```
int32 CF_TraverseAllTransactions (
    CF_Channel_t * chan,
    CF_TraverseAllTransactions_fn_t fn,
    void * context )
```

Traverses all transactions on all active queues and performs an operation on them.

Assumptions, External Events, and Notes:

chan must not be NULL. fn must be a valid function. context must not be NULL.

Parameters

chan	Channel to operate on
fn	Callback to invoke for all traversed transactions
context	Opaque object to pass to all callbacks

Returns

Number of transactions traversed

Definition at line 390 of file cf_utils.c.
References CF_CList_Traverse(), CF_QueueIdx_PEND, CF_QueueIdx_RX, CF_TraverseAllTransactions_Impl(), CF↩_TraverseAll_Arg::counter, and CF_Channel::qs.
Referenced by CF_TraverseAllTransactions_All_Channels(), and CF_TsnChanAction().
Here is the call graph for this function:

12.49.2.11 CF_TraverseAllTransactions_All_Channels()

```
int32 CF_TraverseAllTransactions_All_Channels
(
```

```
            CF_TraverseAllTransactions_fn_t fn,
            void * context )
```

Traverses all transactions on all channels and performs an operation on them.

Assumptions, External Events, and Notes:

fn must be a valid function. context must not be NULL.

Parameters

fn	Callback to invoke for all traversed transactions
context	Opaque object to pass to all callbacks

Returns

Number of transactions traversed

Definition at line 406 of file cf_utils.c.
References CF_AppData, CF_NUM_CHANNELS, CF_TraverseAllTransactions(), CF_Engine::channels, and CF_App↩Data_t::engine.
Referenced by CF_TsnChanAction().
Here is the call graph for this function:

12.49.2.12 CF_TraverseAllTransactions_Impl()

```
CF_CListTraverse_Status_t CF_TraverseAllTransactions↩
_Impl (
            CF_CListNode_t * node,
            void * arg )
```

List traversal function performs operation on every active transaction.

Description

Called on every transaction via list traversal. Calls another function on that transaction.

Assumptions, External Events, and Notes:

node must not be NULL. args must not be NULL.

Parameters

node	Node being currently traversed
arg	Intermediate context object from initial call

Return values

0	for do not exit early (always continue)

Definition at line 375 of file cf_utils.c.
References CF_CLIST_CONT, container_of, CF_TraverseAll_Arg::context, CF_TraverseAll_Arg::counter, and CF_↩ TraverseAll_Arg::fn.
Referenced by CF_TraverseAllTransactions().

12.49.2.13 CF_TxnStatus_From_ConditionCode()

```
CF_TxnStatus_t CF_TxnStatus_From_ConditionCode (
    CF_CFDP_ConditionCode_t cc )
```

Converts a CFDP condition code to an internal transaction status.

Assumptions, External Events, and Notes:

None

Parameters

cc	CFDP condition code

Returns

Transaction status code

Definition at line 589 of file cf_utils.c.
Referenced by CF_CFDP_R2_SubstateRecvEof().

12.49.2.14 CF_TxnStatus_IsError()

```
bool CF_TxnStatus_IsError (
    CF_TxnStatus_t txn_stat )
```

Check if the internal transaction status represents an error.

Assumptions, External Events, and Notes:

Transaction status is a superset of condition codes, and includes other error conditions for which CFDP will not send FIN/ACK/EOF and thus there is no corresponding condition code.

Parameters

txn_stat	Transaction status

Returns

Boolean value indicating if the transaction is in an errorred state

Return values

true	if an error has occurred during the transaction
false	if no error has occurred during the transaction yet

Definition at line 507 of file cf_utils.c.
References CF_TxnStatus_NO_ERROR.
Referenced by CF_CFDP_HandleNotKeepFile(), CF_CFDP_R2_Complete(), CF_CFDP_R2_Reset(), CF_CFDP_R2↩_SubstateSendFin(), CF_CFDP_R_DispatchRecv(), CF_CFDP_S2_WaitForEofAck(), CF_CFDP_SetTxnStatus(), and CF_TxnStatus_To_ConditionCode().

12.49.2.15 CF_TxnStatus_To_ConditionCode()

```
CF_CFDP_ConditionCode_t CF_TxnStatus_To_ConditionCode (
    CF_TxnStatus_t txn_stat )
```

Converts the internal transaction status to a CFDP condition code.
Transaction status is a superset of condition codes, and includes other error conditions for which CFDP will not send FIN/ACK/EOF and thus there is no corresponding condition code.

Assumptions, External Events, and Notes:

Not all transaction status codes directly correlate to a CFDP CC

Parameters

txn_stat	Transaction status

Returns

CFDP protocol condition code

Definition at line 523 of file cf_utils.c.
References CF_CFDP_ConditionCode_CANCEL_REQUEST_RECEIVED, CF_CFDP_ConditionCode_INACTIVITY↩_DETECTED, CF_CFDP_ConditionCode_NO_ERROR, CF_TxnStatus_ACK_LIMIT_NO_EOF, CF_TxnStatus_ACK↩_LIMIT_NO_FIN, CF_TxnStatus_CANCEL_REQUEST_RECEIVED, CF_TxnStatus_CHECK_LIMIT_REACHED, C↩F_TxnStatus_FILE_CHECKSUM_FAILURE, CF_TxnStatus_FILE_SIZE_ERROR, CF_TxnStatus_FILESTORE_REJ↩ECTION, CF_TxnStatus_INACTIVITY_DETECTED, CF_TxnStatus_INVALID_FILE_STRUCTURE, CF_TxnStatus_I↩NVALID_TRANSMISSION_MODE, CF_TxnStatus_IsError(), CF_TxnStatus_KEEP_ALIVE_LIMIT_REACHED, CF_↩TxnStatus_NAK_LIMIT_REACHED, CF_TxnStatus_NO_ERROR, CF_TxnStatus_POS_ACK_LIMIT_REACHED, CF↩_TxnStatus_SUSPEND_REQUEST_RECEIVED, and CF_TxnStatus_UNSUPPORTED_CHECKSUM_TYPE.
Referenced by CF_CFDP_R2_SubstateSendFin(), and CF_CFDP_SendEof().
Here is the call graph for this function:

12.49.2.16 CF_WrappedClose()

```
void CF_WrappedClose (
    osal_id_t fd )
```

Wrap the filesystem close call with a perf counter.

Assumptions, External Events, and Notes:

None

See also

OS_close() for parameter descriptions

Parameters

fd	Passed directly to underlying OSAL call

Definition at line 437 of file cf_utils.c.
References CF_CFDP_CLOSE_ERR_EID, CF_PERF_ID_FCLOSE, CFE_ES_PerfLogEntry, CFE_ES_PerfLogExit, CFE_EVS_EventType_ERROR, CFE_EVS_SendEvent(), OS_close(), OS_ObjectIdToInteger(), and OS_SUCCESS.
Referenced by CF_CFDP_CloseFiles(), CF_CFDP_R2_RecvMd(), CF_CFDP_ResetTransaction(), and CF_Write↩QueueCmd().
Here is the call graph for this function:

12.49.2.17 CF_WrappedLseek()

```
CFE_Status_t CF_WrappedLseek (
    osal_id_t fd,
    off_t offset,
    int mode )
```

Wrap the filesystem lseek call with a perf counter.

Assumptions, External Events, and Notes:

fname must not be NULL.

See also

OS_lseek() for parameter descriptions

Parameters

fd	Passed directly to underlying OSAL call

Parameters

offset	Passed directly to underlying OSAL call
mode	Passed directly to underlying OSAL call

Returns

Status code from OSAL (byte count or error code)

Definition at line 490 of file cf_utils.c.
References CF_PERF_ID_FSEEK, CFE_ES_PerfLogEntry, CFE_ES_PerfLogExit, and OS_lseek().
Referenced by CF_CFDP_R2_CalcCrcChunk(), CF_CFDP_R_ProcessFd(), CF_CFDP_S_SendFileData(), and CF_↩CFDP_S_SubstateSendMetadata().
Here is the call graph for this function:

12.49.2.18 CF_WrappedOpenCreate()

```
CFE_Status_t CF_WrappedOpenCreate (
    osal_id_t * fd,
    const char * fname,
    int32 flags,
    int32 access )
```

Wrap the filesystem open call with a perf counter.

Assumptions, External Events, and Notes:

fname must not be NULL.

See also

OS_OpenCreate() for parameter descriptions

Parameters

fd	Passed directly to underlying OSAL call
fname	Passed directly to underlying OSAL call
flags	Passed directly to underlying OSAL call
access	Passed directly to underlying OSAL call

Returns

Status code from OSAL

Definition at line 421 of file cf_utils.c.
References CF_PERF_ID_FOPEN, CFE_ES_PerfLogEntry, CFE_ES_PerfLogExit, and OS_OpenCreate().
Referenced by CF_CFDP_R2_RecvMd(), CF_CFDP_R_Init(), CF_CFDP_S_SubstateSendMetadata(), and CF_WriteQueueCmd().
Here is the call graph for this function:

12.49.2.19 CF_WrappedRead()

```
CFE_Status_t CF_WrappedRead (
    osal_id_t fd,
    void * buf,
    size_t read_size )
```

Wrap the filesystem read call with a perf counter.

Assumptions, External Events, and Notes:

buf must not be NULL.

See also

OS_read() for parameter descriptions

Parameters

fd	Passed directly to underlying OSAL call
buf	Passed directly to underlying OSAL call
read_size	Passed directly to underlying OSAL call

Returns

Status code from OSAL (byte count or error code)

Definition at line 458 of file cf_utils.c.
References CF_PERF_ID_FREAD, CFE_ES_PerfLogEntry, CFE_ES_PerfLogExit, and OS_read().
Referenced by CF_CFDP_R2_CalcCrcChunk(), and CF_CFDP_S_SendFileData().
Here is the call graph for this function:

12.49.2.20 CF_WrappedWrite()

```
CFE_Status_t CF_WrappedWrite (
    osal_id_t fd,
    const void * buf,
    size_t write_size )
```

Wrap the filesystem write call with a perf counter.

Assumptions, External Events, and Notes:

buf must not be NULL.

See also

OS_write() for parameter descriptions

Parameters

fd	Passed directly to underlying OSAL call
buf	Passed directly to underlying OSAL call
write_size	Passed directly to underlying OSAL call

Returns

Status code from OSAL (byte count or error code)

Definition at line 474 of file cf_utils.c.
References CF_PERF_ID_FWRITE, CFE_ES_PerfLogEntry, CFE_ES_PerfLogExit, and OS_write().
Referenced by CF_CFDP_R_ProcessFd(), and CF_WriteHistoryEntryToFile().
Here is the call graph for this function:

12.49.2.21 CF_WriteHistoryEntryToFile()

```
CFE_Status_t CF_WriteHistoryEntryToFile (
    osal_id_t fd,
    const CF_History_t * history )
```

Write a single history to a file.
This creates a human-readable/string representation of the information in the history object, and writes that string to the indicated file.
This implements the common code between writing the history queue and transaction queue to a file, as both ultimately store the same information in a CF_History_t object, but have a different method to get to it.

Assumptions, External Events, and Notes:

fd should be a valid file descriptor, open for writing.

Parameters

fd	Open File descriptor to write to
history	Pointer to CF history object to write

Return values

CFE_SUCCESS	on success
CF_ERROR	on error

Definition at line 172 of file cf_utils.c.
References CF_Assert, CF_CMD_WHIST_WRITE_ERR_EID, CF_Direction_NUM, CF_ERROR, CF_FILENAME_↩MAX_LEN, CF_WrappedWrite(), CFE_EVS_EventType_ERROR, CFE_EVS_SendEvent(), CFE_SUCCESS, CF_↩History::dir, CF_TxnFilenames::dst_filename, CF_History::fnames, OS_strnlen(), CF_History::peer_eid, CF_History↩::seq_num, CF_History::src_eid, CF_TxnFilenames::src_filename, and CF_History::txn_stat.
Referenced by CF_Traverse_WriteHistoryQueueEntryToFile(), and CF_Traverse_WriteTxnQueueEntryToFile().

Here is the call graph for this function:

12.49.2.22 CF_WriteHistoryQueueDataToFile()

```
CFE_Status_t CF_WriteHistoryQueueDataToFile (
    osal_id_t fd,
    CF_Channel_t * chan,
    CF_Direction_t dir )
```

Write a history-based queue's entries to a file.

Assumptions, External Events, and Notes:

chan must not be NULL.

Parameters

fd	Open File descriptor to write to
chan	Pointer to associated CF channel object
dir	Direction to match/filter

Return values

0	on success
1	on error

Definition at line 289 of file cf_utils.c.
References CF_CList_Traverse(), CF_QueueIdx_HIST, CF_Traverse_WriteHistoryQueueEntryToFile(), CF_Traverse↩_WriteHistoryFileArg::counter, CF_Traverse_WriteHistoryFileArg::error, CF_Traverse_WriteHistoryFileArg::fd, CF_↩Traverse_WriteHistoryFileArg::filter_dir, and CF_Channel::qs.
Referenced by CF_WriteQueueCmd().
Here is the call graph for this function:

12.49.2.23 CF_WriteTxnQueueDataToFile()

```
CFE_Status_t CF_WriteTxnQueueDataToFile (
    osal_id_t fd,
    CF_Channel_t * chan,
    CF_QueueIdx_t queue )
```

Write a transaction-based queue's transaction history to a file.

Assumptions, External Events, and Notes:

chan must not be NULL.

Parameters

fd	Open File descriptor to write to
chan	Pointer to associated CF channel object
queue	Queue Index to write

Return values

0	on success
1	on error

Definition at line 271 of file cf_utils.c.
References CF_CList_Traverse(), CF_Traverse_WriteTxnQueueEntryToFile(), CF_Traverse_WriteTxnFileArg::counter, CF_Traverse_WriteTxnFileArg::error, CF_Traverse_WriteTxnFileArg::fd, and CF_Channel::qs.
Referenced by CF_WriteQueueCmd().
Here is the call graph for this function:

12.50 apps/cf/fsw/src/cf_utils.h File Reference

```
#include "cf_cfdp.h"
#include "cf_app.h"
#include "cf_assert.h"
```

Data Structures

- struct CF_Traverse_TransSeqArg

  Argument structure for use with CList_Traverse()
- struct CF_Traverse_WriteHistoryFileArg

  Argument structure for use with CF_Traverse_WriteHistoryQueueEntryToFile()
- struct CF_Traverse_WriteTxnFileArg

Argument structure for use with CF_Traverse_WriteTxnQueueEntryToFile()

- struct CF_TraverseAll_Arg

  Argument structure for use with CF_TraverseAllTransactions()

- struct CF_Traverse_PriorityArg

  Argument structure for use with CF_CList_Traverse_R()

Typedefs

- typedef struct CF_Traverse_TransSeqArg CF_Traverse_TransSeqArg_t

  Argument structure for use with CList_Traverse()

- typedef struct CF_Traverse_WriteHistoryFileArg CF_Traverse_WriteHistoryFileArg_t

  Argument structure for use with CF_Traverse_WriteHistoryQueueEntryToFile()

- typedef struct CF_Traverse_WriteTxnFileArg CF_Traverse_WriteTxnFileArg_t

  Argument structure for use with CF_Traverse_WriteTxnQueueEntryToFile()

- typedef void(∗ CF_TraverseAllTransactions_fn_t) (CF_Transaction_t ∗txn, void ∗context)

  Callback function type for use with CF_TraverseAllTransactions()

- typedef struct CF_TraverseAll_Arg CF_TraverseAll_Arg_t

  Argument structure for use with CF_TraverseAllTransactions()

- typedef struct CF_Traverse_PriorityArg CF_Traverse_PriorityArg_t

  Argument structure for use with CF_CList_Traverse_R()

Functions

- static void CF_DequeueTransaction (CF_Transaction_t ∗txn)
- static void CF_MoveTransaction (CF_Transaction_t ∗txn, CF_QueueIdx_t queue)
- static void CF_CList_Remove_Ex (CF_Channel_t ∗chan, CF_QueueIdx_t queueidx, CF_CListNode_t ∗node)
- static void CF_CList_InsertAfter_Ex (CF_Channel_t ∗chan, CF_QueueIdx_t queueidx, CF_CListNode_t ∗start, CF_CListNode_t ∗after)
- static void CF_CList_InsertBack_Ex (CF_Channel_t ∗chan, CF_QueueIdx_t queueidx, CF_CListNode_t ∗node)
- CF_Transaction_t ∗ CF_FindUnusedTransaction (CF_Channel_t ∗chan)

  Find an unused transaction on a channel.

- void CF_ResetHistory (CF_Channel_t ∗chan, CF_History_t ∗history)

  Returns a history structure back to its unused state.

- void CF_FreeTransaction (CF_Transaction_t ∗txn)

  Frees and resets a transaction and returns it for later use.

- CF_Transaction_t ∗ CF_FindTransactionBySequenceNumber (CF_Channel_t ∗chan, CF_TransactionSeq_t transaction_sequence_number, CF_EntityId_t src_eid)

  Finds an active transaction by sequence number.

- CFE_Status_t CF_FindTransactionBySequenceNumber_Impl (CF_CListNode_t ∗node, CF_Traverse_TransSeqArg_t ∗context)

  List traversal function to check if the desired sequence number matches.

- CFE_Status_t CF_WriteHistoryEntryToFile (osal_id_t fd, const CF_History_t ∗history)

  Write a single history to a file.

- CFE_Status_t CF_WriteTxnQueueDataToFile (osal_id_t fd, CF_Channel_t ∗chan, CF_QueueIdx_t queue)

  Write a transaction-based queue's transaction history to a file.

- CFE_Status_t CF_WriteHistoryQueueDataToFile (osal_id_t fd, CF_Channel_t ∗chan, CF_Direction_t dir)

  Write a history-based queue's entries to a file.

- void CF_InsertSortPrio (CF_Transaction_t ∗txn, CF_QueueIdx_t queue)

  Insert a transaction into a priority sorted transaction queue.

- int32 CF_TraverseAllTransactions (CF_Channel_t *chan, CF_TraverseAllTransactions_fn_t fn, void *context)

  Traverses all transactions on all active queues and performs an operation on them.
- int32 CF_TraverseAllTransactions_All_Channels (CF_TraverseAllTransactions_fn_t fn, void *context)

  Traverses all transactions on all channels and performs an operation on them.
- CF_CListTraverse_Status_t CF_TraverseAllTransactions_Impl (CF_CListNode_t *node, void *arg)

  List traversal function performs operation on every active transaction.
- CF_CListTraverse_Status_t CF_Traverse_WriteHistoryQueueEntryToFile (CF_CListNode_t *node, void *arg)

  Writes a human readable representation of a history queue entry to a file.
- CF_CListTraverse_Status_t CF_Traverse_WriteTxnQueueEntryToFile (CF_CListNode_t *node, void *arg)

  Writes a human readable representation of a transaction history entry to a file.
- CF_CListTraverse_Status_t CF_PrioSearch (CF_CListNode_t *node, void *context)

  Searches for the first transaction with a lower priority than given.
- CFE_Status_t CF_WrappedOpenCreate (osal_id_t *fd, const char *fname, int32 flags, int32 access)

  Wrap the filesystem open call with a perf counter.
- void CF_WrappedClose (osal_id_t fd)

  Wrap the filesystem close call with a perf counter.
- CFE_Status_t CF_WrappedRead (osal_id_t fd, void *buf, size_t read_size)

  Wrap the filesystem read call with a perf counter.
- CFE_Status_t CF_WrappedWrite (osal_id_t fd, const void *buf, size_t write_size)

  Wrap the filesystem write call with a perf counter.
- CFE_Status_t CF_WrappedLseek (osal_id_t fd, off_t offset, int mode)

  Wrap the filesystem lseek call with a perf counter.
- CF_CFDP_ConditionCode_t CF_TxnStatus_To_ConditionCode (CF_TxnStatus_t txn_stat)

  Converts the internal transaction status to a CFDP condition code.
- CF_TxnStatus_t CF_TxnStatus_From_ConditionCode (CF_CFDP_ConditionCode_t cc)

  Converts a CFDP condition code to an internal transaction status.
- bool CF_TxnStatus_IsError (CF_TxnStatus_t txn_stat)

  Check if the internal transaction status represents an error.

12.50.1 Detailed Description

The CF Application utils header file

12.50.2 Typedef Documentation

12.50.2.1 CF_Traverse_PriorityArg_t `typedef struct CF_Traverse_PriorityArg CF_Traverse_PriorityArg_t`

Argument structure for use with CF_CList_Traverse_R()
This is for searching for transactions of a specific priority

12.50.2.2 CF_Traverse_TransSeqArg_t `typedef struct CF_Traverse_TransSeqArg CF_Traverse_TransSeqArg_t`

Argument structure for use with CList_Traverse()
This identifies a specific transaction sequence number and entity ID The transaction pointer is set by the implementation

12.50.2.3 CF_Traverse_WriteHistoryFileArg_t `typedef struct CF_Traverse_WriteHistoryFileArg CF_Traverse_WriteHistory`

Argument structure for use with CF_Traverse_WriteHistoryQueueEntryToFile()
This is used for writing status files. It contains a designated file descriptor for output and counters.
When traversing history, the list contains all entries, and may need additional filtering for direction (TX/RX) depending on what information the user has requested.

12.50.2.4 CF_Traverse_WriteTxnFileArg_t `typedef struct CF_Traverse_WriteTxnFileArg CF_Traverse_WriteTxnFileArg_t`

Argument structure for use with CF_Traverse_WriteTxnQueueEntryToFile()
This is used for writing status files. It contains a designated file descriptor for output and counters.
When traversing transactions, the entire list is written to the file. No additional filtering is necessary, because the queues themselves are limited in what they contain (therefore "pre-filtered" to some degree).

12.50.2.5 CF_TraverseAll_Arg_t `typedef struct CF_TraverseAll_Arg CF_TraverseAll_Arg_t`

Argument structure for use with CF_TraverseAllTransactions()
This basically allows for running a CF_Traverse on several lists at once

12.50.2.6 CF_TraverseAllTransactions_fn_t `typedef void(* CF_TraverseAllTransactions_fn_t) (CF_Transaction_t *txn, void *context)`

Callback function type for use with CF_TraverseAllTransactions()

Parameters

txn	Pointer to current transaction being traversed
context	Opaque object passed from initial call

Definition at line 88 of file cf_utils.h.

12.50.3 Function Documentation

12.50.3.1 CF_CList_InsertAfter_Ex()

```
static void CF_CList_InsertAfter_Ex (
    CF_Channel_t * chan,
    CF_QueueIdx_t queueidx,
    CF_CListNode_t * start,
    CF_CListNode_t * after ) [inline], [static]
```

Definition at line 148 of file cf_utils.h.
References CF_AppData, CF_CList_InsertAfter(), CF_HkPacket_Payload::channel_hk, CF_Engine::channels, CF_AppData_t::engine, CF_AppData_t::hk, CF_HkPacket::Payload, CF_HkChannel_Data::q_size, and CF_Channel::qs.
Referenced by CF_InsertSortPrio().
Here is the call graph for this function:

12.50.3.2 CF_CList_InsertBack_Ex()

```
static void CF_CList_InsertBack_Ex (
    CF_Channel_t * chan,
    CF_QueueIdx_t queueidx,
    CF_CListNode_t * node ) [inline], [static]
```

Definition at line 155 of file cf_utils.h.

References CF_AppData, CF_CList_InsertBack(), CF_HkPacket_Payload::channel_hk, CF_Engine::channels, CF_AppData_t::engine, CF_AppData_t::hk, CF_HkPacket::Payload, CF_HkChannel_Data::q_size, and CF_Channel::qs.
Referenced by CF_CFDP_InitEngine(), CF_CFDP_ReceiveMessage(), CF_CFDP_ResetTransaction(), CF_FreeTransaction(), CF_InsertSortPrio(), and CF_ResetHistory().
Here is the call graph for this function:

12.50.3.3 CF_CList_Remove_Ex()

```
static void CF_CList_Remove_Ex (
    CF_Channel_t * chan,
    CF_QueueIdx_t queueidx,
    CF_CListNode_t * node ) [inline], [static]
```

Definition at line 141 of file cf_utils.h.
References CF_AppData, CF_Assert, CF_CList_Remove(), CF_HkPacket_Payload::channel_hk, CF_Engine::channels, CF_AppData_t::engine, CF_AppData_t::hk, CF_HkPacket::Payload, CF_HkChannel_Data::q_size, and CF_Channel::qs.
Referenced by CF_FindUnusedTransaction(), and CF_ResetHistory().
Here is the call graph for this function:

12.50.3.4 CF_DequeueTransaction()

```
static void CF_DequeueTransaction (
    CF_Transaction_t * txn ) [inline], [static]
```

Definition at line 122 of file cf_utils.h.
References CF_AppData, CF_Assert, CF_CList_Remove(), CF_NUM_CHANNELS, CF_Transaction::chan_num, CF_HkPacket_Payload::channel_hk, CF_Engine::channels, CF_Transaction::cl_node, CF_StateFlags::com, CF_AppData_t::engine, CF_Transaction::flags, CF_AppData_t::hk, CF_HkPacket::Payload, CF_Flags_Common::q_index, CF_HkChannel_Data::q_size, and CF_Channel::qs.
Referenced by CF_CFDP_ResetTransaction(), and CF_CFDP_S2_SubstateSendEof().

Here is the call graph for this function:

12.50.3.5 CF_FindTransactionBySequenceNumber()

```
CF_Transaction_t* CF_FindTransactionBySequence↩
Number (
            CF_Channel_t * chan,
            CF_TransactionSeq_t transaction_sequence_number,
            CF_EntityId_t src_eid )
```

Finds an active transaction by sequence number.

Description

This function traverses the active rx, pending, txa, and txw transaction and looks for the requested transaction.

Assumptions, External Events, and Notes:

chan must not be NULL.

Parameters

chan	Pointer to the CF channel
transaction_sequence_number	Sequence number to find
src_eid	Entity ID associated with sequence number

Returns

Pointer to the given transaction if found

Return values

NULL	if the transaction is not found

Definition at line 139 of file cf_utils.c.
References CF_CList_Traverse(), CF_FindTransactionBySequenceNumber_Impl(), CF_QueueIdx_PEND, CF_↩QueueIdx_RX, CF_QueueIdx_TXA, CF_QueueIdx_TXW, CF_Channel::qs, and CF_Traverse_TransSeqArg::txn.
Referenced by CF_CFDP_ReceiveMessage(), and CF_FindTransactionBySequenceNumberAllChannels().

Here is the call graph for this function:

12.50.3.6 CF_FindTransactionBySequenceNumber_Impl()

```
CFE_Status_t CF_FindTransactionBySequence↩
Number_Impl (
            CF_CListNode_t * node,
            CF_Traverse_TransSeqArg_t * context )
```

List traversal function to check if the desired sequence number matches.

Assumptions, External Events, and Notes:

context must not be NULL. node must not be NULL.

Parameters

node	Pointer to node currently being traversed
context	Pointer to state object passed through from initial call

Return values

1	when it's found, which terminates list traversal
0	when it isn't found, which causes list traversal to continue

Definition at line 119 of file cf_utils.c.
References container_of, CF_Transaction::history, CF_History::seq_num, CF_Traverse_TransSeqArg::src_eid, CF_↩History::src_eid, CF_Traverse_TransSeqArg::transaction_sequence_number, and CF_Traverse_TransSeqArg::txn.
Referenced by CF_FindTransactionBySequenceNumber().

12.50.3.7 CF_FindUnusedTransaction()

```
CF_Transaction_t* CF_FindUnusedTransaction (
            CF_Channel_t * chan )
```

Find an unused transaction on a channel.

Assumptions, External Events, and Notes:

chan must not be NULL.

Parameters

chan	Pointer to the CF channel

Returns

Pointer to a free transaction

Return values

NULL	if no free transactions available.

Definition at line 43 of file cf_utils.c.
References CF_Assert, CF_CList_Remove_Ex(), CF_Direction_NUM, CF_QueueIdx_FREE, CF_QueueIdx_HIST, CF_QueueIdx_HIST_FREE, CF_History::cl_node, CF_Transaction::cl_node, container_of, CF_History::dir, CF_Transaction::history, and CF_Channel::qs.
Referenced by CF_CFDP_ProcessPlaybackDirectory(), CF_CFDP_ReceiveMessage(), and CF_CFDP_TxFile().
Here is the call graph for this function:

12.50.3.8 CF_FreeTransaction()

```
void CF_FreeTransaction (
    CF_Transaction_t * txn )
```

Frees and resets a transaction and returns it for later use.

Assumptions, External Events, and Notes:

txn must not be NULL.

Parameters

txn	Pointer to the transaction object

Definition at line 101 of file cf_utils.c.
References CF_AppData, CF_CList_InitNode(), CF_CList_InsertBack_Ex(), CF_QueueIdx_FREE, CF_TxnState_IDLE, CF_Transaction::chan_num, CF_Engine::channels, CF_Transaction::cl_node, CF_StateFlags::com, CF_AppData_t::engine, CF_Transaction::fd, CF_Transaction::flags, OS_OBJECT_ID_UNDEFINED, CF_Flags_Common::q_index, and CF_Transaction::state.
Referenced by CF_CFDP_InitEngine(), and CF_CFDP_ResetTransaction().
Here is the call graph for this function:

12.50.3.9 CF_InsertSortPrio()

```
void CF_InsertSortPrio (
    CF_Transaction_t * txn,
    CF_QueueIdx_t queue )
```

Insert a transaction into a priority sorted transaction queue.

Description

This function works by walking the queue in reverse to find a transaction with a higher priority than the given transaction. The given transaction is then inserted after that one, since it would be the next lower priority.

Assumptions, External Events, and Notes:

txn must not be NULL.

Parameters

txn	Pointer to the transaction object
queue	Index of queue to insert into

Definition at line 332 of file cf_utils.c.
References CF_AppData, CF_Assert, CF_CList_InsertAfter_Ex(), CF_CList_InsertBack_Ex(), CF_CList_Traverse_R(), CF_NUM_CHANNELS, CF_PrioSearch(), CF_TxnState_IDLE, CF_Transaction::chan_num, CF_Engine::channels, CF_Transaction::cl_node, CF_StateFlags::com, CF_AppData_t::engine, CF_Transaction::flags, CF_Transaction::priority, CF_Flags_Common::q_index, CF_Channel::qs, CF_Transaction::state, and CF_Traverse_PriorityArg::txn.
Referenced by CF_CFDP_S2_SubstateSendEof(), and CF_CFDP_TxFile_Initiate().
Here is the call graph for this function:

12.50.3.10 CF_MoveTransaction()

```
static void CF_MoveTransaction (
    CF_Transaction_t * txn,
    CF_QueueIdx_t queue )  [inline], [static]
```

Definition at line 130 of file cf_utils.h.
References CF_AppData, CF_Assert, CF_CList_InsertBack(), CF_CList_Remove(), CF_NUM_CHANNELS, CF_Transaction::chan_num, CF_HkPacket_Payload::channel_hk, CF_Engine::channels, CF_Transaction::cl_node, CF_StateFlags::com, CF_AppData_t::engine, CF_Transaction::flags, CF_AppData_t::hk, CF_HkPacket::Payload, CF_Flags_Common::q_index, CF_HkChannel_Data::q_size, and CF_Channel::qs.
Referenced by CF_CFDP_CycleTx().

Here is the call graph for this function:

12.50.3.11 CF_PrioSearch()

```
CF_CListTraverse_Status_t CF_PrioSearch (
    CF_CListNode_t * node,
    void * context )
```

Searches for the first transaction with a lower priority than given.

Assumptions, External Events, and Notes:

node must not be NULL. context must not be NULL.

Parameters

node	Node being currently traversed
context	Pointer to CF_Traverse_PriorityArg_t object indicating the priority to search for

Return values

CF_CLIST_EXIT	when it's found, which terminates list traversal
CF_CLIST_CONT	when it isn't found, which causes list traversal to continue

Definition at line 308 of file cf_utils.c.
References CF_CLIST_CONT, CF_CLIST_EXIT, container_of, CF_Traverse_PriorityArg::priority, CF_Transaction↩::priority, and CF_Traverse_PriorityArg::txn.
Referenced by CF_InsertSortPrio().

12.50.3.12 CF_ResetHistory()

```
void CF_ResetHistory (
    CF_Channel_t * chan,
    CF_History_t * history )
```

Returns a history structure back to its unused state.

Description

There's nothing to do currently other than remove the history from its current queue and put it back on CF_↩QueueIdx_HIST_FREE.

Assumptions, External Events, and Notes:

chan must not be NULL. history must not be NULL.

Parameters

chan	Pointer to the CF channel
history	Pointer to the history entry

Definition at line 89 of file cf_utils.c.
References CF_CList_InsertBack_Ex(), CF_CList_Remove_Ex(), CF_QueueIdx_HIST, CF_QueueIdx_HIST_FREE, and CF_History::cl_node.
Referenced by CF_PurgeHistory().
Here is the call graph for this function:

12.50.3.13 CF_Traverse_WriteHistoryQueueEntryToFile()

```
CF_CListTraverse_Status_t CF_Traverse_WriteHistoryQueueEntryToFile (
            CF_CListNode_t * node,
            void * arg )
```

Writes a human readable representation of a history queue entry to a file.
This function is a wrapper around CF_WriteHistoryEntryToFile() that can be used with CF_Traverse() to write history queue entries to the file.
This also implements a direction filter, so only matching entries are actually written to the file.

Assumptions, External Events, and Notes:

node must not be NULL. arg must not be NULL.

Parameters

node	Node being currently traversed
arg	Pointer to CF_Traverse_WriteHistoryFileArg_t indicating the file information

Return values

CF_CLIST_CONT	if everything is going well
CF_CLIST_EXIT	if a write error occurred, which means traversal should stop

Definition at line 222 of file cf_utils.c.
References CF_CLIST_CONT, CF_CLIST_EXIT, CF_Direction_NUM, CF_WriteHistoryEntryToFile(), container_of, CF_Traverse_WriteHistoryFileArg::counter, CF_History::dir, CF_Traverse_WriteHistoryFileArg::error, CF_Traverse_WriteHistoryFileArg::fd, and CF_Traverse_WriteHistoryFileArg::filter_dir.
Referenced by CF_WriteHistoryQueueDataToFile().

Here is the call graph for this function:

12.50.3.14 CF_Traverse_WriteTxnQueueEntryToFile()

```
CF_CListTraverse_Status_t CF_Traverse_WriteTxn↩
QueueEntryToFile (
            CF_CListNode_t * node,
            void * arg )
```

Writes a human readable representation of a transaction history entry to a file.
This function is a wrapper around CF_WriteHistoryEntryToFile() that can be used with CF_Traverse() to write transaction queue entries to the file.

Assumptions, External Events, and Notes:

node must not be NULL. arg must not be NULL.

Parameters

node	Node being currently traversed
arg	Pointer to CF_Traverse_WriteTxnFileArg_t indicating the file information

Return values

CF_CLIST_CONT	if everything is going well
CF_CLIST_EXIT	if a write error occurred, which means traversal should stop

Definition at line 249 of file cf_utils.c.
References CF_CLIST_CONT, CF_CLIST_EXIT, CF_WriteHistoryEntryToFile(), container_of, CF_Traverse_WriteTxn↩FileArg::counter, CF_Traverse_WriteTxnFileArg::error, CF_Traverse_WriteTxnFileArg::fd, and CF_Transaction::history.
Referenced by CF_WriteTxnQueueDataToFile().
Here is the call graph for this function:

12.50.3.15 CF_TraverseAllTransactions()

```
int32 CF_TraverseAllTransactions (
    CF_Channel_t * chan,
    CF_TraverseAllTransactions_fn_t fn,
    void * context )
```

Traverses all transactions on all active queues and performs an operation on them.

Assumptions, External Events, and Notes:

chan must not be NULL. fn must be a valid function. context must not be NULL.

Parameters

chan	Channel to operate on
fn	Callback to invoke for all traversed transactions
context	Opaque object to pass to all callbacks

Returns

Number of transactions traversed

Definition at line 390 of file cf_utils.c.
References CF_CList_Traverse(), CF_QueueIdx_PEND, CF_QueueIdx_RX, CF_TraverseAllTransactions_Impl(), CF↩_TraverseAll_Arg::counter, and CF_Channel::qs.
Referenced by CF_TraverseAllTransactions_All_Channels(), and CF_TsnChanAction().
Here is the call graph for this function:

12.50.3.16 CF_TraverseAllTransactions_All_Channels()

```
int32 CF_TraverseAllTransactions_All_Channels
(
    CF_TraverseAllTransactions_fn_t fn,
    void * context )
```

Traverses all transactions on all channels and performs an operation on them.

Assumptions, External Events, and Notes:

fn must be a valid function. context must not be NULL.

Parameters

fn	Callback to invoke for all traversed transactions
context	Opaque object to pass to all callbacks

Returns

Number of transactions traversed

Definition at line 406 of file cf_utils.c.
References CF_AppData, CF_NUM_CHANNELS, CF_TraverseAllTransactions(), CF_Engine::channels, and CF_App↩ Data_t::engine.
Referenced by CF_TsnChanAction().
Here is the call graph for this function:

12.50.3.17 CF_TraverseAllTransactions_Impl()

```
CF_CListTraverse_Status_t CF_TraverseAllTransactions↩
_Impl (
            CF_CListNode_t * node,
            void * arg )
```

List traversal function performs operation on every active transaction.

Description

Called on every transaction via list traversal. Calls another function on that transaction.

Assumptions, External Events, and Notes:

node must not be NULL. args must not be NULL.

Parameters

node	Node being currently traversed
arg	Intermediate context object from initial call

Return values

0	for do not exit early (always continue)

Definition at line 375 of file cf_utils.c.
References CF_CLIST_CONT, container_of, CF_TraverseAll_Arg::context, CF_TraverseAll_Arg::counter, and CF_↩ TraverseAll_Arg::fn.
Referenced by CF_TraverseAllTransactions().

12.50.3.18 CF_TxnStatus_From_ConditionCode()

```
CF_TxnStatus_t CF_TxnStatus_From_ConditionCode (
            CF_CFDP_ConditionCode_t cc )
```

Converts a CFDP condition code to an internal transaction status.

Assumptions, External Events, and Notes:

None

Parameters

cc	CFDP condition code

Returns

Transaction status code

Definition at line 589 of file cf_utils.c.
Referenced by CF_CFDP_R2_SubstateRecvEof().

12.50.3.19 CF_TxnStatus_IsError() `bool CF_TxnStatus_IsError ( CF_TxnStatus_t txn_stat )`

Check if the internal transaction status represents an error.

Assumptions, External Events, and Notes:

Transaction status is a superset of condition codes, and includes other error conditions for which CFDP will not send FIN/ACK/EOF and thus there is no corresponding condition code.

Parameters

txn_stat	Transaction status

Returns

Boolean value indicating if the transaction is in an errorred state

Return values

true	if an error has occurred during the transaction
false	if no error has occurred during the transaction yet

Definition at line 507 of file cf_utils.c.
References CF_TxnStatus_NO_ERROR.
Referenced by CF_CFDP_HandleNotKeepFile(), CF_CFDP_R2_Complete(), CF_CFDP_R2_Reset(), CF_CFDP_R2↩_SubstateSendFin(), CF_CFDP_R_DispatchRecv(), CF_CFDP_S2_WaitForEofAck(), CF_CFDP_SetTxnStatus(), and CF_TxnStatus_To_ConditionCode().

12.50.3.20 CF_TxnStatus_To_ConditionCode() `CF_CFDP_ConditionCode_t CF_TxnStatus_To_ConditionCode ( CF_TxnStatus_t txn_stat )`

Converts the internal transaction status to a CFDP condition code.
Transaction status is a superset of condition codes, and includes other error conditions for which CFDP will not send FIN/ACK/EOF and thus there is no corresponding condition code.

Assumptions, External Events, and Notes:

Not all transaction status codes directly correlate to a CFDP CC

Parameters

txn_stat	Transaction status

Returns

CFDP protocol condition code

Definition at line 523 of file cf_utils.c.
References CF_CFDP_ConditionCode_CANCEL_REQUEST_RECEIVED, CF_CFDP_ConditionCode_INACTIVITY↩_DETECTED, CF_CFDP_ConditionCode_NO_ERROR, CF_TxnStatus_ACK_LIMIT_NO_EOF, CF_TxnStatus_ACK↩_LIMIT_NO_FIN, CF_TxnStatus_CANCEL_REQUEST_RECEIVED, CF_TxnStatus_CHECK_LIMIT_REACHED, C↩F_TxnStatus_FILE_CHECKSUM_FAILURE, CF_TxnStatus_FILE_SIZE_ERROR, CF_TxnStatus_FILESTORE_REJ↩ECTION, CF_TxnStatus_INACTIVITY_DETECTED, CF_TxnStatus_INVALID_FILE_STRUCTURE, CF_TxnStatus_I↩NVALID_TRANSMISSION_MODE, CF_TxnStatus_IsError(), CF_TxnStatus_KEEP_ALIVE_LIMIT_REACHED, CF_↩TxnStatus_NAK_LIMIT_REACHED, CF_TxnStatus_NO_ERROR, CF_TxnStatus_POS_ACK_LIMIT_REACHED, CF↩_TxnStatus_SUSPEND_REQUEST_RECEIVED, and CF_TxnStatus_UNSUPPORTED_CHECKSUM_TYPE.
Referenced by CF_CFDP_R2_SubstateSendFin(), and CF_CFDP_SendEof().
Here is the call graph for this function:

12.50.3.21 CF_WrappedClose() `void CF_WrappedClose ( osal_id_t fd )`

Wrap the filesystem close call with a perf counter.

Assumptions, External Events, and Notes:

None

See also

OS_close() for parameter descriptions

Parameters

fd	Passed directly to underlying OSAL call

Definition at line 437 of file cf_utils.c.
References CF_CFDP_CLOSE_ERR_EID, CF_PERF_ID_FCLOSE, CFE_ES_PerfLogEntry, CFE_ES_PerfLogExit,

CFE_EVS_EventType_ERROR, CFE_EVS_SendEvent(), OS_close(), OS_ObjectIdToInteger(), and OS_SUCCESS.
Referenced by CF_CFDP_CloseFiles(), CF_CFDP_R2_RecvMd(), CF_CFDP_ResetTransaction(), and CF_Write↩QueueCmd().
Here is the call graph for this function:

12.50.3.22 CF_WrappedLseek()

```
CFE_Status_t CF_WrappedLseek (
    osal_id_t fd,
    off_t offset,
    int mode )
```

Wrap the filesystem lseek call with a perf counter.

Assumptions, External Events, and Notes:

fname must not be NULL.

See also

OS_lseek() for parameter descriptions

Parameters

fd	Passed directly to underlying OSAL call
offset	Passed directly to underlying OSAL call
mode	Passed directly to underlying OSAL call

Returns

Status code from OSAL (byte count or error code)

Definition at line 490 of file cf_utils.c.
References CF_PERF_ID_FSEEK, CFE_ES_PerfLogEntry, CFE_ES_PerfLogExit, and OS_lseek().
Referenced by CF_CFDP_R2_CalcCrcChunk(), CF_CFDP_R_ProcessFd(), CF_CFDP_S_SendFileData(), and CF_CFDP_S_SubstateSendMetadata().
Here is the call graph for this function:

12.50.3.23 CF_WrappedOpenCreate()

```
CFE_Status_t CF_WrappedOpenCreate (
    osal_id_t * fd,
    const char * fname,
    int32 flags,
    int32 access )
```

Wrap the filesystem open call with a perf counter.

Assumptions, External Events, and Notes:

fname must not be NULL.

See also

OS_OpenCreate() for parameter descriptions

Parameters

fd	Passed directly to underlying OSAL call
fname	Passed directly to underlying OSAL call
flags	Passed directly to underlying OSAL call
access	Passed directly to underlying OSAL call

Returns

Status code from OSAL

Definition at line 421 of file cf_utils.c.
References CF_PERF_ID_FOPEN, CFE_ES_PerfLogEntry, CFE_ES_PerfLogExit, and OS_OpenCreate().
Referenced by CF_CFDP_R2_RecvMd(), CF_CFDP_R_Init(), CF_CFDP_S_SubstateSendMetadata(), and CF_WriteQueueCmd().
Here is the call graph for this function:

12.50.3.24 CF_WrappedRead()

```
CFE_Status_t CF_WrappedRead (
    osal_id_t fd,
    void * buf,
    size_t read_size )
```

Wrap the filesystem read call with a perf counter.

Assumptions, External Events, and Notes:

buf must not be NULL.

See also

OS_read() for parameter descriptions

Parameters

fd	Passed directly to underlying OSAL call
buf	Passed directly to underlying OSAL call
read_size	Passed directly to underlying OSAL call

Returns

Status code from OSAL (byte count or error code)

Definition at line 458 of file cf_utils.c.
References CF_PERF_ID_FREAD, CFE_ES_PerfLogEntry, CFE_ES_PerfLogExit, and OS_read().
Referenced by CF_CFDP_R2_CalcCrcChunk(), and CF_CFDP_S_SendFileData().
Here is the call graph for this function:

12.50.3.25 CF_WrappedWrite()

```
CFE_Status_t CF_WrappedWrite (
    osal_id_t fd,
    const void * buf,
    size_t write_size )
```

Wrap the filesystem write call with a perf counter.

Assumptions, External Events, and Notes:

buf must not be NULL.

See also

OS_write() for parameter descriptions

Parameters

fd	Passed directly to underlying OSAL call
buf	Passed directly to underlying OSAL call
write_size	Passed directly to underlying OSAL call

Returns

Status code from OSAL (byte count or error code)

Definition at line 474 of file cf_utils.c.
References CF_PERF_ID_FWRITE, CFE_ES_PerfLogEntry, CFE_ES_PerfLogExit, and OS_write().
Referenced by CF_CFDP_R_ProcessFd(), and CF_WriteHistoryEntryToFile().
Here is the call graph for this function:

12.50.3.26 CF_WriteHistoryEntryToFile()

```
CFE_Status_t CF_WriteHistoryEntryToFile (
    osal_id_t fd,
    const CF_History_t * history )
```

Write a single history to a file.
This creates a human-readable/string representation of the information in the history object, and writes that string to the indicated file.
This implements the common code between writing the history queue and transaction queue to a file, as both ultimately store the same information in a CF_History_t object, but have a different method to get to it.

Assumptions, External Events, and Notes:

fd should be a valid file descriptor, open for writing.

Parameters

fd	Open File descriptor to write to
history	Pointer to CF history object to write

Return values

CFE_SUCCESS	on success
CF_ERROR	on error

Definition at line 172 of file cf_utils.c.
References CF_Assert, CF_CMD_WHIST_WRITE_ERR_EID, CF_Direction_NUM, CF_ERROR, CF_FILENAME_↩MAX_LEN, CF_WrappedWrite(), CFE_EVS_EventType_ERROR, CFE_EVS_SendEvent(), CFE_SUCCESS, CF_↩History::dir, CF_TxnFilenames::dst_filename, CF_History::fnames, OS_strnlen(), CF_History::peer_eid, CF_History↩::seq_num, CF_History::src_eid, CF_TxnFilenames::src_filename, and CF_History::txn_stat.
Referenced by CF_Traverse_WriteHistoryQueueEntryToFile(), and CF_Traverse_WriteTxnQueueEntryToFile().

Here is the call graph for this function:

12.50.3.27 CF_WriteHistoryQueueDataToFile()

```
CFE_Status_t CF_WriteHistoryQueueDataToFile (
    osal_id_t fd,
    CF_Channel_t * chan,
    CF_Direction_t dir )
```

Write a history-based queue's entries to a file.

Assumptions, External Events, and Notes:

chan must not be NULL.

Parameters

fd	Open File descriptor to write to
chan	Pointer to associated CF channel object
dir	Direction to match/filter

Return values

0	on success
1	on error

Definition at line 289 of file cf_utils.c.
References CF_CList_Traverse(), CF_QueueIdx_HIST, CF_Traverse_WriteHistoryQueueEntryToFile(), CF_Traverse↩_WriteHistoryFileArg::counter, CF_Traverse_WriteHistoryFileArg::error, CF_Traverse_WriteHistoryFileArg::fd, CF_↩Traverse_WriteHistoryFileArg::filter_dir, and CF_Channel::qs.
Referenced by CF_WriteQueueCmd().
Here is the call graph for this function:

12.50.3.28 CF_WriteTxnQueueDataToFile()

```
CFE_Status_t CF_WriteTxnQueueDataToFile (
    osal_id_t fd,
    CF_Channel_t * chan,
    CF_QueueIdx_t queue )
```

Write a transaction-based queue's transaction history to a file.

Assumptions, External Events, and Notes:

chan must not be NULL.

Parameters

fd	Open File descriptor to write to
chan	Pointer to associated CF channel object
queue	Queue Index to write

Return values

0	on success
1	on error

Definition at line 271 of file cf_utils.c.
References CF_CList_Traverse(), CF_Traverse_WriteTxnQueueEntryToFile(), CF_Traverse_WriteTxnFileArg::counter, CF_Traverse_WriteTxnFileArg::error, CF_Traverse_WriteTxnFileArg::fd, and CF_Channel::qs.
Referenced by CF_WriteQueueCmd().
Here is the call graph for this function:

12.51 apps/cf/fsw/src/cf_verify.h File Reference

```
#include "cfe.h"
#include "cf_platform_cfg.h"
#include "cf_perfids.h"
```

12.51.1 Detailed Description

The CF Application configuration verification header

12.52 apps/cf/fsw/src/cf_version.h File Reference

Macros

- #define CF_MAJOR_VERSION (3)

Major version number.

- #define CF_MINOR_VERSION (0)

  Minor version number.

- #define CF_REVISION (99)

  Revision number.

12.52.1 Detailed Description

The CFS CFDP (CF) Application header file containing version number

12.53 apps/cf/fsw/tables/cf_def_config.c File Reference

```
#include "cfe.h"
#include "cfe_tbl_filedef.h"
#include "cf_tbldefs.h"
```

Variables

- CF_ConfigTable_t CF_config_table

12.53.1 Detailed Description

The CF Application default configuration table

12.53.2 Variable Documentation

12.53.2.1 CF_config_table `CF_ConfigTable_t CF_config_table`

Definition at line 28 of file cf_def_config.c.

12.54 build/osal_public_api/inc/osconfig.h File Reference

Macros

- #define OSAL_CONFIG_INCLUDE_DYNAMIC_LOADER

  Configuration file Operating System Abstraction Layer.

- #define OSAL_CONFIG_INCLUDE_NETWORK
- #define OSAL_CONFIG_INCLUDE_STATIC_LOADER
- #define OSAL_CONFIG_CONSOLE_ASYNC
- #define OS_MAX_TASKS 64

  The maximum number of to support.

- #define OS_MAX_QUEUES 64

  The maximum number of queues to support.

- #define OS_MAX_COUNT_SEMAPHORES 20

  The maximum number of counting semaphores to support.

- #define OS_MAX_BIN_SEMAPHORES 20

  The maximum number of binary semaphores to support.

- #define OS_MAX_MUTEXES 20

  The maximum number of mutexes to support.

- #define OS_MAX_CONDVARS 4

The maximum number of condition variables to support.

- #define OS_MAX_MODULES 20

  The maximum number of modules to support.
- #define OS_MAX_TIMEBASES 5

  The maximum number of timebases to support.
- #define OS_MAX_TIMERS 10

  The maximum number of timer callbacks to support.
- #define OS_MAX_NUM_OPEN_FILES 50

  The maximum number of concurrently open files to support.
- #define OS_MAX_NUM_OPEN_DIRS 4

  The maximum number of concurrently open directories to support.
- #define OS_MAX_FILE_SYSTEMS 14

  The maximum number of file systems to support.
- #define OS_MAX_SYM_LEN 64

  The maximum length of symbols.
- #define OS_MAX_FILE_NAME 20

  The maximum length of OSAL file names.
- #define OS_MAX_PATH_LEN 64

  The maximum length of OSAL path names.
- #define OS_MAX_API_NAME 20

  The maximum length of OSAL resource names.
- #define OS_SOCKADDR_MAX_LEN 28

  The maximum size of the socket address structure.
- #define OS_BUFFER_SIZE 172

  The maximum size of output produced by a single OS_printf()
- #define OS_BUFFER_MSG_DEPTH 100

  The maximum number of OS_printf() output strings to buffer.
- #define OS_UTILITYTASK_PRIORITY 245

  Priority level of the background utility task.
- #define OS_UTILITYTASK_STACK_SIZE 2048

  The stack size of the background utility task.
- #define OS_MAX_CMD_LEN 1000

  The maximum size of a shell command.
- #define OS_QUEUE_MAX_DEPTH 50

  The maximum depth of OSAL queues.
- #define OS_SHELL_CMD_INPUT_FILE_NAME ""

  The name of the temporary file used to store shell commands.
- #define OS_PRINTF_CONSOLE_NAME ""

  The name of the primary console device.
- #define OS_ADD_TASK_FLAGS 0

  Flags added to all tasks on creation.
- #define OS_MAX_CONSOLES 1

  The maximum number of console devices to support.
- #define OS_MODULE_FILE_EXTENSION ".so"

  The system-specific file extension used on loadable module files.
- #define OS_FS_DEV_NAME_LEN 32
- #define OS_FS_PHYS_NAME_LEN 64
- #define OS_FS_VOL_NAME_LEN 32

12.54.1 Macro Definition Documentation

12.54.1.1 OS_ADD_TASK_FLAGS `#define OS_ADD_TASK_FLAGS 0`

Flags added to all tasks on creation.
Added to the task flags on creation
Supports adding floating point support for all tasks when the OS requires it
Definition at line 254 of file osconfig.h.

12.54.1.2 OS_BUFFER_MSG_DEPTH `#define OS_BUFFER_MSG_DEPTH 100`

The maximum number of OS_printf() output strings to buffer.
Based on the OSAL_CONFIG_PRINTF_BUFFER_DEPTH configuration option
Definition at line 187 of file osconfig.h.

12.54.1.3 OS_BUFFER_SIZE `#define OS_BUFFER_SIZE 172`

The maximum size of output produced by a single OS_printf()
Based on the OSAL_CONFIG_PRINTF_BUFFER_SIZE configuration option
Definition at line 180 of file osconfig.h.

12.54.1.4 OS_FS_DEV_NAME_LEN `#define OS_FS_DEV_NAME_LEN 32`

Device name length
Definition at line 281 of file osconfig.h.

12.54.1.5 OS_FS_PHYS_NAME_LEN `#define OS_FS_PHYS_NAME_LEN 64`

Physical drive name length
Definition at line 282 of file osconfig.h.

12.54.1.6 OS_FS_VOL_NAME_LEN `#define OS_FS_VOL_NAME_LEN 32`

Volume name length
Definition at line 283 of file osconfig.h.

12.54.1.7 OS_MAX_API_NAME `#define OS_MAX_API_NAME 20`

The maximum length of OSAL resource names.
Based on the OSAL_CONFIG_MAX_API_NAME configuration option

Note

This value must include a terminating NUL character

Definition at line 163 of file osconfig.h.

12.54.1.8 OS_MAX_BIN_SEMAPHORES `#define OS_MAX_BIN_SEMAPHORES 20`

The maximum number of binary semaphores to support.
Based on the OSAL_CONFIG_MAX_BIN_SEMAPHORES configuration option
Definition at line 65 of file osconfig.h.

12.54.1.9 OS_MAX_CMD_LEN `#define OS_MAX_CMD_LEN 1000`

The maximum size of a shell command.
This limit is only applicable if shell support is enabled.
Based on the OSAL_CONFIG_MAX_CMD_LEN configuration option

Note

This value must include a terminating NUL character

Definition at line 218 of file osconfig.h.

12.54.1.10 OS_MAX_CONDVARS `#define OS_MAX_CONDVARS 4`

The maximum number of condition variables to support.
Based on the OSAL_CONFIG_MAX_CONDVARS configuration option
Definition at line 79 of file osconfig.h.

12.54.1.11 OS_MAX_CONSOLES `#define OS_MAX_CONSOLES 1`

The maximum number of console devices to support.
Fixed value based on current OSAL implementation, not user configurable.
Definition at line 269 of file osconfig.h.

12.54.1.12 OS_MAX_COUNT_SEMAPHORES `#define OS_MAX_COUNT_SEMAPHORES 20`

The maximum number of counting semaphores to support.
Based on the OSAL_CONFIG_MAX_COUNT_SEMAPHORES configuration option
Definition at line 58 of file osconfig.h.

12.54.1.13 OS_MAX_FILE_NAME `#define OS_MAX_FILE_NAME 20`

The maximum length of OSAL file names.
This limit applies specifically to the file name portion, not the directory portion, of a path name.
Based on the OSAL_CONFIG_MAX_FILE_NAME configuration option

Note

This value must include a terminating NUL character

Definition at line 142 of file osconfig.h.

12.54.1.14 OS_MAX_FILE_SYSTEMS `#define OS_MAX_FILE_SYSTEMS 14`

The maximum number of file systems to support.
Based on the OSAL_CONFIG_MAX_FILE_SYSTEMS configuration option
Definition at line 121 of file osconfig.h.

12.54.1.15 OS_MAX_MODULES `#define OS_MAX_MODULES 20`

The maximum number of modules to support.
Based on the OSAL_CONFIG_MAX_MODULES configuration option
Definition at line 86 of file osconfig.h.

12.54.1.16 OS_MAX_MUTEXES `#define OS_MAX_MUTEXES 20`

The maximum number of mutexes to support.
Based on the OSAL_CONFIG_MAX_MUTEXES configuration option
Definition at line 72 of file osconfig.h.

12.54.1.17 OS_MAX_NUM_OPEN_DIRS `#define OS_MAX_NUM_OPEN_DIRS 4`

The maximum number of concurrently open directories to support.
Based on the OSAL_CONFIG_MAX_NUM_OPEN_DIRS configuration option
Definition at line 114 of file osconfig.h.

12.54.1.18 OS_MAX_NUM_OPEN_FILES `#define OS_MAX_NUM_OPEN_FILES 50`

The maximum number of concurrently open files to support.
Based on the OSAL_CONFIG_MAX_NUM_OPEN_FILES configuration option
Definition at line 107 of file osconfig.h.

12.54.1.19 OS_MAX_PATH_LEN `#define OS_MAX_PATH_LEN 64`

The maximum length of OSAL path names.
This limit applies to the overall length of a path name, including the file name and directory portions.
Based on the OSAL_CONFIG_MAX_PATH_LEN configuration option

Note

This value must include a terminating NUL character

Definition at line 154 of file osconfig.h.

12.54.1.20 OS_MAX_QUEUES `#define OS_MAX_QUEUES 64`

The maximum number of queues to support.
Based on the OSAL_CONFIG_MAX_QUEUES configuration option
Definition at line 51 of file osconfig.h.

12.54.1.21 OS_MAX_SYM_LEN `#define OS_MAX_SYM_LEN 64`

The maximum length of symbols.
Based on the OSAL_CONFIG_MAX_SYM_LEN configuration option

Note

This value must include a terminating NUL character

Definition at line 130 of file osconfig.h.

12.54.1.22 OS_MAX_TASKS `#define OS_MAX_TASKS 64`

The maximum number of to support.
Based on the OSAL_CONFIG_MAX_TASKS configuration option
Definition at line 44 of file osconfig.h.

12.54.1.23 OS_MAX_TIMEBASES `#define OS_MAX_TIMEBASES 5`

The maximum number of timebases to support.
Based on the OSAL_CONFIG_MAX_TIMEBASES configuration option
Definition at line 93 of file osconfig.h.

12.54.1.24 OS_MAX_TIMERS `#define OS_MAX_TIMERS 10`

The maximum number of timer callbacks to support.
Based on the OSAL_CONFIG_MAX_TIMERS configuration option
Definition at line 100 of file osconfig.h.

12.54.1.25 OS_MODULE_FILE_EXTENSION `#define OS_MODULE_FILE_EXTENSION ".so"`

The system-specific file extension used on loadable module files.
Fixed value based on system selection, not user configurable.
Definition at line 276 of file osconfig.h.

12.54.1.26 OS_PRINTF_CONSOLE_NAME `#define OS_PRINTF_CONSOLE_NAME ""`

The name of the primary console device.
This is the device to which OS_printf() output is written. The output may be configured to tag each line with this prefix for identification.
Based on the OSAL_CONFIG_PRINTF_CONSOLE_NAME configuration option
Definition at line 245 of file osconfig.h.

12.54.1.27 OS_QUEUE_MAX_DEPTH `#define OS_QUEUE_MAX_DEPTH 50`

The maximum depth of OSAL queues.
Based on the OSAL_CONFIG_QUEUE_MAX_DEPTH configuration option
Definition at line 225 of file osconfig.h.

12.54.1.28 OS_SHELL_CMD_INPUT_FILE_NAME `#define OS_SHELL_CMD_INPUT_FILE_NAME ""`

The name of the temporary file used to store shell commands.
This configuration is only applicable if shell support is enabled, and only necessary/relevant on some OS implementations.
Based on the OSAL_CONFIG_SHELL_CMD_INPUT_FILE_NAME configuration option
Definition at line 235 of file osconfig.h.

12.54.1.29 OS_SOCKADDR_MAX_LEN `#define OS_SOCKADDR_MAX_LEN 28`

The maximum size of the socket address structure.
This is part of the Socket API, and should be set large enough to hold the largest address type in use on the target system.
Based on the OSAL_CONFIG_SOCKADDR_MAX_LEN configuration option
Definition at line 173 of file osconfig.h.

12.54.1.30 OS_UTILITYTASK_PRIORITY `#define OS_UTILITYTASK_PRIORITY 245`

Priority level of the background utility task.
This task is responsible for writing buffered output of OS_printf to the actual console device, and any other future maintenance task.

Based on the OSAL_CONFIG_UTILITYTASK_PRIORITY configuration option
Definition at line 197 of file osconfig.h.

12.54.1.31 OS_UTILITYTASK_STACK_SIZE `#define OS_UTILITYTASK_STACK_SIZE 2048`

The stack size of the background utility task.
This task is responsible for writing buffered output of OS_printf to the actual console device, and any other future maintenance task.
Based on the OSAL_CONFIG_UTILITYTASK_STACK_SIZE configuration option
Definition at line 207 of file osconfig.h.

12.54.1.32 OSAL_CONFIG_CONSOLE_ASYNC `#define OSAL_CONFIG_CONSOLE_ASYNC`

Definition at line 27 of file osconfig.h.

12.54.1.33 OSAL_CONFIG_INCLUDE_DYNAMIC_LOADER `#define OSAL_CONFIG_INCLUDE_DYNAMIC_LOADER`

Configuration file Operating System Abstraction Layer.
The specific definitions in this file may only be modified by setting the respective OSAL configuration options in the CMake build.
Any direct modifications to the generated copy will be overwritten each time CMake executes.

Note

This file was automatically generated by CMake from /home/runner/work/CF/CF/osal/default_config.cmake

Definition at line 21 of file osconfig.h.

12.54.1.34 OSAL_CONFIG_INCLUDE_NETWORK `#define OSAL_CONFIG_INCLUDE_NETWORK`

Definition at line 22 of file osconfig.h.

12.54.1.35 OSAL_CONFIG_INCLUDE_STATIC_LOADER `#define OSAL_CONFIG_INCLUDE_STATIC_LOADER`

Definition at line 23 of file osconfig.h.

12.55 cfe/cmake/sample_defs/example_mission_cfg.h File Reference

Macros

- #define CFE_MISSION_MAX_PATH_LEN 64
- #define CFE_MISSION_MAX_FILE_LEN 20
- #define CFE_MISSION_MAX_API_LEN 20
- #define CFE_MISSION_MAX_NUM_FILES 50
- #define CFE_MISSION_ES_MAX_APPLICATIONS 16
- #define CFE_MISSION_ES_PERF_MAX_IDS 128
- #define CFE_MISSION_ES_POOL_MAX_BUCKETS 17
- #define CFE_MISSION_ES_CDS_MAX_NAME_LENGTH 16
- #define CFE_MISSION_ES_DEFAULT_CRC CFE_ES_CrcType_CRC_16
- #define CFE_MISSION_ES_CDS_MAX_FULL_NAME_LEN (CFE_MISSION_ES_CDS_MAX_NAME_LENGTH + CFE_MISSION_MAX_API_LEN + 4)

Checksum/CRC algorithm identifiers

- #define CFE_MISSION_ES_CRC_8 CFE_ES_CrcType_CRC_8 /* 1 */
- #define CFE_MISSION_ES_CRC_16 CFE_ES_CrcType_CRC_16 /* 2 */
- #define CFE_MISSION_ES_CRC_32 CFE_ES_CrcType_CRC_32 /* 3 */
- #define CFE_MISSION_EVS_MAX_MESSAGE_LENGTH 122
- #define CFE_FS_HDR_DESC_MAX_LEN 32

  Max length of description field in a standard cFE File Header.
- #define CFE_FS_FILE_CONTENT_ID 0x63464531

  Magic Number for cFE compliant files (= 'cFE1')
- #define CFE_MISSION_SB_MAX_SB_MSG_SIZE 32768
- #define CFE_MISSION_SB_MAX_PIPES 64
- #define CFE_MISSION_TBL_MAX_NAME_LENGTH 16
- #define CFE_MISSION_TBL_MAX_FULL_NAME_LEN (CFE_MISSION_TBL_MAX_NAME_LENGTH + CFE_MISSION_MAX_API_LEN + 4)
- #define CFE_MISSION_TIME_CFG_DEFAULT_TAI true
- #define CFE_MISSION_TIME_CFG_DEFAULT_UTC false
- #define CFE_MISSION_TIME_CFG_FAKE_TONE true
- #define CFE_MISSION_TIME_AT_TONE_WAS true
- #define CFE_MISSION_TIME_AT_TONE_WILL_BE false
- #define CFE_MISSION_TIME_MIN_ELAPSED 0
- #define CFE_MISSION_TIME_MAX_ELAPSED 200000
- #define CFE_MISSION_TIME_DEF_MET_SECS 1000
- #define CFE_MISSION_TIME_DEF_MET_SUBS 0
- #define CFE_MISSION_TIME_DEF_STCF_SECS 1000000
- #define CFE_MISSION_TIME_DEF_STCF_SUBS 0
- #define CFE_MISSION_TIME_DEF_LEAPS 37
- #define CFE_MISSION_TIME_DEF_DELAY_SECS 0
- #define CFE_MISSION_TIME_DEF_DELAY_SUBS 1000
- #define CFE_MISSION_TIME_EPOCH_YEAR 1980
- #define CFE_MISSION_TIME_EPOCH_DAY 1
- #define CFE_MISSION_TIME_EPOCH_HOUR 0
- #define CFE_MISSION_TIME_EPOCH_MINUTE 0
- #define CFE_MISSION_TIME_EPOCH_SECOND 0
- #define CFE_MISSION_TIME_EPOCH_MICROS 0
- #define CFE_MISSION_TIME_FS_FACTOR 789004800

12.55.1 Detailed Description

This header file contains the mission configuration parameters and typedefs with mission scope.
This provides values for configurable items that affect the interface(s) of this module. This includes the CMD/T↩LM message interface, tables definitions, and any other data products that serve to exchange information with other entities.

Note

> It is no longer necessary to provide this file directly in the defs directory, but if present, this file is still supported/usable for backward compatibility. To use this file, is should be called "cfe_mission_cfg.h".

Going forward, more fine-grained (module/purposes-specific) header files are included with each submodule. These may be overridden as necessary, but only if a definition within that file needs to be changed from the default. This approach will reduce the amount of duplicate/cloned definitions and better support alternative build configurations in the future.
Note that if this file is present, the fine-grained header files noted above will *not* be used.

12.55.2 Macro Definition Documentation

12.55.2.1 CFE_FS_FILE_CONTENT_ID `#define CFE_FS_FILE_CONTENT_ID 0x63464531`

Magic Number for cFE compliant files (= 'cFE1')
Definition at line 313 of file example_mission_cfg.h.

12.55.2.2 CFE_FS_HDR_DESC_MAX_LEN `#define CFE_FS_HDR_DESC_MAX_LEN 32`

Max length of description field in a standard cFE File Header.
Definition at line 311 of file example_mission_cfg.h.

12.55.2.3 CFE_MISSION_ES_CDS_MAX_FULL_NAME_LEN `#define CFE_MISSION_ES_CDS_MAX_FULL_NAME_LEN (CFE_MISSION_ES_CDS_MAX_NAME_LENGTH + CFE_MISSION_MAX_API_LEN + 4)`

Purpose Maximum Length of Full CDS Name in messages

Description:

Indicates the maximum length (in characters) of the entire CDS name of the following form: "ApplicationName.CDSName"

This affects the layout of command/telemetry messages but does not affect run time behavior or internal allocation.

Limits

All CPUs within the same SB domain (mission) must share the same definition Note this affects the size of messages, so it must not cause any message to exceed the max length.

This value should be kept as a multiple of 4, to maintain alignment of any possible neighboring fields without implicit padding.
Definition at line 262 of file example_mission_cfg.h.

12.55.2.4 CFE_MISSION_ES_CDS_MAX_NAME_LENGTH `#define CFE_MISSION_ES_CDS_MAX_NAME_LENGTH 16`

Purpose Maximum Length of CDS Name

Description:

Indicates the maximum length (in characters) of the CDS name ('CDSName') portion of a Full CDS Name of the following form: "ApplicationName.CDSName"

This length does not need to include an extra character for NULL termination.

Limits

This value should be kept as a multiple of 4, to maintain alignment of any possible neighboring fields without implicit padding.

Definition at line 228 of file example_mission_cfg.h.

12.55.2.5 CFE_MISSION_ES_CRC_16 `#define CFE_MISSION_ES_CRC_16 CFE_ES_CrcType_CRC_16 /* 2 */`

Definition at line 270 of file example_mission_cfg.h.

12.55.2.6 CFE_MISSION_ES_CRC_32 `#define CFE_MISSION_ES_CRC_32 CFE_ES_CrcType_CRC_32 /* 3 */`

Definition at line 271 of file example_mission_cfg.h.

12.55.2.7 CFE_MISSION_ES_CRC_8 `#define CFE_MISSION_ES_CRC_8 CFE_ES_CrcType_CRC_8 /* 1 */`

Definition at line 269 of file example_mission_cfg.h.

12.55.2.8 CFE_MISSION_ES_DEFAULT_CRC `#define CFE_MISSION_ES_DEFAULT_CRC CFE_ES_CrcType_CRC_16`

Purpose Mission Default CRC algorithm

Description:

Indicates the which CRC algorithm should be used as the default for verifying the contents of Critical Data Stores and when calculating Table Image data integrity values.

Limits

Currently only CFE_ES_CrcType_CRC_16 is supported (see brief in CFE_ES_CrcType_Enum definition in cfe_es_api_typedefs.h)

Definition at line 242 of file example_mission_cfg.h.

12.55.2.9 CFE_MISSION_ES_MAX_APPLICATIONS `#define CFE_MISSION_ES_MAX_APPLICATIONS 16`

Purpose Mission Max Apps in a message

Description:

Indicates the maximum number of apps in a telemetry housekeeping message

This affects the layout of command/telemetry messages but does not affect run time behavior or internal allocation.

Limits

All CPUs within the same SB domain (mission) must share the same definition Note this affects the size of messages, so it must not cause any message to exceed the max length.

Definition at line 173 of file example_mission_cfg.h.

12.55.2.10 CFE_MISSION_ES_PERF_MAX_IDS `#define CFE_MISSION_ES_PERF_MAX_IDS 128`

Purpose Define Max Number of Performance IDs for messages

Description:

Defines the maximum number of perf ids allowed in command/telemetry messages

This affects the layout of command/telemetry messages but does not affect run time behavior or internal allocation.

Limits

All CPUs within the same SB domain (mission) must share the same definition Note this affects the size of messages, so it must not cause any message to exceed the max length.

Definition at line 190 of file example_mission_cfg.h.

12.55.2.11 CFE_MISSION_ES_POOL_MAX_BUCKETS `#define CFE_MISSION_ES_POOL_MAX_BUCKETS 17`

Purpose Maximum number of block sizes in pool structures

Description:

The upper limit for the number of block sizes supported in the generic pool implementation, which in turn implements the memory pools and CDS. This definition is used as the array size with the pool stats structure, and therefore should be consistent across all CPUs in a mission, as well as with the ground station.

There is also a platform-specific limit which may be fewer than this value.

Limits:

Must be at least one. No specific upper limit, but the number is anticipated to be reasonably small (i.e. tens, not hundreds). Large values have not been tested.

Definition at line 211 of file example_mission_cfg.h.

12.55.2.12 CFE_MISSION_EVS_MAX_MESSAGE_LENGTH `#define CFE_MISSION_EVS_MAX_MESSAGE_LENG↩ TH 122`

Purpose Maximum Event Message Length

Description:

Indicates the maximum length (in characters) of the formatted text string portion of an event message

This length does not need to include an extra character for NULL termination.

Limits

Not Applicable

Definition at line 297 of file example_mission_cfg.h.

12.55.2.13 CFE_MISSION_MAX_API_LEN `#define CFE_MISSION_MAX_API_LEN 20`

Purpose cFE Maximum length for API names within data exchange structures

Description:

The value of this constant dictates the size of filenames within all structures used for external data exchange, such as Software bus messages and table definitions. This is typically the same as OS_MAX_API_LEN but that is OSAL dependent – and as such it definable on a per-processor/OS basis and hence may be different across multiple processors. It is recommended to set this to the value of the largest OS_MAX_API_LEN in use on any CPU on the mission.

This affects only the layout of command/telemetry messages and table definitions; internal allocation may use the platform-specific OS_MAX_API_LEN value.
This length must include an extra character for NULL termination.

Limits

All CPUs within the same SB domain (mission) must share the same definition Note this affects the size of messages, so it must not cause any message to exceed the max length.

This value should be kept as a multiple of 4, to maintain alignment of any possible neighboring fields without implicit padding.
Definition at line 125 of file example_mission_cfg.h.

12.55.2.14 CFE_MISSION_MAX_FILE_LEN `#define CFE_MISSION_MAX_FILE_LEN 20`

Purpose cFE Maximum length for filenames within data exchange structures

Description:

The value of this constant dictates the size of filenames within all structures used for external data exchange, such as Software bus messages and table definitions. This is typically the same as OS_MAX_FILE_LEN but that is OSAL dependent – and as such it definable on a per-processor/OS basis and hence may be different across multiple processors. It is recommended to set this to the value of the largest OS_MAX_FILE_LEN in use on any CPU on the mission.

This affects only the layout of command/telemetry messages and table definitions; internal allocation may use the platform-specific OS_MAX_FILE_LEN value.
This length must include an extra character for NULL termination.

Limits

All CPUs within the same SB domain (mission) and ground tools must share the same definition. Note this affects the size of messages, so it must not cause any message to exceed the max length.

This value should be kept as a multiple of 4, to maintain alignment of any possible neighboring fields without implicit padding.
Definition at line 99 of file example_mission_cfg.h.

12.55.2.15 CFE_MISSION_MAX_NUM_FILES `#define CFE_MISSION_MAX_NUM_FILES 50`

Purpose cFE Maximum number of files in a message/data exchange

Description:

The value of this constant dictates the maximum number of files within all structures used for external data exchange, such as Software bus messages and table definitions. This is typically the same as OS_MAX_NUM_O↩PEN_FILES but that is OSAL dependent – and as such it definable on a per-processor/OS basis and hence may be different across multiple processors. It is recommended to set this to the value of the largest OS_MAX_NU↩M_OPEN_FILES in use on any CPU on the mission.

This affects only the layout of command/telemetry messages and table definitions; internal allocation may use the platform-specific OS_MAX_NUM_OPEN_FILES value.

Limits

All CPUs within the same SB domain (mission) must share the same definition Note this affects the size of messages, so it must not cause any message to exceed the max length.

Definition at line 147 of file example_mission_cfg.h.

12.55.2.16 CFE_MISSION_MAX_PATH_LEN `#define CFE_MISSION_MAX_PATH_LEN 64`

Purpose cFE Maximum length for pathnames within data exchange structures

Description:

The value of this constant dictates the size of pathnames within all structures used for external data exchange, such as Software bus messages and table definitions. This is typically the same as OS_MAX_PATH_LEN but that is OSAL dependent – and as such it definable on a per-processor/OS basis and hence may be different across multiple processors. It is recommended to set this to the value of the largest OS_MAX_PATH_LEN in use on any CPU on the mission.

This affects only the layout of command/telemetry messages and table definitions; internal allocation may use the platform-specific OS_MAX_PATH_LEN value.
This length must include an extra character for NULL termination.

Limits

All CPUs within the same SB domain (mission) and ground tools must share the same definition. Note this affects the size of messages, so it must not cause any message to exceed the max length.

This value should be kept as a multiple of 4, to maintain alignment of any possible neighboring fields without implicit padding.
Definition at line 72 of file example_mission_cfg.h.

12.55.2.17 CFE_MISSION_SB_MAX_PIPES `#define CFE_MISSION_SB_MAX_PIPES 64`

Purpose Maximum Number of pipes that SB command/telemetry messages may hold

Description:

Dictates the maximum number of unique Pipes the SB message definitions will hold.

This affects the layout of command/telemetry messages but does not affect run time behavior or internal allocation.

Limits

All CPUs within the same SB domain (mission) must share the same definition Note this affects the size of messages, so it must not cause any message to exceed the max length.

Definition at line 357 of file example_mission_cfg.h.

12.55.2.18 CFE_MISSION_SB_MAX_SB_MSG_SIZE `#define CFE_MISSION_SB_MAX_SB_MSG_SIZE 32768`

Purpose Maximum SB Message Size

Description:

The following definition dictates the maximum message size allowed on the software bus. SB checks the pkt length field in the header of all messages sent. If the pkt length field indicates the message is larger than this define, SB sends an event and rejects the send.

Limits

This parameter has a lower limit of 6 (CCSDS primary header size). There are no restrictions on the upper limit however, the maximum message size is system dependent and should be verified. Total message size values that are checked against this configuration are defined by a 16 bit data word.

Definition at line 340 of file example_mission_cfg.h.

12.55.2.19 CFE_MISSION_TBL_MAX_FULL_NAME_LEN

```
#define CFE_MISSION_TBL_MAX_FULL_NAME_LEN (CFE_MISSION_TBL_MAX_NAME_LENGTH + CFE_MISSION_MAX_API_LEN + 4)
```

Purpose Maximum Length of Full Table Name in messages

Description:

Indicates the maximum length (in characters) of the entire table name within software bus messages, in "AppName.TableName" notation.

This affects the layout of command/telemetry messages but does not affect run time behavior or internal allocation.

Limits

All CPUs within the same SB domain (mission) must share the same definition Note this affects the size of messages, so it must not cause any message to exceed the max length.

This value should be kept as a multiple of 4, to maintain alignment of any possible neighboring fields without implicit padding.
Definition at line 402 of file example_mission_cfg.h.

12.55.2.20 CFE_MISSION_TBL_MAX_NAME_LENGTH

```
#define CFE_MISSION_TBL_MAX_NAME_LENGTH 16
```

Purpose Maximum Table Name Length

Description:

Indicates the maximum length (in characters) of the table name ('TblName') portion of a Full Table Name of the following form: "ApplicationName.TblName"

This length does not need to include an extra character for NULL termination.

Limits

This value should be kept as a multiple of 4, to maintain alignment of any possible neighboring fields without implicit padding.

Definition at line 382 of file example_mission_cfg.h.

12.55.2.21 CFE_MISSION_TIME_AT_TONE_WAS

```
#define CFE_MISSION_TIME_AT_TONE_WAS true
```

Purpose Default Time and Tone Order

Description:

Time Services may be configured to expect the time at the tone data packet to either precede or follow the tone signal. If the time at the tone data packet follows the tone signal, then the data within the packet describes what the time "was" at the tone. If the time at the tone data packet precedes the tone signal, then the data within the packet describes what the time "will be" at the tone. One, and only one, of the following symbols must be set to true:

- CFE_MISSION_TIME_AT_TONE_WAS
- CFE_MISSION_TIME_AT_TONE_WILL_BE Note: If Time Services is defined as using a simulated tone signal (see CFE_MISSION_TIME_CFG_FAKE_TONE above), then the tone data packet must follow the tone signal.

Limits

Either CFE_MISSION_TIME_AT_TONE_WAS or CFE_MISSION_TIME_AT_TONE_WILL_BE must be set to true. They may not both be true and they may not both be false.

Definition at line 468 of file example_mission_cfg.h.

12.55.2.22 CFE_MISSION_TIME_AT_TONE_WILL_BE `#define CFE_MISSION_TIME_AT_TONE_WILL_BE false`

Definition at line 469 of file example_mission_cfg.h.

12.55.2.23 CFE_MISSION_TIME_CFG_DEFAULT_TAI `#define CFE_MISSION_TIME_CFG_DEFAULT_TAI true`

Purpose Default Time Format

Description:

The following definitions select either UTC or TAI as the default (mission specific) time format. Although it is possible for an application to request time in a specific format, most callers should use CFE_TIME_GetTime(), which returns time in the default format. This avoids having to modify each individual caller when the default choice is changed.

Limits

if CFE_MISSION_TIME_CFG_DEFAULT_TAI is defined as true then CFE_MISSION_TIME_CFG_DEFAULT_↩ UTC must be defined as false. if CFE_MISSION_TIME_CFG_DEFAULT_TAI is defined as false then CFE_MI↩ SSION_TIME_CFG_DEFAULT_UTC must be defined as true.

Definition at line 432 of file example_mission_cfg.h.

12.55.2.24 CFE_MISSION_TIME_CFG_DEFAULT_UTC `#define CFE_MISSION_TIME_CFG_DEFAULT_UTC false`

Definition at line 433 of file example_mission_cfg.h.

12.55.2.25 CFE_MISSION_TIME_CFG_FAKE_TONE `#define CFE_MISSION_TIME_CFG_FAKE_TONE true`

Purpose Default Time Format

Description:

The following definition enables the use of a simulated time at the tone signal using a software bus message.

Limits

Not Applicable

Definition at line 445 of file example_mission_cfg.h.

12.55.2.26 CFE_MISSION_TIME_DEF_DELAY_SECS `#define CFE_MISSION_TIME_DEF_DELAY_SECS 0`

Definition at line 527 of file example_mission_cfg.h.

12.55.2.27 CFE_MISSION_TIME_DEF_DELAY_SUBS `#define CFE_MISSION_TIME_DEF_DELAY_SUBS 1000`

Definition at line 528 of file example_mission_cfg.h.

12.55.2.28 CFE_MISSION_TIME_DEF_LEAPS `#define CFE_MISSION_TIME_DEF_LEAPS 37`

Definition at line 525 of file example_mission_cfg.h.

12.55.2.29 CFE_MISSION_TIME_DEF_MET_SECS `#define CFE_MISSION_TIME_DEF_MET_SECS 1000`

Purpose Default Time Values

Description:

Default time values are provided to avoid problems due to time calculations performed after startup but before commands can be processed. For example, if the default time format is UTC then it is important that the sum of MET and STCF always exceed the value of Leap Seconds to prevent the UTC time calculation `(time = MET + STCF - Leap Seconds)` from resulting in a negative (very large) number.

Some past missions have also created known (albeit wrong) default timestamps. For example, assume the epoch is defined as Jan 1, 1970 and further assume the default time values are set to create a timestamp of Jan 1, 2000. Even though the year 2000 timestamps are wrong, it may be of value to keep the time within some sort of bounds acceptable to the software.

Note: Sub-second units are in micro-seconds (0 to 999,999) and all values must be defined

Limits

Not Applicable

Definition at line 519 of file example_mission_cfg.h.

12.55.2.30 CFE_MISSION_TIME_DEF_MET_SUBS `#define CFE_MISSION_TIME_DEF_MET_SUBS 0`

Definition at line 520 of file example_mission_cfg.h.

12.55.2.31 CFE_MISSION_TIME_DEF_STCF_SECS `#define CFE_MISSION_TIME_DEF_STCF_SECS 1000000`

Definition at line 522 of file example_mission_cfg.h.

12.55.2.32 CFE_MISSION_TIME_DEF_STCF_SUBS `#define CFE_MISSION_TIME_DEF_STCF_SUBS 0`

Definition at line 523 of file example_mission_cfg.h.

12.55.2.33 CFE_MISSION_TIME_EPOCH_DAY `#define CFE_MISSION_TIME_EPOCH_DAY 1`

Definition at line 546 of file example_mission_cfg.h.

12.55.2.34 CFE_MISSION_TIME_EPOCH_HOUR `#define CFE_MISSION_TIME_EPOCH_HOUR 0`

Definition at line 547 of file example_mission_cfg.h.

12.55.2.35 CFE_MISSION_TIME_EPOCH_MICROS `#define CFE_MISSION_TIME_EPOCH_MICROS 0`

Definition at line 550 of file example_mission_cfg.h.

12.55.2.36 CFE_MISSION_TIME_EPOCH_MINUTE `#define CFE_MISSION_TIME_EPOCH_MINUTE 0`

Definition at line 548 of file example_mission_cfg.h.

12.55.2.37 CFE_MISSION_TIME_EPOCH_SECOND `#define CFE_MISSION_TIME_EPOCH_SECOND 0`

Definition at line 549 of file example_mission_cfg.h.

12.55.2.38 CFE_MISSION_TIME_EPOCH_YEAR `#define CFE_MISSION_TIME_EPOCH_YEAR 1980`

Purpose Default EPOCH Values

Description:

Default ground time epoch values Note: these values are used only by the CFE_TIME_Print() API function

Limits

Year - must be within 136 years Day - Jan 1 = 1, Feb 1 = 32, etc. Hour - 0 to 23 Minute - 0 to 59 Second - 0 to 59 Micros - 0 to 999999

Definition at line 545 of file example_mission_cfg.h.

12.55.2.39 CFE_MISSION_TIME_FS_FACTOR `#define CFE_MISSION_TIME_FS_FACTOR 789004800`

Purpose Time File System Factor

Description:

Define the s/c vs file system time conversion constant...

Note: this value is intended for use only by CFE TIME API functions to convert time values based on the ground system epoch (s/c time) to and from time values based on the file system epoch (fs time).
FS time = S/C time + factor S/C time = FS time - factor
Worksheet:
S/C epoch = Jan 1, 2005 (LRO ground system epoch) FS epoch = Jan 1, 1980 (vxWorks DOS file system epoch)
Delta = 25 years, 0 days, 0 hours, 0 minutes, 0 seconds
Leap years = 1980, 1984, 1988, 1992, 1996, 2000, 2004 (divisible by 4 – except if by 100 – unless also by 400)
1 year = 31,536,000 seconds 1 day = 86,400 seconds 1 hour = 3,600 seconds 1 minute = 60 seconds
25 years = 788,400,000 seconds 7 extra leap days = 604,800 seconds
total delta = 789,004,800 seconds

Limits

Not Applicable

Definition at line 588 of file example_mission_cfg.h.

12.55.2.40 CFE_MISSION_TIME_MAX_ELAPSED `#define CFE_MISSION_TIME_MAX_ELAPSED 200000`

Definition at line 494 of file example_mission_cfg.h.

12.55.2.41 CFE_MISSION_TIME_MIN_ELAPSED `#define CFE_MISSION_TIME_MIN_ELAPSED 0`

Purpose Min and Max Time Elapsed

Description:

Based on the definition of Time and Tone Order (CFE_MISSION_TIME_AT_TONE_WAS/WILL_BE) either the "time at the tone" signal or data packet will follow the other. This definition sets the valid window of time for the second of the pair to lag behind the first. Time Services will invalidate both the tone and packet if the second does not arrive within this window following the first.

For example, if the data packet follows the tone, it might be valid for the data packet to arrive between zero and 100,000 micro-seconds after the tone. But, if the tone follows the packet, it might be valid only if the packet arrived between 200,000 and 700,000 micro-seconds before the tone.
Note: units are in micro-seconds

Limits

0 to 999,999 decimal

Definition at line 493 of file example_mission_cfg.h.

12.56 cfe/cmake/sample_defs/example_platform_cfg.h File Reference

Macros

- #define CFE_PLATFORM_ENDIAN CCSDS_LITTLE_ENDIAN
- #define CFE_PLATFORM_CORE_MAX_STARTUP_MSEC 30000
- #define CFE_PLATFORM_ES_START_TASK_PRIORITY 68
- #define CFE_PLATFORM_ES_START_TASK_STACK_SIZE CFE_PLATFORM_ES_DEFAULT_STACK_SIZE
- #define CFE_PLATFORM_ES_NONVOL_DISK_MOUNT_STRING "/cf"
- #define CFE_PLATFORM_ES_RAM_DISK_MOUNT_STRING "/ram"
- #define CFE_PLATFORM_ES_MAX_APPLICATIONS 32
- #define CFE_PLATFORM_ES_MAX_LIBRARIES 10
- #define CFE_PLATFORM_ES_ER_LOG_ENTRIES 20
- #define CFE_PLATFORM_ES_ER_LOG_MAX_CONTEXT_SIZE 256
- #define CFE_PLATFORM_ES_SYSTEM_LOG_SIZE 3072
- #define CFE_PLATFORM_ES_OBJECT_TABLE_SIZE 30
- #define CFE_PLATFORM_ES_MAX_GEN_COUNTERS 8
- #define CFE_PLATFORM_ES_APP_SCAN_RATE 1000
- #define CFE_PLATFORM_ES_APP_KILL_TIMEOUT 5
- #define CFE_PLATFORM_ES_RAM_DISK_SECTOR_SIZE 512
- #define CFE_PLATFORM_ES_RAM_DISK_NUM_SECTORS 4096
- #define CFE_PLATFORM_ES_RAM_DISK_PERCENT_RESERVED 30
- #define CFE_PLATFORM_ES_CDS_SIZE (128 ∗ 1024)
- #define CFE_PLATFORM_ES_USER_RESERVED_SIZE (1024 ∗ 1024)
- #define CFE_PLATFORM_ES_MEMPOOL_ALIGN_SIZE_MIN 4
- #define CFE_PLATFORM_ES_NONVOL_STARTUP_FILE "/cf/cfe_es_startup.scr"
- #define CFE_PLATFORM_ES_VOLATILE_STARTUP_FILE "/ram/cfe_es_startup.scr"
- #define CFE_PLATFORM_ES_DEFAULT_APP_LOG_FILE "/ram/cfe_es_app_info.log"
- #define CFE_PLATFORM_ES_DEFAULT_TASK_LOG_FILE "/ram/cfe_es_taskinfo.log"
- #define CFE_PLATFORM_ES_DEFAULT_SYSLOG_FILE "/ram/cfe_es_syslog.log"
- #define CFE_PLATFORM_ES_DEFAULT_ER_LOG_FILE "/ram/cfe_erlog.log"
- #define CFE_PLATFORM_ES_DEFAULT_PERF_DUMP_FILENAME "/ram/cfe_es_perf.dat"

- #define CFE_PLATFORM_ES_DEFAULT_CDS_REG_DUMP_FILE "/ram/cfe_cds_reg.log"
- #define CFE_PLATFORM_ES_DEFAULT_POR_SYSLOG_MODE 0
- #define CFE_PLATFORM_ES_DEFAULT_PR_SYSLOG_MODE 1
- #define CFE_PLATFORM_ES_PERF_DATA_BUFFER_SIZE 10000
- #define CFE_PLATFORM_ES_PERF_FILTMASK_NONE 0
- #define CFE_PLATFORM_ES_PERF_FILTMASK_ALL ~CFE_PLATFORM_ES_PERF_FILTMASK_NONE
- #define CFE_PLATFORM_ES_PERF_FILTMASK_INIT CFE_PLATFORM_ES_PERF_FILTMASK_ALL
- #define CFE_PLATFORM_ES_PERF_TRIGMASK_NONE 0
- #define CFE_PLATFORM_ES_PERF_TRIGMASK_ALL ~CFE_PLATFORM_ES_PERF_TRIGMASK_NONE
- #define CFE_PLATFORM_ES_PERF_TRIGMASK_INIT CFE_PLATFORM_ES_PERF_TRIGMASK_NONE
- #define CFE_PLATFORM_ES_PERF_CHILD_PRIORITY 200
- #define CFE_PLATFORM_ES_PERF_CHILD_STACK_SIZE 4096
- #define CFE_PLATFORM_ES_PERF_CHILD_MS_DELAY 20
- #define CFE_PLATFORM_ES_PERF_ENTRIES_BTWN_DLYS 50
- #define CFE_PLATFORM_ES_DEFAULT_STACK_SIZE 8192
- #define CFE_PLATFORM_ES_CDS_MAX_NUM_ENTRIES 512
- #define CFE_PLATFORM_ES_MAX_PROCESSOR_RESETS 2
- #define CFE_PLATFORM_ES_POOL_MAX_BUCKETS 17
- #define CFE_PLATFORM_ES_MAX_MEMORY_POOLS 10
- #define CFE_PLATFORM_ES_MEM_BLOCK_SIZE_01 8
- #define CFE_PLATFORM_ES_MEM_BLOCK_SIZE_02 16
- #define CFE_PLATFORM_ES_MEM_BLOCK_SIZE_03 32
- #define CFE_PLATFORM_ES_MEM_BLOCK_SIZE_04 48
- #define CFE_PLATFORM_ES_MEM_BLOCK_SIZE_05 64
- #define CFE_PLATFORM_ES_MEM_BLOCK_SIZE_06 96
- #define CFE_PLATFORM_ES_MEM_BLOCK_SIZE_07 128
- #define CFE_PLATFORM_ES_MEM_BLOCK_SIZE_08 160
- #define CFE_PLATFORM_ES_MEM_BLOCK_SIZE_09 256
- #define CFE_PLATFORM_ES_MEM_BLOCK_SIZE_10 512
- #define CFE_PLATFORM_ES_MEM_BLOCK_SIZE_11 1024
- #define CFE_PLATFORM_ES_MEM_BLOCK_SIZE_12 2048
- #define CFE_PLATFORM_ES_MEM_BLOCK_SIZE_13 4096
- #define CFE_PLATFORM_ES_MEM_BLOCK_SIZE_14 8192
- #define CFE_PLATFORM_ES_MEM_BLOCK_SIZE_15 16384
- #define CFE_PLATFORM_ES_MEM_BLOCK_SIZE_16 32768
- #define CFE_PLATFORM_ES_MAX_BLOCK_SIZE 80000
- #define CFE_PLATFORM_ES_CDS_MEM_BLOCK_SIZE_01 8
- #define CFE_PLATFORM_ES_CDS_MEM_BLOCK_SIZE_02 16
- #define CFE_PLATFORM_ES_CDS_MEM_BLOCK_SIZE_03 32
- #define CFE_PLATFORM_ES_CDS_MEM_BLOCK_SIZE_04 48
- #define CFE_PLATFORM_ES_CDS_MEM_BLOCK_SIZE_05 64
- #define CFE_PLATFORM_ES_CDS_MEM_BLOCK_SIZE_06 96
- #define CFE_PLATFORM_ES_CDS_MEM_BLOCK_SIZE_07 128
- #define CFE_PLATFORM_ES_CDS_MEM_BLOCK_SIZE_08 160
- #define CFE_PLATFORM_ES_CDS_MEM_BLOCK_SIZE_09 256
- #define CFE_PLATFORM_ES_CDS_MEM_BLOCK_SIZE_10 512
- #define CFE_PLATFORM_ES_CDS_MEM_BLOCK_SIZE_11 1024
- #define CFE_PLATFORM_ES_CDS_MEM_BLOCK_SIZE_12 2048
- #define CFE_PLATFORM_ES_CDS_MEM_BLOCK_SIZE_13 4096
- #define CFE_PLATFORM_ES_CDS_MEM_BLOCK_SIZE_14 8192
- #define CFE_PLATFORM_ES_CDS_MEM_BLOCK_SIZE_15 16384

- #define CFE_PLATFORM_ES_CDS_MEM_BLOCK_SIZE_16 32768
- #define CFE_PLATFORM_ES_CDS_MAX_BLOCK_SIZE 80000
- #define CFE_PLATFORM_ES_STARTUP_SYNC_POLL_MSEC 50
- #define CFE_PLATFORM_ES_STARTUP_SCRIPT_TIMEOUT_MSEC 1000
- #define CFE_PLATFORM_EVS_START_TASK_PRIORITY 61
- #define CFE_PLATFORM_EVS_START_TASK_STACK_SIZE CFE_PLATFORM_ES_DEFAULT_STACK_SIZE
- #define CFE_PLATFORM_EVS_MAX_EVENT_FILTERS 8
- #define CFE_PLATFORM_EVS_MAX_APP_EVENT_BURST 32
- #define CFE_PLATFORM_EVS_APP_EVENTS_PER_SEC 15
- #define CFE_PLATFORM_EVS_DEFAULT_LOG_FILE "/ram/cfe_evs.log"
- #define CFE_PLATFORM_EVS_LOG_MAX 20
- #define CFE_PLATFORM_EVS_DEFAULT_APP_DATA_FILE "/ram/cfe_evs_app.dat"
- #define CFE_PLATFORM_EVS_PORT_DEFAULT 0x0001
- #define CFE_PLATFORM_EVS_DEFAULT_TYPE_FLAG 0xE
- #define CFE_PLATFORM_EVS_DEFAULT_LOG_MODE 1
- #define CFE_PLATFORM_EVS_DEFAULT_MSG_FORMAT_MODE CFE_EVS_MsgFormat_LONG
- #define CFE_PLATFORM_SB_MAX_MSG_IDS 256
- #define CFE_PLATFORM_SB_MAX_PIPES 64
- #define CFE_PLATFORM_SB_MAX_DEST_PER_PKT 16
- #define CFE_PLATFORM_SB_DEFAULT_MSG_LIMIT 4
- #define CFE_PLATFORM_SB_BUF_MEMORY_BYTES 524288
- #define CFE_PLATFORM_SB_HIGHEST_VALID_MSGID 0x1FFF
- #define CFE_PLATFORM_SB_DEFAULT_ROUTING_FILENAME "/ram/cfe_sb_route.dat"
- #define CFE_PLATFORM_SB_DEFAULT_PIPE_FILENAME "/ram/cfe_sb_pipe.dat"
- #define CFE_PLATFORM_SB_DEFAULT_MAP_FILENAME "/ram/cfe_sb_msgmap.dat"
- #define CFE_PLATFORM_SB_FILTERED_EVENT1 CFE_SB_SEND_NO_SUBS_EID
- #define CFE_PLATFORM_SB_FILTER_MASK1 CFE_EVS_FIRST_4_STOP
- #define CFE_PLATFORM_SB_FILTERED_EVENT2 CFE_SB_DUP_SUBSCRIP_EID
- #define CFE_PLATFORM_SB_FILTER_MASK2 CFE_EVS_FIRST_4_STOP
- #define CFE_PLATFORM_SB_FILTERED_EVENT3 CFE_SB_MSGID_LIM_ERR_EID
- #define CFE_PLATFORM_SB_FILTER_MASK3 CFE_EVS_FIRST_16_STOP
- #define CFE_PLATFORM_SB_FILTERED_EVENT4 CFE_SB_Q_FULL_ERR_EID
- #define CFE_PLATFORM_SB_FILTER_MASK4 CFE_EVS_FIRST_16_STOP
- #define CFE_PLATFORM_SB_FILTERED_EVENT5 0
- #define CFE_PLATFORM_SB_FILTER_MASK5 CFE_EVS_NO_FILTER
- #define CFE_PLATFORM_SB_FILTERED_EVENT6 0
- #define CFE_PLATFORM_SB_FILTER_MASK6 CFE_EVS_NO_FILTER
- #define CFE_PLATFORM_SB_FILTERED_EVENT7 0
- #define CFE_PLATFORM_SB_FILTER_MASK7 CFE_EVS_NO_FILTER
- #define CFE_PLATFORM_SB_FILTERED_EVENT8 0
- #define CFE_PLATFORM_SB_FILTER_MASK8 CFE_EVS_NO_FILTER
- #define CFE_PLATFORM_SB_MEM_BLOCK_SIZE_01 8
- #define CFE_PLATFORM_SB_MEM_BLOCK_SIZE_02 16
- #define CFE_PLATFORM_SB_MEM_BLOCK_SIZE_03 20
- #define CFE_PLATFORM_SB_MEM_BLOCK_SIZE_04 36
- #define CFE_PLATFORM_SB_MEM_BLOCK_SIZE_05 64
- #define CFE_PLATFORM_SB_MEM_BLOCK_SIZE_06 96
- #define CFE_PLATFORM_SB_MEM_BLOCK_SIZE_07 128
- #define CFE_PLATFORM_SB_MEM_BLOCK_SIZE_08 160
- #define CFE_PLATFORM_SB_MEM_BLOCK_SIZE_09 256
- #define CFE_PLATFORM_SB_MEM_BLOCK_SIZE_10 512

- #define CFE_PLATFORM_SB_MEM_BLOCK_SIZE_11 1024
- #define CFE_PLATFORM_SB_MEM_BLOCK_SIZE_12 2048
- #define CFE_PLATFORM_SB_MEM_BLOCK_SIZE_13 4096
- #define CFE_PLATFORM_SB_MEM_BLOCK_SIZE_14 8192
- #define CFE_PLATFORM_SB_MEM_BLOCK_SIZE_15 16384
- #define CFE_PLATFORM_SB_MEM_BLOCK_SIZE_16 32768
- #define CFE_PLATFORM_SB_MAX_BLOCK_SIZE (CFE_MISSION_SB_MAX_SB_MSG_SIZE + 128)
- #define CFE_PLATFORM_SB_START_TASK_PRIORITY 64
- #define CFE_PLATFORM_SB_START_TASK_STACK_SIZE CFE_PLATFORM_ES_DEFAULT_STACK_SIZE
- #define CFE_PLATFORM_TBL_START_TASK_PRIORITY 70
- #define CFE_PLATFORM_TBL_START_TASK_STACK_SIZE CFE_PLATFORM_ES_DEFAULT_STACK_SIZE
- #define CFE_PLATFORM_TBL_BUF_MEMORY_BYTES 524288
- #define CFE_PLATFORM_TBL_MAX_DBL_TABLE_SIZE 16384
- #define CFE_PLATFORM_TBL_MAX_SNGL_TABLE_SIZE 16384
- #define CFE_PLATFORM_TBL_MAX_NUM_TABLES 128
- #define CFE_PLATFORM_TBL_MAX_CRITICAL_TABLES 32
- #define CFE_PLATFORM_TBL_MAX_NUM_HANDLES 256
- #define CFE_PLATFORM_TBL_MAX_SIMULTANEOUS_LOADS 4
- #define CFE_PLATFORM_TBL_MAX_NUM_VALIDATIONS 10
- #define CFE_PLATFORM_TBL_DEFAULT_REG_DUMP_FILE "/ram/cfe_tbl_reg.log"
- #define CFE_PLATFORM_TBL_VALID_SCID_COUNT 0
- #define CFE_PLATFORM_TBL_U32FROM4CHARS(_C1, _C2, _C3, _C4) ((uint32)(_C1) << 24 | (uint32)(_C2) << 16 | (uint32)(_C3) << 8 | (uint32)(_C4))
- #define CFE_PLATFORM_TBL_VALID_SCID_1 (0x42)
- #define CFE_PLATFORM_TBL_VALID_SCID_2 (CFE_PLATFORM_TBL_U32FROM4CHARS('a', 'b', 'c', 'd'))
- #define CFE_PLATFORM_TBL_VALID_PRID_COUNT 0
- #define CFE_PLATFORM_TBL_VALID_PRID_1 (1)
- #define CFE_PLATFORM_TBL_VALID_PRID_2 (CFE_PLATFORM_TBL_U32FROM4CHARS('a', 'b', 'c', 'd'))
- #define CFE_PLATFORM_TBL_VALID_PRID_3 0
- #define CFE_PLATFORM_TBL_VALID_PRID_4 0
- #define CFE_PLATFORM_TIME_CFG_SERVER true
- #define CFE_PLATFORM_TIME_CFG_CLIENT false
- #define CFE_PLATFORM_TIME_CFG_VIRTUAL true
- #define CFE_PLATFORM_TIME_CFG_SIGNAL false
- #define CFE_PLATFORM_TIME_CFG_SOURCE false
- #define CFE_PLATFORM_TIME_CFG_SRC_MET false
- #define CFE_PLATFORM_TIME_CFG_SRC_GPS false
- #define CFE_PLATFORM_TIME_CFG_SRC_TIME false
- #define CFE_PLATFORM_TIME_MAX_DELTA_SECS 0
- #define CFE_PLATFORM_TIME_MAX_DELTA_SUBS 500000
- #define CFE_PLATFORM_TIME_MAX_LOCAL_SECS 27
- #define CFE_PLATFORM_TIME_MAX_LOCAL_SUBS 0
- #define CFE_PLATFORM_TIME_CFG_TONE_LIMIT 20000
- #define CFE_PLATFORM_TIME_CFG_START_FLY 2
- #define CFE_PLATFORM_TIME_CFG_LATCH_FLY 8
- #define CFE_PLATFORM_TIME_START_TASK_PRIORITY 60
- #define CFE_PLATFORM_TIME_TONE_TASK_PRIORITY 25
- #define CFE_PLATFORM_TIME_ONEHZ_TASK_PRIORITY 25
- #define CFE_PLATFORM_TIME_START_TASK_STACK_SIZE CFE_PLATFORM_ES_DEFAULT_STACK_SIZE
- #define CFE_PLATFORM_TIME_TONE_TASK_STACK_SIZE 4096
- #define CFE_PLATFORM_TIME_ONEHZ_TASK_STACK_SIZE 8192

12.56.1 Detailed Description

This header file contains the internal configuration parameters and typedefs with platform scope.
This provides default values for configurable items that do NOT affect the interface(s) of this module. This includes internal parameters, path names, and limit value(s) that are relevant for a specific platform.

Note

It is no longer necessary to provide this file directly in the defs directory, but if present, this file is still supported/usable for backward compatibility. To use this file, is should be called "cfe_platform_cfg.h".

Going forward, more fine-grained (module/purposes-specific) header files are included with each submodule. These may be overridden as necessary, but only if a definition within that file needs to be changed from the default. This approach will reduce the amount of duplicate/cloned definitions and better support alternative build configurations in the future.
Note that if this file is present, the fine-grained header files noted above will *not* be used.

12.56.2 Macro Definition Documentation

12.56.2.1 CFE_PLATFORM_CORE_MAX_STARTUP_MSEC `#define CFE_PLATFORM_CORE_MAX_STARTUP_MS↩ EC 30000`

Purpose CFE core application startup timeout

Description:

The upper limit for the amount of time that the cFE core applications (ES, SB, EVS, TIME, TBL) are each allotted to reach their respective "ready" states.

The CFE "main" thread starts individual tasks for each of the core applications (except FS). Each of these must perform some initialization work before the next core application can be started, so the main thread waits to ensure that the application has reached the "ready" state before starting the next application.
If any core application fails to start, then it indicates a major problem with the system and startup is aborted.
Units are in milliseconds

Limits:

Must be defined as an integer value that is greater than or equal to zero.

Definition at line 84 of file example_platform_cfg.h.

12.56.2.2 CFE_PLATFORM_ENDIAN `#define CFE_PLATFORM_ENDIAN CCSDS_LITTLE_ENDIAN`

Purpose Platform Endian Indicator

Description:

The value of this constant indicates the endianess of the target system

Limits

This parameter has a lower limit of 0 and an upper limit of 1.

Definition at line 60 of file example_platform_cfg.h.

12.56.2.3 CFE_PLATFORM_ES_APP_KILL_TIMEOUT `#define CFE_PLATFORM_ES_APP_KILL_TIMEOUT 5`

Purpose Define ES Application Kill Timeout

Description:

ES Application Kill Timeout. This parameter controls the number of "scan periods" that ES will wait for an application to Exit after getting the signal Delete, Reload or Restart. The sequence works as follows:

1. ES will set the control request for an App to Delete/Restart/Reload and set this kill timer to the value in this parameter.
2. If the App is responding and Calls it's RunLoop function, it will drop out of it's main loop and call CFE_ES↩_ExitApp. Once it calls Exit App, then ES can delete, restart, or reload the app the next time it scans the app table.
3. If the App is not responding, the ES App will decrement this Kill Timeout value each time it runs. If the timeout value reaches zero, ES will kill the app.

The Kill timeout value depends on the CFE_PLATFORM_ES_APP_SCAN_RATE. If the Scan Rate is 1000, or 1 second, and this CFE_PLATFORM_ES_APP_KILL_TIMEOUT is set to 5, then it will take 5 seconds to kill a non-responding App. If the Scan Rate is 250, or 1/4 second, and the CFE_PLATFORM_ES_APP_KILL_TIMEOUT is set to 2, then it will take 1/2 second to time out.

Limits

There is a lower limit of 1 and an upper limit of 100 on this configuration parameter. Units are number of CFE_PLATFORM_ES_APP_SCAN_RATE cycles.

Definition at line 288 of file example_platform_cfg.h.

12.56.2.4 CFE_PLATFORM_ES_APP_SCAN_RATE `#define CFE_PLATFORM_ES_APP_SCAN_RATE 1000`

Purpose Define ES Application Control Scan Rate

Description:

ES Application Control Scan Rate. This parameter controls the speed that ES scans the Application Table looking for App Delete/Restart/Reload requests. All Applications are deleted, restarted, or reloaded by the ES Application. ES will periodically scan for control requests to process. The scan rate is controlled by this parameter, which is given in milliseconds. A value of 1000 means that ES will scan the Application Table once per second. Be careful not to set the value of this too low, because ES will use more CPU cycles scanning the table.

Limits

There is a lower limit of 100 and an upper limit of 20000 on this configuration parameter. millisecond units.

Definition at line 259 of file example_platform_cfg.h.

12.56.2.5 CFE_PLATFORM_ES_CDS_MAX_BLOCK_SIZE `#define CFE_PLATFORM_ES_CDS_MAX_BLOCK_SI↩ZE 80000`

Definition at line 830 of file example_platform_cfg.h.

12.56.2.6 CFE_PLATFORM_ES_CDS_MAX_NUM_ENTRIES

```
#define CFE_PLATFORM_ES_CDS_MAX_NUM_ENTRIES 512
```

Purpose Define Maximum Number of Registered CDS Blocks

Description:

Maximum number of registered CDS Blocks

Limits

There is a lower limit of 8. There are no restrictions on the upper limit however, the maximum number of CDS entries is system dependent and should be verified.

Definition at line 720 of file example_platform_cfg.h.

12.56.2.7 CFE_PLATFORM_ES_CDS_MEM_BLOCK_SIZE_01

```
#define CFE_PLATFORM_ES_CDS_MEM_BLOCK_SIZE_01 8
```

Purpose Define ES Critical Data Store Memory Pool Block Sizes

Description:

Intermediate ES Critical Data Store Memory Pool Block Sizes

Limits

These sizes MUST be increasing and MUST be an integral multiple of 4.

Definition at line 814 of file example_platform_cfg.h.

12.56.2.8 CFE_PLATFORM_ES_CDS_MEM_BLOCK_SIZE_02

```
#define CFE_PLATFORM_ES_CDS_MEM_BLOCK_SIZE_02 16
```

Definition at line 815 of file example_platform_cfg.h.

12.56.2.9 CFE_PLATFORM_ES_CDS_MEM_BLOCK_SIZE_03

```
#define CFE_PLATFORM_ES_CDS_MEM_BLOCK_SIZE_03 32
```

Definition at line 816 of file example_platform_cfg.h.

12.56.2.10 CFE_PLATFORM_ES_CDS_MEM_BLOCK_SIZE_04

```
#define CFE_PLATFORM_ES_CDS_MEM_BLOCK_SIZE_04 48
```

Definition at line 817 of file example_platform_cfg.h.

12.56.2.11 CFE_PLATFORM_ES_CDS_MEM_BLOCK_SIZE_05

```
#define CFE_PLATFORM_ES_CDS_MEM_BLOCK_SIZE_05 64
```

Definition at line 818 of file example_platform_cfg.h.

12.56.2.12 CFE_PLATFORM_ES_CDS_MEM_BLOCK_SIZE_06

```
#define CFE_PLATFORM_ES_CDS_MEM_BLOCK_S↩
IZE_06 96
```

Definition at line 819 of file example_platform_cfg.h.

12.56.2.13 CFE_PLATFORM_ES_CDS_MEM_BLOCK_SIZE_07

```
#define CFE_PLATFORM_ES_CDS_MEM_BLOCK_S↩
IZE_07 128
```

Definition at line 820 of file example_platform_cfg.h.

12.56.2.14 CFE_PLATFORM_ES_CDS_MEM_BLOCK_SIZE_08

```
#define CFE_PLATFORM_ES_CDS_MEM_BLOCK_S↩
IZE_08 160
```

Definition at line 821 of file example_platform_cfg.h.

12.56.2.15 CFE_PLATFORM_ES_CDS_MEM_BLOCK_SIZE_09

```
#define CFE_PLATFORM_ES_CDS_MEM_BLOCK_S↩
IZE_09 256
```

Definition at line 822 of file example_platform_cfg.h.

12.56.2.16 CFE_PLATFORM_ES_CDS_MEM_BLOCK_SIZE_10

```
#define CFE_PLATFORM_ES_CDS_MEM_BLOCK_S↩
IZE_10 512
```

Definition at line 823 of file example_platform_cfg.h.

12.56.2.17 CFE_PLATFORM_ES_CDS_MEM_BLOCK_SIZE_11

```
#define CFE_PLATFORM_ES_CDS_MEM_BLOCK_S↩
IZE_11 1024
```

Definition at line 824 of file example_platform_cfg.h.

12.56.2.18 CFE_PLATFORM_ES_CDS_MEM_BLOCK_SIZE_12

```
#define CFE_PLATFORM_ES_CDS_MEM_BLOCK_S↩
IZE_12 2048
```

Definition at line 825 of file example_platform_cfg.h.

12.56.2.19 CFE_PLATFORM_ES_CDS_MEM_BLOCK_SIZE_13

```
#define CFE_PLATFORM_ES_CDS_MEM_BLOCK_S↩
IZE_13 4096
```

Definition at line 826 of file example_platform_cfg.h.

12.56.2.20 CFE_PLATFORM_ES_CDS_MEM_BLOCK_SIZE_14

```
#define CFE_PLATFORM_ES_CDS_MEM_BLOCK_S↩
IZE_14 8192
```

Definition at line 827 of file example_platform_cfg.h.

12.56.2.21 CFE_PLATFORM_ES_CDS_MEM_BLOCK_SIZE_15

```
#define CFE_PLATFORM_ES_CDS_MEM_BLOCK_S↩
IZE_15 16384
```

Definition at line 828 of file example_platform_cfg.h.

12.56.2.22 CFE_PLATFORM_ES_CDS_MEM_BLOCK_SIZE_16 `#define CFE_PLATFORM_ES_CDS_MEM_BLOCK_S↩ IZE_16 32768`

Definition at line 829 of file example_platform_cfg.h.

12.56.2.23 CFE_PLATFORM_ES_CDS_SIZE `#define CFE_PLATFORM_ES_CDS_SIZE (128 * 1024)`

Purpose Define Critical Data Store Size

Description:

Defines the Critical Data Store (CDS) area size in bytes size. The CDS is one of four memory areas that are preserved during a processor reset. NOTE: Changing this value changes memory allocation, and may require changes to platform specific values (in CFE_PSP) such as USER_RESERVED_MEM in VxWorks depending on the memory areas being used for preserved data and on OS specific behavior.

Limits

There is a lower limit of 8192 and an upper limit of UINT_MAX (4 Gigabytes) on this configuration parameter.

Definition at line 365 of file example_platform_cfg.h.

12.56.2.24 CFE_PLATFORM_ES_DEFAULT_APP_LOG_FILE `#define CFE_PLATFORM_ES_DEFAULT_APP_LOG_↩ FILE "/ram/cfe_es_app_info.log"`

Purpose Default Application Information Filename

Description:

The value of this constant defines the filename used to store information pertaining to all of the Applications that are registered with Executive Services. This filename is used only when no filename is specified in the the command to query all system apps.

Limits

The length of each string, including the NULL terminator cannot exceed the OS_MAX_PATH_LEN value.

Definition at line 447 of file example_platform_cfg.h.

12.56.2.25 CFE_PLATFORM_ES_DEFAULT_CDS_REG_DUMP_FILE `#define CFE_PLATFORM_ES_DEFAULT_CD↩ S_REG_DUMP_FILE "/ram/cfe_cds_reg.log"`

Purpose Default Critical Data Store Registry Filename

Description:

The value of this constant defines the filename used to store the Critical Data Store Registry. This filename is used only when no filename is specified in the command to stop performance data collecting.

Limits

The length of each string, including the NULL terminator cannot exceed the OS_MAX_PATH_LEN value.

Definition at line 521 of file example_platform_cfg.h.

12.56.2.26 CFE_PLATFORM_ES_DEFAULT_ER_LOG_FILE `#define CFE_PLATFORM_ES_DEFAULT_ER_LOG_FI↩ LE "/ram/cfe_erlog.log"`

Purpose Default Exception and Reset (ER) Log Filename

Description:

The value of this constant defines the filename used to store the Exception and Reset (ER) Log. This filename is used only when no filename is specified in the command to dump the ER log. No file specified in the cmd means the first character in the cmd filename is a NULL terminator (zero).

Limits

The length of each string, including the NULL terminator cannot exceed the OS_MAX_PATH_LEN value.

Definition at line 493 of file example_platform_cfg.h.

12.56.2.27 CFE_PLATFORM_ES_DEFAULT_PERF_DUMP_FILENAME `#define CFE_PLATFORM_ES_DEFAULT_↩ PERF_DUMP_FILENAME "/ram/cfe_es_perf.dat"`

Purpose Default Performance Data Filename

Description:

The value of this constant defines the filename used to store the Performance Data. This filename is used only when no filename is specified in the command to stop performance data collecting.

Limits

The length of each string, including the NULL terminator cannot exceed the OS_MAX_PATH_LEN value.

Definition at line 507 of file example_platform_cfg.h.

12.56.2.28 CFE_PLATFORM_ES_DEFAULT_POR_SYSLOG_MODE `#define CFE_PLATFORM_ES_DEFAULT_POR↩ _SYSLOG_MODE 0`

Purpose Define Default System Log Mode following Power On Reset

Description:

Defines the default mode for the operation of the ES System log following a power on reset. The log may operate in either Overwrite mode = 0, where once the log becomes full the oldest message in the log will be overwritten, or Discard mode = 1, where once the log becomes full the contents of the log are preserved and the new event is discarded. This constant may hold a value of either 0 or 1 depending on the desired default. Overwrite Mode = 0, Discard Mode = 1.

Limits

There is a lower limit of 0 and an upper limit of 1 on this configuration parameter.

Definition at line 539 of file example_platform_cfg.h.

12.56.2.29 CFE_PLATFORM_ES_DEFAULT_PR_SYSLOG_MODE

```
#define CFE_PLATFORM_ES_DEFAULT_PR_S↩
YSLOG_MODE 1
```

Purpose Define Default System Log Mode following Processor Reset

Description:

Defines the default mode for the operation of the ES System log following a processor reset. The log may operate in either Overwrite mode = 0, where once the log becomes full the oldest message in the log will be overwritten, or Discard mode = 1, where once the log becomes full the contents of the log are preserved and the new event is discarded. This constant may hold a value of either 0 or 1 depending on the desired default. Overwrite Mode = 0, Discard Mode = 1.

Limits

There is a lower limit of 0 and an upper limit of 1 on this configuration parameter.

Definition at line 557 of file example_platform_cfg.h.

12.56.2.30 CFE_PLATFORM_ES_DEFAULT_STACK_SIZE

```
#define CFE_PLATFORM_ES_DEFAULT_STACK_SI↩
ZE 8192
```

Purpose Define Default Stack Size for an Application

Description:

This parameter defines a default stack size. This parameter is used by the cFE Core Applications.

Limits

There is a lower limit of 2048. There are no restrictions on the upper limit however, the maximum stack size is system dependent and should be verified. Most operating systems provide tools for measuring the amount of stack used by a task during operation. It is always a good idea to verify that no more than 1/2 of the stack is used.

Definition at line 707 of file example_platform_cfg.h.

12.56.2.31 CFE_PLATFORM_ES_DEFAULT_SYSLOG_FILE

```
#define CFE_PLATFORM_ES_DEFAULT_SYSLOG_FI↩
LE "/ram/cfe_es_syslog.log"
```

Purpose Default System Log Filename

Description:

The value of this constant defines the filename used to store important information (as ASCII text strings) that might not be able to be sent in an Event Message. This filename is used only when no filename is specified in the command to dump the system log. No file specified in the cmd means the first character in the cmd filename is a NULL terminator (zero).

Limits

The length of each string, including the NULL terminator cannot exceed the OS_MAX_PATH_LEN value.

Definition at line 478 of file example_platform_cfg.h.

12.56.2.32 CFE_PLATFORM_ES_DEFAULT_TASK_LOG_FILE `#define CFE_PLATFORM_ES_DEFAULT_TASK_LO↩G_FILE "/ram/cfe_es_taskinfo.log"`

Purpose Default Application Information Filename

Description:

The value of this constant defines the filename used to store information pertaining to all of the Applications that are registered with Executive Services. This filename is used only when no filename is specified in the the command to query all system tasks.

Limits

The length of each string, including the NULL terminator cannot exceed the OS_MAX_PATH_LEN value.

Definition at line 462 of file example_platform_cfg.h.

12.56.2.33 CFE_PLATFORM_ES_ER_LOG_ENTRIES `#define CFE_PLATFORM_ES_ER_LOG_ENTRIES 20`

Purpose Define Max Number of ER (Exception and Reset) log entries

Description:

Defines the maximum number of ER (Exception and Reset) log entries

Limits

There is a lower limit of 1. There are no restrictions on the upper limit however, the maximum number of log entries is system dependent and should be verified.

Definition at line 186 of file example_platform_cfg.h.

12.56.2.34 CFE_PLATFORM_ES_ER_LOG_MAX_CONTEXT_SIZE `#define CFE_PLATFORM_ES_ER_LOG_MAX_C↩ONTEXT_SIZE 256`

Purpose Maximum size of CPU Context in ES Error Log

Description:

This should be large enough to accommodate the CPU context information supplied by the PSP on the given platform.

Limits:

Must be greater than zero and a multiple of sizeof(uint32). Limited only by the available memory and the number of entries in the error log. Any context information beyond this size will be truncated.

Definition at line 200 of file example_platform_cfg.h.

12.56.2.35 CFE_PLATFORM_ES_MAX_APPLICATIONS `#define CFE_PLATFORM_ES_MAX_APPLICATIONS 32`

Purpose Define Max Number of Applications

Description:

Defines the maximum number of applications that can be loaded into the system. This number does not include child tasks.

Limits

There is a lower limit of 6. The lower limit corresponds to the cFE internal applications. There are no restrictions on the upper limit however, the maximum number of applications is system dependent and should be verified. AppIDs that are checked against this configuration are defined by a 32 bit data word.

Definition at line 159 of file example_platform_cfg.h.

12.56.2.36 CFE_PLATFORM_ES_MAX_BLOCK_SIZE `#define CFE_PLATFORM_ES_MAX_BLOCK_SIZE 80000`

Definition at line 803 of file example_platform_cfg.h.

12.56.2.37 CFE_PLATFORM_ES_MAX_GEN_COUNTERS `#define CFE_PLATFORM_ES_MAX_GEN_COUNTERS 8`

Purpose Define Max Number of Generic Counters

Description:

Defines the maximum number of Generic Counters that can be registered.

Limits

This parameter has a lower limit of 1 and an upper limit of 65535.

Definition at line 240 of file example_platform_cfg.h.

12.56.2.38 CFE_PLATFORM_ES_MAX_LIBRARIES `#define CFE_PLATFORM_ES_MAX_LIBRARIES 10`

Purpose Define Max Number of Shared libraries

Description:

Defines the maximum number of cFE Shared libraries that can be loaded into the system.

Limits

There is a lower limit of 1. There are no restrictions on the upper limit however, the maximum number of libraries is system dependent and should be verified.

Definition at line 173 of file example_platform_cfg.h.

12.56.2.39 CFE_PLATFORM_ES_MAX_MEMORY_POOLS `#define CFE_PLATFORM_ES_MAX_MEMORY_POOLS 10`

Purpose Maximum number of memory pools

Description:

The upper limit for the number of memory pools that can concurrently exist within the system.

The CFE_SB and CFE_TBL core subsystems each define a memory pool.
Individual applications may also create memory pools, so this value should be set sufficiently high enough to support the applications being used on this platform.

Limits:

Must be at least 2 to support CFE core - SB and TBL pools. No specific upper limit.

Definition at line 768 of file example_platform_cfg.h.

12.56.2.40 CFE_PLATFORM_ES_MAX_PROCESSOR_RESETS `#define CFE_PLATFORM_ES_MAX_PROCESSOR_↩ RESETS 2`

Purpose Define Number of Processor Resets Before a Power On Reset

Description:

Number of Processor Resets before a Power On Reset is called. If set to 2, then 2 processor resets will occur, and the 3rd processor reset will be a power on reset instead.

Limits

There is a lower limit of 0. There are no restrictions on the upper limit however, the maximum number of processor resets may be system dependent and should be verified.

Definition at line 735 of file example_platform_cfg.h.

12.56.2.41 CFE_PLATFORM_ES_MEM_BLOCK_SIZE_01 `#define CFE_PLATFORM_ES_MEM_BLOCK_SIZE_01 8`

Purpose Define Default ES Memory Pool Block Sizes

Description:

Default Intermediate ES Memory Pool Block Sizes. If an application is using the CFE_ES Memory Pool AP↩ Is (CFE_ES_PoolCreate, CFE_ES_PoolCreateNoSem, CFE_ES_GetPoolBuf and CFE_ES_PutPoolBuf) but finds these sizes inappropriate for their use, they may wish to use the CFE_ES_PoolCreateEx API to specify their own intermediate block sizes

Limits

These sizes MUST be increasing and MUST be an integral multiple of 4. Also, CFE_PLATFORM_ES_MAX_↩ BLOCK_SIZE must be larger than CFE_MISSION_SB_MAX_SB_MSG_SIZE and both CFE_PLATFORM_TB↩ L_MAX_SNGL_TABLE_SIZE and CFE_PLATFORM_TBL_MAX_DBL_TABLE_SIZE. Note that if Table Services have been removed from the CFE, the table size limits are still enforced although the table size definitions may be reduced.

Definition at line 787 of file example_platform_cfg.h.

12.56.2.42 CFE_PLATFORM_ES_MEM_BLOCK_SIZE_02

```
#define CFE_PLATFORM_ES_MEM_BLOCK_SIZE_02 16
```

Definition at line 788 of file example_platform_cfg.h.

12.56.2.43 CFE_PLATFORM_ES_MEM_BLOCK_SIZE_03

```
#define CFE_PLATFORM_ES_MEM_BLOCK_SIZE_03 32
```

Definition at line 789 of file example_platform_cfg.h.

12.56.2.44 CFE_PLATFORM_ES_MEM_BLOCK_SIZE_04

```
#define CFE_PLATFORM_ES_MEM_BLOCK_SIZE_04 48
```

Definition at line 790 of file example_platform_cfg.h.

12.56.2.45 CFE_PLATFORM_ES_MEM_BLOCK_SIZE_05

```
#define CFE_PLATFORM_ES_MEM_BLOCK_SIZE_05 64
```

Definition at line 791 of file example_platform_cfg.h.

12.56.2.46 CFE_PLATFORM_ES_MEM_BLOCK_SIZE_06

```
#define CFE_PLATFORM_ES_MEM_BLOCK_SIZE_06 96
```

Definition at line 792 of file example_platform_cfg.h.

12.56.2.47 CFE_PLATFORM_ES_MEM_BLOCK_SIZE_07

```
#define CFE_PLATFORM_ES_MEM_BLOCK_SIZE_07 128
```

Definition at line 793 of file example_platform_cfg.h.

12.56.2.48 CFE_PLATFORM_ES_MEM_BLOCK_SIZE_08

```
#define CFE_PLATFORM_ES_MEM_BLOCK_SIZE_08 160
```

Definition at line 794 of file example_platform_cfg.h.

12.56.2.49 CFE_PLATFORM_ES_MEM_BLOCK_SIZE_09

```
#define CFE_PLATFORM_ES_MEM_BLOCK_SIZE_09 256
```

Definition at line 795 of file example_platform_cfg.h.

12.56.2.50 CFE_PLATFORM_ES_MEM_BLOCK_SIZE_10

```
#define CFE_PLATFORM_ES_MEM_BLOCK_SIZE_10 512
```

Definition at line 796 of file example_platform_cfg.h.

12.56.2.51 CFE_PLATFORM_ES_MEM_BLOCK_SIZE_11

```
#define CFE_PLATFORM_ES_MEM_BLOCK_SIZE_↩
11 1024
```

Definition at line 797 of file example_platform_cfg.h.

12.56.2.52 CFE_PLATFORM_ES_MEM_BLOCK_SIZE_12

```
#define CFE_PLATFORM_ES_MEM_BLOCK_SIZE_↩
12 2048
```

Definition at line 798 of file example_platform_cfg.h.

12.56.2.53 CFE_PLATFORM_ES_MEM_BLOCK_SIZE_13

```
#define CFE_PLATFORM_ES_MEM_BLOCK_SIZE_↩
13 4096
```

Definition at line 799 of file example_platform_cfg.h.

12.56.2.54 CFE_PLATFORM_ES_MEM_BLOCK_SIZE_14 `#define CFE_PLATFORM_ES_MEM_BLOCK_SIZE_↩ 14 8192`

Definition at line 800 of file example_platform_cfg.h.

12.56.2.55 CFE_PLATFORM_ES_MEM_BLOCK_SIZE_15 `#define CFE_PLATFORM_ES_MEM_BLOCK_SIZE_↩ 15 16384`

Definition at line 801 of file example_platform_cfg.h.

12.56.2.56 CFE_PLATFORM_ES_MEM_BLOCK_SIZE_16 `#define CFE_PLATFORM_ES_MEM_BLOCK_SIZE_↩ 16 32768`

Definition at line 802 of file example_platform_cfg.h.

12.56.2.57 CFE_PLATFORM_ES_MEMPOOL_ALIGN_SIZE_MIN `#define CFE_PLATFORM_ES_MEMPOOL_ALIGN_↩ SIZE_MIN 4`

Purpose Define Memory Pool Alignment Size

Description:

Ensures that buffers obtained from a memory pool are aligned to a certain minimum block size. Note the allocator will always align to the minimum required by the CPU architecture. This may be set greater than the CPU requirement as desired for optimal performance.

For some architectures/applications it may be beneficial to set this to the cache line size of the target CPU, or to use special SIMD instructions that require a more stringent memory alignment.

Limits

This must always be a power of 2, as it is used as a binary address mask.

Definition at line 404 of file example_platform_cfg.h.

12.56.2.58 CFE_PLATFORM_ES_NONVOL_DISK_MOUNT_STRING `#define CFE_PLATFORM_ES_NONVOL_DIS↩ K_MOUNT_STRING "/cf"`

Purpose Default virtual path for persistent storage

Description:

This configures the default location in the virtual file system for persistent/non-volatile storage. Files such as the startup script, app/library dynamic modules, and configuration tables are expected to be stored in this directory.

Definition at line 127 of file example_platform_cfg.h.

12.56.2.59 CFE_PLATFORM_ES_NONVOL_STARTUP_FILE `#define CFE_PLATFORM_ES_NONVOL_STARTUP_FI↩ LE "/cf/cfe_es_startup.scr"`

Purpose ES Nonvolatile Startup Filename

Description:

The value of this constant defines the path and name of the file that contains a list of modules that will be loaded and started by the cFE after the cFE finishes its startup sequence.

Limits

The length of each string, including the NULL terminator cannot exceed the OS_MAX_PATH_LEN value.

Definition at line 418 of file example_platform_cfg.h.

12.56.2.60 CFE_PLATFORM_ES_OBJECT_TABLE_SIZE `#define CFE_PLATFORM_ES_OBJECT_TABLE_SIZE 30`

Purpose Define Number of entries in the ES Object table

Description:

Defines the number of entries in the ES Object table. This table controls the core cFE startup.

Limits

There is a lower limit of 15. There are no restrictions on the upper limit however, the maximum object table size is system dependent and should be verified.

Definition at line 229 of file example_platform_cfg.h.

12.56.2.61 CFE_PLATFORM_ES_PERF_CHILD_MS_DELAY `#define CFE_PLATFORM_ES_PERF_CHILD_MS_DEL↩ AY 20`

Purpose Define Performance Analyzer Child Task Delay

Description:

This parameter defines the delay time (in milliseconds) between performance data file writes performed by the Executive Services Performance Analyzer Child Task.

Limits

It is recommended this parameter be greater than or equal to 20ms. This parameter is limited by the maximum value allowed by the data type. In this case, the data type is an unsigned 32-bit integer, so the valid range is 0 to 0xFFFFFFFF.

Definition at line 681 of file example_platform_cfg.h.

12.56.2.62 CFE_PLATFORM_ES_PERF_CHILD_PRIORITY `#define CFE_PLATFORM_ES_PERF_CHILD_PRIORI↩ TY 200`

Purpose Define Performance Analyzer Child Task Priority

Description:

This parameter defines the priority of the child task spawned by the Executive Services to write performance data to a file. Lower numbers are higher priority, with 1 being the highest priority in the case of a child task.

Limits

Valid range for a child task is 1 to 255 however, the priority cannot be higher (lower number) than the ES parent application priority.

Definition at line 652 of file example_platform_cfg.h.

12.56.2.63 CFE_PLATFORM_ES_PERF_CHILD_STACK_SIZE `#define CFE_PLATFORM_ES_PERF_CHILD_STACK↩_SIZE 4096`

Purpose Define Performance Analyzer Child Task Stack Size

Description:

This parameter defines the stack size of the child task spawned by the Executive Services to write performance data to a file.

Limits

It is recommended this parameter be greater than or equal to 4KB. This parameter is limited by the maximum value allowed by the data type. In this case, the data type is an unsigned 32-bit integer, so the valid range is 0 to 0xFFFFFFFF.

Definition at line 666 of file example_platform_cfg.h.

12.56.2.64 CFE_PLATFORM_ES_PERF_DATA_BUFFER_SIZE `#define CFE_PLATFORM_ES_PERF_DATA_BUFFE↩R_SIZE 10000`

Purpose Define Max Size of Performance Data Buffer

Description:

Defines the maximum size of the performance data buffer. Units are number of performance data entries. An entry is defined by a 32 bit data word followed by a 64 bit time stamp.

Limits

There is a lower limit of 1025. There are no restrictions on the upper limit however, the maximum buffer size is system dependent and should be verified. The units are number of entries. An entry is defined by a 32 bit data word followed by a 64 bit time stamp.

Definition at line 573 of file example_platform_cfg.h.

12.56.2.65 CFE_PLATFORM_ES_PERF_ENTRIES_BTWN_DLYS `#define CFE_PLATFORM_ES_PERF_ENTRIES_↩BTWN_DLYS 50`

Purpose Define Performance Analyzer Child Task Number of Entries Between Delay

Description:

This parameter defines the number of performance analyzer entries the Performance Analyzer Child Task will write to the file between delays.

Definition at line 691 of file example_platform_cfg.h.

12.56.2.66 CFE_PLATFORM_ES_PERF_FILTMASK_ALL `#define CFE_PLATFORM_ES_PERF_FILTMASK_A↩LL ~CFE_PLATFORM_ES_PERF_FILTMASK_NONE`

Purpose Define Filter Mask Setting for Enabling All Performance Entries

Description:

Defines the filter mask for enabling all performance entries. The value is a bit mask. For each bit, 0 means the corresponding entry is disabled and 1 means it is enabled.

Definition at line 593 of file example_platform_cfg.h.

12.56.2.67 CFE_PLATFORM_ES_PERF_FILTMASK_INIT

```
#define CFE_PLATFORM_ES_PERF_FILTMASK_INIT CFE_PLATFORM_ES_PERF_FILTMASK_ALL
```

Purpose Define Default Filter Mask Setting for Performance Data Buffer

Description:

Defines the default filter mask for the performance data buffer. The value is a bit mask. For each bit, 0 means the corresponding entry is disabled and 1 means it is enabled.

Definition at line 604 of file example_platform_cfg.h.

12.56.2.68 CFE_PLATFORM_ES_PERF_FILTMASK_NONE

```
#define CFE_PLATFORM_ES_PERF_FILTMASK_NONE 0
```

Purpose Define Filter Mask Setting for Disabling All Performance Entries

Description:

Defines the filter mask for disabling all performance entries. The value is a bit mask. For each bit, 0 means the corresponding entry is disabled and 1 means it is enabled.

Definition at line 583 of file example_platform_cfg.h.

12.56.2.69 CFE_PLATFORM_ES_PERF_TRIGMASK_ALL

```
#define CFE_PLATFORM_ES_PERF_TRIGMASK_ALL ~CFE_PLATFORM_ES_PERF_TRIGMASK_NONE
```

Purpose Define Filter Trigger Setting for Enabling All Performance Entries

Description:

Defines the trigger mask for enabling all performance data entries. The value is a bit mask. For each bit, 0 means the trigger for the corresponding entry is disabled and 1 means it is enabled.

Definition at line 626 of file example_platform_cfg.h.

12.56.2.70 CFE_PLATFORM_ES_PERF_TRIGMASK_INIT

```
#define CFE_PLATFORM_ES_PERF_TRIGMASK_INIT CFE_PLATFORM_ES_PERF_TRIGMASK_NONE
```

Purpose Define Default Filter Trigger Setting for Performance Data Buffer

Description:

Defines the default trigger mask for the performance data buffer. The value is a 32-bit mask. For each bit, 0 means the trigger for the corresponding entry is disabled and 1 means it is enabled.

Definition at line 637 of file example_platform_cfg.h.

12.56.2.71 CFE_PLATFORM_ES_PERF_TRIGMASK_NONE `#define CFE_PLATFORM_ES_PERF_TRIGMASK_NONE 0`

Purpose Define Default Filter Trigger Setting for Disabling All Performance Entries

Description:

Defines the default trigger mask for disabling all performance data entries. The value is a bit mask. For each bit, 0 means the trigger for the corresponding entry is disabled and 1 means it is enabled.

Definition at line 615 of file example_platform_cfg.h.

12.56.2.72 CFE_PLATFORM_ES_POOL_MAX_BUCKETS `#define CFE_PLATFORM_ES_POOL_MAX_BUCKETS 17`

Purpose Maximum number of block sizes in pool structures

Description:

The upper limit for the number of block sizes supported in the generic pool implementation, which in turn implements the memory pools and CDS.

Limits:

Must be at least one. No specific upper limit, but the number is anticipated to be reasonably small (i.e. tens, not hundreds). Large values have not been tested.

The ES and CDS block size lists must correlate with this value
Definition at line 750 of file example_platform_cfg.h.

12.56.2.73 CFE_PLATFORM_ES_RAM_DISK_MOUNT_STRING `#define CFE_PLATFORM_ES_RAM_DISK_MOUNT_STRING "/ram"`

Purpose Default virtual path for volatile storage

Description:

The CFE_PLATFORM_ES_RAM_DISK_MOUNT_STRING parameter is used to set the cFE mount path for the CFE RAM disk. This is a parameter for missions that do not want to use the default value of "/ram", or for missions that need to have a different value for different CPUs or Spacecraft. Note that the vxWorks OSAL cannot currently handle names that have more than one path separator in it. The names "/ram", "/ramdisk", "/disk123" will all work, but "/disks/ram" will not. Multiple separators can be used with the posix or RTEMS ports.

Definition at line 143 of file example_platform_cfg.h.

12.56.2.74 CFE_PLATFORM_ES_RAM_DISK_NUM_SECTORS `#define CFE_PLATFORM_ES_RAM_DISK_NUM_SECTORS 4096`

Purpose ES Ram Disk Number of Sectors

Description:

Defines the ram disk number of sectors. The ram disk is one of four memory areas that are preserved on a processor reset. NOTE: Changing this value changes memory allocation, and may require changes to platform specific values (in CFE_PSP) such as USER_RESERVED_MEM in VxWorks depending on the memory areas being used for preserved data and on OS specific behavior.

Limits

There is a lower limit of 128. There are no restrictions on the upper limit however, the maximum number of RAM sectors is system dependent and should be verified.

Definition at line 324 of file example_platform_cfg.h.

12.56.2.75 CFE_PLATFORM_ES_RAM_DISK_PERCENT_RESERVED `#define CFE_PLATFORM_ES_RAM_DISK_↩ PERCENT_RESERVED 30`

Purpose Percentage of Ram Disk Reserved for Decompressing Apps

Description:

The CFE_PLATFORM_ES_RAM_DISK_PERCENT_RESERVED parameter is used to make sure that the Volatile (RAM) Disk has a defined amount of free space during a processor reset. The cFE uses the Volatile disk to decompress cFE applications during system startup. If this Volatile disk happens to get filled with logs and misc files, then a processor reset may not work, because there will be no room to decompress cFE apps. To solve that problem, this parameter sets the "Low Water Mark" for disk space on a Processor reset. It should be set to allow the largest cFE Application to be decompressed. During a Processor reset, if there is not sufficient space left on the disk, it will be re-formatted in order to clear up some space.

This feature can be turned OFF by setting the parameter to 0.

Limits

There is a lower limit of 0 and an upper limit of 75 on this configuration parameter.Units are percentage. A setting of zero will turn this feature off.

Definition at line 348 of file example_platform_cfg.h.

12.56.2.76 CFE_PLATFORM_ES_RAM_DISK_SECTOR_SIZE `#define CFE_PLATFORM_ES_RAM_DISK_SECTOR_↩ SIZE 512`

Purpose ES Ram Disk Sector Size

Description:

Defines the ram disk sector size. The ram disk is 1 of 4 memory areas that are preserved on a processor reset. NOTE: Changing this value changes memory allocation, and may require changes to platform specific values (in CFE_PSP) such as USER_RESERVED_MEM in VxWorks depending on the memory areas being used for preserved data and on OS specific behavior.

Limits

There is a lower limit of 128. There are no restrictions on the upper limit however, the maximum RAM disk sector size is system dependent and should be verified.

Definition at line 306 of file example_platform_cfg.h.

12.56.2.77 CFE_PLATFORM_ES_START_TASK_PRIORITY `#define CFE_PLATFORM_ES_START_TASK_PRIORITY 68`

Purpose Define ES Task Priority

Description:

Defines the cFE_ES Task priority.

Limits

Not Applicable

Definition at line 100 of file example_platform_cfg.h.

12.56.2.78 CFE_PLATFORM_ES_START_TASK_STACK_SIZE `#define CFE_PLATFORM_ES_START_TASK_STACK_SIZE CFE_PLATFORM_ES_DEFAULT_STACK_SIZE`

Purpose Define ES Task Stack Size

Description:

Defines the cFE_ES Task Stack Size

Limits

There is a lower limit of 2048 on this configuration parameter. There are no restrictions on the upper limit however, the maximum stack size is system dependent and should be verified. Most operating systems provide tools for measuring the amount of stack used by a task during operation. It is always a good idea to verify that no more than 1/2 of the stack is used.

Definition at line 115 of file example_platform_cfg.h.

12.56.2.79 CFE_PLATFORM_ES_STARTUP_SCRIPT_TIMEOUT_MSEC `#define CFE_PLATFORM_ES_STARTUP_SCRIPT_TIMEOUT_MSEC 1000`

Purpose Startup script timeout

Description:

The upper limit for the total amount of time that all apps listed in the CFE ES startup script may take to all become ready.

Unlike the "core" app timeout, this is a soft limit; if the allotted time is exceeded, it probably indicates an issue with one of the apps, but does not cause CFE ES to take any additional action other than logging the event to the syslog.
Units are in milliseconds

Limits:

Must be defined as an integer value that is greater than or equal to zero.

Definition at line 870 of file example_platform_cfg.h.

12.56.2.80 CFE_PLATFORM_ES_STARTUP_SYNC_POLL_MSEC `#define CFE_PLATFORM_ES_STARTUP_SYNC_POLL_MSEC 50`

Purpose Poll timer for startup sync delay

Description:

During startup, some tasks may need to synchronize their own initialization with the initialization of other applications in the system.

CFE ES implements an API to accomplish this, that performs a task delay (sleep) while polling the overall system state until other tasks are ready.
This value controls the amount of time that the CFE_ES_ApplicationSyncDelay will sleep between each check of the system state. This should be large enough to allow other tasks to run, but not so large as to noticeably delay the startup completion.
Units are in milliseconds

Limits:

Must be defined as an integer value that is greater than or equal to zero.

Definition at line 852 of file example_platform_cfg.h.

12.56.2.81 CFE_PLATFORM_ES_SYSTEM_LOG_SIZE `#define CFE_PLATFORM_ES_SYSTEM_LOG_SIZE 3072`

Purpose Define Size of the cFE System Log.

Description:

Defines the size in bytes of the cFE system log. The system log holds variable length strings that are terminated by a linefeed and null character.

Limits

There is a lower limit of 512. There are no restrictions on the upper limit however, the maximum system log size is system dependent and should be verified.

Definition at line 215 of file example_platform_cfg.h.

12.56.2.82 CFE_PLATFORM_ES_USER_RESERVED_SIZE `#define CFE_PLATFORM_ES_USER_RESERVED_SIZE (1024 * 1024)`

Purpose Define User Reserved Memory Size

Description:

User Reserved Memory Size. This is the size in bytes of the cFE User reserved Memory area. This is a block of memory that is available for cFE application use. The address is obtained by calling CFE_PSP_GetUserReservedArea. The User Reserved Memory is one of four memory areas that are preserved during a processor reset. NOTE: Changing this value changes memory allocation, and may require changes to platform specific values (in CFE_PSP) such as USER_RESERVED_MEM in VxWorks depending on the memory areas being used for preserved data and on OS specific behavior.

Limits

There is a lower limit of 1024 and an upper limit of UINT_MAX (4 Gigabytes) on this configuration parameter.

Definition at line 385 of file example_platform_cfg.h.

12.56.2.83 CFE_PLATFORM_ES_VOLATILE_STARTUP_FILE `#define CFE_PLATFORM_ES_VOLATILE_STARTUP↩ _FILE "/ram/cfe_es_startup.scr"`

Purpose ES Volatile Startup Filename

Description:

The value of this constant defines the path and name of the file that contains a list of modules that will be loaded and started by the cFE after the cFE finishes its startup sequence.

Limits

The length of each string, including the NULL terminator cannot exceed the OS_MAX_PATH_LEN value.

Definition at line 432 of file example_platform_cfg.h.

12.56.2.84 CFE_PLATFORM_EVS_APP_EVENTS_PER_SEC `#define CFE_PLATFORM_EVS_APP_EVENTS_PER_↩ SEC 15`

Purpose Sustained number of event messages per second per app before squelching

Description:

Sustained number of events that may be emitted per app per second.

Limits

This number must be less than or equal to CFE_PLATFORM_EVS_MAX_APP_EVENT_BURST. Values lower than 8 may cause functional and unit test failures.

Definition at line 938 of file example_platform_cfg.h.

12.56.2.85 CFE_PLATFORM_EVS_DEFAULT_APP_DATA_FILE `#define CFE_PLATFORM_EVS_DEFAULT_APP_DA↩ TA_FILE "/ram/cfe_evs_app.dat"`

Purpose Default EVS Application Data Filename

Description:

The value of this constant defines the filename used to store the EVS Application Data(event counts/filtering information). This filename is used only when no filename is specified in the command to dump the event log.

Limits

The length of each string, including the NULL terminator cannot exceed the OS_MAX_PATH_LEN value.

Definition at line 979 of file example_platform_cfg.h.

12.56.2.86 CFE_PLATFORM_EVS_DEFAULT_LOG_FILE `#define CFE_PLATFORM_EVS_DEFAULT_LOG_FI↩ LE "/ram/cfe_evs.log"`

Purpose Default Event Log Filename

Description:

The value of this constant defines the filename used to store the Event Services local event log. This filename is used only when no filename is specified in the command to dump the event log.

Limits

The length of each string, including the NULL terminator cannot exceed the OS_MAX_PATH_LEN value.

Definition at line 952 of file example_platform_cfg.h.

12.56.2.87 CFE_PLATFORM_EVS_DEFAULT_LOG_MODE `#define CFE_PLATFORM_EVS_DEFAULT_LOG_MODE 1`

Purpose Default EVS Local Event Log Mode

Description:

Defines a state of overwrite(0) or discard(1) for the operation of the EVS local event log. The log may operate in either Overwrite mode = 0, where once the log becomes full the oldest event in the log will be overwritten, or Discard mode = 1, where once the log becomes full the contents of the log are preserved and the new event is discarded. Overwrite Mode = 0, Discard Mode = 1.

Limits

The valid settings are 0 or 1

Definition at line 1026 of file example_platform_cfg.h.

12.56.2.88 CFE_PLATFORM_EVS_DEFAULT_MSG_FORMAT_MODE `#define CFE_PLATFORM_EVS_DEFAULT_↩ MSG_FORMAT_MODE CFE_EVS_MsgFormat_LONG`

Purpose Default EVS Message Format Mode

Description:

Defines the default message format (long or short) for event messages being sent to the ground. Choose between CFE_EVS_MsgFormat_LONG or CFE_EVS_MsgFormat_SHORT.

Limits

The valid settings are CFE_EVS_MsgFormat_LONG or CFE_EVS_MsgFormat_SHORT

Definition at line 1039 of file example_platform_cfg.h.

12.56.2.89 CFE_PLATFORM_EVS_DEFAULT_TYPE_FLAG `#define CFE_PLATFORM_EVS_DEFAULT_TYPE_FL↩ AG 0xE`

Purpose Default EVS Event Type Filter Mask

Description:

Defines a state of on or off for all four event types. The term event 'type' refers to the criticality level and may be Debug, Informational, Error or Critical. Each event type has a bit position. (bit 0 = Debug, bit 1 = Info, bit 2 = Error, bit 3 = Critical). This is a global setting, meaning it applies to all applications. To filter an event type, set its bit to zero. For example, 0xE means Debug = OFF, Info = ON, Error = ON, Critical = ON

Limits

The valid settings are 0x0 to 0xF.

Definition at line 1010 of file example_platform_cfg.h.

12.56.2.90 CFE_PLATFORM_EVS_LOG_MAX `#define CFE_PLATFORM_EVS_LOG_MAX 20`

Purpose Maximum Number of Events in EVS Local Event Log

Description:

Dictates the EVS local event log capacity. Units are the number of events.

Limits

There are no restrictions on the lower and upper limits however, the maximum log size is system dependent and should be verified.

Definition at line 964 of file example_platform_cfg.h.

12.56.2.91 CFE_PLATFORM_EVS_MAX_APP_EVENT_BURST `#define CFE_PLATFORM_EVS_MAX_APP_EVENT_↩ BURST 32`

Purpose Maximum number of event before squelching

Description:

Maximum number of events that may be emitted per app per second. Setting this to 0 will cause events to be unrestricted.

Limits

This number must be less than or equal to INT_MAX/1000

Definition at line 926 of file example_platform_cfg.h.

12.56.2.92 CFE_PLATFORM_EVS_MAX_EVENT_FILTERS `#define CFE_PLATFORM_EVS_MAX_EVENT_FILTERS 8`

Purpose Define Maximum Number of Event Filters per Application

Description:

Maximum number of events that may be filtered per application.

Limits

There are no restrictions on the lower and upper limits however, the maximum number of event filters is system dependent and should be verified.

Definition at line 914 of file example_platform_cfg.h.

12.56.2.93 CFE_PLATFORM_EVS_PORT_DEFAULT `#define CFE_PLATFORM_EVS_PORT_DEFAULT 0x0001`

Purpose Default EVS Output Port State

Description:

Defines the default port state (enabled or disabled) for the four output ports defined within the Event Service. Port 1 is usually the uart output terminal. To enable a port, set the proper bit to a 1. Bit 0 is port 1, bit 1 is port2 etc.

Limits

The valid settings are 0x0 to 0xF.

Definition at line 993 of file example_platform_cfg.h.

12.56.2.94 CFE_PLATFORM_EVS_START_TASK_PRIORITY `#define CFE_PLATFORM_EVS_START_TASK_PRIOR↩ ITY 61`

Purpose Define EVS Task Priority

Description:

Defines the cFE_EVS Task priority.

Limits

Not Applicable

Definition at line 886 of file example_platform_cfg.h.

12.56.2.95 CFE_PLATFORM_EVS_START_TASK_STACK_SIZE `#define CFE_PLATFORM_EVS_START_TASK_ST↩ ACK_SIZE CFE_PLATFORM_ES_DEFAULT_STACK_SIZE`

Purpose Define EVS Task Stack Size

Description:

Defines the cFE_EVS Task Stack Size

Limits

There is a lower limit of 2048 on this configuration parameter. There are no restrictions on the upper limit however, the maximum stack size is system dependent and should be verified. Most operating systems provide tools for measuring the amount of stack used by a task during operation. It is always a good idea to verify that no more than 1/2 of the stack is used.

Definition at line 901 of file example_platform_cfg.h.

12.56.2.96 CFE_PLATFORM_SB_BUF_MEMORY_BYTES `#define CFE_PLATFORM_SB_BUF_MEMORY_BYTES 524288`

Purpose Size of the SB buffer memory pool

Description:

Dictates the size of the SB memory pool. For each message the SB sends, the SB dynamically allocates from this memory pool, the memory needed to process the message. The memory needed to process each message is msg size + msg descriptor(CFE_SB_BufferD_t). This memory pool is also used to allocate destination descriptors (CFE_SB_DestinationD_t) during the subscription process. To see the run-time, high-water mark and the current utilization figures regarding this parameter, send an SB command to 'Send Statistics Pkt'. Some memory statistics have been added to the SB housekeeping packet. NOTE: It is important to monitor these statistics to ensure the desired memory margin is met.

Limits

This parameter has a lower limit of 512 and an upper limit of UINT_MAX (4 Gigabytes).

Definition at line 1134 of file example_platform_cfg.h.

12.56.2.97 CFE_PLATFORM_SB_DEFAULT_MAP_FILENAME `#define CFE_PLATFORM_SB_DEFAULT_MAP_FILENAME "/ram/cfe_sb_msgmap.dat"`

Purpose Default Message Map Filename

Description:

The value of this constant defines the filename used to store the software bus message map information. This filename is used only when no filename is specified in the command. The message map is a lookup table (array of 16bit words) that has an element for each possible MsgId value and holds the routing table index for that MsgId. The Msg Map provides fast access to the destinations of a message.

Limits

The length of each string, including the NULL terminator cannot exceed the OS_MAX_PATH_LEN value.

Definition at line 1204 of file example_platform_cfg.h.

12.56.2.98 CFE_PLATFORM_SB_DEFAULT_MSG_LIMIT `#define CFE_PLATFORM_SB_DEFAULT_MSG_LIMIT 4`

Purpose Default Subscription Message Limit

Description:

Dictates the default Message Limit when using the CFE_SB_Subscribe API. This will limit the number of messages with a specific message ID that can be received through a subscription. This only changes the default; other message limits can be set on a per subscription basis using CFE_SB_SubscribeEx .

Limits

This parameter has a lower limit of 4 and an upper limit of 65535.

Definition at line 1112 of file example_platform_cfg.h.

12.56.2.99 CFE_PLATFORM_SB_DEFAULT_PIPE_FILENAME `#define CFE_PLATFORM_SB_DEFAULT_PIPE_FIL↩ ENAME "/ram/cfe_sb_pipe.dat"`

Purpose Default Pipe Information Filename

Description:

The value of this constant defines the filename used to store the software bus pipe information. This filename is used only when no filename is specified in the command.

Limits

The length of each string, including the NULL terminator cannot exceed the OS_MAX_PATH_LEN value.

Definition at line 1187 of file example_platform_cfg.h.

12.56.2.100 CFE_PLATFORM_SB_DEFAULT_ROUTING_FILENAME `#define CFE_PLATFORM_SB_DEFAULT_RO↩ UTING_FILENAME "/ram/cfe_sb_route.dat"`

Purpose Default Routing Information Filename

Description:

The value of this constant defines the filename used to store the software bus routing information. This filename is used only when no filename is specified in the command.

Limits

The length of each string, including the NULL terminator cannot exceed the OS_MAX_PATH_LEN value.

Definition at line 1173 of file example_platform_cfg.h.

12.56.2.101 CFE_PLATFORM_SB_FILTER_MASK1 `#define CFE_PLATFORM_SB_FILTER_MASK1 CFE_EVS_FIRST_4_STOP`

Definition at line 1222 of file example_platform_cfg.h.

12.56.2.102 CFE_PLATFORM_SB_FILTER_MASK2

`#define CFE_PLATFORM_SB_FILTER_MASK2 CFE_EVS_FIRST_4_STOP`

Definition at line 1225 of file example_platform_cfg.h.

12.56.2.103 CFE_PLATFORM_SB_FILTER_MASK3

`#define CFE_PLATFORM_SB_FILTER_MASK3 CFE_EVS_FIRST_16_STOP`

Definition at line 1228 of file example_platform_cfg.h.

12.56.2.104 CFE_PLATFORM_SB_FILTER_MASK4

`#define CFE_PLATFORM_SB_FILTER_MASK4 CFE_EVS_FIRST_16_STOP`

Definition at line 1231 of file example_platform_cfg.h.

12.56.2.105 CFE_PLATFORM_SB_FILTER_MASK5

`#define CFE_PLATFORM_SB_FILTER_MASK5 CFE_EVS_NO_FILTER`

Definition at line 1234 of file example_platform_cfg.h.

12.56.2.106 CFE_PLATFORM_SB_FILTER_MASK6

`#define CFE_PLATFORM_SB_FILTER_MASK6 CFE_EVS_NO_FILTER`

Definition at line 1237 of file example_platform_cfg.h.

12.56.2.107 CFE_PLATFORM_SB_FILTER_MASK7

`#define CFE_PLATFORM_SB_FILTER_MASK7 CFE_EVS_NO_FILTER`

Definition at line 1240 of file example_platform_cfg.h.

12.56.2.108 CFE_PLATFORM_SB_FILTER_MASK8

`#define CFE_PLATFORM_SB_FILTER_MASK8 CFE_EVS_NO_FILTER`

Definition at line 1243 of file example_platform_cfg.h.

12.56.2.109 CFE_PLATFORM_SB_FILTERED_EVENT1

`#define CFE_PLATFORM_SB_FILTERED_EVENT1 CFE_SB_SEND_NO_SUBS_EID`

Purpose SB Event Filtering

Description:

This group of configuration parameters dictates what SB events will be filtered through SB. The filtering will begin after the SB task initializes and stay in effect until a cmd to SB changes it. This allows the operator to set limits on the number of event messages that are sent during system initialization. NOTE: Set all unused event values and mask values to zero

Limits

This filtering applies only to SB events. These parameters have a lower limit of 0 and an upper limit of 65535.

Definition at line 1221 of file example_platform_cfg.h.

12.56.2.110 CFE_PLATFORM_SB_FILTERED_EVENT2

`#define CFE_PLATFORM_SB_FILTERED_EVENT2 CFE_SB_DUP_SUBSCRIP_EID`

Definition at line 1224 of file example_platform_cfg.h.

12.56.2.111 CFE_PLATFORM_SB_FILTERED_EVENT3

`#define CFE_PLATFORM_SB_FILTERED_EVENT3 CFE_SB_MSGID_LIM_ERR_EI`

Definition at line 1227 of file example_platform_cfg.h.

12.56.2.112 CFE_PLATFORM_SB_FILTERED_EVENT4

`#define CFE_PLATFORM_SB_FILTERED_EVENT4 CFE_SB_Q_FULL_ERR_EID`

Definition at line 1230 of file example_platform_cfg.h.

12.56.2.113 CFE_PLATFORM_SB_FILTERED_EVENT5

`#define CFE_PLATFORM_SB_FILTERED_EVENT5 0`

Definition at line 1233 of file example_platform_cfg.h.

12.56.2.114 CFE_PLATFORM_SB_FILTERED_EVENT6

`#define CFE_PLATFORM_SB_FILTERED_EVENT6 0`

Definition at line 1236 of file example_platform_cfg.h.

12.56.2.115 CFE_PLATFORM_SB_FILTERED_EVENT7

`#define CFE_PLATFORM_SB_FILTERED_EVENT7 0`

Definition at line 1239 of file example_platform_cfg.h.

12.56.2.116 CFE_PLATFORM_SB_FILTERED_EVENT8

`#define CFE_PLATFORM_SB_FILTERED_EVENT8 0`

Definition at line 1242 of file example_platform_cfg.h.

12.56.2.117 CFE_PLATFORM_SB_HIGHEST_VALID_MSGID

`#define CFE_PLATFORM_SB_HIGHEST_VALID_MSG↩ID 0x1FFF`

Purpose Highest Valid Message Id

Description:

The value of this constant dictates the range of valid message ID's, from 0 to CFE_PLATFORM_SB_HIGHEST↩_VALID_MSGID (inclusive).

Although this can be defined differently across platforms, each platform can only publish/subscribe to message ids within their allowable range. Typically this value is set the same across all mission platforms to avoid this complexity.

Limits

This parameter has a lower limit is 1, and an upper limit of 0xFFFFFFFE.

When using the direct message map implementation for software bus routing, this value is used to size the map where a value of 0x1FFF results in a 16 KBytes map and 0xFFFF is 128 KBytes.
When using the hash implementation for software bus routing, a multiple of the CFE_PLATFORM_SB_MAX_MSG_IDS is used to size the message map. In that case the range selected here does not impact message map memory use, so it's reasonable to use up to the full range supported by the message ID implementation.
Definition at line 1159 of file example_platform_cfg.h.

12.56.2.118 CFE_PLATFORM_SB_MAX_BLOCK_SIZE

`#define CFE_PLATFORM_SB_MAX_BLOCK_SIZE (CFE_MISSION_SB_MAX_SB_M + 128)`

Definition at line 1272 of file example_platform_cfg.h.

12.56.2.119 CFE_PLATFORM_SB_MAX_DEST_PER_PKT

`#define CFE_PLATFORM_SB_MAX_DEST_PER_PKT 16`

Purpose Maximum Number of unique local destinations a single MsgId can have

Description:

Dictates the maximum number of unique local destinations a single MsgId can have.

Limits

This parameter has a lower limit of 1. There are no restrictions on the upper limit however, the maximum number of destinations per packet is system dependent and should be verified. Destination number values that are checked against this configuration are defined by a 16 bit data word.

Definition at line 1097 of file example_platform_cfg.h.

12.56.2.120 CFE_PLATFORM_SB_MAX_MSG_IDS `#define CFE_PLATFORM_SB_MAX_MSG_IDS 256`

Purpose Maximum Number of Unique Message IDs SB Routing Table can hold

Description:

Dictates the maximum number of unique MsgIds the SB routing table will hold. This constant has a direct effect on the size of SB's tables and arrays. Keeping this count as low as possible will save memory. To see the run-time, high-water mark and the current utilization figures regarding this parameter, send an SB command to 'Send Statistics Pkt'.

Limits

This must be a power of two if software bus message routing hash implementation is being used. Lower than 64 will cause unit test failures, and telemetry reporting is impacted below 32. There is no hard upper limit, but impacts memory footprint. For software bus message routing search implementation the number of msg ids subscribed to impacts performance.

Definition at line 1064 of file example_platform_cfg.h.

12.56.2.121 CFE_PLATFORM_SB_MAX_PIPES `#define CFE_PLATFORM_SB_MAX_PIPES 64`

Purpose Maximum Number of Unique Pipes SB Routing Table can hold

Description:

Dictates the maximum number of unique Pipes the SB routing table will hold. This constant has a direct effect on the size of SB's tables and arrays. Keeping this count as low as possible will save memory. To see the run-time, high-water mark and the current utilization figures regarding this parameter, send an SB command to 'Send Statistics Pkt'.

Limits

This parameter has a lower limit of 1. This parameter must also be less than or equal to OS_MAX_QUEUES.

Definition at line 1081 of file example_platform_cfg.h.

12.56.2.122 CFE_PLATFORM_SB_MEM_BLOCK_SIZE_01 `#define CFE_PLATFORM_SB_MEM_BLOCK_SIZE_01 8`

Purpose Define SB Memory Pool Block Sizes

Description:

Software Bus Memory Pool Block Sizes

Limits

These sizes MUST be increasing and MUST be an integral multiple of 4. The number of block sizes defined cannot exceed CFE_PLATFORM_ES_POOL_MAX_BUCKETS

Definition at line 1256 of file example_platform_cfg.h.

12.56.2.123 CFE_PLATFORM_SB_MEM_BLOCK_SIZE_02 `#define CFE_PLATFORM_SB_MEM_BLOCK_SIZE_02 16`

Definition at line 1257 of file example_platform_cfg.h.

12.56.2.124 CFE_PLATFORM_SB_MEM_BLOCK_SIZE_03 `#define CFE_PLATFORM_SB_MEM_BLOCK_SIZE_03 20`

Definition at line 1258 of file example_platform_cfg.h.

12.56.2.125 CFE_PLATFORM_SB_MEM_BLOCK_SIZE_04 `#define CFE_PLATFORM_SB_MEM_BLOCK_SIZE_04 36`

Definition at line 1259 of file example_platform_cfg.h.

12.56.2.126 CFE_PLATFORM_SB_MEM_BLOCK_SIZE_05 `#define CFE_PLATFORM_SB_MEM_BLOCK_SIZE_05 64`

Definition at line 1260 of file example_platform_cfg.h.

12.56.2.127 CFE_PLATFORM_SB_MEM_BLOCK_SIZE_06 `#define CFE_PLATFORM_SB_MEM_BLOCK_SIZE_06 96`

Definition at line 1261 of file example_platform_cfg.h.

12.56.2.128 CFE_PLATFORM_SB_MEM_BLOCK_SIZE_07 `#define CFE_PLATFORM_SB_MEM_BLOCK_SIZE_↩ 07 128`

Definition at line 1262 of file example_platform_cfg.h.

12.56.2.129 CFE_PLATFORM_SB_MEM_BLOCK_SIZE_08 `#define CFE_PLATFORM_SB_MEM_BLOCK_SIZE_↩ 08 160`

Definition at line 1263 of file example_platform_cfg.h.

12.56.2.130 CFE_PLATFORM_SB_MEM_BLOCK_SIZE_09 `#define CFE_PLATFORM_SB_MEM_BLOCK_SIZE_↩ 09 256`

Definition at line 1264 of file example_platform_cfg.h.

12.56.2.131 CFE_PLATFORM_SB_MEM_BLOCK_SIZE_10

```
#define CFE_PLATFORM_SB_MEM_BLOCK_SIZE_↩
10 512
```

Definition at line 1265 of file example_platform_cfg.h.

12.56.2.132 CFE_PLATFORM_SB_MEM_BLOCK_SIZE_11

```
#define CFE_PLATFORM_SB_MEM_BLOCK_SIZE_↩
11 1024
```

Definition at line 1266 of file example_platform_cfg.h.

12.56.2.133 CFE_PLATFORM_SB_MEM_BLOCK_SIZE_12

```
#define CFE_PLATFORM_SB_MEM_BLOCK_SIZE_↩
12 2048
```

Definition at line 1267 of file example_platform_cfg.h.

12.56.2.134 CFE_PLATFORM_SB_MEM_BLOCK_SIZE_13

```
#define CFE_PLATFORM_SB_MEM_BLOCK_SIZE_↩
13 4096
```

Definition at line 1268 of file example_platform_cfg.h.

12.56.2.135 CFE_PLATFORM_SB_MEM_BLOCK_SIZE_14

```
#define CFE_PLATFORM_SB_MEM_BLOCK_SIZE_↩
14 8192
```

Definition at line 1269 of file example_platform_cfg.h.

12.56.2.136 CFE_PLATFORM_SB_MEM_BLOCK_SIZE_15

```
#define CFE_PLATFORM_SB_MEM_BLOCK_SIZE_↩
15 16384
```

Definition at line 1270 of file example_platform_cfg.h.

12.56.2.137 CFE_PLATFORM_SB_MEM_BLOCK_SIZE_16

```
#define CFE_PLATFORM_SB_MEM_BLOCK_SIZE_↩
16 32768
```

Definition at line 1271 of file example_platform_cfg.h.

12.56.2.138 CFE_PLATFORM_SB_START_TASK_PRIORITY

```
#define CFE_PLATFORM_SB_START_TASK_PRIORI↩
TY 64
```

Purpose Define SB Task Priority

Description:

Defines the cFE_SB Task priority.

Limits

Not Applicable

Definition at line 1283 of file example_platform_cfg.h.

12.56.2.139 CFE_PLATFORM_SB_START_TASK_STACK_SIZE

```
#define CFE_PLATFORM_SB_START_TASK_STACK_SIZE CFE_PLATFORM_ES_DEFAULT_STACK_SIZE
```

Purpose Define SB Task Stack Size

Description:

Defines the cFE_SB Task Stack Size

Limits

There is a lower limit of 2048 on this configuration parameter. There are no restrictions on the upper limit however, the maximum stack size is system dependent and should be verified. Most operating systems provide tools for measuring the amount of stack used by a task during operation. It is always a good idea to verify that no more than 1/2 of the stack is used.

Definition at line 1298 of file example_platform_cfg.h.

12.56.2.140 CFE_PLATFORM_TBL_BUF_MEMORY_BYTES

```
#define CFE_PLATFORM_TBL_BUF_MEMORY_BYTES 524288
```

Purpose Size of Table Services Table Memory Pool

Description:

Defines the TOTAL size of the memory pool that cFE Table Services allocates from the system. The size must be large enough to provide memory for each registered table, the inactive buffers for double buffered tables and for the shared inactive buffers for single buffered tables.

Limits

The cFE does not place a limit on the size of this parameter.

Definition at line 1345 of file example_platform_cfg.h.

12.56.2.141 CFE_PLATFORM_TBL_DEFAULT_REG_DUMP_FILE

```
#define CFE_PLATFORM_TBL_DEFAULT_REG_DUMP_FILE "/ram/cfe_tbl_reg.log"
```

Purpose Default Filename for a Table Registry Dump

Description:

Defines the file name used to store the table registry when no filename is specified in the dump registry command.

Limits

The length of each string, including the NULL terminator cannot exceed the OS_MAX_PATH_LEN value.

Definition at line 1459 of file example_platform_cfg.h.

12.56.2.142 CFE_PLATFORM_TBL_MAX_CRITICAL_TABLES `#define CFE_PLATFORM_TBL_MAX_CRITICAL_T↩ ABLES 32`

Purpose Maximum Number of Critical Tables that can be Registered

Description:

Defines the maximum number of critical tables supported by this processor's Table Services.

Limits

This number must be less than 32767. It should be recognized that this parameter determines the size of the Critical Table Registry which is maintained in the Critical Data Store. An excessively high number will waste Critical Data Store memory. Therefore, this number must not exceed the value defined in CFE_ES_CDS_MAX↩ _CRITICAL_TABLES.

Definition at line 1400 of file example_platform_cfg.h.

12.56.2.143 CFE_PLATFORM_TBL_MAX_DBL_TABLE_SIZE `#define CFE_PLATFORM_TBL_MAX_DBL_TABLE_S↩ IZE 16384`

Purpose Maximum Size Allowed for a Double Buffered Table

Description:

Defines the maximum allowed size (in bytes) of a double buffered table.

Limits

The cFE does not place a limit on the size of this parameter but it must be less than half of CFE_PLATFORM_TBL_BUF_MEMORY_B

Definition at line 1357 of file example_platform_cfg.h.

12.56.2.144 CFE_PLATFORM_TBL_MAX_NUM_HANDLES `#define CFE_PLATFORM_TBL_MAX_NUM_HANDLES 256`

Purpose Maximum Number of Table Handles

Description:

Defines the maximum number of Table Handles.

Limits

This number must be less than 32767. This number must be at least as big as the number of tables (CFE_PLATFORM_TBL_MAX_NUM_TABLES) and should be set higher if tables are shared between applications.

Definition at line 1413 of file example_platform_cfg.h.

12.56.2.145 CFE_PLATFORM_TBL_MAX_NUM_TABLES `#define CFE_PLATFORM_TBL_MAX_NUM_TABLES 128`

Purpose Maximum Number of Tables Allowed to be Registered

Description:

Defines the maximum number of tables supported by this processor's Table Services.

Limits

This number must be less than 32767. It should be recognized that this parameter determines the size of the Table Registry. An excessively high number will waste memory.

Definition at line 1386 of file example_platform_cfg.h.

12.56.2.146 CFE_PLATFORM_TBL_MAX_NUM_VALIDATIONS `#define CFE_PLATFORM_TBL_MAX_NUM_VALIDA↩ TIONS 10`

Purpose Maximum Number of Simultaneous Table Validations

Description:

Defines the maximum number of pending validations that the Table Services can handle at any one time. When a table has a validation function, a validation request is made of the application to perform that validation. This number determines how many of those requests can be outstanding at any one time.

Limits

This number must be less than 32767. An excessively high number will degrade system performance and waste memory. A number less than 20 is suggested but not required.

Definition at line 1446 of file example_platform_cfg.h.

12.56.2.147 CFE_PLATFORM_TBL_MAX_SIMULTANEOUS_LOADS `#define CFE_PLATFORM_TBL_MAX_SIMUL↩ TANEOUS_LOADS 4`

Purpose Maximum Number of Simultaneous Loads to Support

Description:

Defines the maximum number of single buffered tables that can be loaded simultaneously. This number is used to determine the number of shared buffers to allocate.

Limits

This number must be less than 32767. An excessively high number will degrade system performance and waste memory. A number less than 5 is suggested but not required.

Definition at line 1428 of file example_platform_cfg.h.

12.56.2.148 CFE_PLATFORM_TBL_MAX_SNGL_TABLE_SIZE `#define CFE_PLATFORM_TBL_MAX_SNGL_TABLE↩ _SIZE 16384`

Purpose Maximum Size Allowed for a Single Buffered Table

Description:

Defines the maximum allowed size (in bytes) of a single buffered table. **NOTE:** This size determines the size of all shared table buffers. Therefore, this size will be multiplied by CFE_PLATFORM_TBL_MAX_SIMULTANEOUS_LOADS below when allocating memory for shared tables.

Limits

The cFE does not place a limit on the size of this parameter but it must be small enough to allow for CFE_PLATFORM_TBL_MAX_SIMULTANEOUS_LOADS number of tables to fit into CFE_PLATFORM_TBL_BUF_MEMORY_BYTE

Definition at line 1373 of file example_platform_cfg.h.

12.56.2.149 CFE_PLATFORM_TBL_START_TASK_PRIORITY `#define CFE_PLATFORM_TBL_START_TASK_PRIO↩ RITY 70`

Purpose Define TBL Task Priority

Description:

Defines the cFE_TBL Task priority.

Limits

Not Applicable

Definition at line 1314 of file example_platform_cfg.h.

12.56.2.150 CFE_PLATFORM_TBL_START_TASK_STACK_SIZE `#define CFE_PLATFORM_TBL_START_TASK_S↩ TACK_SIZE CFE_PLATFORM_ES_DEFAULT_STACK_SIZE`

Purpose Define TBL Task Stack Size

Description:

Defines the cFE_TBL Task Stack Size

Limits

There is a lower limit of 2048 on this configuration parameter. There are no restrictions on the upper limit however, the maximum stack size is system dependent and should be verified. Most operating systems provide tools for measuring the amount of stack used by a task during operation. It is always a good idea to verify that no more than 1/2 of the stack is used.

Definition at line 1329 of file example_platform_cfg.h.

12.56.2.151 CFE_PLATFORM_TBL_U32FROM4CHARS

```
#define CFE_PLATFORM_TBL_U32FROM4CHARS(
    _C1,
    _C2,
    _C3,
    _C4 ) ((uint32)(_C1) << 24 | (uint32)(_C2) << 16 | (uint32)(_C3) << 8 | (uint32)(↩
_C4))
```

Definition at line 1481 of file example_platform_cfg.h.

12.56.2.152 CFE_PLATFORM_TBL_VALID_PRID_1

```
#define CFE_PLATFORM_TBL_VALID_PRID_1 (1)
```

Purpose Processor ID values used for table load validation

Description:

Defines the processor ID values used for validating the processor ID field in the table file header. To be valid, the spacecraft ID specified in the table file header must match one of the values defined here.

Limits

This value can be any 32 bit unsigned integer.

Definition at line 1530 of file example_platform_cfg.h.

12.56.2.153 CFE_PLATFORM_TBL_VALID_PRID_2

```
#define CFE_PLATFORM_TBL_VALID_PRID_2 (CFE_PLATFORM_TBL_U32FROM4CH
'b', 'c', 'd'))
```

Definition at line 1531 of file example_platform_cfg.h.

12.56.2.154 CFE_PLATFORM_TBL_VALID_PRID_3

```
#define CFE_PLATFORM_TBL_VALID_PRID_3 0
```

Definition at line 1532 of file example_platform_cfg.h.

12.56.2.155 CFE_PLATFORM_TBL_VALID_PRID_4

```
#define CFE_PLATFORM_TBL_VALID_PRID_4 0
```

Definition at line 1533 of file example_platform_cfg.h.

12.56.2.156 CFE_PLATFORM_TBL_VALID_PRID_COUNT

```
#define CFE_PLATFORM_TBL_VALID_PRID_COUNT 0
```

Purpose Number of Processor ID's specified for validation

Description:

Defines the number of specified processor ID values that are verified during table loads. If the number is zero then no validation of the processor ID field in the table file header is performed when tables are loaded. Non-zero values indicate how many values from the list of processor ID's defined below are compared to the processor ID field in the table file header. The ELF2CFETBL tool may be used to create table files with specified processor ID values.

Limits

This number must be greater than or equal to zero and less than or equal to 4.

Definition at line 1516 of file example_platform_cfg.h.

12.56.2.157 CFE_PLATFORM_TBL_VALID_SCID_1 `#define CFE_PLATFORM_TBL_VALID_SCID_1 (0x42)`

Purpose Spacecraft ID values used for table load validation

Description:

Defines the spacecraft ID values used for validating the spacecraft ID field in the table file header. To be valid, the spacecraft ID specified in the table file header must match one of the values defined here.

Limits

This value can be any 32 bit unsigned integer.

Definition at line 1496 of file example_platform_cfg.h.

12.56.2.158 CFE_PLATFORM_TBL_VALID_SCID_2 `#define CFE_PLATFORM_TBL_VALID_SCID_2 (CFE_PLATFORM_TBL_U32FROM4CH 'b', 'c', 'd'))`

Definition at line 1497 of file example_platform_cfg.h.

12.56.2.159 CFE_PLATFORM_TBL_VALID_SCID_COUNT `#define CFE_PLATFORM_TBL_VALID_SCID_COUNT 0`

Purpose Number of Spacecraft ID's specified for validation

Description:

Defines the number of specified spacecraft ID values that are verified during table loads. If the number is zero then no validation of the spacecraft ID field in the table file header is performed when tables are loaded. Non-zero values indicate how many values from the list of spacecraft ID's defined below are compared to the spacecraft ID field in the table file header. The ELF2CFETBL tool may be used to create table files with specified spacecraft ID values.

Limits

This number must be greater than or equal to zero and less than or equal to 2.

Definition at line 1478 of file example_platform_cfg.h.

12.56.2.160 CFE_PLATFORM_TIME_CFG_CLIENT `#define CFE_PLATFORM_TIME_CFG_CLIENT false`

Definition at line 1553 of file example_platform_cfg.h.

12.56.2.161 CFE_PLATFORM_TIME_CFG_LATCH_FLY `#define CFE_PLATFORM_TIME_CFG_LATCH_FLY 8`

Purpose Define Periodic Time to Update Local Clock Tone Latch

Description:

Define Periodic Time to Update Local Clock Tone Latch. Applies only when in flywheel mode. This define dictates the period at which the simulated 'last tone' time is updated. Units are seconds.

Limits

Not Applicable

Definition at line 1710 of file example_platform_cfg.h.

12.56.2.162 CFE_PLATFORM_TIME_CFG_SERVER `#define CFE_PLATFORM_TIME_CFG_SERVER true`

Purpose Time Server or Time Client Selection

Description:

This configuration parameter selects whether the Time task functions as a time "server" or "client". A time server generates the "time at the tone" packet which is received by time clients.

Limits

Enable one, and only one by defining either CFE_PLATFORM_TIME_CFG_SERVER or CFE_PLATFORM_TI↩ ME_CFG_CLIENT AS true. The other must be defined as false.

Definition at line 1552 of file example_platform_cfg.h.

12.56.2.163 CFE_PLATFORM_TIME_CFG_SIGNAL `#define CFE_PLATFORM_TIME_CFG_SIGNAL false`

Purpose Include or Exclude the Primary/Redundant Tone Selection Cmd

Description:

Depending on the specific hardware system configuration, it may be possible to switch between a primary and redundant tone signal. If supported by hardware, this definition will enable command interfaces to select the active tone signal. Both Time Clients and Time Servers support this feature. Note: Set the CFE_PLATFORM_TIME_↩ CFG_SIGNAL define to true to enable tone signal commands.

Limits

Not Applicable

Definition at line 1600 of file example_platform_cfg.h.

12.56.2.164 CFE_PLATFORM_TIME_CFG_SOURCE `#define CFE_PLATFORM_TIME_CFG_SOURCE false`

Purpose Include or Exclude the Internal/External Time Source Selection Cmd

Description:

By default, Time Servers maintain time using an internal MET which may be a h/w register or software counter, depending on available hardware. The following definition enables command interfaces to switch between an internal MET, or external time data received from one of several supported external time sources. Only a Time Server may be configured to use external time data. Note: Set the CFE_PLATFORM_TIME_CFG_SOURCE define to true to include the Time Source Selection Command (command allows selection between the internal or external time source). Then choose the external source with the CFE_TIME_CFG_SRC_??? define.

Limits

Only applies if CFE_PLATFORM_TIME_CFG_SERVER is set to true.

Definition at line 1620 of file example_platform_cfg.h.

12.56.2.165 CFE_PLATFORM_TIME_CFG_SRC_GPS `#define CFE_PLATFORM_TIME_CFG_SRC_GPS false`

Definition at line 1637 of file example_platform_cfg.h.

12.56.2.166 CFE_PLATFORM_TIME_CFG_SRC_MET `#define CFE_PLATFORM_TIME_CFG_SRC_MET false`

Purpose Choose the External Time Source for Server only

Description:

If CFE_PLATFORM_TIME_CFG_SOURCE is set to true, then one of the following external time source types must also be set to true. Do not set any of the external time source types to true unless CFE_PLATFORM_TIME_CFG_SOURCE is set to true.

Limits

1. If CFE_PLATFORM_TIME_CFG_SOURCE is set to true then one and only one of the following three external time sources can and must be set true: CFE_PLATFORM_TIME_CFG_SRC_MET, CFE_PLATFORM_TIME_CFG_SRC_GPS, CFE_PLATFORM_TIME_CFG_SRC_TIME
2. Only applies if CFE_PLATFORM_TIME_CFG_SERVER is set to true.

Definition at line 1636 of file example_platform_cfg.h.

12.56.2.167 CFE_PLATFORM_TIME_CFG_SRC_TIME `#define CFE_PLATFORM_TIME_CFG_SRC_TIME false`

Definition at line 1638 of file example_platform_cfg.h.

12.56.2.168 CFE_PLATFORM_TIME_CFG_START_FLY `#define CFE_PLATFORM_TIME_CFG_START_FLY 2`

Purpose Define Time to Start Flywheel Since Last Tone

Description:

Define time to enter flywheel mode (in seconds since last tone data update) Units are microseconds as measured with the local clock.

Limits

Not Applicable

Definition at line 1697 of file example_platform_cfg.h.

12.56.2.169 CFE_PLATFORM_TIME_CFG_TONE_LIMIT `#define CFE_PLATFORM_TIME_CFG_TONE_LIMIT 20000`

Purpose Define Timing Limits From One Tone To The Next

Description:

Defines limits to the timing of the 1Hz tone signal. A tone signal is valid only if it arrives within one second (plus or minus the tone limit) from the previous tone signal.Units are microseconds as measured with the local clock.

Limits

Not Applicable

Definition at line 1685 of file example_platform_cfg.h.

12.56.2.170 CFE_PLATFORM_TIME_CFG_VIRTUAL `#define CFE_PLATFORM_TIME_CFG_VIRTUAL true`

Purpose Time Tone In Big-Endian Order

Description:

If this configuration parameter is defined, the CFE time server will publish time tones with payloads in big-endian order, and time clients will expect the tones to be in big-endian order. This is useful for mixed-endian environments. This will become obsolete once EDS is available and the CFE time tone message is defined.

Purpose Local MET or Virtual MET Selection for Time Servers

Description:

Depending on the specific hardware system configuration, it may be possible for Time Servers to read the "local" MET from a h/w register rather than having to track the MET as the count of tone signal interrupts (virtual MET)

Time Clients must be defined as using a virtual MET. Also, a Time Server cannot be defined as having both a h/w MET and an external time source (they both cannot synchronize to the same tone).
Note: "disable" this define (set to false) only for Time Servers with local hardware that supports a h/w MET that is synchronized to the tone signal !!!

Limits

Only applies if CFE_PLATFORM_TIME_CFG_SERVER is set to true.

Definition at line 1585 of file example_platform_cfg.h.

12.56.2.171 CFE_PLATFORM_TIME_MAX_DELTA_SECS `#define CFE_PLATFORM_TIME_MAX_DELTA_SECS 0`

Purpose Define the Max Delta Limits for Time Servers using an Ext Time Source

Description:

If CFE_PLATFORM_TIME_CFG_SOURCE is set to true and one of the external time sources is also set to true, then the delta time limits for range checking is used.

When a new time value is received from an external source, the value is compared against the "expected" time value. If the delta exceeds the following defined amount, then the new time data will be ignored. This range checking is only performed after the clock state has been commanded to "valid". Until then, external time data is accepted unconditionally.

Limits

Applies only if both CFE_PLATFORM_TIME_CFG_SERVER and CFE_PLATFORM_TIME_CFG_SOURCE are set to true.

Definition at line 1657 of file example_platform_cfg.h.

12.56.2.172 CFE_PLATFORM_TIME_MAX_DELTA_SUBS `#define CFE_PLATFORM_TIME_MAX_DELTA_SU↩ BS 500000`

Definition at line 1658 of file example_platform_cfg.h.

12.56.2.173 CFE_PLATFORM_TIME_MAX_LOCAL_SECS `#define CFE_PLATFORM_TIME_MAX_LOCAL_SECS 27`

Purpose Define the Local Clock Rollover Value in seconds and subseconds

Description:

Specifies the capability of the local clock. Indicates the time at which the local clock rolls over.

Limits

Not Applicable

Definition at line 1670 of file example_platform_cfg.h.

12.56.2.174 CFE_PLATFORM_TIME_MAX_LOCAL_SUBS `#define CFE_PLATFORM_TIME_MAX_LOCAL_SUBS 0`

Definition at line 1671 of file example_platform_cfg.h.

12.56.2.175 CFE_PLATFORM_TIME_ONEHZ_TASK_PRIORITY `#define CFE_PLATFORM_TIME_ONEHZ_TASK_P↩RIORITY 25`

Definition at line 1727 of file example_platform_cfg.h.

12.56.2.176 CFE_PLATFORM_TIME_ONEHZ_TASK_STACK_SIZE `#define CFE_PLATFORM_TIME_ONEHZ_TASK↩_STACK_SIZE 8192`

Definition at line 1746 of file example_platform_cfg.h.

12.56.2.177 CFE_PLATFORM_TIME_START_TASK_PRIORITY `#define CFE_PLATFORM_TIME_START_TASK_PR↩IORITY 60`

Purpose Define TIME Task Priorities

Description:

Defines the cFE_TIME Task priority. Defines the cFE_TIME Tone Task priority. Defines the cFE_TIME 1HZ Task priority.

Limits

There is a lower limit of zero and an upper limit of 255 on these configuration parameters. Remember that the meaning of each task priority is inverted – a "lower" number has a "higher" priority.

Definition at line 1725 of file example_platform_cfg.h.

12.56.2.178 CFE_PLATFORM_TIME_START_TASK_STACK_SIZE `#define CFE_PLATFORM_TIME_START_TASK↩_STACK_SIZE CFE_PLATFORM_ES_DEFAULT_STACK_SIZE`

Purpose Define TIME Task Stack Sizes

Description:

Defines the cFE_TIME Main Task Stack Size Defines the cFE_TIME Tone Task Stack Size Defines the cFE_TIME 1HZ Task Stack Size

Limits

There is a lower limit of 2048 on these configuration parameters. There are no restrictions on the upper limit however, the maximum stack size is system dependent and should be verified. Most operating systems provide tools for measuring the amount of stack used by a task during operation. It is always a good idea to verify that no more than 1/2 of the stack is used.

Definition at line 1744 of file example_platform_cfg.h.

12.56.2.179 CFE_PLATFORM_TIME_TONE_TASK_PRIORITY `#define CFE_PLATFORM_TIME_TONE_TASK_PRIO↩ RITY 25`

Definition at line 1726 of file example_platform_cfg.h.

12.56.2.180 CFE_PLATFORM_TIME_TONE_TASK_STACK_SIZE `#define CFE_PLATFORM_TIME_TONE_TASK_S↩ TACK_SIZE 4096`

Definition at line 1745 of file example_platform_cfg.h.

12.57 cfe/cmake/sample_defs/sample_perfids.h File Reference

Macros

- #define CFE_MISSION_ES_PERF_EXIT_BIT 31

  bit (31) is reserved by the perf utilities

cFE Performance Monitor IDs (Reserved IDs 0-31)

- #define CFE_MISSION_ES_MAIN_PERF_ID 1

  Performance ID for Executive Services Task.
- #define CFE_MISSION_EVS_MAIN_PERF_ID 2

  Performance ID for Events Services Task.
- #define CFE_MISSION_TBL_MAIN_PERF_ID 3

  Performance ID for Table Services Task.
- #define CFE_MISSION_SB_MAIN_PERF_ID 4

  Performance ID for Software Bus Services Task.
- #define CFE_MISSION_SB_MSG_LIM_PERF_ID 5

  Performance ID for Software Bus Msg Limit Errors.
- #define CFE_MISSION_SB_PIPE_OFLOW_PERF_ID 27

  Performance ID for Software Bus Pipe Overflow Errors.
- #define CFE_MISSION_TIME_MAIN_PERF_ID 6

  Performance ID for Time Services Task.
- #define CFE_MISSION_TIME_TONE1HZISR_PERF_ID 7

  Performance ID for 1 Hz Tone ISR.
- #define CFE_MISSION_TIME_LOCAL1HZISR_PERF_ID 8

  Performance ID for 1 Hz Local ISR.
- #define CFE_MISSION_TIME_SENDMET_PERF_ID 9

  Performance ID for Time ToneSendMET.
- #define CFE_MISSION_TIME_LOCAL1HZTASK_PERF_ID 10

  Performance ID for 1 Hz Local Task.
- #define CFE_MISSION_TIME_TONE1HZTASK_PERF_ID 11

  Performance ID for 1 Hz Tone Task.

12.57.1 Detailed Description

Purpose: This file contains the cFE performance IDs
Design Notes: Each performance id is used to identify something that needs to be measured. Performance ids are limited to the range of 0 to CFE_MISSION_ES_PERF_MAX_IDS - 1. Any performance ids outside of this range will be ignored and will be flagged as an error. Note that performance ids 0-31 are reserved for the cFE Core.
References:

12.57.2 Macro Definition Documentation

12.57.2.1 CFE_MISSION_ES_MAIN_PERF_ID `#define CFE_MISSION_ES_MAIN_PERF_ID 1`

Performance ID for Executive Services Task.
Definition at line 42 of file sample_perfids.h.

12.57.2.2 CFE_MISSION_ES_PERF_EXIT_BIT `#define CFE_MISSION_ES_PERF_EXIT_BIT 31`

bit (31) is reserved by the perf utilities
Definition at line 38 of file sample_perfids.h.

12.57.2.3 CFE_MISSION_EVS_MAIN_PERF_ID `#define CFE_MISSION_EVS_MAIN_PERF_ID 2`

Performance ID for Events Services Task.
Definition at line 43 of file sample_perfids.h.

12.57.2.4 CFE_MISSION_SB_MAIN_PERF_ID `#define CFE_MISSION_SB_MAIN_PERF_ID 4`

Performance ID for Software Bus Services Task.
Definition at line 45 of file sample_perfids.h.

12.57.2.5 CFE_MISSION_SB_MSG_LIM_PERF_ID `#define CFE_MISSION_SB_MSG_LIM_PERF_ID 5`

Performance ID for Software Bus Msg Limit Errors.
Definition at line 46 of file sample_perfids.h.

12.57.2.6 CFE_MISSION_SB_PIPE_OFLOW_PERF_ID `#define CFE_MISSION_SB_PIPE_OFLOW_PERF_ID 27`

Performance ID for Software Bus Pipe Overflow Errors.
Definition at line 47 of file sample_perfids.h.

12.57.2.7 CFE_MISSION_TBL_MAIN_PERF_ID `#define CFE_MISSION_TBL_MAIN_PERF_ID 3`

Performance ID for Table Services Task.
Definition at line 44 of file sample_perfids.h.

12.57.2.8 CFE_MISSION_TIME_LOCAL1HZISR_PERF_ID `#define CFE_MISSION_TIME_LOCAL1HZISR_PERF_↩ ID 8`

Performance ID for 1 Hz Local ISR.
Definition at line 51 of file sample_perfids.h.

12.57.2.9 CFE_MISSION_TIME_LOCAL1HZTASK_PERF_ID

```
#define CFE_MISSION_TIME_LOCAL1HZTASK_PER↩
F_ID 10
```

Performance ID for 1 Hz Local Task.
Definition at line 54 of file sample_perfids.h.

12.57.2.10 CFE_MISSION_TIME_MAIN_PERF_ID

```
#define CFE_MISSION_TIME_MAIN_PERF_ID 6
```

Performance ID for Time Services Task.
Definition at line 49 of file sample_perfids.h.

12.57.2.11 CFE_MISSION_TIME_SENDMET_PERF_ID

```
#define CFE_MISSION_TIME_SENDMET_PERF_ID 9
```

Performance ID for Time ToneSendMET.
Definition at line 53 of file sample_perfids.h.

12.57.2.12 CFE_MISSION_TIME_TONE1HZISR_PERF_ID

```
#define CFE_MISSION_TIME_TONE1HZISR_PERF_ID 7
```

Performance ID for 1 Hz Tone ISR.
Definition at line 50 of file sample_perfids.h.

12.57.2.13 CFE_MISSION_TIME_TONE1HZTASK_PERF_ID

```
#define CFE_MISSION_TIME_TONE1HZTASK_PERF_↩
ID 11
```

Performance ID for 1 Hz Tone Task.
Definition at line 55 of file sample_perfids.h.

12.58 cfe/docs/src/cfe_api.dox File Reference

12.59 cfe/docs/src/cfe_es.dox File Reference

12.60 cfe/docs/src/cfe_evs.dox File Reference

12.61 cfe/docs/src/cfe_frontpage.dox File Reference

12.62 cfe/docs/src/cfe_glossary.dox File Reference

12.63 cfe/docs/src/cfe_sb.dox File Reference

12.64 cfe/docs/src/cfe_tbl.dox File Reference

12.65 cfe/docs/src/cfe_time.dox File Reference

12.66 cfe/docs/src/cfe_xref.dox File Reference

12.67 cfe/docs/src/cfs_versions.dox File Reference

12.68 cfe/modules/config/fsw/inc/cfe_config_external.h File Reference

```
#include "cfe_config_api_typedefs.h"
```

Functions

- void CFE_Config_SetupPlatformConfigInfo (void)

12.68.1 Detailed Description

Initialization for CFE configuration registry, external items
These are generated from the build system, they are not directly set

12.68.2 Function Documentation

12.68.2.1 CFE_Config_SetupPlatformConfigInfo()

```
void CFE_Config_SetupPlatformConfigInfo (
    void )
```

12.69 cfe/modules/config/fsw/inc/cfe_config_init.h File Reference

```
#include "cfe_config_api_typedefs.h"
#include "cfe_config_ids.h"
```

Functions

- void CFE_Config_SetupBasicBuildInfo (void)
- int32 CFE_Config_Init (void)

12.69.1 Detailed Description

Function declarations for items implemented in init.c

12.69.2 Function Documentation

12.69.2.1 CFE_Config_Init()

```
int32 CFE_Config_Init (
    void )
```

12.69.2.2 CFE_Config_SetupBasicBuildInfo()

```
void CFE_Config_SetupBasicBuildInfo (
    void )
```

12.70 cfe/modules/config/fsw/inc/cfe_config_lookup.h File Reference

```
#include "cfe_config_api_typedefs.h"
#include "cfe_config_table.h"
```

Functions

- CFE_Config_ValueEntry_t * CFE_Config_LocateConfigRecordByID (CFE_ConfigId_t ConfigId)

  Gets the value record associated with a config ID.

12.70.1 Detailed Description

Function declarations for items implemented in lookup.c

12.70.2 Function Documentation

12.70.2.1 CFE_Config_LocateConfigRecordByID()

```
CFE_Config_ValueEntry_t* CFE_Config_LocateConfig↩
RecordByID (
            CFE_ConfigId_t ConfigId )
```

Gets the value record associated with a config ID.

12.71 cfe/modules/config/fsw/inc/cfe_config_nametable.h File Reference

```
#include "cfe_configid_offset.h"
```

Data Structures

- struct CFE_Config_IdNameEntry

Typedefs

- typedef struct CFE_Config_IdNameEntry CFE_Config_IdNameEntry_t

Variables

- const CFE_Config_IdNameEntry_t CFE_CONFIGID_NAMETABLE [ ]

12.71.1 Detailed Description

This file contains the CFE configuration registry global data definitions.

12.71.2 Typedef Documentation

12.71.2.1 CFE_Config_IdNameEntry_t

```
typedef struct CFE_Config_IdNameEntry CFE_Config_IdNameEntry_t
```

12.71.3 Variable Documentation

12.71.3.1 CFE_CONFIGID_NAMETABLE

```
const CFE_Config_IdNameEntry_t CFE_CONFIGID_NAMETABLE[ ]
```

12.72 cfe/modules/config/fsw/inc/cfe_config_set.h File Reference

```
#include "cfe_config_api_typedefs.h"
```

Functions

- void CFE_Config_SetValue (CFE_ConfigId_t ConfigId, uint32 Value)
- void CFE_Config_SetObjPointer (CFE_ConfigId_t ConfigId, const void *Ptr)
- void CFE_Config_SetString (CFE_ConfigId_t ConfigId, const char *Ptr)
- void CFE_Config_SetArrayValue (CFE_ConfigId_t ConfigId, const CFE_Config_ArrayValue_t *ArrayPtr)

12.72.1 Detailed Description

Function declarations for items implemented in set.c

12.72.2 Function Documentation

12.72.2.1 CFE_Config_SetArrayValue()

```
void CFE_Config_SetArrayValue (
    CFE_ConfigId_t ConfigId,
    const CFE_Config_ArrayValue_t * ArrayPtr )
```

12.72.2.2 CFE_Config_SetObjPointer()

```
void CFE_Config_SetObjPointer (
    CFE_ConfigId_t ConfigId,
    const void * Ptr )
```

12.72.2.3 CFE_Config_SetString()

```
void CFE_Config_SetString (
    CFE_ConfigId_t ConfigId,
    const char * Ptr )
```

12.72.2.4 CFE_Config_SetValue()

```
void CFE_Config_SetValue (
    CFE_ConfigId_t ConfigId,
    uint32 Value )
```

12.73 cfe/modules/config/fsw/inc/cfe_config_table.h File Reference

```
#include "common_types.h"
#include "cfe_config_ids.h"
```

Data Structures

- union CFE_Config_ValueBuffer
- struct CFE_Config_ValueEntry

Typedefs

- typedef enum CFE_ConfigType CFE_ConfigType_t
- typedef union CFE_Config_ValueBuffer CFE_Config_ValueBuffer_t
- typedef struct CFE_Config_ValueEntry CFE_Config_ValueEntry_t

Enumerations

- enum CFE_ConfigType { CFE_ConfigType_UNDEFINED, CFE_ConfigType_VALUE, CFE_ConfigType_STRING, CFE_ConfigType_POINTER, CFE_ConfigType_ARRAY }

12.73.1 Detailed Description

This file contains the CFE configuration registry global data definitions.

12.73.2 Typedef Documentation

12.73.2.1 CFE_Config_ValueBuffer_t `typedef union CFE_Config_ValueBuffer CFE_Config_ValueBuffer_t`

12.73.2.2 CFE_Config_ValueEntry_t `typedef struct CFE_Config_ValueEntry CFE_Config_ValueEntry_t`

12.73.2.3 CFE_ConfigType_t `typedef enum CFE_ConfigType CFE_ConfigType_t`

12.73.3 Enumeration Type Documentation

12.73.3.1 CFE_ConfigType `enum CFE_ConfigType`

Enumerator

CFE_ConfigType_UNDEFINED	
CFE_ConfigType_VALUE	Value is an unsigned int
CFE_ConfigType_STRING	Value is a string pointer
CFE_ConfigType_POINTER	Value is a non-string object pointer
CFE_ConfigType_ARRAY	Value is a combination of length and pointer

Definition at line 34 of file cfe_config_table.h.

12.74 cfe/modules/core_api/config/default_cfe_core_api_base_msgids.h File Reference

Macros

- #define CFE_CPU1_CMD_MID_BASE 0x1800

  Platform command message ID base offset.
- #define CFE_CPU1_TLM_MID_BASE 0x0800

  Platform telemetry message ID base offset.
- #define CFE_GLOBAL_CMD_MID_BASE 0x1860

  "Global" command message ID base offset
- #define CFE_GLOBAL_TLM_MID_BASE 0x0860

  "Global" telemetry message ID base offset
- #define CFE_PLATFORM_CMD_TOPICID_TO_MIDV(topic) (CFE_CPU1_CMD_MID_BASE | (topic))

  Convert a command topic ID to a MsgID value.
- #define CFE_PLATFORM_TLM_TOPICID_TO_MIDV(topic) (CFE_CPU1_TLM_MID_BASE | (topic))

  Convert a telemetry topic ID to a MsgID value.
- #define CFE_GLOBAL_CMD_TOPICID_TO_MIDV(topic) (CFE_GLOBAL_CMD_MID_BASE | (topic))

  Convert a "global" command topic ID to a MsgID value.
- #define CFE_GLOBAL_TLM_TOPICID_TO_MIDV(topic) (CFE_GLOBAL_TLM_MID_BASE | (topic))

  Convert a "global" telemetry topic ID to a MsgID value.

12.74.1 Detailed Description

This header file contains the platform-specific base msg ID values and logic to convert a topic ID to a message ID value.

12.74.2 Macro Definition Documentation

12.74.2.1 CFE_CPU1_CMD_MID_BASE `#define CFE_CPU1_CMD_MID_BASE 0x1800`

Platform command message ID base offset.

Example mechanism for setting default command bits and deconflicting MIDs across multiple platforms in a mission. For any sufficiently complex mission this method is typically replaced by a centralized message ID management scheme.

0x1800 - Nominal value for default message ID implementation (V1). This sets the command field and the secondary header present field. Typical V1 command MID range is 0x1800-1FFF. Additional cpus can deconflict message IDs by incrementing this value to provide sub-allocations (0x1900 for example). 0x0080 - Command bit for MISSION_MSGI↩ D_V2 message ID implementation (V2). Although this can be used for the value below due to the relatively small set of MIDs in the framework it will not scale so an alternative method of deconfliction is recommended.

Definition at line 46 of file default_cfe_core_api_base_msgids.h.

12.74.2.2 CFE_CPU1_TLM_MID_BASE `#define CFE_CPU1_TLM_MID_BASE 0x0800`

Platform telemetry message ID base offset.

0x0800 - Nominal for message ID V1 0x0000 - Potential value for MISSION_MSGID_V2, but limited to a range of 0x0000-0x007F since the command bit is 0x0080. Alternative method of deconfliction is recommended.

See CFE_CPU1_CMD_MID_BASE for more information

Definition at line 58 of file default_cfe_core_api_base_msgids.h.

12.74.2.3 CFE_GLOBAL_CMD_MID_BASE `#define CFE_GLOBAL_CMD_MID_BASE 0x1860`

"Global" command message ID base offset

0x1860 - Nominal value for message ID V1 0x00E0 - Potential value for MISSION_MSGID_V2, note command bit is 0x0080. Works in limited cases only, alternative method of deconfliction is recommended. See CFE_CPU1_CMD_MID_BASE for more information

Definition at line 69 of file default_cfe_core_api_base_msgids.h.

12.74.2.4 CFE_GLOBAL_CMD_TOPICID_TO_MIDV `#define CFE_GLOBAL_CMD_TOPICID_TO_MIDV( topic ) (CFE_GLOBAL_CMD_MID_BASE | (topic))`

Convert a "global" command topic ID to a MsgID value.

A global command is one that is not specific to an individual instance of CFE, but rather intended to be broadcast to all CFE instances at the same time.

This is otherwise identical to CFE_PLATFORM_CMD_TOPICID_TO_MIDV

Definition at line 116 of file default_cfe_core_api_base_msgids.h.

12.74.2.5 CFE_GLOBAL_TLM_MID_BASE `#define CFE_GLOBAL_TLM_MID_BASE 0x0860`

"Global" telemetry message ID base offset

0x0860 - Nominal value for message ID V1 0x0060 - Potential value for MISSION_MSGID_V2, note command bit is 0x0080. Works in limited cases only, alternative method of deconfliction is recommended. See CFE_CPU1_CMD_MID_BASE for more information

Definition at line 80 of file default_cfe_core_api_base_msgids.h.

12.74.2.6 CFE_GLOBAL_TLM_TOPICID_TO_MIDV

```
#define CFE_GLOBAL_TLM_TOPICID_TO_MIDV( topic ) (CFE_GLOBAL_TLM_MID_BASE | (topic))
```

Convert a "global" telemetry topic ID to a MsgID value.
A global telemetry is one that is not specific to an individual instance of CFE, but rather intended to be broadcast to all CFE instances at the same time.
This is otherwise identical to CFE_PLATFORM_TLM_TOPICID_TO_MIDV
Definition at line 126 of file default_cfe_core_api_base_msgids.h.

12.74.2.7 CFE_PLATFORM_CMD_TOPICID_TO_MIDV

```
#define CFE_PLATFORM_CMD_TOPICID_TO_MIDV( topic ) (CFE_CPU1_CMD_MID_BASE | (topic))
```

Convert a command topic ID to a MsgID value.
This defines the logic to convert a topic ID value into a message ID value. This operates on integer values and should resolve at compile time such that it can be used in e.g. switch/case statements.

Note

The result of this conversion is a simple integer, thus also needs to go through CFE_SB_ValueToMsgId() to obtain a properly-typed CFE_SB_MsgId_t for interacting with SB APIs.

Definition at line 93 of file default_cfe_core_api_base_msgids.h.

12.74.2.8 CFE_PLATFORM_TLM_TOPICID_TO_MIDV

```
#define CFE_PLATFORM_TLM_TOPICID_TO_MIDV( topic ) (CFE_CPU1_TLM_MID_BASE | (topic))
```

Convert a telemetry topic ID to a MsgID value.
This defines the logic to convert a topic ID value into a message ID value. This operates on integer values and should resolve at compile time such that it can be used in e.g. switch/case statements.

Note

The result of this conversion is a simple integer, thus also needs to go through CFE_SB_ValueToMsgId() to obtain a properly-typed CFE_SB_MsgId_t for interacting with SB APIs.

Definition at line 106 of file default_cfe_core_api_base_msgids.h.

12.75 cfe/modules/core_api/config/default_cfe_core_api_interface_cfg.h File Reference

Macros

- #define CFE_MISSION_MAX_PATH_LEN 64
- #define CFE_MISSION_MAX_FILE_LEN 20
- #define CFE_MISSION_MAX_API_LEN 20
- #define CFE_MISSION_MAX_NUM_FILES 50

12.75.1 Detailed Description

Purpose: This header file contains the mission configuration parameters and typedefs with mission scope.

12.75.2 Macro Definition Documentation

12.75.2.1 CFE_MISSION_MAX_API_LEN `#define CFE_MISSION_MAX_API_LEN 20`

Purpose cFE Maximum length for API names within data exchange structures

Description:

The value of this constant dictates the size of filenames within all structures used for external data exchange, such as Software bus messages and table definitions. This is typically the same as OS_MAX_API_LEN but that is OSAL dependent – and as such it definable on a per-processor/OS basis and hence may be different across multiple processors. It is recommended to set this to the value of the largest OS_MAX_API_LEN in use on any CPU on the mission.

This affects only the layout of command/telemetry messages and table definitions; internal allocation may use the platform-specific OS_MAX_API_LEN value.
This length must include an extra character for NULL termination.

Limits

All CPUs within the same SB domain (mission) must share the same definition Note this affects the size of messages, so it must not cause any message to exceed the max length.

This value should be kept as a multiple of 4, to maintain alignment of any possible neighboring fields without implicit padding.
Definition at line 108 of file default_cfe_core_api_interface_cfg.h.

12.75.2.2 CFE_MISSION_MAX_FILE_LEN `#define CFE_MISSION_MAX_FILE_LEN 20`

Purpose cFE Maximum length for filenames within data exchange structures

Description:

The value of this constant dictates the size of filenames within all structures used for external data exchange, such as Software bus messages and table definitions. This is typically the same as OS_MAX_FILE_LEN but that is OSAL dependent – and as such it definable on a per-processor/OS basis and hence may be different across multiple processors. It is recommended to set this to the value of the largest OS_MAX_FILE_LEN in use on any CPU on the mission.

This affects only the layout of command/telemetry messages and table definitions; internal allocation may use the platform-specific OS_MAX_FILE_LEN value.
This length must include an extra character for NULL termination.

Limits

All CPUs within the same SB domain (mission) and ground tools must share the same definition. Note this affects the size of messages, so it must not cause any message to exceed the max length.

This value should be kept as a multiple of 4, to maintain alignment of any possible neighboring fields without implicit padding.
Definition at line 82 of file default_cfe_core_api_interface_cfg.h.

12.75.2.3 CFE_MISSION_MAX_NUM_FILES `#define CFE_MISSION_MAX_NUM_FILES 50`

Purpose cFE Maximum number of files in a message/data exchange

Description:

The value of this constant dictates the maximum number of files within all structures used for external data exchange, such as Software bus messages and table definitions. This is typically the same as OS_MAX_NUM_O↩ PEN_FILES but that is OSAL dependent – and as such it definable on a per-processor/OS basis and hence may be different across multiple processors. It is recommended to set this to the value of the largest OS_MAX_NU↩ M_OPEN_FILES in use on any CPU on the mission.

This affects only the layout of command/telemetry messages and table definitions; internal allocation may use the platform-specific OS_MAX_NUM_OPEN_FILES value.

Limits

All CPUs within the same SB domain (mission) must share the same definition Note this affects the size of messages, so it must not cause any message to exceed the max length.

Definition at line 130 of file default_cfe_core_api_interface_cfg.h.

12.75.2.4 CFE_MISSION_MAX_PATH_LEN `#define CFE_MISSION_MAX_PATH_LEN 64`

Purpose cFE Maximum length for pathnames within data exchange structures

Description:

The value of this constant dictates the size of pathnames within all structures used for external data exchange, such as Software bus messages and table definitions. This is typically the same as OS_MAX_PATH_LEN but that is OSAL dependent – and as such it definable on a per-processor/OS basis and hence may be different across multiple processors. It is recommended to set this to the value of the largest OS_MAX_PATH_LEN in use on any CPU on the mission.

This affects only the layout of command/telemetry messages and table definitions; internal allocation may use the platform-specific OS_MAX_PATH_LEN value.
This length must include an extra character for NULL termination.

Limits

All CPUs within the same SB domain (mission) and ground tools must share the same definition. Note this affects the size of messages, so it must not cause any message to exceed the max length.

This value should be kept as a multiple of 4, to maintain alignment of any possible neighboring fields without implicit padding.
Definition at line 55 of file default_cfe_core_api_interface_cfg.h.

12.76 cfe/modules/core_api/config/default_cfe_mission_cfg.h File Reference

```
#include "cfe_core_api_interface_cfg.h"
#include "cfe_es_mission_cfg.h"
#include "cfe_evs_mission_cfg.h"
#include "cfe_sb_mission_cfg.h"
#include "cfe_tbl_mission_cfg.h"
#include "cfe_time_mission_cfg.h"
#include "cfe_fs_mission_cfg.h"
```

12.76.1 Detailed Description

Purpose: This header file contains the mission configuration parameters and typedefs with mission scope.

12.77 cfe/modules/core_api/config/default_cfe_msgids.h File Reference

```
#include "cfe_es_msgids.h"
#include "cfe_evs_msgids.h"
#include "cfe_sb_msgids.h"
#include "cfe_tbl_msgids.h"
#include "cfe_time_msgids.h"
```

12.77.1 Detailed Description

Purpose: This header file contains the Message Id's for messages used by the cFE core.

12.78 cfe/modules/core_api/fsw/inc/cfe.h File Reference

```
#include "common_types.h"
#include "osapi.h"
#include "cfe_mission_cfg.h"
#include "cfe_error.h"
#include "cfe_es.h"
#include "cfe_evs.h"
#include "cfe_fs.h"
#include "cfe_sb.h"
#include "cfe_time.h"
#include "cfe_tbl.h"
#include "cfe_msg.h"
#include "cfe_resourceid.h"
#include "cfe_psp.h"
```

12.78.1 Detailed Description

Purpose: cFE header file
Author: David Kobe, the Hammers Company, Inc.
Notes: This header file centralizes the includes for all cFE Applications. It includes all header files necessary to completely define the cFE interface.

12.79 cfe/modules/core_api/fsw/inc/cfe_config.h File Reference

```
#include "common_types.h"
#include "cfe_config_api_typedefs.h"
#include "cfe_config_ids.h"
```

Functions

- uint32 CFE_Config_GetValue (CFE_ConfigId_t ConfigId)

  Obtain an integer value correlating to an CFE configuration ID.
- const void * CFE_Config_GetObjPointer (CFE_ConfigId_t ConfigId)

  Obtain a pointer value correlating to an CFE configuration ID.
- CFE_Config_ArrayValue_t CFE_Config_GetArrayValue (CFE_ConfigId_t ConfigId)

  Obtain an array correlating to an CFE configuration ID.
- const char * CFE_Config_GetString (CFE_ConfigId_t ConfigId)

  Obtain a string value correlating to an CFE configuration ID.

- const char * CFE_Config_GetName (CFE_ConfigId_t ConfigId)

  Obtain the name of a CFE configuration ID.
- CFE_ConfigId_t CFE_Config_GetIdByName (const char *Name)

  Obtain the ID value associated with a configuration name.
- void CFE_Config_IterateAll (void *Arg, CFE_Config_Callback_t Callback)

  Iterate all known name/ID value pairs.
- void CFE_Config_GetVersionString (char *Buf, size_t Size, const char *Component, const char *SrcVersion, const char *CodeName, const char *LastOffcRel)

  Obtain the version string for a cFS component or app.

12.79.1 Detailed Description

Title: cFE Status Code Definition Header File
Purpose: Common source of cFE API return status codes.
Design Notes:
References: Flight Software Branch C Coding Standard Version 1.0a

12.79.2 Function Documentation

12.79.2.1 CFE_Config_GetArrayValue() `CFE_Config_ArrayValue_t CFE_Config_GetArrayValue ( CFE_ConfigId_t ConfigId )`

Obtain an array correlating to an CFE configuration ID.
Retreives the CFE_Config_ArrayValue_t value associated with the specified key. This combines an array length (number of elements) and a pointer to the first element.
If no value has been set, or the key is not valid, this returns 0 / NULL.

Parameters

in	*ConfigId*	Configuration ID/Key to look up

Returns

Value associated with key

Return values

NULL	if key is not defined or not set

12.79.2.2 CFE_Config_GetIdByName() `CFE_ConfigId_t CFE_Config_GetIdByName ( const char * Name )`

Obtain the ID value associated with a configuration name.

Parameters

in	*Name*	The name of the ID to look up

Returns

ID associated with name

Return values

CFE_CONFIGID_UNDEFINED	if the name did not correspond to a key

12.79.2.3 CFE_Config_GetName() `const char* CFE_Config_GetName ( CFE_ConfigId_t ConfigId )`

Obtain the name of a CFE configuration ID.
Retreives the printable name associated with the specified key.

Note

This function does not return NULL.

If the ID is not valid/known, then the implementation returns the special string '[unknown]' rather than NULL, so this function may be more easily used in printf() style calls.

Parameters

in	*ConfigId*	Configuration ID/Key to look up

Returns

Name associated with key

12.79.2.4 CFE_Config_GetObjPointer() `const void* CFE_Config_GetObjPointer ( CFE_ConfigId_t ConfigId )`

Obtain a pointer value correlating to an CFE configuration ID.
Retreives the pointer value associated with the specified key.
If no value has been set, or the key is not valid, this returns NULL.

Parameters

in	*ConfigId*	Configuration ID/Key to look up

Returns

Value associated with key

Return values

NULL	if key is not defined or not set

12.79.2.5 CFE_Config_GetString()

```
const char* CFE_Config_GetString (
    CFE_ConfigId_t ConfigId )
```

Obtain a string value correlating to an CFE configuration ID.
Retreives the string value associated with the specified key.
If no value has been set, or the key is not valid, this returns the special string "UNDEFINED"

Note

This function does not return NULL, so it can be used directly in printf-style calls.

Parameters

in	*ConfigId*	Configuration ID/Key to look up

Returns

String value associated with key

12.79.2.6 CFE_Config_GetValue()

```
uint32 CFE_Config_GetValue (
    CFE_ConfigId_t ConfigId )
```

Obtain an integer value correlating to an CFE configuration ID.
Retreives the integer value associated with the specified key.
If no value has been set, or the key is not valid, this returns 0.

Parameters

in	*ConfigId*	Configuration ID/Key to look up

Returns

Value associated with key

Return values

0	if key is not defined or not set

12.79.2.7 CFE_Config_GetVersionString()

```
void CFE_Config_GetVersionString (
    char * Buf,
    size_t Size,
    const char * Component,
    const char * SrcVersion,
    const char * CodeName,
    const char * LastOffcRel )
```

Obtain the version string for a cFS component or app.
Assembles a standardized version string associated with the specified component/app.

Parameters

in	*Buf*	Buffer to place version string in. Will be populated with standard version string containing the provided parameters (i.e.: "cFE DEVELOPMENT BUILD equuleus-rc1+dev0 (Codename equueleus), Last Official Release: cFE 6.7.0"
in	*Size*	Size of the provided buffer
in	*Component*	Component for which to get version string (i.e. "cFE")
in	*SrcVersion*	Source version identifier (i.e. "equuleus-rc1+dev0")
in	*CodeName*	Code name for the build (i.e. "equuleus")
in	*LastOffcRel*	Last official release (i.e. "6.7.0")

12.79.2.8 CFE_Config_IterateAll()

```
void CFE_Config_IterateAll (
    void * Arg,
    CFE_Config_Callback_t Callback )
```

Iterate all known name/ID value pairs.

Parameters

in	*Arg*	User-supplied opaque argument to pass to callback
in	*Callback*	User-supplied callback function to invoke for each ID

12.80 cfe/modules/core_api/fsw/inc/cfe_config_api_typedefs.h File Reference

```
#include "common_types.h"
#include "cfe_resourceid_api_typedefs.h"
```

Data Structures

- struct CFE_Config_ArrayValue

  Wrapper type for array configuration.

Macros

- #define CFE_CONFIGID_C(val) ((CFE_ConfigId_t)CFE_RESOURCEID_WRAP(val))
- #define CFE_CONFIGID_UNDEFINED CFE_CONFIGID_C(CFE_RESOURCEID_UNDEFINED)

Typedefs

- typedef CFE_RESOURCEID_BASE_TYPE CFE_ConfigId_t

  A type for Configuration IDs.
- typedef void(∗ CFE_Config_Callback_t) (void ∗Arg, CFE_ConfigId_t Id, const char ∗Name)
- typedef struct CFE_Config_ArrayValue CFE_Config_ArrayValue_t

  Wrapper type for array configuration.

12.80.1 Detailed Description

Title: cFE Status Code Definition Header File
Purpose: Common source of cFE API return status codes.
Design Notes:
References: Flight Software Branch C Coding Standard Version 1.0a

12.80.2 Macro Definition Documentation

12.80.2.1 CFE_CONFIGID_C

```
#define CFE_CONFIGID_C(
    val ) ((CFE_ConfigId_t)CFE_RESOURCEID_WRAP(val))
```

Definition at line 48 of file cfe_config_api_typedefs.h.

12.80.2.2 CFE_CONFIGID_UNDEFINED

```
#define CFE_CONFIGID_UNDEFINED CFE_CONFIGID_C(CFE_RESOURCEID_UNDEFINED)
```

Definition at line 49 of file cfe_config_api_typedefs.h.

12.80.3 Typedef Documentation

12.80.3.1 CFE_Config_ArrayValue_t

```
typedef struct CFE_Config_ArrayValue CFE_Config_ArrayValue_t
```

Wrapper type for array configuration.
This is a pair containing a size and pointer that is get/set via a single config table entry

12.80.3.2 CFE_Config_Callback_t

```
typedef void(* CFE_Config_Callback_t) (void *Arg, CFE_ConfigId_t
Id, const char *Name)
```

Definition at line 51 of file cfe_config_api_typedefs.h.

12.80.3.3 CFE_ConfigId_t

```
typedef CFE_RESOURCEID_BASE_TYPE CFE_ConfigId_t
```

A type for Configuration IDs.
This is the type that is used for any API accepting or returning a configuration key ID
Definition at line 46 of file cfe_config_api_typedefs.h.

12.81 cfe/modules/core_api/fsw/inc/cfe_endian.h File Reference

```
#include "common_types.h"
```

Macros

- #define CFE_MAKE_BIG16(n) ((((n)&0x00FF) << 8) | (((n)&0xFF00) >> 8))
- #define CFE_MAKE_BIG32(n) ((((n)&0x000000FF) << 24) | (((n)&0x0000FF00) << 8) | (((n)&0x00FF0000) >> 8) | (((n)&0xFF000000) >> 24))

12.81.1 Detailed Description

Purpose: Define macros to enforce big-endian/network byte order for 16 and 32 bit integers

12.81.2 Macro Definition Documentation

12.81.2.1 CFE_MAKE_BIG16

```
#define CFE_MAKE_BIG16(
    n ) ((((n)&0x00FF) << 8) | (((n)&0xFF00) >> 8))
```

Definition at line 64 of file cfe_endian.h.

12.81.2.2 CFE_MAKE_BIG32

```
#define CFE_MAKE_BIG32(
    n ) ((((n)&0x000000FF) << 24) | (((n)&0x0000FF00) << 8) | (((n)&0x00FF0000) >> 8) |
(((n)&0xFF000000) >> 24))
```

Definition at line 65 of file cfe_endian.h.

12.82 cfe/modules/core_api/fsw/inc/cfe_error.h File Reference

```
#include "osapi.h"
```

Macros

- #define CFE_STATUS_C(X) ((CFE_Status_t)(X))

  cFE Status macro for literal
- #define CFE_STATUS_STRING_LENGTH 11

  cFE Status converted to string length limit
- #define CFE_SEVERITY_BITMASK ((CFE_Status_t)0xc0000000)

  Error Severity Bitmask.
- #define CFE_SEVERITY_SUCCESS ((CFE_Status_t)0x00000000)

  Severity Success.
- #define CFE_SEVERITY_INFO ((CFE_Status_t)0x40000000)

  Severity Info.
- #define CFE_SEVERITY_ERROR ((CFE_Status_t)0xc0000000)

  Severity Error.
- #define CFE_SERVICE_BITMASK ((CFE_Status_t)0x0e000000)

  Error Service Bitmask.
- #define CFE_EVENTS_SERVICE ((CFE_Status_t)0x02000000)

  Event Service.
- #define CFE_EXECUTIVE_SERVICE ((CFE_Status_t)0x04000000)

  Executive Service.
- #define CFE_FILE_SERVICE ((CFE_Status_t)0x06000000)

  File Service.
- #define CFE_GENERIC_SERVICE ((CFE_Status_t)0x08000000)

  Generic Service.
- #define CFE_SOFTWARE_BUS_SERVICE ((CFE_Status_t)0x0a000000)

  Software Bus Service.
- #define CFE_TABLE_SERVICE ((CFE_Status_t)0x0c000000)

  Table Service.
- #define CFE_TIME_SERVICE ((CFE_Status_t)0x0e000000)

  Time Service.
- #define CFE_SUCCESS ((CFE_Status_t)0)

Successful execution.

- #define CFE_STATUS_NO_COUNTER_INCREMENT ((CFE_Status_t)0x48000001)

  No Counter Increment.
- #define CFE_STATUS_WRONG_MSG_LENGTH ((CFE_Status_t)0xc8000002)

  Wrong Message Length.
- #define CFE_STATUS_UNKNOWN_MSG_ID ((CFE_Status_t)0xc8000003)

  Unknown Message ID.
- #define CFE_STATUS_BAD_COMMAND_CODE ((CFE_Status_t)0xc8000004)

  Bad Command Code.
- #define CFE_STATUS_EXTERNAL_RESOURCE_FAIL ((CFE_Status_t)0xc8000005)

  External failure.
- #define CFE_STATUS_REQUEST_ALREADY_PENDING ((int32)0xc8000006)

  Request already pending.
- #define CFE_STATUS_VALIDATION_FAILURE ((int32)0xc8000007)

  Request or input value failed basic structural validation.
- #define CFE_STATUS_RANGE_ERROR ((int32)0xc8000008)

  Request or input value is out of range.
- #define CFE_STATUS_INCORRECT_STATE ((int32)0xc8000009)

  Cannot process request at this time.
- #define CFE_STATUS_NOT_IMPLEMENTED ((CFE_Status_t)0xc800ffff)

  Not Implemented.
- #define CFE_EVS_UNKNOWN_FILTER ((CFE_Status_t)0xc2000001)

  Unknown Filter.
- #define CFE_EVS_APP_NOT_REGISTERED ((CFE_Status_t)0xc2000002)

  Application Not Registered.
- #define CFE_EVS_APP_ILLEGAL_APP_ID ((CFE_Status_t)0xc2000003)

  Illegal Application ID.
- #define CFE_EVS_APP_FILTER_OVERLOAD ((CFE_Status_t)0xc2000004)

  Application Filter Overload.
- #define CFE_EVS_RESET_AREA_POINTER ((CFE_Status_t)0xc2000005)

  Reset Area Pointer Failure.
- #define CFE_EVS_EVT_NOT_REGISTERED ((CFE_Status_t)0xc2000006)

  Event Not Registered.
- #define CFE_EVS_FILE_WRITE_ERROR ((CFE_Status_t)0xc2000007)

  File Write Error.
- #define CFE_EVS_INVALID_PARAMETER ((CFE_Status_t)0xc2000008)

  Invalid Pointer.
- #define CFE_EVS_APP_SQUELCHED ((CFE_Status_t)0xc2000009)

  Event squelched.
- #define CFE_EVS_NOT_IMPLEMENTED ((CFE_Status_t)0xc200ffff)

  Not Implemented.
- #define CFE_ES_ERR_RESOURCEID_NOT_VALID ((CFE_Status_t)0xc4000001)

  Resource ID is not valid.
- #define CFE_ES_ERR_NAME_NOT_FOUND ((CFE_Status_t)0xc4000002)

  Resource Name Error.
- #define CFE_ES_ERR_APP_CREATE ((CFE_Status_t)0xc4000004)

  Application Create Error.

- #define CFE_ES_ERR_CHILD_TASK_CREATE ((CFE_Status_t)0xc4000005)

  Child Task Create Error.
- #define CFE_ES_ERR_SYS_LOG_FULL ((CFE_Status_t)0xc4000006)

  System Log Full.
- #define CFE_ES_ERR_MEM_BLOCK_SIZE ((CFE_Status_t)0xc4000008)

  Memory Block Size Error.
- #define CFE_ES_ERR_LOAD_LIB ((CFE_Status_t)0xc4000009)

  Load Library Error.
- #define CFE_ES_BAD_ARGUMENT ((CFE_Status_t)0xc400000a)

  Bad Argument.
- #define CFE_ES_ERR_CHILD_TASK_REGISTER ((CFE_Status_t)0xc400000b)

  Child Task Register Error.
- #define CFE_ES_CDS_ALREADY_EXISTS ((CFE_Status_t)0x4400000d)

  CDS Already Exists.
- #define CFE_ES_CDS_INSUFFICIENT_MEMORY ((CFE_Status_t)0xc400000e)

  CDS Insufficient Memory.
- #define CFE_ES_CDS_INVALID_NAME ((CFE_Status_t)0xc400000f)

  CDS Invalid Name.
- #define CFE_ES_CDS_INVALID_SIZE ((CFE_Status_t)0xc4000010)

  CDS Invalid Size.
- #define CFE_ES_CDS_INVALID ((CFE_Status_t)0xc4000012)

  CDS Invalid.
- #define CFE_ES_CDS_ACCESS_ERROR ((CFE_Status_t)0xc4000013)

  CDS Access Error.
- #define CFE_ES_FILE_IO_ERR ((CFE_Status_t)0xc4000014)

  File IO Error.
- #define CFE_ES_RST_ACCESS_ERR ((CFE_Status_t)0xc4000015)

  Reset Area Access Error.
- #define CFE_ES_ERR_APP_REGISTER ((CFE_Status_t)0xc4000017)

  Application Register Error.
- #define CFE_ES_ERR_CHILD_TASK_DELETE ((CFE_Status_t)0xc4000018)

  Child Task Delete Error.
- #define CFE_ES_ERR_CHILD_TASK_DELETE_MAIN_TASK ((CFE_Status_t)0xc4000019)

  Child Task Delete Passed Main Task.
- #define CFE_ES_CDS_BLOCK_CRC_ERR ((CFE_Status_t)0xc400001A)

  CDS Block CRC Error.
- #define CFE_ES_MUT_SEM_DELETE_ERR ((CFE_Status_t)0xc400001B)

  Mutex Semaphore Delete Error.
- #define CFE_ES_BIN_SEM_DELETE_ERR ((CFE_Status_t)0xc400001C)

  Binary Semaphore Delete Error.
- #define CFE_ES_COUNT_SEM_DELETE_ERR ((CFE_Status_t)0xc400001D)

  Counting Semaphore Delete Error.
- #define CFE_ES_QUEUE_DELETE_ERR ((CFE_Status_t)0xc400001E)

  Queue Delete Error.
- #define CFE_ES_FILE_CLOSE_ERR ((CFE_Status_t)0xc400001F)

  File Close Error.
- #define CFE_ES_CDS_WRONG_TYPE_ERR ((CFE_Status_t)0xc4000020)

CDS Wrong Type Error.

- #define CFE_ES_CDS_OWNER_ACTIVE_ERR ((CFE_Status_t)0xc4000022)

  CDS Owner Active Error.
- #define CFE_ES_APP_CLEANUP_ERR ((CFE_Status_t)0xc4000023)

  Application Cleanup Error.
- #define CFE_ES_TIMER_DELETE_ERR ((CFE_Status_t)0xc4000024)

  Timer Delete Error.
- #define CFE_ES_BUFFER_NOT_IN_POOL ((CFE_Status_t)0xc4000025)

  Buffer Not In Pool.
- #define CFE_ES_TASK_DELETE_ERR ((CFE_Status_t)0xc4000026)

  Task Delete Error.
- #define CFE_ES_OPERATION_TIMED_OUT ((CFE_Status_t)0xc4000027)

  Operation Timed Out.
- #define CFE_ES_LIB_ALREADY_LOADED ((CFE_Status_t)0x44000028)

  Library Already Loaded.
- #define CFE_ES_ERR_SYS_LOG_TRUNCATED ((CFE_Status_t)0x44000029)

  System Log Message Truncated.
- #define CFE_ES_NO_RESOURCE_IDS_AVAILABLE ((CFE_Status_t)0xc400002B)

  Resource ID is not available.
- #define CFE_ES_POOL_BLOCK_INVALID ((CFE_Status_t)0xc400002C)

  Invalid pool block.
- #define CFE_ES_ERR_DUPLICATE_NAME ((CFE_Status_t)0xc400002E)

  Duplicate Name Error.
- #define CFE_ES_NOT_IMPLEMENTED ((CFE_Status_t)0xc400ffff)

  Not Implemented.
- #define CFE_FS_BAD_ARGUMENT ((CFE_Status_t)0xc6000001)

  Bad Argument.
- #define CFE_FS_INVALID_PATH ((CFE_Status_t)0xc6000002)

  Invalid Path.
- #define CFE_FS_FNAME_TOO_LONG ((CFE_Status_t)0xc6000003)

  Filename Too Long.
- #define CFE_FS_NOT_IMPLEMENTED ((CFE_Status_t)0xc600ffff)

  Not Implemented.
- #define CFE_SB_TIME_OUT ((CFE_Status_t)0xca000001)

  Time Out.
- #define CFE_SB_NO_MESSAGE ((CFE_Status_t)0xca000002)

  No Message.
- #define CFE_SB_BAD_ARGUMENT ((CFE_Status_t)0xca000003)

  Bad Argument.
- #define CFE_SB_MAX_PIPES_MET ((CFE_Status_t)0xca000004)

  Max Pipes Met.
- #define CFE_SB_PIPE_CR_ERR ((CFE_Status_t)0xca000005)

  Pipe Create Error.
- #define CFE_SB_PIPE_RD_ERR ((CFE_Status_t)0xca000006)

  Pipe Read Error.
- #define CFE_SB_MSG_TOO_BIG ((CFE_Status_t)0xca000007)

  Message Too Big.

- #define CFE_SB_BUF_ALOC_ERR ((CFE_Status_t)0xca000008)

  Buffer Allocation Error.
- #define CFE_SB_MAX_MSGS_MET ((CFE_Status_t)0xca000009)

  Max Messages Met.
- #define CFE_SB_MAX_DESTS_MET ((CFE_Status_t)0xca00000a)

  Max Destinations Met.
- #define CFE_SB_INTERNAL_ERR ((CFE_Status_t)0xca00000c)

  Internal Error.
- #define CFE_SB_WRONG_MSG_TYPE ((CFE_Status_t)0xca00000d)

  Wrong Message Type.
- #define CFE_SB_BUFFER_INVALID ((CFE_Status_t)0xca00000e)

  Buffer Invalid.
- #define CFE_SB_NOT_IMPLEMENTED ((CFE_Status_t)0xca00ffff)

  Not Implemented.
- #define CFE_TBL_ERR_INVALID_HANDLE ((CFE_Status_t)0xcc000001)

  Invalid Handle.
- #define CFE_TBL_ERR_INVALID_NAME ((CFE_Status_t)0xcc000002)

  Invalid Name.
- #define CFE_TBL_ERR_INVALID_SIZE ((CFE_Status_t)0xcc000003)

  Invalid Size.
- #define CFE_TBL_INFO_UPDATE_PENDING ((CFE_Status_t)0x4c000004)

  Update Pending.
- #define CFE_TBL_ERR_NEVER_LOADED ((CFE_Status_t)0xcc000005)

  Never Loaded.
- #define CFE_TBL_ERR_REGISTRY_FULL ((CFE_Status_t)0xcc000006)

  Registry Full.
- #define CFE_TBL_WARN_DUPLICATE ((CFE_Status_t)0x4c000007)

  Duplicate Warning.
- #define CFE_TBL_ERR_NO_ACCESS ((CFE_Status_t)0xcc000008)

  No Access.
- #define CFE_TBL_ERR_UNREGISTERED ((CFE_Status_t)0xcc000009)

  Unregistered.
- #define CFE_TBL_ERR_HANDLES_FULL ((CFE_Status_t)0xcc00000B)

  Handles Full.
- #define CFE_TBL_ERR_DUPLICATE_DIFF_SIZE ((CFE_Status_t)0xcc00000C)

  Duplicate Table With Different Size.
- #define CFE_TBL_ERR_DUPLICATE_NOT_OWNED ((CFE_Status_t)0xcc00000D)

  Duplicate Table And Not Owned.
- #define CFE_TBL_INFO_UPDATED ((CFE_Status_t)0x4c00000E)

  Updated.
- #define CFE_TBL_ERR_NO_BUFFER_AVAIL ((CFE_Status_t)0xcc00000F)

  No Buffer Available.
- #define CFE_TBL_ERR_DUMP_ONLY ((CFE_Status_t)0xcc000010)

  Dump Only Error.
- #define CFE_TBL_ERR_ILLEGAL_SRC_TYPE ((CFE_Status_t)0xcc000011)

  Illegal Source Type.
- #define CFE_TBL_ERR_LOAD_IN_PROGRESS ((CFE_Status_t)0xcc000012)

Load In Progress.

- #define CFE_TBL_ERR_FILE_TOO_LARGE ((CFE_Status_t)0xcc000014)

  File Too Large.
- #define CFE_TBL_WARN_SHORT_FILE ((CFE_Status_t)0x4c000015)

  Short File Warning.
- #define CFE_TBL_ERR_BAD_CONTENT_ID ((CFE_Status_t)0xcc000016)

  Bad Content ID.
- #define CFE_TBL_INFO_NO_UPDATE_PENDING ((CFE_Status_t)0x4c000017)

  No Update Pending.
- #define CFE_TBL_INFO_TABLE_LOCKED ((CFE_Status_t)0x4c000018)

  Table Locked.
- #define CFE_TBL_INFO_VALIDATION_PENDING ((CFE_Status_t)0x4c000019)
- #define CFE_TBL_INFO_NO_VALIDATION_PENDING ((CFE_Status_t)0x4c00001A)
- #define CFE_TBL_ERR_BAD_SUBTYPE_ID ((CFE_Status_t)0xcc00001B)

  Bad Subtype ID.
- #define CFE_TBL_ERR_FILE_SIZE_INCONSISTENT ((CFE_Status_t)0xcc00001C)

  File Size Inconsistent.
- #define CFE_TBL_ERR_NO_STD_HEADER ((CFE_Status_t)0xcc00001D)

  No Standard Header.
- #define CFE_TBL_ERR_NO_TBL_HEADER ((CFE_Status_t)0xcc00001E)

  No Table Header.
- #define CFE_TBL_ERR_FILENAME_TOO_LONG ((CFE_Status_t)0xcc00001F)

  Filename Too Long.
- #define CFE_TBL_ERR_FILE_FOR_WRONG_TABLE ((CFE_Status_t)0xcc000020)

  File For Wrong Table.
- #define CFE_TBL_ERR_LOAD_INCOMPLETE ((CFE_Status_t)0xcc000021)

  Load Incomplete.
- #define CFE_TBL_WARN_PARTIAL_LOAD ((CFE_Status_t)0x4c000022)

  Partial Load Warning.
- #define CFE_TBL_ERR_PARTIAL_LOAD ((CFE_Status_t)0xcc000023)

  Partial Load Error.
- #define CFE_TBL_INFO_DUMP_PENDING ((CFE_Status_t)0x4c000024)

  Dump Pending.
- #define CFE_TBL_ERR_INVALID_OPTIONS ((CFE_Status_t)0xcc000025)

  Invalid Options.
- #define CFE_TBL_WARN_NOT_CRITICAL ((CFE_Status_t)0x4c000026)

  Not Critical Warning.
- #define CFE_TBL_INFO_RECOVERED_TBL ((CFE_Status_t)0x4c000027)

  Recovered Table.
- #define CFE_TBL_ERR_BAD_SPACECRAFT_ID ((CFE_Status_t)0xcc000028)

  Bad Spacecraft ID.
- #define CFE_TBL_ERR_BAD_PROCESSOR_ID ((CFE_Status_t)0xcc000029)

  Bad Processor ID.
- #define CFE_TBL_MESSAGE_ERROR ((CFE_Status_t)0xcc00002a)

  Message Error.
- #define CFE_TBL_ERR_SHORT_FILE ((CFE_Status_t)0xcc00002b)
- #define CFE_TBL_ERR_ACCESS ((CFE_Status_t)0xcc00002c)

- #define CFE_TBL_BAD_ARGUMENT ((CFE_Status_t)0xcc00002d)

  Bad Argument.
- #define CFE_TBL_NOT_IMPLEMENTED ((CFE_Status_t)0xcc00ffff)

  Not Implemented.
- #define CFE_TIME_NOT_IMPLEMENTED ((CFE_Status_t)0xce00ffff)

  Not Implemented.
- #define CFE_TIME_INTERNAL_ONLY ((CFE_Status_t)0xce000001)

  Internal Only.
- #define CFE_TIME_OUT_OF_RANGE ((CFE_Status_t)0xce000002)

  Out Of Range.
- #define CFE_TIME_TOO_MANY_SYNCH_CALLBACKS ((CFE_Status_t)0xce000003)

  Too Many Sync Callbacks.
- #define CFE_TIME_CALLBACK_NOT_REGISTERED ((CFE_Status_t)0xce000004)

  Callback Not Registered.
- #define CFE_TIME_BAD_ARGUMENT ((CFE_Status_t)0xce000005)

  Bad Argument.

Typedefs

- typedef int32 CFE_Status_t

  cFE Status type for readability and eventually type safety
- typedef char CFE_StatusString_t[CFE_STATUS_STRING_LENGTH]

  For the CFE_ES_StatusToString() function, to ensure everyone is making an array of the same length.

Functions

- char * CFE_ES_StatusToString (CFE_Status_t status, CFE_StatusString_t *status_string)

  Convert status to a string.

12.82.1 Detailed Description

Title: cFE Status Code Definition Header File
Purpose: Common source of cFE API return status codes.
Design Notes:
References: Flight Software Branch C Coding Standard Version 1.0a

12.82.2 Macro Definition Documentation

12.82.2.1 CFE_EVENTS_SERVICE `#define CFE_EVENTS_SERVICE ((CFE_Status_t)0x02000000)`

Event Service.
Definition at line 126 of file cfe_error.h.

12.82.2.2 CFE_EXECUTIVE_SERVICE `#define CFE_EXECUTIVE_SERVICE ((CFE_Status_t)0x04000000)`

Executive Service.
Definition at line 127 of file cfe_error.h.

12.82.2.3 CFE_FILE_SERVICE

```
#define CFE_FILE_SERVICE ((CFE_Status_t)0x06000000)
```

File Service.
Definition at line 128 of file cfe_error.h.

12.82.2.4 CFE_GENERIC_SERVICE

```
#define CFE_GENERIC_SERVICE ((CFE_Status_t)0x08000000)
```

Generic Service.
Definition at line 129 of file cfe_error.h.

12.82.2.5 CFE_SERVICE_BITMASK

```
#define CFE_SERVICE_BITMASK ((CFE_Status_t)0x0e000000)
```

Error Service Bitmask.
Definition at line 124 of file cfe_error.h.

12.82.2.6 CFE_SEVERITY_BITMASK

```
#define CFE_SEVERITY_BITMASK ((CFE_Status_t)0xc0000000)
```

Error Severity Bitmask.
Definition at line 115 of file cfe_error.h.

12.82.2.7 CFE_SEVERITY_ERROR

```
#define CFE_SEVERITY_ERROR ((CFE_Status_t)0xc0000000)
```

Severity Error.
Definition at line 119 of file cfe_error.h.

12.82.2.8 CFE_SEVERITY_INFO

```
#define CFE_SEVERITY_INFO ((CFE_Status_t)0x40000000)
```

Severity Info.
Definition at line 118 of file cfe_error.h.

12.82.2.9 CFE_SEVERITY_SUCCESS

```
#define CFE_SEVERITY_SUCCESS ((CFE_Status_t)0x00000000)
```

Severity Success.
Definition at line 117 of file cfe_error.h.

12.82.2.10 CFE_SOFTWARE_BUS_SERVICE

```
#define CFE_SOFTWARE_BUS_SERVICE ((CFE_Status_t)0x0a000000)
```

Software Bus Service.
Definition at line 130 of file cfe_error.h.

12.82.2.11 CFE_STATUS_C

```
#define CFE_STATUS_C(
    X ) ((CFE_Status_t)(X))
```

cFE Status macro for literal
Definition at line 48 of file cfe_error.h.

12.82.2.12 CFE_STATUS_STRING_LENGTH

```
#define CFE_STATUS_STRING_LENGTH 11
```

cFE Status converted to string length limit
Used for sizing CFE_StatusString_t intended for use in printing CFE_Status_t values Sized for 0x%08x and NULL
Definition at line 56 of file cfe_error.h.

12.82.2.13 CFE_TABLE_SERVICE `#define CFE_TABLE_SERVICE ((CFE_Status_t)0x0c000000)`

Table Service.
Definition at line 131 of file cfe_error.h.

12.82.2.14 CFE_TIME_SERVICE `#define CFE_TIME_SERVICE ((CFE_Status_t)0x0e000000)`

Time Service.
Definition at line 132 of file cfe_error.h.

12.82.3 Typedef Documentation

12.82.3.1 CFE_Status_t `typedef int32 CFE_Status_t`

cFE Status type for readability and eventually type safety
Definition at line 43 of file cfe_error.h.

12.82.3.2 CFE_StatusString_t `typedef char CFE_StatusString_t[CFE_STATUS_STRING_LENGTH]`

For the CFE_ES_StatusToString() function, to ensure everyone is making an array of the same length.
Definition at line 62 of file cfe_error.h.

12.82.4 Function Documentation

12.82.4.1 CFE_ES_StatusToString()

```
char* CFE_ES_StatusToString (
    CFE_Status_t status,
    CFE_StatusString_t * status_string )
```

Convert status to a string.

Parameters

in	*status*	Status value to convert
out	*status_string*	Buffer to store status converted to string

Returns

Passed in string pointer

12.83 cfe/modules/core_api/fsw/inc/cfe_es.h File Reference

```
#include "common_types.h"
#include "cfe_error.h"
#include "cfe_es_api_typedefs.h"
#include "cfe_resourceid_api_typedefs.h"
```

Macros

- #define OS_PRINTF(m, n)
- #define CFE_ES_DBIT(x) (1L << (x)) /* Places a one at bit positions 0 thru 31 */
- #define CFE_ES_DTEST(i, x) (((i)&CFE_ES_DBIT(x)) != 0) /* true iff bit x of i is set */

- #define CFE_ES_TEST_LONG_MASK(m, s) (CFE_ES_DTEST(m[(s) / 32], (s) % 32)) /∗ Test a bit within an array of 32-bit integers. ∗/
- #define CFE_ES_PerfLogEntry(id) (CFE_ES_PerfLogAdd(id, 0))

  Entry marker for use with Software Performance Analysis Tool.
- #define CFE_ES_PerfLogExit(id) (CFE_ES_PerfLogAdd(id, 1))

  Exit marker for use with Software Performance Analysis Tool.

Functions

- CFE_Status_t CFE_ES_AppID_ToIndex (CFE_ES_AppId_t AppID, uint32 ∗Idx)

  Obtain an index value correlating to an ES Application ID.
- int32 CFE_ES_LibID_ToIndex (CFE_ES_LibId_t LibId, uint32 ∗Idx)

  Obtain an index value correlating to an ES Library ID.
- CFE_Status_t CFE_ES_TaskID_ToIndex (CFE_ES_TaskId_t TaskID, uint32 ∗Idx)

  Obtain an index value correlating to an ES Task ID.
- CFE_Status_t CFE_ES_CounterID_ToIndex (CFE_ES_CounterId_t CounterId, uint32 ∗Idx)

  Obtain an index value correlating to an ES Counter ID.
- void CFE_ES_Main (uint32 StartType, uint32 StartSubtype, uint32 ModeId, const char ∗StartFilePath)

  cFE Main Entry Point used by Board Support Package to start cFE
- CFE_Status_t CFE_ES_ResetCFE (uint32 ResetType)

  Reset the cFE Core and all cFE Applications.
- CFE_Status_t CFE_ES_RestartApp (CFE_ES_AppId_t AppID)

  Restart a single cFE Application.
- CFE_Status_t CFE_ES_ReloadApp (CFE_ES_AppId_t AppID, const char ∗AppFileName)

  Reload a single cFE Application.
- CFE_Status_t CFE_ES_DeleteApp (CFE_ES_AppId_t AppID)

  Delete a cFE Application.
- void CFE_ES_ExitApp (uint32 ExitStatus)

  Exit a cFE Application.
- bool CFE_ES_RunLoop (uint32 ∗RunStatus)

  Check for Exit, Restart, or Reload commands.
- CFE_Status_t CFE_ES_WaitForSystemState (uint32 MinSystemState, uint32 TimeOutMilliseconds)

  Allow an Application to Wait for a minimum global system state.
- void CFE_ES_WaitForStartupSync (uint32 TimeOutMilliseconds)

  Allow an Application to Wait for the "OPERATIONAL" global system state.
- void CFE_ES_IncrementTaskCounter (void)

  Increments the execution counter for the calling task.
- int32 CFE_ES_GetResetType (uint32 ∗ResetSubtypePtr)

  Return the most recent Reset Type.
- CFE_Status_t CFE_ES_GetAppID (CFE_ES_AppId_t ∗AppIdPtr)

  Get an Application ID for the calling Application.
- CFE_Status_t CFE_ES_GetTaskID (CFE_ES_TaskId_t ∗TaskIdPtr)

  Get the task ID of the calling context.
- CFE_Status_t CFE_ES_GetAppIDByName (CFE_ES_AppId_t ∗AppIdPtr, const char ∗AppName)

  Get an Application ID associated with a specified Application name.
- CFE_Status_t CFE_ES_GetLibIDByName (CFE_ES_LibId_t ∗LibIdPtr, const char ∗LibName)

  Get a Library ID associated with a specified Library name.
- CFE_Status_t CFE_ES_GetAppName (char ∗AppName, CFE_ES_AppId_t AppId, size_t BufferLength)

Get an Application name for a specified Application ID.

- CFE_Status_t CFE_ES_GetLibName (char ∗LibName, CFE_ES_LibId_t LibId, size_t BufferLength)

  Get a Library name for a specified Library ID.
- CFE_Status_t CFE_ES_GetAppInfo (CFE_ES_AppInfo_t ∗AppInfo, CFE_ES_AppId_t AppId)

  Get Application Information given a specified App ID.
- CFE_Status_t CFE_ES_GetTaskInfo (CFE_ES_TaskInfo_t ∗TaskInfo, CFE_ES_TaskId_t TaskId)

  Get Task Information given a specified Task ID.
- int32 CFE_ES_GetLibInfo (CFE_ES_AppInfo_t ∗LibInfo, CFE_ES_LibId_t LibId)

  Get Library Information given a specified Resource ID.
- int32 CFE_ES_GetModuleInfo (CFE_ES_AppInfo_t ∗ModuleInfo, CFE_ResourceId_t ResourceId)

  Get Information given a specified Resource ID.
- CFE_Status_t CFE_ES_CreateChildTask (CFE_ES_TaskId_t ∗TaskIdPtr, const char ∗TaskName, CFE_ES_ChildTaskMainFuncPtr_ FunctionPtr, CFE_ES_StackPointer_t StackPtr, size_t StackSize, CFE_ES_TaskPriority_Atom_t Priority, uint32 Flags)

  Creates a new task under an existing Application.
- CFE_Status_t CFE_ES_GetTaskIDByName (CFE_ES_TaskId_t ∗TaskIdPtr, const char ∗TaskName)

  Get a Task ID associated with a specified Task name.
- CFE_Status_t CFE_ES_GetTaskName (char ∗TaskName, CFE_ES_TaskId_t TaskId, size_t BufferLength)

  Get a Task name for a specified Task ID.
- CFE_Status_t CFE_ES_DeleteChildTask (CFE_ES_TaskId_t TaskId)

  Deletes a task under an existing Application.
- void CFE_ES_ExitChildTask (void)

  Exits a child task.
- void CFE_ES_BackgroundWakeup (void)

  Wakes up the CFE background task.
- CFE_Status_t CFE_ES_WriteToSysLog (const char ∗SpecStringPtr,...) OS_PRINTF(1

  Write a string to the cFE System Log.
- CFE_Status_t uint32 CFE_ES_CalculateCRC (const void ∗DataPtr, size_t DataLength, uint32 InputCRC, CFE_ES_CrcType_Enum_t TypeCRC)

  Calculate a CRC on a block of memory.
- void CFE_ES_ProcessAsyncEvent (void)

  Notification that an asynchronous event was detected by the underlying OS/PSP.
- CFE_Status_t CFE_ES_RegisterCDS (CFE_ES_CDSHandle_t ∗CDSHandlePtr, size_t BlockSize, const char ∗Name)

  Reserve space (or re-obtain previously reserved space) in the Critical Data Store (CDS)
- CFE_Status_t CFE_ES_GetCDSBlockIDByName (CFE_ES_CDSHandle_t ∗BlockIdPtr, const char ∗BlockName)

  Get a CDS Block ID associated with a specified CDS Block name.
- CFE_Status_t CFE_ES_GetCDSBlockName (char ∗BlockName, CFE_ES_CDSHandle_t BlockId, size_t Buffer↩ Length)

  Get a Block name for a specified Block ID.
- CFE_Status_t CFE_ES_CopyToCDS (CFE_ES_CDSHandle_t Handle, const void ∗DataToCopy)

  Save a block of data in the Critical Data Store (CDS)
- CFE_Status_t CFE_ES_RestoreFromCDS (void ∗RestoreToMemory, CFE_ES_CDSHandle_t Handle)

  Recover a block of data from the Critical Data Store (CDS)
- CFE_Status_t CFE_ES_PoolCreateNoSem (CFE_ES_MemHandle_t ∗PoolID, void ∗MemPtr, size_t Size)

  Initializes a memory pool created by an application without using a semaphore during processing.
- CFE_Status_t CFE_ES_PoolCreate (CFE_ES_MemHandle_t ∗PoolID, void ∗MemPtr, size_t Size)

  Initializes a memory pool created by an application while using a semaphore during processing.

- CFE_Status_t CFE_ES_PoolCreateEx (CFE_ES_MemHandle_t *PoolID, void *MemPtr, size_t Size, uint16 NumBlockSizes, const size_t *BlockSizes, bool UseMutex)

  Initializes a memory pool created by an application with application specified block sizes.
- int32 CFE_ES_PoolDelete (CFE_ES_MemHandle_t PoolID)

  Deletes a memory pool that was previously created.
- int32 CFE_ES_GetPoolBuf (CFE_ES_MemPoolBuf_t *BufPtr, CFE_ES_MemHandle_t Handle, size_t Size)

  Gets a buffer from the memory pool created by CFE_ES_PoolCreate or CFE_ES_PoolCreateNoSem.
- CFE_Status_t CFE_ES_GetPoolBufInfo (CFE_ES_MemHandle_t Handle, CFE_ES_MemPoolBuf_t BufPtr)

  Gets info on a buffer previously allocated via CFE_ES_GetPoolBuf.
- int32 CFE_ES_PutPoolBuf (CFE_ES_MemHandle_t Handle, CFE_ES_MemPoolBuf_t BufPtr)

  Releases a buffer from the memory pool that was previously allocated via CFE_ES_GetPoolBuf.
- CFE_Status_t CFE_ES_GetMemPoolStats (CFE_ES_MemPoolStats_t *BufPtr, CFE_ES_MemHandle_t Handle)

  Extracts the statistics maintained by the memory pool software.
- void CFE_ES_PerfLogAdd (uint32 Marker, uint32 EntryExit)

  Adds a new entry to the data buffer.
- CFE_Status_t CFE_ES_RegisterGenCounter (CFE_ES_CounterId_t *CounterIdPtr, const char *CounterName)

  Register a generic counter.
- CFE_Status_t CFE_ES_DeleteGenCounter (CFE_ES_CounterId_t CounterId)

  Delete a generic counter.
- CFE_Status_t CFE_ES_IncrementGenCounter (CFE_ES_CounterId_t CounterId)

  Increments the specified generic counter.
- CFE_Status_t CFE_ES_SetGenCount (CFE_ES_CounterId_t CounterId, uint32 Count)

  Set the specified generic counter.
- CFE_Status_t CFE_ES_GetGenCount (CFE_ES_CounterId_t CounterId, uint32 *Count)

  Get the specified generic counter count.
- CFE_Status_t CFE_ES_GetGenCounterIDByName (CFE_ES_CounterId_t *CounterIdPtr, const char *CounterName)

  Get the Id associated with a generic counter name.
- CFE_Status_t CFE_ES_GetGenCounterName (char *CounterName, CFE_ES_CounterId_t CounterId, size_t BufferLength)

  Get a Counter name for a specified Counter ID.

12.83.1 Detailed Description

Purpose: Unit specification for Executive Services library functions and macros.
References: Flight Software Branch C Coding Standard Version 1.0a cFE Flight Software Application Developers Guide
Notes:

12.83.2 Macro Definition Documentation

12.83.2.1 CFE_ES_DBIT

```
#define CFE_ES_DBIT(
        x ) (1L << (x)) /* Places a one at bit positions 0 thru 31 */
```

Definition at line 57 of file cfe_es.h.

12.83.2.2 CFE_ES_DTEST

```
#define CFE_ES_DTEST(
    i,
    x ) (((i)&CFE_ES_DBIT(x)) != 0) /* true iff bit x of i is set */
```

Definition at line 58 of file cfe_es.h.

12.83.2.3 CFE_ES_TEST_LONG_MASK

```
#define CFE_ES_TEST_LONG_MASK(
    m,
    s ) (CFE_ES_DTEST(m[(s) / 32], (s) % 32)) /* Test a bit within an array of 32-bit
integers.  */
```

Definition at line 59 of file cfe_es.h.

12.83.2.4 OS_PRINTF

```
#define OS_PRINTF(
    m,
    n )
```

Definition at line 50 of file cfe_es.h.

12.84 cfe/modules/core_api/fsw/inc/cfe_es_api_typedefs.h File Reference

```
#include "common_types.h"
#include "cfe_es_extern_typedefs.h"
```

Data Structures

- union CFE_ES_PoolAlign

  Pool Alignment.

Macros

- #define CFE_ES_STATIC_POOL_TYPE(size)

  Static Pool Type.
- #define CFE_ES_MEMPOOLBUF_C(x) ((CFE_ES_MemPoolBuf_t)(x))

  Conversion macro to create buffer pointer from another type.
- #define CFE_ES_NO_MUTEX false

  Indicates that the memory pool selection will not use a semaphore.
- #define CFE_ES_USE_MUTEX true

  Indicates that the memory pool selection will use a semaphore.

Reset Type extensions

- #define CFE_ES_APP_RESTART CFE_PSP_RST_TYPE_MAX

Conversions for ES resource IDs

- #define CFE_ES_APPID_C(val) ((CFE_ES_AppId_t)CFE_RESOURCEID_WRAP(val))
- #define CFE_ES_TASKID_C(val) ((CFE_ES_TaskId_t)CFE_RESOURCEID_WRAP(val))
- #define CFE_ES_LIBID_C(val) ((CFE_ES_LibId_t)CFE_RESOURCEID_WRAP(val))
- #define CFE_ES_COUNTERID_C(val) ((CFE_ES_CounterId_t)CFE_RESOURCEID_WRAP(val))
- #define CFE_ES_MEMHANDLE_C(val) ((CFE_ES_MemHandle_t)CFE_RESOURCEID_WRAP(val))
- #define CFE_ES_CDSHANDLE_C(val) ((CFE_ES_CDSHandle_t)CFE_RESOURCEID_WRAP(val))

Type-specific initializers for "undefined" resource IDs

- #define CFE_ES_APPID_UNDEFINED CFE_ES_APPID_C(CFE_RESOURCEID_UNDEFINED)
- #define CFE_ES_TASKID_UNDEFINED CFE_ES_TASKID_C(CFE_RESOURCEID_UNDEFINED)
- #define CFE_ES_LIBID_UNDEFINED CFE_ES_LIBID_C(CFE_RESOURCEID_UNDEFINED)
- #define CFE_ES_COUNTERID_UNDEFINED CFE_ES_COUNTERID_C(CFE_RESOURCEID_UNDEFINED)
- #define CFE_ES_MEMHANDLE_UNDEFINED CFE_ES_MEMHANDLE_C(CFE_RESOURCEID_UNDEFINED)
- #define CFE_ES_CDS_BAD_HANDLE CFE_ES_CDSHANDLE_C(CFE_RESOURCEID_UNDEFINED)

Task Stack Constants

- #define CFE_ES_TASK_STACK_ALLOCATE NULL /∗ aka OS_TASK_STACK_ALLOCATE in proposed O↩ SAL change ∗/

  Indicates that the stack for the child task should be dynamically allocated.

Typedefs

- typedef void(∗ CFE_ES_TaskEntryFuncPtr_t) (void)

  Required Prototype of Task Main Functions.
- typedef int32(∗ CFE_ES_LibraryEntryFuncPtr_t) (CFE_ES_LibId_t LibId)

  Required Prototype of Library Initialization Functions.
- typedef CFE_ES_TaskEntryFuncPtr_t CFE_ES_ChildTaskMainFuncPtr_t

  Compatible typedef for ES child task entry point.
- typedef void ∗ CFE_ES_StackPointer_t

  Type for the stack pointer of tasks.
- typedef enum CFE_ES_CrcType_Enum CFE_ES_CrcType_Enum_t

  Checksum/CRC algorithm identifiers.
- typedef union CFE_ES_PoolAlign CFE_ES_PoolAlign_t

  Pool Alignment.
- typedef void ∗ CFE_ES_MemPoolBuf_t

  Pointer type used for memory pool API.

Enumerations

- enum CFE_ES_CrcType_Enum {
  CFE_ES_CrcType_NONE = 0, CFE_ES_CrcType_16_ARC = 1, CFE_ES_CrcType_MAX = 2, CFE_ES_CrcType_CRC_16 = CFE_ES_CrcType_16_ARC,
  CFE_ES_CrcType_CRC_8 = CFE_ES_CrcType_MAX + 1, CFE_ES_CrcType_CRC_32 = CFE_ES_CrcType_↩ MAX + 2 }

  Checksum/CRC algorithm identifiers.

12.84.1 Detailed Description

Purpose: Unit specification for Executive Services library functions and macros.
References: Flight Software Branch C Coding Standard Version 1.0a cFE Flight Software Application Developers Guide
Notes:

12.84.2 Macro Definition Documentation

12.84.2.1 CFE_ES_APP_RESTART `#define CFE_ES_APP_RESTART CFE_PSP_RST_TYPE_MAX`

Application only was reset (extend the PSP enumeration here)
Definition at line 57 of file cfe_es_api_typedefs.h.

12.84.2.2 CFE_ES_APPID_C

```
#define CFE_ES_APPID_C(
    val ) ((CFE_ES_AppId_t)CFE_RESOURCEID_WRAP(val))
```

Definition at line 208 of file cfe_es_api_typedefs.h.

12.84.2.3 CFE_ES_APPID_UNDEFINED

```
#define CFE_ES_APPID_UNDEFINED CFE_ES_APPID_C(CFE_RESOURCEID_UNDEFINED)
```

Definition at line 220 of file cfe_es_api_typedefs.h.

12.84.2.4 CFE_ES_CDS_BAD_HANDLE

```
#define CFE_ES_CDS_BAD_HANDLE CFE_ES_CDSHANDLE_C(CFE_RESOURCEID_UNDEFINED)
```

Definition at line 225 of file cfe_es_api_typedefs.h.

12.84.2.5 CFE_ES_CDSHANDLE_C

```
#define CFE_ES_CDSHANDLE_C(
    val ) ((CFE_ES_CDSHandle_t)CFE_RESOURCEID_WRAP(val))
```

Definition at line 213 of file cfe_es_api_typedefs.h.

12.84.2.6 CFE_ES_COUNTERID_C

```
#define CFE_ES_COUNTERID_C(
    val ) ((CFE_ES_CounterId_t)CFE_RESOURCEID_WRAP(val))
```

Definition at line 211 of file cfe_es_api_typedefs.h.

12.84.2.7 CFE_ES_COUNTERID_UNDEFINED

```
#define CFE_ES_COUNTERID_UNDEFINED CFE_ES_COUNTERID_C(CFE_RESOURCEID_U
```

Definition at line 223 of file cfe_es_api_typedefs.h.

12.84.2.8 CFE_ES_LIBID_C

```
#define CFE_ES_LIBID_C(
    val ) ((CFE_ES_LibId_t)CFE_RESOURCEID_WRAP(val))
```

Definition at line 210 of file cfe_es_api_typedefs.h.

12.84.2.9 CFE_ES_LIBID_UNDEFINED

```
#define CFE_ES_LIBID_UNDEFINED CFE_ES_LIBID_C(CFE_RESOURCEID_UNDEFINED)
```

Definition at line 222 of file cfe_es_api_typedefs.h.

12.84.2.10 CFE_ES_MEMHANDLE_C

```
#define CFE_ES_MEMHANDLE_C(
    val ) ((CFE_ES_MemHandle_t)CFE_RESOURCEID_WRAP(val))
```

Definition at line 212 of file cfe_es_api_typedefs.h.

12.84.2.11 CFE_ES_MEMHANDLE_UNDEFINED

```
#define CFE_ES_MEMHANDLE_UNDEFINED CFE_ES_MEMHANDLE_C(CFE_RESOURCEID_
```

Definition at line 224 of file cfe_es_api_typedefs.h.

12.84.2.12 CFE_ES_MEMPOOLBUF_C

```
#define CFE_ES_MEMPOOLBUF_C(
    x ) ((CFE_ES_MemPoolBuf_t)(x))
```

Conversion macro to create buffer pointer from another type.

In cases where the actual buffer pointer is computed, this macro aids in converting the computed address (typically an OSAL "cpuaddr" type) into a buffer pointer.

Note

Any address calculation needs to take machine alignment requirements into account.

Definition at line 193 of file cfe_es_api_typedefs.h.

12.84.2.13 CFE_ES_NO_MUTEX `#define CFE_ES_NO_MUTEX false`

Indicates that the memory pool selection will not use a semaphore.
Definition at line 240 of file cfe_es_api_typedefs.h.

12.84.2.14 CFE_ES_STATIC_POOL_TYPE `#define CFE_ES_STATIC_POOL_TYPE( size )`

Value:

```
union                                \
{                                    \
    CFE_ES_PoolAlign_t Align;        \
    uint8              Data[size];   \
}
```

Static Pool Type.
A macro to help instantiate static memory pools that are correctly aligned. This resolves to a union type that contains a member called "Data" that will be correctly aligned to be a memory pool and sized according to the argument.
Definition at line 160 of file cfe_es_api_typedefs.h.

12.84.2.15 CFE_ES_TASK_STACK_ALLOCATE `#define CFE_ES_TASK_STACK_ALLOCATE NULL /* aka OS_TA↩ SK_STACK_ALLOCATE in proposed OSAL change */`

Indicates that the stack for the child task should be dynamically allocated.
This value may be supplied as the Stack Pointer argument to CFE_ES_ChildTaskCreate() to indicate that the stack should be dynamically allocated.
Definition at line 237 of file cfe_es_api_typedefs.h.

12.84.2.16 CFE_ES_TASKID_C `#define CFE_ES_TASKID_C( val ) ((CFE_ES_TaskId_t)CFE_RESOURCEID_WRAP(val))`

Definition at line 209 of file cfe_es_api_typedefs.h.

12.84.2.17 CFE_ES_TASKID_UNDEFINED `#define CFE_ES_TASKID_UNDEFINED CFE_ES_TASKID_C(CFE_RESOURCEID_UNDEFINED)`

Definition at line 221 of file cfe_es_api_typedefs.h.

12.84.2.18 CFE_ES_USE_MUTEX `#define CFE_ES_USE_MUTEX true`

Indicates that the memory pool selection will use a semaphore.
Definition at line 241 of file cfe_es_api_typedefs.h.

12.84.3 Typedef Documentation

12.84.3.1 CFE_ES_ChildTaskMainFuncPtr_t `typedef CFE_ES_TaskEntryFuncPtr_t CFE_ES_ChildTaskMainFuncPtr_t`

Compatible typedef for ES child task entry point.
All ES task functions (main + child) use the same entry point type.
Definition at line 77 of file cfe_es_api_typedefs.h.

12.84.3.2 CFE_ES_CrcType_Enum_t `typedef enum CFE_ES_CrcType_Enum CFE_ES_CrcType_Enum_t`

Checksum/CRC algorithm identifiers.
Currently only CFE_ES_CrcType_16_ARC is supported.
All defined CRC algorithms should include a check value, which is the accepted result of computing the CRC across the fixed string "123456789"

12.84.3.3 CFE_ES_LibraryEntryFuncPtr_t `typedef int32(* CFE_ES_LibraryEntryFuncPtr_t) (CFE_ES_LibId_t LibId)`

Required Prototype of Library Initialization Functions.
Definition at line 69 of file cfe_es_api_typedefs.h.

12.84.3.4 CFE_ES_MemPoolBuf_t `typedef void* CFE_ES_MemPoolBuf_t`

Pointer type used for memory pool API.
This is used in the Get/Put API calls to refer to a pool buffer.
This pointer is expected to be type cast to the real object type after getting a new buffer. Using void∗ allows this type conversion to occur easily.

Note

> Older versions of CFE implemented the API using a uint32∗, which required explicit type casting everywhere it was called. Although the API type is now void∗ to make usage easier, the pool buffers are aligned to machine requirements - typically 64 bits.

Definition at line 181 of file cfe_es_api_typedefs.h.

12.84.3.5 CFE_ES_PoolAlign_t `typedef union CFE_ES_PoolAlign CFE_ES_PoolAlign_t`

Pool Alignment.
Union that can be used for minimum memory alignment of ES memory pools on the target. It contains the longest native data types such that the alignment of this structure should reflect the largest possible alignment requirements for any data on this processor.

12.84.3.6 CFE_ES_StackPointer_t `typedef void* CFE_ES_StackPointer_t`

Type for the stack pointer of tasks.
This type is used in the CFE ES task API.
Definition at line 84 of file cfe_es_api_typedefs.h.

12.84.3.7 CFE_ES_TaskEntryFuncPtr_t `typedef void(* CFE_ES_TaskEntryFuncPtr_t) (void)`

Required Prototype of Task Main Functions.
Definition at line 68 of file cfe_es_api_typedefs.h.

12.84.4 Enumeration Type Documentation

12.84.4.1 CFE_ES_CrcType_Enum `enum CFE_ES_CrcType_Enum`

Checksum/CRC algorithm identifiers.
Currently only CFE_ES_CrcType_16_ARC is supported.
All defined CRC algorithms should include a check value, which is the accepted result of computing the CRC across the fixed string "123456789"

Enumerator

CFE_ES_CrcType_NONE	Reserved placeholder value. No computation is performed, always returns 0 as a result.
CFE_ES_CrcType_16_ARC	Implementation of CRC-16/ARC. Polynomial: 0x8005 Initialization: 0x0000 Reflect Input/Output: true Check value: 0xbb3d XorOut: 0x0000
CFE_ES_CrcType_MAX	Placeholder for end of normal enumeration list This should reflect the number of algorithms defined.
CFE_ES_CrcType_CRC_16	CRC-16 historically implied CRC-16/ARC CRC-8 historically defined but not implemented, value must not be 0
CFE_ES_CrcType_CRC_8	CRC-32 historically defined but not implemented, value must not be 0
CFE_ES_CrcType_CRC_32	

Definition at line 94 of file cfe_es_api_typedefs.h.

12.85 cfe/modules/core_api/fsw/inc/cfe_evs.h File Reference

```
#include "common_types.h"
#include "cfe_error.h"
#include "cfe_evs_api_typedefs.h"
#include "cfe_es_api_typedefs.h"
#include "cfe_time_api_typedefs.h"
```

Macros

- #define CFE_EVS_Send(E, T, ...) CFE_EVS_SendEvent((E), CFE_EVS_EventType_##T, __VA_ARGS__)
- #define CFE_EVS_SendDbg(E, ...) CFE_EVS_Send(E, DEBUG, __VA_ARGS__)
- #define CFE_EVS_SendInfo(E, ...) CFE_EVS_Send(E, INFORMATION, __VA_ARGS__)
- #define CFE_EVS_SendErr(E, ...) CFE_EVS_Send(E, ERROR, __VA_ARGS__)
- #define CFE_EVS_SendCrit(E, ...) CFE_EVS_Send(E, CRITICAL, __VA_ARGS__)

Functions

- CFE_Status_t CFE_EVS_Register (const void ∗Filters, uint16 NumEventFilters, uint16 FilterScheme)

  Register an application for receiving event services.
- CFE_Status_t CFE_EVS_SendEvent (uint16 EventID, uint16 EventType, const char ∗Spec,...) OS_PRINTF(3

  Generate a software event.
- CFE_Status_t CFE_Status_t CFE_EVS_SendEventWithAppID (uint16 EventID, uint16 EventType, CFE_ES_AppId_t AppID, const char ∗Spec,...) OS_PRINTF(4

  Generate a software event given the specified Application ID.
- CFE_Status_t CFE_Status_t CFE_Status_t CFE_EVS_SendTimedEvent (CFE_TIME_SysTime_t Time, uint16 EventID, uint16 EventType, const char ∗Spec,...) OS_PRINTF(4

  Generate a software event with a specific time tag.

- CFE_Status_t CFE_EVS_ResetFilter (uint16 EventID)

  Resets the calling application's event filter for a single event ID.
- CFE_Status_t CFE_EVS_ResetAllFilters (void)

  Resets all of the calling application's event filters.

12.85.1 Detailed Description

Title: Event Services API Application Library Header File
Purpose: Unit specification for Event services library functions and macros.
Design Notes:
References: Flight Software Branch C Coding Standard Version 1.0a

12.85.2 Macro Definition Documentation

12.85.2.1 CFE_EVS_Send

```
#define CFE_EVS_Send(
        E,
        T,
        ...  ) CFE_EVS_SendEvent((E), CFE_EVS_EventType_##T, __VA_ARGS__)
```

Definition at line 46 of file cfe_evs.h.

12.85.2.2 CFE_EVS_SendCrit

```
#define CFE_EVS_SendCrit(
        E,
        ...  ) CFE_EVS_Send(E, CRITICAL, __VA_ARGS__)
```

Definition at line 50 of file cfe_evs.h.

12.85.2.3 CFE_EVS_SendDbg

```
#define CFE_EVS_SendDbg(
        E,
        ...  ) CFE_EVS_Send(E, DEBUG, __VA_ARGS__)
```

Definition at line 47 of file cfe_evs.h.

12.85.2.4 CFE_EVS_SendErr

```
#define CFE_EVS_SendErr(
        E,
        ...  ) CFE_EVS_Send(E, ERROR, __VA_ARGS__)
```

Definition at line 49 of file cfe_evs.h.

12.85.2.5 CFE_EVS_SendInfo

```
#define CFE_EVS_SendInfo(
        E,
        ...  ) CFE_EVS_Send(E, INFORMATION, __VA_ARGS__)
```

Definition at line 48 of file cfe_evs.h.

12.86 cfe/modules/core_api/fsw/inc/cfe_evs_api_typedefs.h File Reference

```
#include "common_types.h"
#include "cfe_evs_extern_typedefs.h"
```

Data Structures

- struct CFE_EVS_BinFilter

  Event message filter definition structure.

Macros

Common Event Filter Mask Values

Message is sent if (previous event count) & MASK == 0

- #define CFE_EVS_NO_FILTER 0x0000

  Stops any filtering. All messages are sent.
- #define CFE_EVS_FIRST_ONE_STOP 0xFFFF

  Sends the first event. All remaining messages are filtered.
- #define CFE_EVS_FIRST_TWO_STOP 0xFFFE

  Sends the first 2 events. All remaining messages are filtered.
- #define CFE_EVS_FIRST_4_STOP 0xFFFC

  Sends the first 4 events. All remaining messages are filtered.
- #define CFE_EVS_FIRST_8_STOP 0xFFF8

  Sends the first 8 events. All remaining messages are filtered.
- #define CFE_EVS_FIRST_16_STOP 0xFFF0

  Sends the first 16 events. All remaining messages are filtered.
- #define CFE_EVS_FIRST_32_STOP 0xFFE0

  Sends the first 32 events. All remaining messages are filtered.
- #define CFE_EVS_FIRST_64_STOP 0xFFC0

  Sends the first 64 events. All remaining messages are filtered.
- #define CFE_EVS_EVERY_OTHER_ONE 0x0001

  Sends every other event.
- #define CFE_EVS_EVERY_OTHER_TWO 0x0002

  Sends two, filters one, sends two, filters one, etc.
- #define CFE_EVS_EVERY_FOURTH_ONE 0x0003

  Sends every fourth event message. All others are filtered.

Typedefs

- typedef struct CFE_EVS_BinFilter CFE_EVS_BinFilter_t

  Event message filter definition structure.

12.86.1 Detailed Description

Title: Event Services API Application Library Header File
Purpose: Unit specification for Event services library functions and macros.
Design Notes:
References: Flight Software Branch C Coding Standard Version 1.0a

12.86.2 Macro Definition Documentation

12.86.2.1 CFE_EVS_EVERY_FOURTH_ONE `#define CFE_EVS_EVERY_FOURTH_ONE 0x0003`

Sends every fourth event message. All others are filtered.
Definition at line 54 of file cfe_evs_api_typedefs.h.

12.86.2.2 CFE_EVS_EVERY_OTHER_ONE `#define CFE_EVS_EVERY_OTHER_ONE 0x0001`

Sends every other event.
Definition at line 52 of file cfe_evs_api_typedefs.h.

12.86.2.3 CFE_EVS_EVERY_OTHER_TWO `#define CFE_EVS_EVERY_OTHER_TWO 0x0002`

Sends two, filters one, sends two, filters one, etc.
Definition at line 53 of file cfe_evs_api_typedefs.h.

12.86.2.4 CFE_EVS_FIRST_16_STOP `#define CFE_EVS_FIRST_16_STOP 0xFFF0`

Sends the first 16 events. All remaining messages are filtered.
Definition at line 49 of file cfe_evs_api_typedefs.h.

12.86.2.5 CFE_EVS_FIRST_32_STOP `#define CFE_EVS_FIRST_32_STOP 0xFFE0`

Sends the first 32 events. All remaining messages are filtered.
Definition at line 50 of file cfe_evs_api_typedefs.h.

12.86.2.6 CFE_EVS_FIRST_4_STOP `#define CFE_EVS_FIRST_4_STOP 0xFFFC`

Sends the first 4 events. All remaining messages are filtered.
Definition at line 47 of file cfe_evs_api_typedefs.h.

12.86.2.7 CFE_EVS_FIRST_64_STOP `#define CFE_EVS_FIRST_64_STOP 0xFFC0`

Sends the first 64 events. All remaining messages are filtered.
Definition at line 51 of file cfe_evs_api_typedefs.h.

12.86.2.8 CFE_EVS_FIRST_8_STOP `#define CFE_EVS_FIRST_8_STOP 0xFFF8`

Sends the first 8 events. All remaining messages are filtered.
Definition at line 48 of file cfe_evs_api_typedefs.h.

12.86.2.9 CFE_EVS_FIRST_ONE_STOP `#define CFE_EVS_FIRST_ONE_STOP 0xFFFF`

Sends the first event. All remaining messages are filtered.
Definition at line 45 of file cfe_evs_api_typedefs.h.

12.86.2.10 CFE_EVS_FIRST_TWO_STOP `#define CFE_EVS_FIRST_TWO_STOP 0xFFFE`

Sends the first 2 events. All remaining messages are filtered.
Definition at line 46 of file cfe_evs_api_typedefs.h.

12.86.2.11 CFE_EVS_NO_FILTER `#define CFE_EVS_NO_FILTER 0x0000`

Stops any filtering. All messages are sent.
Definition at line 44 of file cfe_evs_api_typedefs.h.

12.86.3 Typedef Documentation

12.86.3.1 CFE_EVS_BinFilter_t `typedef struct CFE_EVS_BinFilter CFE_EVS_BinFilter_t`

Event message filter definition structure.

12.87 cfe/modules/core_api/fsw/inc/cfe_fs.h File Reference

```
#include "common_types.h"
#include "osconfig.h"
#include "cfe_platform_cfg.h"
#include "cfe_error.h"
#include "cfe_fs_api_typedefs.h"
#include "cfe_fs_extern_typedefs.h"
#include "cfe_time_api_typedefs.h"
```

Functions

- CFE_Status_t CFE_FS_ReadHeader (CFE_FS_Header_t ∗Hdr, osal_id_t FileDes)

  Read the contents of the Standard cFE File Header.
- void CFE_FS_InitHeader (CFE_FS_Header_t ∗Hdr, const char ∗Description, uint32 SubType)

  Initializes the contents of the Standard cFE File Header.
- CFE_Status_t CFE_FS_WriteHeader (osal_id_t FileDes, CFE_FS_Header_t ∗Hdr)

  Write the specified Standard cFE File Header to the specified file.
- CFE_Status_t CFE_FS_SetTimestamp (osal_id_t FileDes, CFE_TIME_SysTime_t NewTimestamp)

  Modifies the Time Stamp field in the Standard cFE File Header for the specified file.
- const char ∗ CFE_FS_GetDefaultMountPoint (CFE_FS_FileCategory_t FileCategory)

  Get the default virtual mount point for a file category.
- const char ∗ CFE_FS_GetDefaultExtension (CFE_FS_FileCategory_t FileCategory)

  Get the default filename extension for a file category.
- int32 CFE_FS_ParseInputFileNameEx (char ∗OutputBuffer, const char ∗InputBuffer, size_t OutputBufSize, size↩_t InputBufSize, const char ∗DefaultInput, const char ∗DefaultPath, const char ∗DefaultExtension)

  Parse a filename input from an input buffer into a local buffer.
- int32 CFE_FS_ParseInputFileName (char ∗OutputBuffer, const char ∗InputName, size_t OutputBufSize, CFE_FS_FileCategory_t FileCategory)

  Parse a filename string from the user into a local buffer.
- CFE_Status_t CFE_FS_ExtractFilenameFromPath (const char ∗OriginalPath, char ∗FileNameOnly)

  Extracts the filename from a unix style path and filename string.
- int32 CFE_FS_BackgroundFileDumpRequest (CFE_FS_FileWriteMetaData_t ∗Meta)

  Register a background file dump request.
- bool CFE_FS_BackgroundFileDumpIsPending (const CFE_FS_FileWriteMetaData_t ∗Meta)

  Query if a background file write request is currently pending.

12.87.1 Detailed Description

Purpose: cFE File Services (FS) library API header file
Author: S.Walling/Microtel

12.88 cfe/modules/core_api/fsw/inc/cfe_fs_api_typedefs.h File Reference

```
#include "common_types.h"
#include "osconfig.h"
#include "cfe_mission_cfg.h"
#include "cfe_fs_extern_typedefs.h"
```

Data Structures

- struct CFE_FS_FileWriteMetaData

  External Metadata/State object associated with background file writes.

Typedefs

- typedef bool(∗ CFE_FS_FileWriteGetData_t) (void ∗Meta, uint32 RecordNum, void ∗∗Buffer, size_t ∗BufSize)
- typedef void(∗ CFE_FS_FileWriteOnEvent_t) (void ∗Meta, CFE_FS_FileWriteEvent_t Event, int32 Status, uint32 RecordNum, size_t BlockSize, size_t Position)
- typedef struct CFE_FS_FileWriteMetaData CFE_FS_FileWriteMetaData_t

  External Metadata/State object associated with background file writes.

Enumerations

- enum CFE_FS_FileCategory_t {
  CFE_FS_FileCategory_UNKNOWN, CFE_FS_FileCategory_DYNAMIC_MODULE, CFE_FS_FileCategory_BINARY_DATA_DUMP
  CFE_FS_FileCategory_TEXT_LOG,
  CFE_FS_FileCategory_SCRIPT, CFE_FS_FileCategory_TEMP, CFE_FS_FileCategory_MAX }

  Generalized file types/categories known to FS.
- enum CFE_FS_FileWriteEvent_t {
  CFE_FS_FileWriteEvent_UNDEFINED, CFE_FS_FileWriteEvent_COMPLETE, CFE_FS_FileWriteEvent_CREATE_ERROR,
  CFE_FS_FileWriteEvent_HEADER_WRITE_ERROR,
  CFE_FS_FileWriteEvent_RECORD_WRITE_ERROR, CFE_FS_FileWriteEvent_MAX }

12.88.1 Detailed Description

Purpose: cFE File Services (FS) library API header file
Author: S.Walling/Microtel

12.88.2 Typedef Documentation

12.88.2.1 CFE_FS_FileWriteGetData_t `typedef bool(* CFE_FS_FileWriteGetData_t) (void *Meta, uint32 RecordNum, void **Buffer, size_t *BufSize)`

Data Getter routine provided by requester
Outputs a data block. Should return true if the file is complete (last record/EOF), otherwise return false.

Parameters

in,out	*Meta*	Pointer to the metadata object
in	*RecordNum*	Incrementing record number counter
out	*Buffer*	Pointer to buffer data block, should be set by implementation
out	*BufSize*	Pointer to buffer data size, should be set by implementation

Returns

End of file status

Return values

true	if at last data record, and output file should be closed
false	if not at last record, more data records to write

Note

The implementation of this function must always set the "Buffer" and "BufSize" outputs. If no data is available, they may be set to NULL and 0, respectively.

Definition at line 98 of file cfe_fs_api_typedefs.h.

12.88.2.2 CFE_FS_FileWriteMetaData_t `typedef struct CFE_FS_FileWriteMetaData CFE_FS_FileWriteMetaData_t`

External Metadata/State object associated with background file writes.
Applications intending to schedule background file write jobs should instantiate this object in static/global data memory. This keeps track of the state of the file write request(s).

12.88.2.3 CFE_FS_FileWriteOnEvent_t `typedef void(* CFE_FS_FileWriteOnEvent_t) (void *Meta, CFE_FS_FileWriteEvent_Event, int32 Status, uint32 RecordNum, size_t BlockSize, size_t Position)`

Event generator routine provided by requester
Invoked from certain points in the file write process. Implementation may invoke CFE_EVS_SendEvent() appropriately to inform of progress.

Parameters

in,out	*Meta*	Pointer to the metadata object
in	*Event*	Generalized type of event to report (not actual event ID)
in	*Status*	Generalized status code (may be from OSAL or CFE)
in	*RecordNum*	Record number counter at which event occurred
in	*BlockSize*	Size of record being processed when event occurred (if applicable)
in	*Position*	File position/size when event occurred

Definition at line 114 of file cfe_fs_api_typedefs.h.

12.88.3 Enumeration Type Documentation

12.88.3.1 CFE_FS_FileCategory_t `enum CFE_FS_FileCategory_t`

Generalized file types/categories known to FS.
This defines different categories of files, where they may reside in different default locations of the virtualized file system. This is different from, and should not be confused with, the "SubType" field in the FS header. This value is only used at runtime for FS APIs and should not actually appear in any output file or message.

Enumerator

CFE_FS_FileCategory_UNKNOWN	Placeholder, unknown file category
CFE_FS_FileCategory_DYNAMIC_MODULE	Dynamically loadable apps/libraries (e.g. .so, .o, .dll, etc)
CFE_FS_FileCategory_BINARY_DATA_DUMP	Binary log file generated by various data dump commands
CFE_FS_FileCategory_TEXT_LOG	Text-based log file generated by various commands
CFE_FS_FileCategory_SCRIPT	Text-based Script files (e.g. ES startup script)
CFE_FS_FileCategory_TEMP	Temporary/Ephemeral files
CFE_FS_FileCategory_MAX	Placeholder, keep last

Definition at line 49 of file cfe_fs_api_typedefs.h.

12.88.3.2 CFE_FS_FileWriteEvent_t enum CFE_FS_FileWriteEvent_t

Enumerator

CFE_FS_FileWriteEvent_UNDEFINED	
CFE_FS_FileWriteEvent_COMPLETE	File is completed successfully
CFE_FS_FileWriteEvent_CREATE_ERROR	Unable to create/open file
CFE_FS_FileWriteEvent_HEADER_WRITE_ERROR	Unable to write FS header
CFE_FS_FileWriteEvent_RECORD_WRITE_ERROR	Unable to write data record
CFE_FS_FileWriteEvent_MAX	

Definition at line 69 of file cfe_fs_api_typedefs.h.

12.89 cfe/modules/core_api/fsw/inc/cfe_msg.h File Reference

```
#include "common_types.h"
#include "cfe_error.h"
#include "cfe_msg_hdr.h"
#include "cfe_msg_api_typedefs.h"
#include "cfe_es_api_typedefs.h"
#include "cfe_sb_api_typedefs.h"
#include "cfe_time_api_typedefs.h"
```

Functions

- CFE_Status_t CFE_MSG_Init (CFE_MSG_Message_t *MsgPtr, CFE_SB_MsgId_t MsgId, CFE_MSG_Size_t Size)

  Initialize a message.
- CFE_Status_t CFE_MSG_GetSize (const CFE_MSG_Message_t *MsgPtr, CFE_MSG_Size_t *Size)

  Gets the total size of a message.
- CFE_Status_t CFE_MSG_SetSize (CFE_MSG_Message_t *MsgPtr, CFE_MSG_Size_t Size)

  Sets the total size of a message.
- CFE_Status_t CFE_MSG_GetType (const CFE_MSG_Message_t *MsgPtr, CFE_MSG_Type_t *Type)

  Gets the message type.
- CFE_Status_t CFE_MSG_SetType (CFE_MSG_Message_t *MsgPtr, CFE_MSG_Type_t Type)

  Sets the message type.
- CFE_Status_t CFE_MSG_GetHeaderVersion (const CFE_MSG_Message_t *MsgPtr, CFE_MSG_HeaderVersion_t *Version)

  Gets the message header version.
- CFE_Status_t CFE_MSG_SetHeaderVersion (CFE_MSG_Message_t *MsgPtr, CFE_MSG_HeaderVersion_t Version)

  Sets the message header version.
- CFE_Status_t CFE_MSG_GetHasSecondaryHeader (const CFE_MSG_Message_t *MsgPtr, bool *Has↩Secondary)

  Gets the message secondary header boolean.
- CFE_Status_t CFE_MSG_SetHasSecondaryHeader (CFE_MSG_Message_t *MsgPtr, bool HasSecondary)

  Sets the message secondary header boolean.
- CFE_Status_t CFE_MSG_GetApId (const CFE_MSG_Message_t *MsgPtr, CFE_MSG_ApId_t *ApId)

  Gets the message application ID.

- CFE_Status_t CFE_MSG_SetApId (CFE_MSG_Message_t *MsgPtr, CFE_MSG_ApId_t ApId)

  Sets the message application ID.
- CFE_Status_t CFE_MSG_GetSegmentationFlag (const CFE_MSG_Message_t *MsgPtr, CFE_MSG_SegmentationFlag_t *SegFlag)

  Gets the message segmentation flag.
- CFE_Status_t CFE_MSG_SetSegmentationFlag (CFE_MSG_Message_t *MsgPtr, CFE_MSG_SegmentationFlag_t SegFlag)

  Sets the message segmentation flag.
- CFE_Status_t CFE_MSG_GetSequenceCount (const CFE_MSG_Message_t *MsgPtr, CFE_MSG_SequenceCount_t *SeqCnt)

  Gets the message sequence count.
- CFE_Status_t CFE_MSG_SetSequenceCount (CFE_MSG_Message_t *MsgPtr, CFE_MSG_SequenceCount_t SeqCnt)

  Sets the message sequence count.
- CFE_MSG_SequenceCount_t CFE_MSG_GetNextSequenceCount (CFE_MSG_SequenceCount_t SeqCnt)

  Gets the next sequence count value (rolls over if appropriate)
- CFE_Status_t CFE_MSG_GetEDSVersion (const CFE_MSG_Message_t *MsgPtr, CFE_MSG_EDSVersion_t *Version)

  Gets the message EDS version.
- CFE_Status_t CFE_MSG_SetEDSVersion (CFE_MSG_Message_t *MsgPtr, CFE_MSG_EDSVersion_t Version)

  Sets the message EDS version.
- CFE_Status_t CFE_MSG_GetEndian (const CFE_MSG_Message_t *MsgPtr, CFE_MSG_Endian_t *Endian)

  Gets the message endian.
- CFE_Status_t CFE_MSG_SetEndian (CFE_MSG_Message_t *MsgPtr, CFE_MSG_Endian_t Endian)

  Sets the message endian.
- CFE_Status_t CFE_MSG_GetPlaybackFlag (const CFE_MSG_Message_t *MsgPtr, CFE_MSG_PlaybackFlag_t *PlayFlag)

  Gets the message playback flag.
- CFE_Status_t CFE_MSG_SetPlaybackFlag (CFE_MSG_Message_t *MsgPtr, CFE_MSG_PlaybackFlag_t PlayFlag)

  Sets the message playback flag.
- CFE_Status_t CFE_MSG_GetSubsystem (const CFE_MSG_Message_t *MsgPtr, CFE_MSG_Subsystem_t *Subsystem)

  Gets the message subsystem.
- CFE_Status_t CFE_MSG_SetSubsystem (CFE_MSG_Message_t *MsgPtr, CFE_MSG_Subsystem_t Subsystem)

  Sets the message subsystem.
- CFE_Status_t CFE_MSG_GetSystem (const CFE_MSG_Message_t *MsgPtr, CFE_MSG_System_t *System)

  Gets the message system.
- CFE_Status_t CFE_MSG_SetSystem (CFE_MSG_Message_t *MsgPtr, CFE_MSG_System_t System)

  Sets the message system.
- CFE_Status_t CFE_MSG_GenerateChecksum (CFE_MSG_Message_t *MsgPtr)

  Calculates and sets the checksum of a message.
- CFE_Status_t CFE_MSG_ValidateChecksum (const CFE_MSG_Message_t *MsgPtr, bool *IsValid)

  Validates the checksum of a message.
- CFE_Status_t CFE_MSG_SetFcnCode (CFE_MSG_Message_t *MsgPtr, CFE_MSG_FcnCode_t FcnCode)

  Sets the function code field in a message.
- CFE_Status_t CFE_MSG_GetFcnCode (const CFE_MSG_Message_t *MsgPtr, CFE_MSG_FcnCode_t *Fcn↩Code)

Gets the function code field from a message.

- CFE_Status_t CFE_MSG_GetMsgTime (const CFE_MSG_Message_t ∗MsgPtr, CFE_TIME_SysTime_t ∗Time)

  Gets the time field from a message.
- CFE_Status_t CFE_MSG_SetMsgTime (CFE_MSG_Message_t ∗MsgPtr, CFE_TIME_SysTime_t NewTime)

  Sets the time field in a message.
- CFE_Status_t CFE_MSG_GetMsgId (const CFE_MSG_Message_t ∗MsgPtr, CFE_SB_MsgId_t ∗MsgId)

  Gets the message id from a message.
- CFE_Status_t CFE_MSG_SetMsgId (CFE_MSG_Message_t ∗MsgPtr, CFE_SB_MsgId_t MsgId)

  Sets the message id bits in a message.
- CFE_Status_t CFE_MSG_GetTypeFromMsgId (CFE_SB_MsgId_t MsgId, CFE_MSG_Type_t ∗Type)

  Gets message type using message ID.
- CFE_Status_t CFE_MSG_OriginationAction (CFE_MSG_Message_t ∗MsgPtr, size_t BufferSize, bool ∗Is↩ Acceptable)

  Perform any necessary actions on a newly-created message, prior to sending.
- CFE_Status_t CFE_MSG_VerificationAction (const CFE_MSG_Message_t ∗MsgPtr, size_t BufferSize, bool ∗Is↩ Acceptable)

  Checks message integrity/acceptability.

12.89.1 Detailed Description

Message access APIs

12.90 cfe/modules/core_api/fsw/inc/cfe_msg_api_typedefs.h File Reference

```
#include "common_types.h"
#include "cfe_error.h"
```

Macros

- #define CFE_MSG_BAD_ARGUMENT CFE_SB_BAD_ARGUMENT

  Error - bad argument.
- #define CFE_MSG_NOT_IMPLEMENTED CFE_SB_NOT_IMPLEMENTED

  Error - not implemented.
- #define CFE_MSG_WRONG_MSG_TYPE CFE_SB_WRONG_MSG_TYPE

  Error - wrong type.

Typedefs

- typedef size_t CFE_MSG_Size_t

  Message size, note CCSDS maximum is UINT16_MAX+7.
- typedef uint32 CFE_MSG_Checksum_t

  Message checksum (Oversized to avoid redefine)
- typedef uint16 CFE_MSG_FcnCode_t

  Message function code.
- typedef uint16 CFE_MSG_HeaderVersion_t

  Message header version.
- typedef uint16 CFE_MSG_ApId_t

  Message application ID.
- typedef uint16 CFE_MSG_SequenceCount_t

Message sequence count.

- typedef uint16 CFE_MSG_EDSVersion_t

  Message EDS version.
- typedef uint16 CFE_MSG_Subsystem_t

  Message subsystem.
- typedef uint16 CFE_MSG_System_t

  Message system.
- typedef enum CFE_MSG_Type CFE_MSG_Type_t

  Message type.
- typedef enum CFE_MSG_SegmentationFlag CFE_MSG_SegmentationFlag_t

  Segmentation flags.
- typedef enum CFE_MSG_Endian CFE_MSG_Endian_t

  Endian flag.
- typedef enum CFE_MSG_PlaybackFlag CFE_MSG_PlaybackFlag_t

  Playback flag.
- typedef struct CFE_MSG_Message CFE_MSG_Message_t

  cFS generic base message
- typedef struct CFE_MSG_CommandHeader CFE_MSG_CommandHeader_t

  cFS command header
- typedef struct CFE_MSG_TelemetryHeader CFE_MSG_TelemetryHeader_t

  cFS telemetry header

Enumerations

- enum CFE_MSG_Type { CFE_MSG_Type_Invalid, CFE_MSG_Type_Cmd, CFE_MSG_Type_Tlm }

  Message type.
- enum CFE_MSG_SegmentationFlag { CFE_MSG_SegFlag_Invalid, CFE_MSG_SegFlag_Continue, CFE_MSG_SegFlag_First, CFE_MSG_SegFlag_Last, CFE_MSG_SegFlag_Unsegmented }

  Segmentation flags.
- enum CFE_MSG_Endian { CFE_MSG_Endian_Invalid, CFE_MSG_Endian_Big, CFE_MSG_Endian_Little }

  Endian flag.
- enum CFE_MSG_PlaybackFlag { CFE_MSG_PlayFlag_Invalid, CFE_MSG_PlayFlag_Original, CFE_MSG_PlayFlag_Playback }

  Playback flag.

12.90.1 Detailed Description

Typedefs for Message API

- Separate from API so these can be adjusted for custom implementations

12.90.2 Macro Definition Documentation

12.90.2.1 CFE_MSG_BAD_ARGUMENT `#define CFE_MSG_BAD_ARGUMENT CFE_SB_BAD_ARGUMENT`

Error - bad argument.
Definition at line 39 of file cfe_msg_api_typedefs.h.

12.90.2.2 CFE_MSG_NOT_IMPLEMENTED `#define CFE_MSG_NOT_IMPLEMENTED CFE_SB_NOT_IMPLEMENTED`

Error - not implemented.
Definition at line 40 of file cfe_msg_api_typedefs.h.

12.90.2.3 CFE_MSG_WRONG_MSG_TYPE `#define CFE_MSG_WRONG_MSG_TYPE CFE_SB_WRONG_MSG_TYPE`

Error - wrong type.
Definition at line 41 of file cfe_msg_api_typedefs.h.

12.90.3 Typedef Documentation

12.90.3.1 CFE_MSG_ApId_t `typedef uint16 CFE_MSG_ApId_t`

Message application ID.
Definition at line 50 of file cfe_msg_api_typedefs.h.

12.90.3.2 CFE_MSG_Checksum_t `typedef uint32 CFE_MSG_Checksum_t`

Message checksum (Oversized to avoid redefine)
Definition at line 47 of file cfe_msg_api_typedefs.h.

12.90.3.3 CFE_MSG_CommandHeader_t `typedef struct CFE_MSG_CommandHeader CFE_MSG_CommandHeader_t`

cFS command header
Definition at line 107 of file cfe_msg_api_typedefs.h.

12.90.3.4 CFE_MSG_EDSVersion_t `typedef uint16 CFE_MSG_EDSVersion_t`

Message EDS version.
Definition at line 52 of file cfe_msg_api_typedefs.h.

12.90.3.5 CFE_MSG_Endian_t `typedef enum CFE_MSG_Endian CFE_MSG_Endian_t`

Endian flag.

12.90.3.6 CFE_MSG_FcnCode_t `typedef uint16 CFE_MSG_FcnCode_t`

Message function code.
Definition at line 48 of file cfe_msg_api_typedefs.h.

12.90.3.7 CFE_MSG_HeaderVersion_t `typedef uint16 CFE_MSG_HeaderVersion_t`

Message header version.
Definition at line 49 of file cfe_msg_api_typedefs.h.

12.90.3.8 CFE_MSG_Message_t `typedef struct CFE_MSG_Message CFE_MSG_Message_t`

cFS generic base message
Definition at line 102 of file cfe_msg_api_typedefs.h.

12.90.3.9 CFE_MSG_PlaybackFlag_t `typedef enum CFE_MSG_PlaybackFlag CFE_MSG_PlaybackFlag_t`

Playback flag.

12.90.3.10 CFE_MSG_SegmentationFlag_t `typedef enum CFE_MSG_SegmentationFlag CFE_MSG_SegmentationFlag_t`

Segmentation flags.

12.90.3.11 CFE_MSG_SequenceCount_t `typedef uint16 CFE_MSG_SequenceCount_t`

Message sequence count.
Definition at line 51 of file cfe_msg_api_typedefs.h.

12.90.3.12 CFE_MSG_Size_t `typedef size_t CFE_MSG_Size_t`

Message size, note CCSDS maximum is UINT16_MAX+7.
Definition at line 46 of file cfe_msg_api_typedefs.h.

12.90.3.13 CFE_MSG_Subsystem_t `typedef uint16 CFE_MSG_Subsystem_t`

Message subsystem.
Definition at line 53 of file cfe_msg_api_typedefs.h.

12.90.3.14 CFE_MSG_System_t `typedef uint16 CFE_MSG_System_t`

Message system.
Definition at line 54 of file cfe_msg_api_typedefs.h.

12.90.3.15 CFE_MSG_TelemetryHeader_t `typedef struct CFE_MSG_TelemetryHeader CFE_MSG_TelemetryHeader_t`

cFS telemetry header
Definition at line 112 of file cfe_msg_api_typedefs.h.

12.90.3.16 CFE_MSG_Type_t `typedef enum CFE_MSG_Type CFE_MSG_Type_t`

Message type.

12.90.4 Enumeration Type Documentation

12.90.4.1 CFE_MSG_Endian `enum CFE_MSG_Endian`

Endian flag.

Enumerator

CFE_MSG_Endian_Invalid	Invalid endian setting.
CFE_MSG_Endian_Big	Big endian.
CFE_MSG_Endian_Little	Little endian.

Definition at line 75 of file cfe_msg_api_typedefs.h.

12.90.4.2 CFE_MSG_PlaybackFlag `enum CFE_MSG_PlaybackFlag`

Playback flag.

Enumerator

CFE_MSG_PlayFlag_Invalid	Invalid playback setting.
CFE_MSG_PlayFlag_Original	Original.
CFE_MSG_PlayFlag_Playback	Playback.

Definition at line 83 of file cfe_msg_api_typedefs.h.

12.90.4.3 CFE_MSG_SegmentationFlag `enum CFE_MSG_SegmentationFlag`

Segmentation flags.

Enumerator

CFE_MSG_SegFlag_Invalid	Invalid segmentation flag.
CFE_MSG_SegFlag_Continue	Continuation segment of User Data.
CFE_MSG_SegFlag_First	First segment of User Data.
CFE_MSG_SegFlag_Last	Last segment of User Data.
CFE_MSG_SegFlag_Unsegmented	Unsegmented data.

Definition at line 65 of file cfe_msg_api_typedefs.h.

12.90.4.4 CFE_MSG_Type `enum CFE_MSG_Type`

Message type.

Enumerator

CFE_MSG_Type_Invalid	Message type invalid, undefined, not implemented.
CFE_MSG_Type_Cmd	Command message type.
CFE_MSG_Type_Tlm	Telemetry message type.

Definition at line 57 of file cfe_msg_api_typedefs.h.

12.91 cfe/modules/core_api/fsw/inc/cfe_resourceid.h File Reference

```
#include "cfe_resourceid_api_typedefs.h"
```

Functions

- uint32 CFE_ResourceId_GetBase (CFE_ResourceId_t ResourceId)

  Get the Base value (type/category) from a resource ID value.
- uint32 CFE_ResourceId_GetSerial (CFE_ResourceId_t ResourceId)

  Get the Serial Number (sequential ID) from a resource ID value.
- CFE_ResourceId_t CFE_ResourceId_FindNext (CFE_ResourceId_t StartId, uint32 TableSize, bool(∗Check↩Func)(CFE_ResourceId_t))

Locate the next resource ID which does not map to an in-use table entry.

- int32 CFE_ResourceId_ToIndex (CFE_ResourceId_t Id, uint32 BaseValue, uint32 TableSize, uint32 *Idx)

  Internal routine to aid in converting an ES resource ID to an array index.

Resource ID test/conversion macros and inline functions

- #define CFE_RESOURCEID_TO_ULONG(id) CFE_ResourceId_ToInteger(CFE_RESOURCEID_UNWRAP(id))

  Convert a derived (app-specific) ID directly into an "unsigned long".

- #define CFE_RESOURCEID_TEST_DEFINED(id) CFE_ResourceId_IsDefined(CFE_RESOURCEID_UNWR↩AP(id))

  Determine if a derived (app-specific) ID is defined or not.

- #define CFE_RESOURCEID_TEST_EQUAL(id1, id2) CFE_ResourceId_Equal(CFE_RESOURCEID_UNWR↩AP(id1), CFE_RESOURCEID_UNWRAP(id2))

  Determine if two derived (app-specific) IDs are equal.

- static unsigned long CFE_ResourceId_ToInteger (CFE_ResourceId_t id)

  Convert a resource ID to an integer.

- static CFE_ResourceId_t CFE_ResourceId_FromInteger (unsigned long Value)

  Convert an integer to a resource ID.

- static bool CFE_ResourceId_Equal (CFE_ResourceId_t id1, CFE_ResourceId_t id2)

  Compare two Resource ID values for equality.

- static bool CFE_ResourceId_IsDefined (CFE_ResourceId_t id)

  Check if a resource ID value is defined.

12.91.1 Detailed Description

Contains global prototypes and definitions related to resource management and related CFE resource IDs.
A CFE ES Resource ID is a common way to identify CFE-managed resources such as apps, tasks, counters, memory pools, CDS blocks, and other entities.
Simple operations are provided as inline functions, which should alleviate the need to do direct manipulation of resource IDs:

- Check for undefined ID value
- Check for equality of two ID values
- Convert ID to simple integer (typically for printing/logging)
- Convert simple integer to ID (inverse of above)

12.91.2 Macro Definition Documentation

12.91.2.1 CFE_RESOURCEID_TEST_DEFINED

```
#define CFE_RESOURCEID_TEST_DEFINED(
    id ) CFE_ResourceId_IsDefined(CFE_RESOURCEID_UNWRAP(id))
```

Determine if a derived (app-specific) ID is defined or not.
This generic routine is implemented as a macro so it is agnostic to the actual argument type, and it will evaluate correctly so long as the argument type is based on the CFE_RESOURCEID_BASE_TYPE.
Definition at line 70 of file cfe_resourceid.h.

12.91.2.2 CFE_RESOURCEID_TEST_EQUAL

```
#define CFE_RESOURCEID_TEST_EQUAL(
    id1,
    id2 ) CFE_ResourceId_Equal(CFE_RESOURCEID_UNWRAP(id1), CFE_RESOURCEID_UNWRAP(id2))
```

Determine if two derived (app-specific) IDs are equal.
This generic routine is implemented as a macro so it is agnostic to the actual argument type, and it will evaluate correctly so long as the argument type is based on the CFE_RESOURCEID_BASE_TYPE.
Definition at line 78 of file cfe_resourceid.h.

12.91.2.3 CFE_RESOURCEID_TO_ULONG

```
#define CFE_RESOURCEID_TO_ULONG(
    id ) CFE_ResourceId_ToInteger(CFE_RESOURCEID_UNWRAP(id))
```

Convert a derived (app-specific) ID directly into an "unsigned long".
This generic routine is implemented as a macro so it is agnostic to the actual argument type, and it will evaluate correctly so long as the argument type is based on the CFE_RESOURCEID_BASE_TYPE.
There is no inverse of this macro, as it depends on the actual derived type desired. Applications needing to recreate an ID from an integer should use CFE_ResourceId_FromInteger() combined with a cast/conversion to the correct/intended derived type, as needed.

Note

This evaluates as an "unsigned long" such that it can be used in printf()-style functions with the "%lx" modifier without extra casting, as this is the most typical use-case for representing an ID as an integer.

Definition at line 62 of file cfe_resourceid.h.

12.91.3 Function Documentation

12.91.3.1 CFE_ResourceId_Equal()

```
static bool CFE_ResourceId_Equal (
    CFE_ResourceId_t id1,
    CFE_ResourceId_t id2 )  [inline], [static]
```

Compare two Resource ID values for equality.

Parameters

in	*id1*	Resource ID to check
in	*id2*	Resource ID to check

Returns

true if id1 and id2 are equal, false otherwise.

Definition at line 133 of file cfe_resourceid.h.
Referenced by CFE_ResourceId_IsDefined().

12.91.3.2 CFE_ResourceId_FindNext()

```
CFE_ResourceId_t CFE_ResourceId_FindNext (
    CFE_ResourceId_t StartId,
    uint32 TableSize,
    bool(*)(CFE_ResourceId_t) CheckFunc )
```

Locate the next resource ID which does not map to an in-use table entry.
This begins searching from StartId which should be the most recently issued ID for the resource category. This will then search for the next ID which does *not* map to a table entry that is in use. That is, it does not alias any valid ID when converted to an array index.

returns an undefined ID value if no open slots are available

Parameters

in	*StartId*	the last issued ID for the resource category (app, lib, etc).
in	*TableSize*	the maximum size of the target table
in	*CheckFunc*	a function to check if the given ID is available

Returns

Next ID value which does not map to a valid entry

Return values

CFE_RESOURCEID_UNDEFINED	if no open slots or bad arguments.

12.91.3.3 CFE_ResourceId_FromInteger()

```
static CFE_ResourceId_t CFE_ResourceId_FromInteger (
    unsigned long Value ) [inline], [static]
```

Convert an integer to a resource ID.
This is the inverse of CFE_ResourceId_ToInteger(), and reconstitutes the original CFE_ResourceId_t value from the integer representation.
This may be used, for instance, where an ID value is parsed from a text file or message using C library APIs such as scanf() or strtoul().

See also

CFE_ResourceId_ToInteger()

Parameters

in	*Value*	Integer value to convert

Returns

ID value corresponding to integer

Definition at line 121 of file cfe_resourceid.h.

12.91.3.4 CFE_ResourceId_GetBase()

```
uint32 CFE_ResourceId_GetBase (
    CFE_ResourceId_t ResourceId )
```

Get the Base value (type/category) from a resource ID value.
This masks out the ID serial number to obtain the base value, which is different for each resource type.

Note

The value is NOT shifted or otherwise adjusted.

Parameters

in	*ResourceId*	the resource ID to decode

Returns

The base value associated with that ID

12.91.3.5 CFE_ResourceId_GetSerial()

```
uint32 CFE_ResourceId_GetSerial (
    CFE_ResourceId_t ResourceId )
```

Get the Serial Number (sequential ID) from a resource ID value.
This masks out the ID base value to obtain the serial number, which is different for each entity created.

Parameters

in	*ResourceId*	the resource ID to decode

Returns

The serial number associated with that ID

12.91.3.6 CFE_ResourceId_IsDefined()

```
static bool CFE_ResourceId_IsDefined (
    CFE_ResourceId_t id )  [inline], [static]
```

Check if a resource ID value is defined.
The constant CFE_RESOURCEID_UNDEFINED represents an undefined ID value, such that the expression:

```
CFE_ResourceId_IsDefined(CFE_RESOURCEID_UNDEFINED)
```

Always returns false.

Parameters

in	*id*	Resource ID to check

Returns

True if the ID may refer to a defined entity, false if invalid/undefined.

Definition at line 151 of file cfe_resourceid.h.
References CFE_ResourceId_Equal(), and CFE_RESOURCEID_UNDEFINED.
Here is the call graph for this function:

12.91.3.7 CFE_ResourceId_ToIndex()

```
int32 CFE_ResourceId_ToIndex (
    CFE_ResourceId_t Id,
```

```
uint32 BaseValue,
uint32 TableSize,
uint32 * Idx )
```

Internal routine to aid in converting an ES resource ID to an array index.

Parameters

in	*Id*	The resource ID
in	*BaseValue*	The respective ID base value corresponding to the ID type
in	*TableSize*	The actual size of the internal table (MAX index value + 1)
out	*Idx*	The output index

Returns

Execution status, see cFE Return Code Defines

Return values

CFE_SUCCESS	Successful execution.
CFE_ES_BAD_ARGUMENT	Bad Argument.
CFE_ES_ERR_RESOURCEID_NOT_VALID	Resource ID is not valid.

12.91.3.8 CFE_ResourceId_ToInteger()

```
static unsigned long CFE_ResourceId_ToInteger (
CFE_ResourceId_t id ) [inline], [static]
```

Convert a resource ID to an integer.

This is primarily intended for logging purposes, such was writing to debug console, event messages, or log files, using printf-like APIs.

For compatibility with C library APIs, this returns an "unsigned long" type and should be used with the "%lx" format specifier in a printf format string.

Note

No assumptions should be made about the actual integer value, such as its base/range. It may be printed, but should not be modified or tested/compared using other arithmetic ops, and should never be used as the index to an array or table. See the related function CFE_ResourceId_ToIndex() for cases where a zero-based array/table index is needed.

See also

CFE_ResourceId_FromInteger()

Parameters

in	*id*	Resource ID to convert

Returns

Integer value corresponding to ID

Definition at line 102 of file cfe_resourceid.h.

12.92 cfe/modules/core_api/fsw/inc/cfe_resourceid_api_typedefs.h File Reference

```
#include "cfe_resourceid_typedef.h"
```

Macros

Resource ID predefined values

- #define CFE_RESOURCEID_UNDEFINED ((CFE_ResourceId_t)CFE_RESOURCEID_WRAP(0))
  A resource ID value that represents an undefined/unused resource.
- #define CFE_RESOURCEID_RESERVED ((CFE_ResourceId_t)CFE_RESOURCEID_WRAP(0xFFFFFFFF))
  A resource ID value that represents a reserved entry.

12.92.1 Detailed Description

Contains global prototypes and definitions related to resource management and related CFE resource IDs.
A CFE ES Resource ID is a common way to identify CFE-managed resources such as apps, tasks, counters, memory pools, CDS blocks, and other entities.
Simple operations are provided as inline functions, which should alleviate the need to do direct manipulation of resource IDs:

- Check for undefined ID value
- Check for equality of two ID values
- Convert ID to simple integer (typically for printing/logging)
- Convert simple integer to ID (inverse of above)

12.92.2 Macro Definition Documentation

12.92.2.1 CFE_RESOURCEID_RESERVED `#define CFE_RESOURCEID_RESERVED ((CFE_ResourceId_t)CFE_R↩ESOURCEID_WRAP(0xFFFFFFFF))`

A resource ID value that represents a reserved entry.
This is not a valid value for any resource type, but is used to mark table entries that are not available for use. For instance, this may be used while setting up an entry initially.
Definition at line 74 of file cfe_resourceid_api_typedefs.h.

12.92.2.2 CFE_RESOURCEID_UNDEFINED `#define CFE_RESOURCEID_UNDEFINED ((CFE_ResourceId_t)CFE↩_RESOURCEID_WRAP(0))`

A resource ID value that represents an undefined/unused resource.
This constant may be used to initialize local variables of the CFE_ResourceId_t type to a safe value that will not alias a valid ID.
By design, this value is also the result of zeroing a CFE_ResourceId_t type via standard functions like memset(), such that objects initialized using this method will also be set to safe values.
Definition at line 65 of file cfe_resourceid_api_typedefs.h.

12.93 cfe/modules/core_api/fsw/inc/cfe_sb.h File Reference

```
#include "common_types.h"
#include "cfe_error.h"
#include "cfe_sb_api_typedefs.h"
```

```
#include "cfe_es_api_typedefs.h"
```

Macros

- #define CFE_BIT(x) (1 << (x))

  Places a one at bit positions 0 - 31.
- #define CFE_SET(i, x) ((i) |= CFE_BIT(x))

  Sets bit x of i.
- #define CFE_CLR(i, x) ((i) &= ~CFE_BIT(x))

  Clears bit x of i.
- #define CFE_TST(i, x) (((i)&CFE_BIT(x)) != 0)

  true(non zero) if bit x of i is set

Functions

- CFE_Status_t CFE_SB_CreatePipe (CFE_SB_PipeId_t *PipeIdPtr, uint16 Depth, const char *PipeName)

  Creates a new software bus pipe.
- CFE_Status_t CFE_SB_DeletePipe (CFE_SB_PipeId_t PipeId)

  Delete a software bus pipe.
- CFE_Status_t CFE_SB_PipeId_ToIndex (CFE_SB_PipeId_t PipeID, uint32 *Idx)

  Obtain an index value correlating to an SB Pipe ID.
- CFE_Status_t CFE_SB_SetPipeOpts (CFE_SB_PipeId_t PipeId, uint8 Opts)

  Set options on a pipe.
- CFE_Status_t CFE_SB_GetPipeOpts (CFE_SB_PipeId_t PipeId, uint8 *OptsPtr)

  Get options on a pipe.
- CFE_Status_t CFE_SB_GetPipeName (char *PipeNameBuf, size_t PipeNameSize, CFE_SB_PipeId_t PipeId)

  Get the pipe name for a given id.
- CFE_Status_t CFE_SB_GetPipeIdByName (CFE_SB_PipeId_t *PipeIdPtr, const char *PipeName)

  Get pipe id by pipe name.
- CFE_Status_t CFE_SB_SubscribeEx (CFE_SB_MsgId_t MsgId, CFE_SB_PipeId_t PipeId, CFE_SB_Qos_t Quality, uint16 MsgLim)

  Subscribe to a message on the software bus.
- CFE_Status_t CFE_SB_Subscribe (CFE_SB_MsgId_t MsgId, CFE_SB_PipeId_t PipeId)

  Subscribe to a message on the software bus with default parameters.
- CFE_Status_t CFE_SB_SubscribeLocal (CFE_SB_MsgId_t MsgId, CFE_SB_PipeId_t PipeId, uint16 MsgLim)

  Subscribe to a message while keeping the request local to a cpu.
- CFE_Status_t CFE_SB_Unsubscribe (CFE_SB_MsgId_t MsgId, CFE_SB_PipeId_t PipeId)

  Remove a subscription to a message on the software bus.
- CFE_Status_t CFE_SB_UnsubscribeLocal (CFE_SB_MsgId_t MsgId, CFE_SB_PipeId_t PipeId)

  Remove a subscription to a message on the software bus on the current CPU.
- CFE_Status_t CFE_SB_TransmitMsg (const CFE_MSG_Message_t *MsgPtr, bool IsOrigination)

  Transmit a message.
- CFE_Status_t CFE_SB_ReceiveBuffer (CFE_SB_Buffer_t **BufPtr, CFE_SB_PipeId_t PipeId, int32 TimeOut)

  Receive a message from a software bus pipe.
- CFE_SB_Buffer_t * CFE_SB_AllocateMessageBuffer (size_t MsgSize)

  Get a buffer pointer to use for "zero copy" SB sends.
- CFE_Status_t CFE_SB_ReleaseMessageBuffer (CFE_SB_Buffer_t *BufPtr)

Release an unused "zero copy" buffer pointer.

- CFE_Status_t CFE_SB_TransmitBuffer (CFE_SB_Buffer_t *BufPtr, bool IsOrigination)

  Transmit a buffer.
- void CFE_SB_SetUserDataLength (CFE_MSG_Message_t *MsgPtr, size_t DataLength)

  Sets the length of user data in a software bus message.
- void CFE_SB_TimeStampMsg (CFE_MSG_Message_t *MsgPtr)

  Sets the time field in a software bus message with the current spacecraft time.
- int32 CFE_SB_MessageStringSet (char *DestStringPtr, const char *SourceStringPtr, size_t DestMaxSize, size_t SourceMaxSize)

  Copies a string into a software bus message.
- void * CFE_SB_GetUserData (CFE_MSG_Message_t *MsgPtr)

  Get a pointer to the user data portion of a software bus message.
- size_t CFE_SB_GetUserDataLength (const CFE_MSG_Message_t *MsgPtr)

  Gets the length of user data in a software bus message.
- int32 CFE_SB_MessageStringGet (char *DestStringPtr, const char *SourceStringPtr, const char *DefaultString, size_t DestMaxSize, size_t SourceMaxSize)

  Copies a string out of a software bus message.
- bool CFE_SB_IsValidMsgId (CFE_SB_MsgId_t MsgId)

  Identifies whether a given CFE_SB_MsgId_t is valid.
- static bool CFE_SB_MsgId_Equal (CFE_SB_MsgId_t MsgId1, CFE_SB_MsgId_t MsgId2)

  Identifies whether two CFE_SB_MsgId_t values are equal.
- static CFE_SB_MsgId_Atom_t CFE_SB_MsgIdToValue (CFE_SB_MsgId_t MsgId)

  Converts a CFE_SB_MsgId_t to a normal integer.
- static CFE_SB_MsgId_t CFE_SB_ValueToMsgId (CFE_SB_MsgId_Atom_t MsgIdValue)

  Converts a normal integer into a CFE_SB_MsgId_t.
- CFE_SB_MsgId_Atom_t CFE_SB_CmdTopicIdToMsgId (uint16 TopicId, uint16 InstanceNum)

  Converts a topic ID and instance number combination into a MsgID value integer.
- CFE_SB_MsgId_Atom_t CFE_SB_TlmTopicIdToMsgId (uint16 TopicId, uint16 InstanceNum)

  Converts a topic ID and instance number combination into a MsgID value integer.
- CFE_SB_MsgId_Atom_t CFE_SB_GlobalCmdTopicIdToMsgId (uint16 TopicId)

  Converts a topic ID to a MsgID value integer for Global commands.
- CFE_SB_MsgId_Atom_t CFE_SB_GlobalTlmTopicIdToMsgId (uint16 TopicId)

  Converts a topic ID to a MsgID value integer for Global telemetry.
- CFE_SB_MsgId_Atom_t CFE_SB_LocalCmdTopicIdToMsgId (uint16 TopicId)

  Converts a topic ID to a MsgID value integer for local commands.
- CFE_SB_MsgId_Atom_t CFE_SB_LocalTlmTopicIdToMsgId (uint16 TopicId)

  Converts a topic ID to a MsgID value integer for local telemetry.

12.93.1 Detailed Description

Purpose: This header file contains all definitions for the cFE Software Bus Application Programmer's Interface.
Author: R.McGraw/SSI

12.93.2 Macro Definition Documentation

12.93.2.1 CFE_BIT

```
#define CFE_BIT(
    x ) (1 << (x))
```

Places a one at bit positions 0 - 31.
Definition at line 44 of file cfe_sb.h.

12.93.2.2 CFE_CLR

```
#define CFE_CLR(
    i,
    x ) ((i) &= ~CFE_BIT(x))
```

Clears bit x of i.
Definition at line 46 of file cfe_sb.h.

12.93.2.3 CFE_SET

```
#define CFE_SET(
    i,
    x ) ((i) |= CFE_BIT(x))
```

Sets bit x of i.
Definition at line 45 of file cfe_sb.h.

12.93.2.4 CFE_TST

```
#define CFE_TST(
    i,
    x ) (((i)&CFE_BIT(x)) != 0)
```

true(non zero) if bit x of i is set
Definition at line 47 of file cfe_sb.h.

12.94 cfe/modules/core_api/fsw/inc/cfe_sb_api_typedefs.h File Reference

```
#include "common_types.h"
#include "cfe_sb_extern_typedefs.h"
#include "cfe_msg_api_typedefs.h"
#include "cfe_resourceid_api_typedefs.h"
#include "cfe_msg_hdr.h"
```

Data Structures

- union CFE_SB_Msg

  Software Bus generic message.

Macros

- #define CFE_SB_POLL 0

  Option used with CFE_SB_ReceiveBuffer to request immediate pipe status.
- #define CFE_SB_PEND_FOREVER -1

  Option used with CFE_SB_ReceiveBuffer to force a wait for next message.
- #define CFE_SB_SUBSCRIPTION 0

  Subtype specifier used in CFE_SB_SingleSubscriptionTlm_t by SBN App.
- #define CFE_SB_UNSUBSCRIPTION 1

  Subtype specified used in CFE_SB_SingleSubscriptionTlm_t by SBN App.
- #define CFE_SB_MSGID_WRAP_VALUE(val)

  Translation macro to convert from MsgId integer values to opaque/abstract API values.

- #define CFE_SB_MSGID_C(val) ((CFE_SB_MsgId_t)CFE_SB_MSGID_WRAP_VALUE(val))

  Translation macro to convert to MsgId integer values from a literal.
- #define CFE_SB_MSGID_UNWRAP_VALUE(mid) ((mid).Value)

  Translation macro to convert to MsgId integer values from opaque/abstract API values.
- #define CFE_SB_MSGID_RESERVED CFE_SB_MSGID_WRAP_VALUE(0)

  Reserved value for CFE_SB_MsgId_t that will not match any valid MsgId.
- #define CFE_SB_INVALID_MSG_ID CFE_SB_MSGID_C(0)

  A literal of the CFE_SB_MsgId_t type representing an invalid ID.
- #define CFE_SB_PIPEID_C(val) ((CFE_SB_PipeId_t)CFE_RESOURCEID_WRAP(val))

  Cast/Convert a generic CFE_ResourceId_t to a CFE_SB_PipeId_t.
- #define CFE_SB_INVALID_PIPE CFE_SB_PIPEID_C(CFE_RESOURCEID_UNDEFINED)

  A CFE_SB_PipeId_t value which is always invalid.
- #define CFE_SB_PIPEOPTS_IGNOREMINE 0x00000001

  Messages sent by the app that owns this pipe will not be sent to this pipe.
- #define CFE_SB_DEFAULT_QOS ((CFE_SB_Qos_t) {0})

  Default Qos macro.

Typedefs

- typedef union CFE_SB_Msg CFE_SB_Buffer_t

  Software Bus generic message.

12.94.1 Detailed Description

Purpose: This header file contains all definitions for the cFE Software Bus Application Programmer's Interface.
Author: R.McGraw/SSI

12.94.2 Macro Definition Documentation

12.94.2.1 CFE_SB_DEFAULT_QOS `#define CFE_SB_DEFAULT_QOS ((CFE_SB_Qos_t) {0})`

Default Qos macro.
Definition at line 135 of file cfe_sb_api_typedefs.h.

12.94.2.2 CFE_SB_INVALID_MSG_ID `#define CFE_SB_INVALID_MSG_ID CFE_SB_MSGID_C(0)`

A literal of the CFE_SB_MsgId_t type representing an invalid ID.
This value should be used for runtime initialization of CFE_SB_MsgId_t values.

Note

This may be a compound literal in a future revision. Per C99, compound literals are lvalues, not rvalues, so this value should not be used in static/compile-time data initialization. For static data initialization purposes (rvalue), CFE_SB_MSGID_RESERVED should be used instead. However, in the current implementation, they are equivalent.

Definition at line 113 of file cfe_sb_api_typedefs.h.

12.94.2.3 CFE_SB_INVALID_PIPE

```
#define CFE_SB_INVALID_PIPE CFE_SB_PIPEID_C(CFE_RESOURCEID_UNDEFINED)
```

A CFE_SB_PipeId_t value which is always invalid.
This may be used as a safe initializer for CFE_SB_PipeId_t values
Definition at line 125 of file cfe_sb_api_typedefs.h.

12.94.2.4 CFE_SB_MSGID_C

```
#define CFE_SB_MSGID_C(
            val ) ((CFE_SB_MsgId_t)CFE_SB_MSGID_WRAP_VALUE(val))
```

Translation macro to convert to MsgId integer values from a literal.
This ensures that the literal is interpreted as the CFE_SB_MsgId_t type, rather than the default type associated with that literal (e.g. int/unsigned int).

Note

Due to constraints in C99 this style of initializer can only be used at runtime, not for static/compile-time initializers.

See also

CFE_SB_ValueToMsgId()

Definition at line 80 of file cfe_sb_api_typedefs.h.

12.94.2.5 CFE_SB_MSGID_RESERVED

```
#define CFE_SB_MSGID_RESERVED CFE_SB_MSGID_WRAP_VALUE(0)
```

Reserved value for CFE_SB_MsgId_t that will not match any valid MsgId.
This rvalue macro can be used for static/compile-time data initialization to ensure that the initialized value does not alias to a valid MsgId object.
Definition at line 100 of file cfe_sb_api_typedefs.h.

12.94.2.6 CFE_SB_MSGID_UNWRAP_VALUE

```
#define CFE_SB_MSGID_UNWRAP_VALUE(
            mid ) ((mid).Value)
```

Translation macro to convert to MsgId integer values from opaque/abstract API values.
This conversion exists in macro form to allow compile-time evaluation for constants, and should not be used directly in application code.
For applications, use the CFE_SB_MsgIdToValue() inline function instead.

See also

CFE_SB_MsgIdToValue()

Definition at line 92 of file cfe_sb_api_typedefs.h.

12.94.2.7 CFE_SB_MSGID_WRAP_VALUE

```
#define CFE_SB_MSGID_WRAP_VALUE(
            val )
```

Value:

```
{                                   \
    val                             \
}
```

Translation macro to convert from MsgId integer values to opaque/abstract API values.
This conversion exists in macro form to allow compile-time evaluation for constants, and should not be used directly in application code.
For applications, use the CFE_SB_ValueToMsgId() inline function instead.

See also

CFE_SB_ValueToMsgId()

Definition at line 64 of file cfe_sb_api_typedefs.h.

12.94.2.8 CFE_SB_PEND_FOREVER `#define CFE_SB_PEND_FOREVER -1`

Option used with CFE_SB_ReceiveBuffer to force a wait for next message.
Definition at line 46 of file cfe_sb_api_typedefs.h.

12.94.2.9 CFE_SB_PIPEID_C `#define CFE_SB_PIPEID_C( val ) ((CFE_SB_PipeId_t)CFE_RESOURCEID_WRAP(val))`

Cast/Convert a generic CFE_ResourceId_t to a CFE_SB_PipeId_t.
Definition at line 118 of file cfe_sb_api_typedefs.h.

12.94.2.10 CFE_SB_POLL `#define CFE_SB_POLL 0`

Option used with CFE_SB_ReceiveBuffer to request immediate pipe status.
Definition at line 45 of file cfe_sb_api_typedefs.h.

12.94.2.11 CFE_SB_SUBSCRIPTION `#define CFE_SB_SUBSCRIPTION 0`

Subtype specifier used in CFE_SB_SingleSubscriptionTlm_t by SBN App.
Definition at line 47 of file cfe_sb_api_typedefs.h.

12.94.2.12 CFE_SB_UNSUBSCRIPTION `#define CFE_SB_UNSUBSCRIPTION 1`

Subtype specified used in CFE_SB_SingleSubscriptionTlm_t by SBN App.
Definition at line 48 of file cfe_sb_api_typedefs.h.

12.94.3 Typedef Documentation

12.94.3.1 CFE_SB_Buffer_t `typedef union CFE_SB_Msg CFE_SB_Buffer_t`

Software Bus generic message.

12.95 cfe/modules/core_api/fsw/inc/cfe_tbl.h File Reference

```
#include "common_types.h"
#include "cfe_error.h"
#include "cfe_tbl_api_typedefs.h"
#include "cfe_sb_api_typedefs.h"
```

Functions

- CFE_Status_t CFE_TBL_Register (CFE_TBL_Handle_t ∗TblHandlePtr, const char ∗Name, size_t Size, uint16 TblOptionFlags, CFE_TBL_CallbackFuncPtr_t TblValidationFuncPtr)

  Register a table with cFE to obtain Table Management Services.
- CFE_Status_t CFE_TBL_Share (CFE_TBL_Handle_t ∗TblHandlePtr, const char ∗TblName)

  Obtain handle of table registered by another application.
- CFE_Status_t CFE_TBL_Unregister (CFE_TBL_Handle_t TblHandle)

  Unregister a table.
- CFE_Status_t CFE_TBL_Load (CFE_TBL_Handle_t TblHandle, CFE_TBL_SrcEnum_t SrcType, const void ∗SrcDataPtr)

  Load a specified table with data from specified source.

- CFE_Status_t CFE_TBL_Update (CFE_TBL_Handle_t TblHandle)

  Update contents of a specified table, if an update is pending.
- CFE_Status_t CFE_TBL_Validate (CFE_TBL_Handle_t TblHandle)

  Perform steps to validate the contents of a table image.
- CFE_Status_t CFE_TBL_Manage (CFE_TBL_Handle_t TblHandle)

  Perform standard operations to maintain a table.
- CFE_Status_t CFE_TBL_DumpToBuffer (CFE_TBL_Handle_t TblHandle)

  Copies the contents of a Dump Only Table to a shared buffer.
- CFE_Status_t CFE_TBL_Modified (CFE_TBL_Handle_t TblHandle)

  Notify cFE Table Services that table contents have been modified by the Application.
- CFE_Status_t CFE_TBL_GetAddress (void **TblPtr, CFE_TBL_Handle_t TblHandle)

  Obtain the current address of the contents of the specified table.
- CFE_Status_t CFE_TBL_ReleaseAddress (CFE_TBL_Handle_t TblHandle)

  Release previously obtained pointer to the contents of the specified table.
- CFE_Status_t CFE_TBL_GetAddresses (void **TblPtrs[ ], uint16 NumTables, const CFE_TBL_Handle_t Tbl↩Handles[ ])

  Obtain the current addresses of an array of specified tables.
- CFE_Status_t CFE_TBL_ReleaseAddresses (uint16 NumTables, const CFE_TBL_Handle_t TblHandles[ ])

  Release the addresses of an array of specified tables.
- CFE_Status_t CFE_TBL_GetStatus (CFE_TBL_Handle_t TblHandle)

  Obtain current status of pending actions for a table.
- CFE_Status_t CFE_TBL_GetInfo (CFE_TBL_Info_t *TblInfoPtr, const char *TblName)

  Obtain characteristics/information of/about a specified table.
- CFE_Status_t CFE_TBL_NotifyByMessage (CFE_TBL_Handle_t TblHandle, CFE_SB_MsgId_t MsgId, CFE_MSG_FcnCode_t CommandCode, uint32 Parameter)

  Instruct cFE Table Services to notify Application via message when table requires management.

12.95.1 Detailed Description

Title: Table Services API Application Library Header File
Purpose: Unit specification for Table services library functions and macros.
Design Notes:
References: Flight Software Branch C Coding Standard Version 1.0a
Notes:

12.96 cfe/modules/core_api/fsw/inc/cfe_tbl_api_typedefs.h File Reference

```
#include "common_types.h"
#include "cfe_mission_cfg.h"
#include "cfe_tbl_extern_typedefs.h"
#include "cfe_time_extern_typedefs.h"
```

Data Structures

- struct CFE_TBL_Info

  Table Info.

Macros

- #define CFE_TBL_OPT_BUFFER_MSK (0x0001)

  Table buffer mask.
- #define CFE_TBL_OPT_SNGL_BUFFER (0x0000)

  Single buffer table.
- #define CFE_TBL_OPT_DBL_BUFFER (0x0001)

  Double buffer table.
- #define CFE_TBL_OPT_LD_DMP_MSK (0x0002)

  Table load/dump mask.
- #define CFE_TBL_OPT_LOAD_DUMP (0x0000)

  Load/Dump table.
- #define CFE_TBL_OPT_DUMP_ONLY (0x0002)

  Dump only table.
- #define CFE_TBL_OPT_USR_DEF_MSK (0x0004)

  Table user defined mask.
- #define CFE_TBL_OPT_NOT_USR_DEF (0x0000)

  Not user defined table.
- #define CFE_TBL_OPT_USR_DEF_ADDR (0x0006)

  User Defined table,.
- #define CFE_TBL_OPT_CRITICAL_MSK (0x0008)

  Table critical mask.
- #define CFE_TBL_OPT_NOT_CRITICAL (0x0000)

  Not critical table.
- #define CFE_TBL_OPT_CRITICAL (0x0008)

  Critical table.
- #define CFE_TBL_OPT_DEFAULT (CFE_TBL_OPT_SNGL_BUFFER | CFE_TBL_OPT_LOAD_DUMP)

  Default table options.
- #define CFE_TBL_MAX_FULL_NAME_LEN (CFE_MISSION_TBL_MAX_FULL_NAME_LEN)

  Table maximum full name length.
- #define CFE_TBL_BAD_TABLE_HANDLE (CFE_TBL_Handle_t)0xFFFF

  Bad table handle.

Typedefs

- typedef int32(∗ CFE_TBL_CallbackFuncPtr_t) (void ∗TblPtr)

  Table Callback Function.
- typedef int16 CFE_TBL_Handle_t

  Table Handle primitive.
- typedef enum CFE_TBL_SrcEnum CFE_TBL_SrcEnum_t

  Table Source.
- typedef struct CFE_TBL_Info CFE_TBL_Info_t

  Table Info.

Enumerations

- enum CFE_TBL_SrcEnum { CFE_TBL_SRC_FILE = 0, CFE_TBL_SRC_ADDRESS }

  Table Source.

12.96.1 Detailed Description

Title: Table Services API Application Library Header File
Purpose: Unit specification for Table services library functions and macros.
Design Notes:
References: Flight Software Branch C Coding Standard Version 1.0a
Notes:

12.96.2 Macro Definition Documentation

12.96.2.1 CFE_TBL_BAD_TABLE_HANDLE `#define CFE_TBL_BAD_TABLE_HANDLE (CFE_TBL_Handle_t)0xFFFF`

Bad table handle.
Definition at line 79 of file cfe_tbl_api_typedefs.h.

12.96.2.2 CFE_TBL_MAX_FULL_NAME_LEN `#define CFE_TBL_MAX_FULL_NAME_LEN (CFE_MISSION_TBL_MAX_FULL_NAME_LEN)`

Table maximum full name length.
The full length of table names is defined at the mission scope. This is defined here to support applications that depend on cfe_tbl.h providing this value.
Definition at line 76 of file cfe_tbl_api_typedefs.h.

12.96.3 Typedef Documentation

12.96.3.1 CFE_TBL_CallbackFuncPtr_t `typedef int32(* CFE_TBL_CallbackFuncPtr_t) (void *TblPtr)`

Table Callback Function.
Definition at line 84 of file cfe_tbl_api_typedefs.h.

12.96.3.2 CFE_TBL_Handle_t `typedef int16 CFE_TBL_Handle_t`

Table Handle primitive.
Definition at line 87 of file cfe_tbl_api_typedefs.h.

12.96.3.3 CFE_TBL_Info_t `typedef struct CFE_TBL_Info CFE_TBL_Info_t`

Table Info.

12.96.3.4 CFE_TBL_SrcEnum_t `typedef enum CFE_TBL_SrcEnum CFE_TBL_SrcEnum_t`

Table Source.

12.96.4 Enumeration Type Documentation

12.96.4.1 CFE_TBL_SrcEnum `enum CFE_TBL_SrcEnum`

Table Source.

Enumerator

CFE_TBL_SRC_FILE	File source When this option is selected, the `SrcDataPtr` will be interpreted as a pointer to a null terminated character string. The string should specify the full path and filename of the file containing the initial data contents of the table.
CFE_TBL_SRC_ADDRESS	Address source When this option is selected, the `SrcDataPtr` will be interpreted as a pointer to a memory location that is the beginning of the initialization data for loading the table OR, in the case of a "user defined" dump only table, the address of the active table itself. The block of memory is assumed to be of the same size specified in the CFE_TBL_Register function Size parameter.

Definition at line 90 of file cfe_tbl_api_typedefs.h.

12.97 cfe/modules/core_api/fsw/inc/cfe_tbl_filedef.h File Reference

```
#include "cfe_mission_cfg.h"
#include "common_types.h"
#include "cfe_tbl_extern_typedefs.h"
#include "cfe_fs_extern_typedefs.h"
```

Data Structures

- struct CFE_TBL_FileDef

  Table File summary object.

Macros

- #define CFE_TBL_FILEDEF(ObjName, TblName, Desc, Filename) CFE_TBL_FileDef_t CFE_TBL_FileDef = {#ObjName "\0", #TblName "\0", #Desc "\0", #Filename "\0", sizeof(ObjName)};

  Macro to assist in with table definition object declaration.

Typedefs

- typedef struct CFE_TBL_FileDef CFE_TBL_FileDef_t

  Table File summary object.

12.97.1 Detailed Description

Title: ELF2CFETBL Utility Header File for Table Images
Purpose: This header file provides a data structure definition and macro definition required in source code that is intended to be compiled into a cFE compatible Table Image file.
Design Notes:
Typically, a user would include this file in a ".c" file that contains nothing but a desired instantiation of values for a table image along with the macro defined below. After compilation, the resultant elf file can be processed using the 'elf2cfetbl' utility to generate a file that can be loaded onto a cFE flight system and successfully loaded into a table using the cFE Table Services.
References: Flight Software Branch C Coding Standard Version 1.0a
Notes:

12.97.2 Macro Definition Documentation

12.97.2.1 CFE_TBL_FILEDEF

```
#define CFE_TBL_FILEDEF(
            ObjName,
            TblName,
            Desc,
            Filename ) CFE_TBL_FileDef_t CFE_TBL_FileDef = {#ObjName "\0", #TblName "\0", #Desc
"\0", #Filename "\0", sizeof(ObjName)};
```

Macro to assist in with table definition object declaration.

See notes in the CFE_TBL_FileDef_t structure type about naming conventions and recommended practices for the various fields.

The CFE_TBL_FILEDEF macro can be used to simplify the declaration of a table image when using the elf2cfetbl utility. Note that the macro adds a NULL at the end to ensure that it is null-terminated. (C allows a struct to be statically initialized with a string exactly the length of the array, which loses the null terminator.) This means the actual length limit of the fields are the above LEN - 1.

An example of the source code and how this macro would be used is as follows:

```
 #include "cfe_tbl_filedef.h"
typedef struct MyTblStruct
{
    int     Int1;
    int     Int2;
    int     Int3;
    char    Char1;
} MyTblStruct_t;
MyTblStruct_t MyTblStruct = { 0x01020304, 0x05060708, 0x090A0B0C, 0x0D };
CFE_TBL_FILEDEF(MyTblStruct, MyApp.TableName, Table Utility Test Table, MyTblDefault.bin )
```

Definition at line 149 of file cfe_tbl_filedef.h.

12.97.3 Typedef Documentation

12.97.3.1 CFE_TBL_FileDef_t

```
typedef struct CFE_TBL_FileDef CFE_TBL_FileDef_t
```

Table File summary object.

The definition of the file definition metadata that can be used by external tools (e.g. elf2cfetbl) to generate CFE table data files.

12.98 cfe/modules/core_api/fsw/inc/cfe_time.h File Reference

```
#include "common_types.h"
#include "cfe_error.h"
#include "cfe_time_api_typedefs.h"
#include "cfe_es_api_typedefs.h"
```

Macros

- #define CFE_TIME_Copy(m, t)

  Time Copy.

Functions

- CFE_TIME_SysTime_t CFE_TIME_GetTime (void)

  Get the current spacecraft time.
- CFE_TIME_SysTime_t CFE_TIME_GetTAI (void)

  Get the current TAI (MET + SCTF) time.
- CFE_TIME_SysTime_t CFE_TIME_GetUTC (void)

  Get the current UTC (MET + SCTF - Leap Seconds) time.

- CFE_TIME_SysTime_t CFE_TIME_GetMET (void)

  Get the current value of the Mission Elapsed Time (MET).
- uint32 CFE_TIME_GetMETseconds (void)

  Get the current seconds count of the mission-elapsed time.
- uint32 CFE_TIME_GetMETsubsecs (void)

  Get the current sub-seconds count of the mission-elapsed time.
- CFE_TIME_SysTime_t CFE_TIME_GetSTCF (void)

  Get the current value of the spacecraft time correction factor (STCF).
- int16 CFE_TIME_GetLeapSeconds (void)

  Get the current value of the leap seconds counter.
- CFE_TIME_ClockState_Enum_t CFE_TIME_GetClockState (void)

  Get the current state of the spacecraft clock.
- uint16 CFE_TIME_GetClockInfo (void)

  Provides information about the spacecraft clock.
- CFE_TIME_SysTime_t CFE_TIME_Add (CFE_TIME_SysTime_t Time1, CFE_TIME_SysTime_t Time2)

  Adds two time values.
- CFE_TIME_SysTime_t CFE_TIME_Subtract (CFE_TIME_SysTime_t Time1, CFE_TIME_SysTime_t Time2)

  Subtracts two time values.
- CFE_TIME_Compare_t CFE_TIME_Compare (CFE_TIME_SysTime_t TimeA, CFE_TIME_SysTime_t TimeB)

  Compares two time values.
- CFE_TIME_SysTime_t CFE_TIME_MET2SCTime (CFE_TIME_SysTime_t METTime)

  Convert specified MET into Spacecraft Time.
- uint32 CFE_TIME_Sub2MicroSecs (uint32 SubSeconds)

  Converts a sub-seconds count to an equivalent number of microseconds.
- uint32 CFE_TIME_Micro2SubSecs (uint32 MicroSeconds)

  Converts a number of microseconds to an equivalent sub-seconds count.
- void CFE_TIME_ExternalTone (void)

  Provides the 1 Hz signal from an external source.
- void CFE_TIME_ExternalMET (CFE_TIME_SysTime_t NewMET)

  Provides the Mission Elapsed Time from an external source.
- void CFE_TIME_ExternalGPS (CFE_TIME_SysTime_t NewTime, int16 NewLeaps)

  Provide the time from an external source that has data common to GPS receivers.
- void CFE_TIME_ExternalTime (CFE_TIME_SysTime_t NewTime)

  Provide the time from an external source that measures time relative to a known epoch.
- CFE_Status_t CFE_TIME_RegisterSynchCallback (CFE_TIME_SynchCallbackPtr_t CallbackFuncPtr)

  Registers a callback function that is called whenever time synchronization occurs.
- CFE_Status_t CFE_TIME_UnregisterSynchCallback (CFE_TIME_SynchCallbackPtr_t CallbackFuncPtr)

  Unregisters a callback function that is called whenever time synchronization occurs.
- void CFE_TIME_Print (char *PrintBuffer, CFE_TIME_SysTime_t TimeToPrint)

  Print a time value as a string.
- void CFE_TIME_Local1HzISR (void)

  This function is called via a timer callback set up at initialization of the TIME service.

12.98.1 Detailed Description

Purpose: cFE Time Services (TIME) library API header file
Author: S.Walling/Microtel
Notes:

12.98.2 Macro Definition Documentation

12.98.2.1 CFE_TIME_Copy

```
#define CFE_TIME_Copy(
            m,
            t )
```

Value:

```
{                                       \
    (m)->Seconds    = (t)->Seconds;     \
    (m)->Subseconds = (t)->Subseconds;  \
}
```

Time Copy.
Macro to copy systime into another systime. Preferred to use this macro as it does not require the two arguments to be exactly the same type, it will work with any two structures that define "Seconds" and "Subseconds" members.
Definition at line 48 of file cfe_time.h.

12.99 cfe/modules/core_api/fsw/inc/cfe_time_api_typedefs.h File Reference

```
#include "common_types.h"
#include "cfe_time_extern_typedefs.h"
```

Macros

- #define CFE_TIME_PRINTED_STRING_SIZE 24

  Required size of buffer to be passed into CFE_TIME_Print (includes null terminator)
- #define CFE_TIME_ZERO_VALUE ((CFE_TIME_SysTime_t) {0, 0})

Typedefs

- typedef enum CFE_TIME_Compare CFE_TIME_Compare_t

  Enumerated types identifying the relative relationships of two times.
- typedef int32(∗ CFE_TIME_SynchCallbackPtr_t) (void)

  Time Synchronization Callback Function Ptr Type.

Enumerations

- enum CFE_TIME_Compare { CFE_TIME_A_LT_B = -1, CFE_TIME_EQUAL = 0, CFE_TIME_A_GT_B = 1 }

  Enumerated types identifying the relative relationships of two times.

12.99.1 Detailed Description

Purpose: cFE Time Services (TIME) library API header file
Author: S.Walling/Microtel
Notes:

12.99.2 Macro Definition Documentation

12.99.2.1 CFE_TIME_PRINTED_STRING_SIZE

```
#define CFE_TIME_PRINTED_STRING_SIZE 24
```

Required size of buffer to be passed into CFE_TIME_Print (includes null terminator)
Definition at line 44 of file cfe_time_api_typedefs.h.

12.99.2.2 CFE_TIME_ZERO_VALUE `#define CFE_TIME_ZERO_VALUE ((CFE_TIME_SysTime_t) {0, 0})`

A general-purpose initializer for CFE_TIME_SysTime_t values.

Represents "time zero" in the CFE_TIME_SysTime_t domain. This can be used as a general purpose initializer for instantiations of the CFE_TIME_SysTime_t type.

Definition at line 54 of file cfe_time_api_typedefs.h.

12.99.3 Typedef Documentation

12.99.3.1 CFE_TIME_Compare_t `typedef enum CFE_TIME_Compare CFE_TIME_Compare_t`

Enumerated types identifying the relative relationships of two times.

Description

Since time fields contain numbers that are relative to an epoch time, then it is possible for a time value to be "negative". This can lead to some confusion about what relationship exists between two time values. To resolve this confusion, the cFE provides the API CFE_TIME_Compare which returns these enumerated values.

12.99.3.2 CFE_TIME_SynchCallbackPtr_t `typedef int32(* CFE_TIME_SynchCallbackPtr_t) (void)`

Time Synchronization Callback Function Ptr Type.

Description

Applications that wish to get direct notification of the receipt of the cFE Time Synchronization signal (typically a 1 Hz signal), must register a callback function with the following prototype via the CFE_TIME_RegisterSynchCallback API.

Definition at line 84 of file cfe_time_api_typedefs.h.

12.99.4 Enumeration Type Documentation

12.99.4.1 CFE_TIME_Compare `enum CFE_TIME_Compare`

Enumerated types identifying the relative relationships of two times.

Description

Since time fields contain numbers that are relative to an epoch time, then it is possible for a time value to be "negative". This can lead to some confusion about what relationship exists between two time values. To resolve this confusion, the cFE provides the API CFE_TIME_Compare which returns these enumerated values.

Enumerator

CFE_TIME_A_LT_B	The first specified time is considered to be before the second specified time.
CFE_TIME_EQUAL	The two specified times are considered to be equal.
CFE_TIME_A_GT↩ _B	The first specified time is considered to be after the second specified time.

Definition at line 69 of file cfe_time_api_typedefs.h.

12.100 cfe/modules/core_api/fsw/inc/cfe_version.h File Reference

Macros

- #define CFE_BUILD_NUMBER 195

  Development: Number of development git commits since CFE_BUILD_BASELINE.
- #define CFE_BUILD_BASELINE "equuleus-rc1"

  Development: Reference git tag for build number.
- #define CFE_BUILD_DEV_CYCLE "equuleus-rc2"

  Development: Release name for current development cycle.
- #define CFE_BUILD_CODENAME "Equuleus"

  : Development: Code name for the current build
- #define CFE_MAJOR_VERSION 6

  Major version number.
- #define CFE_MINOR_VERSION 7

  Minor version number.
- #define CFE_REVISION 0

  Revision version number. Value of 0 indicates a development version.
- #define CFE_LAST_OFFICIAL "v6.7.0"

  Last official release.
- #define CFE_MISSION_REV 0xFF

  Mission revision.
- #define CFE_STR_HELPER(x) #x

  Convert argument to string.
- #define CFE_STR(x) CFE_STR_HELPER(x)

  Expand macro before conversion.
- #define CFE_SRC_VERSION CFE_BUILD_BASELINE "+dev" CFE_STR(CFE_BUILD_NUMBER)

  Short Build Version String.
- #define CFE_CFG_MAX_VERSION_STR_LEN 256

  Max Version String length.

12.100.1 Detailed Description

Provide version identifiers for the cFE core. See Version Numbers for further details.

12.100.2 Macro Definition Documentation

12.100.2.1 CFE_BUILD_BASELINE `#define CFE_BUILD_BASELINE "equuleus-rc1"`

Development: Reference git tag for build number.
Definition at line 30 of file cfe_version.h.

12.100.2.2 CFE_BUILD_CODENAME `#define CFE_BUILD_CODENAME "Equuleus"`

: Development: Code name for the current build
Definition at line 32 of file cfe_version.h.

12.100.2.3 CFE_BUILD_DEV_CYCLE `#define CFE_BUILD_DEV_CYCLE "equuleus-rc2"`

Development: Release name for current development cycle.
Definition at line 31 of file cfe_version.h.

12.100.2.4 CFE_BUILD_NUMBER `#define CFE_BUILD_NUMBER 195`

Development: Number of development git commits since CFE_BUILD_BASELINE.
Definition at line 29 of file cfe_version.h.

12.100.2.5 CFE_CFG_MAX_VERSION_STR_LEN `#define CFE_CFG_MAX_VERSION_STR_LEN 256`

Max Version String length.
Maximum length that a cFE version string can be.
Definition at line 69 of file cfe_version.h.

12.100.2.6 CFE_LAST_OFFICIAL `#define CFE_LAST_OFFICIAL "v6.7.0"`

Last official release.
Definition at line 42 of file cfe_version.h.

12.100.2.7 CFE_MAJOR_VERSION `#define CFE_MAJOR_VERSION 6`

Major version number.
Definition at line 35 of file cfe_version.h.

12.100.2.8 CFE_MINOR_VERSION `#define CFE_MINOR_VERSION 7`

Minor version number.
Definition at line 36 of file cfe_version.h.

12.100.2.9 CFE_MISSION_REV `#define CFE_MISSION_REV 0xFF`

Mission revision.
Values 1-254 are reserved for mission use to denote patches/customizations as needed. NOTE: Reserving 0 and 0xFF for cFS open-source development use (pending resolution of nasa/cFS#440)
Definition at line 51 of file cfe_version.h.

12.100.2.10 CFE_REVISION `#define CFE_REVISION 0`

Revision version number. Value of 0 indicates a development version.
Definition at line 37 of file cfe_version.h.

12.100.2.11 CFE_SRC_VERSION `#define CFE_SRC_VERSION CFE_BUILD_BASELINE "+dev" CFE_STR(CFE_BUILD_NUMBER)`

Short Build Version String.
Short string identifying the build, see Version Numbers for suggested format for development and official releases.
Definition at line 62 of file cfe_version.h.

12.100.2.12 CFE_STR `#define CFE_STR( x ) CFE_STR_HELPER(x)`

Expand macro before conversion.
Definition at line 54 of file cfe_version.h.

12.100.2.13 CFE_STR_HELPER `#define CFE_STR_HELPER( x ) #x`

Convert argument to string.
Definition at line 53 of file cfe_version.h.

12.101 cfe/modules/es/config/default_cfe_es_extern_typedefs.h File Reference

```
#include "common_types.h"
#include "cfe_resourceid_typedef.h"
#include "cfe_mission_cfg.h"
```

Data Structures

- struct CFE_ES_AppInfo

  Application Information.
- struct CFE_ES_TaskInfo

  Task Information.
- struct CFE_ES_CDSRegDumpRec

  CDS Register Dump Record.
- struct CFE_ES_BlockStats

  Block statistics.
- struct CFE_ES_MemPoolStats

  Memory Pool Statistics.

Macros

- #define CFE_ES_MEMOFFSET_C(x) ((CFE_ES_MemOffset_t)(x))

  Memory Offset initializer wrapper.
- #define CFE_ES_MEMOFFSET_TO_SIZET(x) ((size_t)(x))

  Memory Offset to integer value (size_t) wrapper.
- #define CFE_ES_MEMADDRESS_C(x) ((CFE_ES_MemAddress_t)((cpuaddr)(x)&0xFFFFFFFF))

  Memory Address initializer wrapper.
- #define CFE_ES_MEMADDRESS_TO_PTR(x) ((void *)(cpuaddr)(x))

  Memory Address to pointer wrapper.

Typedefs

- typedef uint8 CFE_ES_LogMode_Enum_t

  Identifies handling of log messages after storage is filled.
- typedef uint8 CFE_ES_ExceptionAction_Enum_t

  Identifies action to take if exception occurs.
- typedef uint8 CFE_ES_AppType_Enum_t

  Identifies type of CFE application.
- typedef uint32 CFE_ES_RunStatus_Enum_t

Run Status and Exit Status identifiers.

- typedef uint32 CFE_ES_SystemState_Enum_t

  The overall cFE System State.
- typedef uint8 CFE_ES_LogEntryType_Enum_t

  Type of entry in the Error and Reset (ER) Log.
- typedef uint32 CFE_ES_AppState_Enum_t

  Application Run State.
- typedef CFE_RESOURCEID_BASE_TYPE CFE_ES_AppId_t

  A type for Application IDs.
- typedef CFE_RESOURCEID_BASE_TYPE CFE_ES_TaskId_t

  A type for Task IDs.
- typedef CFE_RESOURCEID_BASE_TYPE CFE_ES_LibId_t

  A type for Library IDs.
- typedef CFE_RESOURCEID_BASE_TYPE CFE_ES_CounterId_t

  A type for Counter IDs.
- typedef CFE_RESOURCEID_BASE_TYPE CFE_ES_MemHandle_t

  Memory Handle type.
- typedef CFE_RESOURCEID_BASE_TYPE CFE_ES_CDSHandle_t

  CDS Handle type.
- typedef uint16 CFE_ES_TaskPriority_Atom_t

  Type used for task priority in CFE ES as including the commands/telemetry messages.
- typedef uint32 CFE_ES_MemOffset_t

  Type used for memory sizes and offsets in commands and telemetry.
- typedef uint32 CFE_ES_MemAddress_t

  Type used for memory addresses in command and telemetry messages.
- typedef struct CFE_ES_AppInfo CFE_ES_AppInfo_t

  Application Information.
- typedef struct CFE_ES_TaskInfo CFE_ES_TaskInfo_t

  Task Information.
- typedef struct CFE_ES_CDSRegDumpRec CFE_ES_CDSRegDumpRec_t

  CDS Register Dump Record.
- typedef struct CFE_ES_BlockStats CFE_ES_BlockStats_t

  Block statistics.
- typedef struct CFE_ES_MemPoolStats CFE_ES_MemPoolStats_t

  Memory Pool Statistics.

Enumerations

- enum CFE_ES_LogMode { CFE_ES_LogMode_OVERWRITE = 0, CFE_ES_LogMode_DISCARD = 1 }

  Label definitions associated with CFE_ES_LogMode_Enum_t.
- enum CFE_ES_ExceptionAction { CFE_ES_ExceptionAction_RESTART_APP = 0, CFE_ES_ExceptionAction_PROC_RESTART = 1 }

  Label definitions associated with CFE_ES_ExceptionAction_Enum_t.
- enum CFE_ES_AppType { CFE_ES_AppType_CORE = 1, CFE_ES_AppType_EXTERNAL = 2, CFE_ES_AppType_LIBRARY = 3 }

  Label definitions associated with CFE_ES_AppType_Enum_t.

- enum CFE_ES_RunStatus {
  CFE_ES_RunStatus_UNDEFINED = 0, CFE_ES_RunStatus_APP_RUN = 1, CFE_ES_RunStatus_APP_EXIT = 2, CFE_ES_RunStatus_APP_ERROR = 3,
  CFE_ES_RunStatus_SYS_EXCEPTION = 4, CFE_ES_RunStatus_SYS_RESTART = 5, CFE_ES_RunStatus_SYS_RELOAD = 6, CFE_ES_RunStatus_SYS_DELETE = 7,
  CFE_ES_RunStatus_CORE_APP_INIT_ERROR = 8, CFE_ES_RunStatus_CORE_APP_RUNTIME_ERROR = 9, CFE_ES_RunStatus_MAX }

  Label definitions associated with CFE_ES_RunStatus_Enum_t.
- enum CFE_ES_SystemState {
  CFE_ES_SystemState_UNDEFINED = 0, CFE_ES_SystemState_EARLY_INIT = 1, CFE_ES_SystemState_CORE_STARTUP = 2, CFE_ES_SystemState_CORE_READY = 3,
  CFE_ES_SystemState_APPS_INIT = 4, CFE_ES_SystemState_OPERATIONAL = 5, CFE_ES_SystemState_SHUTDOWN = 6, CFE_ES_SystemState_MAX }

  Label definitions associated with CFE_ES_SystemState_Enum_t.
- enum CFE_ES_LogEntryType { CFE_ES_LogEntryType_CORE = 1, CFE_ES_LogEntryType_APPLICATION = 2 }

  Label definitions associated with CFE_ES_LogEntryType_Enum_t.
- enum CFE_ES_AppState {
  CFE_ES_AppState_UNDEFINED = 0, CFE_ES_AppState_EARLY_INIT = 1, CFE_ES_AppState_LATE_INIT = 2, CFE_ES_AppState_RUNNING = 3,
  CFE_ES_AppState_WAITING = 4, CFE_ES_AppState_STOPPED = 5, CFE_ES_AppState_MAX }

  Label definitions associated with CFE_ES_AppState_Enum_t.

12.101.1 Detailed Description

Declarations and prototypes for cfe_es_extern_typedefs module

12.101.2 Macro Definition Documentation

12.101.2.1 CFE_ES_MEMADDRESS_C

```
#define CFE_ES_MEMADDRESS_C( x ) ((CFE_ES_MemAddress_t)((cpuaddr)(x)&0xFFFFFFFF))
```

Memory Address initializer wrapper.
A converter macro to use when initializing a CFE_ES_MemAddress_t from a pointer value of a different type.
Definition at line 417 of file default_cfe_es_extern_typedefs.h.

12.101.2.2 CFE_ES_MEMADDRESS_TO_PTR

```
#define CFE_ES_MEMADDRESS_TO_PTR( x ) ((void *)(cpuaddr)(x))
```

Memory Address to pointer wrapper.
A converter macro to use when interpreting a CFE_ES_MemAddress_t as a pointer value.
Definition at line 425 of file default_cfe_es_extern_typedefs.h.

12.101.2.3 CFE_ES_MEMOFFSET_C

```
#define CFE_ES_MEMOFFSET_C( x ) ((CFE_ES_MemOffset_t)(x))
```

Memory Offset initializer wrapper.
A converter macro to use when initializing a CFE_ES_MemOffset_t from an integer value of a different type.
Definition at line 380 of file default_cfe_es_extern_typedefs.h.

12.101.2.4 CFE_ES_MEMOFFSET_TO_SIZET `#define CFE_ES_MEMOFFSET_TO_SIZET( x ) ((size_t)(x))`

Memory Offset to integer value (size_t) wrapper.
A converter macro to use when interpreting a CFE_ES_MemOffset_t value as a "size_t" type
Definition at line 388 of file default_cfe_es_extern_typedefs.h.

12.101.3 Typedef Documentation

12.101.3.1 CFE_ES_AppId_t `typedef CFE_RESOURCEID_BASE_TYPE CFE_ES_AppId_t`

A type for Application IDs.
This is the type that is used for any API accepting or returning an App ID
Definition at line 312 of file default_cfe_es_extern_typedefs.h.

12.101.3.2 CFE_ES_AppInfo_t `typedef struct CFE_ES_AppInfo CFE_ES_AppInfo_t`

Application Information.
Structure that is used to provide information about an app. It is primarily used for the QueryOne and QueryAll Commands.
While this structure is primarily intended for Application info, it can also represent Library information where only a subset of the information applies.

12.101.3.3 CFE_ES_AppState_Enum_t `typedef uint32 CFE_ES_AppState_Enum_t`

Application Run State.
The normal progression of APP states: UNDEFINED -> EARLY_INIT -> LATE_INIT -> RUNNING -> WAITING -> STOPPED

Note

These are defined in order so that relational comparisons e.g. if (STATEA < STATEB) are possible

See also

enum CFE_ES_AppState

Definition at line 305 of file default_cfe_es_extern_typedefs.h.

12.101.3.4 CFE_ES_AppType_Enum_t `typedef uint8 CFE_ES_AppType_Enum_t`

Identifies type of CFE application.

See also

enum CFE_ES_AppType

Definition at line 104 of file default_cfe_es_extern_typedefs.h.

12.101.3.5 CFE_ES_BlockStats_t `typedef struct CFE_ES_BlockStats CFE_ES_BlockStats_t`

Block statistics.
Sub-Structure that is used to provide information about a specific block size/bucket within a memory pool.

12.101.3.6 CFE_ES_CDSHandle_t `typedef CFE_RESOURCEID_BASE_TYPE CFE_ES_CDSHandle_t`

CDS Handle type.
Data type used to hold Handles of Critical Data Stores. See CFE_ES_RegisterCDS
Definition at line 348 of file default_cfe_es_extern_typedefs.h.

12.101.3.7 CFE_ES_CDSRegDumpRec_t `typedef struct CFE_ES_CDSRegDumpRec CFE_ES_CDSRegDumpRec_t`

CDS Register Dump Record.

Structure that is used to provide information about a critical data store. It is primarily used for the Dump CDS registry (CFE_ES_DUMP_CDS_REGISTRY_CC) command.

Note

There is not currently a telemetry message directly containing this data structure, but it does define the format of the data file generated by the Dump CDS registry command. Therefore it should be considered part of the overall telemetry interface.

12.101.3.8 CFE_ES_CounterId_t `typedef CFE_RESOURCEID_BASE_TYPE CFE_ES_CounterId_t`

A type for Counter IDs.

This is the type that is used for any API accepting or returning a Counter ID

Definition at line 333 of file default_cfe_es_extern_typedefs.h.

12.101.3.9 CFE_ES_ExceptionAction_Enum_t `typedef uint8 CFE_ES_ExceptionAction_Enum_t`

Identifies action to take if exception occurs.

See also

enum CFE_ES_ExceptionAction

Definition at line 76 of file default_cfe_es_extern_typedefs.h.

12.101.3.10 CFE_ES_LibId_t `typedef CFE_RESOURCEID_BASE_TYPE CFE_ES_LibId_t`

A type for Library IDs.

This is the type that is used for any API accepting or returning a Lib ID

Definition at line 326 of file default_cfe_es_extern_typedefs.h.

12.101.3.11 CFE_ES_LogEntryType_Enum_t `typedef uint8 CFE_ES_LogEntryType_Enum_t`

Type of entry in the Error and Reset (ER) Log.

See also

enum CFE_ES_LogEntryType

Definition at line 252 of file default_cfe_es_extern_typedefs.h.

12.101.3.12 CFE_ES_LogMode_Enum_t `typedef uint8 CFE_ES_LogMode_Enum_t`

Identifies handling of log messages after storage is filled.

See also

enum CFE_ES_LogMode

Definition at line 53 of file default_cfe_es_extern_typedefs.h.

12.101.3.13 CFE_ES_MemAddress_t `typedef uint32 CFE_ES_MemAddress_t`

Type used for memory addresses in command and telemetry messages.
For backward compatibility with existing CFE code this should be uint32, but if running on a 64-bit platform, addresses in telemetry will be truncated to 32 bits and therefore will not be valid.
On 64-bit platforms this can be a 64-bit address which will allow the full memory address in commands and telemetry, but this will break compatibility with existing control systems, and may also change the alignment/padding of messages.
In either case this must be an unsigned type.
FSW code should access this value via the macros provided, which converts to the native "cpuaddr" type provided by OSAL. This macro provides independence between the message representation and local representation of a memory address.
Definition at line 409 of file default_cfe_es_extern_typedefs.h.

12.101.3.14 CFE_ES_MemHandle_t `typedef CFE_RESOURCEID_BASE_TYPE CFE_ES_MemHandle_t`

Memory Handle type.
Data type used to hold Handles of Memory Pools created via CFE_ES_PoolCreate and CFE_ES_PoolCreateNoSem
Definition at line 341 of file default_cfe_es_extern_typedefs.h.

12.101.3.15 CFE_ES_MemOffset_t `typedef uint32 CFE_ES_MemOffset_t`

Type used for memory sizes and offsets in commands and telemetry.
For backward compatibility with existing CFE code this should be uint32, but all telemetry information will be limited to 4GB in size as a result.
On 64-bit platforms this can be a 64-bit value which will allow larger memory objects, but this will break compatibility with existing control systems, and may also change the alignment/padding of messages.
In either case this must be an unsigned type.
Definition at line 372 of file default_cfe_es_extern_typedefs.h.

12.101.3.16 CFE_ES_MemPoolStats_t `typedef struct CFE_ES_MemPoolStats CFE_ES_MemPoolStats_t`

Memory Pool Statistics.
Structure that is used to provide information about a memory pool. Used by the Memory Pool Stats telemetry message.

See also

CFE_ES_SEND_MEM_POOL_STATS_CC

12.101.3.17 CFE_ES_RunStatus_Enum_t `typedef uint32 CFE_ES_RunStatus_Enum_t`

Run Status and Exit Status identifiers.

See also

enum CFE_ES_RunStatus

Definition at line 172 of file default_cfe_es_extern_typedefs.h.

12.101.3.18 CFE_ES_SystemState_Enum_t `typedef uint32 CFE_ES_SystemState_Enum_t`

The overall cFE System State.
These values are used with the CFE_ES_WaitForSystemState API call to synchronize application startup.

Note

These are defined in order so that relational comparisons e.g. if (STATEA < STATEB) are possible

See also

enum CFE_ES_SystemState

Definition at line 229 of file default_cfe_es_extern_typedefs.h.

12.101.3.19 CFE_ES_TaskId_t `typedef CFE_RESOURCEID_BASE_TYPE CFE_ES_TaskId_t`

A type for Task IDs.
This is the type that is used for any API accepting or returning a Task ID
Definition at line 319 of file default_cfe_es_extern_typedefs.h.

12.101.3.20 CFE_ES_TaskInfo_t `typedef struct CFE_ES_TaskInfo CFE_ES_TaskInfo_t`

Task Information.
Structure that is used to provide information about a task. It is primarily used for the Query All Tasks (CFE_ES_QUERY_ALL_TASKS_CC) command.

Note

There is not currently a telemetry message directly containing this data structure, but it does define the format of the data file generated by the Query All Tasks command. Therefore it should be considered part of the overall telemetry interface.

12.101.3.21 CFE_ES_TaskPriority_Atom_t `typedef uint16 CFE_ES_TaskPriority_Atom_t`

Type used for task priority in CFE ES as including the commands/telemetry messages.

Note

the valid range is only 0-255 (same as OSAL) but a wider type is used for backward compatibility in binary formats of messages.

Definition at line 358 of file default_cfe_es_extern_typedefs.h.

12.101.4 Enumeration Type Documentation

12.101.4.1 CFE_ES_AppState `enum CFE_ES_AppState`

Label definitions associated with CFE_ES_AppState_Enum_t.

Enumerator

CFE_ES_AppState_UNDEFINED	Initial state before app thread is started.
CFE_ES_AppState_EARLY_INIT	App thread has started, app performing early initialization of its own data.
CFE_ES_AppState_LATE_INIT	Early/Local initialization is complete. First sync point.
CFE_ES_AppState_RUNNING	All initialization is complete. Second sync point.
CFE_ES_AppState_WAITING	Application is waiting on a Restart/Reload/Delete request.
CFE_ES_AppState_STOPPED	Application is stopped.
CFE_ES_AppState_MAX	Reserved entry, marker for the maximum state.

Definition at line 257 of file default_cfe_es_extern_typedefs.h.

12.101.4.2 CFE_ES_AppType `enum CFE_ES_AppType`

Label definitions associated with CFE_ES_AppType_Enum_t.

Enumerator

CFE_ES_AppType_CORE	CFE core application.
CFE_ES_AppType_EXTERNAL	CFE external application.
CFE_ES_AppType_LIBRARY	CFE library.

Definition at line 81 of file default_cfe_es_extern_typedefs.h.

12.101.4.3 CFE_ES_ExceptionAction `enum CFE_ES_ExceptionAction`

Label definitions associated with CFE_ES_ExceptionAction_Enum_t.

Enumerator

CFE_ES_ExceptionAction_RESTART_APP	Restart application if exception occurs.
CFE_ES_ExceptionAction_PROC_RESTART	Restart processor if exception occurs.

Definition at line 58 of file default_cfe_es_extern_typedefs.h.

12.101.4.4 CFE_ES_LogEntryType `enum CFE_ES_LogEntryType`

Label definitions associated with CFE_ES_LogEntryType_Enum_t.

Enumerator

CFE_ES_LogEntryType_CORE	Log entry from a core subsystem.
CFE_ES_LogEntryType_APPLICATION	Log entry from an application.

Definition at line 234 of file default_cfe_es_extern_typedefs.h.

12.101.4.5 CFE_ES_LogMode `enum CFE_ES_LogMode`

Label definitions associated with CFE_ES_LogMode_Enum_t.

Enumerator

CFE_ES_LogMode_OVERWRITE	Overwrite Log Mode.
CFE_ES_LogMode_DISCARD	Discard Log Mode.

Definition at line 35 of file default_cfe_es_extern_typedefs.h.

12.101.4.6 CFE_ES_RunStatus `enum CFE_ES_RunStatus`

Label definitions associated with CFE_ES_RunStatus_Enum_t.

Enumerator

CFE_ES_RunStatus_UNDEFINED	Reserved value, should not be used.

Enumerator

CFE_ES_RunStatus_APP_RUN	Indicates that the Application should continue to run.
CFE_ES_RunStatus_APP_EXIT	Indicates that the Application wants to exit normally.
CFE_ES_RunStatus_APP_ERROR	Indicates that the Application is quitting with an error.
CFE_ES_RunStatus_SYS_EXCEPTION	The cFE App caused an exception.
CFE_ES_RunStatus_SYS_RESTART	The system is requesting a restart of the cFE App.
CFE_ES_RunStatus_SYS_RELOAD	The system is requesting a reload of the cFE App.
CFE_ES_RunStatus_SYS_DELETE	The system is requesting that the cFE App is stopped.
CFE_ES_RunStatus_CORE_APP_INIT_ERROR	Indicates that the Core Application could not Init.
CFE_ES_RunStatus_CORE_APP_RUNTIME_ERROR	Indicates that the Core Application had a runtime failure.
CFE_ES_RunStatus_MAX	Reserved value, marker for the maximum state.

Definition at line 109 of file default_cfe_es_extern_typedefs.h.

12.101.4.7 CFE_ES_SystemState `enum CFE_ES_SystemState`

Label definitions associated with CFE_ES_SystemState_Enum_t.

Enumerator

CFE_ES_SystemState_UNDEFINED	reserved
CFE_ES_SystemState_EARLY_INIT	single threaded mode while setting up CFE itself
CFE_ES_SystemState_CORE_STARTUP	core apps (CFE_ES_ObjectTable) are starting (multi-threaded)
CFE_ES_SystemState_CORE_READY	core is ready, starting other external apps/libraries (if any)
CFE_ES_SystemState_APPS_INIT	startup apps have all completed their early init, but not necessarily operational yet
CFE_ES_SystemState_OPERATIONAL	normal operation mode; all apps are RUNNING
CFE_ES_SystemState_SHUTDOWN	reserved for future use, all apps would be STOPPED
CFE_ES_SystemState_MAX	Reserved value, marker for the maximum state.

Definition at line 177 of file default_cfe_es_extern_typedefs.h.

12.102 cfe/modules/es/config/default_cfe_es_fcncodes.h File Reference

Macros

Executive Services Command Codes

- #define CFE_ES_NOOP_CC 0
- #define CFE_ES_RESET_COUNTERS_CC 1
- #define CFE_ES_RESTART_CC 2
- #define CFE_ES_START_APP_CC 4
- #define CFE_ES_STOP_APP_CC 5
- #define CFE_ES_RESTART_APP_CC 6
- #define CFE_ES_RELOAD_APP_CC 7
- #define CFE_ES_QUERY_ONE_CC 8
- #define CFE_ES_QUERY_ALL_CC 9
- #define CFE_ES_CLEAR_SYS_LOG_CC 10
- #define CFE_ES_WRITE_SYS_LOG_CC 11
- #define CFE_ES_CLEAR_ER_LOG_CC 12
- #define CFE_ES_WRITE_ER_LOG_CC 13

- #define CFE_ES_START_PERF_DATA_CC 14
- #define CFE_ES_STOP_PERF_DATA_CC 15
- #define CFE_ES_SET_PERF_FILTER_MASK_CC 16
- #define CFE_ES_SET_PERF_TRIGGER_MASK_CC 17
- #define CFE_ES_OVER_WRITE_SYS_LOG_CC 18
- #define CFE_ES_RESET_PR_COUNT_CC 19
- #define CFE_ES_SET_MAX_PR_COUNT_CC 20
- #define CFE_ES_DELETE_CDS_CC 21
- #define CFE_ES_SEND_MEM_POOL_STATS_CC 22
- #define CFE_ES_DUMP_CDS_REGISTRY_CC 23
- #define CFE_ES_QUERY_ALL_TASKS_CC 24

12.102.1 Detailed Description

Specification for the CFE Executive Services (CFE_ES) command function codes

Note

This file should be strictly limited to the command/function code (CC) macro definitions. Other definitions such as enums, typedefs, or other macros should be placed in the msgdefs.h or msg.h files.

12.102.2 Macro Definition Documentation

12.102.2.1 CFE_ES_CLEAR_ER_LOG_CC `#define CFE_ES_CLEAR_ER_LOG_CC 12`

Name Clears the contents of the Exception and Reset Log

Description

This command causes the contents of the Executive Services Exception and Reset Log to be cleared.

Command Mnemonic(s) $sc_$cpu_ES_ClearERLog

Command Structure

CFE_ES_ClearERLogCmd_t

Command Verification

Successful execution of this command may be verified with the following telemetry:

- **`$sc_$cpu_ES_CMDPC`** - command execution counter will increment
- The CFE_ES_ERLOG1_INF_EID informational event message will be generated.
- **`$sc_$cpu_ES_ERLOGINDEX`** - Index into Exception Reset Log goes to zero

Error Conditions

There are no error conditions for this command. If the Executive Services receives the command, the event is sent (although it may be filtered by EVS) and the counter is incremented unconditionally.

Criticality

This command is not dangerous. However, any previously logged data will be lost.

See also

CFE_ES_CLEAR_SYS_LOG_CC, CFE_ES_WRITE_SYS_LOG_CC, CFE_ES_WRITE_ER_LOG_CC

Definition at line 540 of file default_cfe_es_fcncodes.h.

12.102.2.2 CFE_ES_CLEAR_SYS_LOG_CC `#define CFE_ES_CLEAR_SYS_LOG_CC 10`

Name Clear Executive Services System Log

Description

This command clears the contents of the Executive Services System Log.

Command Mnemonic(s) $sc_$cpu_ES_ClearSysLog

Command Structure

CFE_ES_ClearSysLogCmd_t

Command Verification

Successful execution of this command may be verified with the following telemetry:

- **$sc_$cpu_ES_CMDPC -** command execution counter will increment
- The CFE_ES_SYSLOG1_INF_EID informational event message will be generated.
- **$sc_$cpu_ES_SYSLOGBYTEUSED -** System Log Bytes Used will go to zero
- **$sc_$cpu_ES_SYSLOGENTRIES -** Number of System Log Entries will go to zero

Error Conditions

There are no error conditions for this command. If the Executive Services receives the command, the event is sent (although it may be filtered by EVS) and the counter is incremented unconditionally.

Criticality

This command is not dangerous. However, any previously logged data will be lost.

See also

CFE_ES_WRITE_SYS_LOG_CC, CFE_ES_CLEAR_ER_LOG_CC, CFE_ES_WRITE_ER_LOG_CC, CFE_ES_OVER_WRITE_SY

Definition at line 463 of file default_cfe_es_fcncodes.h.

12.102.2.3 CFE_ES_DELETE_CDS_CC `#define CFE_ES_DELETE_CDS_CC 21`

Name Delete Critical Data Store

Description

This command allows the user to delete a Critical Data Store that was created by an Application that is now no longer executing.

Command Mnemonic(s) $sc_$cpu_ES_DeleteCDS

Command Structure

CFE_ES_DeleteCDSCmd_t

Command Verification

Successful execution of this command may be verified with the following telemetry:

- **$sc_$cpu_ES_CMDPC** - command execution counter will increment
- The CFE_ES_CDS_DELETED_INFO_EID informational event message will be generated.
- The specified CDS should no longer appear in a CDS Registry dump generated upon receipt of the CFE_ES_DUMP_CDS_REGISTRY_CC command

Error Conditions

This command may fail for the following reason(s):

- The specified CDS is the CDS portion of a Critical Table
- The specified CDS is not found in the CDS Registry
- The specified CDS is associated with an Application that is still active
- An error occurred while accessing the CDS memory (see the System Log for more details)

Evidence of failure may be found in the following telemetry:

- **$sc_$cpu_ES_CMDEC** - command error counter will increment
- A command specific error event message is issued for all error cases

Criticality

This command is not critical because it is not possible to delete a CDS that is associated with an active application. However, deleting a CDS does eliminate any "history" that an application may be wishing to keep.

See also

CFE_ES_DUMP_CDS_REGISTRY_CC, CFE_TBL_DELETE_CDS_CC

Definition at line 909 of file default_cfe_es_fcncodes.h.

12.102.2.4 CFE_ES_DUMP_CDS_REGISTRY_CC `#define CFE_ES_DUMP_CDS_REGISTRY_CC 23`

Name Dump Critical Data Store Registry to a File

Description

This command allows the user to dump the Critical Data Store Registry to an onboard file.

Command Mnemonic(s) $sc_$cpu_ES_WriteCDS2File

Command Structure

CFE_ES_DumpCDSRegistryCmd_t

Command Verification

Successful execution of this command may be verified with the following telemetry:

- **$sc_$cpu_ES_CMDPC** - command execution counter will increment
- The CFE_ES_CDS_REG_DUMP_INF_EID debug event message will be generated.
- The file specified in the command (or the default specified by the CFE_PLATFORM_ES_DEFAULT_CDS_REG_DUMP_FILE configuration parameter) will be updated with the latest information.

Error Conditions

This command may fail for the following reason(s):

- The file name specified could not be parsed
- Error occurred while creating or writing to the dump file

Evidence of failure may be found in the following telemetry:

- **$sc_$cpu_ES_CMDEC** - command error counter will increment
- A command specific error event message is issued for all error cases

Criticality

This command is not inherently dangerous. It will create a new file in the file system (or overwrite an existing one) and could, if performed repeatedly without sufficient file management by the operator, fill the file system.

See also

CFE_ES_DELETE_CDS_CC, CFE_TBL_DELETE_CDS_CC

Definition at line 990 of file default_cfe_es_fcncodes.h.

12.102.2.5 CFE_ES_NOOP_CC `#define CFE_ES_NOOP_CC 0`

Name Executive Services No-Op

Description

This command performs no other function than to increment the command execution counter. The command may be used to verify general aliveness of the Executive Services task.

Command Mnemonic(s) $sc_$cpu_ES_NOOP

Command Structure

CFE_ES_NoopCmd_t

Command Verification

Successful execution of this command may be verified with the following telemetry:

- **$sc_$cpu_ES_CMDPC** - command execution counter will increment
- The CFE_ES_BUILD_INF_EID informational event message will be generated
- The CFE_ES_NOOP_INF_EID informational event message will be generated

Error Conditions

This command may fail for the following reason(s):

- The command packet length is incorrect

Evidence of failure may be found in the following telemetry:

- **$sc_$cpu_ES_CMDEC** - command error counter will increment
- the CFE_ES_LEN_ERR_EID error event message will be generated

Criticality

None

See also

Definition at line 73 of file default_cfe_es_fcncodes.h.

12.102.2.6 CFE_ES_OVER_WRITE_SYS_LOG_CC `#define CFE_ES_OVER_WRITE_SYS_LOG_CC 18`

Name Set Executive Services System Log Mode to Discard/Overwrite

Description

This command allows the user to configure the Executive Services to either discard new System Log messages when it is full or to overwrite the oldest messages.

Command Mnemonic(s) $sc_$cpu_ES_OverwriteSysLogMode

Command Structure

CFE_ES_OverWriteSysLogCmd_t

Command Verification

Successful execution of this command may be verified with the following telemetry:

- **`$sc_$cpu_ES_CMDPC`** - command execution counter will increment
- **`$sc_$cpu_ES_SYSLOGMODE`** - Current System Log Mode should reflect the commanded value
- The CFE_ES_SYSLOGMODE_EID debug event message will be generated.

Error Conditions

This command may fail for the following reason(s):

- The desired mode is neither CFE_ES_LogMode_OVERWRITE or CFE_ES_LogMode_DISCARD

Evidence of failure may be found in the following telemetry:

- **`$sc_$cpu_ES_CMDEC`** - command error counter will increment
- A command specific error event message is issued for all error cases

Criticality

None. (It should be noted that "Overwrite" mode would allow a message identifying the cause of a problem to be lost by a subsequent flood of additional messages).

See also

CFE_ES_CLEAR_SYS_LOG_CC, CFE_ES_WRITE_SYS_LOG_CC

Definition at line 792 of file default_cfe_es_fcncodes.h.

12.102.2.7 CFE_ES_QUERY_ALL_CC `#define CFE_ES_QUERY_ALL_CC 9`

Name Writes all Executive Services Information on all loaded modules to a File

Description

This command takes the information kept by Executive Services on all of the registered applications and libraries and writes it to the specified file.

Command Mnemonic(s) $sc_$cpu_ES_WriteAppInfo2File

Command Structure

CFE_ES_QueryAllCmd_t

Command Verification

Successful execution of this command may be verified with the following telemetry:

- **`$sc_$cpu_ES_CMDPC`** - command execution counter will increment
- The CFE_ES_ALL_APPS_EID debug event message will be generated.
- The file specified in the command (or the default specified by the CFE_PLATFORM_ES_DEFAULT_APP_LOG_FILE configuration parameter) will be updated with the latest information.

Error Conditions

This command may fail for the following reason(s):

- The specified FileName cannot be parsed
- An Error occurs while trying to write to the file

Evidence of failure may be found in the following telemetry:

- **`$sc_$cpu_ES_CMDEC`** - command error counter will increment
- A command specific error event message is issued for all error cases

Criticality

This command is not inherently dangerous. It will create a new file in the file system (or overwrite an existing one) and could, if performed repeatedly without sufficient file management by the operator, fill the file system.

See also

CFE_ES_QUERY_ONE_CC, CFE_ES_QUERY_ALL_TASKS_CC

Definition at line 428 of file default_cfe_es_fcncodes.h.

12.102.2.8 CFE_ES_QUERY_ALL_TASKS_CC `#define CFE_ES_QUERY_ALL_TASKS_CC 24`

Name Writes a list of All Executive Services Tasks to a File

Description

This command takes the information kept by Executive Services on all of the registered tasks and writes it to the specified file.

Command Mnemonic(s) $sc_$cpu_ES_WriteTaskInfo2File

Command Structure

CFE_ES_QueryAllTasksCmd_t

Command Verification

Successful execution of this command may be verified with the following telemetry:

- **`$sc_$cpu_ES_CMDPC`** - command execution counter will increment
- The CFE_ES_TASKINFO_EID debug event message will be generated.
- The file specified in the command (or the default specified by the CFE_PLATFORM_ES_DEFAULT_TASK_LOG_FILE configuration parameter) will be updated with the latest information.

Error Conditions

This command may fail for the following reason(s):

- The file name specified could not be parsed
- An Error occurs while trying to write to the file

Evidence of failure may be found in the following telemetry:

- **`$sc_$cpu_ES_CMDEC`** - command error counter will increment
- A command specific error event message is issued for all error cases

Criticality

This command is not inherently dangerous. It will create a new file in the file system (or overwrite an existing one) and could, if performed repeatedly without sufficient file management by the operator, fill the file system.

See also

CFE_ES_QUERY_ALL_CC, CFE_ES_QUERY_ONE_CC

Definition at line 1032 of file default_cfe_es_fcncodes.h.

12.102.2.9 CFE_ES_QUERY_ONE_CC `#define CFE_ES_QUERY_ONE_CC 8`

Name Request Executive Services Information on a specified module

Description

This command takes the information kept by Executive Services on the specified application or library and telemeters it to the ground.

Command Mnemonic(s) $sc_$cpu_ES_QueryApp

Command Structure

CFE_ES_QueryOneCmd_t

Command Verification

Successful execution of this command may be verified with the following telemetry:

- **$sc_$cpu_ES_CMDPC** - command execution counter will increment
- The CFE_ES_ONE_APP_EID debug event message will be generated.
- Receipt of the CFE_ES_OneAppTlm_t telemetry packet

Error Conditions

This command may fail for the following reason(s):

- The specified name is not recognized as an active application or library

Evidence of failure may be found in the following telemetry:

- **$sc_$cpu_ES_CMDEC** - command error counter will increment
- A command specific error event message is issued for all error cases

Criticality

None

See also

CFE_ES_QUERY_ALL_CC, CFE_ES_QUERY_ALL_TASKS_CC

Definition at line 386 of file default_cfe_es_fcncodes.h.

12.102.2.10 CFE_ES_RELOAD_APP_CC `#define CFE_ES_RELOAD_APP_CC 7`

Name Stops, Unloads, Loads from the command specified File and Restarts an Application

Description

This command halts and removes the specified Application from the system. Then it immediately loads the Application from the command specified file and restarts it. This command is especially useful for restarting a Command Ingest Application since once it has been stopped, no further commands can come in to restart it.

Command Mnemonic(s) $sc_$cpu_ES_ReloadApp

Command Structure

CFE_ES_ReloadAppCmd_t

Command Verification

Successful execution of this command may be verified with the following telemetry:

- **$sc_$cpu_ES_CMDPC** - command execution counter will increment
- The CFE_ES_RELOAD_APP_DBG_EID debug event message will be generated. NOTE: This event message only identifies that the reload process has been initiated, not that it has completed.

Error Conditions

This command may fail for the following reason(s):

- The specified application filename string cannot be parsed
- The specified application name is not recognized as an active application
- The specified application is one of the cFE's Core applications (ES, EVS, SB, TBL, TIME)

Evidence of failure may be found in the following telemetry:

- **`$sc_$cpu_ES_CMDEC`** - command error counter will increment
- A command specific error event message is issued for all error cases
- Additional information on the reason for command failure may be found in the System Log

Criticality

This command is not inherently dangerous, however the restarting of certain applications (e.g. - Spacecraft Attitude and Control) may have a detrimental effect on the spacecraft.

See also

CFE_ES_START_APP_CC, CFE_ES_STOP_APP_CC, CFE_ES_RESTART_APP_CC

Definition at line 350 of file default_cfe_es_fcncodes.h.

12.102.2.11 CFE_ES_RESET_COUNTERS_CC `#define CFE_ES_RESET_COUNTERS_CC 1`

Name Executive Services Reset Counters

Description

This command resets the following counters within the Executive Services housekeeping telemetry:

- Command Execution Counter
- Command Error Counter

Command Mnemonic(s) $sc_$cpu_ES_ResetCtrs

Command Structure

CFE_ES_ResetCountersCmd_t

Command Verification

Successful execution of this command may be verified with the following telemetry:

- **`$sc_$cpu_ES_CMDPC`** - command execution counter and error counter will be reset to zero
- The CFE_ES_RESET_INF_EID informational event message will be generated

Error Conditions

There are no error conditions for this command. If the Executive Services receives the command, the event is sent (although it may be filtered by EVS) and the counter is incremented unconditionally.

Criticality

This command is not inherently dangerous. However, it is possible for ground systems and on-board safing procedures to be designed such that they react to changes in the counter values that are reset by this command.

See also

CFE_ES_RESET_PR_COUNT_CC

Definition at line 110 of file default_cfe_es_fcncodes.h.

12.102.2.12 CFE_ES_RESET_PR_COUNT_CC `#define CFE_ES_RESET_PR_COUNT_CC 19`

Name Resets the Processor Reset Counter to Zero

Description

This command allows the user to reset the Processor Reset Counter to zero. The Processor Reset Counter counts the number of Processor Resets that have occurred so as to identify when a Processor Reset should automatically be upgraded to a full Power-On Reset.

Command Mnemonic(s) $sc_$cpu_ES_ResetPRCnt

Command Structure

CFE_ES_ResetPRCountCmd_t

Command Verification

Successful execution of this command may be verified with the following telemetry:

- **`$sc_$cpu_ES_CMDPC`** - command execution counter will increment
- **`$sc_$cpu_ES_ProcResetCnt`** - Current number of processor resets will go to zero
- The CFE_ES_RESET_PR_COUNT_EID informational event message will be generated.

Error Conditions

There are no error conditions for this command. If the Executive Services receives the command, the event is sent (although it may be filtered by EVS) and the counter is incremented unconditionally.

Criticality

This command is not critical. The only impact would be that the system would have to have more processor resets before an automatic power-on reset occurred.

See also

CFE_ES_SET_MAX_PR_COUNT_CC, CFE_ES_RESET_COUNTERS_CC

Definition at line 829 of file default_cfe_es_fcncodes.h.

12.102.2.13 CFE_ES_RESTART_APP_CC `#define CFE_ES_RESTART_APP_CC 6`

Name Stops, Unloads, Loads using the previous File name, and Restarts an Application

Description

This command halts and removes the specified Application from the system. Then it immediately loads the Application from the same filename last used to start. This command is especially useful for restarting a Command Ingest Application since once it has been stopped, no further commands can come in to restart it.

Command Mnemonic(s) $sc_$cpu_ES_ResetApp

Command Structure

CFE_ES_RestartAppCmd_t

Command Verification

Successful execution of this command may be verified with the following telemetry:

- **`$sc_$cpu_ES_CMDPC`** - command execution counter will increment
- The CFE_ES_RESTART_APP_DBG_EID debug event message will be generated. NOTE: This event message only identifies that the restart process has been initiated, not that it has completed.

Error Conditions

This command may fail for the following reason(s):

- The original file is missing
- The specified application name is not recognized as an active application
- The specified application is one of the cFE's Core applications (ES, EVS, SB, TBL, TIME)

Evidence of failure may be found in the following telemetry:

- **`$sc_$cpu_ES_CMDEC`** - command error counter will increment
- A command specific error event message is issued for all error cases
- Additional information on the reason for command failure may be found in the System Log

Criticality

This command is not inherently dangerous, however the restarting of certain applications (e.g. - Spacecraft Attitude and Control) may have a detrimental effect on the spacecraft.

See also

CFE_ES_START_APP_CC, CFE_ES_STOP_APP_CC, CFE_ES_RELOAD_APP_CC

Definition at line 304 of file default_cfe_es_fcncodes.h.

12.102.2.14 CFE_ES_RESTART_CC `#define CFE_ES_RESTART_CC 2`

Name Executive Services Processor / Power-On Reset

Description

This command restarts the cFE in one of two modes. The Power-On Reset will cause the cFE to restart as though the power were first applied to the processor. The Processor Reset will attempt to retain the contents of the volatile disk and the contents of the Critical Data Store. NOTE: If a requested Processor Reset should cause the Processor Reset Counter (**`$sc_$cpu_ES_ProcResetCnt`**) to exceed OR EQUAL the limit CFE_PLATFORM_ES_MAX_PROCESSOR_RESETS (which is reported in housekeeping telemetry as **`$sc_$cpu_ES_MaxProcResets`**), the command is **AUTOMATICALLY** upgraded to a Power-On Reset.

Command Mnemonic(s) $sc_$cpu_ES_ProcessorReset, $sc_$cpu_ES_PowerOnReset

Command Structure

CFE_ES_RestartCmd_t

Command Verification

Successful execution of this command may be verified with the following telemetry:

- **`$sc_$cpu_ES_ProcResetCnt`** - processor reset counter will increment (processor reset) or reset to zero (power-on reset)
- **`$sc_$cpu_ES_ResetType`** - processor reset type will be updated
- **`$sc_$cpu_ES_ResetSubtype`** - processor reset subtype will be updated
- New entries in the Exception Reset Log and System Log can be found
  NOTE: Verification of a Power-On Reset is shown through the loss of data nominally retained through a Processor Reset
  NOTE: Since the reset of the processor resets the command execution counter (**`$sc_$cpu_ES_CMDPC`**), this counter **CANNOT** be used to verify command execution.

Error Conditions

This command may fail for the following reason(s):

- The Restart Type was not a recognized value.

Evidence of failure may be found in the following telemetry:

- **`$sc_$cpu_ES_CMDEC`** - command error counter will increment
- the CFE_ES_BOOT_ERR_EID error event message will be generated

Criticality

This command is, by definition, dangerous. Significant loss of data will occur. All processes and the cFE itself will be stopped and restarted. With the Power-On reset option, all data on the volatile disk and the contents of the Critical Data Store will be lost.

See also

CFE_ES_RESET_PR_COUNT_CC, CFE_ES_SET_MAX_PR_COUNT_CC

Definition at line 162 of file default_cfe_es_fcncodes.h.

12.102.2.15 CFE_ES_SEND_MEM_POOL_STATS_CC `#define CFE_ES_SEND_MEM_POOL_STATS_CC 22`

Name Telemeter Memory Pool Statistics

Description

This command allows the user to obtain a snapshot of the statistics maintained for a specified memory pool.

Command Mnemonic(s) $sc_$cpu_ES_PoolStats

Command Structure

CFE_ES_SendMemPoolStatsCmd_t

Command Verification

Successful execution of this command may be verified with the following telemetry:

- **`$sc_$cpu_ES_CMDPC`** - command execution counter will increment
- The CFE_ES_TLM_POOL_STATS_INFO_EID debug event message will be generated.
- The Memory Pool Statistics Telemetry Packet is produced

Error Conditions

This command may fail for the following reason(s):

- The specified handle is not associated with a known memory pool

Evidence of failure may be found in the following telemetry:

- **`$sc_$cpu_ES_CMDEC`** - command error counter will increment
- A command specific error event message is issued for all error cases

Criticality

An incorrect Memory Pool Handle value can cause a system crash. Extreme care should be taken to ensure the memory handle value used in the command is correct.

See also

Definition at line 948 of file default_cfe_es_fcncodes.h.

12.102.2.16 CFE_ES_SET_MAX_PR_COUNT_CC `#define CFE_ES_SET_MAX_PR_COUNT_CC 20`

Name Configure the Maximum Number of Processor Resets before a Power-On Reset

Description

This command allows the user to specify the number of Processor Resets that are allowed before the next Processor Reset is upgraded to a Power-On Reset.

Command Mnemonic(s) $sc_$cpu_ES_SetMaxPRCnt

Command Structure

CFE_ES_SetMaxPRCountCmd_t

Command Verification

Successful execution of this command may be verified with the following telemetry:

- **`$sc_$cpu_ES_CMDPC`** - command execution counter will increment
- **`$sc_$cpu_ES_MaxProcResets`** - Current maximum number of processor resets before an automatic power-on reset will go to the command specified value.
- The CFE_ES_SET_MAX_PR_COUNT_EID informational event message will be generated.

Error Conditions

There are no error conditions for this command. If the Executive Services receives the command, the event is sent (although it may be filtered by EVS) and the counter is incremented unconditionally.

Criticality

If the operator were to set the Maximum Processor Reset Count to too high a value, the processor would require an inordinate number of consecutive processor resets before an automatic power-on reset would occur. This could potentially leave the spacecraft without any control for a significant amount of time if a processor reset fails to clear a problem.

See also

CFE_ES_RESET_PR_COUNT_CC

Definition at line 867 of file default_cfe_es_fcncodes.h.

12.102.2.17 CFE_ES_SET_PERF_FILTER_MASK_CC `#define CFE_ES_SET_PERF_FILTER_MASK_CC 16`

Name Set Performance Analyzer's Filter Masks

Description

This command sets the Performance Analyzer's Filter Masks.

Command Mnemonic(s) $sc_$cpu_ES_LAFilterMask

Command Structure

CFE_ES_SetPerfFilterMaskCmd_t

Command Verification

Successful execution of this command may be verified with the following telemetry:

- **`$sc_$cpu_ES_CMDPC`** - command execution counter will increment
- **`$sc_$cpu_ES_PerfFltrMask`[MaskCnt]** - the current performance filter mask value(s) should reflect the commanded value
- The CFE_ES_PERF_FILTMSKCMD_EID debug event message will be generated.

Error Conditions

This command may fail for the following reason(s):

- The Filter Mask ID number is out of range

Evidence of failure may be found in the following telemetry:

- **`$sc_$cpu_ES_CMDEC`** - command error counter will increment
- A command specific error event message is issued for all error cases

Criticality

Changing the filter masks may cause a small change in the Performance Analyzer's CPU utilization.

See also

CFE_ES_START_PERF_DATA_CC, CFE_ES_STOP_PERF_DATA_CC, CFE_ES_SET_PERF_TRIGGER_MASK_CC

Definition at line 715 of file default_cfe_es_fcncodes.h.

12.102.2.18 CFE_ES_SET_PERF_TRIGGER_MASK_CC `#define CFE_ES_SET_PERF_TRIGGER_MASK_CC 17`

Name Set Performance Analyzer's Trigger Masks

Description

This command sets the Performance Analyzer's Trigger Masks.

Command Mnemonic(s) $sc_$cpu_ES_LATriggerMask

Command Structure

CFE_ES_SetPerfTriggerMaskCmd_t

Command Verification

Successful execution of this command may be verified with the following telemetry:

- **`$sc_$cpu_ES_CMDPC`** - command execution counter will increment
- **`$sc_$cpu_ES_PerfTrigMask`[MaskCnt]** - the current performance trigger mask value(s) should reflect the commanded value
- The CFE_ES_PERF_TRIGMSKCMD_EID debug event message will be generated.

Error Conditions

This command may fail for the following reason(s):

- The Trigger Mask ID number is out of range

Evidence of failure may be found in the following telemetry:

- **`$sc_$cpu_ES_CMDEC`** - command error counter will increment
- A command specific error event message is issued for all error cases

Criticality

Changing the trigger masks may cause a small change in the Performance Analyzer's CPU utilization.

See also

CFE_ES_START_PERF_DATA_CC, CFE_ES_STOP_PERF_DATA_CC, CFE_ES_SET_PERF_FILTER_MASK_CC

Definition at line 752 of file default_cfe_es_fcncodes.h.

12.102.2.19 CFE_ES_START_APP_CC `#define CFE_ES_START_APP_CC 4`

Name Load and Start an Application

Description

This command starts the specified application with the specified start address, stack size, etc options.

Command Mnemonic(s) $sc_$cpu_ES_StartApp

Command Structure

CFE_ES_StartAppCmd_t

Command Verification

Successful execution of this command may be verified with the following telemetry:

- **`$sc_$cpu_ES_CMDPC`** - command execution counter will increment
- The CFE_ES_START_INF_EID informational event message will be generated

Error Conditions

This command may fail for the following reason(s):

- The specified application filename string cannot be parsed
- The specified application entry point is an empty string
- The specified application name is an empty string
- The specified priority is greater than 255
- The specified exception action is neither CFE_ES_ExceptionAction_RESTART_APP (0) or CFE_ES_ExceptionAction_PROC_ (1)
- The Operating System was unable to load the specified application file

Evidence of failure may be found in the following telemetry:

- **`$sc_$cpu_ES_CMDEC`** - command error counter will increment
- A command specific error event message is issued for all error cases

Criticality

This command is not inherently dangerous although system resources could be taxed beyond their limits with the starting of erroneous or invalid applications.

See also

CFE_ES_STOP_APP_CC, CFE_ES_RESTART_APP_CC, CFE_ES_RELOAD_APP_CC

Definition at line 205 of file default_cfe_es_fcncodes.h.

12.102.2.20 CFE_ES_START_PERF_DATA_CC `#define CFE_ES_START_PERF_DATA_CC 14`

Name Start Performance Analyzer

Description

This command causes the Performance Analyzer to begin collecting data using the specified trigger mode.

Command Mnemonic(s) $sc_$cpu_ES_StartLAData

Command Structure

CFE_ES_StartPerfDataCmd_t

Command Verification

Successful execution of this command may be verified with the following telemetry:

- **`$sc_$cpu_ES_CMDPC`** - command execution counter will increment
- **`$sc_$cpu_ES_PerfState`** - Current performance analyzer state will change to either WAITING FOR TRIGGER or, if conditions are appropriate fast enough, TRIGGERED.
- **`$sc_$cpu_ES_PerfMode`** - Performance Analyzer Mode will change to the commanded trigger mode (TRIGGER START, TRIGGER CENTER, or TRIGGER END).
- **`$sc_$cpu_ES_PerfTrigCnt`** - Performance Trigger Count will go to zero
- **`$sc_$cpu_ES_PerfDataStart`** - Data Start Index will go to zero
- **`$sc_$cpu_ES_PerfDataEnd`** - Data End Index will go to zero
- **`$sc_$cpu_ES_PerfDataCnt`** - Performance Data Counter will go to zero
- The CFE_ES_PERF_STARTCMD_EID debug event message will be generated.

Error Conditions

This command may fail for the following reason(s):

- A previous CFE_ES_STOP_PERF_DATA_CC command has not completely finished.
- An invalid trigger mode is requested.

Evidence of failure may be found in the following telemetry:

- **`$sc_$cpu_ES_CMDEC`** - command error counter will increment
- A command specific error event message is issued for all error cases

Criticality

This command is not inherently dangerous but may cause a small increase in CPU utilization as the performance analyzer data is collected.

See also

CFE_ES_STOP_PERF_DATA_CC, CFE_ES_SET_PERF_FILTER_MASK_CC, CFE_ES_SET_PERF_TRIGGER_MASK_CC

Definition at line 628 of file default_cfe_es_fcncodes.h.

12.102.2.21 CFE_ES_STOP_APP_CC `#define CFE_ES_STOP_APP_CC 5`

Name Stop and Unload Application

Description

This command halts and removes the specified Application from the system. **NOTE:** This command should never be used on the Command Ingest application. This would prevent further commands from entering the system. If Command Ingest needs to be stopped and restarted, use CFE_ES_RESTART_APP_CC or CFE_ES_RELOAD_APP_CC.

Command Mnemonic(s) $sc_$cpu_ES_StopApp

Command Structure

CFE_ES_StopAppCmd_t

Command Verification

Successful execution of this command may be verified with the following telemetry:

- **`$sc_$cpu_ES_CMDPC`** - command execution counter will increment
- The CFE_ES_STOP_DBG_EID debug event message will be generated. NOTE: This event message only identifies that the stop request has been initiated, not that it has completed.
- Once the stop has successfully completed, the list of Applications and Tasks created in response to the **`$sc_$cpu_ES_WriteAppInfo2File`**, **`$sc_$cpu_ES_WriteTaskInfo2File`** **should** no longer contain the specified application.
- **`$sc_$cpu_ES_RegTasks`** - number of tasks will decrease after tasks associated with app (main task and any child tasks) are stopped
- **`$sc_$cpu_ES_RegExtApps`** - external application counter will decrement after app is cleaned up

Error Conditions

This command may fail for the following reason(s):

- The specified application name is not recognized as an active application
- The specified application is one of the cFE's Core applications (ES, EVS, SB, TBL, TIME)

Evidence of failure may be found in the following telemetry:

- **`$sc_$cpu_ES_CMDEC`** - command error counter will increment
- A command specific error event message is issued for all error cases
- Additional information on the reason for command failure may be found in the System Log

Criticality

This command is not inherently dangerous, however the removal of certain applications (e.g. - Spacecraft Attitude and Control) may have a detrimental effect on the spacecraft.

See also

CFE_ES_START_APP_CC, CFE_ES_RESTART_APP_CC, CFE_ES_RELOAD_APP_CC

Definition at line 258 of file default_cfe_es_fcncodes.h.

12.102.2.22 CFE_ES_STOP_PERF_DATA_CC `#define CFE_ES_STOP_PERF_DATA_CC 15`

Name Stop Performance Analyzer and write data file

Description

This command stops the Performance Analyzer from collecting any more data, and writes all previously collected performance data to a log file.

Command Mnemonic(s) $sc_$cpu_ES_StopLAData

Command Structure

CFE_ES_StopPerfDataCmd_t

Command Verification

Successful execution of this command may be verified with the following telemetry:

- **`$sc_$cpu_ES_CMDPC`** - command execution counter will increment
- **`$sc_$cpu_ES_PerfState`** - Current performance analyzer state will change to IDLE.
- The CFE_ES_PERF_STOPCMD_EID debug event message will be generated to indicate that data collection has been stopped. NOTE: Performance log data is written to the file as a background job. This event indicates that the file write process is initiated, not that it has completed.
- The file specified in the command (or the default specified by the CFE_PLATFORM_ES_DEFAULT_PERF_DUMP_FILENAME configuration parameter) will be updated with the latest information.

Error Conditions

This command may fail for the following reason(s):

- The file name specified could not be parsed
- Log data from a previous Stop Performance Analyzer command is still being written to a file.

Evidence of failure may be found in the following telemetry:

- **`$sc_$cpu_ES_CMDEC`** - command error counter will increment
- A command specific error event message is issued for all error cases

NOTE: The performance analyzer data collection will still be stopped in the event of an error parsing the log file name or writing the log file.

Criticality

This command is not inherently dangerous. However, depending on configuration, performance data log files may be large in size and thus may fill the available storage.

See also

CFE_ES_START_PERF_DATA_CC, CFE_ES_SET_PERF_FILTER_MASK_CC, CFE_ES_SET_PERF_TRIGGER_MASK_CC

Definition at line 678 of file default_cfe_es_fcncodes.h.

12.102.2.23 CFE_ES_WRITE_ER_LOG_CC `#define CFE_ES_WRITE_ER_LOG_CC 13`

Name Writes Exception and Reset Log to a File

Description

This command causes the contents of the Executive Services Exception and Reset Log to be written to the specified file.

Command Mnemonic(s) $sc_$cpu_ES_WriteERLog2File

Command Structure

CFE_ES_WriteERLogCmd_t

Command Verification

Successful execution of this command may be verified with the following telemetry:

- **`$sc_$cpu_ES_CMDPC`** - command execution counter will increment
- The CFE_ES_ERLOG2_EID debug event message will be generated.
- The file specified in the command (or the default specified by the CFE_PLATFORM_ES_DEFAULT_ER_LOG_FILE configuration parameter) will be updated with the latest information.

Error Conditions

This command may fail for the following reason(s):

- A previous request to write the ER log has not yet completed
- The specified FileName cannot be parsed
- An Error occurs while trying to write to the file

Evidence of failure may be found in the following telemetry:

- **`$sc_$cpu_ES_CMDEC`** - command error counter will increment
- A command specific error event message is issued for all error cases

Criticality

This command is not inherently dangerous. It will create a new file in the file system (or overwrite an existing one) and could, if performed repeatedly without sufficient file management by the operator, fill the file system.

See also

CFE_ES_CLEAR_SYS_LOG_CC, CFE_ES_WRITE_SYS_LOG_CC, CFE_ES_CLEAR_ER_LOG_CC

Definition at line 583 of file default_cfe_es_fcncodes.h.

12.102.2.24 CFE_ES_WRITE_SYS_LOG_CC `#define CFE_ES_WRITE_SYS_LOG_CC 11`

Name Writes contents of Executive Services System Log to a File

Description

This command causes the contents of the Executive Services System Log to be written to a log file.

Command Mnemonic(s) $sc_$cpu_ES_WriteSysLog2File

Command Structure

CFE_ES_WriteSysLogCmd_t

Command Verification

Successful execution of this command may be verified with the following telemetry:

- **`$sc_$cpu_ES_CMDPC`** - command execution counter will increment
- The CFE_ES_SYSLOG2_EID debug event message will be generated.
- The file specified in the command (or the default specified by the CFE_PLATFORM_ES_DEFAULT_SYSLOG_FILE configuration parameter) will be updated with the latest information.

Error Conditions

This command may fail for the following reason(s):

- The specified FileName cannot be parsed
- An Error occurs while trying to write to the file

Evidence of failure may be found in the following telemetry:

- **`$sc_$cpu_ES_CMDEC`** - command error counter will increment
- A command specific error event message is issued for all error cases

Criticality

This command is not inherently dangerous. It will create a new file in the file system (or overwrite an existing one) and could, if performed repeatedly without sufficient file management by the operator, fill the file system.

See also

CFE_ES_CLEAR_SYS_LOG_CC, CFE_ES_CLEAR_ER_LOG_CC, CFE_ES_WRITE_ER_LOG_CC, CFE_ES_OVER_WRITE_SY

Definition at line 506 of file default_cfe_es_fcncodes.h.

12.103 cfe/modules/es/config/default_cfe_es_interface_cfg.h File Reference

Macros

- #define CFE_MISSION_ES_MAX_APPLICATIONS 16
- #define CFE_MISSION_ES_PERF_MAX_IDS 128
- #define CFE_MISSION_ES_POOL_MAX_BUCKETS 17
- #define CFE_MISSION_ES_CDS_MAX_NAME_LENGTH 16
- #define CFE_MISSION_ES_DEFAULT_CRC CFE_ES_CrcType_16_ARC
- #define CFE_MISSION_ES_CDS_MAX_FULL_NAME_LEN (CFE_MISSION_ES_CDS_MAX_NAME_LENGTH + CFE_MISSION_MAX_API_LEN + 4)

Checksum/CRC algorithm identifiers

- #define CFE_MISSION_ES_CRC_8 CFE_ES_CrcType_CRC_8
- #define CFE_MISSION_ES_CRC_16 CFE_ES_CrcType_CRC_16
- #define CFE_MISSION_ES_CRC_32 CFE_ES_CrcType_CRC_32

12.103.1 Detailed Description

CFE Executive Services (CFE_ES) Application Public Definitions
This provides default values for configurable items that affect the interface(s) of this module. This includes the CMD/TLM message interface, tables definitions, and any other data products that serve to exchange information with other entities.

Note

This file may be overridden/superceded by mission-provided definitions either by overriding this header or by generating definitions from a command/data dictionary tool.

12.103.2 Macro Definition Documentation

12.103.2.1 CFE_MISSION_ES_CDS_MAX_FULL_NAME_LEN `#define CFE_MISSION_ES_CDS_MAX_FULL_NAME↩_LEN (CFE_MISSION_ES_CDS_MAX_NAME_LENGTH + CFE_MISSION_MAX_API_LEN + 4)`

Purpose Maximum Length of Full CDS Name in messages

Description:

Indicates the maximum length (in characters) of the entire CDS name of the following form: "ApplicationName.↩CDSName"

This affects the layout of command/telemetry messages but does not affect run time behavior or internal allocation.

Limits

All CPUs within the same SB domain (mission) must share the same definition Note this affects the size of messages, so it must not cause any message to exceed the max length.

This value should be kept as a multiple of 4, to maintain alignment of any possible neighboring fields without implicit padding.
Definition at line 143 of file default_cfe_es_interface_cfg.h.

12.103.2.2 CFE_MISSION_ES_CDS_MAX_NAME_LENGTH `#define CFE_MISSION_ES_CDS_MAX_NAME_LENG↩TH 16`

Purpose Maximum Length of CDS Name

Description:

Indicates the maximum length (in characters) of the CDS name ('CDSName') portion of a Full CDS Name of the following form: "ApplicationName.CDSName"

This length does not need to include an extra character for NULL termination.

Limits

This value should be kept as a multiple of 4, to maintain alignment of any possible neighboring fields without implicit padding.

Definition at line 109 of file default_cfe_es_interface_cfg.h.

12.103.2.3 CFE_MISSION_ES_CRC_16 `#define CFE_MISSION_ES_CRC_16 CFE_ES_CrcType_CRC_16`

Definition at line 151 of file default_cfe_es_interface_cfg.h.

12.103.2.4 CFE_MISSION_ES_CRC_32 `#define CFE_MISSION_ES_CRC_32 CFE_ES_CrcType_CRC_32`

Definition at line 152 of file default_cfe_es_interface_cfg.h.

12.103.2.5 CFE_MISSION_ES_CRC_8 `#define CFE_MISSION_ES_CRC_8 CFE_ES_CrcType_CRC_8`

Definition at line 150 of file default_cfe_es_interface_cfg.h.

12.103.2.6 CFE_MISSION_ES_DEFAULT_CRC `#define CFE_MISSION_ES_DEFAULT_CRC CFE_ES_CrcType_16_ARC`

Purpose Mission Default CRC algorithm

Description:

Indicates the which CRC algorithm should be used as the default for verifying the contents of Critical Data Stores and when calculating Table Image data integrity values.

Limits

Currently only CFE_ES_CrcType_16_ARC is supported (see brief in CFE_ES_CrcType_Enum definition in cfe_es_api_typedefs.h)

Definition at line 123 of file default_cfe_es_interface_cfg.h.

12.103.2.7 CFE_MISSION_ES_MAX_APPLICATIONS `#define CFE_MISSION_ES_MAX_APPLICATIONS 16`

Purpose Mission Max Apps in a message

Description:

Indicates the maximum number of apps in a telemetry housekeeping message

This affects the layout of command/telemetry messages but does not affect run time behavior or internal allocation.

Limits

All CPUs within the same SB domain (mission) must share the same definition Note this affects the size of messages, so it must not cause any message to exceed the max length.

Definition at line 49 of file default_cfe_es_interface_cfg.h.

12.103.2.8 CFE_MISSION_ES_PERF_MAX_IDS `#define CFE_MISSION_ES_PERF_MAX_IDS 128`

Purpose Define Max Number of Performance IDs for messages

Description:

Defines the maximum number of perf ids allowed.

Each performance id is used to identify something that needs to be measured. Performance ids are limited to the range of 0 to CFE_MISSION_ES_PERF_MAX_IDS - 1. Any performance ids outside of this range will be ignored and will be flagged as an error.
This affects the layout of telemetry messages but does not affect run time behavior or internal allocation.

Limits

All CPUs within the same SB domain (mission) must share the same definition Note this affects the size of messages, so it must not cause any message to exceed the max length.

Definition at line 71 of file default_cfe_es_interface_cfg.h.

12.103.2.9 CFE_MISSION_ES_POOL_MAX_BUCKETS `#define CFE_MISSION_ES_POOL_MAX_BUCKETS 17`

Purpose Maximum number of block sizes in pool structures

Description:

The upper limit for the number of block sizes supported in the generic pool implementation, which in turn implements the memory pools and CDS. This definition is used as the array size with the pool stats structure, and therefore should be consistent across all CPUs in a mission, as well as with the ground station.

There is also a platform-specific limit which may be fewer than this value.

Limits:

Must be at least one. No specific upper limit, but the number is anticipated to be reasonably small (i.e. tens, not hundreds). Large values have not been tested.

Definition at line 92 of file default_cfe_es_interface_cfg.h.

12.104 cfe/modules/es/config/default_cfe_es_internal_cfg.h File Reference

Macros

- #define CFE_PLATFORM_ES_START_TASK_PRIORITY 68
- #define CFE_PLATFORM_ES_START_TASK_STACK_SIZE CFE_PLATFORM_ES_DEFAULT_STACK_SIZE
- #define CFE_PLATFORM_ES_NONVOL_DISK_MOUNT_STRING "/cf"
- #define CFE_PLATFORM_ES_RAM_DISK_MOUNT_STRING "/ram"
- #define CFE_PLATFORM_ES_MAX_APPLICATIONS 32
- #define CFE_PLATFORM_ES_MAX_LIBRARIES 10
- #define CFE_PLATFORM_ES_ER_LOG_ENTRIES 20
- #define CFE_PLATFORM_ES_ER_LOG_MAX_CONTEXT_SIZE 256
- #define CFE_PLATFORM_ES_SYSTEM_LOG_SIZE 3072
- #define CFE_PLATFORM_ES_OBJECT_TABLE_SIZE 30
- #define CFE_PLATFORM_ES_MAX_GEN_COUNTERS 8
- #define CFE_PLATFORM_ES_APP_SCAN_RATE 1000
- #define CFE_PLATFORM_ES_APP_KILL_TIMEOUT 5
- #define CFE_PLATFORM_ES_RAM_DISK_SECTOR_SIZE 512
- #define CFE_PLATFORM_ES_RAM_DISK_NUM_SECTORS 4096
- #define CFE_PLATFORM_ES_RAM_DISK_PERCENT_RESERVED 30
- #define CFE_PLATFORM_ES_CDS_SIZE (128 ∗ 1024)
- #define CFE_PLATFORM_ES_USER_RESERVED_SIZE (1024 ∗ 1024)
- #define CFE_PLATFORM_ES_MEMPOOL_ALIGN_SIZE_MIN 4
- #define CFE_PLATFORM_ES_NONVOL_STARTUP_FILE "/cf/cfe_es_startup.scr"
- #define CFE_PLATFORM_ES_VOLATILE_STARTUP_FILE "/ram/cfe_es_startup.scr"
- #define CFE_PLATFORM_ES_DEFAULT_APP_LOG_FILE "/ram/cfe_es_app_info.log"
- #define CFE_PLATFORM_ES_DEFAULT_TASK_LOG_FILE "/ram/cfe_es_taskinfo.log"
- #define CFE_PLATFORM_ES_DEFAULT_SYSLOG_FILE "/ram/cfe_es_syslog.log"
- #define CFE_PLATFORM_ES_DEFAULT_ER_LOG_FILE "/ram/cfe_erlog.log"
- #define CFE_PLATFORM_ES_DEFAULT_PERF_DUMP_FILENAME "/ram/cfe_es_perf.dat"
- #define CFE_PLATFORM_ES_DEFAULT_CDS_REG_DUMP_FILE "/ram/cfe_cds_reg.log"
- #define CFE_PLATFORM_ES_DEFAULT_POR_SYSLOG_MODE 0
- #define CFE_PLATFORM_ES_DEFAULT_PR_SYSLOG_MODE 1
- #define CFE_PLATFORM_ES_PERF_DATA_BUFFER_SIZE 10000
- #define CFE_PLATFORM_ES_PERF_FILTMASK_NONE 0

- #define CFE_PLATFORM_ES_PERF_FILTMASK_ALL ~CFE_PLATFORM_ES_PERF_FILTMASK_NONE
- #define CFE_PLATFORM_ES_PERF_FILTMASK_INIT CFE_PLATFORM_ES_PERF_FILTMASK_ALL
- #define CFE_PLATFORM_ES_PERF_TRIGMASK_NONE 0
- #define CFE_PLATFORM_ES_PERF_TRIGMASK_ALL ~CFE_PLATFORM_ES_PERF_TRIGMASK_NONE
- #define CFE_PLATFORM_ES_PERF_TRIGMASK_INIT CFE_PLATFORM_ES_PERF_TRIGMASK_NONE
- #define CFE_PLATFORM_ES_PERF_CHILD_PRIORITY 200
- #define CFE_PLATFORM_ES_PERF_CHILD_STACK_SIZE 4096
- #define CFE_PLATFORM_ES_PERF_CHILD_MS_DELAY 20
- #define CFE_PLATFORM_ES_PERF_ENTRIES_BTWN_DLYS 50
- #define CFE_PLATFORM_ES_DEFAULT_STACK_SIZE 8192
- #define CFE_PLATFORM_ES_CDS_MAX_NUM_ENTRIES 512
- #define CFE_PLATFORM_ES_MAX_PROCESSOR_RESETS 2
- #define CFE_PLATFORM_ES_POOL_MAX_BUCKETS 17
- #define CFE_PLATFORM_ES_MAX_MEMORY_POOLS 10
- #define CFE_PLATFORM_ES_MEM_BLOCK_SIZE_01 8
- #define CFE_PLATFORM_ES_MEM_BLOCK_SIZE_02 16
- #define CFE_PLATFORM_ES_MEM_BLOCK_SIZE_03 32
- #define CFE_PLATFORM_ES_MEM_BLOCK_SIZE_04 48
- #define CFE_PLATFORM_ES_MEM_BLOCK_SIZE_05 64
- #define CFE_PLATFORM_ES_MEM_BLOCK_SIZE_06 96
- #define CFE_PLATFORM_ES_MEM_BLOCK_SIZE_07 128
- #define CFE_PLATFORM_ES_MEM_BLOCK_SIZE_08 160
- #define CFE_PLATFORM_ES_MEM_BLOCK_SIZE_09 256
- #define CFE_PLATFORM_ES_MEM_BLOCK_SIZE_10 512
- #define CFE_PLATFORM_ES_MEM_BLOCK_SIZE_11 1024
- #define CFE_PLATFORM_ES_MEM_BLOCK_SIZE_12 2048
- #define CFE_PLATFORM_ES_MEM_BLOCK_SIZE_13 4096
- #define CFE_PLATFORM_ES_MEM_BLOCK_SIZE_14 8192
- #define CFE_PLATFORM_ES_MEM_BLOCK_SIZE_15 16384
- #define CFE_PLATFORM_ES_MEM_BLOCK_SIZE_16 32768
- #define CFE_PLATFORM_ES_MAX_BLOCK_SIZE 80000
- #define CFE_PLATFORM_ES_CDS_MEM_BLOCK_SIZE_01 8
- #define CFE_PLATFORM_ES_CDS_MEM_BLOCK_SIZE_02 16
- #define CFE_PLATFORM_ES_CDS_MEM_BLOCK_SIZE_03 32
- #define CFE_PLATFORM_ES_CDS_MEM_BLOCK_SIZE_04 48
- #define CFE_PLATFORM_ES_CDS_MEM_BLOCK_SIZE_05 64
- #define CFE_PLATFORM_ES_CDS_MEM_BLOCK_SIZE_06 96
- #define CFE_PLATFORM_ES_CDS_MEM_BLOCK_SIZE_07 128
- #define CFE_PLATFORM_ES_CDS_MEM_BLOCK_SIZE_08 160
- #define CFE_PLATFORM_ES_CDS_MEM_BLOCK_SIZE_09 256
- #define CFE_PLATFORM_ES_CDS_MEM_BLOCK_SIZE_10 512
- #define CFE_PLATFORM_ES_CDS_MEM_BLOCK_SIZE_11 1024
- #define CFE_PLATFORM_ES_CDS_MEM_BLOCK_SIZE_12 2048
- #define CFE_PLATFORM_ES_CDS_MEM_BLOCK_SIZE_13 4096
- #define CFE_PLATFORM_ES_CDS_MEM_BLOCK_SIZE_14 8192
- #define CFE_PLATFORM_ES_CDS_MEM_BLOCK_SIZE_15 16384
- #define CFE_PLATFORM_ES_CDS_MEM_BLOCK_SIZE_16 32768
- #define CFE_PLATFORM_ES_CDS_MAX_BLOCK_SIZE 80000
- #define CFE_PLATFORM_ES_STARTUP_SYNC_POLL_MSEC 50
- #define CFE_PLATFORM_ES_STARTUP_SCRIPT_TIMEOUT_MSEC 1000

12.104.1 Detailed Description

CFE Executive Services (CFE_ES) Application Private Config Definitions
This provides default values for configurable items that are internal to this module and do NOT affect the interface(s) of this module. Changes to items in this file only affect the local module and will be transparent to external entities that are using the public interface(s).

Note

This file may be overridden/superceded by mission-provided definitions either by overriding this header or by generating definitions from a command/data dictionary tool.

12.104.2 Macro Definition Documentation

12.104.2.1 CFE_PLATFORM_ES_APP_KILL_TIMEOUT `#define CFE_PLATFORM_ES_APP_KILL_TIMEOUT 5`

Purpose Define ES Application Kill Timeout

Description:

ES Application Kill Timeout. This parameter controls the number of "scan periods" that ES will wait for an application to Exit after getting the signal Delete, Reload or Restart. The sequence works as follows:

1. ES will set the control request for an App to Delete/Restart/Reload and set this kill timer to the value in this parameter.
2. If the App is responding and Calls it's RunLoop function, it will drop out of it's main loop and call CFE_ES↩_ExitApp. Once it calls Exit App, then ES can delete, restart, or reload the app the next time it scans the app table.
3. If the App is not responding, the ES App will decrement this Kill Timeout value each time it runs. If the timeout value reaches zero, ES will kill the app.

The Kill timeout value depends on the CFE_PLATFORM_ES_APP_SCAN_RATE. If the Scan Rate is 1000, or 1 second, and this CFE_PLATFORM_ES_APP_KILL_TIMEOUT is set to 5, then it will take 5 seconds to kill a non-responding App. If the Scan Rate is 250, or 1/4 second, and the CFE_PLATFORM_ES_APP_KILL_TIMEOUT is set to 2, then it will take 1/2 second to time out.

Limits

There is a lower limit of 1 and an upper limit of 100 on this configuration parameter. Units are number of CFE_PLATFORM_ES_APP_SCAN_RATE cycles.

Definition at line 232 of file default_cfe_es_internal_cfg.h.

12.104.2.2 CFE_PLATFORM_ES_APP_SCAN_RATE `#define CFE_PLATFORM_ES_APP_SCAN_RATE 1000`

Purpose Define ES Application Control Scan Rate

Description:

ES Application Control Scan Rate. This parameter controls the speed that ES scans the Application Table looking for App Delete/Restart/Reload requests. All Applications are deleted, restarted, or reloaded by the ES Application. ES will periodically scan for control requests to process. The scan rate is controlled by this parameter, which is given in milliseconds. A value of 1000 means that ES will scan the Application Table once per second. Be careful not to set the value of this too low, because ES will use more CPU cycles scanning the table.

Limits

There is a lower limit of 100 and an upper limit of 20000 on this configuration parameter. millisecond units.

Definition at line 203 of file default_cfe_es_internal_cfg.h.

12.104.2.3 CFE_PLATFORM_ES_CDS_MAX_BLOCK_SIZE `#define CFE_PLATFORM_ES_CDS_MAX_BLOCK_SIZE 80000`

Definition at line 774 of file default_cfe_es_internal_cfg.h.

12.104.2.4 CFE_PLATFORM_ES_CDS_MAX_NUM_ENTRIES `#define CFE_PLATFORM_ES_CDS_MAX_NUM_ENTRIES 512`

Purpose Define Maximum Number of Registered CDS Blocks

Description:

Maximum number of registered CDS Blocks

Limits

There is a lower limit of 8. There are no restrictions on the upper limit however, the maximum number of CDS entries is system dependent and should be verified.

Definition at line 664 of file default_cfe_es_internal_cfg.h.

12.104.2.5 CFE_PLATFORM_ES_CDS_MEM_BLOCK_SIZE_01 `#define CFE_PLATFORM_ES_CDS_MEM_BLOCK_SIZE_01 8`

Purpose Define ES Critical Data Store Memory Pool Block Sizes

Description:

Intermediate ES Critical Data Store Memory Pool Block Sizes

Limits

These sizes MUST be increasing and MUST be an integral multiple of 4.

Definition at line 758 of file default_cfe_es_internal_cfg.h.

12.104.2.6 CFE_PLATFORM_ES_CDS_MEM_BLOCK_SIZE_02 `#define CFE_PLATFORM_ES_CDS_MEM_BLOCK_SIZE_02 16`

Definition at line 759 of file default_cfe_es_internal_cfg.h.

12.104.2.7 CFE_PLATFORM_ES_CDS_MEM_BLOCK_SIZE_03 `#define CFE_PLATFORM_ES_CDS_MEM_BLOCK_SIZE_03 32`

Definition at line 760 of file default_cfe_es_internal_cfg.h.

12.104.2.8 CFE_PLATFORM_ES_CDS_MEM_BLOCK_SIZE_04

```
#define CFE_PLATFORM_ES_CDS_MEM_BLOCK_S↩
IZE_04 48
```

Definition at line 761 of file default_cfe_es_internal_cfg.h.

12.104.2.9 CFE_PLATFORM_ES_CDS_MEM_BLOCK_SIZE_05

```
#define CFE_PLATFORM_ES_CDS_MEM_BLOCK_S↩
IZE_05 64
```

Definition at line 762 of file default_cfe_es_internal_cfg.h.

12.104.2.10 CFE_PLATFORM_ES_CDS_MEM_BLOCK_SIZE_06

```
#define CFE_PLATFORM_ES_CDS_MEM_BLOCK↩
_SIZE_06 96
```

Definition at line 763 of file default_cfe_es_internal_cfg.h.

12.104.2.11 CFE_PLATFORM_ES_CDS_MEM_BLOCK_SIZE_07

```
#define CFE_PLATFORM_ES_CDS_MEM_BLOCK↩
_SIZE_07 128
```

Definition at line 764 of file default_cfe_es_internal_cfg.h.

12.104.2.12 CFE_PLATFORM_ES_CDS_MEM_BLOCK_SIZE_08

```
#define CFE_PLATFORM_ES_CDS_MEM_BLOCK↩
_SIZE_08 160
```

Definition at line 765 of file default_cfe_es_internal_cfg.h.

12.104.2.13 CFE_PLATFORM_ES_CDS_MEM_BLOCK_SIZE_09

```
#define CFE_PLATFORM_ES_CDS_MEM_BLOCK↩
_SIZE_09 256
```

Definition at line 766 of file default_cfe_es_internal_cfg.h.

12.104.2.14 CFE_PLATFORM_ES_CDS_MEM_BLOCK_SIZE_10

```
#define CFE_PLATFORM_ES_CDS_MEM_BLOCK↩
_SIZE_10 512
```

Definition at line 767 of file default_cfe_es_internal_cfg.h.

12.104.2.15 CFE_PLATFORM_ES_CDS_MEM_BLOCK_SIZE_11

```
#define CFE_PLATFORM_ES_CDS_MEM_BLOCK↩
_SIZE_11 1024
```

Definition at line 768 of file default_cfe_es_internal_cfg.h.

12.104.2.16 CFE_PLATFORM_ES_CDS_MEM_BLOCK_SIZE_12

```
#define CFE_PLATFORM_ES_CDS_MEM_BLOCK↩
_SIZE_12 2048
```

Definition at line 769 of file default_cfe_es_internal_cfg.h.

12.104.2.17 CFE_PLATFORM_ES_CDS_MEM_BLOCK_SIZE_13

```
#define CFE_PLATFORM_ES_CDS_MEM_BLOCK↩
_SIZE_13 4096
```

Definition at line 770 of file default_cfe_es_internal_cfg.h.

12.104.2.18 CFE_PLATFORM_ES_CDS_MEM_BLOCK_SIZE_14

```
#define CFE_PLATFORM_ES_CDS_MEM_BLOCK↩
_SIZE_14 8192
```

Definition at line 771 of file default_cfe_es_internal_cfg.h.

12.104.2.19 CFE_PLATFORM_ES_CDS_MEM_BLOCK_SIZE_15

```
#define CFE_PLATFORM_ES_CDS_MEM_BLOCK↩
_SIZE_15 16384
```

Definition at line 772 of file default_cfe_es_internal_cfg.h.

12.104.2.20 CFE_PLATFORM_ES_CDS_MEM_BLOCK_SIZE_16

```
#define CFE_PLATFORM_ES_CDS_MEM_BLOCK↩
_SIZE_16 32768
```

Definition at line 773 of file default_cfe_es_internal_cfg.h.

12.104.2.21 CFE_PLATFORM_ES_CDS_SIZE

```
#define CFE_PLATFORM_ES_CDS_SIZE (128 * 1024)
```

Purpose Define Critical Data Store Size

Description:

Defines the Critical Data Store (CDS) area size in bytes size. The CDS is one of four memory areas that are preserved during a processor reset. NOTE: Changing this value changes memory allocation, and may require changes to platform specific values (in CFE_PSP) such as USER_RESERVED_MEM in VxWorks depending on the memory areas being used for preserved data and on OS specific behavior.

Limits

There is a lower limit of 8192 and an upper limit of UINT_MAX (4 Gigabytes) on this configuration parameter.

Definition at line 309 of file default_cfe_es_internal_cfg.h.

12.104.2.22 CFE_PLATFORM_ES_DEFAULT_APP_LOG_FILE

```
#define CFE_PLATFORM_ES_DEFAULT_APP_LOG↩
_FILE "/ram/cfe_es_app_info.log"
```

Purpose Default Application Information Filename

Description:

The value of this constant defines the filename used to store information pertaining to all of the Applications that are registered with Executive Services. This filename is used only when no filename is specified in the the command to query all system apps.

Limits

The length of each string, including the NULL terminator cannot exceed the OS_MAX_PATH_LEN value.

Definition at line 391 of file default_cfe_es_internal_cfg.h.

12.104.2.23 CFE_PLATFORM_ES_DEFAULT_CDS_REG_DUMP_FILE

```
#define CFE_PLATFORM_ES_DEFAULT_C↩
DS_REG_DUMP_FILE "/ram/cfe_cds_reg.log"
```

Purpose Default Critical Data Store Registry Filename

Description:

The value of this constant defines the filename used to store the Critical Data Store Registry. This filename is used only when no filename is specified in the command to stop performance data collecting.

Limits

The length of each string, including the NULL terminator cannot exceed the OS_MAX_PATH_LEN value.

Definition at line 465 of file default_cfe_es_internal_cfg.h.

12.104.2.24 CFE_PLATFORM_ES_DEFAULT_ER_LOG_FILE

```
#define CFE_PLATFORM_ES_DEFAULT_ER_LOG_FI↩
LE "/ram/cfe_erlog.log"
```

Purpose Default Exception and Reset (ER) Log Filename

Description:

The value of this constant defines the filename used to store the Exception and Reset (ER) Log. This filename is used only when no filename is specified in the command to dump the ER log. No file specified in the cmd means the first character in the cmd filename is a NULL terminator (zero).

Limits

The length of each string, including the NULL terminator cannot exceed the OS_MAX_PATH_LEN value.

Definition at line 437 of file default_cfe_es_internal_cfg.h.

12.104.2.25 CFE_PLATFORM_ES_DEFAULT_PERF_DUMP_FILENAME

```
#define CFE_PLATFORM_ES_DEFAULT↩
_PERF_DUMP_FILENAME "/ram/cfe_es_perf.dat"
```

Purpose Default Performance Data Filename

Description:

The value of this constant defines the filename used to store the Performance Data. This filename is used only when no filename is specified in the command to stop performance data collecting.

Limits

The length of each string, including the NULL terminator cannot exceed the OS_MAX_PATH_LEN value.

Definition at line 451 of file default_cfe_es_internal_cfg.h.

12.104.2.26 CFE_PLATFORM_ES_DEFAULT_POR_SYSLOG_MODE `#define CFE_PLATFORM_ES_DEFAULT_PO↩ R_SYSLOG_MODE 0`

Purpose Define Default System Log Mode following Power On Reset

Description:

Defines the default mode for the operation of the ES System log following a power on reset. The log may operate in either Overwrite mode = 0, where once the log becomes full the oldest message in the log will be overwritten, or Discard mode = 1, where once the log becomes full the contents of the log are preserved and the new event is discarded. This constant may hold a value of either 0 or 1 depending on the desired default. Overwrite Mode = 0, Discard Mode = 1.

Limits

There is a lower limit of 0 and an upper limit of 1 on this configuration parameter.

Definition at line 483 of file default_cfe_es_internal_cfg.h.

12.104.2.27 CFE_PLATFORM_ES_DEFAULT_PR_SYSLOG_MODE `#define CFE_PLATFORM_ES_DEFAULT_PR_↩ SYSLOG_MODE 1`

Purpose Define Default System Log Mode following Processor Reset

Description:

Defines the default mode for the operation of the ES System log following a processor reset. The log may operate in either Overwrite mode = 0, where once the log becomes full the oldest message in the log will be overwritten, or Discard mode = 1, where once the log becomes full the contents of the log are preserved and the new event is discarded. This constant may hold a value of either 0 or 1 depending on the desired default. Overwrite Mode = 0, Discard Mode = 1.

Limits

There is a lower limit of 0 and an upper limit of 1 on this configuration parameter.

Definition at line 501 of file default_cfe_es_internal_cfg.h.

12.104.2.28 CFE_PLATFORM_ES_DEFAULT_STACK_SIZE `#define CFE_PLATFORM_ES_DEFAULT_STACK_SI↩ ZE 8192`

Purpose Define Default Stack Size for an Application

Description:

This parameter defines a default stack size. This parameter is used by the cFE Core Applications.

Limits

There is a lower limit of 2048. There are no restrictions on the upper limit however, the maximum stack size is system dependent and should be verified. Most operating systems provide tools for measuring the amount of stack used by a task during operation. It is always a good idea to verify that no more than 1/2 of the stack is used.

Definition at line 651 of file default_cfe_es_internal_cfg.h.

12.104.2.29 CFE_PLATFORM_ES_DEFAULT_SYSLOG_FILE `#define CFE_PLATFORM_ES_DEFAULT_SYSLOG_FI↩ LE "/ram/cfe_es_syslog.log"`

Purpose Default System Log Filename

Description:

The value of this constant defines the filename used to store important information (as ASCII text strings) that might not be able to be sent in an Event Message. This filename is used only when no filename is specified in the command to dump the system log. No file specified in the cmd means the first character in the cmd filename is a NULL terminator (zero).

Limits

The length of each string, including the NULL terminator cannot exceed the OS_MAX_PATH_LEN value.

Definition at line 422 of file default_cfe_es_internal_cfg.h.

12.104.2.30 CFE_PLATFORM_ES_DEFAULT_TASK_LOG_FILE `#define CFE_PLATFORM_ES_DEFAULT_TASK_L↩ OG_FILE "/ram/cfe_es_taskinfo.log"`

Purpose Default Application Information Filename

Description:

The value of this constant defines the filename used to store information pertaining to all of the Applications that are registered with Executive Services. This filename is used only when no filename is specified in the the command to query all system tasks.

Limits

The length of each string, including the NULL terminator cannot exceed the OS_MAX_PATH_LEN value.

Definition at line 406 of file default_cfe_es_internal_cfg.h.

12.104.2.31 CFE_PLATFORM_ES_ER_LOG_ENTRIES `#define CFE_PLATFORM_ES_ER_LOG_ENTRIES 20`

Purpose Define Max Number of ER (Exception and Reset) log entries

Description:

Defines the maximum number of ER (Exception and Reset) log entries

Limits

There is a lower limit of 1. There are no restrictions on the upper limit however, the maximum number of log entries is system dependent and should be verified.

Definition at line 130 of file default_cfe_es_internal_cfg.h.

12.104.2.32 CFE_PLATFORM_ES_ER_LOG_MAX_CONTEXT_SIZE `#define CFE_PLATFORM_ES_ER_LOG_MAX_↩ CONTEXT_SIZE 256`

Purpose Maximum size of CPU Context in ES Error Log

Description:

This should be large enough to accommodate the CPU context information supplied by the PSP on the given platform.

Limits:

Must be greater than zero and a multiple of sizeof(uint32). Limited only by the available memory and the number of entries in the error log. Any context information beyond this size will be truncated.

Definition at line 144 of file default_cfe_es_internal_cfg.h.

12.104.2.33 CFE_PLATFORM_ES_MAX_APPLICATIONS `#define CFE_PLATFORM_ES_MAX_APPLICATIONS 32`

Purpose Define Max Number of Applications

Description:

Defines the maximum number of applications that can be loaded into the system. This number does not include child tasks.

Limits

There is a lower limit of 6. The lower limit corresponds to the cFE internal applications. There are no restrictions on the upper limit however, the maximum number of applications is system dependent and should be verified. AppIDs that are checked against this configuration are defined by a 32 bit data word.

Definition at line 103 of file default_cfe_es_internal_cfg.h.

12.104.2.34 CFE_PLATFORM_ES_MAX_BLOCK_SIZE `#define CFE_PLATFORM_ES_MAX_BLOCK_SIZE 80000`

Definition at line 747 of file default_cfe_es_internal_cfg.h.

12.104.2.35 CFE_PLATFORM_ES_MAX_GEN_COUNTERS `#define CFE_PLATFORM_ES_MAX_GEN_COUNTERS 8`

Purpose Define Max Number of Generic Counters

Description:

Defines the maximum number of Generic Counters that can be registered.

Limits

This parameter has a lower limit of 1 and an upper limit of 65535.

Definition at line 184 of file default_cfe_es_internal_cfg.h.

12.104.2.36 CFE_PLATFORM_ES_MAX_LIBRARIES `#define CFE_PLATFORM_ES_MAX_LIBRARIES 10`

Purpose Define Max Number of Shared libraries

Description:

Defines the maximum number of cFE Shared libraries that can be loaded into the system.

Limits

There is a lower limit of 1. There are no restrictions on the upper limit however, the maximum number of libraries is system dependent and should be verified.

Definition at line 117 of file default_cfe_es_internal_cfg.h.

12.104.2.37 CFE_PLATFORM_ES_MAX_MEMORY_POOLS `#define CFE_PLATFORM_ES_MAX_MEMORY_POOLS 10`

Purpose Maximum number of memory pools

Description:

The upper limit for the number of memory pools that can concurrently exist within the system.

The CFE_SB and CFE_TBL core subsystems each define a memory pool.
Individual applications may also create memory pools, so this value should be set sufficiently high enough to support the applications being used on this platform.

Limits:

Must be at least 2 to support CFE core - SB and TBL pools. No specific upper limit.

Definition at line 712 of file default_cfe_es_internal_cfg.h.

12.104.2.38 CFE_PLATFORM_ES_MAX_PROCESSOR_RESETS `#define CFE_PLATFORM_ES_MAX_PROCESSOR↩ _RESETS 2`

Purpose Define Number of Processor Resets Before a Power On Reset

Description:

Number of Processor Resets before a Power On Reset is called. If set to 2, then 2 processor resets will occur, and the 3rd processor reset will be a power on reset instead.

Limits

There is a lower limit of 0. There are no restrictions on the upper limit however, the maximum number of processor resets may be system dependent and should be verified.

Definition at line 679 of file default_cfe_es_internal_cfg.h.

12.104.2.39 CFE_PLATFORM_ES_MEM_BLOCK_SIZE_01 `#define CFE_PLATFORM_ES_MEM_BLOCK_SIZE_01 8`

Purpose Define Default ES Memory Pool Block Sizes

Description:

Default Intermediate ES Memory Pool Block Sizes. If an application is using the CFE_ES Memory Pool APIs (CFE_ES_PoolCreate, CFE_ES_PoolCreateNoSem, CFE_ES_GetPoolBuf and CFE_ES_PutPoolBuf) but finds these sizes inappropriate for their use, they may wish to use the CFE_ES_PoolCreateEx API to specify their own intermediate block sizes

Limits

These sizes MUST be increasing and MUST be an integral multiple of 4. Also, CFE_PLATFORM_ES_MAX_BLOCK_SIZE must be larger than CFE_MISSION_SB_MAX_SB_MSG_SIZE and both CFE_PLATFORM_TBL_MAX_SNGL_TABLE_SIZE and CFE_PLATFORM_TBL_MAX_DBL_TABLE_SIZE. Note that if Table Services have been removed from the CFE, the table size limits are still enforced although the table size definitions may be reduced.

Definition at line 731 of file default_cfe_es_internal_cfg.h.

12.104.2.40 CFE_PLATFORM_ES_MEM_BLOCK_SIZE_02 `#define CFE_PLATFORM_ES_MEM_BLOCK_SIZE_02 16`

Definition at line 732 of file default_cfe_es_internal_cfg.h.

12.104.2.41 CFE_PLATFORM_ES_MEM_BLOCK_SIZE_03 `#define CFE_PLATFORM_ES_MEM_BLOCK_SIZE_03 32`

Definition at line 733 of file default_cfe_es_internal_cfg.h.

12.104.2.42 CFE_PLATFORM_ES_MEM_BLOCK_SIZE_04 `#define CFE_PLATFORM_ES_MEM_BLOCK_SIZE_04 48`

Definition at line 734 of file default_cfe_es_internal_cfg.h.

12.104.2.43 CFE_PLATFORM_ES_MEM_BLOCK_SIZE_05 `#define CFE_PLATFORM_ES_MEM_BLOCK_SIZE_05 64`

Definition at line 735 of file default_cfe_es_internal_cfg.h.

12.104.2.44 CFE_PLATFORM_ES_MEM_BLOCK_SIZE_06 `#define CFE_PLATFORM_ES_MEM_BLOCK_SIZE_06 96`

Definition at line 736 of file default_cfe_es_internal_cfg.h.

12.104.2.45 CFE_PLATFORM_ES_MEM_BLOCK_SIZE_07 `#define CFE_PLATFORM_ES_MEM_BLOCK_SIZE_07 128`

Definition at line 737 of file default_cfe_es_internal_cfg.h.

12.104.2.46 CFE_PLATFORM_ES_MEM_BLOCK_SIZE_08 `#define CFE_PLATFORM_ES_MEM_BLOCK_SIZE_08 160`

Definition at line 738 of file default_cfe_es_internal_cfg.h.

12.104.2.47 CFE_PLATFORM_ES_MEM_BLOCK_SIZE_09 `#define CFE_PLATFORM_ES_MEM_BLOCK_SIZE_↩ 09 256`

Definition at line 739 of file default_cfe_es_internal_cfg.h.

12.104.2.48 CFE_PLATFORM_ES_MEM_BLOCK_SIZE_10 `#define CFE_PLATFORM_ES_MEM_BLOCK_SIZE_↩ 10 512`

Definition at line 740 of file default_cfe_es_internal_cfg.h.

12.104.2.49 CFE_PLATFORM_ES_MEM_BLOCK_SIZE_11 `#define CFE_PLATFORM_ES_MEM_BLOCK_SIZE_↩ 11 1024`

Definition at line 741 of file default_cfe_es_internal_cfg.h.

12.104.2.50 CFE_PLATFORM_ES_MEM_BLOCK_SIZE_12 `#define CFE_PLATFORM_ES_MEM_BLOCK_SIZE_↩ 12 2048`

Definition at line 742 of file default_cfe_es_internal_cfg.h.

12.104.2.51 CFE_PLATFORM_ES_MEM_BLOCK_SIZE_13 `#define CFE_PLATFORM_ES_MEM_BLOCK_SIZE_↩ 13 4096`

Definition at line 743 of file default_cfe_es_internal_cfg.h.

12.104.2.52 CFE_PLATFORM_ES_MEM_BLOCK_SIZE_14 `#define CFE_PLATFORM_ES_MEM_BLOCK_SIZE_↩ 14 8192`

Definition at line 744 of file default_cfe_es_internal_cfg.h.

12.104.2.53 CFE_PLATFORM_ES_MEM_BLOCK_SIZE_15 `#define CFE_PLATFORM_ES_MEM_BLOCK_SIZE_↩ 15 16384`

Definition at line 745 of file default_cfe_es_internal_cfg.h.

12.104.2.54 CFE_PLATFORM_ES_MEM_BLOCK_SIZE_16 `#define CFE_PLATFORM_ES_MEM_BLOCK_SIZE_↩ 16 32768`

Definition at line 746 of file default_cfe_es_internal_cfg.h.

12.104.2.55 CFE_PLATFORM_ES_MEMPOOL_ALIGN_SIZE_MIN `#define CFE_PLATFORM_ES_MEMPOOL_ALIGN↩ _SIZE_MIN 4`

Purpose Define Memory Pool Alignment Size

Description:

> Ensures that buffers obtained from a memory pool are aligned to a certain minimum block size. Note the allocator will always align to the minimum required by the CPU architecture. This may be set greater than the CPU requirement as desired for optimal performance.

For some architectures/applications it may be beneficial to set this to the cache line size of the target CPU, or to use special SIMD instructions that require a more stringent memory alignment.

Limits

This must always be a power of 2, as it is used as a binary address mask.

Definition at line 348 of file default_cfe_es_internal_cfg.h.

12.104.2.56 CFE_PLATFORM_ES_NONVOL_DISK_MOUNT_STRING `#define CFE_PLATFORM_ES_NONVOL_DI↩ SK_MOUNT_STRING "/cf"`

Purpose Default virtual path for persistent storage

Description:

This configures the default location in the virtual file system for persistent/non-volatile storage. Files such as the startup script, app/library dynamic modules, and configuration tables are expected to be stored in this directory.

Definition at line 71 of file default_cfe_es_internal_cfg.h.

12.104.2.57 CFE_PLATFORM_ES_NONVOL_STARTUP_FILE `#define CFE_PLATFORM_ES_NONVOL_STARTUP_F↩ ILE "/cf/cfe_es_startup.scr"`

Purpose ES Nonvolatile Startup Filename

Description:

The value of this constant defines the path and name of the file that contains a list of modules that will be loaded and started by the cFE after the cFE finishes its startup sequence.

Limits

The length of each string, including the NULL terminator cannot exceed the OS_MAX_PATH_LEN value.

Definition at line 362 of file default_cfe_es_internal_cfg.h.

12.104.2.58 CFE_PLATFORM_ES_OBJECT_TABLE_SIZE `#define CFE_PLATFORM_ES_OBJECT_TABLE_SIZE 30`

Purpose Define Number of entries in the ES Object table

Description:

Defines the number of entries in the ES Object table. This table controls the core cFE startup.

Limits

There is a lower limit of 15. There are no restrictions on the upper limit however, the maximum object table size is system dependent and should be verified.

Definition at line 173 of file default_cfe_es_internal_cfg.h.

12.104.2.59 CFE_PLATFORM_ES_PERF_CHILD_MS_DELAY `#define CFE_PLATFORM_ES_PERF_CHILD_MS_DE↩ LAY 20`

Purpose Define Performance Analyzer Child Task Delay

Description:

This parameter defines the delay time (in milliseconds) between performance data file writes performed by the Executive Services Performance Analyzer Child Task.

Limits

It is recommended this parameter be greater than or equal to 20ms. This parameter is limited by the maximum value allowed by the data type. In this case, the data type is an unsigned 32-bit integer, so the valid range is 0 to 0xFFFFFFFF.

Definition at line 625 of file default_cfe_es_internal_cfg.h.

12.104.2.60 CFE_PLATFORM_ES_PERF_CHILD_PRIORITY `#define CFE_PLATFORM_ES_PERF_CHILD_PRIORI↩ TY 200`

Purpose Define Performance Analyzer Child Task Priority

Description:

This parameter defines the priority of the child task spawned by the Executive Services to write performance data to a file. Lower numbers are higher priority, with 1 being the highest priority in the case of a child task.

Limits

Valid range for a child task is 1 to 255 however, the priority cannot be higher (lower number) than the ES parent application priority.

Definition at line 596 of file default_cfe_es_internal_cfg.h.

12.104.2.61 CFE_PLATFORM_ES_PERF_CHILD_STACK_SIZE `#define CFE_PLATFORM_ES_PERF_CHILD_STAC↩ K_SIZE 4096`

Purpose Define Performance Analyzer Child Task Stack Size

Description:

This parameter defines the stack size of the child task spawned by the Executive Services to write performance data to a file.

Limits

It is recommended this parameter be greater than or equal to 4KB. This parameter is limited by the maximum value allowed by the data type. In this case, the data type is an unsigned 32-bit integer, so the valid range is 0 to 0xFFFFFFFF.

Definition at line 610 of file default_cfe_es_internal_cfg.h.

12.104.2.62 CFE_PLATFORM_ES_PERF_DATA_BUFFER_SIZE `#define CFE_PLATFORM_ES_PERF_DATA_BUFFER_SIZE 10000`

Purpose Define Max Size of Performance Data Buffer

Description:

Defines the maximum size of the performance data buffer. Units are number of performance data entries. An entry is defined by a 32 bit data word followed by a 64 bit time stamp.

Limits

There is a lower limit of 1025. There are no restrictions on the upper limit however, the maximum buffer size is system dependent and should be verified. The units are number of entries. An entry is defined by a 32 bit data word followed by a 64 bit time stamp.

Definition at line 517 of file default_cfe_es_internal_cfg.h.

12.104.2.63 CFE_PLATFORM_ES_PERF_ENTRIES_BTWN_DLYS `#define CFE_PLATFORM_ES_PERF_ENTRIES_BTWN_DLYS 50`

Purpose Define Performance Analyzer Child Task Number of Entries Between Delay

Description:

This parameter defines the number of performance analyzer entries the Performance Analyzer Child Task will write to the file between delays.

Definition at line 635 of file default_cfe_es_internal_cfg.h.

12.104.2.64 CFE_PLATFORM_ES_PERF_FILTMASK_ALL `#define CFE_PLATFORM_ES_PERF_FILTMASK_ALL ~CFE_PLATFORM_ES_PERF_FILTMASK_NONE`

Purpose Define Filter Mask Setting for Enabling All Performance Entries

Description:

Defines the filter mask for enabling all performance entries. The value is a bit mask. For each bit, 0 means the corresponding entry is disabled and 1 means it is enabled.

Definition at line 537 of file default_cfe_es_internal_cfg.h.

12.104.2.65 CFE_PLATFORM_ES_PERF_FILTMASK_INIT `#define CFE_PLATFORM_ES_PERF_FILTMASK_INIT CFE_PLATFORM_ES_PERF_FILTMASK_ALL`

Purpose Define Default Filter Mask Setting for Performance Data Buffer

Description:

Defines the default filter mask for the performance data buffer. The value is a bit mask. For each bit, 0 means the corresponding entry is disabled and 1 means it is enabled.

Definition at line 548 of file default_cfe_es_internal_cfg.h.

12.104.2.66 CFE_PLATFORM_ES_PERF_FILTMASK_NONE `#define CFE_PLATFORM_ES_PERF_FILTMASK_NONE 0`

Purpose Define Filter Mask Setting for Disabling All Performance Entries

Description:

Defines the filter mask for disabling all performance entries. The value is a bit mask. For each bit, 0 means the corresponding entry is disabled and 1 means it is enabled.

Definition at line 527 of file default_cfe_es_internal_cfg.h.

12.104.2.67 CFE_PLATFORM_ES_PERF_TRIGMASK_ALL `#define CFE_PLATFORM_ES_PERF_TRIGMASK_ALL ~CFE_PLATFORM_ES_PERF_TRIGMASK_NONE`

Purpose Define Filter Trigger Setting for Enabling All Performance Entries

Description:

Defines the trigger mask for enabling all performance data entries. The value is a bit mask. For each bit, 0 means the trigger for the corresponding entry is disabled and 1 means it is enabled.

Definition at line 570 of file default_cfe_es_internal_cfg.h.

12.104.2.68 CFE_PLATFORM_ES_PERF_TRIGMASK_INIT `#define CFE_PLATFORM_ES_PERF_TRIGMASK_INIT CFE_PLATFORM_ES_PERF_TRIGMASK_NONE`

Purpose Define Default Filter Trigger Setting for Performance Data Buffer

Description:

Defines the default trigger mask for the performance data buffer. The value is a 32-bit mask. For each bit, 0 means the trigger for the corresponding entry is disabled and 1 means it is enabled.

Definition at line 581 of file default_cfe_es_internal_cfg.h.

12.104.2.69 CFE_PLATFORM_ES_PERF_TRIGMASK_NONE `#define CFE_PLATFORM_ES_PERF_TRIGMASK_NONE 0`

Purpose Define Default Filter Trigger Setting for Disabling All Performance Entries

Description:

Defines the default trigger mask for disabling all performance data entries. The value is a bit mask. For each bit, 0 means the trigger for the corresponding entry is disabled and 1 means it is enabled.

Definition at line 559 of file default_cfe_es_internal_cfg.h.

12.104.2.70 CFE_PLATFORM_ES_POOL_MAX_BUCKETS `#define CFE_PLATFORM_ES_POOL_MAX_BUCKETS 17`

Purpose Maximum number of block sizes in pool structures

Description:

The upper limit for the number of block sizes supported in the generic pool implementation, which in turn implements the memory pools and CDS.

Limits:

Must be at least one. No specific upper limit, but the number is anticipated to be reasonably small (i.e. tens, not hundreds). Large values have not been tested.

The ES and CDS block size lists must correlate with this value
Definition at line 694 of file default_cfe_es_internal_cfg.h.

12.104.2.71 CFE_PLATFORM_ES_RAM_DISK_MOUNT_STRING `#define CFE_PLATFORM_ES_RAM_DISK_MOUN↩ T_STRING "/ram"`

Purpose Default virtual path for volatile storage

Description:

The CFE_PLATFORM_ES_RAM_DISK_MOUNT_STRING parameter is used to set the cFE mount path for the CFE RAM disk. This is a parameter for missions that do not want to use the default value of "/ram", or for missions that need to have a different value for different CPUs or Spacecraft. Note that the vxWorks OSAL cannot currently handle names that have more than one path separator in it. The names "/ram", "/ramdisk", "/disk123" will all work, but "/disks/ram" will not. Multiple separators can be used with the posix or RTEMS ports.

Definition at line 87 of file default_cfe_es_internal_cfg.h.

12.104.2.72 CFE_PLATFORM_ES_RAM_DISK_NUM_SECTORS `#define CFE_PLATFORM_ES_RAM_DISK_NUM_S↩ ECTORS 4096`

Purpose ES Ram Disk Number of Sectors

Description:

Defines the ram disk number of sectors. The ram disk is one of four memory areas that are preserved on a processor reset. NOTE: Changing this value changes memory allocation, and may require changes to platform specific values (in CFE_PSP) such as USER_RESERVED_MEM in VxWorks depending on the memory areas being used for preserved data and on OS specific behavior.

Limits

There is a lower limit of 128. There are no restrictions on the upper limit however, the maximum number of RAM sectors is system dependent and should be verified.

Definition at line 268 of file default_cfe_es_internal_cfg.h.

12.104.2.73 CFE_PLATFORM_ES_RAM_DISK_PERCENT_RESERVED `#define CFE_PLATFORM_ES_RAM_DISK↩_PERCENT_RESERVED 30`

Purpose Percentage of Ram Disk Reserved for Decompressing Apps

Description:

The CFE_PLATFORM_ES_RAM_DISK_PERCENT_RESERVED parameter is used to make sure that the Volatile (RAM) Disk has a defined amount of free space during a processor reset. The cFE uses the Volatile disk to decompress cFE applications during system startup. If this Volatile disk happens to get filled with logs and misc files, then a processor reset may not work, because there will be no room to decompress cFE apps. To solve that problem, this parameter sets the "Low Water Mark" for disk space on a Processor reset. It should be set to allow the largest cFE Application to be decompressed. During a Processor reset, if there is not sufficient space left on the disk, it will be re-formatted in order to clear up some space.

This feature can be turned OFF by setting the parameter to 0.

Limits

There is a lower limit of 0 and an upper limit of 75 on this configuration parameter.Units are percentage. A setting of zero will turn this feature off.

Definition at line 292 of file default_cfe_es_internal_cfg.h.

12.104.2.74 CFE_PLATFORM_ES_RAM_DISK_SECTOR_SIZE `#define CFE_PLATFORM_ES_RAM_DISK_SECTOR↩_SIZE 512`

Purpose ES Ram Disk Sector Size

Description:

Defines the ram disk sector size. The ram disk is 1 of 4 memory areas that are preserved on a processor reset. NOTE: Changing this value changes memory allocation, and may require changes to platform specific values (in CFE_PSP) such as USER_RESERVED_MEM in VxWorks depending on the memory areas being used for preserved data and on OS specific behavior.

Limits

There is a lower limit of 128. There are no restrictions on the upper limit however, the maximum RAM disk sector size is system dependent and should be verified.

Definition at line 250 of file default_cfe_es_internal_cfg.h.

12.104.2.75 CFE_PLATFORM_ES_START_TASK_PRIORITY `#define CFE_PLATFORM_ES_START_TASK_PRIORI↩TY 68`

Purpose Define ES Task Priority

Description:

Defines the cFE_ES Task priority.

Limits

Not Applicable

Definition at line 44 of file default_cfe_es_internal_cfg.h.

12.104.2.76 CFE_PLATFORM_ES_START_TASK_STACK_SIZE

```
#define CFE_PLATFORM_ES_START_TASK_STACK_SIZE CFE_PLATFORM_ES_DEFAULT_STACK_SIZE
```

Purpose Define ES Task Stack Size

Description:

Defines the cFE_ES Task Stack Size

Limits

There is a lower limit of 2048 on this configuration parameter. There are no restrictions on the upper limit however, the maximum stack size is system dependent and should be verified. Most operating systems provide tools for measuring the amount of stack used by a task during operation. It is always a good idea to verify that no more than 1/2 of the stack is used.

Definition at line 59 of file default_cfe_es_internal_cfg.h.

12.104.2.77 CFE_PLATFORM_ES_STARTUP_SCRIPT_TIMEOUT_MSEC

```
#define CFE_PLATFORM_ES_STARTUP_SCRIPT_TIMEOUT_MSEC 1000
```

Purpose Startup script timeout

Description:

The upper limit for the total amount of time that all apps listed in the CFE ES startup script may take to all become ready.

Unlike the "core" app timeout, this is a soft limit; if the allotted time is exceeded, it probably indicates an issue with one of the apps, but does not cause CFE ES to take any additional action other than logging the event to the syslog.
Units are in milliseconds

Limits:

Must be defined as an integer value that is greater than or equal to zero.

Definition at line 814 of file default_cfe_es_internal_cfg.h.

12.104.2.78 CFE_PLATFORM_ES_STARTUP_SYNC_POLL_MSEC

```
#define CFE_PLATFORM_ES_STARTUP_SYNC_POLL_MSEC 50
```

Purpose Poll timer for startup sync delay

Description:

During startup, some tasks may need to synchronize their own initialization with the initialization of other applications in the system.

CFE ES implements an API to accomplish this, that performs a task delay (sleep) while polling the overall system state until other tasks are ready.
This value controls the amount of time that the CFE_ES_ApplicationSyncDelay will sleep between each check of the system state. This should be large enough to allow other tasks to run, but not so large as to noticeably delay the startup completion.
Units are in milliseconds

Limits:

Must be defined as an integer value that is greater than or equal to zero.

Definition at line 796 of file default_cfe_es_internal_cfg.h.

12.104.2.79 CFE_PLATFORM_ES_SYSTEM_LOG_SIZE `#define CFE_PLATFORM_ES_SYSTEM_LOG_SIZE 3072`

Purpose Define Size of the cFE System Log.

Description:

Defines the size in bytes of the cFE system log. The system log holds variable length strings that are terminated by a linefeed and null character.

Limits

There is a lower limit of 512. There are no restrictions on the upper limit however, the maximum system log size is system dependent and should be verified.

Definition at line 159 of file default_cfe_es_internal_cfg.h.

12.104.2.80 CFE_PLATFORM_ES_USER_RESERVED_SIZE `#define CFE_PLATFORM_ES_USER_RESERVED_SIZE (1024 * 1024)`

Purpose Define User Reserved Memory Size

Description:

User Reserved Memory Size. This is the size in bytes of the cFE User reserved Memory area. This is a block of memory that is available for cFE application use. The address is obtained by calling CFE_PSP_GetUserReservedArea. The User Reserved Memory is one of four memory areas that are preserved during a processor reset. NOTE: Changing this value changes memory allocation, and may require changes to platform specific values (in CFE_PSP) such as USER_RESERVED_MEM in VxWorks depending on the memory areas being used for preserved data and on OS specific behavior.

Limits

There is a lower limit of 1024 and an upper limit of UINT_MAX (4 Gigabytes) on this configuration parameter.

Definition at line 329 of file default_cfe_es_internal_cfg.h.

12.104.2.81 CFE_PLATFORM_ES_VOLATILE_STARTUP_FILE `#define CFE_PLATFORM_ES_VOLATILE_STARTUP_FILE "/ram/cfe_es_startup.scr"`

Purpose ES Volatile Startup Filename

Description:

The value of this constant defines the path and name of the file that contains a list of modules that will be loaded and started by the cFE after the cFE finishes its startup sequence.

Limits

The length of each string, including the NULL terminator cannot exceed the OS_MAX_PATH_LEN value.

Definition at line 376 of file default_cfe_es_internal_cfg.h.

12.105 cfe/modules/es/config/default_cfe_es_mission_cfg.h File Reference

```
#include "cfe_es_interface_cfg.h"
```

12.105.1 Detailed Description

CFE Executive Services (CFE_ES) Application Mission Configuration Header File
This is a compatibility header for the "mission_cfg.h" file that has traditionally provided public config definitions for each CFS app.

Note

This file may be overridden/superceded by mission-provided definitions either by overriding this header or by generating definitions from a command/data dictionary tool.

12.106 cfe/modules/es/config/default_cfe_es_msg.h File Reference

```
#include "cfe_mission_cfg.h"
#include "cfe_es_fcncodes.h"
#include "cfe_es_msgdefs.h"
#include "cfe_es_msgstruct.h"
```

12.106.1 Detailed Description

Specification for the CFE Executive Services (CFE_ES) command and telemetry message data types.
This is a compatibility header for the "cfe_es_msg.h" file that has traditionally provided the message definitions for cFS apps.

Note

This file may be overridden/superceded by mission-provided definitions either by overriding this header or by generating definitions from a command/data dictionary tool.

12.107 cfe/modules/es/config/default_cfe_es_msgdefs.h File Reference

```
#include "common_types.h"
#include "cfe_mission_cfg.h"
#include "cfe_es_extern_typedefs.h"
#include "cfe_es_fcncodes.h"
```

Data Structures

- struct CFE_ES_RestartCmd_Payload

  Restart cFE Command Payload.
- struct CFE_ES_FileNameCmd_Payload

  Generic file name command payload.
- struct CFE_ES_OverWriteSysLogCmd_Payload

  Overwrite/Discard System Log Configuration Command Payload.
- struct CFE_ES_StartAppCmd_Payload

  Start Application Command Payload.
- struct CFE_ES_AppNameCmd_Payload

  Generic application name command payload.

- struct CFE_ES_AppReloadCmd_Payload

  Reload Application Command Payload.
- struct CFE_ES_SetMaxPRCountCmd_Payload

  Set Maximum Processor Reset Count Command Payload.
- struct CFE_ES_DeleteCDSCmd_Payload

  Delete Critical Data Store Command Payload.
- struct CFE_ES_StartPerfCmd_Payload

  Start Performance Analyzer Command Payload.
- struct CFE_ES_StopPerfCmd_Payload

  Stop Performance Analyzer Command Payload.
- struct CFE_ES_SetPerfFilterMaskCmd_Payload

  Set Performance Analyzer Filter Mask Command Payload.
- struct CFE_ES_SetPerfTrigMaskCmd_Payload

  Set Performance Analyzer Trigger Mask Command Payload.
- struct CFE_ES_SendMemPoolStatsCmd_Payload

  Send Memory Pool Statistics Command Payload.
- struct CFE_ES_DumpCDSRegistryCmd_Payload

  Dump CDS Registry Command Payload.
- struct CFE_ES_OneAppTlm_Payload
- struct CFE_ES_PoolStatsTlm_Payload
- struct CFE_ES_HousekeepingTlm_Payload

Typedefs

- typedef struct CFE_ES_RestartCmd_Payload CFE_ES_RestartCmd_Payload_t

  Restart cFE Command Payload.
- typedef struct CFE_ES_FileNameCmd_Payload CFE_ES_FileNameCmd_Payload_t

  Generic file name command payload.
- typedef struct CFE_ES_OverWriteSysLogCmd_Payload CFE_ES_OverWriteSysLogCmd_Payload_t

  Overwrite/Discard System Log Configuration Command Payload.
- typedef struct CFE_ES_StartAppCmd_Payload CFE_ES_StartAppCmd_Payload_t

  Start Application Command Payload.
- typedef struct CFE_ES_AppNameCmd_Payload CFE_ES_AppNameCmd_Payload_t

  Generic application name command payload.
- typedef struct CFE_ES_AppReloadCmd_Payload CFE_ES_AppReloadCmd_Payload_t

  Reload Application Command Payload.
- typedef struct CFE_ES_SetMaxPRCountCmd_Payload CFE_ES_SetMaxPRCountCmd_Payload_t

  Set Maximum Processor Reset Count Command Payload.
- typedef struct CFE_ES_DeleteCDSCmd_Payload CFE_ES_DeleteCDSCmd_Payload_t

  Delete Critical Data Store Command Payload.
- typedef uint32 CFE_ES_PerfMode_Enum_t
- typedef struct CFE_ES_StartPerfCmd_Payload CFE_ES_StartPerfCmd_Payload_t

  Start Performance Analyzer Command Payload.
- typedef struct CFE_ES_StopPerfCmd_Payload CFE_ES_StopPerfCmd_Payload_t

  Stop Performance Analyzer Command Payload.
- typedef struct CFE_ES_SetPerfFilterMaskCmd_Payload CFE_ES_SetPerfFilterMaskCmd_Payload_t

  Set Performance Analyzer Filter Mask Command Payload.
- typedef struct CFE_ES_SetPerfTrigMaskCmd_Payload CFE_ES_SetPerfTrigMaskCmd_Payload_t

Set Performance Analyzer Trigger Mask Command Payload.

- typedef struct CFE_ES_SendMemPoolStatsCmd_Payload CFE_ES_SendMemPoolStatsCmd_Payload_t

  Send Memory Pool Statistics Command Payload.
- typedef struct CFE_ES_DumpCDSRegistryCmd_Payload CFE_ES_DumpCDSRegistryCmd_Payload_t

  Dump CDS Registry Command Payload.
- typedef struct CFE_ES_OneAppTlm_Payload CFE_ES_OneAppTlm_Payload_t
- typedef struct CFE_ES_PoolStatsTlm_Payload CFE_ES_PoolStatsTlm_Payload_t
- typedef struct CFE_ES_HousekeepingTlm_Payload CFE_ES_HousekeepingTlm_Payload_t

Enumerations

- enum CFE_ES_PerfMode { CFE_ES_PerfTrigger_START = 0, CFE_ES_PerfTrigger_CENTER, CFE_ES_PerfTrigger_END }

  Labels for values to use in CFE_ES_StartPerfCmd_Payload.TriggerMode.

12.107.1 Detailed Description

Specification for the CFE Executive Services (CFE_ES) command and telemetry message constant definitions.
For CFE_ES this is only the function/command code definitions

12.107.2 Typedef Documentation

12.107.2.1 CFE_ES_AppNameCmd_Payload_t `typedef struct CFE_ES_AppNameCmd_Payload CFE_ES_AppNameCmd_Payload_t`

Generic application name command payload.
For command details, see CFE_ES_STOP_APP_CC, CFE_ES_RESTART_APP_CC, CFE_ES_QUERY_ONE_CC

12.107.2.2 CFE_ES_AppReloadCmd_Payload_t `typedef struct CFE_ES_AppReloadCmd_Payload CFE_ES_AppReloadCmd_Payloa`

Reload Application Command Payload.
For command details, see CFE_ES_RELOAD_APP_CC

12.107.2.3 CFE_ES_DeleteCDSCmd_Payload_t `typedef struct CFE_ES_DeleteCDSCmd_Payload CFE_ES_DeleteCDSCmd_Payloa`

Delete Critical Data Store Command Payload.
For command details, see CFE_ES_DELETE_CDS_CC

12.107.2.4 CFE_ES_DumpCDSRegistryCmd_Payload_t `typedef struct CFE_ES_DumpCDSRegistryCmd_Payload CFE_ES_DumpCDSRegistryCmd_Payload_t`

Dump CDS Registry Command Payload.
For command details, see CFE_ES_DUMP_CDS_REGISTRY_CC

12.107.2.5 CFE_ES_FileNameCmd_Payload_t `typedef struct CFE_ES_FileNameCmd_Payload CFE_ES_FileNameCmd_Payload_t`

Generic file name command payload.
This format is shared by several executive services commands. For command details, see CFE_ES_QUERY_ALL_CC, CFE_ES_QUERY_ALL_TASKS_CC, CFE_ES_WRITE_SYS_LOG_CC, and CFE_ES_WRITE_ER_LOG_CC

12.107.2.6 CFE_ES_HousekeepingTlm_Payload_t `typedef struct CFE_ES_HousekeepingTlm_Payload CFE_ES_HousekeepingTl`

Name Executive Services Housekeeping Packet

12.107.2.7 CFE_ES_OneAppTlm_Payload_t `typedef struct CFE_ES_OneAppTlm_Payload CFE_ES_OneAppTlm_Payload_t`

Name Single Application Information Packet

12.107.2.8 CFE_ES_OverWriteSysLogCmd_Payload_t `typedef struct CFE_ES_OverWriteSysLogCmd_Payload CFE_ES_OverWriteSysLogCmd_Payload_t`

Overwrite/Discard System Log Configuration Command Payload.
For command details, see CFE_ES_OVER_WRITE_SYS_LOG_CC

12.107.2.9 CFE_ES_PerfMode_Enum_t `typedef uint32 CFE_ES_PerfMode_Enum_t`

Definition at line 157 of file default_cfe_es_msgdefs.h.

12.107.2.10 CFE_ES_PoolStatsTlm_Payload_t `typedef struct CFE_ES_PoolStatsTlm_Payload CFE_ES_PoolStatsTlm_Payload`

Name Memory Pool Statistics Packet

12.107.2.11 CFE_ES_RestartCmd_Payload_t `typedef struct CFE_ES_RestartCmd_Payload CFE_ES_RestartCmd_Payload_t`

Restart cFE Command Payload.
For command details, see CFE_ES_RESTART_CC

12.107.2.12 CFE_ES_SendMemPoolStatsCmd_Payload_t `typedef struct CFE_ES_SendMemPoolStatsCmd_Payload CFE_ES_SendMemPoolStatsCmd_Payload_t`

Send Memory Pool Statistics Command Payload.
For command details, see CFE_ES_SEND_MEM_POOL_STATS_CC

12.107.2.13 CFE_ES_SetMaxPRCountCmd_Payload_t `typedef struct CFE_ES_SetMaxPRCountCmd_Payload CFE_ES_SetMaxPRCountCmd_Payload_t`

Set Maximum Processor Reset Count Command Payload.
For command details, see CFE_ES_SET_MAX_PR_COUNT_CC

12.107.2.14 CFE_ES_SetPerfFilterMaskCmd_Payload_t `typedef struct CFE_ES_SetPerfFilterMaskCmd_Payload CFE_ES_SetPerfFilterMaskCmd_Payload_t`

Set Performance Analyzer Filter Mask Command Payload.
For command details, see CFE_ES_SET_PERF_FILTER_MASK_CC

12.107.2.15 CFE_ES_SetPerfTrigMaskCmd_Payload_t `typedef struct CFE_ES_SetPerfTrigMaskCmd_Payload CFE_ES_SetPerfTrigMaskCmd_Payload_t`

Set Performance Analyzer Trigger Mask Command Payload.
For command details, see CFE_ES_SET_PERF_TRIGGER_MASK_CC

12.107.2.16 CFE_ES_StartAppCmd_Payload_t `typedef struct CFE_ES_StartAppCmd_Payload CFE_ES_StartAppCmd_Payload_t`

Start Application Command Payload.
For command details, see CFE_ES_START_APP_CC

12.107.2.17 CFE_ES_StartPerfCmd_Payload_t `typedef struct CFE_ES_StartPerfCmd_Payload CFE_ES_StartPerfCmd_Payload`

Start Performance Analyzer Command Payload.
For command details, see CFE_ES_START_PERF_DATA_CC

12.107.2.18 CFE_ES_StopPerfCmd_Payload_t `typedef struct CFE_ES_StopPerfCmd_Payload CFE_ES_StopPerfCmd_Payload_t`

Stop Performance Analyzer Command Payload.
For command details, see CFE_ES_STOP_PERF_DATA_CC

12.107.3 Enumeration Type Documentation

12.107.3.1 CFE_ES_PerfMode `enum CFE_ES_PerfMode`

Labels for values to use in CFE_ES_StartPerfCmd_Payload.TriggerMode.

See also

CFE_ES_StartPerfCmd_Payload

Enumerator

CFE_ES_PerfTrigger_START	
CFE_ES_PerfTrigger_CENTER	
CFE_ES_PerfTrigger_END	

Definition at line 150 of file default_cfe_es_msgdefs.h.

12.108 cfe/modules/es/config/default_cfe_es_msgids.h File Reference

```
#include "cfe_core_api_base_msgids.h"
#include "cfe_es_topicids.h"
```

Macros

- #define CFE_ES_CMD_MID CFE_PLATFORM_CMD_TOPICID_TO_MIDV(CFE_MISSION_ES_CMD_TOPICID) /∗ 0x1806 ∗/
- #define CFE_ES_SEND_HK_MID CFE_PLATFORM_CMD_TOPICID_TO_MIDV(CFE_MISSION_ES_SEND_HK_TOPICID) /∗ 0x1808 ∗/
- #define CFE_ES_HK_TLM_MID CFE_PLATFORM_TLM_TOPICID_TO_MIDV(CFE_MISSION_ES_HK_TLM_TOPICID) /∗ 0x0800 ∗/
- #define CFE_ES_APP_TLM_MID CFE_PLATFORM_TLM_TOPICID_TO_MIDV(CFE_MISSION_ES_APP_TLM_TOPICID) /∗ 0x080B ∗/
- #define CFE_ES_MEMSTATS_TLM_MID CFE_PLATFORM_TLM_TOPICID_TO_MIDV(CFE_MISSION_ES_MEMSTATS_TLM_T /∗ 0x0810 ∗/

12.108.1 Detailed Description

CFE Executive Services (CFE_ES) Application Message IDs

12.108.2 Macro Definition Documentation

12.108.2.1 CFE_ES_APP_TLM_MID `#define CFE_ES_APP_TLM_MID CFE_PLATFORM_TLM_TOPICID_TO_MIDV(CFE_MISSION_ES_APP_T /∗ 0x080B ∗/`

Definition at line 39 of file default_cfe_es_msgids.h.

12.108.2.2 CFE_ES_CMD_MID

```
#define CFE_ES_CMD_MID CFE_PLATFORM_CMD_TOPICID_TO_MIDV(CFE_MISSION_ES_CMD_TOPICID)
/* 0x1806 */
```

Definition at line 32 of file default_cfe_es_msgids.h.

12.108.2.3 CFE_ES_HK_TLM_MID

```
#define CFE_ES_HK_TLM_MID CFE_PLATFORM_TLM_TOPICID_TO_MIDV(CFE_MISSION_ES_HK_TLM_
/* 0x0800 */
```

Definition at line 38 of file default_cfe_es_msgids.h.

12.108.2.4 CFE_ES_MEMSTATS_TLM_MID

```
#define CFE_ES_MEMSTATS_TLM_MID CFE_PLATFORM_TLM_TOPICID_TO_MIDV(CFE_MISS
/* 0x0810 */
```

Definition at line 40 of file default_cfe_es_msgids.h.

12.108.2.5 CFE_ES_SEND_HK_MID

```
#define CFE_ES_SEND_HK_MID CFE_PLATFORM_CMD_TOPICID_TO_MIDV(CFE_MISSION_ES_SEND
/* 0x1808 */
```

Definition at line 33 of file default_cfe_es_msgids.h.

12.109 cfe/modules/es/config/default_cfe_es_msgstruct.h File Reference

```
#include "cfe_es_msgdefs.h"
#include "cfe_msg_hdr.h"
#include "cfe_mission_cfg.h"
```

Data Structures

- struct CFE_ES_NoopCmd
- struct CFE_ES_ResetCountersCmd
- struct CFE_ES_ClearSysLogCmd
- struct CFE_ES_ClearERLogCmd
- struct CFE_ES_ResetPRCountCmd
- struct CFE_ES_SendHkCmd
- struct CFE_ES_RestartCmd

  Restart cFE Command.
- struct CFE_ES_FileNameCmd

  Generic file name command.
- struct CFE_ES_QueryAllCmd
- struct CFE_ES_QueryAllTasksCmd
- struct CFE_ES_WriteSysLogCmd
- struct CFE_ES_WriteERLogCmd
- struct CFE_ES_OverWriteSysLogCmd

  Overwrite/Discard System Log Configuration Command Payload.
- struct CFE_ES_StartApp

  Start Application Command.
- struct CFE_ES_StopAppCmd
- struct CFE_ES_RestartAppCmd
- struct CFE_ES_QueryOneCmd
- struct CFE_ES_ReloadAppCmd

  Reload Application Command.

- struct CFE_ES_SetMaxPRCountCmd

  Set Maximum Processor Reset Count Command.
- struct CFE_ES_DeleteCDSCmd

  Delete Critical Data Store Command.
- struct CFE_ES_StartPerfDataCmd

  Start Performance Analyzer Command.
- struct CFE_ES_StopPerfDataCmd

  Stop Performance Analyzer Command.
- struct CFE_ES_SetPerfFilterMaskCmd

  Set Performance Analyzer Filter Mask Command.
- struct CFE_ES_SetPerfTriggerMaskCmd

  Set Performance Analyzer Trigger Mask Command.
- struct CFE_ES_SendMemPoolStatsCmd

  Send Memory Pool Statistics Command.
- struct CFE_ES_DumpCDSRegistryCmd

  Dump CDS Registry Command.
- struct CFE_ES_OneAppTlm
- struct CFE_ES_MemStatsTlm
- struct CFE_ES_HousekeepingTlm

Typedefs

- typedef struct CFE_ES_NoopCmd CFE_ES_NoopCmd_t
- typedef struct CFE_ES_ResetCountersCmd CFE_ES_ResetCountersCmd_t
- typedef struct CFE_ES_ClearSysLogCmd CFE_ES_ClearSysLogCmd_t
- typedef struct CFE_ES_ClearERLogCmd CFE_ES_ClearERLogCmd_t
- typedef struct CFE_ES_ResetPRCountCmd CFE_ES_ResetPRCountCmd_t
- typedef struct CFE_ES_SendHkCmd CFE_ES_SendHkCmd_t
- typedef struct CFE_ES_RestartCmd CFE_ES_RestartCmd_t

  Restart cFE Command.
- typedef struct CFE_ES_FileNameCmd CFE_ES_FileNameCmd_t

  Generic file name command.
- typedef struct CFE_ES_QueryAllCmd CFE_ES_QueryAllCmd_t
- typedef struct CFE_ES_QueryAllTasksCmd CFE_ES_QueryAllTasksCmd_t
- typedef struct CFE_ES_WriteSysLogCmd CFE_ES_WriteSysLogCmd_t
- typedef struct CFE_ES_WriteERLogCmd CFE_ES_WriteERLogCmd_t
- typedef struct CFE_ES_OverWriteSysLogCmd CFE_ES_OverWriteSysLogCmd_t

  Overwrite/Discard System Log Configuration Command Payload.
- typedef struct CFE_ES_StartApp CFE_ES_StartAppCmd_t

  Start Application Command.
- typedef struct CFE_ES_StopAppCmd CFE_ES_StopAppCmd_t
- typedef struct CFE_ES_RestartAppCmd CFE_ES_RestartAppCmd_t
- typedef struct CFE_ES_QueryOneCmd CFE_ES_QueryOneCmd_t
- typedef struct CFE_ES_ReloadAppCmd CFE_ES_ReloadAppCmd_t

  Reload Application Command.
- typedef struct CFE_ES_SetMaxPRCountCmd CFE_ES_SetMaxPRCountCmd_t

  Set Maximum Processor Reset Count Command.
- typedef struct CFE_ES_DeleteCDSCmd CFE_ES_DeleteCDSCmd_t

  Delete Critical Data Store Command.

- typedef struct CFE_ES_StartPerfDataCmd CFE_ES_StartPerfDataCmd_t

  Start Performance Analyzer Command.
- typedef struct CFE_ES_StopPerfDataCmd CFE_ES_StopPerfDataCmd_t

  Stop Performance Analyzer Command.
- typedef struct CFE_ES_SetPerfFilterMaskCmd CFE_ES_SetPerfFilterMaskCmd_t

  Set Performance Analyzer Filter Mask Command.
- typedef struct CFE_ES_SetPerfTriggerMaskCmd CFE_ES_SetPerfTriggerMaskCmd_t

  Set Performance Analyzer Trigger Mask Command.
- typedef struct CFE_ES_SendMemPoolStatsCmd CFE_ES_SendMemPoolStatsCmd_t

  Send Memory Pool Statistics Command.
- typedef struct CFE_ES_DumpCDSRegistryCmd CFE_ES_DumpCDSRegistryCmd_t

  Dump CDS Registry Command.
- typedef struct CFE_ES_OneAppTlm CFE_ES_OneAppTlm_t
- typedef struct CFE_ES_MemStatsTlm CFE_ES_MemStatsTlm_t
- typedef struct CFE_ES_HousekeepingTlm CFE_ES_HousekeepingTlm_t

12.109.1 Detailed Description

Purpose: cFE Executive Services (ES) Command and Telemetry packet definition file.
References: Flight Software Branch C Coding Standard Version 1.0a cFE Flight Software Application Developers Guide
Notes:

12.109.2 Typedef Documentation

12.109.2.1 CFE_ES_ClearERLogCmd_t `typedef struct CFE_ES_ClearERLogCmd CFE_ES_ClearERLogCmd_t`

12.109.2.2 CFE_ES_ClearSysLogCmd_t `typedef struct CFE_ES_ClearSysLogCmd CFE_ES_ClearSysLogCmd_t`

12.109.2.3 CFE_ES_DeleteCDSCmd_t `typedef struct CFE_ES_DeleteCDSCmd CFE_ES_DeleteCDSCmd_t`

Delete Critical Data Store Command.

12.109.2.4 CFE_ES_DumpCDSRegistryCmd_t `typedef struct CFE_ES_DumpCDSRegistryCmd CFE_ES_DumpCDSRegistryCmd_t`

Dump CDS Registry Command.

12.109.2.5 CFE_ES_FileNameCmd_t `typedef struct CFE_ES_FileNameCmd CFE_ES_FileNameCmd_t`

Generic file name command.

12.109.2.6 CFE_ES_HousekeepingTlm_t `typedef struct CFE_ES_HousekeepingTlm CFE_ES_HousekeepingTlm_t`

Name Executive Services Housekeeping Packet

12.109.2.7 CFE_ES_MemStatsTlm_t `typedef struct CFE_ES_MemStatsTlm CFE_ES_MemStatsTlm_t`

Name Memory Pool Statistics Packet

12.109.2.8 CFE_ES_NoopCmd_t `typedef struct CFE_ES_NoopCmd CFE_ES_NoopCmd_t`

12.109.2.9 CFE_ES_OneAppTlm_t `typedef struct CFE_ES_OneAppTlm CFE_ES_OneAppTlm_t`

Name Single Application Information Packet

12.109.2.10 CFE_ES_OverWriteSysLogCmd_t `typedef struct CFE_ES_OverWriteSysLogCmd CFE_ES_OverWriteSysLogCmd_t`

Overwrite/Discard System Log Configuration Command Payload.

12.109.2.11 CFE_ES_QueryAllCmd_t `typedef struct CFE_ES_QueryAllCmd CFE_ES_QueryAllCmd_t`

12.109.2.12 CFE_ES_QueryAllTasksCmd_t `typedef struct CFE_ES_QueryAllTasksCmd CFE_ES_QueryAllTasksCmd_t`

12.109.2.13 CFE_ES_QueryOneCmd_t `typedef struct CFE_ES_QueryOneCmd CFE_ES_QueryOneCmd_t`

12.109.2.14 CFE_ES_ReloadAppCmd_t `typedef struct CFE_ES_ReloadAppCmd CFE_ES_ReloadAppCmd_t`

Reload Application Command.

12.109.2.15 CFE_ES_ResetCountersCmd_t `typedef struct CFE_ES_ResetCountersCmd CFE_ES_ResetCountersCmd_t`

12.109.2.16 CFE_ES_ResetPRCountCmd_t `typedef struct CFE_ES_ResetPRCountCmd CFE_ES_ResetPRCountCmd_t`

12.109.2.17 CFE_ES_RestartAppCmd_t `typedef struct CFE_ES_RestartAppCmd CFE_ES_RestartAppCmd_t`

12.109.2.18 CFE_ES_RestartCmd_t `typedef struct CFE_ES_RestartCmd CFE_ES_RestartCmd_t`

Restart cFE Command.

12.109.2.19 CFE_ES_SendHkCmd_t `typedef struct CFE_ES_SendHkCmd CFE_ES_SendHkCmd_t`

12.109.2.20 CFE_ES_SendMemPoolStatsCmd_t `typedef struct CFE_ES_SendMemPoolStatsCmd CFE_ES_SendMemPoolStatsCmd`

Send Memory Pool Statistics Command.

12.109.2.21 CFE_ES_SetMaxPRCountCmd_t

`typedef struct CFE_ES_SetMaxPRCountCmd CFE_ES_SetMaxPRCountCmd_t`

Set Maximum Processor Reset Count Command.

12.109.2.22 CFE_ES_SetPerfFilterMaskCmd_t

`typedef struct CFE_ES_SetPerfFilterMaskCmd CFE_ES_SetPerfFilterMaskCmd`

Set Performance Analyzer Filter Mask Command.

12.109.2.23 CFE_ES_SetPerfTriggerMaskCmd_t

`typedef struct CFE_ES_SetPerfTriggerMaskCmd CFE_ES_SetPerfTriggerMas`

Set Performance Analyzer Trigger Mask Command.

12.109.2.24 CFE_ES_StartAppCmd_t

`typedef struct CFE_ES_StartApp CFE_ES_StartAppCmd_t`

Start Application Command.

12.109.2.25 CFE_ES_StartPerfDataCmd_t

`typedef struct CFE_ES_StartPerfDataCmd CFE_ES_StartPerfDataCmd_t`

Start Performance Analyzer Command.

12.109.2.26 CFE_ES_StopAppCmd_t

`typedef struct CFE_ES_StopAppCmd CFE_ES_StopAppCmd_t`

12.109.2.27 CFE_ES_StopPerfDataCmd_t

`typedef struct CFE_ES_StopPerfDataCmd CFE_ES_StopPerfDataCmd_t`

Stop Performance Analyzer Command.

12.109.2.28 CFE_ES_WriteERLogCmd_t

`typedef struct CFE_ES_WriteERLogCmd CFE_ES_WriteERLogCmd_t`

12.109.2.29 CFE_ES_WriteSysLogCmd_t

`typedef struct CFE_ES_WriteSysLogCmd CFE_ES_WriteSysLogCmd_t`

12.110 cfe/modules/es/config/default_cfe_es_platform_cfg.h File Reference

```
#include "cfe_es_mission_cfg.h"
#include "cfe_es_internal_cfg.h"
```

12.110.1 Detailed Description

CFE Executive Services (CFE_ES) Application Platform Configuration Header File
This is a compatibility header for the "platform_cfg.h" file that has traditionally provided both public and private config definitions for each CFS app.
These definitions are now provided in two separate files, one for the public/mission scope and one for internal scope.

Note

This file may be overridden/superceded by mission-provided definitions either by overriding this header or by generating definitions from a command/data dictionary tool.

12.111 cfe/modules/es/config/default_cfe_es_topicids.h File Reference

Macros

- #define CFE_MISSION_ES_CMD_TOPICID 6
- #define CFE_MISSION_ES_SEND_HK_TOPICID 8
- #define CFE_MISSION_ES_HK_TLM_TOPICID 0
- #define CFE_MISSION_ES_APP_TLM_TOPICID 11
- #define CFE_MISSION_ES_MEMSTATS_TLM_TOPICID 16

12.111.1 Detailed Description

CFE Executive Services (CFE_ES) Application Topic IDs

12.111.2 Macro Definition Documentation

12.111.2.1 CFE_MISSION_ES_APP_TLM_TOPICID `#define CFE_MISSION_ES_APP_TLM_TOPICID 11`

Definition at line 48 of file default_cfe_es_topicids.h.

12.111.2.2 CFE_MISSION_ES_CMD_TOPICID `#define CFE_MISSION_ES_CMD_TOPICID 6`

Purpose cFE Portable Message Numbers for Commands

Description:

Portable message numbers for the cFE ES command messages

Limits

Not Applicable

Definition at line 35 of file default_cfe_es_topicids.h.

12.111.2.3 CFE_MISSION_ES_HK_TLM_TOPICID `#define CFE_MISSION_ES_HK_TLM_TOPICID 0`

Purpose cFE Portable Message Numbers for Telemetry

Description:

Portable message numbers for the cFE ES telemetry messages

Limits

Not Applicable

Definition at line 47 of file default_cfe_es_topicids.h.

12.111.2.4 CFE_MISSION_ES_MEMSTATS_TLM_TOPICID `#define CFE_MISSION_ES_MEMSTATS_TLM_TOPIC↩ ID 16`

Definition at line 49 of file default_cfe_es_topicids.h.

12.111.2.5 CFE_MISSION_ES_SEND_HK_TOPICID `#define CFE_MISSION_ES_SEND_HK_TOPICID 8`

Definition at line 36 of file default_cfe_es_topicids.h.

12.112 cfe/modules/es/fsw/inc/cfe_es_eventids.h File Reference

Macros

ES event IDs

- #define CFE_ES_INIT_INF_EID 1

  ES Initialization Event ID.
- #define CFE_ES_INITSTATS_INF_EID 2

  ES Initialization Statistics Information Event ID.
- #define CFE_ES_NOOP_INF_EID 3

  ES No-op Command Success Event ID.
- #define CFE_ES_RESET_INF_EID 4

  ES Reset Counters Command Success Event ID.
- #define CFE_ES_START_INF_EID 6

  ES Start Application Command Success Event ID.
- #define CFE_ES_STOP_DBG_EID 7

  ES Stop Application Command Request Success Event ID.
- #define CFE_ES_STOP_INF_EID 8

  ES Stop Application Completed Event ID.
- #define CFE_ES_RESTART_APP_DBG_EID 9

  ES Restart Application Command Request Success Event ID.
- #define CFE_ES_RESTART_APP_INF_EID 10

  ES Restart Application Completed Event ID.
- #define CFE_ES_RELOAD_APP_DBG_EID 11

  ES Reload Application Command Request Success Event ID.
- #define CFE_ES_RELOAD_APP_INF_EID 12

  ES Reload Application Complete Event ID.
- #define CFE_ES_EXIT_APP_INF_EID 13

  ES Nominal Exit Application Complete Event ID.
- #define CFE_ES_ERREXIT_APP_INF_EID 14

  ES Error Exit Application Complete Event ID.
- #define CFE_ES_ONE_APP_EID 15

  ES Query One Application Command Success Event ID.
- #define CFE_ES_ALL_APPS_EID 16

  ES Query All Applications Command Success Event ID.
- #define CFE_ES_SYSLOG1_INF_EID 17

  ES Clear System Log Command Success Event ID.
- #define CFE_ES_SYSLOG2_EID 18

  ES Write System Log Command Success Event ID.
- #define CFE_ES_ERLOG1_INF_EID 19

  ES Clear Exception Reset Log Command Success Event ID.
- #define CFE_ES_ERLOG2_EID 20

  ES Write Exception Reset Log Complete Event ID.
- #define CFE_ES_MID_ERR_EID 21

  ES Invalid Message ID Received Event ID.
- #define CFE_ES_CC1_ERR_EID 22

  ES Invalid Command Code Received Event ID.
- #define CFE_ES_LEN_ERR_EID 23

  ES Invalid Command Length Event ID.
- #define CFE_ES_BOOT_ERR_EID 24

  ES Restart Command Invalid Restart Type Event ID.

- #define CFE_ES_START_ERR_EID 26

  ES Start Application Command Application Creation Failed Event ID.
- #define CFE_ES_START_INVALID_FILENAME_ERR_EID 27

  ES Start Application Command Invalid Filename Event ID.
- #define CFE_ES_START_INVALID_ENTRY_POINT_ERR_EID 28

  ES Start Application Command Entry Point NULL Event ID.
- #define CFE_ES_START_NULL_APP_NAME_ERR_EID 29

  ES Start Application Command App Name NULL Event ID.
- #define CFE_ES_START_PRIORITY_ERR_EID 31

  ES Start Application Command Priority Too Large Event ID.
- #define CFE_ES_START_EXC_ACTION_ERR_EID 32

  ES Start Application Command Exception Action Invalid Event ID.
- #define CFE_ES_ERREXIT_APP_ERR_EID 33

  ES Error Exit Application Cleanup Failed Event ID.
- #define CFE_ES_STOP_ERR1_EID 35

  ES Stop Application Command Request Failed Event ID.
- #define CFE_ES_STOP_ERR2_EID 36

  ES Stop Application Command Get AppID By Name Failed Event ID.
- #define CFE_ES_STOP_ERR3_EID 37

  ES Stop Application Cleanup Failed Event ID.
- #define CFE_ES_RESTART_APP_ERR1_EID 38

  ES Restart Application Command Request Failed Event ID.
- #define CFE_ES_RESTART_APP_ERR2_EID 39

  ES Restart Application Command Get AppID By Name Failed Event ID.
- #define CFE_ES_RESTART_APP_ERR3_EID 40

  ES Restart Application Startup Failed Event ID.
- #define CFE_ES_RESTART_APP_ERR4_EID 41

  ES Restart Application Cleanup Failed Event ID.
- #define CFE_ES_RELOAD_APP_ERR1_EID 42

  ES Reload Application Command Request Failed Event ID.
- #define CFE_ES_RELOAD_APP_ERR2_EID 43

  ES Reload Application Command Get AppID By Name Failed Event ID.
- #define CFE_ES_RELOAD_APP_ERR3_EID 44

  ES Reload Application Startup Failed Event ID.
- #define CFE_ES_RELOAD_APP_ERR4_EID 45

  ES Reload Application Cleanup Failed Event ID.
- #define CFE_ES_EXIT_APP_ERR_EID 46

  ES Exit Application Cleanup Failed Event ID.
- #define CFE_ES_PCR_ERR1_EID 47

  ES Process Control Invalid Exception State Event ID.
- #define CFE_ES_PCR_ERR2_EID 48

  ES Process Control Unknown State Event ID.
- #define CFE_ES_ONE_ERR_EID 49

  ES Query One Application Data Command Transmit Message Failed Event ID.
- #define CFE_ES_ONE_APPID_ERR_EID 50

  ES Query One Application Data Command Get AppID By Name Failed Event ID.
- #define CFE_ES_OSCREATE_ERR_EID 51

  ES Query All Application Data Command File Creation Failed Event ID.
- #define CFE_ES_WRHDR_ERR_EID 52

  ES Query All Application Data Command File Write Header Failed Event ID.
- #define CFE_ES_TASKWR_ERR_EID 53

  ES Query All Application Data Command File Write App Data Failed Event ID.
- #define CFE_ES_SYSLOG2_ERR_EID 55

  ES Write System Log Command Filename Parse or File Creation Failed Event ID.
- #define CFE_ES_ERLOG2_ERR_EID 56

ES Write Exception Reset Log Command Request or File Creation Failed Event ID.

- #define CFE_ES_PERF_STARTCMD_EID 57

  ES Start Performance Analyzer Data Collection Command Success Event ID.
- #define CFE_ES_PERF_STARTCMD_ERR_EID 58

  ES Start Performance Analyzer Data Collection Command Idle Check Failed Event ID.
- #define CFE_ES_PERF_STARTCMD_TRIG_ERR_EID 59

  ES Start Performance Analyzer Data Collection Command Invalid Trigger Event ID.
- #define CFE_ES_PERF_STOPCMD_EID 60

  ES Stop Performance Analyzer Data Collection Command Request Success Event ID.
- #define CFE_ES_PERF_STOPCMD_ERR2_EID 62

  ES Stop Performance Analyzer Data Collection Command Request Idle Check Failed Event ID.
- #define CFE_ES_PERF_FILTMSKCMD_EID 63

  ES Set Performance Analyzer Filter Mask Command Success Event ID.
- #define CFE_ES_PERF_FILTMSKERR_EID 64

  ES Set Performance Analyzer Filter Mask Command Invalid Index Event ID.
- #define CFE_ES_PERF_TRIGMSKCMD_EID 65

  ES Set Performance Analyzer Trigger Mask Command Success Event ID.
- #define CFE_ES_PERF_TRIGMSKERR_EID 66

  ES Set Performance Analyzer Trigger Mask Command Invalid Mask Event ID.
- #define CFE_ES_PERF_LOG_ERR_EID 67

  ES Stop Performance Analyzer Data Collection Command Filename Parse or File Create Failed Event ID.
- #define CFE_ES_PERF_DATAWRITTEN_EID 68

  Performance Log Write Success Event ID.
- #define CFE_ES_CDS_REGISTER_ERR_EID 69

  ES Register CDS API Failed Event ID.
- #define CFE_ES_SYSLOGMODE_EID 70

  ES Set System Log Overwrite Mode Command Success Event ID.
- #define CFE_ES_ERR_SYSLOGMODE_EID 71

  ES Set System Log Overwrite Mode Command Failed Event ID.
- #define CFE_ES_RESET_PR_COUNT_EID 72

  ES Set Processor Reset Counter to Zero Command Success Event ID.
- #define CFE_ES_SET_MAX_PR_COUNT_EID 73

  ES Set Maximum Processor Reset Limit Command Success Event ID.
- #define CFE_ES_FILEWRITE_ERR_EID 74

  ES File Write Failed Event ID.
- #define CFE_ES_CDS_DELETE_ERR_EID 76

  ES Delete CDS Command Delete Failed Event ID.
- #define CFE_ES_CDS_NAME_ERR_EID 77

  ES Delete CDS Command Lookup CDS Failed Event ID.
- #define CFE_ES_CDS_DELETED_INFO_EID 78

  ES Delete CDS Command Success Event ID.
- #define CFE_ES_CDS_DELETE_TBL_ERR_EID 79

  ES Delete CDS Command For Critical Table Event ID.
- #define CFE_ES_CDS_OWNER_ACTIVE_EID 80

  ES Delete CDS Command With Active Owner Event ID.
- #define CFE_ES_TLM_POOL_STATS_INFO_EID 81

  ES Telemeter Memory Statistics Command Success Event ID.
- #define CFE_ES_INVALID_POOL_HANDLE_ERR_EID 82

  ES Telemeter Memory Statistics Command Invalid Handle Event ID.
- #define CFE_ES_CDS_REG_DUMP_INF_EID 83

  ES Write Critical Data Store Registry Command Success Event ID.
- #define CFE_ES_CDS_DUMP_ERR_EID 84

  ES Write Critical Data Store Registry Command Record Write Failed Event ID.
- #define CFE_ES_WRITE_CFE_HDR_ERR_EID 85

  ES Write Critical Data Store Registry Command Header Write Failed Event ID.

- #define CFE_ES_CREATING_CDS_DUMP_ERR_EID 86

  ES Write Critical Data Store Registry Command Filename Parse or File Create Failed Event ID.
- #define CFE_ES_TASKINFO_EID 87

  ES Write All Task Data Command Success Event ID.
- #define CFE_ES_TASKINFO_OSCREATE_ERR_EID 88

  ES Write All Task Data Command Filename Parse or File Create Failed Event ID.
- #define CFE_ES_TASKINFO_WRHDR_ERR_EID 89

  ES Write All Task Data Command Write Header Failed Event ID.
- #define CFE_ES_TASKINFO_WR_ERR_EID 90

  ES Write All Task Data Command Write Data Failed Event ID.
- #define CFE_ES_VERSION_INF_EID 91

  cFS Version Information Event ID
- #define CFE_ES_BUILD_INF_EID 92

  cFS Build Information Event ID
- #define CFE_ES_ERLOG_PENDING_ERR_EID 93

  ES Write Exception Reset Log Command Already In Progress Event ID.

12.112.1 Detailed Description

cFE Executive Services Event IDs

12.112.2 Macro Definition Documentation

12.112.2.1 CFE_ES_ALL_APPS_EID `#define CFE_ES_ALL_APPS_EID 16`

ES Query All Applications Command Success Event ID.

Type: DEBUG

Cause:

ES Query All Applications Command success.

Definition at line 206 of file cfe_es_eventids.h.

12.112.2.2 CFE_ES_BOOT_ERR_EID `#define CFE_ES_BOOT_ERR_EID 24`

ES Restart Command Invalid Restart Type Event ID.

Type: ERROR

Cause:

ES cFE Restart Command failure due to invalid restart type.

Definition at line 294 of file cfe_es_eventids.h.

12.112.2.3 CFE_ES_BUILD_INF_EID `#define CFE_ES_BUILD_INF_EID 92`

cFS Build Information Event ID

Type: INFORMATION

Cause:

ES Initialization complete and response to ES NO-OP Command .
The `Build` field identifies the build date, time, hostname and user identifier of the build host machine for the current running binary. The first string is the build date/time, and the second string is formatted as "user@hostname"
This additionally reports the configuration name that was selected by the user, which may affect various platform/mission limits.
By default, if not specified/overridden, the default values of these variables will be: BUILDDATE ==> the output of "date +%Y%m%d%H%M" HOSTNAME ==> the output of "hostname" USER ==> the output of "whoami"
The values can be overridden by setting an environment variable with the names above to the value desired for the field when running "make".
Definition at line 1047 of file cfe_es_eventids.h.

12.112.2.4 CFE_ES_CC1_ERR_EID `#define CFE_ES_CC1_ERR_EID 22`

ES Invalid Command Code Received Event ID.

Type: ERROR

Cause:

Invalid command code for message ID CFE_ES_CMD_MID received on the ES message pipe.
Definition at line 272 of file cfe_es_eventids.h.

12.112.2.5 CFE_ES_CDS_DELETE_ERR_EID `#define CFE_ES_CDS_DELETE_ERR_EID 76`

ES Delete CDS Command Delete Failed Event ID.

Type: ERROR

Cause:

ES Delete CDS Command failed while deleting, see reported status code or system log for details.
Definition at line 834 of file cfe_es_eventids.h.

12.112.2.6 CFE_ES_CDS_DELETE_TBL_ERR_EID `#define CFE_ES_CDS_DELETE_TBL_ERR_EID 79`

ES Delete CDS Command For Critical Table Event ID.

Type: ERROR

Cause:

Delete CDS Command failure due to the specified CDS name being a critical table. Critical Table images can only be deleted via a Table Services command, CFE_TBL_DELETE_CDS_CC.
Definition at line 871 of file cfe_es_eventids.h.

12.112.2.7 CFE_ES_CDS_DELETED_INFO_EID `#define CFE_ES_CDS_DELETED_INFO_EID 78`

ES Delete CDS Command Success Event ID.

Type: INFORMATION

Cause:

ES Delete CDS Command success.
Definition at line 857 of file cfe_es_eventids.h.

12.112.2.8 CFE_ES_CDS_DUMP_ERR_EID `#define CFE_ES_CDS_DUMP_ERR_EID 84`

ES Write Critical Data Store Registry Command Record Write Failed Event ID.

Type: ERROR

Cause:

ES Write Critical Data Store Registry Command failed to write CDS record.
Definition at line 929 of file cfe_es_eventids.h.

12.112.2.9 CFE_ES_CDS_NAME_ERR_EID `#define CFE_ES_CDS_NAME_ERR_EID 77`

ES Delete CDS Command Lookup CDS Failed Event ID.

Type: ERROR

Cause:

ES Delete CDS Command failed due to the specified CDS name not found in the CDS Registry.
Definition at line 846 of file cfe_es_eventids.h.

12.112.2.10 CFE_ES_CDS_OWNER_ACTIVE_EID `#define CFE_ES_CDS_OWNER_ACTIVE_EID 80`

ES Delete CDS Command With Active Owner Event ID.

Type: ERROR

Cause:

ES Delete CDS Command failure due to the specifies CDS name is registered to an active application.
Definition at line 883 of file cfe_es_eventids.h.

12.112.2.11 CFE_ES_CDS_REG_DUMP_INF_EID `#define CFE_ES_CDS_REG_DUMP_INF_EID 83`

ES Write Critical Data Store Registry Command Success Event ID.

Type: DEBUG

Cause:

ES Write Critical Data Store Registry Command success.
Definition at line 917 of file cfe_es_eventids.h.

12.112.2.12 CFE_ES_CDS_REGISTER_ERR_EID `#define CFE_ES_CDS_REGISTER_ERR_EID 69`

ES Register CDS API Failed Event ID.

Type: ERROR

Cause:

CFE_ES_RegisterCDS API failure, see reported status code or system log for details.
Definition at line 766 of file cfe_es_eventids.h.

12.112.2.13 CFE_ES_CREATING_CDS_DUMP_ERR_EID `#define CFE_ES_CREATING_CDS_DUMP_ERR_EID 86`

ES Write Critical Data Store Registry Command Filename Parse or File Create Failed Event ID.

Type: ERROR

Cause:

ES Write Critical Data Store Registry Command failed to parse filename or open/create the file. OVERLOADED
Definition at line 953 of file cfe_es_eventids.h.

12.112.2.14 CFE_ES_ERLOG1_INF_EID `#define CFE_ES_ERLOG1_INF_EID 19`

ES Clear Exception Reset Log Command Success Event ID.

Type: INFORMATION

Cause:

ES Clear Exception Reset Log Command success.
Definition at line 239 of file cfe_es_eventids.h.

12.112.2.15 CFE_ES_ERLOG2_EID `#define CFE_ES_ERLOG2_EID 20`

ES Write Exception Reset Log Complete Event ID.

Type: DEBUG

Cause:

Request to write the Exception Reset log successfully completed.
Definition at line 250 of file cfe_es_eventids.h.

12.112.2.16 CFE_ES_ERLOG2_ERR_EID `#define CFE_ES_ERLOG2_ERR_EID 56`

ES Write Exception Reset Log Command Request or File Creation Failed Event ID.

Type: ERROR

Cause:

ES Write Exception Reset Log Command request failed or file creation failed. OVERLOADED
Definition at line 626 of file cfe_es_eventids.h.

12.112.2.17 CFE_ES_ERLOG_PENDING_ERR_EID `#define CFE_ES_ERLOG_PENDING_ERR_EID 93`

ES Write Exception Reset Log Command Already In Progress Event ID.

Type: ERROR

Cause:

ES Write Exception Reset Log Command failure due to a write already being in progress.
Definition at line 1059 of file cfe_es_eventids.h.

12.112.2.18 CFE_ES_ERR_SYSLOGMODE_EID `#define CFE_ES_ERR_SYSLOGMODE_EID 71`

ES Set System Log Overwrite Mode Command Failed Event ID.

Type: ERROR

Cause:

ES Set System Log Overwrite Mode Command failed due to invalid mode requested.
Definition at line 789 of file cfe_es_eventids.h.

12.112.2.19 CFE_ES_ERREXIT_APP_ERR_EID `#define CFE_ES_ERREXIT_APP_ERR_EID 33`

ES Error Exit Application Cleanup Failed Event ID.

Type: ERROR

Cause:

Error request to exit an application failed during application cleanup. Application and related resources will be in undefined state.
Definition at line 379 of file cfe_es_eventids.h.

12.112.2.20 CFE_ES_ERREXIT_APP_INF_EID `#define CFE_ES_ERREXIT_APP_INF_EID 14`

ES Error Exit Application Complete Event ID.

Type: INFORMATION

Cause:

Error request to exit an application successfully completed. This event indicates the Application exited due to an error condition. The details of the error that occurred should be given by the Application through an event message, System Log entry, or both.
Definition at line 184 of file cfe_es_eventids.h.

12.112.2.21 CFE_ES_EXIT_APP_ERR_EID `#define CFE_ES_EXIT_APP_ERR_EID 46`

ES Exit Application Cleanup Failed Event ID.

Type: ERROR

Cause:

Nominal request to exit an application failed during application cleanup. Application and related resources will be in undefined state.
Definition at line 522 of file cfe_es_eventids.h.

12.112.2.22 CFE_ES_EXIT_APP_INF_EID `#define CFE_ES_EXIT_APP_INF_EID 13`

ES Nominal Exit Application Complete Event ID.

Type: INFORMATION

Cause:

Nominal request to exit an application successfully completed. This event indicates the Application exited due to a nominal exit condition.
Definition at line 170 of file cfe_es_eventids.h.

12.112.2.23 CFE_ES_FILEWRITE_ERR_EID `#define CFE_ES_FILEWRITE_ERR_EID 74`

ES File Write Failed Event ID.

Type: ERROR

Cause:

ES File Write failure writing data to file. OVERLOADED
Definition at line 822 of file cfe_es_eventids.h.

12.112.2.24 CFE_ES_INIT_INF_EID `#define CFE_ES_INIT_INF_EID 1`

ES Initialization Event ID.

Type: INFORMATION

Cause:

Executive Services Task initialization complete.
Definition at line 42 of file cfe_es_eventids.h.

12.112.2.25 CFE_ES_INITSTATS_INF_EID `#define CFE_ES_INITSTATS_INF_EID 2`

ES Initialization Statistics Information Event ID.

Type: INFORMATION

Cause:

Executive Services Task initialization complete.
Definition at line 53 of file cfe_es_eventids.h.

12.112.2.26 CFE_ES_INVALID_POOL_HANDLE_ERR_EID `#define CFE_ES_INVALID_POOL_HANDLE_ERR_E↩ ID 82`

ES Telemeter Memory Statistics Command Invalid Handle Event ID.

Type: ERROR

Cause:

ES Telemeter Memory Statistics Command failure due to an invalid memory handle.
Definition at line 906 of file cfe_es_eventids.h.

12.112.2.27 CFE_ES_LEN_ERR_EID `#define CFE_ES_LEN_ERR_EID 23`

ES Invalid Command Length Event ID.

Type: ERROR

Cause:

Invalid length for the command code in message ID CFE_ES_CMD_MID received on the ES message pipe.
Definition at line 283 of file cfe_es_eventids.h.

12.112.2.28 CFE_ES_MID_ERR_EID `#define CFE_ES_MID_ERR_EID 21`

ES Invalid Message ID Received Event ID.

Type: ERROR

Cause:

Invalid message ID received on the ES message pipe.
Definition at line 261 of file cfe_es_eventids.h.

12.112.2.29 CFE_ES_NOOP_INF_EID `#define CFE_ES_NOOP_INF_EID 3`

ES No-op Command Success Event ID.

Type: INFORMATION

Cause:

ES No-op Command success.
Definition at line 64 of file cfe_es_eventids.h.

12.112.2.30 CFE_ES_ONE_APP_EID `#define CFE_ES_ONE_APP_EID 15`

ES Query One Application Command Success Event ID.

Type: DEBUG

Cause:

ES Query One Application Command success.
Definition at line 195 of file cfe_es_eventids.h.

12.112.2.31 CFE_ES_ONE_APPID_ERR_EID `#define CFE_ES_ONE_APPID_ERR_EID 50`

ES Query One Application Data Command Get AppID By Name Failed Event ID.

Type: ERROR

Cause:

ES Query One Application Data Command failed to get application ID from application name. Message will not be sent.
Definition at line 569 of file cfe_es_eventids.h.

12.112.2.32 CFE_ES_ONE_ERR_EID `#define CFE_ES_ONE_ERR_EID 49`

ES Query One Application Data Command Transmit Message Failed Event ID.

Type: ERROR

Cause:

ES Query One Application Data Command failed during message transmission.
Definition at line 557 of file cfe_es_eventids.h.

12.112.2.33 CFE_ES_OSCREATE_ERR_EID `#define CFE_ES_OSCREATE_ERR_EID 51`

ES Query All Application Data Command File Creation Failed Event ID.

Type: ERROR

Cause:

ES Query All Application Data Command failed to create file.
Definition at line 580 of file cfe_es_eventids.h.

12.112.2.34 CFE_ES_PCR_ERR1_EID `#define CFE_ES_PCR_ERR1_EID 47`

ES Process Control Invalid Exception State Event ID.

Type: ERROR

Cause:

Invalid Exception state encountered when processing requests for application state changes. Exceptions are processed immediately, so this state should never occur during routine processing.
Definition at line 534 of file cfe_es_eventids.h.

12.112.2.35 CFE_ES_PCR_ERR2_EID `#define CFE_ES_PCR_ERR2_EID 48`

ES Process Control Unknown State Event ID.

Type: ERROR

Cause:

Unknown state encountered when processing requests for application state changes.
Definition at line 545 of file cfe_es_eventids.h.

12.112.2.36 CFE_ES_PERF_DATAWRITTEN_EID `#define CFE_ES_PERF_DATAWRITTEN_EID 68`

Performance Log Write Success Event ID.

Type: DEBUG

Cause:

Request to write the performance log successfully completed.
Definition at line 755 of file cfe_es_eventids.h.

12.112.2.37 CFE_ES_PERF_FILTMSKCMD_EID `#define CFE_ES_PERF_FILTMSKCMD_EID 63`

ES Set Performance Analyzer Filter Mask Command Success Event ID.

Type: DEBUG

Cause:

ES Set Performance Analyzer Filter Mask Command success.
Definition at line 697 of file cfe_es_eventids.h.

12.112.2.38 CFE_ES_PERF_FILTMSKERR_EID `#define CFE_ES_PERF_FILTMSKERR_EID 64`

ES Set Performance Analyzer Filter Mask Command Invalid Index Event ID.

Type: ERROR

Cause:

ES Set Performance Analyzer Filter Mask Command failed filter index range check.
Definition at line 709 of file cfe_es_eventids.h.

12.112.2.39 CFE_ES_PERF_LOG_ERR_EID `#define CFE_ES_PERF_LOG_ERR_EID 67`

ES Stop Performance Analyzer Data Collection Command Filename Parse or File Create Failed Event ID.

Type: ERROR

Cause:

ES Stop Performance Analyzer Data Collection Command failed either parsing the file name or during open/creation of the file. OVERLOADED
Definition at line 744 of file cfe_es_eventids.h.

12.112.2.40 CFE_ES_PERF_STARTCMD_EID `#define CFE_ES_PERF_STARTCMD_EID 57`

ES Start Performance Analyzer Data Collection Command Success Event ID.

Type: DEBUG

Cause:

ES Start Performance Analyzer Data Collection Command success.
Definition at line 637 of file cfe_es_eventids.h.

12.112.2.41 CFE_ES_PERF_STARTCMD_ERR_EID `#define CFE_ES_PERF_STARTCMD_ERR_EID 58`

ES Start Performance Analyzer Data Collection Command Idle Check Failed Event ID.

Type: ERROR

Cause:

ES Start Performance Analyzer Data Collection Command failed due to already being started.
Definition at line 649 of file cfe_es_eventids.h.

12.112.2.42 CFE_ES_PERF_STARTCMD_TRIG_ERR_EID `#define CFE_ES_PERF_STARTCMD_TRIG_ERR_EID 59`

ES Start Performance Analyzer Data Collection Command Invalid Trigger Event ID.

Type: ERROR

Cause:

ES Start Performance Analyzer Data Collection Command failed due to invalid trigger mode.
Definition at line 661 of file cfe_es_eventids.h.

12.112.2.43 CFE_ES_PERF_STOPCMD_EID `#define CFE_ES_PERF_STOPCMD_EID 60`

ES Stop Performance Analyzer Data Collection Command Request Success Event ID.

Type: DEBUG

Cause:

ES Stop Performance Analyzer Data Collection Command success. Note this event signifies the request to stop and write the performance data has been successfully submitted. The successful completion will generate a CFE_ES_PERF_DATAWRITTEN_EID event.
Definition at line 674 of file cfe_es_eventids.h.

12.112.2.44 CFE_ES_PERF_STOPCMD_ERR2_EID `#define CFE_ES_PERF_STOPCMD_ERR2_EID 62`

ES Stop Performance Analyzer Data Collection Command Request Idle Check Failed Event ID.

Type: ERROR

Cause:

ES Stop Performance Analyzer Data Collection Command failed due to a write already in progress.
Definition at line 686 of file cfe_es_eventids.h.

12.112.2.45 CFE_ES_PERF_TRIGMSKCMD_EID `#define CFE_ES_PERF_TRIGMSKCMD_EID 65`

ES Set Performance Analyzer Trigger Mask Command Success Event ID.

Type: DEBUG

Cause:

ES Set Performance Analyzer Trigger Mask Command success.
Definition at line 720 of file cfe_es_eventids.h.

12.112.2.46 CFE_ES_PERF_TRIGMSKERR_EID `#define CFE_ES_PERF_TRIGMSKERR_EID 66`

ES Set Performance Analyzer Trigger Mask Command Invalid Mask Event ID.

Type: ERROR

Cause:

ES Set Performance Analyzer Trigger Mask Command failed the mask range check.
Definition at line 732 of file cfe_es_eventids.h.

12.112.2.47 CFE_ES_RELOAD_APP_DBG_EID `#define CFE_ES_RELOAD_APP_DBG_EID 11`

ES Reload Application Command Request Success Event ID.

Type: DEBUG

Cause:

ES Reload Application Command success. Note this event signifies the request to reload the application has been successfully submitted. The successful completion will generate a CFE_ES_RELOAD_APP_INF_EID event.
Definition at line 147 of file cfe_es_eventids.h.

12.112.2.48 CFE_ES_RELOAD_APP_ERR1_EID `#define CFE_ES_RELOAD_APP_ERR1_EID 42`

ES Reload Application Command Request Failed Event ID.

Type: ERROR

Cause:

ES Reload Application Command request failed.
Definition at line 473 of file cfe_es_eventids.h.

12.112.2.49 CFE_ES_RELOAD_APP_ERR2_EID `#define CFE_ES_RELOAD_APP_ERR2_EID 43`

ES Reload Application Command Get AppID By Name Failed Event ID.

Type: ERROR

Cause:

ES Reload Application Command failed to get application ID from application name. The application will not be reloaded.
Definition at line 485 of file cfe_es_eventids.h.

12.112.2.50 CFE_ES_RELOAD_APP_ERR3_EID `#define CFE_ES_RELOAD_APP_ERR3_EID 44`

ES Reload Application Startup Failed Event ID.

Type: ERROR

Cause:

Request to reload an application failed during application startup. The application will not be reloaded.
Definition at line 497 of file cfe_es_eventids.h.

12.112.2.51 CFE_ES_RELOAD_APP_ERR4_EID `#define CFE_ES_RELOAD_APP_ERR4_EID 45`

ES Reload Application Cleanup Failed Event ID.

Type: ERROR

Cause:

Request to reload an application failed during application cleanup. The application will not be reloaded and will be in an undefined state along with it's associated resources.
Definition at line 510 of file cfe_es_eventids.h.

12.112.2.52 CFE_ES_RELOAD_APP_INF_EID `#define CFE_ES_RELOAD_APP_INF_EID 12`

ES Reload Application Complete Event ID.

Type: INFORMATION

Cause:

Request to reload an application successfully completed.
Definition at line 158 of file cfe_es_eventids.h.

12.112.2.53 CFE_ES_RESET_INF_EID `#define CFE_ES_RESET_INF_EID 4`

ES Reset Counters Command Success Event ID.

Type: INFORMATION

Cause:

ES Reset Counters Command success.
Definition at line 75 of file cfe_es_eventids.h.

12.112.2.54 CFE_ES_RESET_PR_COUNT_EID `#define CFE_ES_RESET_PR_COUNT_EID 72`

ES Set Processor Reset Counter to Zero Command Success Event ID.

Type: INFORMATION

Cause:

ES Set Processor Reset Counter to Zero Command success.
Definition at line 800 of file cfe_es_eventids.h.

12.112.2.55 CFE_ES_RESTART_APP_DBG_EID `#define CFE_ES_RESTART_APP_DBG_EID 9`

ES Restart Application Command Request Success Event ID.

Type: DEBUG

Cause:

ES Restart Application Command success. Note this event signifies the request to restart the application has been successfully submitted. The successful completion will generate a CFE_ES_RESTART_APP_INF_EID event.
Definition at line 123 of file cfe_es_eventids.h.

12.112.2.56 CFE_ES_RESTART_APP_ERR1_EID `#define CFE_ES_RESTART_APP_ERR1_EID 38`

ES Restart Application Command Request Failed Event ID.

Type: ERROR

Cause:

ES Restart Application Command request failed.
Definition at line 425 of file cfe_es_eventids.h.

12.112.2.57 CFE_ES_RESTART_APP_ERR2_EID `#define CFE_ES_RESTART_APP_ERR2_EID 39`

ES Restart Application Command Get AppID By Name Failed Event ID.

Type: ERROR

Cause:

ES Restart Application Command failed to get application ID from application name. The application will not be restarted.
Definition at line 437 of file cfe_es_eventids.h.

12.112.2.58 CFE_ES_RESTART_APP_ERR3_EID `#define CFE_ES_RESTART_APP_ERR3_EID 40`

ES Restart Application Startup Failed Event ID.

Type: ERROR

Cause:

Request to restart an application failed during application startup. The application will not be restarted.
Definition at line 449 of file cfe_es_eventids.h.

12.112.2.59 CFE_ES_RESTART_APP_ERR4_EID `#define CFE_ES_RESTART_APP_ERR4_EID 41`

ES Restart Application Cleanup Failed Event ID.

Type: ERROR

Cause:

Request to restart an application failed during application cleanup. The application will not be restarted and will be in an undefined state along with it's associated resources.
Definition at line 462 of file cfe_es_eventids.h.

12.112.2.60 CFE_ES_RESTART_APP_INF_EID `#define CFE_ES_RESTART_APP_INF_EID 10`

ES Restart Application Completed Event ID.

Type: INFORMATION

Cause:

Request to restart an application successfully completed.
Definition at line 134 of file cfe_es_eventids.h.

12.112.2.61 CFE_ES_SET_MAX_PR_COUNT_EID `#define CFE_ES_SET_MAX_PR_COUNT_EID 73`

ES Set Maximum Processor Reset Limit Command Success Event ID.

Type: INFORMATION

Cause:

ES Set Maximum Processor Reset Limit Command success.
Definition at line 811 of file cfe_es_eventids.h.

12.112.2.62 CFE_ES_START_ERR_EID `#define CFE_ES_START_ERR_EID 26`

ES Start Application Command Application Creation Failed Event ID.

Type: ERROR

Cause:

ES Start Application Command failure during application creation after successful parameter validation.
Definition at line 306 of file cfe_es_eventids.h.

12.112.2.63 CFE_ES_START_EXC_ACTION_ERR_EID `#define CFE_ES_START_EXC_ACTION_ERR_EID 32`

ES Start Application Command Exception Action Invalid Event ID.

Type: ERROR

Cause:

ES Start Application Command failure due to invalid application exception action.
Definition at line 367 of file cfe_es_eventids.h.

12.112.2.64 CFE_ES_START_INF_EID `#define CFE_ES_START_INF_EID 6`

ES Start Application Command Success Event ID.

Type: INFORMATION

Cause:

ES Start Application Command success.
Definition at line 86 of file cfe_es_eventids.h.

12.112.2.65 CFE_ES_START_INVALID_ENTRY_POINT_ERR_EID `#define CFE_ES_START_INVALID_ENTRY_PO↩INT_ERR_EID 28`

ES Start Application Command Entry Point NULL Event ID.

Type: ERROR

Cause:

ES Start Application Command failure due to a NULL Application Entry Point.
Definition at line 330 of file cfe_es_eventids.h.

12.112.2.66 CFE_ES_START_INVALID_FILENAME_ERR_EID `#define CFE_ES_START_INVALID_FILENAME_ER↩ R_EID 27`

ES Start Application Command Invalid Filename Event ID.

Type: ERROR

Cause:

ES Start Application Command failure due to invalid filename.
Definition at line 318 of file cfe_es_eventids.h.

12.112.2.67 CFE_ES_START_NULL_APP_NAME_ERR_EID `#define CFE_ES_START_NULL_APP_NAME_ERR_E↩ ID 29`

ES Start Application Command App Name NULL Event ID.

Type: ERROR

Cause:

ES Start Application Command failure due to NULL Application Name.
Definition at line 342 of file cfe_es_eventids.h.

12.112.2.68 CFE_ES_START_PRIORITY_ERR_EID `#define CFE_ES_START_PRIORITY_ERR_EID 31`

ES Start Application Command Priority Too Large Event ID.

Type: ERROR

Cause:

ES Start Application Command failure due to a requested application priority greater than the maximum priority allowed for tasks as defined by the OS Abstraction Layer (OS_MAX_PRIORITY).
Definition at line 355 of file cfe_es_eventids.h.

12.112.2.69 CFE_ES_STOP_DBG_EID `#define CFE_ES_STOP_DBG_EID 7`

ES Stop Application Command Request Success Event ID.

Type: DEBUG

Cause:

ES Stop Application Command success. Note this event signifies the request to delete the application has been successfully submitted. The successful completion will generate a CFE_ES_STOP_INF_EID event.
Definition at line 99 of file cfe_es_eventids.h.

12.112.2.70 CFE_ES_STOP_ERR1_EID `#define CFE_ES_STOP_ERR1_EID 35`

ES Stop Application Command Request Failed Event ID.

Type: ERROR

Cause:

ES Stop Application Command request failed.
Definition at line 390 of file cfe_es_eventids.h.

12.112.2.71 CFE_ES_STOP_ERR2_EID `#define CFE_ES_STOP_ERR2_EID 36`

ES Stop Application Command Get AppID By Name Failed Event ID.

Type: ERROR

Cause:

ES Stop Application Command failed to get application ID from application name. The application will not be deleted.
Definition at line 402 of file cfe_es_eventids.h.

12.112.2.72 CFE_ES_STOP_ERR3_EID `#define CFE_ES_STOP_ERR3_EID 37`

ES Stop Application Cleanup Failed Event ID.

Type: ERROR

Cause:

Request to delete an application failed during application cleanup. Application and related resources will be in undefined state.
Definition at line 414 of file cfe_es_eventids.h.

12.112.2.73 CFE_ES_STOP_INF_EID `#define CFE_ES_STOP_INF_EID 8`

ES Stop Application Completed Event ID.

Type: INFORMATION

Cause:

Request to delete an application successfully completed.
Definition at line 110 of file cfe_es_eventids.h.

12.112.2.74 CFE_ES_SYSLOG1_INF_EID `#define CFE_ES_SYSLOG1_INF_EID 17`

ES Clear System Log Command Success Event ID.

Type: INFORMATION

Cause:

ES Clear System Log Command success.
Definition at line 217 of file cfe_es_eventids.h.

12.112.2.75 CFE_ES_SYSLOG2_EID `#define CFE_ES_SYSLOG2_EID 18`

ES Write System Log Command Success Event ID.

Type: DEBUG

Cause:

ES Write System Log Command success.
Definition at line 228 of file cfe_es_eventids.h.

12.112.2.76 CFE_ES_SYSLOG2_ERR_EID `#define CFE_ES_SYSLOG2_ERR_EID 55`

ES Write System Log Command Filename Parse or File Creation Failed Event ID.

Type: ERROR

Cause:

ES Write System Log Command failed parsing file name or creating the file. OVERLOADED
Definition at line 614 of file cfe_es_eventids.h.

12.112.2.77 CFE_ES_SYSLOGMODE_EID `#define CFE_ES_SYSLOGMODE_EID 70`

ES Set System Log Overwrite Mode Command Success Event ID.

Type: DEBUG

Cause:

ES Set System Log Overwrite Mode Command success.
Definition at line 777 of file cfe_es_eventids.h.

12.112.2.78 CFE_ES_TASKINFO_EID `#define CFE_ES_TASKINFO_EID 87`

ES Write All Task Data Command Success Event ID.

Type: DEBUG

Cause:

ES Write All Task Data Command success.

Definition at line 964 of file cfe_es_eventids.h.

12.112.2.79 CFE_ES_TASKINFO_OSCREATE_ERR_EID `#define CFE_ES_TASKINFO_OSCREATE_ERR_EID 88`

ES Write All Task Data Command Filename Parse or File Create Failed Event ID.

Type: ERROR

Cause:

ES Write All Task Data Command failed to parse the filename or open/create the file.

Definition at line 976 of file cfe_es_eventids.h.

12.112.2.80 CFE_ES_TASKINFO_WR_ERR_EID `#define CFE_ES_TASKINFO_WR_ERR_EID 90`

ES Write All Task Data Command Write Data Failed Event ID.

Type: ERROR

Cause:

ES Write All Task Data Command failed to write task data to file.

Definition at line 1000 of file cfe_es_eventids.h.

12.112.2.81 CFE_ES_TASKINFO_WRHDR_ERR_EID `#define CFE_ES_TASKINFO_WRHDR_ERR_EID 89`

ES Write All Task Data Command Write Header Failed Event ID.

Type: ERROR

Cause:

ES Write All Task Data Command failed to write file header.

Definition at line 988 of file cfe_es_eventids.h.

12.112.2.82 CFE_ES_TASKWR_ERR_EID `#define CFE_ES_TASKWR_ERR_EID 53`

ES Query All Application Data Command File Write App Data Failed Event ID.

Type: ERROR

Cause:

ES Query All Application Data Command failed to write file application data.
Definition at line 602 of file cfe_es_eventids.h.

12.112.2.83 CFE_ES_TLM_POOL_STATS_INFO_EID `#define CFE_ES_TLM_POOL_STATS_INFO_EID 81`

ES Telemeter Memory Statistics Command Success Event ID.

Type: DEBUG

Cause:

ES Telemeter Memory Statistics Command success.
Definition at line 894 of file cfe_es_eventids.h.

12.112.2.84 CFE_ES_VERSION_INF_EID `#define CFE_ES_VERSION_INF_EID 91`

cFS Version Information Event ID

Type: INFORMATION

Cause:

ES Initialization complete and response to ES NO-OP Command .
A separate version info event will be generated for every module which is statically linked into the CFE core executable (e.g. OSAL, PSP, MSG, SBR, etc).
The version information reported in this event is derived from the source revision control system at build time, as opposed to manually-assigned semantic version numbers. It is intended to uniquely identify the actual source code that is currently running, to the extent this is possible.
The `Mission` version information also identifies the build configuration name, if available.
Definition at line 1021 of file cfe_es_eventids.h.

12.112.2.85 CFE_ES_WRHDR_ERR_EID `#define CFE_ES_WRHDR_ERR_EID 52`

ES Query All Application Data Command File Write Header Failed Event ID.

Type: ERROR

Cause:

ES Query All Application Data Command failed to write file header.
Definition at line 591 of file cfe_es_eventids.h.

12.112.2.86 CFE_ES_WRITE_CFE_HDR_ERR_EID `#define CFE_ES_WRITE_CFE_HDR_ERR_EID 85`

ES Write Critical Data Store Registry Command Header Write Failed Event ID.

Type: ERROR

Cause:

ES Write Critical Data Store Registry Command failed to write header.
Definition at line 941 of file cfe_es_eventids.h.

12.113 cfe/modules/evs/config/default_cfe_evs_extern_typedefs.h File Reference

`#include "common_types.h"`

Typedefs

- typedef uint8 CFE_EVS_MsgFormat_Enum_t

  Identifies format of log messages.
- typedef uint8 CFE_EVS_LogMode_Enum_t

  Identifies handling of log messages after storage is filled.
- typedef uint16 CFE_EVS_EventType_Enum_t

  Identifies type of event message.
- typedef uint8 CFE_EVS_EventFilter_Enum_t

  Identifies event filter schemes.
- typedef uint8 CFE_EVS_EventOutput_Enum_t

  Identifies event output port.

Enumerations

- enum CFE_EVS_MsgFormat { CFE_EVS_MsgFormat_SHORT = 0, CFE_EVS_MsgFormat_LONG = 1 }

  Label definitions associated with CFE_EVS_MsgFormat_Enum_t.
- enum CFE_EVS_LogMode { CFE_EVS_LogMode_OVERWRITE = 0, CFE_EVS_LogMode_DISCARD = 1 }

  Label definitions associated with CFE_EVS_LogMode_Enum_t.
- enum CFE_EVS_EventType { CFE_EVS_EventType_DEBUG = 1, CFE_EVS_EventType_INFORMATION = 2, CFE_EVS_EventType_ERROR = 3, CFE_EVS_EventType_CRITICAL = 4 }

  Label definitions associated with CFE_EVS_EventType_Enum_t.
- enum CFE_EVS_EventFilter { CFE_EVS_EventFilter_BINARY = 0 }

  Label definitions associated with CFE_EVS_EventFilter_Enum_t.
- enum CFE_EVS_EventOutput { CFE_EVS_EventOutput_PORT1 = 1, CFE_EVS_EventOutput_PORT2 = 2, CFE_EVS_EventOutput_PORT3 = 3, CFE_EVS_EventOutput_PORT4 = 4 }

  Label definitions associated with CFE_EVS_EventOutput_Enum_t.

12.113.1 Detailed Description

Declarations and prototypes for cfe_evs_extern_typedefs module

12.113.2 Typedef Documentation

12.113.2.1 CFE_EVS_EventFilter_Enum_t `typedef uint8 CFE_EVS_EventFilter_Enum_t`

Identifies event filter schemes.

See also

enum CFE_EVS_EventFilter

Definition at line 125 of file default_cfe_evs_extern_typedefs.h.

12.113.2.2 CFE_EVS_EventOutput_Enum_t `typedef uint8 CFE_EVS_EventOutput_Enum_t`

Identifies event output port.

See also

enum CFE_EVS_EventOutput

Definition at line 158 of file default_cfe_evs_extern_typedefs.h.

12.113.2.3 CFE_EVS_EventType_Enum_t `typedef uint16 CFE_EVS_EventType_Enum_t`

Identifies type of event message.

See also

enum CFE_EVS_EventType

Definition at line 107 of file default_cfe_evs_extern_typedefs.h.

12.113.2.4 CFE_EVS_LogMode_Enum_t `typedef uint8 CFE_EVS_LogMode_Enum_t`

Identifies handling of log messages after storage is filled.

See also

enum CFE_EVS_LogMode

Definition at line 74 of file default_cfe_evs_extern_typedefs.h.

12.113.2.5 CFE_EVS_MsgFormat_Enum_t `typedef uint8 CFE_EVS_MsgFormat_Enum_t`

Identifies format of log messages.

See also

enum CFE_EVS_MsgFormat

Definition at line 51 of file default_cfe_evs_extern_typedefs.h.

12.113.3 Enumeration Type Documentation

12.113.3.1 CFE_EVS_EventFilter `enum CFE_EVS_EventFilter`

Label definitions associated with CFE_EVS_EventFilter_Enum_t.

Enumerator

CFE_EVS_EventFilter_BINARY	Binary event filter.

Definition at line 112 of file default_cfe_evs_extern_typedefs.h.

12.113.3.2 CFE_EVS_EventOutput `enum CFE_EVS_EventOutput`

Label definitions associated with CFE_EVS_EventOutput_Enum_t.

Enumerator

CFE_EVS_EventOutput_PORT1	Output Port 1.
CFE_EVS_EventOutput_PORT2	Output Port 2.
CFE_EVS_EventOutput_PORT3	Output Port 3.
CFE_EVS_EventOutput_PORT4	Output Port 4.

Definition at line 130 of file default_cfe_evs_extern_typedefs.h.

12.113.3.3 CFE_EVS_EventType `enum CFE_EVS_EventType`

Label definitions associated with CFE_EVS_EventType_Enum_t.

Enumerator

CFE_EVS_EventType_DEBUG	Events that are intended only for debugging, not nominal operations.
CFE_EVS_EventType_INFORMATION	Events that identify a state change or action that is not an error.
CFE_EVS_EventType_ERROR	Events that identify an error but are not catastrophic (e.g. - bad command.
CFE_EVS_EventType_CRITICAL	Events that identify errors that are unrecoverable autonomously.

Definition at line 79 of file default_cfe_evs_extern_typedefs.h.

12.113.3.4 CFE_EVS_LogMode `enum CFE_EVS_LogMode`

Label definitions associated with CFE_EVS_LogMode_Enum_t.

Enumerator

CFE_EVS_LogMode_OVERWRITE	Overwrite Log Mode.
CFE_EVS_LogMode_DISCARD	Discard Log Mode.

Definition at line 56 of file default_cfe_evs_extern_typedefs.h.

12.113.3.5 CFE_EVS_MsgFormat `enum CFE_EVS_MsgFormat`

Label definitions associated with CFE_EVS_MsgFormat_Enum_t.

Enumerator

CFE_EVS_MsgFormat_SHORT	Short Format Messages.
CFE_EVS_MsgFormat_LONG	Long Format Messages.

Definition at line 33 of file default_cfe_evs_extern_typedefs.h.

12.114 cfe/modules/evs/config/default_cfe_evs_fcncodes.h File Reference

Macros

Event Services Command Codes

- #define CFE_EVS_NOOP_CC 0
- #define CFE_EVS_RESET_COUNTERS_CC 1
- #define CFE_EVS_ENABLE_EVENT_TYPE_CC 2
- #define CFE_EVS_DISABLE_EVENT_TYPE_CC 3
- #define CFE_EVS_SET_EVENT_FORMAT_MODE_CC 4
- #define CFE_EVS_ENABLE_APP_EVENT_TYPE_CC 5
- #define CFE_EVS_DISABLE_APP_EVENT_TYPE_CC 6
- #define CFE_EVS_ENABLE_APP_EVENTS_CC 7
- #define CFE_EVS_DISABLE_APP_EVENTS_CC 8
- #define CFE_EVS_RESET_APP_COUNTER_CC 9
- #define CFE_EVS_SET_FILTER_CC 10
- #define CFE_EVS_ENABLE_PORTS_CC 11
- #define CFE_EVS_DISABLE_PORTS_CC 12
- #define CFE_EVS_RESET_FILTER_CC 13
- #define CFE_EVS_RESET_ALL_FILTERS_CC 14
- #define CFE_EVS_ADD_EVENT_FILTER_CC 15
- #define CFE_EVS_DELETE_EVENT_FILTER_CC 16
- #define CFE_EVS_WRITE_APP_DATA_FILE_CC 17
- #define CFE_EVS_WRITE_LOG_DATA_FILE_CC 18
- #define CFE_EVS_SET_LOG_MODE_CC 19
- #define CFE_EVS_CLEAR_LOG_CC 20

12.114.1 Detailed Description

Specification for the CFE Event Services (CFE_EVS) command function codes

Note

This file should be strictly limited to the command/function code (CC) macro definitions. Other definitions such as enums, typedefs, or other macros should be placed in the msgdefs.h or msg.h files.

12.114.2 Macro Definition Documentation

12.114.2.1 CFE_EVS_ADD_EVENT_FILTER_CC `#define CFE_EVS_ADD_EVENT_FILTER_CC 15`

Name Add Application Event Filter

Description

This command adds the given filter for the given application identifier and event identifier. Note: In order for this command to take effect, applications must be registered for Event Service.

Command Mnemonic(s) $sc_$cpu_EVS_AddEvtFltr

Command Structure

CFE_EVS_AddEventFilterCmd_t

Command Verification

Successful execution of this command may be verified with the following telemetry:

- **`$sc_$cpu_EVS_CMDPC`** - command execution counter will increment
- The generation of CFE_EVS_ADDFILTER_EID debug event message

Error Conditions

This command may fail for the following reason(s):

- Application name is not valid or not registered with event services
- Specified event ID is already added to the application event filter
- Maximum number of event IDs already added to filter

Evidence of failure may be found in the following telemetry:

- **`$sc_$cpu_EVS_CMDEC`** - command error counter will increment
- An Error specific event message

Criticality

None.

See also

CFE_EVS_SET_FILTER_CC, CFE_EVS_RESET_FILTER_CC, CFE_EVS_RESET_ALL_FILTERS_CC, CFE_EVS_DELETE_EVENT_FILTER_CC

Definition at line 693 of file default_cfe_evs_fcncodes.h.

12.114.2.2 CFE_EVS_CLEAR_LOG_CC `#define CFE_EVS_CLEAR_LOG_CC 20`

Name Clear Event Log

Description

This command clears the contents of the local event log.

Command Mnemonic(s) $sc_$cpu_EVS_ClrLog

Command Structure

CFE_EVS_ClearLogCmd_t

Command Verification

Successful execution of this command may be verified with the following telemetry:

- **`$sc_$cpu_EVS_CMDPC`** - command execution counter will increment
- **`$sc_$cpu_EVS_LOGFULL`** - The LogFullFlag in the Housekeeping telemetry will be cleared
- **`$sc_$cpu_EVS_LOGOVERFLOWC`** - The LogOverflowCounter in the Housekeeping telemetry will be reset to 0

Error Conditions

There are no error conditions for this command. If the Event Services receives the command, the log is cleared.

Criticality

Clearing the local event log is not particularly hazardous, as the result may be making available space to record valuable event data. However, inappropriately clearing the local event log could result in a loss of critical information. Note: the event log is a back-up log to the on-board recorder.

See also

CFE_EVS_WRITE_LOG_DATA_FILE_CC, CFE_EVS_SET_LOG_MODE_CC

Definition at line 873 of file default_cfe_evs_fcncodes.h.

12.114.2.3 CFE_EVS_DELETE_EVENT_FILTER_CC `#define CFE_EVS_DELETE_EVENT_FILTER_CC 16`

Name Delete Application Event Filter

Description

This command removes the given filter for the given application identifier and event identifier. Note: In order for this command to take effect, applications must be registered for Event Service.

Command Mnemonic(s) $sc_$cpu_EVS_DelEvtFltr

Command Structure

CFE_EVS_DeleteEventFilterCmd_t

Command Verification

Successful execution of this command may be verified with the following telemetry:

- **`$sc_$cpu_EVS_CMDPC`** - command execution counter will increment
- The generation of CFE_EVS_DELFILTER_EID debug event message

Error Conditions

This command may fail for the following reason(s):

- Application name is not valid or not registered with event services
- Specified event ID is not found in the application event filter

Evidence of failure may be found in the following telemetry:

- **`$sc_$cpu_EVS_CMDEC`** - command error counter will increment
- An Error specific event message

Criticality

None.

See also

CFE_EVS_SET_FILTER_CC, CFE_EVS_RESET_FILTER_CC, CFE_EVS_RESET_ALL_FILTERS_CC, CFE_EVS_ADD_EVENT_FILTER_CC

Definition at line 728 of file default_cfe_evs_fcncodes.h.

12.114.2.4 CFE_EVS_DISABLE_APP_EVENT_TYPE_CC `#define CFE_EVS_DISABLE_APP_EVENT_TYPE_CC 6`

Name Disable Application Event Type

Description

This command disables the command specified event type for the command specified application, preventing the application from sending event messages of the command specified event type through Event Service. An Event Type is defined to be a classification of an Event Message such as debug, informational, critical, and error. Note: In order for this command to take effect, applications must be registered for Event Service.

Command Mnemonic(s) $sc_$cpu_EVS_DisAppEvtType, $sc_$cpu_EVS_DisAppEvtTypeMask

Command Structure

CFE_EVS_DisableAppEventTypeCmd_t The following bit positions apply to structure member named 'BitMask'. Bit 0 - Debug Bit 1 - Informational Bit 2 - Error Bit 3 - Critical A one in a bit position means the event type will be disabled (or filtered) for the specified application. A zero in a bit position means the filtering state is unchanged for the specified application.

Command Verification

Successful execution of this command may be verified with the following telemetry:

- **`$sc_$cpu_EVS_CMDPC`** - command execution counter will increment
- The generation of CFE_EVS_DISAPPENTTYPE_EID debug event message
- The clearing of the Event Type Active Flag in The Event Type Active Flag in EVS App Data File

Error Conditions

This command may fail for the following reason(s):

- BitMask field invalid - mask cannot be zero, and only bits 0-3 may be set
- Application name is not valid or not registered with event services

Evidence of failure may be found in the following telemetry:

- **`$sc_$cpu_EVS_CMDEC`** - command error counter will increment
- An Error specific event message

Criticality

Disabling an application's event type is not particularly hazardous, as the result may be shutting off unnecessary event messages and possible event flooding of the system. However, inappropriately disabling an application's event type could result in a loss of critical information and missed behavior for the ground system.

See also

CFE_EVS_ENABLE_EVENT_TYPE_CC, CFE_EVS_DISABLE_EVENT_TYPE_CC, CFE_EVS_ENABLE_APP_EVENT_TYPE_CC
CFE_EVS_ENABLE_APP_EVENTS_CC, CFE_EVS_DISABLE_APP_EVENTS_CC

Definition at line 353 of file default_cfe_evs_fcncodes.h.

12.114.2.5 CFE_EVS_DISABLE_APP_EVENTS_CC `#define CFE_EVS_DISABLE_APP_EVENTS_CC 8`

Name Disable Event Services for an Application

Description

This command disables the command specified application from sending events through Event Service. Note: In order for this command to take effect, applications must be registered for Event Service.

Command Mnemonic(s) $sc_$cpu_EVS_DisAppEvGen

Command Structure

CFE_EVS_DisableAppEventsCmd_t

Command Verification

Successful execution of this command may be verified with the following telemetry:

- **`$sc_$cpu_EVS_CMDPC`** - command execution counter will increment
- The generation of CFE_EVS_DISAPPEVT_EID debug event message

Error Conditions

This command may fail for the following reason(s):

- Application name is not valid or not registered with event services

Evidence of failure may be found in the following telemetry:

- **`$sc_$cpu_EVS_CMDEC`** - command error counter will increment
- An Error specific event message

Criticality

Disabling an application's events is not particularly hazardous, as the result may be shutting off unnecessary event messages and possible event flooding of the system. However, inappropriately disabling an application's events could result in a loss of critical information and missed behavior for the ground system.

See also

CFE_EVS_ENABLE_EVENT_TYPE_CC, CFE_EVS_DISABLE_EVENT_TYPE_CC, CFE_EVS_ENABLE_APP_EVENT_TYPE_CC
CFE_EVS_DISABLE_APP_EVENT_TYPE_CC, CFE_EVS_ENABLE_APP_EVENTS_CC

Definition at line 431 of file default_cfe_evs_fcncodes.h.

12.114.2.6 CFE_EVS_DISABLE_EVENT_TYPE_CC `#define CFE_EVS_DISABLE_EVENT_TYPE_CC 3`

Name Disable Event Type

Description

This command disables the command specified Event Type preventing event messages of this type to be sent through Event Service. An Event Type is defined to be a classification of an Event Message such as debug, informational, error and critical. This command is a global disable of a particular event type, it applies to all applications.

Command Mnemonic(s) $sc_$cpu_EVS_DisEventType, $sc_$cpu_EVS_DisEventTypeMask

Command Structure

CFE_EVS_DisableEventTypeCmd_t The following bit positions apply to structure member named 'BitMask'. Bit 0 - Debug Bit 1 - Informational Bit 2 - Error Bit 3 - Critical A one in a bit position means the event type will be disabled (or filtered). A zero in a bit position means the filtering state is unchanged.

Command Verification

Successful execution of this command may be verified with the following telemetry:

- **`$sc_$cpu_EVS_CMDPC`** - command execution counter will increment
- The generation of CFE_EVS_DISEVTTYPE_EID debug message

Error Conditions

This command may fail for the following reason(s):

- BitMask field invalid - mask cannot be zero, and only bits 0-3 may be set

Evidence of failure may be found in the following telemetry:

- **`$sc_$cpu_EVS_CMDEC`** - command error counter will increment
- An Error specific event message

Criticality

Disabling an event type is not particularly hazardous, as the result may be shutting off unnecessary event messages and possible event flooding of the system. However, inappropriately disabling an event type could result in a loss of critical information and missed behavior for the ground system.

See also

CFE_EVS_ENABLE_EVENT_TYPE_CC, CFE_EVS_ENABLE_APP_EVENT_TYPE_CC, CFE_EVS_DISABLE_APP_EVENT_TYP
CFE_EVS_ENABLE_APP_EVENTS_CC, CFE_EVS_DISABLE_APP_EVENTS_CC

Definition at line 201 of file default_cfe_evs_fcncodes.h.

12.114.2.7 CFE_EVS_DISABLE_PORTS_CC `#define CFE_EVS_DISABLE_PORTS_CC 12`

Name Disable Event Services Output Ports

Description

This command disables the specified port from outputting event messages.

Command Mnemonic(s) $sc_$cpu_EVS_DisPort, $sc_$cpu_EVS_DisPortMask

Command Structure

CFE_EVS_DisablePortsCmd_t The following bit positions apply to structure member named 'BitMask'. Bit 0 - Port 1 Bit 1 - Port 2 Bit 2 - Port 3 Bit 3 - Port 4 A one in a bit position means the port will be disabled. A zero in a bit position means the port state is unchanged.

Command Verification

Successful execution of this command may be verified with the following telemetry:

- **`$sc_$cpu_EVS_CMDPC`** - command execution counter will increment
- The generation of CFE_EVS_DISPORT_EID debug event message

Error Conditions

This command may fail for the following reason(s):

- BitMask field invalid - mask cannot be zero, and only bits 0-3 may be set

Evidence of failure may be found in the following telemetry:

- **`$sc_$cpu_EVS_CMDEC`** - command error counter will increment
- An Error specific event message

Criticality

None.

See also

CFE_EVS_ENABLE_PORTS_CC

Definition at line 587 of file default_cfe_evs_fcncodes.h.

12.114.2.8 CFE_EVS_ENABLE_APP_EVENT_TYPE_CC `#define CFE_EVS_ENABLE_APP_EVENT_TYPE_CC 5`

Name Enable Application Event Type

Description

This command enables the command specified event type for the command specified application, allowing the application to send event messages of the command specified event type through Event Service. An Event Type is defined to be a classification of an Event Message such as debug, informational, critical, and error. Note: In order for this command to take effect, applications must be registered for Event Service.

Command Mnemonic(s) $sc_$cpu_EVS_EnaAppEvtType, $sc_$cpu_EVS_EnaAppEvtTypeMask

Command Structure

CFE_EVS_EnableAppEventTypeCmd_t The following bit positions apply to structure member named 'BitMask'. Bit 0 - Debug Bit 1 - Informational Bit 2 - Error Bit 3 - Critical A one in a bit position means the event type will be enabled (or unfiltered) for the specified application. A zero in a bit position means the filtering state is unchanged for the specified application.

Command Verification

Successful execution of this command may be verified with the following telemetry:

- **`$sc_$cpu_EVS_CMDPC`** - command execution counter will increment
- The generation of CFE_EVS_ENAAPPEVTTYPE_EID debug event message

Error Conditions

This command may fail for the following reason(s):

- BitMask field invalid - mask cannot be zero, and only bits 0-3 may be set
- Application name is not valid or not registered with event services

Evidence of failure may be found in the following telemetry:

- **`$sc_$cpu_EVS_CMDEC`** - command error counter will increment
- An Error specific event message

Criticality

Enabling an application event type is not particularly hazardous, as the result may be turning on necessary event messages and communication to the ground system. However, inappropriately enabling an application's event type could result in flooding of the ground system.

See also

CFE_EVS_ENABLE_EVENT_TYPE_CC, CFE_EVS_DISABLE_EVENT_TYPE_CC, CFE_EVS_DISABLE_APP_EVENT_TYPE_C
CFE_EVS_ENABLE_APP_EVENTS_CC, CFE_EVS_DISABLE_APP_EVENTS_CC

Definition at line 300 of file default_cfe_evs_fcncodes.h.

12.114.2.9 CFE_EVS_ENABLE_APP_EVENTS_CC `#define CFE_EVS_ENABLE_APP_EVENTS_CC 7`

Name Enable Event Services for an Application

Description

This command enables the command specified application to send events through the Event Service. Note: In order for this command to take effect, applications must be registered for Event Service.

Command Mnemonic(s) $sc_$cpu_EVS_EnaAppEvGen

Command Structure

CFE_EVS_EnableAppEventsCmd_t

Command Verification

Successful execution of this command may be verified with the following telemetry:

- **`$sc_$cpu_EVS_CMDPC`** - command execution counter will increment
- The generation of CFE_EVS_ENAAPPEVT_EID debug event message
- The setting of the Active Flag in The Active Flag in EVS App Data File

Error Conditions

This command may fail for the following reason(s):

- Application name is not valid or not registered with event services

Evidence of failure may be found in the following telemetry:

- **`$sc_$cpu_EVS_CMDEC`** - command error counter will increment
- An Error specific event message

Criticality

Enabling an application events is not particularly hazardous, as the result may be turning on necessary event messages and communication to the ground system. However, inappropriately enabling an application's events could result in flooding of the ground system.

See also

CFE_EVS_ENABLE_EVENT_TYPE_CC, CFE_EVS_DISABLE_EVENT_TYPE_CC, CFE_EVS_ENABLE_APP_EVENT_TYPE_CC
CFE_EVS_DISABLE_APP_EVENT_TYPE_CC, CFE_EVS_DISABLE_APP_EVENTS_CC

Definition at line 392 of file default_cfe_evs_fcncodes.h.

12.114.2.10 CFE_EVS_ENABLE_EVENT_TYPE_CC `#define CFE_EVS_ENABLE_EVENT_TYPE_CC 2`

Name Enable Event Type

Description

This command enables the command specified Event Type allowing event messages of this type to be sent through Event Service. An Event Type is defined to be a classification of an Event Message such as debug, informational, error and critical. This command is a global enable of a particular event type, it applies to all applications.

Command Mnemonic(s) $sc_$cpu_EVS_EnaEventType, $sc_$cpu_EVS_EnaEventTypeMask

Command Structure

CFE_EVS_EnableEventTypeCmd_t The following bit positions apply to structure member named 'BitMask'. Bit 0 - Debug Bit 1 - Informational Bit 2 - Error Bit 3 - Critical A one in a bit position means the event type will be enabled (or unfiltered). A zero in a bit position means the filtering state is unchanged.

Command Verification

Successful execution of this command may be verified with the following telemetry:

- **`$sc_$cpu_EVS_CMDPC`** - command execution counter will increment
- The generation of CFE_EVS_ENAEVTTYPE_EID debug message

Error Conditions

This command may fail for the following reason(s):

- BitMask field invalid - mask cannot be zero, and only bits 0-3 may be set

Evidence of failure may be found in the following telemetry:

- **$sc_$cpu_EVS_CMDEC -** command error counter will increment
- An Error specific event message

Criticality

Enabling an event type is not particularly hazardous, as the result may be turning on necessary event messages and communication to the ground system. However, inappropriately enabling an event type could result in flooding of the system.

See also

CFE_EVS_DISABLE_EVENT_TYPE_CC, CFE_EVS_ENABLE_APP_EVENT_TYPE_CC, CFE_EVS_DISABLE_APP_EVENT_TYI
CFE_EVS_ENABLE_APP_EVENTS_CC, CFE_EVS_DISABLE_APP_EVENTS_CC

Definition at line 152 of file default_cfe_evs_fcncodes.h.

12.114.2.11 CFE_EVS_ENABLE_PORTS_CC `#define CFE_EVS_ENABLE_PORTS_CC 11`

Name Enable Event Services Output Ports

Description

This command enables the command specified port to output event messages

Command Mnemonic(s) $sc_$cpu_EVS_EnaPort, $sc_$cpu_EVS_EnaPortMask

Command Structure

CFE_EVS_EnablePortsCmd_t The following bit positions apply to structure member named 'BitMask'. Bit 0 - Port 1 Bit 1 - Port 2 Bit 2 - Port 3 Bit 3 - Port 4 A one in a bit position means the port will be enabled. A zero in a bit position means the port state is unchanged.

Command Verification

Successful execution of this command may be verified with the following telemetry:

- **$sc_$cpu_EVS_CMDPC -** command execution counter will increment
- The generation of CFE_EVS_ENAPORT_EID debug event message

Error Conditions

This command may fail for the following reason(s):

- BitMask field invalid - mask cannot be zero, and only bits 0-3 may be set

Evidence of failure may be found in the following telemetry:

- **$sc_$cpu_EVS_CMDEC -** command error counter will increment
- An Error specific event message

Criticality

None.

See also

CFE_EVS_DISABLE_PORTS_CC

Definition at line 548 of file default_cfe_evs_fcncodes.h.

12.114.2.12 CFE_EVS_NOOP_CC `#define CFE_EVS_NOOP_CC 0`

Name Event Services No-Op

Description

This command performs no other function than to increment the command execution counter. The command may be used to verify general aliveness of the Event Services task.

Command Mnemonic(s) $sc_$cpu_EVS_NOOP

Command Structure

CFE_EVS_NoopCmd_t

Command Verification

Successful execution of this command may be verified with the following telemetry:

- **`$sc_$cpu_EVS_CMDPC`** - command execution counter will increment
- The CFE_EVS_NOOP_EID informational event message will be generated

Error Conditions

There are no error conditions for this command. If the Event Services receives the command, the event is sent (although it may be filtered by EVS itself) and the counter is incremented unconditionally.

Criticality

None

See also

Definition at line 65 of file default_cfe_evs_fcncodes.h.

12.114.2.13 CFE_EVS_RESET_ALL_FILTERS_CC `#define CFE_EVS_RESET_ALL_FILTERS_CC 14`

Name Reset All Event Filters for an Application

Description

This command resets all of the command specified applications event filters. Note: In order for this command to take effect, applications must be registered for Event Service.

Command Mnemonic(s) $sc_$cpu_EVS_RstAllFltrs

Command Structure

CFE_EVS_ResetAllFiltersCmd_t

Command Verification

Successful execution of this command may be verified with the following telemetry:

- **`$sc_$cpu_EVS_CMDPC`** - command execution counter will increment
- The generation of CFE_EVS_RSTALLFILTER_EID debug event message

Error Conditions

This command may fail for the following reason(s):

- Application name is not valid or not registered with event services

Evidence of failure may be found in the following telemetry:

- **`$sc_$cpu_EVS_CMDEC`** - command error counter will increment
- An Error specific event message

Criticality

None.

See also

CFE_EVS_SET_FILTER_CC, CFE_EVS_RESET_FILTER_CC, CFE_EVS_ADD_EVENT_FILTER_CC, CFE_EVS_DELETE_EVENT_FILTER_CC

Definition at line 657 of file default_cfe_evs_fcncodes.h.

12.114.2.14 CFE_EVS_RESET_APP_COUNTER_CC `#define CFE_EVS_RESET_APP_COUNTER_CC 9`

Name Reset Application Event Counters

Description

This command sets the command specified application's event counter to zero. Note: In order for this command to take effect, applications must be registered for Event Service.

Command Mnemonic(s) $sc_$cpu_EVS_RstAppCtrs

Command Structure

CFE_EVS_ResetAppCounterCmd_t

Command Verification

Successful execution of this command may be verified with the following telemetry:

- **$sc_$cpu_EVS_CMDPC -** command execution counter will increment
- The generation of CFE_EVS_RSTEVTCNT_EID debug event message

Error Conditions

This command may fail for the following reason(s):

- Application name is not valid or not registered with event services

Evidence of failure may be found in the following telemetry:

- **$sc_$cpu_EVS_CMDEC -** command error counter will increment
- An Error specific event message

Criticality

This command is not inherently dangerous. However, it is possible for ground systems and on-board safing procedures to be designed such that they react to changes in the counter value that is reset by this command.

See also

CFE_EVS_RESET_COUNTERS_CC

Definition at line 467 of file default_cfe_evs_fcncodes.h.

12.114.2.15 CFE_EVS_RESET_COUNTERS_CC `#define CFE_EVS_RESET_COUNTERS_CC 1`

Name Event Services Reset Counters

Description

This command resets the following counters within the Event Services housekeeping telemetry:

- Command Execution Counter ($sc_$cpu_EVS_CMDPC)
- Command Error Counter ($sc_$cpu_EVS_CMDEC)

Command Mnemonic(s) $sc_$cpu_EVS_ResetCtrs

Command Structure

CFE_EVS_ResetCountersCmd_t

Command Verification

Successful execution of this command may be verified with the following telemetry:

- **$sc_$cpu_EVS_CMDPC -** command execution counter will be reset to 0
- **$sc_$cpu_EVS_CMDEC -** command error counter will be reset to 0
- The CFE_EVS_RSTCNT_EID debug event message will be generated

Error Conditions

There are no error conditions for this command. If the Event Services receives the command, the event is sent (although it may be filtered by EVS) and the counter is incremented unconditionally.

Criticality

This command is not inherently dangerous. However, it is possible for ground systems and on-board safing procedures to be designed such that they react to changes in the counter values that are reset by this command.

See also

CFE_EVS_RESET_APP_COUNTER_CC

Definition at line 104 of file default_cfe_evs_fcncodes.h.

12.114.2.16 CFE_EVS_RESET_FILTER_CC `#define CFE_EVS_RESET_FILTER_CC 13`

Name Reset an Event Filter for an Application

Description

This command resets the command specified application's event filter for the command specified event ID. Note: In order for this command to take effect, applications must be registered for Event Service.

Command Mnemonic(s) $sc_$cpu_EVS_RstBinFltrCtr

Command Structure

CFE_EVS_ResetFilterCmd_t

Command Verification

Successful execution of this command may be verified with the following telemetry:

- **`$sc_$cpu_EVS_CMDPC`** - command execution counter will increment
- The generation of CFE_EVS_RSTFILTER_EID debug event message

Error Conditions

This command may fail for the following reason(s):

- Application name is not valid or not registered with event services
- Specified event ID is not found in the application event filter

Evidence of failure may be found in the following telemetry:

- **`$sc_$cpu_EVS_CMDEC`** - command error counter will increment
- An Error specific event message

Criticality

None.

See also

CFE_EVS_SET_FILTER_CC, CFE_EVS_RESET_ALL_FILTERS_CC, CFE_EVS_ADD_EVENT_FILTER_CC, CFE_EVS_DELETE_EVENT_FILTER_CC

Definition at line 623 of file default_cfe_evs_fcncodes.h.

12.114.2.17 CFE_EVS_SET_EVENT_FORMAT_MODE_CC `#define CFE_EVS_SET_EVENT_FORMAT_MODE_CC 4`

Name Set Event Format Mode

Description

This command sets the event format mode to the command specified value. The event format mode may be either short or long. A short event format detaches the Event Data from the event message and only includes the following information in the event packet: Processor ID, Application ID, Event ID, and Event Type. Refer to section 5.3.3.4 for a description of the Event Service event packet contents. Event Data is defined to be data describing an Event that is supplied to the cFE Event Service. ASCII text strings are used as the primary format for Event Data because heritage ground systems use string compares as the basis for their automated alert systems. Two systems, ANSR and SERS were looked at for interface definitions. The short event format is used to accommodate experiences with limited telemetry bandwidth. The long event format includes all event information included within the short format along with the Event Data.

Command Mnemonic(s) $sc_$cpu_EVS_SetEvtFmt

Command Structure

CFE_EVS_SetEventFormatModeCmd_t

Command Verification

Successful execution of this command may be verified with the following telemetry:

- **`$sc_$cpu_EVS_CMDPC`** - command execution counter will increment
- The generation of CFE_EVS_SETEVTFMTMOD_EID debug message

Error Conditions

This command may fail for the following reason(s):

- Invalid MsgFormat mode selection

Evidence of failure may be found in the following telemetry:

- **`$sc_$cpu_EVS_CMDEC`** - command error counter will increment
- An Error specific event message

Criticality

Setting the event format mode is not particularly hazardous, as the result may be saving necessary bandwidth. However, inappropriately setting the event format mode could result in a loss of information and missed behavior for the ground system

See also

Definition at line 248 of file default_cfe_evs_fcncodes.h.

12.114.2.18 CFE_EVS_SET_FILTER_CC `#define CFE_EVS_SET_FILTER_CC 10`

Name Set Application Event Filter

Description

This command sets the command specified application's event filter mask to the command specified value for the command specified event. Note: In order for this command to take effect, applications must be registered for Event Service.

Command Mnemonic(s) $sc_$cpu_EVS_SetBinFltrMask

Command Structure

CFE_EVS_SetFilterCmd_t

Command Verification

Successful execution of this command may be verified with the following telemetry:

- **`$sc_$cpu_EVS_CMDPC`** - command execution counter will increment
- The generation of CFE_EVS_SETFILTERMSK_EID debug event message

Error Conditions

This command may fail for the following reason(s):

- Application name is not valid or not registered with event services
- Specified event ID is not found in the application event filter

Evidence of failure may be found in the following telemetry:

- **`$sc_$cpu_EVS_CMDEC`** - command error counter will increment
- An Error specific event message

Criticality

Setting an application event filter mask is not particularly hazardous, as the result may be shutting off unnecessary event messages and possible event flooding of the system. However, inappropriately setting an application's event filter mask could result in a loss of critical information and missed behavior for the ground system or flooding of the ground system.

See also

CFE_EVS_RESET_FILTER_CC, CFE_EVS_RESET_ALL_FILTERS_CC, CFE_EVS_ADD_EVENT_FILTER_CC, CFE_EVS_DELETE_EVENT_FILTER_CC

Definition at line 509 of file default_cfe_evs_fcncodes.h.

12.114.2.19 CFE_EVS_SET_LOG_MODE_CC `#define CFE_EVS_SET_LOG_MODE_CC 19`

Name Set Logging Mode

Description

This command sets the logging mode to the command specified value.

Command Mnemonic(s) $sc_$cpu_EVS_SetLogMode

Command Structure

CFE_EVS_SetLogModeCmd_t

Command Verification

Successful execution of this command may be verified with the following telemetry:

- **`$sc_$cpu_EVS_CMDPC`** - command execution counter will increment
- The generation of CFE_EVS_LOGMODE_EID debug event message

Error Conditions

This command may fail for the following reason(s):

- Invalid LogMode selected - must be either CFE_EVS_LogMode_OVERWRITE or CFE_EVS_LogMode_DISCARD

Evidence of failure may be found in the following telemetry:

- **`$sc_$cpu_EVS_CMDEC`** - command error counter will increment
- An Error specific event message

Criticality

Setting the event logging mode is not particularly hazardous, as the result may be saving valuable event data. However, inappropriately setting the log mode could result in a loss of critical information. Note: the event log is a back-up log to the on-board recorder.

See also

CFE_EVS_WRITE_LOG_DATA_FILE_CC, CFE_EVS_CLEAR_LOG_CC

Definition at line 838 of file default_cfe_evs_fcncodes.h.

12.114.2.20 CFE_EVS_WRITE_APP_DATA_FILE_CC `#define CFE_EVS_WRITE_APP_DATA_FILE_CC 17`

Name Write Event Services Application Information to File

Description

This command writes all application data to a file for all applications that have registered with the EVS. The application data includes the Application ID, Active Flag, Event Count, Event Types Active Flag, and Filter Data.

Command Mnemonic(s) $sc_$cpu_EVS_WriteAppData2File

Command Structure

CFE_EVS_WriteAppDataFileCmd_t

Command Verification

Successful execution of this command may be verified with the following telemetry:

- **`$sc_$cpu_EVS_CMDPC`** - command execution counter will increment
- The generation of CFE_EVS_WRDAT_EID debug event message
- The file specified in the command (or the default specified by the CFE_PLATFORM_EVS_DEFAULT_APP_DATA_FILE configuration parameter) will be updated with the latest information.

Error Conditions

This command may fail for the following reason(s):

- The specified FileName cannot be parsed
- An Error occurs while trying to write to the file

Evidence of failure may be found in the following telemetry:

- **`$sc_$cpu_EVS_CMDEC`** - command error counter will increment
- An Error specific event message

Criticality

Writing a file is not particularly hazardous, but if proper file management is not taken, then the file system can fill up if this command is used repeatedly.

See also

CFE_EVS_WRITE_LOG_DATA_FILE_CC, CFE_EVS_SET_LOG_MODE_CC

Definition at line 767 of file default_cfe_evs_fcncodes.h.

12.114.2.21 CFE_EVS_WRITE_LOG_DATA_FILE_CC `#define CFE_EVS_WRITE_LOG_DATA_FILE_CC 18`

Name Write Event Log to File

Description

This command requests the Event Service to generate a file containing the contents of the local event log.

Command Mnemonic(s) $sc_$cpu_EVS_WriteLog2File

Command Structure

CFE_EVS_WriteLogDataFileCmd_t

Command Verification

Successful execution of this command may be verified with the following telemetry:

- **`$sc_$cpu_EVS_CMDPC`** - command execution counter will increment
- The generation of CFE_EVS_WRLOG_EID debug event message

Error Conditions

This command may fail for the following reason(s):

- The specified FileName cannot be parsed
- An Error occurs while trying to write to the file

Evidence of failure may be found in the following telemetry:

- **`$sc_$cpu_EVS_CMDEC`** - command error counter will increment
- An Error specific event message

Criticality

Writing a file is not particularly hazardous, but if proper file management is not taken, then the file system can fill up if this command is used repeatedly.

See also

CFE_EVS_WRITE_APP_DATA_FILE_CC, CFE_EVS_SET_LOG_MODE_CC, CFE_EVS_CLEAR_LOG_CC

Definition at line 802 of file default_cfe_evs_fcncodes.h.

12.115 cfe/modules/evs/config/default_cfe_evs_interface_cfg.h File Reference

Macros

- #define CFE_MISSION_EVS_MAX_MESSAGE_LENGTH 122

12.115.1 Detailed Description

CFE Event Services (CFE_EVS) Application Public Definitions
This provides default values for configurable items that affect the interface(s) of this module. This includes the CMD/TLM message interface, tables definitions, and any other data products that serve to exchange information with other entities.

Note

This file may be overridden/superceded by mission-provided definitions either by overriding this header or by generating definitions from a command/data dictionary tool.

12.115.2 Macro Definition Documentation

12.115.2.1 CFE_MISSION_EVS_MAX_MESSAGE_LENGTH `#define CFE_MISSION_EVS_MAX_MESSAGE_LENG↩ TH 122`

Purpose Maximum Event Message Length

Description:

Indicates the maximum length (in characters) of the formatted text string portion of an event message

This length does not need to include an extra character for NULL termination.

Limits

Not Applicable

Definition at line 47 of file default_cfe_evs_interface_cfg.h.

12.116 cfe/modules/evs/config/default_cfe_evs_internal_cfg.h File Reference

Macros

- #define CFE_PLATFORM_EVS_START_TASK_PRIORITY 61
- #define CFE_PLATFORM_EVS_START_TASK_STACK_SIZE CFE_PLATFORM_ES_DEFAULT_STACK_SIZE
- #define CFE_PLATFORM_EVS_MAX_EVENT_FILTERS 8
- #define CFE_PLATFORM_EVS_MAX_APP_EVENT_BURST 32
- #define CFE_PLATFORM_EVS_APP_EVENTS_PER_SEC 15
- #define CFE_PLATFORM_EVS_DEFAULT_LOG_FILE "/ram/cfe_evs.log"
- #define CFE_PLATFORM_EVS_LOG_MAX 20
- #define CFE_PLATFORM_EVS_DEFAULT_APP_DATA_FILE "/ram/cfe_evs_app.dat"
- #define CFE_PLATFORM_EVS_PORT_DEFAULT 0x0001
- #define CFE_PLATFORM_EVS_DEFAULT_TYPE_FLAG 0xE
- #define CFE_PLATFORM_EVS_DEFAULT_LOG_MODE 1
- #define CFE_PLATFORM_EVS_DEFAULT_MSG_FORMAT_MODE CFE_EVS_MsgFormat_LONG

12.116.1 Detailed Description

CFE Event Services (CFE_EVS) Application Private Config Definitions
This provides default values for configurable items that are internal to this module and do NOT affect the interface(s) of this module. Changes to items in this file only affect the local module and will be transparent to external entities that are using the public interface(s).

Note

This file may be overridden/superceded by mission-provided definitions either by overriding this header or by generating definitions from a command/data dictionary tool.

12.116.2 Macro Definition Documentation

12.116.2.1 CFE_PLATFORM_EVS_APP_EVENTS_PER_SEC `#define CFE_PLATFORM_EVS_APP_EVENTS_PER_SEC 15`

Purpose Sustained number of event messages per second per app before squelching

Description:

Sustained number of events that may be emitted per app per second.

Limits

This number must be less than or equal to CFE_PLATFORM_EVS_MAX_APP_EVENT_BURST. Values lower than 8 may cause functional and unit test failures.

Definition at line 96 of file default_cfe_evs_internal_cfg.h.

12.116.2.2 CFE_PLATFORM_EVS_DEFAULT_APP_DATA_FILE `#define CFE_PLATFORM_EVS_DEFAULT_APP_DATA_FILE "/ram/cfe_evs_app.dat"`

Purpose Default EVS Application Data Filename

Description:

The value of this constant defines the filename used to store the EVS Application Data(event counts/filtering information). This filename is used only when no filename is specified in the command to dump the event log.

Limits

The length of each string, including the NULL terminator cannot exceed the OS_MAX_PATH_LEN value.

Definition at line 137 of file default_cfe_evs_internal_cfg.h.

12.116.2.3 CFE_PLATFORM_EVS_DEFAULT_LOG_FILE `#define CFE_PLATFORM_EVS_DEFAULT_LOG_FI↩ LE "/ram/cfe_evs.log"`

Purpose Default Event Log Filename

Description:

The value of this constant defines the filename used to store the Event Services local event log. This filename is used only when no filename is specified in the command to dump the event log.

Limits

The length of each string, including the NULL terminator cannot exceed the OS_MAX_PATH_LEN value.

Definition at line 110 of file default_cfe_evs_internal_cfg.h.

12.116.2.4 CFE_PLATFORM_EVS_DEFAULT_LOG_MODE `#define CFE_PLATFORM_EVS_DEFAULT_LOG_MODE 1`

Purpose Default EVS Local Event Log Mode

Description:

Defines a state of overwrite(0) or discard(1) for the operation of the EVS local event log. The log may operate in either Overwrite mode = 0, where once the log becomes full the oldest event in the log will be overwritten, or Discard mode = 1, where once the log becomes full the contents of the log are preserved and the new event is discarded. Overwrite Mode = 0, Discard Mode = 1.

Limits

The valid settings are 0 or 1

Definition at line 184 of file default_cfe_evs_internal_cfg.h.

12.116.2.5 CFE_PLATFORM_EVS_DEFAULT_MSG_FORMAT_MODE `#define CFE_PLATFORM_EVS_DEFAULT_↩ MSG_FORMAT_MODE CFE_EVS_MsgFormat_LONG`

Purpose Default EVS Message Format Mode

Description:

Defines the default message format (long or short) for event messages being sent to the ground. Choose between CFE_EVS_MsgFormat_LONG or CFE_EVS_MsgFormat_SHORT.

Limits

The valid settings are CFE_EVS_MsgFormat_LONG or CFE_EVS_MsgFormat_SHORT

Definition at line 197 of file default_cfe_evs_internal_cfg.h.

12.116.2.6 CFE_PLATFORM_EVS_DEFAULT_TYPE_FLAG `#define CFE_PLATFORM_EVS_DEFAULT_TYPE_FL↩ AG 0xE`

Purpose Default EVS Event Type Filter Mask

Description:

Defines a state of on or off for all four event types. The term event 'type' refers to the criticality level and may be Debug, Informational, Error or Critical. Each event type has a bit position. (bit 0 = Debug, bit 1 = Info, bit 2 = Error, bit 3 = Critical). This is a global setting, meaning it applies to all applications. To filter an event type, set its bit to zero. For example, 0xE means Debug = OFF, Info = ON, Error = ON, Critical = ON

Limits

The valid settings are 0x0 to 0xF.

Definition at line 168 of file default_cfe_evs_internal_cfg.h.

12.116.2.7 CFE_PLATFORM_EVS_LOG_MAX `#define CFE_PLATFORM_EVS_LOG_MAX 20`

Purpose Maximum Number of Events in EVS Local Event Log

Description:

Dictates the EVS local event log capacity. Units are the number of events.

Limits

There are no restrictions on the lower and upper limits however, the maximum log size is system dependent and should be verified.

Definition at line 122 of file default_cfe_evs_internal_cfg.h.

12.116.2.8 CFE_PLATFORM_EVS_MAX_APP_EVENT_BURST `#define CFE_PLATFORM_EVS_MAX_APP_EVENT_↩ BURST 32`

Purpose Maximum number of event before squelching

Description:

Maximum number of events that may be emitted per app per second. Setting this to 0 will cause events to be unrestricted.

Limits

This number must be less than or equal to INT_MAX/1000

Definition at line 84 of file default_cfe_evs_internal_cfg.h.

12.116.2.9 CFE_PLATFORM_EVS_MAX_EVENT_FILTERS `#define CFE_PLATFORM_EVS_MAX_EVENT_FILTERS 8`

Purpose Define Maximum Number of Event Filters per Application

Description:

Maximum number of events that may be filtered per application.

Limits

There are no restrictions on the lower and upper limits however, the maximum number of event filters is system dependent and should be verified.

Definition at line 72 of file default_cfe_evs_internal_cfg.h.

12.116.2.10 CFE_PLATFORM_EVS_PORT_DEFAULT `#define CFE_PLATFORM_EVS_PORT_DEFAULT 0x0001`

Purpose Default EVS Output Port State

Description:

Defines the default port state (enabled or disabled) for the four output ports defined within the Event Service. Port 1 is usually the uart output terminal. To enable a port, set the proper bit to a 1. Bit 0 is port 1, bit 1 is port2 etc.

Limits

The valid settings are 0x0 to 0xF.

Definition at line 151 of file default_cfe_evs_internal_cfg.h.

12.116.2.11 CFE_PLATFORM_EVS_START_TASK_PRIORITY `#define CFE_PLATFORM_EVS_START_TASK_PRIO↩ RITY 61`

Purpose Define EVS Task Priority

Description:

Defines the cFE_EVS Task priority.

Limits

Not Applicable

Definition at line 44 of file default_cfe_evs_internal_cfg.h.

12.116.2.12 CFE_PLATFORM_EVS_START_TASK_STACK_SIZE `#define CFE_PLATFORM_EVS_START_TASK_S↩ TACK_SIZE CFE_PLATFORM_ES_DEFAULT_STACK_SIZE`

Purpose Define EVS Task Stack Size

Description:

Defines the cFE_EVS Task Stack Size

Limits

There is a lower limit of 2048 on this configuration parameter. There are no restrictions on the upper limit however, the maximum stack size is system dependent and should be verified. Most operating systems provide tools for measuring the amount of stack used by a task during operation. It is always a good idea to verify that no more than 1/2 of the stack is used.

Definition at line 59 of file default_cfe_evs_internal_cfg.h.

12.117 cfe/modules/evs/config/default_cfe_evs_mission_cfg.h File Reference

```
#include "cfe_evs_interface_cfg.h"
```

12.117.1 Detailed Description

CFE Event Services (CFE_EVS) Application Mission Configuration Header File
This is a compatibility header for the "mission_cfg.h" file that has traditionally provided public config definitions for each CFS app.

Note

This file may be overridden/superceded by mission-provided definitions either by overriding this header or by generating definitions from a command/data dictionary tool.

12.118 cfe/modules/evs/config/default_cfe_evs_msg.h File Reference

```
#include "cfe_mission_cfg.h"
#include "cfe_evs_fcncodes.h"
#include "cfe_evs_msgdefs.h"
#include "cfe_evs_msgstruct.h"
```

12.118.1 Detailed Description

Specification for the CFE Event Services (CFE_EVS) command and telemetry message data types.
This is a compatibility header for the "cfe_evs_msg.h" file that has traditionally provided the message definitions for cFS apps.

Note

This file may be overridden/superceded by mission-provided definitions either by overriding this header or by generating definitions from a command/data dictionary tool.

12.119 cfe/modules/evs/config/default_cfe_evs_msgdefs.h File Reference

```
#include "common_types.h"
#include "cfe_mission_cfg.h"
#include "cfe_es_extern_typedefs.h"
#include "cfe_evs_extern_typedefs.h"
#include "cfe_evs_fcncodes.h"
```

Data Structures

- struct CFE_EVS_LogFileCmd_Payload

  Write Event Log to File Command Payload.
- struct CFE_EVS_AppDataCmd_Payload

  Write Event Services Application Information to File Command Payload.
- struct CFE_EVS_SetLogMode_Payload

  Set Log Mode Command Payload.
- struct CFE_EVS_SetEventFormatCode_Payload

  Set Event Format Mode Command Payload.
- struct CFE_EVS_BitMaskCmd_Payload

  Generic Bitmask Command Payload.

- struct CFE_EVS_AppNameCmd_Payload

  Generic App Name Command Payload.
- struct CFE_EVS_AppNameEventIDCmd_Payload

  Generic App Name and Event ID Command Payload.
- struct CFE_EVS_AppNameBitMaskCmd_Payload

  Generic App Name and Bitmask Command Payload.
- struct CFE_EVS_AppNameEventIDMaskCmd_Payload

  Generic App Name, Event ID, Mask Command Payload.
- struct CFE_EVS_AppTlmData
- struct CFE_EVS_HousekeepingTlm_Payload
- struct CFE_EVS_PacketID
- struct CFE_EVS_LongEventTlm_Payload
- struct CFE_EVS_ShortEventTlm_Payload

Macros

- #define CFE_EVS_DEBUG_BIT 0x0001
- #define CFE_EVS_INFORMATION_BIT 0x0002
- #define CFE_EVS_ERROR_BIT 0x0004
- #define CFE_EVS_CRITICAL_BIT 0x0008
- #define CFE_EVS_PORT1_BIT 0x0001
- #define CFE_EVS_PORT2_BIT 0x0002
- #define CFE_EVS_PORT3_BIT 0x0004
- #define CFE_EVS_PORT4_BIT 0x0008

Typedefs

- typedef struct CFE_EVS_LogFileCmd_Payload CFE_EVS_LogFileCmd_Payload_t

  Write Event Log to File Command Payload.
- typedef struct CFE_EVS_AppDataCmd_Payload CFE_EVS_AppDataCmd_Payload_t

  Write Event Services Application Information to File Command Payload.
- typedef struct CFE_EVS_SetLogMode_Payload CFE_EVS_SetLogMode_Payload_t

  Set Log Mode Command Payload.
- typedef struct CFE_EVS_SetEventFormatCode_Payload CFE_EVS_SetEventFormatMode_Payload_t

  Set Event Format Mode Command Payload.
- typedef struct CFE_EVS_BitMaskCmd_Payload CFE_EVS_BitMaskCmd_Payload_t

  Generic Bitmask Command Payload.
- typedef struct CFE_EVS_AppNameCmd_Payload CFE_EVS_AppNameCmd_Payload_t

  Generic App Name Command Payload.
- typedef struct CFE_EVS_AppNameEventIDCmd_Payload CFE_EVS_AppNameEventIDCmd_Payload_t

  Generic App Name and Event ID Command Payload.
- typedef struct CFE_EVS_AppNameBitMaskCmd_Payload CFE_EVS_AppNameBitMaskCmd_Payload_t

  Generic App Name and Bitmask Command Payload.
- typedef struct CFE_EVS_AppNameEventIDMaskCmd_Payload CFE_EVS_AppNameEventIDMaskCmd_Payload_t

  Generic App Name, Event ID, Mask Command Payload.
- typedef struct CFE_EVS_AppTlmData CFE_EVS_AppTlmData_t
- typedef struct CFE_EVS_HousekeepingTlm_Payload CFE_EVS_HousekeepingTlm_Payload_t
- typedef struct CFE_EVS_PacketID CFE_EVS_PacketID_t
- typedef struct CFE_EVS_LongEventTlm_Payload CFE_EVS_LongEventTlm_Payload_t
- typedef struct CFE_EVS_ShortEventTlm_Payload CFE_EVS_ShortEventTlm_Payload_t

12.119.1 Detailed Description

Specification for the CFE Event Services (CFE_EVS) command and telemetry message constant definitions.
For CFE_EVS this is only the function/command code definitions

12.119.2 Macro Definition Documentation

12.119.2.1 CFE_EVS_CRITICAL_BIT `#define CFE_EVS_CRITICAL_BIT 0x0008`

Definition at line 39 of file default_cfe_evs_msgdefs.h.

12.119.2.2 CFE_EVS_DEBUG_BIT `#define CFE_EVS_DEBUG_BIT 0x0001`

Definition at line 36 of file default_cfe_evs_msgdefs.h.

12.119.2.3 CFE_EVS_ERROR_BIT `#define CFE_EVS_ERROR_BIT 0x0004`

Definition at line 38 of file default_cfe_evs_msgdefs.h.

12.119.2.4 CFE_EVS_INFORMATION_BIT `#define CFE_EVS_INFORMATION_BIT 0x0002`

Definition at line 37 of file default_cfe_evs_msgdefs.h.

12.119.2.5 CFE_EVS_PORT1_BIT `#define CFE_EVS_PORT1_BIT 0x0001`

Definition at line 42 of file default_cfe_evs_msgdefs.h.

12.119.2.6 CFE_EVS_PORT2_BIT `#define CFE_EVS_PORT2_BIT 0x0002`

Definition at line 43 of file default_cfe_evs_msgdefs.h.

12.119.2.7 CFE_EVS_PORT3_BIT `#define CFE_EVS_PORT3_BIT 0x0004`

Definition at line 44 of file default_cfe_evs_msgdefs.h.

12.119.2.8 CFE_EVS_PORT4_BIT `#define CFE_EVS_PORT4_BIT 0x0008`

Definition at line 45 of file default_cfe_evs_msgdefs.h.

12.119.3 Typedef Documentation

12.119.3.1 CFE_EVS_AppDataCmd_Payload_t `typedef struct CFE_EVS_AppDataCmd_Payload CFE_EVS_AppDataCmd_Payload_t`

Write Event Services Application Information to File Command Payload.
For command details, see CFE_EVS_WRITE_APP_DATA_FILE_CC

12.119.3.2 CFE_EVS_AppNameBitMaskCmd_Payload_t `typedef struct CFE_EVS_AppNameBitMaskCmd_Payload CFE_EVS_AppNameBitMaskCmd_Payload_t`

Generic App Name and Bitmask Command Payload.
For command details, see CFE_EVS_ENABLE_APP_EVENT_TYPE_CC and/or CFE_EVS_DISABLE_APP_EVENT_TYPE_CC

12.119.3.3 CFE_EVS_AppNameCmd_Payload_t `typedef struct CFE_EVS_AppNameCmd_Payload CFE_EVS_AppNameCmd_Payload_`

Generic App Name Command Payload.
For command details, see CFE_EVS_ENABLE_APP_EVENTS_CC, CFE_EVS_DISABLE_APP_EVENTS_CC, CFE_EVS_RESET_APP_COUNTER_CC and/or CFE_EVS_RESET_ALL_FILTERS_CC

12.119.3.4 CFE_EVS_AppNameEventIDCmd_Payload_t `typedef struct CFE_EVS_AppNameEventIDCmd_Payload CFE_EVS_AppNameEventIDCmd_Payload_t`

Generic App Name and Event ID Command Payload.
For command details, see CFE_EVS_RESET_FILTER_CC and CFE_EVS_DELETE_EVENT_FILTER_CC

12.119.3.5 CFE_EVS_AppNameEventIDMaskCmd_Payload_t `typedef struct CFE_EVS_AppNameEventIDMaskCmd_Payload CFE_EVS_AppNameEventIDMaskCmd_Payload_t`

Generic App Name, Event ID, Mask Command Payload.
For command details, see CFE_EVS_SET_FILTER_CC, CFE_EVS_ADD_EVENT_FILTER_CC and/or CFE_EVS_DELETE_EVENT_FIL

12.119.3.6 CFE_EVS_AppTlmData_t `typedef struct CFE_EVS_AppTlmData CFE_EVS_AppTlmData_t`

12.119.3.7 CFE_EVS_BitMaskCmd_Payload_t `typedef struct CFE_EVS_BitMaskCmd_Payload CFE_EVS_BitMaskCmd_Payload_t`

Generic Bitmask Command Payload.
For command details, see CFE_EVS_ENABLE_EVENT_TYPE_CC, CFE_EVS_DISABLE_EVENT_TYPE_CC, CFE_EVS_ENABLE_PORTS_CC and/or CFE_EVS_DISABLE_PORTS_CC

12.119.3.8 CFE_EVS_HousekeepingTlm_Payload_t `typedef struct CFE_EVS_HousekeepingTlm_Payload CFE_EVS_HousekeepingTlm_Payload_t`

Name Event Services Housekeeping Telemetry Packet

12.119.3.9 CFE_EVS_LogFileCmd_Payload_t `typedef struct CFE_EVS_LogFileCmd_Payload CFE_EVS_LogFileCmd_Payload_t`

Write Event Log to File Command Payload.
For command details, see CFE_EVS_WRITE_LOG_DATA_FILE_CC

12.119.3.10 CFE_EVS_LongEventTlm_Payload_t `typedef struct CFE_EVS_LongEventTlm_Payload CFE_EVS_LongEventTlm_Pay`

Name Event Message Telemetry Packet (Long format)

12.119.3.11 CFE_EVS_PacketID_t `typedef struct CFE_EVS_PacketID CFE_EVS_PacketID_t`

Telemetry packet structures

12.119.3.12 CFE_EVS_SetEventFormatMode_Payload_t `typedef struct CFE_EVS_SetEventFormatCode_Payload CFE_EVS_SetEventFormatMode_Payload_t`

Set Event Format Mode Command Payload.
For command details, see CFE_EVS_SET_EVENT_FORMAT_MODE_CC

12.119.3.13 CFE_EVS_SetLogMode_Payload_t `typedef struct CFE_EVS_SetLogMode_Payload CFE_EVS_SetLogMode_Payload_`

Set Log Mode Command Payload.
For command details, see CFE_EVS_SET_LOG_MODE_CC

12.119.3.14 CFE_EVS_ShortEventTlm_Payload_t `typedef struct CFE_EVS_ShortEventTlm_Payload CFE_EVS_ShortEventTlm_`

Name Event Message Telemetry Packet (Short format)

12.120 cfe/modules/evs/config/default_cfe_evs_msgids.h File Reference

```
#include "cfe_core_api_base_msgids.h"
#include "cfe_evs_topicids.h"
```

Macros

- #define CFE_EVS_CMD_MID CFE_PLATFORM_CMD_TOPICID_TO_MIDV(CFE_MISSION_EVS_CMD_TOPICID) /∗ 0x1801 ∗/
- #define CFE_EVS_SEND_HK_MID CFE_PLATFORM_CMD_TOPICID_TO_MIDV(CFE_MISSION_EVS_SEND_HK_TOPICID) /∗ 0x1809 ∗/
- #define CFE_EVS_HK_TLM_MID CFE_PLATFORM_TLM_TOPICID_TO_MIDV(CFE_MISSION_EVS_HK_TLM_TOPICID) /∗ 0x0801 ∗/
- #define CFE_EVS_LONG_EVENT_MSG_MID
- #define CFE_EVS_SHORT_EVENT_MSG_MID CFE_PLATFORM_TLM_TOPICID_TO_MIDV(CFE_MISSION_EVS_SHORT_EVE /∗ 0x0809 ∗/

12.120.1 Detailed Description

CFE Event Services (CFE_EVS) Application Message IDs

12.120.2 Macro Definition Documentation

12.120.2.1 CFE_EVS_CMD_MID `#define CFE_EVS_CMD_MID CFE_PLATFORM_CMD_TOPICID_TO_MIDV(CFE_MISSION_EVS_CMD_TOPIC`

`/∗ 0x1801 ∗/`

Definition at line 32 of file default_cfe_evs_msgids.h.

12.120.2.2 CFE_EVS_HK_TLM_MID `#define CFE_EVS_HK_TLM_MID CFE_PLATFORM_TLM_TOPICID_TO_MIDV(CFE_MISSION_EVS_HK_`

`/∗ 0x0801 ∗/`

Definition at line 38 of file default_cfe_evs_msgids.h.

12.120.2.3 CFE_EVS_LONG_EVENT_MSG_MID `#define CFE_EVS_LONG_EVENT_MSG_MID`

Value:

```
CFE_PLATFORM_TLM_TOPICID_TO_MIDV(CFE_MISSION_EVS_LONG_EVENT_MSG_TOPICID) /* 0x0808 \
                                                                          */
```

Definition at line 39 of file default_cfe_evs_msgids.h.

12.120.2.4 CFE_EVS_SEND_HK_MID `#define CFE_EVS_SEND_HK_MID CFE_PLATFORM_CMD_TOPICID_TO_MIDV(CFE_MISSION_EVS_S`

`/∗ 0x1809 ∗/`

Definition at line 33 of file default_cfe_evs_msgids.h.

12.120.2.5 CFE_EVS_SHORT_EVENT_MSG_MID `#define CFE_EVS_SHORT_EVENT_MSG_MID CFE_PLATFORM_TLM_TOPICID_TO_MIDV`

`/∗ 0x0809 ∗/`

Definition at line 41 of file default_cfe_evs_msgids.h.

12.121 cfe/modules/evs/config/default_cfe_evs_msgstruct.h File Reference

```
#include "common_types.h"
#include "cfe_evs_msgdefs.h"
#include "cfe_evs_extern_typedefs.h"
#include "cfe_msg_hdr.h"
```

Data Structures

- struct CFE_EVS_NoopCmd
- struct CFE_EVS_ResetCountersCmd
- struct CFE_EVS_ClearLogCmd
- struct CFE_EVS_SendHkCmd
- struct CFE_EVS_WriteLogDataFileCmd

  Write Event Log to File Command.
- struct CFE_EVS_WriteAppDataFileCmd

  Write Event Services Application Information to File Command.
- struct CFE_EVS_SetLogModeCmd

  Set Log Mode Command.
- struct CFE_EVS_SetEventFormatModeCmd

  Set Event Format Mode Command.
- struct CFE_EVS_EnablePortsCmd
- struct CFE_EVS_DisablePortsCmd
- struct CFE_EVS_EnableEventTypeCmd
- struct CFE_EVS_DisableEventTypeCmd
- struct CFE_EVS_EnableAppEventsCmd
- struct CFE_EVS_DisableAppEventsCmd
- struct CFE_EVS_ResetAppCounterCmd
- struct CFE_EVS_ResetAllFiltersCmd
- struct CFE_EVS_ResetFilterCmd
- struct CFE_EVS_DeleteEventFilterCmd
- struct CFE_EVS_EnableAppEventTypeCmd
- struct CFE_EVS_DisableAppEventTypeCmd
- struct CFE_EVS_AddEventFilterCmd
- struct CFE_EVS_SetFilterCmd
- struct CFE_EVS_HousekeepingTlm
- struct CFE_EVS_LongEventTlm
- struct CFE_EVS_ShortEventTlm

Typedefs

- typedef struct CFE_EVS_NoopCmd CFE_EVS_NoopCmd_t
- typedef struct CFE_EVS_ResetCountersCmd CFE_EVS_ResetCountersCmd_t
- typedef struct CFE_EVS_ClearLogCmd CFE_EVS_ClearLogCmd_t
- typedef struct CFE_EVS_SendHkCmd CFE_EVS_SendHkCmd_t
- typedef struct CFE_EVS_WriteLogDataFileCmd CFE_EVS_WriteLogDataFileCmd_t

  Write Event Log to File Command.
- typedef struct CFE_EVS_WriteAppDataFileCmd CFE_EVS_WriteAppDataFileCmd_t

  Write Event Services Application Information to File Command.
- typedef struct CFE_EVS_SetLogModeCmd CFE_EVS_SetLogModeCmd_t

Set Log Mode Command.

- typedef struct CFE_EVS_SetEventFormatModeCmd CFE_EVS_SetEventFormatModeCmd_t

  Set Event Format Mode Command.
- typedef struct CFE_EVS_EnablePortsCmd CFE_EVS_EnablePortsCmd_t
- typedef struct CFE_EVS_DisablePortsCmd CFE_EVS_DisablePortsCmd_t
- typedef struct CFE_EVS_EnableEventTypeCmd CFE_EVS_EnableEventTypeCmd_t
- typedef struct CFE_EVS_DisableEventTypeCmd CFE_EVS_DisableEventTypeCmd_t
- typedef struct CFE_EVS_EnableAppEventsCmd CFE_EVS_EnableAppEventsCmd_t
- typedef struct CFE_EVS_DisableAppEventsCmd CFE_EVS_DisableAppEventsCmd_t
- typedef struct CFE_EVS_ResetAppCounterCmd CFE_EVS_ResetAppCounterCmd_t
- typedef struct CFE_EVS_ResetAllFiltersCmd CFE_EVS_ResetAllFiltersCmd_t
- typedef struct CFE_EVS_ResetFilterCmd CFE_EVS_ResetFilterCmd_t
- typedef struct CFE_EVS_DeleteEventFilterCmd CFE_EVS_DeleteEventFilterCmd_t
- typedef struct CFE_EVS_EnableAppEventTypeCmd CFE_EVS_EnableAppEventTypeCmd_t
- typedef struct CFE_EVS_DisableAppEventTypeCmd CFE_EVS_DisableAppEventTypeCmd_t
- typedef struct CFE_EVS_AddEventFilterCmd CFE_EVS_AddEventFilterCmd_t
- typedef struct CFE_EVS_SetFilterCmd CFE_EVS_SetFilterCmd_t
- typedef struct CFE_EVS_HousekeepingTlm CFE_EVS_HousekeepingTlm_t
- typedef struct CFE_EVS_LongEventTlm CFE_EVS_LongEventTlm_t
- typedef struct CFE_EVS_ShortEventTlm CFE_EVS_ShortEventTlm_t

12.121.1 Detailed Description

Purpose: cFE Executive Services (EVS) Command and Telemetry packet definition file.
References: Flight Software Branch C Coding Standard Version 1.0a cFE Flight Software Application Developers Guide
Notes:

12.121.2 Typedef Documentation

12.121.2.1 CFE_EVS_AddEventFilterCmd_t `typedef struct CFE_EVS_AddEventFilterCmd CFE_EVS_AddEventFilterCmd_t`

12.121.2.2 CFE_EVS_ClearLogCmd_t `typedef struct CFE_EVS_ClearLogCmd CFE_EVS_ClearLogCmd_t`

12.121.2.3 CFE_EVS_DeleteEventFilterCmd_t `typedef struct CFE_EVS_DeleteEventFilterCmd CFE_EVS_DeleteEventFilterC`

12.121.2.4 CFE_EVS_DisableAppEventsCmd_t `typedef struct CFE_EVS_DisableAppEventsCmd CFE_EVS_DisableAppEventsCm`

12.121.2.5 CFE_EVS_DisableAppEventTypeCmd_t `typedef struct CFE_EVS_DisableAppEventTypeCmd CFE_EVS_DisableAppEventTypeCmd_t`

12.121.2.6 CFE_EVS_DisableEventTypeCmd_t `typedef struct CFE_EVS_DisableEventTypeCmd CFE_EVS_DisableEventTypeCm`

12.121.2.7 CFE_EVS_DisablePortsCmd_t `typedef struct CFE_EVS_DisablePortsCmd CFE_EVS_DisablePortsCmd_t`

12.121.2.8 CFE_EVS_EnableAppEventsCmd_t

`typedef struct CFE_EVS_EnableAppEventsCmd CFE_EVS_EnableAppEventsCmd_t`

12.121.2.9 CFE_EVS_EnableAppEventTypeCmd_t

`typedef struct CFE_EVS_EnableAppEventTypeCmd CFE_EVS_EnableAppEven`

12.121.2.10 CFE_EVS_EnableEventTypeCmd_t

`typedef struct CFE_EVS_EnableEventTypeCmd CFE_EVS_EnableEventTypeCmd_`

12.121.2.11 CFE_EVS_EnablePortsCmd_t

`typedef struct CFE_EVS_EnablePortsCmd CFE_EVS_EnablePortsCmd_t`

12.121.2.12 CFE_EVS_HousekeepingTlm_t

`typedef struct CFE_EVS_HousekeepingTlm CFE_EVS_HousekeepingTlm_t`

12.121.2.13 CFE_EVS_LongEventTlm_t

`typedef struct CFE_EVS_LongEventTlm CFE_EVS_LongEventTlm_t`

12.121.2.14 CFE_EVS_NoopCmd_t

`typedef struct CFE_EVS_NoopCmd CFE_EVS_NoopCmd_t`

12.121.2.15 CFE_EVS_ResetAllFiltersCmd_t

`typedef struct CFE_EVS_ResetAllFiltersCmd CFE_EVS_ResetAllFiltersCmd_t`

12.121.2.16 CFE_EVS_ResetAppCounterCmd_t

`typedef struct CFE_EVS_ResetAppCounterCmd CFE_EVS_ResetAppCounterCmd_`

12.121.2.17 CFE_EVS_ResetCountersCmd_t

`typedef struct CFE_EVS_ResetCountersCmd CFE_EVS_ResetCountersCmd_t`

12.121.2.18 CFE_EVS_ResetFilterCmd_t

`typedef struct CFE_EVS_ResetFilterCmd CFE_EVS_ResetFilterCmd_t`

12.121.2.19 CFE_EVS_SendHkCmd_t

`typedef struct CFE_EVS_SendHkCmd CFE_EVS_SendHkCmd_t`

12.121.2.20 CFE_EVS_SetEventFormatModeCmd_t

`typedef struct CFE_EVS_SetEventFormatModeCmd CFE_EVS_SetEventForm`

Set Event Format Mode Command.

12.121.2.21 CFE_EVS_SetFilterCmd_t

`typedef struct CFE_EVS_SetFilterCmd CFE_EVS_SetFilterCmd_t`

12.121.2.22 CFE_EVS_SetLogModeCmd_t

`typedef struct CFE_EVS_SetLogModeCmd CFE_EVS_SetLogModeCmd_t`

Set Log Mode Command.

12.121.2.23 CFE_EVS_ShortEventTlm_t

`typedef struct CFE_EVS_ShortEventTlm CFE_EVS_ShortEventTlm_t`

12.121.2.24 CFE_EVS_WriteAppDataFileCmd_t `typedef struct CFE_EVS_WriteAppDataFileCmd CFE_EVS_WriteAppDataFileCm`

Write Event Services Application Information to File Command.

12.121.2.25 CFE_EVS_WriteLogDataFileCmd_t `typedef struct CFE_EVS_WriteLogDataFileCmd CFE_EVS_WriteLogDataFileCm`

Write Event Log to File Command.

12.122 cfe/modules/evs/config/default_cfe_evs_platform_cfg.h File Reference

```
#include "cfe_evs_mission_cfg.h"
#include "cfe_evs_internal_cfg.h"
```

12.122.1 Detailed Description

CFE Event Services (CFE_EVS) Application Platform Configuration Header File
This is a compatibility header for the "platform_cfg.h" file that has traditionally provided both public and private config definitions for each CFS app.
These definitions are now provided in two separate files, one for the public/mission scope and one for internal scope.

Note

This file may be overridden/superceded by mission-provided definitions either by overriding this header or by generating definitions from a command/data dictionary tool.

12.123 cfe/modules/evs/config/default_cfe_evs_topicids.h File Reference

Macros

- #define CFE_MISSION_EVS_CMD_TOPICID 1
- #define CFE_MISSION_EVS_SEND_HK_TOPICID 9
- #define CFE_MISSION_EVS_HK_TLM_TOPICID 1
- #define CFE_MISSION_EVS_LONG_EVENT_MSG_TOPICID 8
- #define CFE_MISSION_EVS_SHORT_EVENT_MSG_TOPICID 9

12.123.1 Detailed Description

CFE Event Services (CFE_EVS) Application Topic IDs

12.123.2 Macro Definition Documentation

12.123.2.1 CFE_MISSION_EVS_CMD_TOPICID `#define CFE_MISSION_EVS_CMD_TOPICID 1`

Purpose cFE Portable Message Numbers for Commands

Description:

Portable message numbers for the cFE EVS command messages

Limits

Not Applicable

Definition at line 35 of file default_cfe_evs_topicids.h.

12.123.2.2 CFE_MISSION_EVS_HK_TLM_TOPICID `#define CFE_MISSION_EVS_HK_TLM_TOPICID 1`

Purpose cFE Portable Message Numbers for Telemetry

Description:

Portable message numbers for the cFE EVS telemetry messages

Limits

Not Applicable

Definition at line 47 of file default_cfe_evs_topicids.h.

12.123.2.3 CFE_MISSION_EVS_LONG_EVENT_MSG_TOPICID `#define CFE_MISSION_EVS_LONG_EVENT_MSG↩ _TOPICID 8`

Definition at line 48 of file default_cfe_evs_topicids.h.

12.123.2.4 CFE_MISSION_EVS_SEND_HK_TOPICID `#define CFE_MISSION_EVS_SEND_HK_TOPICID 9`

Definition at line 36 of file default_cfe_evs_topicids.h.

12.123.2.5 CFE_MISSION_EVS_SHORT_EVENT_MSG_TOPICID `#define CFE_MISSION_EVS_SHORT_EVENT_M↩ SG_TOPICID 9`

Definition at line 49 of file default_cfe_evs_topicids.h.

12.124 cfe/modules/evs/fsw/inc/cfe_evs_eventids.h File Reference

Macros

EVS event IDs

- #define CFE_EVS_NOOP_EID 0
  EVS No-op Command Success Event ID.
- #define CFE_EVS_STARTUP_EID 1
  EVS Initialization Event ID.
- #define CFE_EVS_ERR_WRLOGFILE_EID 2
  EVS Write Event Log Command File Write Entry Failed Event ID.
- #define CFE_EVS_ERR_CRLOGFILE_EID 3
  EVS Write Event Log Command Filename Parse or File Create Failed Event ID.
- #define CFE_EVS_ERR_MSGID_EID 5
  EVS Invalid Message ID Received Event ID.
- #define CFE_EVS_ERR_EVTIDNOREGS_EID 6
  EVS Command Event Not Registered For Filtering Event ID.
- #define CFE_EVS_ERR_APPNOREGS_EID 7
  EVS Command Application Not Registered With EVS Event ID.
- #define CFE_EVS_ERR_ILLAPPIDRANGE_EID 8
  EVS Command Get Application Data Failure Event ID.
- #define CFE_EVS_ERR_NOAPPIDFOUND_EID 9
  EVS Command Get Application ID Failure Event ID.
- #define CFE_EVS_ERR_ILLEGALFMTMOD_EID 10
  EVS Set Event Format Command Invalid Format Event ID.
- #define CFE_EVS_ERR_MAXREGSFILTER_EID 11

EVS Add Filter Command Max Filters Exceeded Event ID.

- #define CFE_EVS_ERR_WRDATFILE_EID 12

  EVS Write Application Data Command Write Data Failure Event ID.
- #define CFE_EVS_ERR_CRDATFILE_EID 13

  EVS Write Application Data Command Filename Parse or File Create Failed Event ID.
- #define CFE_EVS_WRITE_HEADER_ERR_EID 14

  EVS Write File Header to Log File Failure Event ID.
- #define CFE_EVS_ERR_CC_EID 15

  EVS Invalid Command Code Received Event ID.
- #define CFE_EVS_RSTCNT_EID 16

  EVS Reset Counters Command Success Event ID.
- #define CFE_EVS_SETFILTERMSK_EID 17

  EVS Set Filter Command Success Event ID.
- #define CFE_EVS_ENAPORT_EID 18

  EVS Enable Ports Command Success Event ID.
- #define CFE_EVS_DISPORT_EID 19

  EVS Disable Ports Command Success Event ID.
- #define CFE_EVS_ENAEVTTYPE_EID 20

  EVS Enable Event Type Command Success Event ID.
- #define CFE_EVS_DISEVTTYPE_EID 21

  EVS Disable Event Type Command Success Event ID.
- #define CFE_EVS_SETEVTFMTMOD_EID 22

  EVS Set Event Format Mode Command Success Event ID.
- #define CFE_EVS_ENAAPPEVTTYPE_EID 23

  EVS Enable App Event Type Command Success Event ID.
- #define CFE_EVS_DISAPPENTTYPE_EID 24

  EVS Disable App Event Type Command Success Event ID.
- #define CFE_EVS_ENAAPPEVT_EID 25

  EVS Enable App Events Command Success Event ID.
- #define CFE_EVS_DISAPPEVT_EID 26

  EVS Disable App Events Command Success Event ID.
- #define CFE_EVS_RSTEVTCNT_EID 27

  EVS Reset App Event Counter Command Success Event ID.
- #define CFE_EVS_RSTFILTER_EID 28

  EVS Reset App Event Filter Command Success Event ID.
- #define CFE_EVS_RSTALLFILTER_EID 29

  EVS Reset All Filters Command Success Event ID.
- #define CFE_EVS_ADDFILTER_EID 30

  EVS Add Event Filter Command Success Event ID.
- #define CFE_EVS_DELFILTER_EID 31

  EVS Delete Event Filter Command Success Event ID.
- #define CFE_EVS_WRDAT_EID 32

  EVS Write Application Data Command Success Event ID.
- #define CFE_EVS_WRLOG_EID 33

  EVS Write Event Log Command Success Event ID.
- #define CFE_EVS_EVT_FILTERED_EID 37

  EVS Add Filter Command Duplicate Registration Event ID.
- #define CFE_EVS_LOGMODE_EID 38

  EVS Set Log Mode Command Success Event ID.
- #define CFE_EVS_ERR_LOGMODE_EID 39

  EVS Set Log Mode Command Invalid Mode Event ID.
- #define CFE_EVS_ERR_INVALID_BITMASK_EID 40

  EVS Port Or Event Type Bitmask Invalid Event ID.
- #define CFE_EVS_ERR_UNREGISTERED_EVS_APP 41

  EVS Send Event API App Not Registered With EVS Event ID.

- #define CFE_EVS_FILTER_MAX_EID 42
  EVS Filter Max Count Reached Event ID.
- #define CFE_EVS_LEN_ERR_EID 43
  EVS Invalid Command Length Event ID.
- #define CFE_EVS_SQUELCHED_ERR_EID 44
  EVS Events Squelched Error Event ID.

12.124.1 Detailed Description

cFE Event Services Event IDs

12.124.2 Macro Definition Documentation

12.124.2.1 CFE_EVS_ADDFILTER_EID `#define CFE_EVS_ADDFILTER_EID 30`

EVS Add Event Filter Command Success Event ID.

Type: DEBUG

Cause:

EVS Add Event Filter Command success.
Definition at line 367 of file cfe_evs_eventids.h.

12.124.2.2 CFE_EVS_DELFILTER_EID `#define CFE_EVS_DELFILTER_EID 31`

EVS Delete Event Filter Command Success Event ID.

Type: DEBUG

Cause:

EVS Delete Event Filter Command success.
Definition at line 378 of file cfe_evs_eventids.h.

12.124.2.3 CFE_EVS_DISAPPENTTYPE_EID `#define CFE_EVS_DISAPPENTTYPE_EID 24`

EVS Disable App Event Type Command Success Event ID.

Type: DEBUG

Cause:

EVS Disable App Event Type Command success.
Definition at line 301 of file cfe_evs_eventids.h.

12.124.2.4 CFE_EVS_DISAPPEVT_EID `#define CFE_EVS_DISAPPEVT_EID 26`

EVS Disable App Events Command Success Event ID.

Type: DEBUG

Cause:

EVS Disable App Events Command success.

Definition at line 323 of file cfe_evs_eventids.h.

12.124.2.5 CFE_EVS_DISEVTTYPE_EID `#define CFE_EVS_DISEVTTYPE_EID 21`

EVS Disable Event Type Command Success Event ID.

Type: DEBUG

Cause:

EVS Disable Event Type Command success.

Definition at line 268 of file cfe_evs_eventids.h.

12.124.2.6 CFE_EVS_DISPORT_EID `#define CFE_EVS_DISPORT_EID 19`

EVS Disable Ports Command Success Event ID.

Type: DEBUG

Cause:

EVS Disable Ports Command success.

Definition at line 246 of file cfe_evs_eventids.h.

12.124.2.7 CFE_EVS_ENAAPPEVT_EID `#define CFE_EVS_ENAAPPEVT_EID 25`

EVS Enable App Events Command Success Event ID.

Type: DEBUG

Cause:

EVS Enable App Events Command success.

Definition at line 312 of file cfe_evs_eventids.h.

12.124.2.8 CFE_EVS_ENAAPPEVTTYPE_EID `#define CFE_EVS_ENAAPPEVTTYPE_EID 23`

EVS Enable App Event Type Command Success Event ID.

Type: DEBUG

Cause:

EVS Enable App Event Type Command success.
Definition at line 290 of file cfe_evs_eventids.h.

12.124.2.9 CFE_EVS_ENAEVTTYPE_EID `#define CFE_EVS_ENAEVTTYPE_EID 20`

EVS Enable Event Type Command Success Event ID.

Type: DEBUG

Cause:

EVS Enable Event Type Command success.
Definition at line 257 of file cfe_evs_eventids.h.

12.124.2.10 CFE_EVS_ENAPORT_EID `#define CFE_EVS_ENAPORT_EID 18`

EVS Enable Ports Command Success Event ID.

Type: DEBUG

Cause:

EVS Enable Ports Command success.
Definition at line 235 of file cfe_evs_eventids.h.

12.124.2.11 CFE_EVS_ERR_APPNOREGS_EID `#define CFE_EVS_ERR_APPNOREGS_EID 7`

EVS Command Application Not Registered With EVS Event ID.

Type: ERROR

Cause:

An EVS command handler failure due to the referenced application not being registered with EVS. OVERLOADED
Definition at line 110 of file cfe_evs_eventids.h.

12.124.2.12 CFE_EVS_ERR_CC_EID `#define CFE_EVS_ERR_CC_EID 15`

EVS Invalid Command Code Received Event ID.

Type: ERROR

Cause:

Invalid command code for message ID CFE_EVS_CMD_MID received on the EVS message pipe.
Definition at line 202 of file cfe_evs_eventids.h.

12.124.2.13 CFE_EVS_ERR_CRDATFILE_EID `#define CFE_EVS_ERR_CRDATFILE_EID 13`

EVS Write Application Data Command Filename Parse or File Create Failed Event ID.

Type: ERROR

Cause:

Write Application Data Command failed to parse the filename or open/create the file. OVERLOADED
Definition at line 180 of file cfe_evs_eventids.h.

12.124.2.14 CFE_EVS_ERR_CRLOGFILE_EID `#define CFE_EVS_ERR_CRLOGFILE_EID 3`

EVS Write Event Log Command Filename Parse or File Create Failed Event ID.

Type: ERROR

Cause:

EVS Write Event Log Command failure parsing the file name or during open/creation of the file. OVERLOADED
Definition at line 77 of file cfe_evs_eventids.h.

12.124.2.15 CFE_EVS_ERR_EVTIDNOREGS_EID `#define CFE_EVS_ERR_EVTIDNOREGS_EID 6`

EVS Command Event Not Registered For Filtering Event ID.

Type: ERROR

Cause:

An EVS command handler failure due to the event not being registered for filtering. OVERLOADED
Definition at line 99 of file cfe_evs_eventids.h.

12.124.2.16 CFE_EVS_ERR_ILLAPPIDRANGE_EID `#define CFE_EVS_ERR_ILLAPPIDRANGE_EID 8`

EVS Command Get Application Data Failure Event ID.

Type: ERROR

Cause:

An EVS command handler failure retrieving the application data. OVERLOADED
Definition at line 121 of file cfe_evs_eventids.h.

12.124.2.17 CFE_EVS_ERR_ILLEGALFMTMOD_EID `#define CFE_EVS_ERR_ILLEGALFMTMOD_EID 10`

EVS Set Event Format Command Invalid Format Event ID.

Type: ERROR

Cause:

EVS Set Event Format Command failure due to invalid format argument.
Definition at line 144 of file cfe_evs_eventids.h.

12.124.2.18 CFE_EVS_ERR_INVALID_BITMASK_EID `#define CFE_EVS_ERR_INVALID_BITMASK_EID 40`

EVS Port Or Event Type Bitmask Invalid Event ID.

Type: ERROR

Cause:

Invalid bitmask for EVS port or event type. OVERLOADED
Definition at line 446 of file cfe_evs_eventids.h.

12.124.2.19 CFE_EVS_ERR_LOGMODE_EID `#define CFE_EVS_ERR_LOGMODE_EID 39`

EVS Set Log Mode Command Invalid Mode Event ID.

Type: ERROR

Cause:

EVS Set Log Mode Command failure due to invalid log mode.
Definition at line 435 of file cfe_evs_eventids.h.

12.124.2.20 CFE_EVS_ERR_MAXREGSFILTER_EID `#define CFE_EVS_ERR_MAXREGSFILTER_EID 11`

EVS Add Filter Command Max Filters Exceeded Event ID.

Type: ERROR

Cause:

EVS Add Filter Command failure due to exceeding the maximum number of filters.
Definition at line 156 of file cfe_evs_eventids.h.

12.124.2.21 CFE_EVS_ERR_MSGID_EID `#define CFE_EVS_ERR_MSGID_EID 5`

EVS Invalid Message ID Received Event ID.

Type: ERROR

Cause:

Invalid message ID received on the EVS message pipe.
Definition at line 88 of file cfe_evs_eventids.h.

12.124.2.22 CFE_EVS_ERR_NOAPPIDFOUND_EID `#define CFE_EVS_ERR_NOAPPIDFOUND_EID 9`

EVS Command Get Application ID Failure Event ID.

Type: ERROR

Cause:

An EVS command handler failure retrieving the application ID. OVERLOADED
Definition at line 132 of file cfe_evs_eventids.h.

12.124.2.23 CFE_EVS_ERR_UNREGISTERED_EVS_APP `#define CFE_EVS_ERR_UNREGISTERED_EVS_APP 41`

EVS Send Event API App Not Registered With EVS Event ID.

Type: ERROR

Cause:

An EVS Send Event API called for application not registered with EVS.
Definition at line 457 of file cfe_evs_eventids.h.

12.124.2.24 CFE_EVS_ERR_WRDATFILE_EID `#define CFE_EVS_ERR_WRDATFILE_EID 12`

EVS Write Application Data Command Write Data Failure Event ID.

Type: ERROR

Cause:

Write Application Data Command failure to write application EVS data.
Definition at line 168 of file cfe_evs_eventids.h.

12.124.2.25 CFE_EVS_ERR_WRLOGFILE_EID `#define CFE_EVS_ERR_WRLOGFILE_EID 2`

EVS Write Event Log Command File Write Entry Failed Event ID.

Type: ERROR

Cause:

EVS Write Event Log Command failure writing data to the file.
Definition at line 65 of file cfe_evs_eventids.h.

12.124.2.26 CFE_EVS_EVT_FILTERED_EID `#define CFE_EVS_EVT_FILTERED_EID 37`

EVS Add Filter Command Duplicate Registration Event ID.

Type: ERROR

Cause:

EVS Add Filter Command failure due to event already being registered for filtering.
Definition at line 412 of file cfe_evs_eventids.h.

12.124.2.27 CFE_EVS_FILTER_MAX_EID `#define CFE_EVS_FILTER_MAX_EID 42`

EVS Filter Max Count Reached Event ID.

Type: INFORMATIONAL

Cause:

Filter count for the event reached CFE_EVS_MAX_FILTER_COUNT and is latched until filter is reset.
Definition at line 468 of file cfe_evs_eventids.h.

12.124.2.28 CFE_EVS_LEN_ERR_EID `#define CFE_EVS_LEN_ERR_EID 43`

EVS Invalid Command Length Event ID.

Type: ERROR

Cause:

Invalid length for the command code in message ID CFE_EVS_CMD_MID received on the EVS message pipe.
Definition at line 479 of file cfe_evs_eventids.h.

12.124.2.29 CFE_EVS_LOGMODE_EID `#define CFE_EVS_LOGMODE_EID 38`

EVS Set Log Mode Command Success Event ID.

Type: DEBUG

Cause:

EVS Set Log Mode Command success.
Definition at line 423 of file cfe_evs_eventids.h.

12.124.2.30 CFE_EVS_NOOP_EID `#define CFE_EVS_NOOP_EID 0`

EVS No-op Command Success Event ID.

Type: INFORMATION

Cause:

EVS NO-OP command success.
Definition at line 42 of file cfe_evs_eventids.h.

12.124.2.31 CFE_EVS_RSTALLFILTER_EID `#define CFE_EVS_RSTALLFILTER_EID 29`

EVS Reset All Filters Command Success Event ID.

Type: DEBUG

Cause:

EVS Reset All FIlters Command success.
Definition at line 356 of file cfe_evs_eventids.h.

12.124.2.32 CFE_EVS_RSTCNT_EID `#define CFE_EVS_RSTCNT_EID 16`

EVS Reset Counters Command Success Event ID.

Type: DEBUG

Cause:

EVS Reset Counters Command success.

Definition at line 213 of file cfe_evs_eventids.h.

12.124.2.33 CFE_EVS_RSTEVTCNT_EID `#define CFE_EVS_RSTEVTCNT_EID 27`

EVS Reset App Event Counter Command Success Event ID.

Type: DEBUG

Cause:

EVS Reset App Event Counter Command success.

Definition at line 334 of file cfe_evs_eventids.h.

12.124.2.34 CFE_EVS_RSTFILTER_EID `#define CFE_EVS_RSTFILTER_EID 28`

EVS Reset App Event Filter Command Success Event ID.

Type: DEBUG

Cause:

EVS Reset App Event Filter Command success.

Definition at line 345 of file cfe_evs_eventids.h.

12.124.2.35 CFE_EVS_SETEVTFMTMOD_EID `#define CFE_EVS_SETEVTFMTMOD_EID 22`

EVS Set Event Format Mode Command Success Event ID.

Type: DEBUG

Cause:

EVS Set Event Format Mode Command success.

Definition at line 279 of file cfe_evs_eventids.h.

12.124.2.36 CFE_EVS_SETFILTERMSK_EID `#define CFE_EVS_SETFILTERMSK_EID 17`

EVS Set Filter Command Success Event ID.

Type: DEBUG

Cause:

EVS Set Filter Command success.

Definition at line 224 of file cfe_evs_eventids.h.

12.124.2.37 CFE_EVS_SQUELCHED_ERR_EID `#define CFE_EVS_SQUELCHED_ERR_EID 44`

EVS Events Squelched Error Event ID.

Type: ERROR

Cause:

Events generated in app at a rate in excess of CFE_PLATFORM_EVS_MAX_APP_EVENT_BURST in one moment or CFE_PLATFORM_EVS_APP_EVENTS_PER_SEC sustained

Definition at line 492 of file cfe_evs_eventids.h.

12.124.2.38 CFE_EVS_STARTUP_EID `#define CFE_EVS_STARTUP_EID 1`

EVS Initialization Event ID.

Type: INFORMATION

Cause:

Event Services Task initialization complete.

Definition at line 53 of file cfe_evs_eventids.h.

12.124.2.39 CFE_EVS_WRDAT_EID `#define CFE_EVS_WRDAT_EID 32`

EVS Write Application Data Command Success Event ID.

Type: DEBUG

Cause:

EVS Write Application Data Command success.

Definition at line 389 of file cfe_evs_eventids.h.

12.124.2.40 CFE_EVS_WRITE_HEADER_ERR_EID `#define CFE_EVS_WRITE_HEADER_ERR_EID 14`

EVS Write File Header to Log File Failure Event ID.

Type: ERROR

Cause:

Bytes written during Write File Header to Log File was not equal to the expected header size.
Definition at line 191 of file cfe_evs_eventids.h.

12.124.2.41 CFE_EVS_WRLOG_EID `#define CFE_EVS_WRLOG_EID 33`

EVS Write Event Log Command Success Event ID.

Type: DEBUG

Cause:

EVS Write Event Log Command success.
Definition at line 400 of file cfe_evs_eventids.h.

12.125 cfe/modules/fs/config/default_cfe_fs_extern_typedefs.h File Reference

```
#include "cfe_mission_cfg.h"
#include "cfe_fs_filedef.h"
```

12.125.1 Detailed Description

Declarations and prototypes for cfe_fs_extern_typedefs module

12.126 cfe/modules/fs/config/default_cfe_fs_filedef.h File Reference

```
#include "common_types.h"
#include "cfe_fs_interface_cfg.h"
```

Data Structures

- struct CFE_FS_Header

  Standard cFE File header structure definition.

Typedefs

- typedef uint32 CFE_FS_SubType_Enum_t

  Content descriptor for File Headers.
- typedef struct CFE_FS_Header CFE_FS_Header_t

  Standard cFE File header structure definition.

Enumerations

- enum CFE_FS_SubType {
  CFE_FS_SubType_ES_ERLOG = 1, CFE_FS_SubType_ES_SYSLOG = 2, CFE_FS_SubType_ES_QUERYALL = 3, CFE_FS_SubType_ES_PERFDATA = 4,
  CFE_FS_SubType_ES_CDS_REG = 6, CFE_FS_SubType_TBL_REG = 9, CFE_FS_SubType_TBL_IMG = 8, CFE_FS_SubType_EVS_APPDATA = 15,
  CFE_FS_SubType_EVS_EVENTLOG = 16, CFE_FS_SubType_SB_PIPEDATA = 20, CFE_FS_SubType_SB_ROUTEDATA = 21, CFE_FS_SubType_SB_MAPDATA = 22,
  CFE_FS_SubType_ES_QUERYALLTASKS = 23 }

  File subtypes used within cFE.

12.126.1 Detailed Description

Declarations and prototypes for cfe_fs_extern_typedefs module

12.126.2 Typedef Documentation

12.126.2.1 CFE_FS_Header_t `typedef struct CFE_FS_Header CFE_FS_Header_t`

Standard cFE File header structure definition.

12.126.2.2 CFE_FS_SubType_Enum_t `typedef uint32 CFE_FS_SubType_Enum_t`

Content descriptor for File Headers.

See also

enum CFE_FS_SubType

Definition at line 176 of file default_cfe_fs_filedef.h.

12.126.3 Enumeration Type Documentation

12.126.3.1 CFE_FS_SubType `enum CFE_FS_SubType`

File subtypes used within cFE.

This defines all the file subtypes used by cFE. Note apps can extend as needed but need to avoid conflicts (app context not currently included in the file header).

Enumerator

CFE_FS_SubType_ES_ERLOG	Executive Services Exception/Reset Log Type. Executive Services Exception/Reset Log File which is generated in response to a $sc_$cpu_ES_WriteERLog2File command.
CFE_FS_SubType_ES_SYSLOG	Executive Services System Log Type. Executive Services System Log File which is generated in response to a $sc_$cpu_ES_WriteSysLog2File command.
CFE_FS_SubType_ES_QUERYALL	Executive Services Information on All Applications File. Executive Services Information on All Applications File which is generated in response to a $sc_$cpu_ES_WriteAppInfo2File command.

Enumerator

CFE_FS_SubType_ES_PERFDATA	Executive Services Performance Data File. Executive Services Performance Analyzer Data File which is generated in response to a $sc_$cpu_ES_StopLAData command.
CFE_FS_SubType_ES_CDS_REG	Executive Services Critical Data Store Registry Dump File. Executive Services Critical Data Store Registry Dump File which is generated in response to a $sc_$cpu_ES_WriteCDS2File command.
CFE_FS_SubType_TBL_REG	Table Services Registry Dump File. Table Services Registry Dump File which is generated in response to a $sc_$cpu_TBL_WriteReg2File command.
CFE_FS_SubType_TBL_IMG	Table Services Table Image File. Table Services Table Image File which is generated either on the ground or in response to a $sc_$cpu_TBL_DUMP command.
CFE_FS_SubType_EVS_APPDATA	Event Services Application Data Dump File. Event Services Application Data Dump File which is generated in response to a $sc_$cpu_EVS_WriteAppData2File command.
CFE_FS_SubType_EVS_EVENTLOG	Event Services Local Event Log Dump File. Event Services Local Event Log Dump File which is generated in response to a $sc_$cpu_EVS_WriteLog2File command.
CFE_FS_SubType_SB_PIPEDATA	Software Bus Pipe Data Dump File. Software Bus Pipe Data Dump File which is generated in response to a $sc_$cpu_SB_WritePipe2File command.
CFE_FS_SubType_SB_ROUTEDATA	Software Bus Message Routing Data Dump File. Software Bus Message Routing Data Dump File which is generated in response to a $sc_$cpu_SB_WriteRouting2File command.
CFE_FS_SubType_SB_MAPDATA	Software Bus Message Mapping Data Dump File. Software Bus Message Mapping Data Dump File which is generated in response to a $sc_$cpu_SB_WriteMap2File command.
CFE_FS_SubType_ES_QUERYALLTASKS	Executive Services Query All Tasks Data File. Executive Services Query All Tasks Data File which is generated in response to a $sc_$cpu_ES_WriteTaskInfo2File command.

Definition at line 39 of file default_cfe_fs_filedef.h.

12.127 cfe/modules/fs/config/default_cfe_fs_interface_cfg.h File Reference

Macros

- #define CFE_FS_HDR_DESC_MAX_LEN 32

  Max length of description field in a standard cFE File Header.
- #define CFE_FS_FILE_CONTENT_ID 0x63464531

  Magic Number for cFE compliant files (= 'cFE1')

12.127.1 Detailed Description

Declarations and prototypes for cfe_fs_extern_typedefs module

12.127.2 Macro Definition Documentation

12.127.2.1 CFE_FS_FILE_CONTENT_ID `#define CFE_FS_FILE_CONTENT_ID 0x63464531`

Magic Number for cFE compliant files (= 'cFE1')
Definition at line 39 of file default_cfe_fs_interface_cfg.h.

12.127.2.2 CFE_FS_HDR_DESC_MAX_LEN `#define CFE_FS_HDR_DESC_MAX_LEN 32`

Max length of description field in a standard cFE File Header.
Definition at line 37 of file default_cfe_fs_interface_cfg.h.

12.128 cfe/modules/fs/config/default_cfe_fs_mission_cfg.h File Reference

```
#include "cfe_fs_interface_cfg.h"
```

12.128.1 Detailed Description

CFE File Services (CFE_FS) Application Mission Configuration Header File
This is a compatibility header for the "mission_cfg.h" file that has traditionally provided public config definitions for each CFS app.

Note

This file may be overridden/superceded by mission-provided definitions either by overriding this header or by generating definitions from a command/data dictionary tool.

12.129 cfe/modules/msg/fsw/inc/ccsds_hdr.h File Reference

```
#include "common_types.h"
```

Data Structures

- struct CCSDS_PrimaryHeader

  CCSDS packet primary header.
- struct CCSDS_ExtendedHeader

  CCSDS packet extended header.

Typedefs

- typedef struct CCSDS_PrimaryHeader CCSDS_PrimaryHeader_t

  CCSDS packet primary header.
- typedef struct CCSDS_ExtendedHeader CCSDS_ExtendedHeader_t

  CCSDS packet extended header.

12.129.1 Detailed Description

Define CCSDS packet header types

- Avoid direct access for portability, use APIs
- Used to construct message structures

12.129.2 Typedef Documentation

12.129.2.1 CCSDS_ExtendedHeader_t `typedef struct CCSDS_ExtendedHeader CCSDS_ExtendedHeader_t`

CCSDS packet extended header.

12.129.2.2 CCSDS_PrimaryHeader_t `typedef struct CCSDS_PrimaryHeader CCSDS_PrimaryHeader_t`

CCSDS packet primary header.

12.130 cfe/modules/resourceid/fsw/inc/cfe_core_resourceid_basevalues.h File Reference

```
#include "cfe_resourceid_basevalue.h"
```

Enumerations

- enum { CFE_RESOURCEID_ES_TASKID_BASE_OFFSET = OS_OBJECT_TYPE_OS_TASK, CFE_RESOURCEID_ES_APPID_BASE_O = OS_OBJECT_TYPE_USER + 1, CFE_RESOURCEID_ES_LIBID_BASE_OFFSET = OS_OBJECT_TYPE_↩ USER + 2, CFE_RESOURCEID_ES_COUNTID_BASE_OFFSET = OS_OBJECT_TYPE_USER + 3, CFE_RESOURCEID_ES_POOLID_BASE_OFFSET = OS_OBJECT_TYPE_USER + 4, CFE_RESOURCEID_ES_CDSBLOCKID_ = OS_OBJECT_TYPE_USER + 5, CFE_RESOURCEID_SB_PIPEID_RESOURCE_BASE_OFFSET = OS_O↩ BJECT_TYPE_USER + 6, CFE_RESOURCEID_CONFIGID_BASE_OFFSET = OS_OBJECT_TYPE_USER + 7, CFE_RESOURCEID_TBL_VALRESULTID_BASE_OFFSET = OS_OBJECT_TYPE_USER + 8, CFE_RESOURCEID_TBL_DUMPC = OS_OBJECT_TYPE_USER + 9 }
- enum { CFE_ES_TASKID_BASE = CFE_RESOURCEID_MAKE_BASE(CFE_RESOURCEID_ES_TASKID_BASE_O↩ FFSET), CFE_ES_APPID_BASE = CFE_RESOURCEID_MAKE_BASE(CFE_RESOURCEID_ES_APPID_BA↩ SE_OFFSET), CFE_ES_LIBID_BASE = CFE_RESOURCEID_MAKE_BASE(CFE_RESOURCEID_ES_LIBID↩ _BASE_OFFSET), CFE_ES_COUNTID_BASE = CFE_RESOURCEID_MAKE_BASE(CFE_RESOURCEID_E↩ S_COUNTID_BASE_OFFSET), CFE_ES_POOLID_BASE = CFE_RESOURCEID_MAKE_BASE(CFE_RESOURCEID_ES_POOLID_BASE_O↩ FFSET), CFE_ES_CDSBLOCKID_BASE = CFE_RESOURCEID_MAKE_BASE(CFE_RESOURCEID_ES_CD↩ SBLOCKID_BASE_OFFSET), CFE_SB_PIPEID_BASE = CFE_RESOURCEID_MAKE_BASE(CFE_RESOUR↩ CEID_SB_PIPEID_RESOURCE_BASE_OFFSET), CFE_CONFIGID_BASE = CFE_RESOURCEID_MAKE_B↩ ASE(CFE_RESOURCEID_CONFIGID_BASE_OFFSET), CFE_TBL_VALRESULTID_BASE = CFE_RESOURCEID_MAKE_BASE(CFE_RESOURCEID_TBL_VALRES↩ ULTID_BASE_OFFSET), CFE_TBL_DUMPCTRLID_BASE = CFE_RESOURCEID_MAKE_BASE(CFE_RES↩ OURCEID_TBL_DUMPCTRLID_BASE_OFFSET) }

12.130.1 Detailed Description

Contains CFE internal prototypes and definitions related to resource management and related CFE resource IDs.
A CFE ES Resource ID is a common way to identify CFE-managed resources such as apps, tasks, counters, memory pools, CDS blocks, and other entities.

12.131 cfe/modules/resourceid/fsw/inc/cfe_resourceid_basevalue.h File Reference

```
#include "cfe_resourceid_typedef.h"
#include "osapi-idmap.h"
```

Macros

- #define CFE_RESOURCEID_SHIFT OS_OBJECT_TYPE_SHIFT

- #define CFE_RESOURCEID_MAX OS_OBJECT_INDEX_MASK
- #define CFE_RESOURCEID_MAKE_BASE(offset) (CFE_RESOURCEID_MARK | ((offset) << CFE_RESOURCEID_SHIFT))

  A macro to generate a CFE resource ID base value from an offset.

12.131.1 Detailed Description

An implementation of CFE resource ID base values/limits that will be compatible with OSAL IDs. This is intended as a transitional tool to provide runtime value uniqueness, particularly when the "simple" (compatible) resource ID implementation is used. In this mode, compiler type checking is disabled, and so OSAL IDs can be silently interchanged with CFE IDs.
However, by ensuring uniqueness in the runtime values, any ID handling errors may at least be detectable at runtime.
This still works fine with the "strict" resource ID option, but is less important as the compiler type checking should prevent this type of error before the code even runs.
The downside to this implementation is that it has a dependency on the OSAL ID structure.

12.131.2 Macro Definition Documentation

12.131.2.1 CFE_RESOURCEID_MAKE_BASE

```
#define CFE_RESOURCEID_MAKE_BASE(
    offset ) (CFE_RESOURCEID_MARK | ((offset) << CFE_RESOURCEID_SHIFT))
```

A macro to generate a CFE resource ID base value from an offset.
Each CFE ID range is effectively an extension of OSAL ID ranges by starting at OS_OBJECT_TYPE_USER.
Definition at line 73 of file cfe_resourceid_basevalue.h.

12.131.2.2 CFE_RESOURCEID_MAX

```
#define CFE_RESOURCEID_MAX OS_OBJECT_INDEX_MASK
```

Definition at line 65 of file cfe_resourceid_basevalue.h.

12.131.2.3 CFE_RESOURCEID_SHIFT

```
#define CFE_RESOURCEID_SHIFT OS_OBJECT_TYPE_SHIFT
```

Definition at line 64 of file cfe_resourceid_basevalue.h.

12.132 cfe/modules/sb/config/default_cfe_sb_extern_typedefs.h File Reference

```
#include "common_types.h"
#include "cfe_mission_cfg.h"
#include "cfe_resourceid_typedef.h"
```

Data Structures

- struct CFE_SB_MsgId_t

  CFE_SB_MsgId_t type definition.
- struct CFE_SB_Qos_t

  Quality Of Service Type Definition.

Macros

- #define CFE_SB_SUB_ENTRIES_PER_PKT 20

  Configuration parameter used by SBN App.

Typedefs

- typedef uint8 CFE_SB_QosPriority_Enum_t

  Selects the priority level for message routing.
- typedef uint8 CFE_SB_QosReliability_Enum_t

  Selects the reliability level for message routing.
- typedef uint16 CFE_SB_RouteId_Atom_t

  An integer type that should be used for indexing into the Routing Table.
- typedef uint32 CFE_SB_MsgId_Atom_t

  CFE_SB_MsgId_Atom_t primitive type definition.
- typedef CFE_RESOURCEID_BASE_TYPE CFE_SB_PipeId_t

  CFE_SB_PipeId_t to primitive type definition.

Enumerations

- enum CFE_SB_QosPriority { CFE_SB_QosPriority_LOW = 0, CFE_SB_QosPriority_HIGH = 1 }

  Label definitions associated with CFE_SB_QosPriority_Enum_t.
- enum CFE_SB_QosReliability { CFE_SB_QosReliability_LOW = 0, CFE_SB_QosReliability_HIGH = 1 }

  Label definitions associated with CFE_SB_QosReliability_Enum_t.

12.132.1 Detailed Description

Declarations and prototypes for cfe_sb_extern_typedefs module

12.132.2 Macro Definition Documentation

12.132.2.1 CFE_SB_SUB_ENTRIES_PER_PKT `#define CFE_SB_SUB_ENTRIES_PER_PKT 20`

Configuration parameter used by SBN App.
Definition at line 32 of file default_cfe_sb_extern_typedefs.h.

12.132.3 Typedef Documentation

12.132.3.1 CFE_SB_MsgId_Atom_t `typedef uint32 CFE_SB_MsgId_Atom_t`

CFE_SB_MsgId_Atom_t primitive type definition.
This is an integer type capable of holding any Message ID value Note: This value is limited via CFE_PLATFORM_SB_HIGHEST_VALID_M
Definition at line 91 of file default_cfe_sb_extern_typedefs.h.

12.132.3.2 CFE_SB_PipeId_t `typedef CFE_RESOURCEID_BASE_TYPE CFE_SB_PipeId_t`

CFE_SB_PipeId_t to primitive type definition.
Software Bus pipe identifier used in many SB APIs, as well as SB Telemetry messages and data files.
Definition at line 114 of file default_cfe_sb_extern_typedefs.h.

12.132.3.3 CFE_SB_QosPriority_Enum_t `typedef uint8 CFE_SB_QosPriority_Enum_t`

Selects the priority level for message routing.

See also

enum CFE_SB_QosPriority

Definition at line 55 of file default_cfe_sb_extern_typedefs.h.

12.132.3.4 CFE_SB_QosReliability_Enum_t `typedef uint8 CFE_SB_QosReliability_Enum_t`

Selects the reliability level for message routing.

See also

enum CFE_SB_QosReliability

Definition at line 78 of file default_cfe_sb_extern_typedefs.h.

12.132.3.5 CFE_SB_RouteId_Atom_t `typedef uint16 CFE_SB_RouteId_Atom_t`

An integer type that should be used for indexing into the Routing Table.
Definition at line 83 of file default_cfe_sb_extern_typedefs.h.

12.132.4 Enumeration Type Documentation

12.132.4.1 CFE_SB_QosPriority `enum CFE_SB_QosPriority`

Label definitions associated with CFE_SB_QosPriority_Enum_t.

Enumerator

CFE_SB_QosPriority_LOW	Normal priority level.
CFE_SB_QosPriority_HIGH	High priority.

Definition at line 37 of file default_cfe_sb_extern_typedefs.h.

12.132.4.2 CFE_SB_QosReliability `enum CFE_SB_QosReliability`

Label definitions associated with CFE_SB_QosReliability_Enum_t.

Enumerator

CFE_SB_QosReliability_LOW	Normal (best-effort) reliability.
CFE_SB_QosReliability_HIGH	High reliability.

Definition at line 60 of file default_cfe_sb_extern_typedefs.h.

12.133 cfe/modules/sb/config/default_cfe_sb_fcncodes.h File Reference

Macros

- #define CFE_SB_NOOP_CC 0
- #define CFE_SB_RESET_COUNTERS_CC 1

- #define CFE_SB_SEND_SB_STATS_CC 2
- #define CFE_SB_WRITE_ROUTING_INFO_CC 3
- #define CFE_SB_ENABLE_ROUTE_CC 4
- #define CFE_SB_DISABLE_ROUTE_CC 5
- #define CFE_SB_WRITE_PIPE_INFO_CC 7
- #define CFE_SB_WRITE_MAP_INFO_CC 8
- #define CFE_SB_ENABLE_SUB_REPORTING_CC 9
- #define CFE_SB_DISABLE_SUB_REPORTING_CC 10
- #define CFE_SB_SEND_PREV_SUBS_CC 11

12.133.1 Detailed Description

Specification for the CFE Event Services (CFE_SB) command function codes

Note

This file should be strictly limited to the command/function code (CC) macro definitions. Other definitions such as enums, typedefs, or other macros should be placed in the msgdefs.h or msg.h files.

12.133.2 Macro Definition Documentation

12.133.2.1 CFE_SB_DISABLE_ROUTE_CC `#define CFE_SB_DISABLE_ROUTE_CC 5`

Name Disable Software Bus Route

Description

This command will disable a particular destination. The destination is specified in terms of MsgID and PipeID. The MsgId and PipeID are parameters in the command. All destinations are enabled by default.

Command Mnemonic(s) $sc_$cpu_SB_DisRoute

Command Structure

CFE_SB_DisableRouteCmd_t

Command Verification

Successful execution of this command may be verified with the following telemetry:

- **`$sc_$cpu_SB_CMDPC`** - command execution counter will increment
- View routing information CFE_SB_WRITE_ROUTING_INFO_CC to verify enable/disable state change
- The CFE_SB_DSBL_RTE2_EID debug event message will be generated
- Destination will stop receiving messages

Error Conditions

This command may fail for the following reason(s):

- the MsgId or PipeId parameters do not pass validation
- the destination does not exist.

Evidence of failure may be found in the following telemetry:

- **`$sc_$cpu_SB_CMDEC`** - command error counter will increment
- A command specific error event message is issued for all error cases. See CFE_SB_DSBL_RTE1_EID or CFE_SB_DSBL_RTE3_EID

Criticality

This command is not intended to be used in nominal conditions. It is possible to get into a state where a destination cannot be re-enabled without resetting the processor. For instance, sending this command with CFE_SB_CMD_MID and the SB_Cmd_Pipe would inhibit any ground commanding to the software bus until the processor was reset. There are similar problems that may occur when using this command.

Definition at line 271 of file default_cfe_sb_fcncodes.h.

12.133.2.2 CFE_SB_DISABLE_SUB_REPORTING_CC `#define CFE_SB_DISABLE_SUB_REPORTING_CC 10`

Name Disable Subscription Reporting Command

Description

This command will disable subscription reporting and is intended to be used only by the CFS SBN (Software Bus Networking) Application. It is not intended to be sent from the ground or used by operations. When subscription reporting is enabled, SB will generate and send a software bus packet for each subscription received. The software bus packet that is sent contains the information received in the subscription API. This subscription report is needed by SBN if offboard routing is required.

Command Mnemonic(s) $sc_$cpu_SB_DisSubRptg

Command Structure

CFE_SB_DisableSubReportingCmd_t

Command Verification

Successful execution of this command will result in the suppression of packets (with the CFE_SB_ONESUB_TLM_MID MsgId) for each subscription received by SB through the subscription APIs.

Error Conditions

None

Criticality

None

See also

CFE_SB_SingleSubscriptionTlm_t, CFE_SB_ENABLE_SUB_REPORTING_CC, CFE_SB_SEND_PREV_SUBS_CC

Definition at line 428 of file default_cfe_sb_fcncodes.h.

12.133.2.3 CFE_SB_ENABLE_ROUTE_CC `#define CFE_SB_ENABLE_ROUTE_CC 4`

Name Enable Software Bus Route

Description

This command will enable a particular destination. The destination is specified in terms of MsgID and PipeID. The MsgId and PipeID are parameters in the command. All destinations are enabled by default. This command is needed only after a CFE_SB_DISABLE_ROUTE_CC command is used.

Command Mnemonic(s) $sc_$cpu_SB_EnaRoute

Command Structure

CFE_SB_EnableRouteCmd_t

Command Verification

Successful execution of this command may be verified with the following telemetry:

- **`$sc_$cpu_SB_CMDPC`** - command execution counter will increment
- View routing information CFE_SB_WRITE_ROUTING_INFO_CC to verify enable/disable state change
- The CFE_SB_ENBL_RTE2_EID debug event message will be generated
- Destination will begin receiving messages

Error Conditions

This command may fail for the following reason(s):

- the MsgId or PipeId parameters do not pass validation
- the destination does not exist.

Evidence of failure may be found in the following telemetry:

- **`$sc_$cpu_SB_CMDEC`** - command error counter will increment
- A command specific error event message is issued for all error cases. See CFE_SB_ENBL_RTE1_EID or CFE_SB_ENBL_RTE3_EID

Criticality

This command is not inherently dangerous.

Definition at line 230 of file default_cfe_sb_fcncodes.h.

12.133.2.4 CFE_SB_ENABLE_SUB_REPORTING_CC `#define CFE_SB_ENABLE_SUB_REPORTING_CC 9`

Name Enable Subscription Reporting Command

Description

This command will enable subscription reporting and is intended to be used only by the CFS SBN (Software Bus Networking) Application. It is not intended to be sent from the ground or used by operations. When subscription reporting is enabled, SB will generate and send a software bus packet for each subscription received. The software bus packet that is sent contains the information received in the subscription API. This subscription report is needed by SBN if offboard routing is required.

Command Mnemonic(s) $sc_$cpu_SB_EnaSubRptg

Command Structure

CFE_SB_EnableSubReportingCmd_t

Command Verification

Successful execution of this command will result in the sending of a packet (with the CFE_SB_ONESUB_TLM_MID MsgId) for each subscription received by SB through the subscription APIs.

Error Conditions

None

Criticality

None

See also

CFE_SB_SingleSubscriptionTlm_t, CFE_SB_DISABLE_SUB_REPORTING_CC, CFE_SB_SEND_PREV_SUBS_CC

Definition at line 395 of file default_cfe_sb_fcncodes.h.

12.133.2.5 CFE_SB_NOOP_CC `#define CFE_SB_NOOP_CC 0`

Name Software Bus No-Op

Description

This command performs no other function than to increment the command execution counter. The command may be used to verify general aliveness of the Software Bus task.

Command Mnemonic(s) $sc_$cpu_SB_NOOP

Command Structure

CFE_SB_NoopCmd_t

Command Verification

Successful execution of this command may be verified with the following telemetry:

- **`$sc_$cpu_SB_CMDPC`** - command execution counter will increment
- The CFE_SB_CMD0_RCVD_EID informational event message will be generated

Error Conditions

There are no error conditions for this command. If the Software Bus receives the command, the event is sent (although it may be filtered by EVS) and the counter is incremented unconditionally.

Criticality

None

See also

Definition at line 66 of file default_cfe_sb_fcncodes.h.

12.133.2.6 CFE_SB_RESET_COUNTERS_CC `#define CFE_SB_RESET_COUNTERS_CC 1`

Name Software Bus Reset Counters

Description

This command resets the following counters within the Software Bus housekeeping telemetry:

- Command Execution Counter ($sc_$cpu_SB_CMDPC)
- Command Error Counter ($sc_$cpu_SB_CMDEC)
- No Subscribers Counter ($sc_$cpu_SB_NoSubEC)
- Duplicate Subscriptions Counter ($sc_$cpu_SB_DupSubCnt)
- Msg Send Error Counter ($sc_$cpu_SB_MsgSndEC)
- Msg Receive Error Counter ($sc_$cpu_SB_MsgRecEC)
- Internal Error Counter ($sc_$cpu_SB_InternalEC)
- Create Pipe Error Counter ($sc_$cpu_SB_NewPipeEC)
- Subscribe Error Counter ($sc_$cpu_SB_SubscrEC)
- Pipe Overflow Error Counter ($sc_$cpu_SB_PipeOvrEC)
- Msg Limit Error Counter ($sc_$cpu_SB_MsgLimEC)

Command Mnemonic(s) $sc_$cpu_SB_ResetCtrs

Command Structure

CFE_SB_ResetCountersCmd_t

Command Verification

Successful execution of this command may be verified with the following telemetry:

- **`$sc_$cpu_SB_CMDPC`** - command execution counter will be reset to 0
- All other counters listed in description will be reset to 0
- The CFE_SB_CMD1_RCVD_EID informational event message will be generated

Error Conditions

There are no error conditions for this command. If the Software Bus receives the command, the event is sent (although it may be filtered by EVS) and the counter is incremented unconditionally.

Criticality

This command is not inherently dangerous. However, it is possible for ground systems and on-board safing procedures to be designed such that they react to changes in the counter values that are reset by this command.

See also

Definition at line 113 of file default_cfe_sb_fcncodes.h.

12.133.2.7 CFE_SB_SEND_PREV_SUBS_CC `#define CFE_SB_SEND_PREV_SUBS_CC 11`

Name Send Previous Subscriptions Command

This command generates a series of packets that contain information

regarding all subscriptions previously received by SB. This command is intended to be used only by the CFS SBN(Software Bus Networking) Application. It is not intended to be sent from the ground or used by operations. When this command is received the software bus will generate and send a series of packets containing information about all subscription previously received.

Command Mnemonic(s) $sc_$cpu_SB_SendPrevSubs

Command Structure

CFE_SB_SendPrevSubsCmd_t

Command Verification

Successful execution of this command will result in a series of packets (with the CFE_SB_ALLSUBS_TLM_MID MsgId) being sent on the software bus.

Error Conditions

None

Criticality

None

See also

CFE_SB_AllSubscriptionsTlm_t, CFE_SB_ENABLE_SUB_REPORTING_CC, CFE_SB_DISABLE_SUB_REPORTING_CC

Definition at line 460 of file default_cfe_sb_fcncodes.h.

12.133.2.8 CFE_SB_SEND_SB_STATS_CC `#define CFE_SB_SEND_SB_STATS_CC 2`

Name Send Software Bus Statistics

Description

This command will cause the SB task to send a statistics packet containing current utilization figures and high water marks which may be useful for checking the margin of the SB platform configuration settings.

Command Mnemonic(s) $sc_$cpu_SB_DumpStats

Command Structure

CFE_SB_SendSbStatsCmd_t

Command Verification

Successful execution of this command may be verified with the following telemetry:

- **`$sc_$cpu_SB_CMDPC`** - command execution counter will increment
- Receipt of statistics packet with MsgId CFE_SB_STATS_TLM_MID
- The CFE_SB_SND_STATS_EID debug event message will be generated

Error Conditions

There are no error conditions for this command. If the Software Bus receives the command, the debug event is sent and the counter is incremented unconditionally.

Criticality

This command is not inherently dangerous. It will create and send a message on the software bus. If performed repeatedly, it is possible that receiver pipes may overflow.

See also

Definition at line 147 of file default_cfe_sb_fcncodes.h.

12.133.2.9 CFE_SB_WRITE_MAP_INFO_CC `#define CFE_SB_WRITE_MAP_INFO_CC 8`

Name Write Map Info to a File

This command will create a file containing the software bus message

map information. The message map is a lookup table (an array of uint16s)that allows fast access to the correct routing table element during a software bus send operation. This is diagnostic information that may be needed due to the dynamic nature of the cFE software bus. An absolute path and filename may be specified in the command. If this command field contains an empty string (NULL terminator as the first character) the default file path and name is used. The default file path and name is defined in the platform configuration file as CFE_PLATFORM_SB_DEFAULT_MAP_FILENAME.

Command Mnemonic(s) $sc_$cpu_SB_WriteMap2File

Command Structure

CFE_SB_WriteMapInfoCmd_t

Command Verification

Successful execution of this command may be verified with the following telemetry:

- **`$sc_$cpu_SB_CMDPC`** - command execution counter will increment. NOTE: the command counter is incremented when the request is accepted, before writing the file, which is performed as a background task.
- The file specified in the command (or the default specified by the CFE_PLATFORM_SB_DEFAULT_MAP_FILENAME configuration parameter) will be updated with the latest information.
- The CFE_SB_SND_RTG_EID debug event message will be generated

Error Conditions

This command may fail for the following reason(s):

- A previous request to write a software bus information file has not yet completed
- The specified FileName cannot be parsed

Evidence of failure may be found in the following telemetry:

- **`$sc_$cpu_SB_CMDEC`** - command error counter will increment
- A command specific error event message is issued for all error cases. See CFE_SB_SND_RTG_ERR1_EID and CFE_SB_FILEWRITE_ERR_EID

Criticality

This command is not inherently dangerous. It will create a new file in the file system and could, if performed repeatedly without sufficient file management by the operator, fill the file system.

Definition at line 362 of file default_cfe_sb_fcncodes.h.

12.133.2.10 CFE_SB_WRITE_PIPE_INFO_CC `#define CFE_SB_WRITE_PIPE_INFO_CC 7`

Name Write Pipe Info to a File

Description

This command will create a file containing the software bus pipe information. The pipe information contains information about every pipe that has been created through the CFE_SB_CreatePipe API. An absolute path and filename may be specified in the command. If this command field contains an empty string (NULL terminator as the first character) the default file path and name is used. The default file path and name is defined in the platform configuration file as CFE_PLATFORM_SB_DEFAULT_PIPE_FILENAME.

Command Mnemonic(s) $sc_$cpu_SB_WritePipe2File

Command Structure

CFE_SB_WritePipeInfoCmd_t

Command Verification

Successful execution of this command may be verified with the following telemetry:

- **`$sc_$cpu_SB_CMDPC`** - command execution counter will increment. NOTE: the command counter is incremented when the request is accepted, before writing the file, which is performed as a background task.
- The file specified in the command (or the default specified by the CFE_PLATFORM_SB_DEFAULT_PIPE_FILENAME configuration parameter) will be updated with the latest information.
- The CFE_SB_SND_RTG_EID debug event message will be generated

Error Conditions

This command may fail for the following reason(s):

- A previous request to write a software bus information file has not yet completed
- The specified FileName cannot be parsed

Evidence of failure may be found in the following telemetry:

- **`$sc_$cpu_SB_CMDEC`** - command error counter will increment
- A command specific error event message is issued for all error cases. See CFE_SB_SND_RTG_ERR1_EID and CFE_SB_FILEWRITE_ERR_EID

Criticality

This command is not inherently dangerous. It will create a new file in the file system and could, if performed repeatedly without sufficient file management by the operator, fill the file system.

Definition at line 316 of file default_cfe_sb_fcncodes.h.

12.133.2.11 CFE_SB_WRITE_ROUTING_INFO_CC `#define CFE_SB_WRITE_ROUTING_INFO_CC 3`

Name Write Software Bus Routing Info to a File

Description

This command will create a file containing the software bus routing information. The routing information contains information about every subscription that has been received through the SB subscription APIs. An absolute path and filename may be specified in the command. If this command field contains an empty string (NULL terminator as the first character) the default file path and name is used. The default file path and name is defined in the platform configuration file as CFE_PLATFORM_SB_DEFAULT_ROUTING_FILENAME.

Command Mnemonic(s) $sc_$cpu_SB_WriteRouting2File

Command Structure

CFE_SB_WriteRoutingInfoCmd_t

Command Verification

Successful execution of this command may be verified with the following telemetry:

- **`$sc_$cpu_SB_CMDPC`** - command execution counter will increment. NOTE: the command counter is incremented when the request is accepted, before writing the file, which is performed as a background task.
- The file specified in the command (or the default specified by the CFE_PLATFORM_SB_DEFAULT_ROUTING_FILENAME configuration parameter) will be updated with the latest information.
- The CFE_SB_SND_RTG_EID debug event message will be generated

Error Conditions

This command may fail for the following reason(s):

- A previous request to write a software bus information file has not yet completed
- The specified FileName cannot be parsed

Evidence of failure may be found in the following telemetry:

- **`$sc_$cpu_SB_CMDEC`** - command error counter will increment
- A command specific error event message is issued for all error cases. See CFE_SB_SND_RTG_ERR1_EID and CFE_SB_FILEWRITE_ERR_EID

Criticality

This command is not inherently dangerous. It will create a new file in the file system and could, if performed repeatedly without sufficient file management by the operator, fill the file system.

Definition at line 192 of file default_cfe_sb_fcncodes.h.

12.134 cfe/modules/sb/config/default_cfe_sb_interface_cfg.h File Reference

Macros

- #define CFE_MISSION_SB_MAX_SB_MSG_SIZE 32768
- #define CFE_MISSION_SB_MAX_PIPES 64

12.134.1 Detailed Description

CFE Software Bus (CFE_SB) Application Public Definitions
This provides default values for configurable items that affect the interface(s) of this module. This includes the CMD/TLM message interface, tables definitions, and any other data products that serve to exchange information with other entities.

Note

This file may be overridden/superceded by mission-provided definitions either by overriding this header or by generating definitions from a command/data dictionary tool.

12.134.2 Macro Definition Documentation

12.134.2.1 CFE_MISSION_SB_MAX_PIPES `#define CFE_MISSION_SB_MAX_PIPES 64`

Purpose Maximum Number of pipes that SB command/telemetry messages may hold

Description:

Dictates the maximum number of unique Pipes the SB message definitions will hold.

This affects the layout of command/telemetry messages but does not affect run time behavior or internal allocation.

Limits

All CPUs within the same SB domain (mission) must share the same definition Note this affects the size of messages, so it must not cause any message to exceed the max length.

Definition at line 67 of file default_cfe_sb_interface_cfg.h.

12.134.2.2 CFE_MISSION_SB_MAX_SB_MSG_SIZE `#define CFE_MISSION_SB_MAX_SB_MSG_SIZE 32768`

Purpose Maximum SB Message Size

Description:

The following definition dictates the maximum message size allowed on the software bus. SB checks the pkt length field in the header of all messages sent. If the pkt length field indicates the message is larger than this define, SB sends an event and rejects the send.

Limits

This parameter has a lower limit of 6 (CCSDS primary header size). There are no restrictions on the upper limit however, the maximum message size is system dependent and should be verified. Total message size values that are checked against this configuration are defined by a 16 bit data word.

Definition at line 50 of file default_cfe_sb_interface_cfg.h.

12.135 cfe/modules/sb/config/default_cfe_sb_internal_cfg.h File Reference

Macros

- #define CFE_PLATFORM_SB_MAX_MSG_IDS 256
- #define CFE_PLATFORM_SB_MAX_PIPES 64
- #define CFE_PLATFORM_SB_MAX_DEST_PER_PKT 16
- #define CFE_PLATFORM_SB_DEFAULT_MSG_LIMIT 4
- #define CFE_PLATFORM_SB_BUF_MEMORY_BYTES 524288
- #define CFE_PLATFORM_SB_HIGHEST_VALID_MSGID 0x1FFF
- #define CFE_PLATFORM_SB_DEFAULT_ROUTING_FILENAME "/ram/cfe_sb_route.dat"
- #define CFE_PLATFORM_SB_DEFAULT_PIPE_FILENAME "/ram/cfe_sb_pipe.dat"
- #define CFE_PLATFORM_SB_DEFAULT_MAP_FILENAME "/ram/cfe_sb_msgmap.dat"
- #define CFE_PLATFORM_SB_FILTERED_EVENT1 CFE_SB_SEND_NO_SUBS_EID
- #define CFE_PLATFORM_SB_FILTER_MASK1 CFE_EVS_FIRST_4_STOP
- #define CFE_PLATFORM_SB_FILTERED_EVENT2 CFE_SB_DUP_SUBSCRIP_EID
- #define CFE_PLATFORM_SB_FILTER_MASK2 CFE_EVS_FIRST_4_STOP
- #define CFE_PLATFORM_SB_FILTERED_EVENT3 CFE_SB_MSGID_LIM_ERR_EID
- #define CFE_PLATFORM_SB_FILTER_MASK3 CFE_EVS_FIRST_16_STOP
- #define CFE_PLATFORM_SB_FILTERED_EVENT4 CFE_SB_Q_FULL_ERR_EID
- #define CFE_PLATFORM_SB_FILTER_MASK4 CFE_EVS_FIRST_16_STOP
- #define CFE_PLATFORM_SB_FILTERED_EVENT5 0
- #define CFE_PLATFORM_SB_FILTER_MASK5 CFE_EVS_NO_FILTER
- #define CFE_PLATFORM_SB_FILTERED_EVENT6 0
- #define CFE_PLATFORM_SB_FILTER_MASK6 CFE_EVS_NO_FILTER
- #define CFE_PLATFORM_SB_FILTERED_EVENT7 0
- #define CFE_PLATFORM_SB_FILTER_MASK7 CFE_EVS_NO_FILTER
- #define CFE_PLATFORM_SB_FILTERED_EVENT8 0
- #define CFE_PLATFORM_SB_FILTER_MASK8 CFE_EVS_NO_FILTER
- #define CFE_PLATFORM_SB_MEM_BLOCK_SIZE_01 8
- #define CFE_PLATFORM_SB_MEM_BLOCK_SIZE_02 16
- #define CFE_PLATFORM_SB_MEM_BLOCK_SIZE_03 20
- #define CFE_PLATFORM_SB_MEM_BLOCK_SIZE_04 36
- #define CFE_PLATFORM_SB_MEM_BLOCK_SIZE_05 64
- #define CFE_PLATFORM_SB_MEM_BLOCK_SIZE_06 96

- #define CFE_PLATFORM_SB_MEM_BLOCK_SIZE_07 128
- #define CFE_PLATFORM_SB_MEM_BLOCK_SIZE_08 160
- #define CFE_PLATFORM_SB_MEM_BLOCK_SIZE_09 256
- #define CFE_PLATFORM_SB_MEM_BLOCK_SIZE_10 512
- #define CFE_PLATFORM_SB_MEM_BLOCK_SIZE_11 1024
- #define CFE_PLATFORM_SB_MEM_BLOCK_SIZE_12 2048
- #define CFE_PLATFORM_SB_MEM_BLOCK_SIZE_13 4096
- #define CFE_PLATFORM_SB_MEM_BLOCK_SIZE_14 8192
- #define CFE_PLATFORM_SB_MEM_BLOCK_SIZE_15 16384
- #define CFE_PLATFORM_SB_MEM_BLOCK_SIZE_16 32768
- #define CFE_PLATFORM_SB_MAX_BLOCK_SIZE (CFE_MISSION_SB_MAX_SB_MSG_SIZE + 128)
- #define CFE_PLATFORM_SB_START_TASK_PRIORITY 64
- #define CFE_PLATFORM_SB_START_TASK_STACK_SIZE CFE_PLATFORM_ES_DEFAULT_STACK_SIZE

12.135.1 Detailed Description

CFE Software Bus (CFE_SB) Application Private Config Definitions
This provides default values for configurable items that are internal to this module and do NOT affect the interface(s) of this module. Changes to items in this file only affect the local module and will be transparent to external entities that are using the public interface(s).

Note

This file may be overridden/superceded by mission-provided definitions either by overriding this header or by generating definitions from a command/data dictionary tool.

12.135.2 Macro Definition Documentation

12.135.2.1 CFE_PLATFORM_SB_BUF_MEMORY_BYTES `#define CFE_PLATFORM_SB_BUF_MEMORY_BYT←ES 524288`

Purpose Size of the SB buffer memory pool

Description:

Dictates the size of the SB memory pool. For each message the SB sends, the SB dynamically allocates from this memory pool, the memory needed to process the message. The memory needed to process each message is msg size + msg descriptor(CFE_SB_BufferD_t). This memory pool is also used to allocate destination descriptors (CFE_SB_DestinationD_t) during the subscription process. To see the run-time, high-water mark and the current utilization figures regarding this parameter, send an SB command to 'Send Statistics Pkt'. Some memory statistics have been added to the SB housekeeping packet. NOTE: It is important to monitor these statistics to ensure the desired memory margin is met.

Limits

This parameter has a lower limit of 512 and an upper limit of UINT_MAX (4 Gigabytes).

Definition at line 123 of file default_cfe_sb_internal_cfg.h.

12.135.2.2 CFE_PLATFORM_SB_DEFAULT_MAP_FILENAME `#define CFE_PLATFORM_SB_DEFAULT_MAP_FILE↩ NAME "/ram/cfe_sb_msgmap.dat"`

Purpose Default Message Map Filename

Description:

The value of this constant defines the filename used to store the software bus message map information. This filename is used only when no filename is specified in the command. The message map is a lookup table (array of 16bit words) that has an element for each possible MsgId value and holds the routing table index for that MsgId. The Msg Map provides fast access to the destinations of a message.

Limits

The length of each string, including the NULL terminator cannot exceed the OS_MAX_PATH_LEN value.

Definition at line 193 of file default_cfe_sb_internal_cfg.h.

12.135.2.3 CFE_PLATFORM_SB_DEFAULT_MSG_LIMIT `#define CFE_PLATFORM_SB_DEFAULT_MSG_LIMIT 4`

Purpose Default Subscription Message Limit

Description:

Dictates the default Message Limit when using the CFE_SB_Subscribe API. This will limit the number of messages with a specific message ID that can be received through a subscription. This only changes the default; other message limits can be set on a per subscription basis using CFE_SB_SubscribeEx .

Limits

This parameter has a lower limit of 4 and an upper limit of 65535.

Definition at line 101 of file default_cfe_sb_internal_cfg.h.

12.135.2.4 CFE_PLATFORM_SB_DEFAULT_PIPE_FILENAME `#define CFE_PLATFORM_SB_DEFAULT_PIPE_FIL↩ ENAME "/ram/cfe_sb_pipe.dat"`

Purpose Default Pipe Information Filename

Description:

The value of this constant defines the filename used to store the software bus pipe information. This filename is used only when no filename is specified in the command.

Limits

The length of each string, including the NULL terminator cannot exceed the OS_MAX_PATH_LEN value.

Definition at line 176 of file default_cfe_sb_internal_cfg.h.

12.135.2.5 CFE_PLATFORM_SB_DEFAULT_ROUTING_FILENAME

```
#define CFE_PLATFORM_SB_DEFAULT_ROU↩
TING_FILENAME "/ram/cfe_sb_route.dat"
```

Purpose Default Routing Information Filename

Description:

The value of this constant defines the filename used to store the software bus routing information. This filename is used only when no filename is specified in the command.

Limits

The length of each string, including the NULL terminator cannot exceed the OS_MAX_PATH_LEN value.

Definition at line 162 of file default_cfe_sb_internal_cfg.h.

12.135.2.6 CFE_PLATFORM_SB_FILTER_MASK1

```
#define CFE_PLATFORM_SB_FILTER_MASK1 CFE_EVS_FIRST_4_STOP
```

Definition at line 211 of file default_cfe_sb_internal_cfg.h.

12.135.2.7 CFE_PLATFORM_SB_FILTER_MASK2

```
#define CFE_PLATFORM_SB_FILTER_MASK2 CFE_EVS_FIRST_4_STOP
```

Definition at line 214 of file default_cfe_sb_internal_cfg.h.

12.135.2.8 CFE_PLATFORM_SB_FILTER_MASK3

```
#define CFE_PLATFORM_SB_FILTER_MASK3 CFE_EVS_FIRST_16_STOP
```

Definition at line 217 of file default_cfe_sb_internal_cfg.h.

12.135.2.9 CFE_PLATFORM_SB_FILTER_MASK4

```
#define CFE_PLATFORM_SB_FILTER_MASK4 CFE_EVS_FIRST_16_STOP
```

Definition at line 220 of file default_cfe_sb_internal_cfg.h.

12.135.2.10 CFE_PLATFORM_SB_FILTER_MASK5

```
#define CFE_PLATFORM_SB_FILTER_MASK5 CFE_EVS_NO_FILTER
```

Definition at line 223 of file default_cfe_sb_internal_cfg.h.

12.135.2.11 CFE_PLATFORM_SB_FILTER_MASK6

```
#define CFE_PLATFORM_SB_FILTER_MASK6 CFE_EVS_NO_FILTER
```

Definition at line 226 of file default_cfe_sb_internal_cfg.h.

12.135.2.12 CFE_PLATFORM_SB_FILTER_MASK7

```
#define CFE_PLATFORM_SB_FILTER_MASK7 CFE_EVS_NO_FILTER
```

Definition at line 229 of file default_cfe_sb_internal_cfg.h.

12.135.2.13 CFE_PLATFORM_SB_FILTER_MASK8

```
#define CFE_PLATFORM_SB_FILTER_MASK8 CFE_EVS_NO_FILTER
```

Definition at line 232 of file default_cfe_sb_internal_cfg.h.

12.135.2.14 CFE_PLATFORM_SB_FILTERED_EVENT1 `#define CFE_PLATFORM_SB_FILTERED_EVENT1 CFE_SB_SEND_NO_SUBS_EID`

Purpose SB Event Filtering

Description:

This group of configuration parameters dictates what SB events will be filtered through SB. The filtering will begin after the SB task initializes and stay in effect until a cmd to SB changes it. This allows the operator to set limits on the number of event messages that are sent during system initialization. NOTE: Set all unused event values and mask values to zero

Limits

This filtering applies only to SB events. These parameters have a lower limit of 0 and an upper limit of 65535.

Definition at line 210 of file default_cfe_sb_internal_cfg.h.

12.135.2.15 CFE_PLATFORM_SB_FILTERED_EVENT2 `#define CFE_PLATFORM_SB_FILTERED_EVENT2 CFE_SB_DUP_SUBSCRIP_EID`

Definition at line 213 of file default_cfe_sb_internal_cfg.h.

12.135.2.16 CFE_PLATFORM_SB_FILTERED_EVENT3 `#define CFE_PLATFORM_SB_FILTERED_EVENT3 CFE_SB_MSGID_LIM_ERR_EI`

Definition at line 216 of file default_cfe_sb_internal_cfg.h.

12.135.2.17 CFE_PLATFORM_SB_FILTERED_EVENT4 `#define CFE_PLATFORM_SB_FILTERED_EVENT4 CFE_SB_Q_FULL_ERR_EID`

Definition at line 219 of file default_cfe_sb_internal_cfg.h.

12.135.2.18 CFE_PLATFORM_SB_FILTERED_EVENT5 `#define CFE_PLATFORM_SB_FILTERED_EVENT5 0`

Definition at line 222 of file default_cfe_sb_internal_cfg.h.

12.135.2.19 CFE_PLATFORM_SB_FILTERED_EVENT6 `#define CFE_PLATFORM_SB_FILTERED_EVENT6 0`

Definition at line 225 of file default_cfe_sb_internal_cfg.h.

12.135.2.20 CFE_PLATFORM_SB_FILTERED_EVENT7 `#define CFE_PLATFORM_SB_FILTERED_EVENT7 0`

Definition at line 228 of file default_cfe_sb_internal_cfg.h.

12.135.2.21 CFE_PLATFORM_SB_FILTERED_EVENT8 `#define CFE_PLATFORM_SB_FILTERED_EVENT8 0`

Definition at line 231 of file default_cfe_sb_internal_cfg.h.

12.135.2.22 CFE_PLATFORM_SB_HIGHEST_VALID_MSGID `#define CFE_PLATFORM_SB_HIGHEST_VALID_MSG↩ ID 0x1FFF`

Purpose Highest Valid Message Id

Description:

The value of this constant dictates the range of valid message ID's, from 0 to CFE_PLATFORM_SB_HIGHEST↩ _VALID_MSGID (inclusive).

Although this can be defined differently across platforms, each platform can only publish/subscribe to message ids within their allowable range. Typically this value is set the same across all mission platforms to avoid this complexity.

Limits

This parameter has a lower limit is 1, and an upper limit of 0xFFFFFFFE.

When using the direct message map implementation for software bus routing, this value is used to size the map where a value of 0x1FFF results in a 16 KBytes map and 0xFFFF is 128 KBytes.
When using the hash implementation for software bus routing, a multiple of the CFE_PLATFORM_SB_MAX_MSG_IDS is used to size the message map. In that case the range selected here does not impact message map memory use, so it's reasonable to use up to the full range supported by the message ID implementation.
Definition at line 148 of file default_cfe_sb_internal_cfg.h.

12.135.2.23 CFE_PLATFORM_SB_MAX_BLOCK_SIZE `#define CFE_PLATFORM_SB_MAX_BLOCK_SIZE (CFE_MISSION_SB_MAX_SB_M + 128)`

Definition at line 261 of file default_cfe_sb_internal_cfg.h.

12.135.2.24 CFE_PLATFORM_SB_MAX_DEST_PER_PKT `#define CFE_PLATFORM_SB_MAX_DEST_PER_PKT 16`

Purpose Maximum Number of unique local destinations a single MsgId can have

Description:

Dictates the maximum number of unique local destinations a single MsgId can have.

Limits

This parameter has a lower limit of 1. There are no restrictions on the upper limit however, the maximum number of destinations per packet is system dependent and should be verified. Destination number values that are checked against this configuration are defined by a 16 bit data word.

Definition at line 86 of file default_cfe_sb_internal_cfg.h.

12.135.2.25 CFE_PLATFORM_SB_MAX_MSG_IDS `#define CFE_PLATFORM_SB_MAX_MSG_IDS 256`

Purpose Maximum Number of Unique Message IDs SB Routing Table can hold

Description:

Dictates the maximum number of unique MsgIds the SB routing table will hold. This constant has a direct effect on the size of SB's tables and arrays. Keeping this count as low as possible will save memory. To see the run-time, high-water mark and the current utilization figures regarding this parameter, send an SB command to 'Send Statistics Pkt'.

Limits

This must be a power of two if software bus message routing hash implementation is being used. Lower than 64 will cause unit test failures, and telemetry reporting is impacted below 32. There is no hard upper limit, but impacts memory footprint. For software bus message routing search implementation the number of msg ids subscribed to impacts performance.

Definition at line 53 of file default_cfe_sb_internal_cfg.h.

12.135.2.26 CFE_PLATFORM_SB_MAX_PIPES `#define CFE_PLATFORM_SB_MAX_PIPES 64`

Purpose Maximum Number of Unique Pipes SB Routing Table can hold

Description:

Dictates the maximum number of unique Pipes the SB routing table will hold. This constant has a direct effect on the size of SB's tables and arrays. Keeping this count as low as possible will save memory. To see the run-time, high-water mark and the current utilization figures regarding this parameter, send an SB command to 'Send Statistics Pkt'.

Limits

This parameter has a lower limit of 1. This parameter must also be less than or equal to OS_MAX_QUEUES.

Definition at line 70 of file default_cfe_sb_internal_cfg.h.

12.135.2.27 CFE_PLATFORM_SB_MEM_BLOCK_SIZE_01 `#define CFE_PLATFORM_SB_MEM_BLOCK_SIZE_01 8`

Purpose Define SB Memory Pool Block Sizes

Description:

Software Bus Memory Pool Block Sizes

Limits

These sizes MUST be increasing and MUST be an integral multiple of 4. The number of block sizes defined cannot exceed CFE_PLATFORM_ES_POOL_MAX_BUCKETS

Definition at line 245 of file default_cfe_sb_internal_cfg.h.

12.135.2.28 CFE_PLATFORM_SB_MEM_BLOCK_SIZE_02 `#define CFE_PLATFORM_SB_MEM_BLOCK_SIZE_02 16`

Definition at line 246 of file default_cfe_sb_internal_cfg.h.

12.135.2.29 CFE_PLATFORM_SB_MEM_BLOCK_SIZE_03 `#define CFE_PLATFORM_SB_MEM_BLOCK_SIZE_03 20`

Definition at line 247 of file default_cfe_sb_internal_cfg.h.

12.135.2.30 CFE_PLATFORM_SB_MEM_BLOCK_SIZE_04 `#define CFE_PLATFORM_SB_MEM_BLOCK_SIZE_04 36`

Definition at line 248 of file default_cfe_sb_internal_cfg.h.

12.135.2.31 CFE_PLATFORM_SB_MEM_BLOCK_SIZE_05 `#define CFE_PLATFORM_SB_MEM_BLOCK_SIZE_05 64`

Definition at line 249 of file default_cfe_sb_internal_cfg.h.

12.135.2.32 CFE_PLATFORM_SB_MEM_BLOCK_SIZE_06 `#define CFE_PLATFORM_SB_MEM_BLOCK_SIZE_06 96`

Definition at line 250 of file default_cfe_sb_internal_cfg.h.

12.135.2.33 CFE_PLATFORM_SB_MEM_BLOCK_SIZE_07

```
#define CFE_PLATFORM_SB_MEM_BLOCK_SIZE_↩
07 128
```

Definition at line 251 of file default_cfe_sb_internal_cfg.h.

12.135.2.34 CFE_PLATFORM_SB_MEM_BLOCK_SIZE_08

```
#define CFE_PLATFORM_SB_MEM_BLOCK_SIZE_↩
08 160
```

Definition at line 252 of file default_cfe_sb_internal_cfg.h.

12.135.2.35 CFE_PLATFORM_SB_MEM_BLOCK_SIZE_09

```
#define CFE_PLATFORM_SB_MEM_BLOCK_SIZE_↩
09 256
```

Definition at line 253 of file default_cfe_sb_internal_cfg.h.

12.135.2.36 CFE_PLATFORM_SB_MEM_BLOCK_SIZE_10

```
#define CFE_PLATFORM_SB_MEM_BLOCK_SIZE_↩
10 512
```

Definition at line 254 of file default_cfe_sb_internal_cfg.h.

12.135.2.37 CFE_PLATFORM_SB_MEM_BLOCK_SIZE_11

```
#define CFE_PLATFORM_SB_MEM_BLOCK_SIZE_↩
11 1024
```

Definition at line 255 of file default_cfe_sb_internal_cfg.h.

12.135.2.38 CFE_PLATFORM_SB_MEM_BLOCK_SIZE_12

```
#define CFE_PLATFORM_SB_MEM_BLOCK_SIZE_↩
12 2048
```

Definition at line 256 of file default_cfe_sb_internal_cfg.h.

12.135.2.39 CFE_PLATFORM_SB_MEM_BLOCK_SIZE_13

```
#define CFE_PLATFORM_SB_MEM_BLOCK_SIZE_↩
13 4096
```

Definition at line 257 of file default_cfe_sb_internal_cfg.h.

12.135.2.40 CFE_PLATFORM_SB_MEM_BLOCK_SIZE_14

```
#define CFE_PLATFORM_SB_MEM_BLOCK_SIZE_↩
14 8192
```

Definition at line 258 of file default_cfe_sb_internal_cfg.h.

12.135.2.41 CFE_PLATFORM_SB_MEM_BLOCK_SIZE_15

```
#define CFE_PLATFORM_SB_MEM_BLOCK_SIZE_↩
15 16384
```

Definition at line 259 of file default_cfe_sb_internal_cfg.h.

12.135.2.42 CFE_PLATFORM_SB_MEM_BLOCK_SIZE_16

```
#define CFE_PLATFORM_SB_MEM_BLOCK_SIZE_↩
16 32768
```

Definition at line 260 of file default_cfe_sb_internal_cfg.h.

12.135.2.43 CFE_PLATFORM_SB_START_TASK_PRIORITY `#define CFE_PLATFORM_SB_START_TASK_PRIORITY 64`

Purpose Define SB Task Priority

Description:

Defines the cFE_SB Task priority.

Limits

Not Applicable

Definition at line 272 of file default_cfe_sb_internal_cfg.h.

12.135.2.44 CFE_PLATFORM_SB_START_TASK_STACK_SIZE `#define CFE_PLATFORM_SB_START_TASK_STACK_SIZE CFE_PLATFORM_ES_DEFAULT_STACK_SIZE`

Purpose Define SB Task Stack Size

Description:

Defines the cFE_SB Task Stack Size

Limits

There is a lower limit of 2048 on this configuration parameter. There are no restrictions on the upper limit however, the maximum stack size is system dependent and should be verified. Most operating systems provide tools for measuring the amount of stack used by a task during operation. It is always a good idea to verify that no more than 1/2 of the stack is used.

Definition at line 287 of file default_cfe_sb_internal_cfg.h.

12.136 cfe/modules/sb/config/default_cfe_sb_mission_cfg.h File Reference

```
#include "cfe_sb_interface_cfg.h"
```

12.136.1 Detailed Description

CFE Event Services (CFE_SB) Application Mission Configuration Header File
This is a compatibility header for the "mission_cfg.h" file that has traditionally provided public config definitions for each CFS app.

Note

This file may be overridden/superceded by mission-provided definitions either by overriding this header or by generating definitions from a command/data dictionary tool.

12.137 cfe/modules/sb/config/default_cfe_sb_msg.h File Reference

```
#include "cfe_mission_cfg.h"
#include "cfe_sb_fcncodes.h"
#include "cfe_sb_msgdefs.h"
#include "cfe_sb_msgstruct.h"
```

12.137.1 Detailed Description

Specification for the CFE Event Services (CFE_SB) command and telemetry message data types.
This is a compatibility header for the "cfe_sb_msg.h" file that has traditionally provided the message definitions for cFS apps.

Note

This file may be overridden/superceded by mission-provided definitions either by overriding this header or by generating definitions from a command/data dictionary tool.

12.138 cfe/modules/sb/config/default_cfe_sb_msgdefs.h File Reference

```
#include "common_types.h"
#include "cfe_mission_cfg.h"
#include "cfe_es_extern_typedefs.h"
#include "cfe_sb_extern_typedefs.h"
#include "cfe_sb_fcncodes.h"
```

Data Structures

- struct CFE_SB_WriteFileInfoCmd_Payload

  Write File Info Command Payload.
- struct CFE_SB_RouteCmd_Payload

  Enable/Disable Route Command Payload.
- struct CFE_SB_HousekeepingTlm_Payload
- struct CFE_SB_PipeDepthStats

  SB Pipe Depth Statistics.
- struct CFE_SB_PipeInfoEntry

  SB Pipe Information File Entry.
- struct CFE_SB_StatsTlm_Payload
- struct CFE_SB_RoutingFileEntry

  SB Routing File Entry.
- struct CFE_SB_MsgMapFileEntry

  SB Map File Entry.
- struct CFE_SB_SingleSubscriptionTlm_Payload
- struct CFE_SB_SubEntries

  SB Previous Subscriptions Entry.
- struct CFE_SB_AllSubscriptionsTlm_Payload

Typedefs

- typedef struct CFE_SB_WriteFileInfoCmd_Payload CFE_SB_WriteFileInfoCmd_Payload_t

  Write File Info Command Payload.
- typedef struct CFE_SB_RouteCmd_Payload CFE_SB_RouteCmd_Payload_t

  Enable/Disable Route Command Payload.
- typedef struct CFE_SB_HousekeepingTlm_Payload CFE_SB_HousekeepingTlm_Payload_t
- typedef struct CFE_SB_PipeDepthStats CFE_SB_PipeDepthStats_t

  SB Pipe Depth Statistics.
- typedef struct CFE_SB_PipeInfoEntry CFE_SB_PipeInfoEntry_t

  SB Pipe Information File Entry.

- typedef struct CFE_SB_StatsTlm_Payload CFE_SB_StatsTlm_Payload_t
- typedef struct CFE_SB_RoutingFileEntry CFE_SB_RoutingFileEntry_t

  SB Routing File Entry.
- typedef struct CFE_SB_MsgMapFileEntry CFE_SB_MsgMapFileEntry_t

  SB Map File Entry.
- typedef struct CFE_SB_SingleSubscriptionTlm_Payload CFE_SB_SingleSubscriptionTlm_Payload_t
- typedef struct CFE_SB_SubEntries CFE_SB_SubEntries_t

  SB Previous Subscriptions Entry.
- typedef struct CFE_SB_AllSubscriptionsTlm_Payload CFE_SB_AllSubscriptionsTlm_Payload_t

12.138.1 Detailed Description

Specification for the CFE Event Services (CFE_SB) command and telemetry message constant definitions.
For CFE_SB this is only the function/command code definitions

12.138.2 Typedef Documentation

12.138.2.1 CFE_SB_AllSubscriptionsTlm_Payload_t `typedef struct CFE_SB_AllSubscriptionsTlm_Payload CFE_SB_AllSubscriptionsTlm_Payload_t`

Name SB Previous Subscriptions Packet

This structure defines the pkt(s) sent by SB that contains a list of all current subscriptions. This pkt is generated on cmd and intended to be used primarily by the Software Bus Networking Application (SBN). Typically, when the cmd is received there are more subscriptions than can fit in one pkt. The complete list of subscriptions is sent via a series of segmented pkts.

12.138.2.2 CFE_SB_HousekeepingTlm_Payload_t `typedef struct CFE_SB_HousekeepingTlm_Payload CFE_SB_HousekeepingTl`

Name Software Bus task housekeeping Packet

12.138.2.3 CFE_SB_MsgMapFileEntry_t `typedef struct CFE_SB_MsgMapFileEntry CFE_SB_MsgMapFileEntry_t`

SB Map File Entry.
Structure of one element of the map information in response to CFE_SB_WRITE_MAP_INFO_CC

12.138.2.4 CFE_SB_PipeDepthStats_t `typedef struct CFE_SB_PipeDepthStats CFE_SB_PipeDepthStats_t`

SB Pipe Depth Statistics.
Used in SB Statistics Telemetry Packet CFE_SB_StatsTlm_t

12.138.2.5 CFE_SB_PipeInfoEntry_t `typedef struct CFE_SB_PipeInfoEntry CFE_SB_PipeInfoEntry_t`

SB Pipe Information File Entry.
This statistics structure is output as part of the CFE SB "Send Pipe Info" command (CFE_SB_SEND_PIPE_INFO_CC).
Previous versions of CFE simply wrote the internal CFE_SB_PipeD_t object to the file, but this also contains information such as pointers which are not relevant outside the running CFE process.
By defining the pipe info structure separately, it also provides some independence, such that the internal CFE_SB_↩ PipeD_t definition can evolve without changing the binary format of the information file.

12.138.2.6 CFE_SB_RouteCmd_Payload_t `typedef struct CFE_SB_RouteCmd_Payload CFE_SB_RouteCmd_Payload_t`

Enable/Disable Route Command Payload.
This structure contains a definition used by two SB commands, 'Enable Route' CFE_SB_ENABLE_ROUTE_CC and 'Disable Route' CFE_SB_DISABLE_ROUTE_CC. A route is the destination pipe for a particular message and is therefore defined as a MsgId and PipeId combination.

12.138.2.7 CFE_SB_RoutingFileEntry_t `typedef struct CFE_SB_RoutingFileEntry CFE_SB_RoutingFileEntry_t`

SB Routing File Entry.
Structure of one element of the routing information in response to CFE_SB_WRITE_ROUTING_INFO_CC

12.138.2.8 CFE_SB_SingleSubscriptionTlm_Payload_t `typedef struct CFE_SB_SingleSubscriptionTlm_Payload CFE_SB_SingleSubscriptionTlm_Payload_t`

Name SB Subscription Report Packet

This structure defines the pkt sent by SB when a subscription or a request to unsubscribe is received while subscription reporting is enabled. By default subscription reporting is disabled. This feature is intended to be used primarily by Software Bus Networking Application (SBN)

See also

CFE_SB_ENABLE_SUB_REPORTING_CC, CFE_SB_DISABLE_SUB_REPORTING_CC

12.138.2.9 CFE_SB_StatsTlm_Payload_t `typedef struct CFE_SB_StatsTlm_Payload CFE_SB_StatsTlm_Payload_t`

Name SB Statistics Telemetry Packet

SB Statistics packet sent in response to CFE_SB_SEND_SB_STATS_CC

12.138.2.10 CFE_SB_SubEntries_t `typedef struct CFE_SB_SubEntries CFE_SB_SubEntries_t`

SB Previous Subscriptions Entry.
This structure defines an entry used in the CFE_SB_PrevSubsPkt_t Intended to be used primarily by Software Bus Networking Application (SBN)
Used in structure definition CFE_SB_AllSubscriptionsTlm_t

12.138.2.11 CFE_SB_WriteFileInfoCmd_Payload_t `typedef struct CFE_SB_WriteFileInfoCmd_Payload CFE_SB_WriteFileInfoCmd_Payload_t`

Write File Info Command Payload.
This structure contains a generic definition used by SB commands that write to a file

12.139 cfe/modules/sb/config/default_cfe_sb_msgids.h File Reference

```
#include "cfe_core_api_base_msgids.h"
#include "cfe_sb_topicids.h"
```

Macros

- #define CFE_SB_CMD_MID CFE_PLATFORM_CMD_TOPICID_TO_MIDV(CFE_MISSION_SB_CMD_TOPICID) /∗ 0x1803 ∗/
- #define CFE_SB_SEND_HK_MID CFE_PLATFORM_CMD_TOPICID_TO_MIDV(CFE_MISSION_SB_SEND_HK_TOPICID) /∗ 0x180B ∗/

- #define CFE_SB_SUB_RPT_CTRL_MID CFE_PLATFORM_CMD_TOPICID_TO_MIDV(CFE_MISSION_SB_SUB_RPT_CTRL_TO
/* 0x180E */
- #define CFE_SB_HK_TLM_MID CFE_PLATFORM_TLM_TOPICID_TO_MIDV(CFE_MISSION_SB_HK_TLM_TOPICID)
/* 0x0803 */
- #define CFE_SB_STATS_TLM_MID CFE_PLATFORM_TLM_TOPICID_TO_MIDV(CFE_MISSION_SB_STATS_TLM_TOPICID)
/* 0x080A */
- #define CFE_SB_ALLSUBS_TLM_MID CFE_PLATFORM_TLM_TOPICID_TO_MIDV(CFE_MISSION_SB_ALLSUBS_TLM_TOPIC
/* 0x080D */
- #define CFE_SB_ONESUB_TLM_MID CFE_PLATFORM_TLM_TOPICID_TO_MIDV(CFE_MISSION_SB_ONESUB_TLM_TOPICI
/* 0x080E */

12.139.1 Detailed Description

CFE Event Services (CFE_SB) Application Message IDs

12.139.2 Macro Definition Documentation

12.139.2.1 CFE_SB_ALLSUBS_TLM_MID

```
#define CFE_SB_ALLSUBS_TLM_MID CFE_PLATFORM_TLM_TOPICID_TO_MIDV(CFE_MISSIO
/* 0x080D */
```

Definition at line 41 of file default_cfe_sb_msgids.h.

12.139.2.2 CFE_SB_CMD_MID

```
#define CFE_SB_CMD_MID CFE_PLATFORM_CMD_TOPICID_TO_MIDV(CFE_MISSION_SB_CMD_TOPICID)
/* 0x1803 */
```

Definition at line 32 of file default_cfe_sb_msgids.h.

12.139.2.3 CFE_SB_HK_TLM_MID

```
#define CFE_SB_HK_TLM_MID CFE_PLATFORM_TLM_TOPICID_TO_MIDV(CFE_MISSION_SB_HK_TLM_
/* 0x0803 */
```

Definition at line 39 of file default_cfe_sb_msgids.h.

12.139.2.4 CFE_SB_ONESUB_TLM_MID

```
#define CFE_SB_ONESUB_TLM_MID CFE_PLATFORM_TLM_TOPICID_TO_MIDV(CFE_MISSION_
/* 0x080E */
```

Definition at line 42 of file default_cfe_sb_msgids.h.

12.139.2.5 CFE_SB_SEND_HK_MID

```
#define CFE_SB_SEND_HK_MID CFE_PLATFORM_CMD_TOPICID_TO_MIDV(CFE_MISSION_SB_SEND
/* 0x180B */
```

Definition at line 33 of file default_cfe_sb_msgids.h.

12.139.2.6 CFE_SB_STATS_TLM_MID

```
#define CFE_SB_STATS_TLM_MID CFE_PLATFORM_TLM_TOPICID_TO_MIDV(CFE_MISSION_SB_
/* 0x080A */
```

Definition at line 40 of file default_cfe_sb_msgids.h.

12.139.2.7 CFE_SB_SUB_RPT_CTRL_MID

```
#define CFE_SB_SUB_RPT_CTRL_MID CFE_PLATFORM_CMD_TOPICID_TO_MIDV(CFE_MISS
/* 0x180E */
```

Definition at line 34 of file default_cfe_sb_msgids.h.

12.140 cfe/modules/sb/config/default_cfe_sb_msgstruct.h File Reference

```
#include "cfe_sb_msgdefs.h"
#include "cfe_msg_hdr.h"
```

Data Structures

- struct CFE_SB_NoopCmd
- struct CFE_SB_ResetCountersCmd
- struct CFE_SB_EnableSubReportingCmd
- struct CFE_SB_DisableSubReportingCmd
- struct CFE_SB_SendSbStatsCmd
- struct CFE_SB_SendPrevSubsCmd
- struct CFE_SB_SendHkCmd
- struct CFE_SB_WriteRoutingInfoCmd
- struct CFE_SB_WritePipeInfoCmd
- struct CFE_SB_WriteMapInfoCmd
- struct CFE_SB_EnableRouteCmd
- struct CFE_SB_DisableRouteCmd
- struct CFE_SB_HousekeepingTlm
- struct CFE_SB_StatsTlm
- struct CFE_SB_SingleSubscriptionTlm
- struct CFE_SB_AllSubscriptionsTlm

Typedefs

- typedef struct CFE_SB_NoopCmd CFE_SB_NoopCmd_t
- typedef struct CFE_SB_ResetCountersCmd CFE_SB_ResetCountersCmd_t
- typedef struct CFE_SB_EnableSubReportingCmd CFE_SB_EnableSubReportingCmd_t
- typedef struct CFE_SB_DisableSubReportingCmd CFE_SB_DisableSubReportingCmd_t
- typedef struct CFE_SB_SendSbStatsCmd CFE_SB_SendSbStatsCmd_t
- typedef struct CFE_SB_SendPrevSubsCmd CFE_SB_SendPrevSubsCmd_t
- typedef struct CFE_SB_SendHkCmd CFE_SB_SendHkCmd_t
- typedef struct CFE_SB_WriteRoutingInfoCmd CFE_SB_WriteRoutingInfoCmd_t
- typedef struct CFE_SB_WritePipeInfoCmd CFE_SB_WritePipeInfoCmd_t
- typedef struct CFE_SB_WriteMapInfoCmd CFE_SB_WriteMapInfoCmd_t
- typedef struct CFE_SB_EnableRouteCmd CFE_SB_EnableRouteCmd_t
- typedef struct CFE_SB_DisableRouteCmd CFE_SB_DisableRouteCmd_t
- typedef struct CFE_SB_HousekeepingTlm CFE_SB_HousekeepingTlm_t
- typedef struct CFE_SB_StatsTlm CFE_SB_StatsTlm_t
- typedef struct CFE_SB_SingleSubscriptionTlm CFE_SB_SingleSubscriptionTlm_t
- typedef struct CFE_SB_AllSubscriptionsTlm CFE_SB_AllSubscriptionsTlm_t

12.140.1 Detailed Description

Purpose: cFE Executive Services (SB) Command and Telemetry packet definition file.
References: Flight Software Branch C Coding Standard Version 1.0a cFE Flight Software Application Developers Guide
Notes:

12.140.2 Typedef Documentation

12.140.2.1 CFE_SB_AllSubscriptionsTlm_t

typedef struct CFE_SB_AllSubscriptionsTlm CFE_SB_AllSubscriptionsTlm_t

12.140.2.2 CFE_SB_DisableRouteCmd_t

typedef struct CFE_SB_DisableRouteCmd CFE_SB_DisableRouteCmd_t

12.140.2.3 CFE_SB_DisableSubReportingCmd_t

typedef struct CFE_SB_DisableSubReportingCmd CFE_SB_DisableSubReport

12.140.2.4 CFE_SB_EnableRouteCmd_t

typedef struct CFE_SB_EnableRouteCmd CFE_SB_EnableRouteCmd_t

12.140.2.5 CFE_SB_EnableSubReportingCmd_t

typedef struct CFE_SB_EnableSubReportingCmd CFE_SB_EnableSubReportin

12.140.2.6 CFE_SB_HousekeepingTlm_t

typedef struct CFE_SB_HousekeepingTlm CFE_SB_HousekeepingTlm_t

12.140.2.7 CFE_SB_NoopCmd_t

typedef struct CFE_SB_NoopCmd CFE_SB_NoopCmd_t

12.140.2.8 CFE_SB_ResetCountersCmd_t

typedef struct CFE_SB_ResetCountersCmd CFE_SB_ResetCountersCmd_t

12.140.2.9 CFE_SB_SendHkCmd_t

typedef struct CFE_SB_SendHkCmd CFE_SB_SendHkCmd_t

12.140.2.10 CFE_SB_SendPrevSubsCmd_t

typedef struct CFE_SB_SendPrevSubsCmd CFE_SB_SendPrevSubsCmd_t

12.140.2.11 CFE_SB_SendSbStatsCmd_t

typedef struct CFE_SB_SendSbStatsCmd CFE_SB_SendSbStatsCmd_t

12.140.2.12 CFE_SB_SingleSubscriptionTlm_t

typedef struct CFE_SB_SingleSubscriptionTlm CFE_SB_SingleSubscription

12.140.2.13 CFE_SB_StatsTlm_t

typedef struct CFE_SB_StatsTlm CFE_SB_StatsTlm_t

12.140.2.14 CFE_SB_WriteMapInfoCmd_t

typedef struct CFE_SB_WriteMapInfoCmd CFE_SB_WriteMapInfoCmd_t

12.140.2.15 CFE_SB_WritePipeInfoCmd_t

typedef struct CFE_SB_WritePipeInfoCmd CFE_SB_WritePipeInfoCmd_t

12.140.2.16 CFE_SB_WriteRoutingInfoCmd_t

typedef struct CFE_SB_WriteRoutingInfoCmd CFE_SB_WriteRoutingInfoCmd_t

12.141 cfe/modules/sb/config/default_cfe_sb_platform_cfg.h File Reference

```
#include "cfe_sb_mission_cfg.h"
#include "cfe_sb_internal_cfg.h"
```

12.141.1 Detailed Description

CFE Software Bus (CFE_SB) Application Platform Configuration Header File
This is a compatibility header for the "platform_cfg.h" file that has traditionally provided both public and private config definitions for each CFS app.
These definitions are now provided in two separate files, one for the public/mission scope and one for internal scope.

Note

This file may be overridden/superceded by mission-provided definitions either by overriding this header or by generating definitions from a command/data dictionary tool.

12.142 cfe/modules/sb/config/default_cfe_sb_topicids.h File Reference

Macros

- #define CFE_MISSION_SB_CMD_TOPICID 3
- #define CFE_MISSION_SB_SEND_HK_TOPICID 11
- #define CFE_MISSION_SB_SUB_RPT_CTRL_TOPICID 14
- #define CFE_MISSION_SB_HK_TLM_TOPICID 3
- #define CFE_MISSION_SB_STATS_TLM_TOPICID 10
- #define CFE_MISSION_SB_ALLSUBS_TLM_TOPICID 13
- #define CFE_MISSION_SB_ONESUB_TLM_TOPICID 14

12.142.1 Detailed Description

CFE Software Bus (CFE_SB) Application Topic IDs

12.142.2 Macro Definition Documentation

12.142.2.1 CFE_MISSION_SB_ALLSUBS_TLM_TOPICID `#define CFE_MISSION_SB_ALLSUBS_TLM_TOPICID 13`

Definition at line 50 of file default_cfe_sb_topicids.h.

12.142.2.2 CFE_MISSION_SB_CMD_TOPICID `#define CFE_MISSION_SB_CMD_TOPICID 3`

Purpose cFE Portable Message Numbers for Commands

Description:

Portable message numbers for the cFE command messages

Limits

Not Applicable

Definition at line 35 of file default_cfe_sb_topicids.h.

12.142.2.3 CFE_MISSION_SB_HK_TLM_TOPICID `#define CFE_MISSION_SB_HK_TLM_TOPICID 3`

Purpose cFE Portable Message Numbers for Telemetry

Description:

Portable message numbers for the cFE telemetry messages

Limits

Not Applicable

Definition at line 48 of file default_cfe_sb_topicids.h.

12.142.2.4 CFE_MISSION_SB_ONESUB_TLM_TOPICID `#define CFE_MISSION_SB_ONESUB_TLM_TOPICID 14`

Definition at line 51 of file default_cfe_sb_topicids.h.

12.142.2.5 CFE_MISSION_SB_SEND_HK_TOPICID `#define CFE_MISSION_SB_SEND_HK_TOPICID 11`

Definition at line 36 of file default_cfe_sb_topicids.h.

12.142.2.6 CFE_MISSION_SB_STATS_TLM_TOPICID `#define CFE_MISSION_SB_STATS_TLM_TOPICID 10`

Definition at line 49 of file default_cfe_sb_topicids.h.

12.142.2.7 CFE_MISSION_SB_SUB_RPT_CTRL_TOPICID `#define CFE_MISSION_SB_SUB_RPT_CTRL_TOPIC↩ ID 14`

Definition at line 37 of file default_cfe_sb_topicids.h.

12.143 cfe/modules/sb/fsw/inc/cfe_sb_eventids.h File Reference

Macros

SB event IDs

- #define CFE_SB_INIT_EID 1

  SB Initialization Event ID.
- #define CFE_SB_CR_PIPE_BAD_ARG_EID 2

  SB Create Pipe API Bad Argument Event ID.
- #define CFE_SB_MAX_PIPES_MET_EID 3

  SB Create Pipe API Max Pipes Exceeded Event ID.
- #define CFE_SB_CR_PIPE_ERR_EID 4

  SB Create Pipe API Queue Create Failure Event ID.
- #define CFE_SB_PIPE_ADDED_EID 5

  SB Create Pipe API Success Event ID.
- #define CFE_SB_SUB_ARG_ERR_EID 6

  SB Subscribe API Bad Argument Event ID.
- #define CFE_SB_DUP_SUBSCRIP_EID 7

  SB Subscribe API Duplicate MsgId Subscription Event ID.
- #define CFE_SB_MAX_MSGS_MET_EID 8

  SB Subscribe API Max Subscriptions Exceeded Event ID.
- #define CFE_SB_MAX_DESTS_MET_EID 9

SB Subscribe API Max Destinations Exceeded Event ID.

- #define CFE_SB_SUBSCRIPTION_RCVD_EID 10

  SB Subscribe API Success Event ID.
- #define CFE_SB_UNSUB_ARG_ERR_EID 11

  SB Unsubscribe API Bad Argument Event ID.
- #define CFE_SB_UNSUB_NO_SUBS_EID 12

  SB Unsubscribe API No MsgId Subscription Event ID.
- #define CFE_SB_SEND_BAD_ARG_EID 13

  SB Transmit API Bad Argument Event ID.
- #define CFE_SB_SEND_NO_SUBS_EID 14

  SB Transmit API No MsgId Subscribers Event ID.
- #define CFE_SB_MSG_TOO_BIG_EID 15

  SB Transmit API Message Size Limit Exceeded Event ID.
- #define CFE_SB_GET_BUF_ERR_EID 16

  SB Transmit API Buffer Request Failure Event ID.
- #define CFE_SB_MSGID_LIM_ERR_EID 17

  SB Transmit API MsgId Pipe Limit Exceeded Event ID.
- #define CFE_SB_RCV_BAD_ARG_EID 18

  SB Receive Buffer API Bad Argument Event ID.
- #define CFE_SB_BAD_PIPEID_EID 19

  SB Receive Buffer API Invalid Pipe Event ID.
- #define CFE_SB_DEST_BLK_ERR_EID 20

  SB Subscribe API Get Destination Block Failure Event ID.
- #define CFE_SB_SEND_INV_MSGID_EID 21

  SB Transmit API Invalid MsgId Event ID.
- #define CFE_SB_SUBSCRIPTION_RPT_EID 22

  SB Subscription Report Sent Event ID.
- #define CFE_SB_HASHCOLLISION_EID 23

  SB Subscribe API Message Table Hash Collision Event ID.
- #define CFE_SB_Q_FULL_ERR_EID 25

  SB Transmit API Pipe Overflow Event ID.
- #define CFE_SB_Q_WR_ERR_EID 26

  SB Transmit API Queue Write Failure Event ID.
- #define CFE_SB_Q_RD_ERR_EID 27

  SB Transmit API Queue Read Failure Event ID.
- #define CFE_SB_CMD0_RCVD_EID 28

  SB No-op Command Success Event ID.
- #define CFE_SB_CMD1_RCVD_EID 29

  SB Reset Counters Command Success Event ID.
- #define CFE_SB_SND_STATS_EID 32

  SB Send Statistics Command Success Event ID.
- #define CFE_SB_ENBL_RTE1_EID 33

  SB Enable Route Command Invalid MsgId/PipeID Pair Event ID.
- #define CFE_SB_ENBL_RTE2_EID 34

  SB Enable Route Command Success Event ID.
- #define CFE_SB_ENBL_RTE3_EID 35

  SB Enable Route Command Invalid MsgId or Pipe Event ID.
- #define CFE_SB_DSBL_RTE1_EID 36

  SB Disable Route Command Invalid MsgId/PipeId Pair Event ID.
- #define CFE_SB_DSBL_RTE2_EID 37

  SB Disable Route Command Success Event ID.
- #define CFE_SB_DSBL_RTE3_EID 38

  SB Disable Route Command Invalid MsgId or Pipe Event ID.
- #define CFE_SB_SND_RTG_EID 39

  SB File Write Success Event ID.

- #define CFE_SB_SND_RTG_ERR1_EID 40

  SB File Write Create File Failure Event ID.
- #define CFE_SB_BAD_CMD_CODE_EID 42

  SB Invalid Command Code Received Event ID.
- #define CFE_SB_BAD_MSGID_EID 43

  SB Invalid Message ID Received Event ID.
- #define CFE_SB_FULL_SUB_PKT_EID 44

  SB Send Previous Subscriptions Command Full Packet Sent Event ID.
- #define CFE_SB_PART_SUB_PKT_EID 45

  SB Send Previous Subscriptions Command Partial Packet Sent Event ID.
- #define CFE_SB_DEL_PIPE_ERR1_EID 46

  SB Pipe Delete API Bad Argument Event ID.
- #define CFE_SB_PIPE_DELETED_EID 47

  SB Pipe Delete API Success Event ID.
- #define CFE_SB_SUBSCRIPTION_REMOVED_EID 48

  SB Unsubscribe API Success Event ID.
- #define CFE_SB_FILEWRITE_ERR_EID 49

  SB File Write Failed Event ID.
- #define CFE_SB_SUB_INV_PIPE_EID 50

  SB Subscribe API Invalid Pipe Event ID.
- #define CFE_SB_SUB_INV_CALLER_EID 51

  SB Subscribe API Not Owner Event ID.
- #define CFE_SB_UNSUB_INV_PIPE_EID 52

  SB Unsubscribe API Invalid Pipe Event ID.
- #define CFE_SB_UNSUB_INV_CALLER_EID 53

  SB Unsubscribe API Not Owner Event ID.
- #define CFE_SB_DEL_PIPE_ERR2_EID 54

  SB Delete Pipe API Not Owner Event ID.
- #define CFE_SB_SETPIPEOPTS_ID_ERR_EID 55

  SB Set Pipe Opts API Invalid Pipe Event ID.
- #define CFE_SB_SETPIPEOPTS_OWNER_ERR_EID 56

  SB Set Pipe Opts API Not Owner Event ID.
- #define CFE_SB_SETPIPEOPTS_EID 57

  SB Set Pipe Opts API Success Event ID.
- #define CFE_SB_GETPIPEOPTS_ID_ERR_EID 58

  SB Get Pipe Opts API Invalid Pipe Event ID.
- #define CFE_SB_GETPIPEOPTS_PTR_ERR_EID 59

  SB Get Pipe Opts API Invalid Pointer Event ID.
- #define CFE_SB_GETPIPEOPTS_EID 60

  SB Get Pipe Opts API Success Event ID.
- #define CFE_SB_GETPIPENAME_EID 62

  SB Get Pipe Name API Success Event ID.
- #define CFE_SB_GETPIPENAME_NULL_PTR_EID 63

  SB Get Pipe Name API Invalid Pointer Event ID.
- #define CFE_SB_GETPIPENAME_ID_ERR_EID 64

  SB Get Pipe Name API Invalid Pipe or Resource Event ID.
- #define CFE_SB_GETPIPEIDBYNAME_EID 65

  SB Get Pipe ID By Name API Success Event ID.
- #define CFE_SB_GETPIPEIDBYNAME_NULL_ERR_EID 66

  SB Get Pipe ID By Name API Invalid Pointer Event ID.
- #define CFE_SB_GETPIPEIDBYNAME_NAME_ERR_EID 67

  SB Get Pipe ID By Name API Name Not Found Or ID Not Matched Event ID.
- #define CFE_SB_LEN_ERR_EID 68

  SB Invalid Command Length Event ID.
- #define CFE_SB_CR_PIPE_NAME_TAKEN_EID 69

SB Create Pipe API Name Taken Event ID.

- #define CFE_SB_CR_PIPE_NO_FREE_EID 70

  SB Create Pipe API Queues Exhausted Event ID.

- #define CFE_SB_SEND_MESSAGE_INTEGRITY_FAIL_EID 71

  SB integrity actions on transmit message failure event.

- #define CFE_SB_RCV_MESSAGE_INTEGRITY_FAIL_EID 72

  SB validation of received message failure event.

12.143.1 Detailed Description

cFE Software Bus Services Event IDs

12.143.2 Macro Definition Documentation

12.143.2.1 CFE_SB_BAD_CMD_CODE_EID `#define CFE_SB_BAD_CMD_CODE_EID 42`

SB Invalid Command Code Received Event ID.

Type: ERROR

Cause:

Invalid command code for message ID CFE_SB_CMD_MID or CFE_SB_SUB_RPT_CTRL_MID received on the SB message pipe. OVERLOADED

Definition at line 461 of file cfe_sb_eventids.h.

12.143.2.2 CFE_SB_BAD_MSGID_EID `#define CFE_SB_BAD_MSGID_EID 43`

SB Invalid Message ID Received Event ID.

Type: ERROR

Cause:

Invalid message ID received on the SB message pipe.

Definition at line 472 of file cfe_sb_eventids.h.

12.143.2.3 CFE_SB_BAD_PIPEID_EID `#define CFE_SB_BAD_PIPEID_EID 19`

SB Receive Buffer API Invalid Pipe Event ID.

Type: ERROR

Cause:

CFE_SB_ReceiveBuffer API failure due to an invalid Pipe ID.

Definition at line 244 of file cfe_sb_eventids.h.

12.143.2.4 CFE_SB_CMD0_RCVD_EID `#define CFE_SB_CMD0_RCVD_EID 28`

SB No-op Command Success Event ID.

Type: INFORMATION

Cause:

SB NO-OP Command success.
Definition at line 335 of file cfe_sb_eventids.h.

12.143.2.5 CFE_SB_CMD1_RCVD_EID `#define CFE_SB_CMD1_RCVD_EID 29`

SB Reset Counters Command Success Event ID.

Type: DEBUG

Cause:

SB Reset Counters Command success.
Definition at line 346 of file cfe_sb_eventids.h.

12.143.2.6 CFE_SB_CR_PIPE_BAD_ARG_EID `#define CFE_SB_CR_PIPE_BAD_ARG_EID 2`

SB Create Pipe API Bad Argument Event ID.

Type: ERROR

Cause:

CFE_SB_CreatePipe API failure due to a bad input argument.
Definition at line 53 of file cfe_sb_eventids.h.

12.143.2.7 CFE_SB_CR_PIPE_ERR_EID `#define CFE_SB_CR_PIPE_ERR_EID 4`

SB Create Pipe API Queue Create Failure Event ID.

Type: ERROR

Cause:

CFE_SB_CreatePipe API failure creating the queue.
Definition at line 75 of file cfe_sb_eventids.h.

12.143.2.8 CFE_SB_CR_PIPE_NAME_TAKEN_EID `#define CFE_SB_CR_PIPE_NAME_TAKEN_EID 69`

SB Create Pipe API Name Taken Event ID.

Type: ERROR

Cause:

CFE_SB_CreatePipe API failure due to pipe name taken.
Definition at line 750 of file cfe_sb_eventids.h.

12.143.2.9 CFE_SB_CR_PIPE_NO_FREE_EID `#define CFE_SB_CR_PIPE_NO_FREE_EID 70`

SB Create Pipe API Queues Exhausted Event ID.

Type: ERROR

Cause:

CFE_SB_CreatePipe API failure due to no free queues.
Definition at line 761 of file cfe_sb_eventids.h.

12.143.2.10 CFE_SB_DEL_PIPE_ERR1_EID `#define CFE_SB_DEL_PIPE_ERR1_EID 46`

SB Pipe Delete API Bad Argument Event ID.

Type: ERROR

Cause:

An SB Delete Pipe API failed due to an invalid input argument.
Definition at line 507 of file cfe_sb_eventids.h.

12.143.2.11 CFE_SB_DEL_PIPE_ERR2_EID `#define CFE_SB_DEL_PIPE_ERR2_EID 54`

SB Delete Pipe API Not Owner Event ID.

Type: ERROR

Cause:

An SB Delete Pipe API failed due to not being the pipe owner.
Definition at line 595 of file cfe_sb_eventids.h.

12.143.2.12 CFE_SB_DEST_BLK_ERR_EID `#define CFE_SB_DEST_BLK_ERR_EID 20`

SB Subscribe API Get Destination Block Failure Event ID.

Type: ERROR

Cause:

An SB Subscribe API call failed to get a destination block.
Definition at line 255 of file cfe_sb_eventids.h.

12.143.2.13 CFE_SB_DSBL_RTE1_EID `#define CFE_SB_DSBL_RTE1_EID 36`

SB Disable Route Command Invalid MsgId/PipeId Pair Event ID.

Type: ERROR

Cause:

SB Disable Route Command failure due to the Message ID not being subscribed to the pipe.
Definition at line 404 of file cfe_sb_eventids.h.

12.143.2.14 CFE_SB_DSBL_RTE2_EID `#define CFE_SB_DSBL_RTE2_EID 37`

SB Disable Route Command Success Event ID.

Type: DEBUG

Cause:

SB Disable Route Command success.
Definition at line 415 of file cfe_sb_eventids.h.

12.143.2.15 CFE_SB_DSBL_RTE3_EID `#define CFE_SB_DSBL_RTE3_EID 38`

SB Disable Route Command Invalid MsgId or Pipe Event ID.

Type: ERROR

Cause:

SB Disable Route Command failure due to an invalid MsgId or Pipe.
Definition at line 427 of file cfe_sb_eventids.h.

12.143.2.16 CFE_SB_DUP_SUBSCRIP_EID `#define CFE_SB_DUP_SUBSCRIP_EID 7`

SB Subscribe API Duplicate MsgId Subscription Event ID.

Type: INFORMATION

Cause:

An SB Subscribe API was called with a Message ID that was already subscribed on the pipe on the pipe.
Definition at line 109 of file cfe_sb_eventids.h.

12.143.2.17 CFE_SB_ENBL_RTE1_EID `#define CFE_SB_ENBL_RTE1_EID 33`

SB Enable Route Command Invalid MsgId/PipeID Pair Event ID.

Type: ERROR

Cause:

SB Enable Route Command failure due to the Message ID not being subscribed to the pipe.
Definition at line 369 of file cfe_sb_eventids.h.

12.143.2.18 CFE_SB_ENBL_RTE2_EID `#define CFE_SB_ENBL_RTE2_EID 34`

SB Enable Route Command Success Event ID.

Type: DEBUG

Cause:

SB Enable Route Command success.
Definition at line 380 of file cfe_sb_eventids.h.

12.143.2.19 CFE_SB_ENBL_RTE3_EID `#define CFE_SB_ENBL_RTE3_EID 35`

SB Enable Route Command Invalid MsgId or Pipe Event ID.

Type: ERROR

Cause:

SB Enable Route Command failure due to an invalid MsgId or Pipe.
Definition at line 392 of file cfe_sb_eventids.h.

12.143.2.20 CFE_SB_FILEWRITE_ERR_EID `#define CFE_SB_FILEWRITE_ERR_EID 49`

SB File Write Failed Event ID.

Type: ERROR

Cause:

An SB file write failure encountered when writing to the file.
Definition at line 540 of file cfe_sb_eventids.h.

12.143.2.21 CFE_SB_FULL_SUB_PKT_EID `#define CFE_SB_FULL_SUB_PKT_EID 44`

SB Send Previous Subscriptions Command Full Packet Sent Event ID.

Type: DEBUG

Cause:

SB Send Previous Subscriptions Command processing sent a full subscription packet.
Definition at line 484 of file cfe_sb_eventids.h.

12.143.2.22 CFE_SB_GET_BUF_ERR_EID `#define CFE_SB_GET_BUF_ERR_EID 16`

SB Transmit API Buffer Request Failure Event ID.

Type: ERROR

Cause:

An SB Transmit API call buffer request failed.
Definition at line 210 of file cfe_sb_eventids.h.

12.143.2.23 CFE_SB_GETPIPEIDBYNAME_EID `#define CFE_SB_GETPIPEIDBYNAME_EID 65`

SB Get Pipe ID By Name API Success Event ID.

Type: DEBUG

Cause:

CFE_SB_GetPipeIdByName success.
Definition at line 705 of file cfe_sb_eventids.h.

12.143.2.24 CFE_SB_GETPIPEIDBYNAME_NAME_ERR_EID `#define CFE_SB_GETPIPEIDBYNAME_NAME_ERR_EID 67`

SB Get Pipe ID By Name API Name Not Found Or ID Not Matched Event ID.

Type: ERROR

Cause:

CFE_SB_GetPipeIdByName failure due to name not found or ID mismatch. OVERLOADED
Definition at line 727 of file cfe_sb_eventids.h.

12.143.2.25 CFE_SB_GETPIPEIDBYNAME_NULL_ERR_EID `#define CFE_SB_GETPIPEIDBYNAME_NULL_ERR_EID 66`

SB Get Pipe ID By Name API Invalid Pointer Event ID.

Type: ERROR

Cause:

CFE_SB_GetPipeIdByName failure due to invalid pointer.
Definition at line 716 of file cfe_sb_eventids.h.

12.143.2.26 CFE_SB_GETPIPENAME_EID `#define CFE_SB_GETPIPENAME_EID 62`

SB Get Pipe Name API Success Event ID.

Type: DEBUG

Cause:

CFE_SB_GetPipeName success.
Definition at line 672 of file cfe_sb_eventids.h.

12.143.2.27 CFE_SB_GETPIPENAME_ID_ERR_EID `#define CFE_SB_GETPIPENAME_ID_ERR_EID 64`

SB Get Pipe Name API Invalid Pipe or Resource Event ID.

Type: ERROR

Cause:

CFE_SB_GetPipeName failure due to invalid pipe ID or failure in retrieving resource name. OVERLOADED
Definition at line 694 of file cfe_sb_eventids.h.

12.143.2.28 CFE_SB_GETPIPENAME_NULL_PTR_EID `#define CFE_SB_GETPIPENAME_NULL_PTR_EID 63`

SB Get Pipe Name API Invalid Pointer Event ID.

Type: ERROR

Cause:

CFE_SB_GetPipeName failure due to invalid pointer.
Definition at line 683 of file cfe_sb_eventids.h.

12.143.2.29 CFE_SB_GETPIPEOPTS_EID `#define CFE_SB_GETPIPEOPTS_EID 60`

SB Get Pipe Opts API Success Event ID.

Type: DEBUG

Cause:

CFE_SB_GetPipeOpts success.
Definition at line 661 of file cfe_sb_eventids.h.

12.143.2.30 CFE_SB_GETPIPEOPTS_ID_ERR_EID `#define CFE_SB_GETPIPEOPTS_ID_ERR_EID 58`

SB Get Pipe Opts API Invalid Pipe Event ID.

Type: ERROR

Cause:

CFE_SB_GetPipeOpts failure due to invalid pipe ID.
Definition at line 639 of file cfe_sb_eventids.h.

12.143.2.31 CFE_SB_GETPIPEOPTS_PTR_ERR_EID `#define CFE_SB_GETPIPEOPTS_PTR_ERR_EID 59`

SB Get Pipe Opts API Invalid Pointer Event ID.

Type: ERROR

Cause:

CFE_SB_GetPipeOpts failure due to invalid pointer.
Definition at line 650 of file cfe_sb_eventids.h.

12.143.2.32 CFE_SB_HASHCOLLISION_EID `#define CFE_SB_HASHCOLLISION_EID 23`

SB Subscribe API Message Table Hash Collision Event ID.

Type: DEBUG

Cause:

An SB Subscribe API call caused a message table hash collision, which will impact message transmission performance. This can be resolved by deconflicting MsgId values or increasing CFE_PLATFORM_SB_MAX_MSG_IDS.
Definition at line 290 of file cfe_sb_eventids.h.

12.143.2.33 CFE_SB_INIT_EID `#define CFE_SB_INIT_EID 1`

SB Initialization Event ID.

Type: INFORMATION

Cause:

Software Bus Services Task initialization complete.
Definition at line 42 of file cfe_sb_eventids.h.

12.143.2.34 CFE_SB_LEN_ERR_EID `#define CFE_SB_LEN_ERR_EID 68`

SB Invalid Command Length Event ID.

Type: ERROR

Cause:

Invalid length for the command code in message ID CFE_SB_CMD_MID or CFE_SB_SUB_RPT_CTRL_MID received on the SB message pipe.
Definition at line 739 of file cfe_sb_eventids.h.

12.143.2.35 CFE_SB_MAX_DESTS_MET_EID `#define CFE_SB_MAX_DESTS_MET_EID 9`

SB Subscribe API Max Destinations Exceeded Event ID.

Type: ERROR

Cause:

An SB Subscribe API was called with a message id that already has the maximum allowed number of destinations.
Definition at line 133 of file cfe_sb_eventids.h.

12.143.2.36 CFE_SB_MAX_MSGS_MET_EID `#define CFE_SB_MAX_MSGS_MET_EID 8`

SB Subscribe API Max Subscriptions Exceeded Event ID.

Type: ERROR

Cause:

An SB Subscribe API was called on a pipe that already has the maximum allowed number of subscriptions.
Definition at line 121 of file cfe_sb_eventids.h.

12.143.2.37 CFE_SB_MAX_PIPES_MET_EID `#define CFE_SB_MAX_PIPES_MET_EID 3`

SB Create Pipe API Max Pipes Exceeded Event ID.

Type: ERROR

Cause:

CFE_SB_CreatePipe API failure to do maximum number of pipes being exceeded.
Definition at line 64 of file cfe_sb_eventids.h.

12.143.2.38 CFE_SB_MSG_TOO_BIG_EID `#define CFE_SB_MSG_TOO_BIG_EID 15`

SB Transmit API Message Size Limit Exceeded Event ID.

Type: ERROR

Cause:

An SB Transmit API was called with a message that is too big.
Definition at line 199 of file cfe_sb_eventids.h.

12.143.2.39 CFE_SB_MSGID_LIM_ERR_EID `#define CFE_SB_MSGID_LIM_ERR_EID 17`

SB Transmit API MsgId Pipe Limit Exceeded Event ID.

Type: ERROR

Cause:

An SB Transmit API call failed to deliver the MsgId to a pipe due to the limit for the number of messages with that MsgId for that pipe being exceeded.
Definition at line 222 of file cfe_sb_eventids.h.

12.143.2.40 CFE_SB_PART_SUB_PKT_EID `#define CFE_SB_PART_SUB_PKT_EID 45`

SB Send Previous Subscriptions Command Partial Packet Sent Event ID.

Type: DEBUG

Cause:

SB Send Previous Subscriptions Command processing sent a partial subscription packet.
Definition at line 496 of file cfe_sb_eventids.h.

12.143.2.41 CFE_SB_PIPE_ADDED_EID `#define CFE_SB_PIPE_ADDED_EID 5`

SB Create Pipe API Success Event ID.

Type: DEBUG

Cause:

CFE_SB_CreatePipe API successfully completed.
Definition at line 86 of file cfe_sb_eventids.h.

12.143.2.42 CFE_SB_PIPE_DELETED_EID `#define CFE_SB_PIPE_DELETED_EID 47`

SB Pipe Delete API Success Event ID.

Type: DEBUG

Cause:

An SB Delete Pipe API successfully completed.
Definition at line 518 of file cfe_sb_eventids.h.

12.143.2.43 CFE_SB_Q_FULL_ERR_EID `#define CFE_SB_Q_FULL_ERR_EID 25`

SB Transmit API Pipe Overflow Event ID.

Type: ERROR

Cause:

An SB Transmit API call failed to deliver the Message ID to a pipe due to the pipe queue being full.
Definition at line 302 of file cfe_sb_eventids.h.

12.143.2.44 CFE_SB_Q_RD_ERR_EID `#define CFE_SB_Q_RD_ERR_EID 27`

SB Transmit API Queue Read Failure Event ID.

Type: ERROR

Cause:

An SB Transmit API called failed due to a pipe queue read failure.
Definition at line 324 of file cfe_sb_eventids.h.

12.143.2.45 CFE_SB_Q_WR_ERR_EID `#define CFE_SB_Q_WR_ERR_EID 26`

SB Transmit API Queue Write Failure Event ID.

Type: ERROR

Cause:

An SB Transmit API call failed due to a pipe queue write failure.
Definition at line 313 of file cfe_sb_eventids.h.

12.143.2.46 CFE_SB_RCV_BAD_ARG_EID `#define CFE_SB_RCV_BAD_ARG_EID 18`

SB Receive Buffer API Bad Argument Event ID.

Type: ERROR

Cause:

CFE_SB_ReceiveBuffer API failure due to a bad input argument.
Definition at line 233 of file cfe_sb_eventids.h.

12.143.2.47 CFE_SB_RCV_MESSAGE_INTEGRITY_FAIL_EID `#define CFE_SB_RCV_MESSAGE_INTEGRITY_FAI↩ L_EID 72`

SB validation of received message failure event.

Type: ERROR

Cause:

A CFE SB receive transaction has rejected a message due to failure of the associated message integrity action(s).
Definition at line 785 of file cfe_sb_eventids.h.

12.143.2.48 CFE_SB_SEND_BAD_ARG_EID `#define CFE_SB_SEND_BAD_ARG_EID 13`

SB Transmit API Bad Argument Event ID.

Type: ERROR

Cause:

An SB Transmit API failed due to an invalid input argument.
Definition at line 177 of file cfe_sb_eventids.h.

12.143.2.49 CFE_SB_SEND_INV_MSGID_EID `#define CFE_SB_SEND_INV_MSGID_EID 21`

SB Transmit API Invalid MsgId Event ID.

Type: ERROR

Cause:

An SB Transmit API was called with an invalid message ID.
Definition at line 266 of file cfe_sb_eventids.h.

12.143.2.50 CFE_SB_SEND_MESSAGE_INTEGRITY_FAIL_EID `#define CFE_SB_SEND_MESSAGE_INTEGRITY_↩ FAIL_EID 71`

SB integrity actions on transmit message failure event.

Type: ERROR

Cause:

A CFE SB transmit transaction has rejected a message due to failure of the associated message integrity action(s).
Definition at line 773 of file cfe_sb_eventids.h.

12.143.2.51 CFE_SB_SEND_NO_SUBS_EID `#define CFE_SB_SEND_NO_SUBS_EID 14`

SB Transmit API No MsgId Subscribers Event ID.

Type: INFORMATION

Cause:

An SB Transmit API was called with a Message ID with no subscriptions.
Definition at line 188 of file cfe_sb_eventids.h.

12.143.2.52 CFE_SB_SETPIPEOPTS_EID `#define CFE_SB_SETPIPEOPTS_EID 57`

SB Set Pipe Opts API Success Event ID.

Type: DEBUG

Cause:

CFE_SB_SetPipeOpts success.
Definition at line 628 of file cfe_sb_eventids.h.

12.143.2.53 CFE_SB_SETPIPEOPTS_ID_ERR_EID `#define CFE_SB_SETPIPEOPTS_ID_ERR_EID 55`

SB Set Pipe Opts API Invalid Pipe Event ID.

Type: ERROR

Cause:

CFE_SB_SetPipeOpts API failure due to an invalid pipe ID
Definition at line 606 of file cfe_sb_eventids.h.

12.143.2.54 CFE_SB_SETPIPEOPTS_OWNER_ERR_EID `#define CFE_SB_SETPIPEOPTS_OWNER_ERR_EID 56`

SB Set Pipe Opts API Not Owner Event ID.

Type: ERROR

Cause:

CFE_SB_SetPipeOpts API failure due to not being the pipe owner.
Definition at line 617 of file cfe_sb_eventids.h.

12.143.2.55 CFE_SB_SND_RTG_EID `#define CFE_SB_SND_RTG_EID 39`

SB File Write Success Event ID.

Type: DEBUG

Cause:

An SB file write successfully completed. OVERLOADED
Definition at line 438 of file cfe_sb_eventids.h.

12.143.2.56 CFE_SB_SND_RTG_ERR1_EID `#define CFE_SB_SND_RTG_ERR1_EID 40`

SB File Write Create File Failure Event ID.

Type: ERROR

Cause:

An SB file write failure due to file creation error. OVERLOADED
Definition at line 449 of file cfe_sb_eventids.h.

12.143.2.57 CFE_SB_SND_STATS_EID `#define CFE_SB_SND_STATS_EID 32`

SB Send Statistics Command Success Event ID.

Type: DEBUG

Cause:

SB Send Statistics Command success.
Definition at line 357 of file cfe_sb_eventids.h.

12.143.2.58 CFE_SB_SUB_ARG_ERR_EID `#define CFE_SB_SUB_ARG_ERR_EID 6`

SB Subscribe API Bad Argument Event ID.

Type: ERROR

Cause:

An SB Subscribe API failed due to an invalid input argument.
Definition at line 97 of file cfe_sb_eventids.h.

12.143.2.59 CFE_SB_SUB_INV_CALLER_EID `#define CFE_SB_SUB_INV_CALLER_EID 51`

SB Subscribe API Not Owner Event ID.

Type: ERROR

Cause:

An SB Subscribe API failed due to not being the pipe owner.
Definition at line 562 of file cfe_sb_eventids.h.

12.143.2.60 CFE_SB_SUB_INV_PIPE_EID `#define CFE_SB_SUB_INV_PIPE_EID 50`

SB Subscribe API Invalid Pipe Event ID.

Type: ERROR

Cause:

An SB Subscribe API failed due to an invalid pipe ID.
Definition at line 551 of file cfe_sb_eventids.h.

12.143.2.61 CFE_SB_SUBSCRIPTION_RCVD_EID `#define CFE_SB_SUBSCRIPTION_RCVD_EID 10`

SB Subscribe API Success Event ID.

Type: DEBUG

Cause:

An SB Subscribe API completed successfully.
Definition at line 144 of file cfe_sb_eventids.h.

12.143.2.62 CFE_SB_SUBSCRIPTION_REMOVED_EID `#define CFE_SB_SUBSCRIPTION_REMOVED_EID 48`

SB Unsubscribe API Success Event ID.

Type: DEBUG

Cause:

An SB Unsubscribe API successfully completed.
Definition at line 529 of file cfe_sb_eventids.h.

12.143.2.63 CFE_SB_SUBSCRIPTION_RPT_EID `#define CFE_SB_SUBSCRIPTION_RPT_EID 22`

SB Subscription Report Sent Event ID.

Type: DEBUG

Cause:

SB Subscription Report sent in response to a successful subscription.
Definition at line 277 of file cfe_sb_eventids.h.

12.143.2.64 CFE_SB_UNSUB_ARG_ERR_EID `#define CFE_SB_UNSUB_ARG_ERR_EID 11`

SB Unsubscribe API Bad Argument Event ID.

Type: ERROR

Cause:

An SB Unsubscribe API failed due to an invalid input argument.
Definition at line 155 of file cfe_sb_eventids.h.

12.143.2.65 CFE_SB_UNSUB_INV_CALLER_EID `#define CFE_SB_UNSUB_INV_CALLER_EID 53`

SB Unsubscribe API Not Owner Event ID.

Type: ERROR

Cause:

An SB Unsubscribe API failed due to not being the pipe owner.
Definition at line 584 of file cfe_sb_eventids.h.

12.143.2.66 CFE_SB_UNSUB_INV_PIPE_EID `#define CFE_SB_UNSUB_INV_PIPE_EID 52`

SB Unsubscribe API Invalid Pipe Event ID.

Type: ERROR

Cause:

An SB Unsubscribe API failed due to an invalid pipe ID.
Definition at line 573 of file cfe_sb_eventids.h.

12.143.2.67 CFE_SB_UNSUB_NO_SUBS_EID `#define CFE_SB_UNSUB_NO_SUBS_EID 12`

SB Unsubscribe API No MsgId Subscription Event ID.

Type: INFORMATION

Cause:

An SB Unsubscribe API was called with a Message ID that wasn't subscribed on the pipe
Definition at line 166 of file cfe_sb_eventids.h.

12.144 cfe/modules/tbl/config/default_cfe_tbl_extern_typedefs.h File Reference

```
#include "common_types.h"
#include "cfe_es_extern_typedefs.h"
#include "cfe_mission_cfg.h"
```

Data Structures

- struct CFE_TBL_File_Hdr

  The definition of the header fields that are included in CFE Table Data files.

Typedefs

- typedef uint16 CFE_TBL_BufferSelect_Enum_t

  Selects the buffer to operate on for validate or dump commands.
- typedef struct CFE_TBL_File_Hdr CFE_TBL_File_Hdr_t

  The definition of the header fields that are included in CFE Table Data files.

Enumerations

- enum CFE_TBL_BufferSelect { CFE_TBL_BufferSelect_INACTIVE = 0, CFE_TBL_BufferSelect_ACTIVE = 1 }

  Label definitions associated with CFE_TBL_BufferSelect_Enum_t.

12.144.1 Detailed Description

Declarations and prototypes for cfe_tbl_extern_typedefs module

12.144.2 Typedef Documentation

12.144.2.1 CFE_TBL_BufferSelect_Enum_t `typedef uint16 CFE_TBL_BufferSelect_Enum_t`

Selects the buffer to operate on for validate or dump commands.

See also

enum CFE_TBL_BufferSelect

Definition at line 53 of file default_cfe_tbl_extern_typedefs.h.

12.144.2.2 CFE_TBL_File_Hdr_t `typedef struct CFE_TBL_File_Hdr CFE_TBL_File_Hdr_t`

The definition of the header fields that are included in CFE Table Data files.
This header follows the CFE_FS header and precedes the actual table data.

Note

The Offset and NumBytes fields in the table header are to 32 bits for backward compatibility with existing CFE versions. This means that even on 64-bit CPUs, individual table files will be limited to 4GiB in size.

12.144.3 Enumeration Type Documentation

12.144.3.1 CFE_TBL_BufferSelect `enum CFE_TBL_BufferSelect`

Label definitions associated with CFE_TBL_BufferSelect_Enum_t.

Enumerator

CFE_TBL_BufferSelect_INACTIVE	Select the Inactive buffer for validate or dump.
CFE_TBL_BufferSelect_ACTIVE	Select the Active buffer for validate or dump.

Definition at line 35 of file default_cfe_tbl_extern_typedefs.h.

12.145 cfe/modules/tbl/config/default_cfe_tbl_fcncodes.h File Reference

Macros

Table Services Command Codes

- #define CFE_TBL_NOOP_CC 0
- #define CFE_TBL_RESET_COUNTERS_CC 1
- #define CFE_TBL_LOAD_CC 2
- #define CFE_TBL_DUMP_CC 3
- #define CFE_TBL_VALIDATE_CC 4
- #define CFE_TBL_ACTIVATE_CC 5
- #define CFE_TBL_DUMP_REGISTRY_CC 6
- #define CFE_TBL_SEND_REGISTRY_CC 7
- #define CFE_TBL_DELETE_CDS_CC 8
- #define CFE_TBL_ABORT_LOAD_CC 9

12.145.1 Detailed Description

Specification for the CFE Event Services (CFE_TBL) command function codes

Note

This file should be strictly limited to the command/function code (CC) macro definitions. Other definitions such as enums, typedefs, or other macros should be placed in the msgdefs.h or msg.h files.

12.145.2 Macro Definition Documentation

12.145.2.1 CFE_TBL_ABORT_LOAD_CC `#define CFE_TBL_ABORT_LOAD_CC 9`

Name Abort Table Load

Description

This command will cause Table Services to discard the contents of a table buffer that was previously loaded with the data in a file as specified by a Table Load command. For single buffered tables, the allocated shared working buffer is freed and becomes available for other Table Load commands.

Command Mnemonic(s) $sc_$cpu_TBL_LOADABORT

Command Structure

CFE_TBL_AbortLoadCmd_t

Command Verification

Successful execution of this command may be verified with the following telemetry:

- **$sc_$cpu_TBL_CMDPC -** command execution counter will increment
- The CFE_TBL_LOAD_ABORT_INF_EID informational event message is generated
- If the load was aborted for a single buffered table, the **$sc_$cpu_TBL_NumFreeShrBuf telemetry** point should increment

Error Conditions

This command may fail for the following reason(s):

- The specified table name was not found in the table registry.
- The specified table did not have a load in progress to be aborted.

Evidence of failure may be found in the following telemetry:

- **$sc_$cpu_TBL_CMDEC -** command error counter will increment
- Error specific event message

Criticality

This command will cause the loss of data put into an inactive table buffer.

See also

CFE_TBL_LOAD_CC, CFE_TBL_DUMP_CC, CFE_TBL_VALIDATE_CC, CFE_TBL_ACTIVATE_CC

Definition at line 461 of file default_cfe_tbl_fcncodes.h.

12.145.2.2 CFE_TBL_ACTIVATE_CC `#define CFE_TBL_ACTIVATE_CC 5`

Name Activate Table

Description

This command will cause Table Services to notify a table's owner that an update is pending. The owning application will then update the contents of the active table buffer with the contents of the associated inactive table buffer at a time of their convenience.

Command Mnemonic(s) $sc_$cpu_TBL_ACTIVATE

Command Structure

CFE_TBL_ActivateCmd_t

Command Verification

Successful execution of this command may be verified with the following telemetry:

- **$sc_$cpu_TBL_CMDPC -** command execution counter will increment
- The CFE_TBL_UPDATE_SUCCESS_INF_EID informational event message will be generated

Error Conditions

This command may fail for the following reason(s):

- The specified table name was not found in the table registry.
- The table was registered as a "dump only" type and thus cannot be activated
- The table buffer has not been validated.

Evidence of failure may be found in the following telemetry:

- **`$sc_$cpu_TBL_CMDEC`** - command error counter will increment
- Command specific error event message are issued for all error cases

Criticality

This command will cause the contents of the specified table to be updated with the contents in the inactive table buffer.

See also

CFE_TBL_LOAD_CC, CFE_TBL_DUMP_CC, CFE_TBL_VALIDATE_CC, CFE_TBL_ABORT_LOAD_CC

Definition at line 299 of file default_cfe_tbl_fcncodes.h.

12.145.2.3 CFE_TBL_DELETE_CDS_CC `#define CFE_TBL_DELETE_CDS_CC 8`

Name Delete Critical Table from Critical Data Store

Description

This command will delete the Critical Data Store (CDS) associated with the specified Critical Table. Note that any table still present in the Table Registry is unable to be deleted from the Critical Data Store. All Applications that are accessing the critical table must release and unregister their access before the CDS can be deleted.

Command Mnemonic(s) $sc_$cpu_TBL_DeleteCDS

Command Structure

CFE_TBL_DeleteCDSCmd_t

Command Verification

Successful execution of this command may be verified with the following telemetry:

- **`$sc_$cpu_TBL_CMDPC`** - command execution counter will increment
- The CFE_TBL_CDS_DELETED_INFO_EID informational event message will be generated

Error Conditions

This command may fail for the following reason(s):

- The specified table name was not found in the critical data store registry
- The specified table name WAS found in the table registry (all registrations/sharing of the table must be unregistered before the table's CDS can be deleted)
- The table's owning application is still active

Evidence of failure may be found in the following telemetry:

- **`$sc_$cpu_TBL_CMDEC`** - command error counter will increment
- Error specific event message

Criticality

This command will cause the loss of the specified table's contents before the owning Application was terminated.

See also

CFE_ES_DUMP_CDS_REGISTRY_CC, CFE_ES_DELETE_CDS_CC

Definition at line 422 of file default_cfe_tbl_fcncodes.h.

12.145.2.4 CFE_TBL_DUMP_CC `#define CFE_TBL_DUMP_CC 3`

Name Dump Table

Description

This command will cause the Table Services to put the contents of the specified table buffer into the command specified file.

Command Mnemonic(s) $sc_$cpu_TBL_DUMP

Command Structure

CFE_TBL_DumpCmd_t

Command Verification

Successful execution of this command may be verified with the following telemetry:

- **`$sc_$cpu_TBL_CMDPC`** - command execution counter will increment
- Either the CFE_TBL_OVERWRITE_DUMP_INF_EID OR the CFE_TBL_WRITE_DUMP_INF_EID informational event message will be generated

Error Conditions

This command may fail for the following reason(s):

- A single buffered table's inactive buffer was requested to be dumped and no such buffer is currently allocated.
- Error occurred during write operation to file. Possible causes might be insufficient space in the file system or the filename or file path is improperly specified.
- The specified table name was not found in the table registry.

Evidence of failure may be found in the following telemetry:

- **`$sc_$cpu_TBL_CMDEC`** - command error counter will increment
- A command specific error event message is issued for all error cases

Criticality

This command is not inherently dangerous. It will create a new file in the file system and could, if performed repeatedly without sufficient file management by the operator, fill the file system.

See also

CFE_TBL_LOAD_CC, CFE_TBL_VALIDATE_CC, CFE_TBL_ACTIVATE_CC, CFE_TBL_ABORT_LOAD_CC

Definition at line 202 of file default_cfe_tbl_fcncodes.h.

12.145.2.5 CFE_TBL_DUMP_REGISTRY_CC `#define CFE_TBL_DUMP_REGISTRY_CC 6`

Name Dump Table Registry

Description

This command will cause Table Services to write some of the contents of the Table Registry to the command specified file. This allows the operator to see the current state and configuration of all tables that have been registered with the cFE.

Command Mnemonic(s) $sc_$cpu_TBL_WriteReg2File

Command Structure

CFE_TBL_DumpRegistryCmd_t

Command Verification

Successful execution of this command may be verified with the following telemetry:

- **`$sc_$cpu_TBL_CMDPC`** - command execution counter will increment
- The generation of either CFE_TBL_OVERWRITE_REG_DUMP_INF_EID or CFE_TBL_WRITE_REG_DUMP_INF_EID debug event messages
- The specified file should appear (or be updated) at the specified location in the file system

Error Conditions

This command may fail for the following reason(s):

- A table registry dump is already in progress, not yet completed
- The specified DumpFilename could not be parsed
- Error occurred during write operation to file. Possible causes might be insufficient space in the file system or the filename or file path is improperly specified.

Evidence of failure may be found in the following telemetry:

- **`$sc_$cpu_TBL_CMDEC`** - command error counter will increment
- An Error specific event message

Criticality

This command is not inherently dangerous. It will create a new file in the file system and could, if performed repeatedly without sufficient file management by the operator, fill the file system.

See also

CFE_TBL_SEND_REGISTRY_CC

Definition at line 343 of file default_cfe_tbl_fcncodes.h.

12.145.2.6 CFE_TBL_LOAD_CC `#define CFE_TBL_LOAD_CC 2`

Name Load Table

Description

This command loads the contents of the specified file into an inactive buffer for the table specified within the file.

Command Mnemonic(s) $sc_$cpu_TBL_Load

Command Structure

CFE_TBL_LoadCmd_t

Command Verification

Successful execution of this command may be verified with the following telemetry:

- **`$sc_$cpu_TBL_CMDPC`** - command execution counter will increment
- The CFE_TBL_FILE_LOADED_INF_EID informational event message will be generated

Error Conditions

This command can fail for the following reasons:

- Table name found in table image file's table header is not found in table registry (ie - The table associated with the table image in the file has not been registered by an application).
- The table image file has an invalid or incorrect size. The size of the image file must match the size field within in the header, and must also match the expected size of the table indicated in the registry.
- No working buffers are available for the load. This would indicate that too many single-buffered table loads are in progress at the same time.
- An attempt is being made to load an uninitialized table with a file containing only a partial table image.
- The table image file was unable to be opened. Either the file does not exist at the specified location, the filename is in error, or the file system has been corrupted.

Evidence of failure may be found in the following telemetry:

- **`$sc_$cpu_TBL_CMDEC`** - command error counter will increment
- Command specific error event messages are issued for all error cases

Criticality

This command is not inherently dangerous. It is performing the first step of loading a table and can be aborted (using the Abort Table Load command described below) without affecting the contents of the active table image.

See also

CFE_TBL_DUMP_CC, CFE_TBL_VALIDATE_CC, CFE_TBL_ACTIVATE_CC, CFE_TBL_ABORT_LOAD_CC

Definition at line 159 of file default_cfe_tbl_fcncodes.h.

12.145.2.7 CFE_TBL_NOOP_CC `#define CFE_TBL_NOOP_CC 0`

Name Table No-Op

Description

This command performs no other function than to increment the command execution counter. The command may be used to verify general aliveness of the Table Services task.

Command Mnemonic(s) $sc_$cpu_TBL_NOOP

Command Structure

CFE_TBL_NoopCmd_t

Command Verification

Successful execution of this command may be verified with the following telemetry:

- **`$sc_$cpu_TBL_CMDPC`** - command execution counter will increment
- The CFE_TBL_NOOP_INF_EID informational event message will be generated

Error Conditions

There are no error conditions for this command. If the Table Services receives the command, the event is sent (although it may be filtered by EVS) and the counter is incremented unconditionally.

Criticality

None

See also

Definition at line 68 of file default_cfe_tbl_fcncodes.h.

12.145.2.8 CFE_TBL_RESET_COUNTERS_CC `#define CFE_TBL_RESET_COUNTERS_CC 1`

Name Table Reset Counters

Description

This command resets the following counters within the Table Services housekeeping telemetry:

- Command Execution Counter ($sc_$cpu_TBL_CMDPC)
- Command Error Counter ($sc_$cpu_TBL_CMDEC)
- Successful Table Validations Counter ($sc_$cpu_TBL_ValSuccessCtr)
- Failed Table Validations Counter ($sc_$cpu_TBL_ValFailedCtr)
- Number of Table Validations Requested ($sc_$cpu_TBL_ValReqCtr)
- Number of completed table validations ($sc_$cpu_TBL_ValCompltdCtr)

Command Mnemonic(s) $sc_$cpu_TBL_ResetCtrs

Command Structure

CFE_TBL_ResetCountersCmd_t

Command Verification

Successful execution of this command may be verified with the following telemetry:

- **`$sc_$cpu_TBL_CMDPC`** - command execution counter will be reset to 0
- The CFE_TBL_RESET_INF_EID debug event message will be generated

Error Conditions

There are no error conditions for this command. If the Table Services receives the command, the event is sent (although it may be filtered by EVS) and the counter is incremented unconditionally.

Criticality

This command is not inherently dangerous. However, it is possible for ground systems and on-board safing procedures to be designed such that they react to changes in the counter values that are reset by this command.

See also

Definition at line 109 of file default_cfe_tbl_fcncodes.h.

12.145.2.9 CFE_TBL_SEND_REGISTRY_CC `#define CFE_TBL_SEND_REGISTRY_CC 7`

Name Telemeter One Table Registry Entry

Description

This command will cause Table Services to telemeter the contents of the Table Registry for the command specified table.

Command Mnemonic(s) $sc_$cpu_TBL_TLMReg

Command Structure

CFE_TBL_SendRegistryCmd_t

Command Verification

Successful execution of this command may be verified with the following telemetry:

- **`$sc_$cpu_TBL_CMDPC`** - command execution counter will increment
- Receipt of a Table Registry Info Packet (see CFE_TBL_TableRegistryTlm_t)
- The CFE_TBL_TLM_REG_CMD_INF_EID debug event message will be generated

Error Conditions

This command may fail for the following reason(s):

- The specified table name was not found in the table registry.

Evidence of failure may be found in the following telemetry:

- **`$sc_$cpu_TBL_CMDEC`** - command error counter will increment
- Error specific event message

Criticality

This command is not inherently dangerous. It will generate additional telemetry.

See also

CFE_TBL_DUMP_REGISTRY_CC

Definition at line 378 of file default_cfe_tbl_fcncodes.h.

12.145.2.10 CFE_TBL_VALIDATE_CC `#define CFE_TBL_VALIDATE_CC 4`

Name Validate Table

Description

This command will cause Table Services to calculate the Data Integrity Value for the specified table and to notify the owning application that the table's validation function should be executed. The results of both the Data Integrity Value computation and the validation function are reported in Table Services Housekeeping Telemetry.

Command Mnemonic(s) $sc_$cpu_TBL_VALIDATE

Command Structure

CFE_TBL_ValidateCmd_t

Command Verification

Successful execution of this command may be verified with the following telemetry:

- **`$sc_$cpu_TBL_CMDPC`** - command execution counter will increment
- **`$sc_$cpu_TBL_ValReqCtr`** - table validation request counter will increment
- **`$sc_$cpu_TBL_LastValCRC`** - calculated data integrity value will be updated
- The CFE_TBL_VAL_REQ_MADE_INF_EID debug event message (indicating the application is being notified of a validation request)

If the specified table has an associated validation function, then the following telemetry will also change:

- Either **`$sc_$cpu_TBL_ValSuccessCtr`** **OR** **`$sc_$cpu_TBL_ValFailedCtr`** **will** increment
- **`$sc_$cpu_TBL_ValCompltdCtr`** - table validations performed counter will increment
- **`$sc_$cpu_TBl_LastValS`** - table validation function return status will update
- The CFE_TBL_VALIDATION_INF_EID informational event message (indicating the validation function return status) will be generated

Error Conditions

This command may fail for the following reason(s):

- A single buffered table's inactive buffer was requested to be validated and no such buffer is currently allocated.
- Too many validations have been requested simultaneously. The operator must wait for one or more applications to perform their table validation functions before trying again.
- The specified table name was not found in the table registry.

Evidence of failure may be found in the following telemetry:

- **`$sc_$cpu_TBL_CMDEC`** - command error counter will increment
- Command specific error event message are issued for all error cases

Criticality

The success or failure of a table validation does not have any immediate impact on table contents. The results are sent to the operator in telemetry and the operator must determine whether the results are acceptable and send a command to activate the validated table image.

See also

CFE_TBL_LOAD_CC, CFE_TBL_DUMP_CC, CFE_TBL_ACTIVATE_CC, CFE_TBL_ABORT_LOAD_CC

Definition at line 259 of file default_cfe_tbl_fcncodes.h.

12.146 cfe/modules/tbl/config/default_cfe_tbl_interface_cfg.h File Reference

Macros

- #define CFE_MISSION_TBL_MAX_NAME_LENGTH 16
- #define CFE_MISSION_TBL_MAX_FULL_NAME_LEN (CFE_MISSION_TBL_MAX_NAME_LENGTH + CFE_MISSION_MAX_API_LEN + 4)

12.146.1 Detailed Description

CFE Table Services (CFE_TBL) Application Public Definitions
This provides default values for configurable items that affect the interface(s) of this module. This includes the CMD/TLM message interface, tables definitions, and any other data products that serve to exchange information with other entities.

Note

This file may be overridden/superceded by mission-provided definitions either by overriding this header or by generating definitions from a command/data dictionary tool.

12.146.2 Macro Definition Documentation

12.146.2.1 CFE_MISSION_TBL_MAX_FULL_NAME_LEN

```
#define CFE_MISSION_TBL_MAX_FULL_NAME_L↩
EN (CFE_MISSION_TBL_MAX_NAME_LENGTH + CFE_MISSION_MAX_API_LEN + 4)
```

Purpose Maximum Length of Full Table Name in messages

Description:

Indicates the maximum length (in characters) of the entire table name within software bus messages, in "App↩ Name.TableName" notation.

This affects the layout of command/telemetry messages but does not affect run time behavior or internal allocation.

Limits

All CPUs within the same SB domain (mission) must share the same definition Note this affects the size of messages, so it must not cause any message to exceed the max length.

This value should be kept as a multiple of 4, to maintain alignment of any possible neighboring fields without implicit padding.
Definition at line 69 of file default_cfe_tbl_interface_cfg.h.

12.146.2.2 CFE_MISSION_TBL_MAX_NAME_LENGTH `#define CFE_MISSION_TBL_MAX_NAME_LENGTH 16`

Purpose Maximum Table Name Length

Description:

Indicates the maximum length (in characters) of the table name ('TblName') portion of a Full Table Name of the following form: "ApplicationName.TblName"

This length does not need to include an extra character for NULL termination.

Limits

This value should be kept as a multiple of 4, to maintain alignment of any possible neighboring fields without implicit padding.

Definition at line 49 of file default_cfe_tbl_interface_cfg.h.

12.147 cfe/modules/tbl/config/default_cfe_tbl_internal_cfg.h File Reference

Macros

- #define CFE_PLATFORM_TBL_START_TASK_PRIORITY 70
- #define CFE_PLATFORM_TBL_START_TASK_STACK_SIZE CFE_PLATFORM_ES_DEFAULT_STACK_SIZE
- #define CFE_PLATFORM_TBL_BUF_MEMORY_BYTES 524288
- #define CFE_PLATFORM_TBL_MAX_DBL_TABLE_SIZE 16384
- #define CFE_PLATFORM_TBL_MAX_SNGL_TABLE_SIZE 16384
- #define CFE_PLATFORM_TBL_MAX_NUM_TABLES 128
- #define CFE_PLATFORM_TBL_MAX_CRITICAL_TABLES 32
- #define CFE_PLATFORM_TBL_MAX_NUM_HANDLES 256
- #define CFE_PLATFORM_TBL_MAX_SIMULTANEOUS_LOADS 4
- #define CFE_PLATFORM_TBL_MAX_NUM_VALIDATIONS 10
- #define CFE_PLATFORM_TBL_DEFAULT_REG_DUMP_FILE "/ram/cfe_tbl_reg.log"
- #define CFE_PLATFORM_TBL_VALID_SCID_COUNT 0
- #define CFE_PLATFORM_TBL_U32FROM4CHARS(_C1, _C2, _C3, _C4) ((uint32)(_C1) << 24 | (uint32)(_C2) << 16 | (uint32)(_C3) << 8 | (uint32)(_C4))
- #define CFE_PLATFORM_TBL_VALID_SCID_1 (0x42)
- #define CFE_PLATFORM_TBL_VALID_SCID_2 (CFE_PLATFORM_TBL_U32FROM4CHARS('a', 'b', 'c', 'd'))
- #define CFE_PLATFORM_TBL_VALID_PRID_COUNT 0
- #define CFE_PLATFORM_TBL_VALID_PRID_1 (1)
- #define CFE_PLATFORM_TBL_VALID_PRID_2 (CFE_PLATFORM_TBL_U32FROM4CHARS('a', 'b', 'c', 'd'))
- #define CFE_PLATFORM_TBL_VALID_PRID_3 0
- #define CFE_PLATFORM_TBL_VALID_PRID_4 0

12.147.1 Detailed Description

CFE Table Services (CFE_TBL) Application Private Config Definitions
This provides default values for configurable items that are internal to this module and do NOT affect the interface(s) of this module. Changes to items in this file only affect the local module and will be transparent to external entities that are using the public interface(s).

Note

This file may be overridden/superceded by mission-provided definitions either by overriding this header or by generating definitions from a command/data dictionary tool.

12.147.2 Macro Definition Documentation

12.147.2.1 CFE_PLATFORM_TBL_BUF_MEMORY_BYTES `#define CFE_PLATFORM_TBL_BUF_MEMORY_BYTES 524288`

Purpose Size of Table Services Table Memory Pool

Description:

Defines the TOTAL size of the memory pool that cFE Table Services allocates from the system. The size must be large enough to provide memory for each registered table, the inactive buffers for double buffered tables and for the shared inactive buffers for single buffered tables.

Limits

The cFE does not place a limit on the size of this parameter.

Definition at line 75 of file default_cfe_tbl_internal_cfg.h.

12.147.2.2 CFE_PLATFORM_TBL_DEFAULT_REG_DUMP_FILE `#define CFE_PLATFORM_TBL_DEFAULT_REG_DUMP_FILE "/ram/cfe_tbl_reg.log"`

Purpose Default Filename for a Table Registry Dump

Description:

Defines the file name used to store the table registry when no filename is specified in the dump registry command.

Limits

The length of each string, including the NULL terminator cannot exceed the OS_MAX_PATH_LEN value.

Definition at line 189 of file default_cfe_tbl_internal_cfg.h.

12.147.2.3 CFE_PLATFORM_TBL_MAX_CRITICAL_TABLES `#define CFE_PLATFORM_TBL_MAX_CRITICAL_TABLES 32`

Purpose Maximum Number of Critical Tables that can be Registered

Description:

Defines the maximum number of critical tables supported by this processor's Table Services.

Limits

This number must be less than 32767. It should be recognized that this parameter determines the size of the Critical Table Registry which is maintained in the Critical Data Store. An excessively high number will waste Critical Data Store memory. Therefore, this number must not exceed the value defined in CFE_PLATFORM_E↩S_CDS_MAX_NUM_ENTRIES.

Definition at line 130 of file default_cfe_tbl_internal_cfg.h.

12.147.2.4 CFE_PLATFORM_TBL_MAX_DBL_TABLE_SIZE `#define CFE_PLATFORM_TBL_MAX_DBL_TABLE_SI↩ZE 16384`

Purpose Maximum Size Allowed for a Double Buffered Table

Description:

Defines the maximum allowed size (in bytes) of a double buffered table.

Limits

The cFE does not place a limit on the size of this parameter but it must be less than half of CFE_PLATFORM_TBL_BUF_MEMORY_B

Definition at line 87 of file default_cfe_tbl_internal_cfg.h.

12.147.2.5 CFE_PLATFORM_TBL_MAX_NUM_HANDLES `#define CFE_PLATFORM_TBL_MAX_NUM_HANDLES 256`

Purpose Maximum Number of Table Handles

Description:

Defines the maximum number of Table Handles.

Limits

This number must be less than 32767. This number must be at least as big as the number of tables (CFE_PLATFORM_TBL_MAX_NUM_TABLES) and should be set higher if tables are shared between applications.

Definition at line 143 of file default_cfe_tbl_internal_cfg.h.

12.147.2.6 CFE_PLATFORM_TBL_MAX_NUM_TABLES `#define CFE_PLATFORM_TBL_MAX_NUM_TABLES 128`

Purpose Maximum Number of Tables Allowed to be Registered

Description:

Defines the maximum number of tables supported by this processor's Table Services.

Limits

This number must be less than 32767. It should be recognized that this parameter determines the size of the Table Registry. An excessively high number will waste memory.

Definition at line 116 of file default_cfe_tbl_internal_cfg.h.

12.147.2.7 CFE_PLATFORM_TBL_MAX_NUM_VALIDATIONS `#define CFE_PLATFORM_TBL_MAX_NUM_VALIDATIONS 10`

Purpose Maximum Number of Simultaneous Table Validations

Description:

Defines the maximum number of pending validations that the Table Services can handle at any one time. When a table has a validation function, a validation request is made of the application to perform that validation. This number determines how many of those requests can be outstanding at any one time.

Limits

This number must be less than 32767. An excessively high number will degrade system performance and waste memory. A number less than 20 is suggested but not required.

Definition at line 176 of file default_cfe_tbl_internal_cfg.h.

12.147.2.8 CFE_PLATFORM_TBL_MAX_SIMULTANEOUS_LOADS `#define CFE_PLATFORM_TBL_MAX_SIMULTANEOUS_LOADS 4`

Purpose Maximum Number of Simultaneous Loads to Support

Description:

Defines the maximum number of single buffered tables that can be loaded simultaneously. This number is used to determine the number of shared buffers to allocate.

Limits

This number must be less than 32767. An excessively high number will degrade system performance and waste memory. A number less than 5 is suggested but not required.

Definition at line 158 of file default_cfe_tbl_internal_cfg.h.

12.147.2.9 CFE_PLATFORM_TBL_MAX_SNGL_TABLE_SIZE `#define CFE_PLATFORM_TBL_MAX_SNGL_TABLE_SIZE 16384`

Purpose Maximum Size Allowed for a Single Buffered Table

Description:

Defines the maximum allowed size (in bytes) of a single buffered table. **NOTE:** This size determines the size of all shared table buffers. Therefore, this size will be multiplied by CFE_PLATFORM_TBL_MAX_SIMULTANEOUS_LOADS below when allocating memory for shared tables.

Limits

The cFE does not place a limit on the size of this parameter but it must be small enough to allow for CFE_PLATFORM_TBL_MAX_SIMULTANEOUS_LOADS number of tables to fit into CFE_PLATFORM_TBL_BUF_MEMORY_BYTE

Definition at line 103 of file default_cfe_tbl_internal_cfg.h.

12.147.2.10 CFE_PLATFORM_TBL_START_TASK_PRIORITY

```
#define CFE_PLATFORM_TBL_START_TASK_PRIO↩
RITY 70
```

Purpose Define TBL Task Priority

Description:

Defines the cFE_TBL Task priority.

Limits

Not Applicable

Definition at line 44 of file default_cfe_tbl_internal_cfg.h.

12.147.2.11 CFE_PLATFORM_TBL_START_TASK_STACK_SIZE

```
#define CFE_PLATFORM_TBL_START_TASK_S↩
TACK_SIZE CFE_PLATFORM_ES_DEFAULT_STACK_SIZE
```

Purpose Define TBL Task Stack Size

Description:

Defines the cFE_TBL Task Stack Size

Limits

There is a lower limit of 2048 on this configuration parameter. There are no restrictions on the upper limit however, the maximum stack size is system dependent and should be verified. Most operating systems provide tools for measuring the amount of stack used by a task during operation. It is always a good idea to verify that no more than 1/2 of the stack is used.

Definition at line 59 of file default_cfe_tbl_internal_cfg.h.

12.147.2.12 CFE_PLATFORM_TBL_U32FROM4CHARS

```
#define CFE_PLATFORM_TBL_U32FROM4CHARS(
            _C1,
            _C2,
            _C3,
            _C4 ) ((uint32)(_C1) << 24 | (uint32)(_C2) << 16 | (uint32)(_C3) << 8 | (uint32)(↩
_C4))
```

Definition at line 211 of file default_cfe_tbl_internal_cfg.h.

12.147.2.13 CFE_PLATFORM_TBL_VALID_PRID_1

```
#define CFE_PLATFORM_TBL_VALID_PRID_1 (1)
```

Purpose Processor ID values used for table load validation

Description:

Defines the processor ID values used for validating the processor ID field in the table file header. To be valid, the spacecraft ID specified in the table file header must match one of the values defined here.

Limits

This value can be any 32 bit unsigned integer.

Definition at line 260 of file default_cfe_tbl_internal_cfg.h.

12.147.2.14 CFE_PLATFORM_TBL_VALID_PRID_2 `#define CFE_PLATFORM_TBL_VALID_PRID_2 (CFE_PLATFORM_TBL_U32FROM4CH 'b', 'c', 'd'))`

Definition at line 261 of file default_cfe_tbl_internal_cfg.h.

12.147.2.15 CFE_PLATFORM_TBL_VALID_PRID_3 `#define CFE_PLATFORM_TBL_VALID_PRID_3 0`

Definition at line 262 of file default_cfe_tbl_internal_cfg.h.

12.147.2.16 CFE_PLATFORM_TBL_VALID_PRID_4 `#define CFE_PLATFORM_TBL_VALID_PRID_4 0`

Definition at line 263 of file default_cfe_tbl_internal_cfg.h.

12.147.2.17 CFE_PLATFORM_TBL_VALID_PRID_COUNT `#define CFE_PLATFORM_TBL_VALID_PRID_COUNT 0`

Purpose Number of Processor ID's specified for validation

Description:

Defines the number of specified processor ID values that are verified during table loads. If the number is zero then no validation of the processor ID field in the table file header is performed when tables are loaded. Non-zero values indicate how many values from the list of processor ID's defined below are compared to the processor ID field in the table file header. The ELF2CFETBL tool may be used to create table files with specified processor ID values.

Limits

This number must be greater than or equal to zero and less than or equal to 4.

Definition at line 246 of file default_cfe_tbl_internal_cfg.h.

12.147.2.18 CFE_PLATFORM_TBL_VALID_SCID_1 `#define CFE_PLATFORM_TBL_VALID_SCID_1 (0x42)`

Purpose Spacecraft ID values used for table load validation

Description:

Defines the spacecraft ID values used for validating the spacecraft ID field in the table file header. To be valid, the spacecraft ID specified in the table file header must match one of the values defined here.

Limits

This value can be any 32 bit unsigned integer.

Definition at line 226 of file default_cfe_tbl_internal_cfg.h.

12.147.2.19 CFE_PLATFORM_TBL_VALID_SCID_2 `#define CFE_PLATFORM_TBL_VALID_SCID_2 (CFE_PLATFORM_TBL_U32FROM4CH 'b', 'c', 'd'))`

Definition at line 227 of file default_cfe_tbl_internal_cfg.h.

12.147.2.20 CFE_PLATFORM_TBL_VALID_SCID_COUNT `#define CFE_PLATFORM_TBL_VALID_SCID_COUNT 0`

Purpose Number of Spacecraft ID's specified for validation

Description:

Defines the number of specified spacecraft ID values that are verified during table loads. If the number is zero then no validation of the spacecraft ID field in the table file header is performed when tables are loaded. Non-zero values indicate how many values from the list of spacecraft ID's defined below are compared to the spacecraft ID field in the table file header. The ELF2CFETBL tool may be used to create table files with specified spacecraft ID values.

Limits

This number must be greater than or equal to zero and less than or equal to 2.

Definition at line 208 of file default_cfe_tbl_internal_cfg.h.

12.148 cfe/modules/tbl/config/default_cfe_tbl_mission_cfg.h File Reference

```
#include "cfe_tbl_interface_cfg.h"
```

12.148.1 Detailed Description

CFE Event Services (CFE_TBL) Application Mission Configuration Header File
This is a compatibility header for the "mission_cfg.h" file that has traditionally provided public config definitions for each CFS app.

Note

This file may be overridden/superceded by mission-provided definitions either by overriding this header or by generating definitions from a command/data dictionary tool.

12.149 cfe/modules/tbl/config/default_cfe_tbl_msg.h File Reference

```
#include "cfe_mission_cfg.h"
#include "cfe_tbl_fcncodes.h"
#include "cfe_tbl_msgdefs.h"
#include "cfe_tbl_msgstruct.h"
```

12.149.1 Detailed Description

Specification for the CFE Event Services (CFE_TBL) command and telemetry message data types.
This is a compatibility header for the "cfe_tbl_msg.h" file that has traditionally provided the message definitions for cFS apps.

Note

This file may be overridden/superceded by mission-provided definitions either by overriding this header or by generating definitions from a command/data dictionary tool.

12.150 cfe/modules/tbl/config/default_cfe_tbl_msgdefs.h File Reference

```
#include "common_types.h"
#include "cfe_mission_cfg.h"
#include "cfe_es_extern_typedefs.h"
#include "cfe_time_extern_typedefs.h"
#include "cfe_tbl_fcncodes.h"
```

Data Structures

- struct CFE_TBL_LoadCmd_Payload

  Load Table Command Payload.
- struct CFE_TBL_DumpCmd_Payload

  Dump Table Command Payload.
- struct CFE_TBL_ValidateCmd_Payload

  Validate Table Command Payload.
- struct CFE_TBL_ActivateCmd_Payload

  Activate Table Command Payload.
- struct CFE_TBL_DumpRegistryCmd_Payload

  Dump Registry Command Payload.
- struct CFE_TBL_SendRegistryCmd_Payload

  Send Table Registry Command Payload.
- struct CFE_TBL_DelCDSCmd_Payload

  Delete Critical Table CDS Command Payload.
- struct CFE_TBL_AbortLoadCmd_Payload

  Abort Load Command Payload.
- struct CFE_TBL_NotifyCmd_Payload

  Table Management Notification Command Payload.
- struct CFE_TBL_HousekeepingTlm_Payload
- struct CFE_TBL_TblRegPacket_Payload

Typedefs

- typedef struct CFE_TBL_LoadCmd_Payload CFE_TBL_LoadCmd_Payload_t

  Load Table Command Payload.
- typedef struct CFE_TBL_DumpCmd_Payload CFE_TBL_DumpCmd_Payload_t

  Dump Table Command Payload.
- typedef struct CFE_TBL_ValidateCmd_Payload CFE_TBL_ValidateCmd_Payload_t

  Validate Table Command Payload.
- typedef struct CFE_TBL_ActivateCmd_Payload CFE_TBL_ActivateCmd_Payload_t

  Activate Table Command Payload.
- typedef struct CFE_TBL_DumpRegistryCmd_Payload CFE_TBL_DumpRegistryCmd_Payload_t

  Dump Registry Command Payload.
- typedef struct CFE_TBL_SendRegistryCmd_Payload CFE_TBL_SendRegistryCmd_Payload_t

  Send Table Registry Command Payload.
- typedef struct CFE_TBL_DelCDSCmd_Payload CFE_TBL_DelCDSCmd_Payload_t

  Delete Critical Table CDS Command Payload.
- typedef struct CFE_TBL_AbortLoadCmd_Payload CFE_TBL_AbortLoadCmd_Payload_t

  Abort Load Command Payload.

- typedef struct CFE_TBL_NotifyCmd_Payload CFE_TBL_NotifyCmd_Payload_t

  Table Management Notification Command Payload.
- typedef struct CFE_TBL_HousekeepingTlm_Payload CFE_TBL_HousekeepingTlm_Payload_t
- typedef struct CFE_TBL_TblRegPacket_Payload CFE_TBL_TblRegPacket_Payload_t

12.150.1 Detailed Description

Specification for the CFE Event Services (CFE_TBL) command and telemetry message constant definitions.
For CFE_TBL this is only the function/command code definitions

12.150.2 Typedef Documentation

12.150.2.1 CFE_TBL_AbortLoadCmd_Payload_t `typedef struct CFE_TBL_AbortLoadCmd_Payload CFE_TBL_AbortLoadCmd_Pay`

Abort Load Command Payload.
For command details, see CFE_TBL_ABORT_LOAD_CC

12.150.2.2 CFE_TBL_ActivateCmd_Payload_t `typedef struct CFE_TBL_ActivateCmd_Payload CFE_TBL_ActivateCmd_Payload`

Activate Table Command Payload.
For command details, see CFE_TBL_ACTIVATE_CC

12.150.2.3 CFE_TBL_DelCDSCmd_Payload_t `typedef struct CFE_TBL_DelCDSCmd_Payload CFE_TBL_DelCDSCmd_Payload_t`

Delete Critical Table CDS Command Payload.
For command details, see CFE_TBL_DELETE_CDS_CC

12.150.2.4 CFE_TBL_DumpCmd_Payload_t `typedef struct CFE_TBL_DumpCmd_Payload CFE_TBL_DumpCmd_Payload_t`

Dump Table Command Payload.
For command details, see CFE_TBL_DUMP_CC

12.150.2.5 CFE_TBL_DumpRegistryCmd_Payload_t `typedef struct CFE_TBL_DumpRegistryCmd_Payload CFE_TBL_DumpRegistryCmd_Payload_t`

Dump Registry Command Payload.
For command details, see CFE_TBL_DUMP_REGISTRY_CC

12.150.2.6 CFE_TBL_HousekeepingTlm_Payload_t `typedef struct CFE_TBL_HousekeepingTlm_Payload CFE_TBL_HousekeepingTlm_Payload_t`

Name Table Services Housekeeping Packet

12.150.2.7 CFE_TBL_LoadCmd_Payload_t `typedef struct CFE_TBL_LoadCmd_Payload CFE_TBL_LoadCmd_Payload_t`

Load Table Command Payload.
For command details, see CFE_TBL_LOAD_CC

12.150.2.8 CFE_TBL_NotifyCmd_Payload_t `typedef struct CFE_TBL_NotifyCmd_Payload CFE_TBL_NotifyCmd_Payload_t`

Table Management Notification Command Payload.

Description

Whenever an application that owns a table calls the CFE_TBL_NotifyByMessage API following the table registration, Table services will generate the following command message with the application specified message ID, command code and parameter whenever the table requires management (e.g. - loads and validations).

12.150.2.9 CFE_TBL_SendRegistryCmd_Payload_t

`typedef struct CFE_TBL_SendRegistryCmd_Payload CFE_TBL_SendRegistryCmd_Payload_t`

Send Table Registry Command Payload.
For command details, see CFE_TBL_SEND_REGISTRY_CC

12.150.2.10 CFE_TBL_TblRegPacket_Payload_t

`typedef struct CFE_TBL_TblRegPacket_Payload CFE_TBL_TblRegPacket_Pay`

Name Table Registry Info Packet

12.150.2.11 CFE_TBL_ValidateCmd_Payload_t

`typedef struct CFE_TBL_ValidateCmd_Payload CFE_TBL_ValidateCmd_Payloa`

Validate Table Command Payload.
For command details, see CFE_TBL_VALIDATE_CC

12.151 cfe/modules/tbl/config/default_cfe_tbl_msgids.h File Reference

```
#include "cfe_core_api_base_msgids.h"
#include "cfe_tbl_topicids.h"
```

Macros

- #define CFE_TBL_CMD_MID CFE_PLATFORM_CMD_TOPICID_TO_MIDV(CFE_MISSION_TBL_CMD_TOPICID) /∗ 0x1804 ∗/
- #define CFE_TBL_SEND_HK_MID CFE_PLATFORM_CMD_TOPICID_TO_MIDV(CFE_MISSION_TBL_SEND_HK_TOPICID) /∗ 0x180C ∗/
- #define CFE_TBL_HK_TLM_MID CFE_PLATFORM_TLM_TOPICID_TO_MIDV(CFE_MISSION_TBL_HK_TLM_TOPICID) /∗ 0x0804 ∗/
- #define CFE_TBL_REG_TLM_MID CFE_PLATFORM_TLM_TOPICID_TO_MIDV(CFE_MISSION_TBL_REG_TLM_TOPICID) /∗ 0x080C ∗/

12.151.1 Detailed Description

CFE Event Services (CFE_TBL) Application Message IDs

12.151.2 Macro Definition Documentation

12.151.2.1 CFE_TBL_CMD_MID

`#define CFE_TBL_CMD_MID CFE_PLATFORM_CMD_TOPICID_TO_MIDV(CFE_MISSION_TBL_CMD_TOPICI /* 0x1804 */`

Definition at line 32 of file default_cfe_tbl_msgids.h.

12.151.2.2 CFE_TBL_HK_TLM_MID

`#define CFE_TBL_HK_TLM_MID CFE_PLATFORM_TLM_TOPICID_TO_MIDV(CFE_MISSION_TBL_HK_ /* 0x0804 */`

Definition at line 38 of file default_cfe_tbl_msgids.h.

12.151.2.3 CFE_TBL_REG_TLM_MID

`#define CFE_TBL_REG_TLM_MID CFE_PLATFORM_TLM_TOPICID_TO_MIDV(CFE_MISSION_TBL_R /* 0x080C */`

Definition at line 39 of file default_cfe_tbl_msgids.h.

12.151.2.4 CFE_TBL_SEND_HK_MID

```
#define CFE_TBL_SEND_HK_MID CFE_PLATFORM_CMD_TOPICID_TO_MIDV(CFE_MISSION_TBL_S
/* 0x180C */
```

Definition at line 33 of file default_cfe_tbl_msgids.h.

12.152 cfe/modules/tbl/config/default_cfe_tbl_msgstruct.h File Reference

```
#include "cfe_tbl_msgdefs.h"
#include "cfe_msg_hdr.h"
```

Data Structures

- struct CFE_TBL_NoopCmd
- struct CFE_TBL_ResetCountersCmd
- struct CFE_TBL_SendHkCmd
- struct CFE_TBL_LoadCmd

  Load Table Command.
- struct CFE_TBL_DumpCmd
- struct CFE_TBL_ValidateCmd

  Validate Table Command.
- struct CFE_TBL_ActivateCmd

  Activate Table Command.
- struct CFE_TBL_DumpRegistryCmd

  Dump Registry Command.
- struct CFE_TBL_SendRegistryCmd

  Send Table Registry Command.
- struct CFE_TBL_DeleteCDSCmd

  Delete Critical Table CDS Command.
- struct CFE_TBL_AbortLoadCmd

  Abort Load Command.
- struct CFE_TBL_NotifyCmd
- struct CFE_TBL_HousekeepingTlm
- struct CFE_TBL_TableRegistryTlm

Typedefs

- typedef struct CFE_TBL_NoopCmd CFE_TBL_NoopCmd_t
- typedef struct CFE_TBL_ResetCountersCmd CFE_TBL_ResetCountersCmd_t
- typedef struct CFE_TBL_SendHkCmd CFE_TBL_SendHkCmd_t
- typedef struct CFE_TBL_LoadCmd CFE_TBL_LoadCmd_t

  Load Table Command.
- typedef struct CFE_TBL_DumpCmd CFE_TBL_DumpCmd_t
- typedef struct CFE_TBL_ValidateCmd CFE_TBL_ValidateCmd_t

  Validate Table Command.
- typedef struct CFE_TBL_ActivateCmd CFE_TBL_ActivateCmd_t

  Activate Table Command.
- typedef struct CFE_TBL_DumpRegistryCmd CFE_TBL_DumpRegistryCmd_t

  Dump Registry Command.
- typedef struct CFE_TBL_SendRegistryCmd CFE_TBL_SendRegistryCmd_t

  Send Table Registry Command.

- typedef struct CFE_TBL_DeleteCDSCmd CFE_TBL_DeleteCDSCmd_t

  Delete Critical Table CDS Command.
- typedef struct CFE_TBL_AbortLoadCmd CFE_TBL_AbortLoadCmd_t

  Abort Load Command.
- typedef struct CFE_TBL_NotifyCmd CFE_TBL_NotifyCmd_t
- typedef struct CFE_TBL_HousekeepingTlm CFE_TBL_HousekeepingTlm_t
- typedef struct CFE_TBL_TableRegistryTlm CFE_TBL_TableRegistryTlm_t

12.152.1 Detailed Description

Purpose: cFE Executive Services (TBL) Command and Telemetry packet definition file.
References: Flight Software Branch C Coding Standard Version 1.0a cFE Flight Software Application Developers Guide
Notes:

12.152.2 Typedef Documentation

12.152.2.1 CFE_TBL_AbortLoadCmd_t `typedef struct CFE_TBL_AbortLoadCmd CFE_TBL_AbortLoadCmd_t`

Abort Load Command.

12.152.2.2 CFE_TBL_ActivateCmd_t `typedef struct CFE_TBL_ActivateCmd CFE_TBL_ActivateCmd_t`

Activate Table Command.

12.152.2.3 CFE_TBL_DeleteCDSCmd_t `typedef struct CFE_TBL_DeleteCDSCmd CFE_TBL_DeleteCDSCmd_t`

Delete Critical Table CDS Command.

12.152.2.4 CFE_TBL_DumpCmd_t `typedef struct CFE_TBL_DumpCmd CFE_TBL_DumpCmd_t`

/brief Dump Table Command

12.152.2.5 CFE_TBL_DumpRegistryCmd_t `typedef struct CFE_TBL_DumpRegistryCmd CFE_TBL_DumpRegistryCmd_t`

Dump Registry Command.

12.152.2.6 CFE_TBL_HousekeepingTlm_t `typedef struct CFE_TBL_HousekeepingTlm CFE_TBL_HousekeepingTlm_t`

12.152.2.7 CFE_TBL_LoadCmd_t `typedef struct CFE_TBL_LoadCmd CFE_TBL_LoadCmd_t`

Load Table Command.

12.152.2.8 CFE_TBL_NoopCmd_t `typedef struct CFE_TBL_NoopCmd CFE_TBL_NoopCmd_t`

12.152.2.9 CFE_TBL_NotifyCmd_t `typedef struct CFE_TBL_NotifyCmd CFE_TBL_NotifyCmd_t`

/brief Table Management Notification Command

12.152.2.10 CFE_TBL_ResetCountersCmd_t

`typedef struct CFE_TBL_ResetCountersCmd CFE_TBL_ResetCountersCmd_t`

12.152.2.11 CFE_TBL_SendHkCmd_t

`typedef struct CFE_TBL_SendHkCmd CFE_TBL_SendHkCmd_t`

12.152.2.12 CFE_TBL_SendRegistryCmd_t

`typedef struct CFE_TBL_SendRegistryCmd CFE_TBL_SendRegistryCmd_t`

Send Table Registry Command.

12.152.2.13 CFE_TBL_TableRegistryTlm_t

`typedef struct CFE_TBL_TableRegistryTlm CFE_TBL_TableRegistryTlm_t`

12.152.2.14 CFE_TBL_ValidateCmd_t

`typedef struct CFE_TBL_ValidateCmd CFE_TBL_ValidateCmd_t`

Validate Table Command.

12.153 cfe/modules/tbl/config/default_cfe_tbl_platform_cfg.h File Reference

```
#include "cfe_tbl_mission_cfg.h"
#include "cfe_tbl_internal_cfg.h"
```

12.153.1 Detailed Description

CFE Table Services (CFE_TBL) Application Platform Configuration Header File
This is a compatibility header for the "platform_cfg.h" file that has traditionally provided both public and private config definitions for each CFS app.
These definitions are now provided in two separate files, one for the public/mission scope and one for internal scope.

Note

This file may be overridden/superceded by mission-provided definitions either by overriding this header or by generating definitions from a command/data dictionary tool.

12.154 cfe/modules/tbl/config/default_cfe_tbl_topicids.h File Reference

Macros

- #define CFE_MISSION_TBL_CMD_TOPICID 4
- #define CFE_MISSION_TBL_SEND_HK_TOPICID 12
- #define CFE_MISSION_TBL_HK_TLM_TOPICID 4
- #define CFE_MISSION_TBL_REG_TLM_TOPICID 12

12.154.1 Detailed Description

CFE Table Services (CFE_TBL) Application Topic IDs

12.154.2 Macro Definition Documentation

12.154.2.1 CFE_MISSION_TBL_CMD_TOPICID `#define CFE_MISSION_TBL_CMD_TOPICID 4`

Purpose cFE Portable Message Numbers for Commands

Description:

Portable message numbers for the cFE command messages

Limits

Not Applicable

Definition at line 35 of file default_cfe_tbl_topicids.h.

12.154.2.2 CFE_MISSION_TBL_HK_TLM_TOPICID `#define CFE_MISSION_TBL_HK_TLM_TOPICID 4`

Purpose cFE Portable Message Numbers for Telemetry

Description:

Portable message numbers for the cFE telemetry messages

Limits

Not Applicable

Definition at line 47 of file default_cfe_tbl_topicids.h.

12.154.2.3 CFE_MISSION_TBL_REG_TLM_TOPICID `#define CFE_MISSION_TBL_REG_TLM_TOPICID 12`

Definition at line 48 of file default_cfe_tbl_topicids.h.

12.154.2.4 CFE_MISSION_TBL_SEND_HK_TOPICID `#define CFE_MISSION_TBL_SEND_HK_TOPICID 12`

Definition at line 36 of file default_cfe_tbl_topicids.h.

12.155 cfe/modules/tbl/fsw/inc/cfe_tbl_eventids.h File Reference

Macros

TBL event IDs

- #define CFE_TBL_INIT_INF_EID 1
  TB Initialization Event ID.
- #define CFE_TBL_NOOP_INF_EID 10
  TBL No-op Command Success Event ID.
- #define CFE_TBL_RESET_INF_EID 11
  TBL Reset Counters Command Success Event ID.
- #define CFE_TBL_FILE_LOADED_INF_EID 12
  TBL Load Table Command Success Event ID.
- #define CFE_TBL_OVERWRITE_DUMP_INF_EID 13
  TBL Write Table To Existing File Success Event ID.
- #define CFE_TBL_WRITE_DUMP_INF_EID 14
  TBL Write Table To New File Success Event ID.

- #define CFE_TBL_OVERWRITE_REG_DUMP_INF_EID 15

  TBL Write Table Registry To Existing File Success Event ID.
- #define CFE_TBL_VAL_REQ_MADE_INF_EID 16

  TBL Validate Table Request Success Event ID.
- #define CFE_TBL_LOAD_PEND_REQ_INF_EID 17

  TBL Load Table Pending Notification Success Event ID.
- #define CFE_TBL_TLM_REG_CMD_INF_EID 18

  TBL Telemeter Table Registry Entry Command Success Event ID.
- #define CFE_TBL_LOAD_ABORT_INF_EID 21

  TBL Abort Table Load Success Event ID.
- #define CFE_TBL_WRITE_REG_DUMP_INF_EID 22

  TBL Write Table Registry To New File Success Event ID.
- #define CFE_TBL_ASSUMED_VALID_INF_EID 23

  TBL Validate Table Valid Due To No Validation Function Event ID.
- #define CFE_TBL_LOAD_SUCCESS_INF_EID 35

  TBL Load Table API Success Event ID.
- #define CFE_TBL_VALIDATION_INF_EID 36

  TBL Validate Table Success Event ID.
- #define CFE_TBL_UPDATE_SUCCESS_INF_EID 37

  TBL Update Table Success Event ID.
- #define CFE_TBL_CDS_DELETED_INFO_EID 38

  TBL Delete Table CDS Command Success Event ID.
- #define CFE_TBL_MID_ERR_EID 50

  TBL Invalid Message ID Received Event ID.
- #define CFE_TBL_CC1_ERR_EID 51

  TBL Invalid Command Code Received Event ID.
- #define CFE_TBL_LEN_ERR_EID 52

  TBL Invalid Command Length Event ID.
- #define CFE_TBL_FILE_ACCESS_ERR_EID 53

  TBL Load Table File Open Failure Event ID.
- #define CFE_TBL_FILE_STD_HDR_ERR_EID 54

  TBL Load Table File Read Standard Header Failure Event ID.
- #define CFE_TBL_FILE_TBL_HDR_ERR_EID 55

  TBL Load Table File Read Table Header Failure Event ID.
- #define CFE_TBL_FAIL_HK_SEND_ERR_EID 56

  TBL Send Housekeeping Command Transmit Failure Event ID.
- #define CFE_TBL_NO_SUCH_TABLE_ERR_EID 57

  TBL Table Name Not Found Event ID.
- #define CFE_TBL_FILE_TYPE_ERR_EID 58

  TBL Load Table Invalid File Content ID Event ID.
- #define CFE_TBL_FILE_SUBTYPE_ERR_EID 59

  TBL Load Table Invalid File Subtype Event ID.
- #define CFE_TBL_NO_WORK_BUFFERS_ERR_EID 60

  TBL Load Or Dump Table No Working Buffers Available Event ID.
- #define CFE_TBL_CREATING_DUMP_FILE_ERR_EID 62

  TBL Write File Creation Failure Event ID.
- #define CFE_TBL_WRITE_CFE_HDR_ERR_EID 63

  TBL Write Standard File Header Failure Event ID.
- #define CFE_TBL_WRITE_TBL_HDR_ERR_EID 64

  TBL Write Table File Header Failure Event ID.
- #define CFE_TBL_WRITE_TBL_IMG_ERR_EID 65

  TBL Write Table File Data Failure Event ID.
- #define CFE_TBL_NO_INACTIVE_BUFFER_ERR_EID 66

  TBL Validate Or Write Table Command No Inactive Buffer Event ID.
- #define CFE_TBL_TOO_MANY_VALIDATIONS_ERR_EID 67

TBL Validate Table Command Result Storage Exceeded Event ID.

- #define CFE_TBL_WRITE_TBL_REG_ERR_EID 68

  TBL Write Table Registry File Data Failure Event ID.
- #define CFE_TBL_LOAD_ABORT_ERR_EID 69

  TBL Abort Table Load No Load Started Event ID.
- #define CFE_TBL_ACTIVATE_ERR_EID 70

  TBL Activate Table Command No Inactive Buffer Event ID.
- #define CFE_TBL_FILE_INCOMPLETE_ERR_EID 71

  TBL Load Table Incomplete Load Event ID.
- #define CFE_TBL_LOAD_EXCEEDS_SIZE_ERR_EID 72

  TBL Load Table File Exceeds Table Size Event ID.
- #define CFE_TBL_ZERO_LENGTH_LOAD_ERR_EID 73

  TBL Load Table File Zero Length Event ID.
- #define CFE_TBL_PARTIAL_LOAD_ERR_EID 74

  TBL Load Table Uninitialized Partial Load Event ID.
- #define CFE_TBL_FILE_TOO_BIG_ERR_EID 75

  TBL Load Table File Excess Data Event ID.
- #define CFE_TBL_TOO_MANY_DUMPS_ERR_EID 76

  TBL Write Table Command Dump Only Control Blocks Exceeded Event ID.
- #define CFE_TBL_DUMP_PENDING_ERR_EID 77

  TBL Write Table Command Already In Progress Event ID.
- #define CFE_TBL_ACTIVATE_DUMP_ONLY_ERR_EID 78

  TBL Activate Table Command For Dump Only Table Event ID.
- #define CFE_TBL_LOADING_A_DUMP_ONLY_ERR_EID 79

  TBL Load Table For Dump Only Table Event ID.
- #define CFE_TBL_ILLEGAL_BUFF_PARAM_ERR_EID 80

  TBL Validate Or Write Table Command Invalid Buffer Event ID.
- #define CFE_TBL_UNVALIDATED_ERR_EID 81

  TBL Activate Table Command Inactive Image Not Validated Event ID.
- #define CFE_TBL_IN_REGISTRY_ERR_EID 82

  TBL Delete Table CDS Command For Registered Table Event ID.
- #define CFE_TBL_NOT_CRITICAL_TBL_ERR_EID 83

  TBL Delete Table CDS Command Invalid CDS Type Event ID.
- #define CFE_TBL_NOT_IN_CRIT_REG_ERR_EID 84

  TBL Delete Table CDS Command Not In Critical Table Registry Event ID.
- #define CFE_TBL_CDS_NOT_FOUND_ERR_EID 85

  TBL Delete Table CDS Command Not In CDS Registry Event ID.
- #define CFE_TBL_CDS_DELETE_ERR_EID 86

  TBL Delete Table CDS Command Internal Error Event ID.
- #define CFE_TBL_CDS_OWNER_ACTIVE_ERR_EID 87

  TBL Delete Table CDS Command App Active Event ID.
- #define CFE_TBL_LOADING_PENDING_ERR_EID 88

  TBL Load Table Command Load Pending Event ID.
- #define CFE_TBL_FAIL_NOTIFY_SEND_ERR_EID 89

  TBL Send Notification Transmit Failed Event ID.
- #define CFE_TBL_REGISTER_ERR_EID 90

  TBL Register Table Failed Event ID.
- #define CFE_TBL_SHARE_ERR_EID 91

  TBL Share Table Failed Event ID.
- #define CFE_TBL_UNREGISTER_ERR_EID 92

  TBL Unregister Table Failed Event ID.
- #define CFE_TBL_LOAD_VAL_ERR_EID 93

  TBL Validation Function Invalid Return Code Event ID.
- #define CFE_TBL_LOAD_TYPE_ERR_EID 94

  TBL Load Table API Invalid Source Type Event ID.

- #define CFE_TBL_UPDATE_ERR_EID 95
  TBL Update Table Failed Event ID.
- #define CFE_TBL_VALIDATION_ERR_EID 96
  TBL Validate Table Validation Failed Event ID.
- #define CFE_TBL_SPACECRAFT_ID_ERR_EID 97
  TBL Read Header Invalid Spacecraft ID Event ID.
- #define CFE_TBL_PROCESSOR_ID_ERR_EID 98
  TBL Read Header Invalid Processor ID Event ID.
- #define CFE_TBL_LOAD_IN_PROGRESS_ERR_EID 100
  TBL Load Table API Load Already In Progress Event ID.
- #define CFE_TBL_LOAD_FILENAME_LONG_ERR_EID 101
  TBL Load Table Filename Too Long Event ID.
- #define CFE_TBL_LOAD_TBLNAME_MISMATCH_ERR_EID 102
  TBL Load Table Name Mismatch Event ID.
- #define CFE_TBL_HANDLE_ACCESS_ERR_EID 103
  TBL Load Table API Access Violation Event ID.

12.155.1 Detailed Description

cFE Table Services Event IDs

12.155.2 Macro Definition Documentation

12.155.2.1 CFE_TBL_ACTIVATE_DUMP_ONLY_ERR_EID `#define CFE_TBL_ACTIVATE_DUMP_ONLY_ERR_EID 78`

TBL Activate Table Command For Dump Only Table Event ID.

Type: ERROR

Cause:

TBL Activate Table Command failure due to table being dump only.
Definition at line 544 of file cfe_tbl_eventids.h.

12.155.2.2 CFE_TBL_ACTIVATE_ERR_EID `#define CFE_TBL_ACTIVATE_ERR_EID 70`

TBL Activate Table Command No Inactive Buffer Event ID.

Type: ERROR

Cause:

TBL Activate Table Command failure due to no associated inactive buffer.
Definition at line 450 of file cfe_tbl_eventids.h.

12.155.2.3 CFE_TBL_ASSUMED_VALID_INF_EID `#define CFE_TBL_ASSUMED_VALID_INF_EID 23`

TBL Validate Table Valid Due To No Validation Function Event ID.

Type: INFORMATION

Cause:

TBL Validate Table Command marking table as valid due to no validation function being registered.
Definition at line 180 of file cfe_tbl_eventids.h.

12.155.2.4 CFE_TBL_CC1_ERR_EID `#define CFE_TBL_CC1_ERR_EID 51`

TBL Invalid Command Code Received Event ID.

Type: ERROR

Cause:

Invalid command code for message ID CFE_TBL_CMD_MID received on the TBL message pipe.
Definition at line 246 of file cfe_tbl_eventids.h.

12.155.2.5 CFE_TBL_CDS_DELETE_ERR_EID `#define CFE_TBL_CDS_DELETE_ERR_EID 86`

TBL Delete Table CDS Command Internal Error Event ID.

Type: ERROR

Cause:

TBL Delete Table CDS Command failure due to an internal error. See the system log for more information.
Definition at line 640 of file cfe_tbl_eventids.h.

12.155.2.6 CFE_TBL_CDS_DELETED_INFO_EID `#define CFE_TBL_CDS_DELETED_INFO_EID 38`

TBL Delete Table CDS Command Success Event ID.

Type: INFORMATION

Cause:

TBL Delete Table CDS Command success.
Definition at line 224 of file cfe_tbl_eventids.h.

12.155.2.7 CFE_TBL_CDS_NOT_FOUND_ERR_EID `#define CFE_TBL_CDS_NOT_FOUND_ERR_EID 85`

TBL Delete Table CDS Command Not In CDS Registry Event ID.

Type: ERROR

Cause:

TBL Delete Table CDS Command failure due to the table name not found in the CDS registry.
Definition at line 628 of file cfe_tbl_eventids.h.

12.155.2.8 CFE_TBL_CDS_OWNER_ACTIVE_ERR_EID `#define CFE_TBL_CDS_OWNER_ACTIVE_ERR_EID 87`

TBL Delete Table CDS Command App Active Event ID.

Type: ERROR

Cause:

TBL Delete Table CDS Command failure due to the owning application being active.
Definition at line 652 of file cfe_tbl_eventids.h.

12.155.2.9 CFE_TBL_CREATING_DUMP_FILE_ERR_EID `#define CFE_TBL_CREATING_DUMP_FILE_ERR_EID 62`

TBL Write File Creation Failure Event ID.

Type: ERROR

Cause:

TBL Write Table or Table Registry File failed to create file. OVERLOADED
Definition at line 357 of file cfe_tbl_eventids.h.

12.155.2.10 CFE_TBL_DUMP_PENDING_ERR_EID `#define CFE_TBL_DUMP_PENDING_ERR_EID 77`

TBL Write Table Command Already In Progress Event ID.

Type: ERROR

Cause:

TBL Write Table Command failure due to a dump already in progress for the same table.
Definition at line 532 of file cfe_tbl_eventids.h.

12.155.2.11 CFE_TBL_FAIL_HK_SEND_ERR_EID `#define CFE_TBL_FAIL_HK_SEND_ERR_EID 56`

TBL Send Housekeeping Command Transmit Failure Event ID.

Type: ERROR

Cause:

TBL Send Housekeeping Command failure transmitting the housekeeping message.
Definition at line 302 of file cfe_tbl_eventids.h.

12.155.2.12 CFE_TBL_FAIL_NOTIFY_SEND_ERR_EID `#define CFE_TBL_FAIL_NOTIFY_SEND_ERR_EID 89`

TBL Send Notification Transmit Failed Event ID.

Type: ERROR

Cause:

TBL send notification transmit message failure.
Definition at line 674 of file cfe_tbl_eventids.h.

12.155.2.13 CFE_TBL_FILE_ACCESS_ERR_EID `#define CFE_TBL_FILE_ACCESS_ERR_EID 53`

TBL Load Table File Open Failure Event ID.

Type: ERROR

Cause:

Load Table failure opening the file. OVERLOADED
Definition at line 268 of file cfe_tbl_eventids.h.

12.155.2.14 CFE_TBL_FILE_INCOMPLETE_ERR_EID `#define CFE_TBL_FILE_INCOMPLETE_ERR_EID 71`

TBL Load Table Incomplete Load Event ID.

Type: ERROR

Cause:

TBL Load Table failure due to inability to read the size of data specified in the table header from file. OVERLOADED
Definition at line 462 of file cfe_tbl_eventids.h.

12.155.2.15 CFE_TBL_FILE_LOADED_INF_EID `#define CFE_TBL_FILE_LOADED_INF_EID 12`

TBL Load Table Command Success Event ID.

Type: INFORMATION

Cause:

TBL Load Table Command successfully loaded the new table data to the working buffer.
Definition at line 76 of file cfe_tbl_eventids.h.

12.155.2.16 CFE_TBL_FILE_STD_HDR_ERR_EID `#define CFE_TBL_FILE_STD_HDR_ERR_EID 54`

TBL Load Table File Read Standard Header Failure Event ID.

Type: ERROR

Cause:

Load Table failure reading the file standard header.
Definition at line 279 of file cfe_tbl_eventids.h.

12.155.2.17 CFE_TBL_FILE_SUBTYPE_ERR_EID `#define CFE_TBL_FILE_SUBTYPE_ERR_EID 59`

TBL Load Table Invalid File Subtype Event ID.

Type: ERROR

Cause:

TBL Load Table Failure due to invalid file subtype.
Definition at line 335 of file cfe_tbl_eventids.h.

12.155.2.18 CFE_TBL_FILE_TBL_HDR_ERR_EID `#define CFE_TBL_FILE_TBL_HDR_ERR_EID 55`

TBL Load Table File Read Table Header Failure Event ID.

Type: ERROR

Cause:

Load Table failure reading the file table header.
Definition at line 290 of file cfe_tbl_eventids.h.

12.155.2.19 CFE_TBL_FILE_TOO_BIG_ERR_EID `#define CFE_TBL_FILE_TOO_BIG_ERR_EID 75`

TBL Load Table File Excess Data Event ID.

Type: ERROR

Cause:

TBL Load Table failure due to the file header specified size of data being smaller than the actual data contained in the file. OVERLOADED
Definition at line 508 of file cfe_tbl_eventids.h.

12.155.2.20 CFE_TBL_FILE_TYPE_ERR_EID `#define CFE_TBL_FILE_TYPE_ERR_EID 58`

TBL Load Table Invalid File Content ID Event ID.

Type: ERROR

Cause:

TBL Load Table failure due to invalid file content ID.
Definition at line 324 of file cfe_tbl_eventids.h.

12.155.2.21 CFE_TBL_HANDLE_ACCESS_ERR_EID `#define CFE_TBL_HANDLE_ACCESS_ERR_EID 103`

TBL Load Table API Access Violation Event ID.

Type: ERROR

Cause:

CFE_TBL_Load API failure due to the application not owning the table.
Definition at line 817 of file cfe_tbl_eventids.h.

12.155.2.22 CFE_TBL_ILLEGAL_BUFF_PARAM_ERR_EID `#define CFE_TBL_ILLEGAL_BUFF_PARAM_ERR_E↩ ID 80`

TBL Validate Or Write Table Command Invalid Buffer Event ID.

Type: ERROR

Cause:

TBL Validate Table Command or TBL Write Table Command failure due to an invalid buffer selection. OVERLOADED
Definition at line 568 of file cfe_tbl_eventids.h.

12.155.2.23 CFE_TBL_IN_REGISTRY_ERR_EID `#define CFE_TBL_IN_REGISTRY_ERR_EID 82`

TBL Delete Table CDS Command For Registered Table Event ID.

Type: ERROR

Cause:

TBL Delete Table CDS Command failure due to the table being currently registered.
Definition at line 592 of file cfe_tbl_eventids.h.

12.155.2.24 CFE_TBL_INIT_INF_EID `#define CFE_TBL_INIT_INF_EID 1`

TB Initialization Event ID.

Type: INFORMATION

Cause:

Table Services Task initialization complete.
Definition at line 42 of file cfe_tbl_eventids.h.

12.155.2.25 CFE_TBL_LEN_ERR_EID `#define CFE_TBL_LEN_ERR_EID 52`

TBL Invalid Command Length Event ID.

Type: ERROR

Cause:

Invalid length for the message ID and command code received on the TBL message pipe.
Definition at line 257 of file cfe_tbl_eventids.h.

12.155.2.26 CFE_TBL_LOAD_ABORT_ERR_EID `#define CFE_TBL_LOAD_ABORT_ERR_EID 69`

TBL Abort Table Load No Load Started Event ID.

Type: ERROR

Cause:

TBL Abort Table Load Command failure due to no load in progress.
Definition at line 438 of file cfe_tbl_eventids.h.

12.155.2.27 CFE_TBL_LOAD_ABORT_INF_EID `#define CFE_TBL_LOAD_ABORT_INF_EID 21`

TBL Abort Table Load Success Event ID.

Type: INFORMATION

Cause:

TBL Abort Table Load Command success.
Definition at line 157 of file cfe_tbl_eventids.h.

12.155.2.28 CFE_TBL_LOAD_EXCEEDS_SIZE_ERR_EID `#define CFE_TBL_LOAD_EXCEEDS_SIZE_ERR_EID 72`

TBL Load Table File Exceeds Table Size Event ID.

Type: ERROR

Cause:

TBL Load Table failure due to the file header specified offset and/or size of data exceeding the table size. OVERLOADED
Definition at line 474 of file cfe_tbl_eventids.h.

12.155.2.29 CFE_TBL_LOAD_FILENAME_LONG_ERR_EID `#define CFE_TBL_LOAD_FILENAME_LONG_ERR_E↩ ID 101`

TBL Load Table Filename Too Long Event ID.

Type: ERROR

Cause:

Load table filename too long.
Definition at line 795 of file cfe_tbl_eventids.h.

12.155.2.30 CFE_TBL_LOAD_IN_PROGRESS_ERR_EID `#define CFE_TBL_LOAD_IN_PROGRESS_ERR_EID 100`

TBL Load Table API Load Already In Progress Event ID.

Type: ERROR

Cause:

CFE_TBL_Load API failure due to load already in progress.
Definition at line 784 of file cfe_tbl_eventids.h.

12.155.2.31 CFE_TBL_LOAD_PEND_REQ_INF_EID `#define CFE_TBL_LOAD_PEND_REQ_INF_EID 17`

TBL Load Table Pending Notification Success Event ID.

Type: DEBUG

Cause:

TBL load table pending notification successfully sent.
Definition at line 134 of file cfe_tbl_eventids.h.

12.155.2.32 CFE_TBL_LOAD_SUCCESS_INF_EID `#define CFE_TBL_LOAD_SUCCESS_INF_EID 35`

TBL Load Table API Success Event ID.

Type: DEBUG (the first time) and INFORMATION (normally)

Cause:

CFE_TBL_Load API success for dump only or normal table. OVERLOADED
Definition at line 191 of file cfe_tbl_eventids.h.

12.155.2.33 CFE_TBL_LOAD_TBLNAME_MISMATCH_ERR_EID `#define CFE_TBL_LOAD_TBLNAME_MISMATCH↩ _ERR_EID 102`

TBL Load Table Name Mismatch Event ID.

Type: ERROR

Cause:

Load table name in the table file header does not match the specified table name.
Definition at line 806 of file cfe_tbl_eventids.h.

12.155.2.34 CFE_TBL_LOAD_TYPE_ERR_EID `#define CFE_TBL_LOAD_TYPE_ERR_EID 94`

TBL Load Table API Invalid Source Type Event ID.

Type: ERROR

Cause:

CFE_TBL_Load API valid due to invalid source type.
Definition at line 729 of file cfe_tbl_eventids.h.

12.155.2.35 CFE_TBL_LOAD_VAL_ERR_EID `#define CFE_TBL_LOAD_VAL_ERR_EID 93`

TBL Validation Function Invalid Return Code Event ID.

Type: ERROR

Cause:

Invalid table validation function return code.
Definition at line 718 of file cfe_tbl_eventids.h.

12.155.2.36 CFE_TBL_LOADING_A_DUMP_ONLY_ERR_EID `#define CFE_TBL_LOADING_A_DUMP_ONLY_ERR_↩ EID 79`

TBL Load Table For Dump Only Table Event ID.

Type: ERROR

Cause:

TBL Load Table failure due to table being dump only. OVERLOADED
Definition at line 555 of file cfe_tbl_eventids.h.

12.155.2.37 CFE_TBL_LOADING_PENDING_ERR_EID `#define CFE_TBL_LOADING_PENDING_ERR_EID 88`

TBL Load Table Command Load Pending Event ID.

Type: ERROR

Cause:

TBL Load Table Command failed due to a load already pending.
Definition at line 663 of file cfe_tbl_eventids.h.

12.155.2.38 CFE_TBL_MID_ERR_EID `#define CFE_TBL_MID_ERR_EID 50`

TBL Invalid Message ID Received Event ID.

Type: ERROR

Cause:

Invalid message ID received on the TBL message pipe.
Definition at line 235 of file cfe_tbl_eventids.h.

12.155.2.39 CFE_TBL_NO_INACTIVE_BUFFER_ERR_EID `#define CFE_TBL_NO_INACTIVE_BUFFER_ERR_EID 66`

TBL Validate Or Write Table Command No Inactive Buffer Event ID.

Type: ERROR

Cause:

TBL Validate Table Command or TBL Write Table Command failure due to requesting non-existent inactive buffer. O↩ VERLOADED

Definition at line 403 of file cfe_tbl_eventids.h.

12.155.2.40 CFE_TBL_NO_SUCH_TABLE_ERR_EID `#define CFE_TBL_NO_SUCH_TABLE_ERR_EID 57`

TBL Table Name Not Found Event ID.

Type: ERROR

Cause:

TBL command handler unable to find table name. OVERLOADED

Definition at line 313 of file cfe_tbl_eventids.h.

12.155.2.41 CFE_TBL_NO_WORK_BUFFERS_ERR_EID `#define CFE_TBL_NO_WORK_BUFFERS_ERR_EID 60`

TBL Load Or Dump Table No Working Buffers Available Event ID.

Type: ERROR

Cause:

TBL Load or Dump failure due to no working buffers available or internal error. OVERLOADED

Definition at line 346 of file cfe_tbl_eventids.h.

12.155.2.42 CFE_TBL_NOOP_INF_EID `#define CFE_TBL_NOOP_INF_EID 10`

TBL No-op Command Success Event ID.

Type: INFORMATION

Cause:

NO-OP TBL No-op Command success.

Definition at line 53 of file cfe_tbl_eventids.h.

12.155.2.43 CFE_TBL_NOT_CRITICAL_TBL_ERR_EID `#define CFE_TBL_NOT_CRITICAL_TBL_ERR_EID 83`

TBL Delete Table CDS Command Invalid CDS Type Event ID.

Type: ERROR

Cause:

TBL Delete Table CDS Command failure due to CDS being in the table registry but not registered as a table within ES.
Definition at line 604 of file cfe_tbl_eventids.h.

12.155.2.44 CFE_TBL_NOT_IN_CRIT_REG_ERR_EID `#define CFE_TBL_NOT_IN_CRIT_REG_ERR_EID 84`

TBL Delete Table CDS Command Not In Critical Table Registry Event ID.

Type: ERROR

Cause:

TBL Delete Table CDS Command failure due to the table not being in the critical table registry.
Definition at line 616 of file cfe_tbl_eventids.h.

12.155.2.45 CFE_TBL_OVERWRITE_DUMP_INF_EID `#define CFE_TBL_OVERWRITE_DUMP_INF_EID 13`

TBL Write Table To Existing File Success Event ID.

Type: INFORMATION

Cause:

TBL write table to an existing file success.
Definition at line 87 of file cfe_tbl_eventids.h.

12.155.2.46 CFE_TBL_OVERWRITE_REG_DUMP_INF_EID `#define CFE_TBL_OVERWRITE_REG_DUMP_INF_E↩ ID 15`

TBL Write Table Registry To Existing File Success Event ID.

Type: DEBUG

Cause:

TBL Write Table Registry to an existing file completed successfully.
Definition at line 109 of file cfe_tbl_eventids.h.

12.155.2.47 CFE_TBL_PARTIAL_LOAD_ERR_EID `#define CFE_TBL_PARTIAL_LOAD_ERR_EID 74`

TBL Load Table Uninitialized Partial Load Event ID.

Type: ERROR

Cause:

TBL Load Table failure due to attempting a partial load to an uninitialized table. OVERLOADED
Definition at line 496 of file cfe_tbl_eventids.h.

12.155.2.48 CFE_TBL_PROCESSOR_ID_ERR_EID `#define CFE_TBL_PROCESSOR_ID_ERR_EID 98`

TBL Read Header Invalid Processor ID Event ID.

Type: ERROR

Cause:

Invalid processor ID in table file header.
Definition at line 773 of file cfe_tbl_eventids.h.

12.155.2.49 CFE_TBL_REGISTER_ERR_EID `#define CFE_TBL_REGISTER_ERR_EID 90`

TBL Register Table Failed Event ID.

Type: ERROR

Cause:

TBL table registration failure. See system log for more information.
Definition at line 685 of file cfe_tbl_eventids.h.

12.155.2.50 CFE_TBL_RESET_INF_EID `#define CFE_TBL_RESET_INF_EID 11`

TBL Reset Counters Command Success Event ID.

Type: DEBUG

Cause:

TBL Reset Counters Command success.
Definition at line 64 of file cfe_tbl_eventids.h.

12.155.2.51 CFE_TBL_SHARE_ERR_EID `#define CFE_TBL_SHARE_ERR_EID 91`

TBL Share Table Failed Event ID.

Type: ERROR

Cause:

TBL share table failure. See system log for more information.
Definition at line 696 of file cfe_tbl_eventids.h.

12.155.2.52 CFE_TBL_SPACECRAFT_ID_ERR_EID `#define CFE_TBL_SPACECRAFT_ID_ERR_EID 97`

TBL Read Header Invalid Spacecraft ID Event ID.

Type: ERROR

Cause:

Invalid spacecraft ID in table file header.
Definition at line 762 of file cfe_tbl_eventids.h.

12.155.2.53 CFE_TBL_TLM_REG_CMD_INF_EID `#define CFE_TBL_TLM_REG_CMD_INF_EID 18`

TBL Telemeter Table Registry Entry Command Success Event ID.

Type: DEBUG

Cause:

TBL Telemeter Table Registry Entry command successfully set the table registry index to telemeter in the next housekeeping packet.
Definition at line 146 of file cfe_tbl_eventids.h.

12.155.2.54 CFE_TBL_TOO_MANY_DUMPS_ERR_EID `#define CFE_TBL_TOO_MANY_DUMPS_ERR_EID 76`

TBL Write Table Command Dump Only Control Blocks Exceeded Event ID.

Type: ERROR

Cause:

TBL Write Table Command failure due to exceeding the allocated number of control blocks available to write a dump only table.
Definition at line 520 of file cfe_tbl_eventids.h.

12.155.2.55 CFE_TBL_TOO_MANY_VALIDATIONS_ERR_EID `#define CFE_TBL_TOO_MANY_VALIDATIONS_ERR↩ _EID 67`

TBL Validate Table Command Result Storage Exceeded Event ID.

Type: ERROR

Cause:

TBL Validate Table Command failure due to exceeding result storage.
Definition at line 415 of file cfe_tbl_eventids.h.

12.155.2.56 CFE_TBL_UNREGISTER_ERR_EID `#define CFE_TBL_UNREGISTER_ERR_EID 92`

TBL Unregister Table Failed Event ID.

Type: ERROR

Cause:

TBL unregister table failure. See system log for more information.
Definition at line 707 of file cfe_tbl_eventids.h.

12.155.2.57 CFE_TBL_UNVALIDATED_ERR_EID `#define CFE_TBL_UNVALIDATED_ERR_EID 81`

TBL Activate Table Command Inactive Image Not Validated Event ID.

Type: ERROR

Cause:

TBL Activate Table Command failure due to the inactive image not being validated.
Definition at line 580 of file cfe_tbl_eventids.h.

12.155.2.58 CFE_TBL_UPDATE_ERR_EID `#define CFE_TBL_UPDATE_ERR_EID 95`

TBL Update Table Failed Event ID.

Type: ERROR

Cause:

TBL update table failure due to an internal error. OVERLOADED
Definition at line 740 of file cfe_tbl_eventids.h.

12.155.2.59 CFE_TBL_UPDATE_SUCCESS_INF_EID `#define CFE_TBL_UPDATE_SUCCESS_INF_EID 37`

TBL Update Table Success Event ID.

Type: INFORMATION

Cause:

Table update successfully completed.
Definition at line 213 of file cfe_tbl_eventids.h.

12.155.2.60 CFE_TBL_VAL_REQ_MADE_INF_EID `#define CFE_TBL_VAL_REQ_MADE_INF_EID 16`

TBL Validate Table Request Success Event ID.

Type: DEBUG

Cause:

TBL Validate Table Command success. Note this event signifies the request to validate the table has been successfully submitted. Completion will generate a CFE_TBL_VALIDATION_INF_EID or CFE_TBL_VALIDATION_ERR_EID event messages.
Definition at line 123 of file cfe_tbl_eventids.h.

12.155.2.61 CFE_TBL_VALIDATION_ERR_EID `#define CFE_TBL_VALIDATION_ERR_EID 96`

TBL Validate Table Validation Failed Event ID.

Type: ERROR

Cause:

TBL validate table function indicates validation failed. OVERLOADED
Definition at line 751 of file cfe_tbl_eventids.h.

12.155.2.62 CFE_TBL_VALIDATION_INF_EID `#define CFE_TBL_VALIDATION_INF_EID 36`

TBL Validate Table Success Event ID.

Type: INFORMATION

Cause:

Table active or inactive image successfully validated by the registered validation function. OVERLOADED
Definition at line 202 of file cfe_tbl_eventids.h.

12.155.2.63 CFE_TBL_WRITE_CFE_HDR_ERR_EID `#define CFE_TBL_WRITE_CFE_HDR_ERR_EID 63`

TBL Write Standard File Header Failure Event ID.

Type: ERROR

Cause:

TBL Write Table or Table Registry File failure writing the standard file header. OVERLOADED
Definition at line 368 of file cfe_tbl_eventids.h.

12.155.2.64 CFE_TBL_WRITE_DUMP_INF_EID `#define CFE_TBL_WRITE_DUMP_INF_EID 14`

TBL Write Table To New File Success Event ID.

Type: INFORMATION

Cause:

TBL write table to a new file success.
Definition at line 98 of file cfe_tbl_eventids.h.

12.155.2.65 CFE_TBL_WRITE_REG_DUMP_INF_EID `#define CFE_TBL_WRITE_REG_DUMP_INF_EID 22`

TBL Write Table Registry To New File Success Event ID.

Type: DEBUG

Cause:

TBL Write Table Registry to a new file completed successfully.
Definition at line 168 of file cfe_tbl_eventids.h.

12.155.2.66 CFE_TBL_WRITE_TBL_HDR_ERR_EID `#define CFE_TBL_WRITE_TBL_HDR_ERR_EID 64`

TBL Write Table File Header Failure Event ID.

Type: ERROR

Cause:

TBL Write Table failure writing the table image file header.
Definition at line 379 of file cfe_tbl_eventids.h.

12.155.2.67 CFE_TBL_WRITE_TBL_IMG_ERR_EID `#define CFE_TBL_WRITE_TBL_IMG_ERR_EID 65`

TBL Write Table File Data Failure Event ID.

Type: ERROR

Cause:

TBL Write Table failure writing the table data.
Definition at line 390 of file cfe_tbl_eventids.h.

12.155.2.68 CFE_TBL_WRITE_TBL_REG_ERR_EID `#define CFE_TBL_WRITE_TBL_REG_ERR_EID 68`

TBL Write Table Registry File Data Failure Event ID.

Type: ERROR

Cause:

TB Write Table Registry failure writing file data.
Definition at line 426 of file cfe_tbl_eventids.h.

12.155.2.69 CFE_TBL_ZERO_LENGTH_LOAD_ERR_EID `#define CFE_TBL_ZERO_LENGTH_LOAD_ERR_EID 73`

TBL Load Table File Zero Length Event ID.

Type: ERROR

Cause:

TBL Load Table failure due to the file header specified size of data being zero.
Definition at line 485 of file cfe_tbl_eventids.h.

12.156 cfe/modules/time/config/default_cfe_time_extern_typedefs.h File Reference

```
#include "common_types.h"
```

Data Structures

- struct CFE_TIME_SysTime

  Data structure used to hold system time values.

Typedefs

- typedef struct CFE_TIME_SysTime CFE_TIME_SysTime_t

  Data structure used to hold system time values.
- typedef uint8 CFE_TIME_FlagBit_Enum_t

  Bit positions of the various clock state flags.
- typedef int16 CFE_TIME_ClockState_Enum_t

  Enumerated types identifying the quality of the current time.
- typedef uint8 CFE_TIME_SourceSelect_Enum_t

  Clock Source Selection Parameters.
- typedef uint8 CFE_TIME_ToneSignalSelect_Enum_t

  Tone Signal Selection Parameters.
- typedef uint8 CFE_TIME_AdjustDirection_Enum_t

  STCF adjustment direction (for both one-time and 1Hz adjustments)
- typedef uint8 CFE_TIME_FlywheelState_Enum_t

  Fly-wheel status values.
- typedef uint8 CFE_TIME_SetState_Enum_t

  Clock status values (has the clock been set to correct time)

Enumerations

- enum CFE_TIME_FlagBit { CFE_TIME_FlagBit_CLKSET = 0, CFE_TIME_FlagBit_FLYING = 1, CFE_TIME_FlagBit_SRCINT = 2, CFE_TIME_FlagBit_SIGPRI = 3, CFE_TIME_FlagBit_SRVFLY = 4, CFE_TIME_FlagBit_CMDFLY = 5, CFE_TIME_FlagBit_ADDADJ = 6, CFE_TIME_FlagBit_ADD1HZ = 7, CFE_TIME_FlagBit_ADDTCL = 8, CFE_TIME_FlagBit_SERVER = 9, CFE_TIME_FlagBit_GDTONE = 10 }

  Label definitions associated with CFE_TIME_FlagBit_Enum_t.
- enum CFE_TIME_ClockState { CFE_TIME_ClockState_INVALID = -1, CFE_TIME_ClockState_VALID = 0, CFE_TIME_ClockState_FLYWHEEL = 1 }

  Label definitions associated with CFE_TIME_ClockState_Enum_t.
- enum CFE_TIME_SourceSelect { CFE_TIME_SourceSelect_INTERNAL = 1, CFE_TIME_SourceSelect_EXTERNAL = 2 }

  Label definitions associated with CFE_TIME_SourceSelect_Enum_t.
- enum CFE_TIME_ToneSignalSelect { CFE_TIME_ToneSignalSelect_PRIMARY = 1, CFE_TIME_ToneSignalSelect_REDUNDANT = 2 }

  Label definitions associated with CFE_TIME_ToneSignalSelect_Enum_t.
- enum CFE_TIME_AdjustDirection { CFE_TIME_AdjustDirection_ADD = 1, CFE_TIME_AdjustDirection_SUBTRACT = 2 }

  Label definitions associated with CFE_TIME_AdjustDirection_Enum_t.
- enum CFE_TIME_FlywheelState { CFE_TIME_FlywheelState_NO_FLY = 0, CFE_TIME_FlywheelState_IS_FLY = 1 }

  Label definitions associated with CFE_TIME_FlywheelState_Enum_t.
- enum CFE_TIME_SetState { CFE_TIME_SetState_NOT_SET = 0, CFE_TIME_SetState_WAS_SET = 1 }

  Label definitions associated with CFE_TIME_SetState_Enum_t.

12.156.1 Detailed Description

Declarations and prototypes for cfe_time_extern_typedefs module

12.156.2 Typedef Documentation

12.156.2.1 CFE_TIME_AdjustDirection_Enum_t `typedef uint8 CFE_TIME_AdjustDirection_Enum_t`

STCF adjustment direction (for both one-time and 1Hz adjustments)

See also

enum CFE_TIME_AdjustDirection

Definition at line 234 of file default_cfe_time_extern_typedefs.h.

12.156.2.2 CFE_TIME_ClockState_Enum_t `typedef int16 CFE_TIME_ClockState_Enum_t`

Enumerated types identifying the quality of the current time.

Description

The CFE_TIME_ClockState_Enum_t enumerations identify the three recognized states of the current time. If the clock has never been successfully synchronized with the primary onboard clock source, the time is considered to be CFE_TIME_ClockState_INVALID. If the time is currently synchronized (i.e. - the primary synchronization mechanism has not been dropped for any significant amount of time), then the current time is considered to be CFE_TIME_ClockState_VALID. If the time had, at some point in the past, been synchronized, but the synchronization with the primary onboard clock has since been lost, then the time is considered to be CFE_TIME_ClockState_FLYWHEEL. Since different clocks drift at different rates from one another, the accuracy of the time while in CFE_TIME_ClockState_FLYWHEEL is dependent upon the time spent in that state.

See also

enum CFE_TIME_ClockState

Definition at line 165 of file default_cfe_time_extern_typedefs.h.

12.156.2.3 CFE_TIME_FlagBit_Enum_t `typedef uint8 CFE_TIME_FlagBit_Enum_t`

Bit positions of the various clock state flags.

See also

enum CFE_TIME_FlagBit

Definition at line 113 of file default_cfe_time_extern_typedefs.h.

12.156.2.4 CFE_TIME_FlywheelState_Enum_t `typedef uint8 CFE_TIME_FlywheelState_Enum_t`

Fly-wheel status values.

See also

enum CFE_TIME_FlywheelState

Definition at line 257 of file default_cfe_time_extern_typedefs.h.

12.156.2.5 CFE_TIME_SetState_Enum_t `typedef uint8 CFE_TIME_SetState_Enum_t`

Clock status values (has the clock been set to correct time)

See also

enum CFE_TIME_SetState

Definition at line 280 of file default_cfe_time_extern_typedefs.h.

12.156.2.6 CFE_TIME_SourceSelect_Enum_t `typedef uint8 CFE_TIME_SourceSelect_Enum_t`

Clock Source Selection Parameters.

See also

enum CFE_TIME_SourceSelect

Definition at line 188 of file default_cfe_time_extern_typedefs.h.

12.156.2.7 CFE_TIME_SysTime_t `typedef struct CFE_TIME_SysTime CFE_TIME_SysTime_t`

Data structure used to hold system time values.

Description

The CFE_TIME_SysTime_t data structure is used to hold time values. Time is referred to as the elapsed time (in seconds and subseconds) since a specified epoch time. The subseconds field contains the number of 2^(-32) second intervals that have elapsed since the epoch.

12.156.2.8 CFE_TIME_ToneSignalSelect_Enum_t `typedef uint8 CFE_TIME_ToneSignalSelect_Enum_t`

Tone Signal Selection Parameters.

See also

enum CFE_TIME_ToneSignalSelect

Definition at line 211 of file default_cfe_time_extern_typedefs.h.

12.156.3 Enumeration Type Documentation

12.156.3.1 CFE_TIME_AdjustDirection `enum CFE_TIME_AdjustDirection`

Label definitions associated with CFE_TIME_AdjustDirection_Enum_t.

Enumerator

CFE_TIME_AdjustDirection_ADD	Add time adjustment.
CFE_TIME_AdjustDirection_SUBTRACT	Subtract time adjustment.

Definition at line 216 of file default_cfe_time_extern_typedefs.h.

12.156.3.2 CFE_TIME_ClockState `enum CFE_TIME_ClockState`

Label definitions associated with CFE_TIME_ClockState_Enum_t.

Enumerator

CFE_TIME_ClockState_INVALID	The spacecraft time has not been set since the last clock reset. Times returned by clock routines have no relationship to any ground-based time reference.
CFE_TIME_ClockState_VALID	The spacecraft time has been set at least once since the last clock reset, and it is synchronized with the primary on-board time base. Times returned by clock routines can be trusted.
CFE_TIME_ClockState_FLYWHEEL	The spacecraft time has been set at least once since the last clock reset, but it is not currently synchronized with the primary on-board time base. Times returned by clock routines are a "best guess" based on a non-optimal oscillator.

Definition at line 118 of file default_cfe_time_extern_typedefs.h.

12.156.3.3 CFE_TIME_FlagBit `enum CFE_TIME_FlagBit`

Label definitions associated with CFE_TIME_FlagBit_Enum_t.

Enumerator

CFE_TIME_FlagBit_CLKSET	The spacecraft time has been set.
CFE_TIME_FlagBit_FLYING	This instance of Time Services is flywheeling.
CFE_TIME_FlagBit_SRCINT	The clock source is set to internal.
CFE_TIME_FlagBit_SIGPRI	The clock signal is set to primary.
CFE_TIME_FlagBit_SRVFLY	The Time Server is in flywheel mode.
CFE_TIME_FlagBit_CMDFLY	This instance of Time Services was commanded into flywheel mode.
CFE_TIME_FlagBit_ADDADJ	One time STCF Adjustment is to be done in positive direction.
CFE_TIME_FlagBit_ADD1HZ	1 Hz STCF Adjustment is to be done in a positive direction
CFE_TIME_FlagBit_ADDTCL	Time Client Latency is applied in a positive direction.
CFE_TIME_FlagBit_SERVER	This instance of Time Services is a Time Server.
CFE_TIME_FlagBit_GDTONE	The tone received is good compared to the last tone received.

Definition at line 50 of file default_cfe_time_extern_typedefs.h.

12.156.3.4 CFE_TIME_FlywheelState `enum CFE_TIME_FlywheelState`

Label definitions associated with CFE_TIME_FlywheelState_Enum_t.

Enumerator

CFE_TIME_FlywheelState_NO_FLY	Not in flywheel state.
CFE_TIME_FlywheelState_IS_FLY	In flywheel state.

Definition at line 239 of file default_cfe_time_extern_typedefs.h.

12.156.3.5 CFE_TIME_SetState `enum CFE_TIME_SetState`

Label definitions associated with CFE_TIME_SetState_Enum_t.

Enumerator

CFE_TIME_SetState_NOT_SET	Spacecraft time has not been set.
CFE_TIME_SetState_WAS_SET	Spacecraft time has been set.

Definition at line 262 of file default_cfe_time_extern_typedefs.h.

12.156.3.6 CFE_TIME_SourceSelect `enum CFE_TIME_SourceSelect`

Label definitions associated with CFE_TIME_SourceSelect_Enum_t.

Enumerator

CFE_TIME_SourceSelect_INTERNAL	Use Internal Source.
CFE_TIME_SourceSelect_EXTERNAL	Use External Source.

Definition at line 170 of file default_cfe_time_extern_typedefs.h.

12.156.3.7 CFE_TIME_ToneSignalSelect `enum CFE_TIME_ToneSignalSelect`

Label definitions associated with CFE_TIME_ToneSignalSelect_Enum_t.

Enumerator

CFE_TIME_ToneSignalSelect_PRIMARY	Primary Source.
CFE_TIME_ToneSignalSelect_REDUNDANT	Redundant Source.

Definition at line 193 of file default_cfe_time_extern_typedefs.h.

12.157 cfe/modules/time/config/default_cfe_time_fcncodes.h File Reference

Macros

Time Services Command Codes

- #define CFE_TIME_NOOP_CC 0 /∗ no-op command ∗/
- #define CFE_TIME_RESET_COUNTERS_CC 1 /∗ reset counters ∗/
- #define CFE_TIME_SEND_DIAGNOSTIC_CC 2 /∗ request diagnostic hk telemetry ∗/
- #define CFE_TIME_SET_SOURCE_CC 3 /∗ set clock source (int vs ext) ∗/
- #define CFE_TIME_SET_STATE_CC 4 /∗ set clock state ∗/
- #define CFE_TIME_ADD_DELAY_CC 5 /∗ add tone delay value ∗/
- #define CFE_TIME_SUB_DELAY_CC 6 /∗ sub tone delay value ∗/
- #define CFE_TIME_SET_TIME_CC 7 /∗ set time ∗/
- #define CFE_TIME_SET_MET_CC 8 /∗ set MET ∗/
- #define CFE_TIME_SET_STCF_CC 9 /∗ set STCF ∗/
- #define CFE_TIME_SET_LEAP_SECONDS_CC 10 /∗ set Leap Seconds ∗/
- #define CFE_TIME_ADD_ADJUST_CC 11 /∗ add one time STCF adjustment ∗/
- #define CFE_TIME_SUB_ADJUST_CC 12 /∗ subtract one time STCF adjustment ∗/
- #define CFE_TIME_ADD_ONE_HZ_ADJUSTMENT_CC 13 /∗ add 1Hz STCF adjustment ∗/
- #define CFE_TIME_SUB_ONE_HZ_ADJUSTMENT_CC 14 /∗ subtract 1Hz STCF adjustment ∗/
- #define CFE_TIME_SET_SIGNAL_CC 15 /∗ set clock signal (pri vs red) ∗/

12.157.1 Detailed Description

Specification for the CFE Time Services (CFE_TIME) command function codes

Note

This file should be strictly limited to the command/function code (CC) macro definitions. Other definitions such as enums, typedefs, or other macros should be placed in the msgdefs.h or msg.h files.

12.157.2 Macro Definition Documentation

12.157.2.1 CFE_TIME_ADD_ADJUST_CC `#define CFE_TIME_ADD_ADJUST_CC 11 /* add one time STCF adjustment */`

Name Add Delta to Spacecraft Time Correlation Factor

Description

This command adjusts the Spacecraft Time Correlation Factor (STCF) by adding the specified value. The new STCF takes effect immediately upon execution of this command.

Command Mnemonic(s) $sc_$cpu_TIME_AddSTCFAdj

Command Structure

CFE_TIME_AddAdjustCmd_t

Command Verification

Successful execution of this command may be verified with the following telemetry:

- **`$sc_$cpu_TIME_CMDPC`** - command execution counter will increment
- **`$sc_$cpu_TIME_STCFSecs`** - Housekeeping Telemetry point indicating new STCF seconds value
- **`$sc_$cpu_TIME_STCFSubsecs`** - Housekeeping Telemetry point indicating new STCF subseconds value
- The CFE_TIME_DELTA_EID informational event message will be generated

Error Conditions

- An invalid number of microseconds was specified (must be less than 1 million)
- Platform receiving the command is not a Time Server

  Evidence of Failure may be found in the following telemetry:
- **`$sc_$cpu_TIME_CMDEC`** - command error counter will increment
- Error specific event messages will be issued (CFE_TIME_DELTA_ERR_EID or CFE_TIME_DELTA_CFG_EID)

Criticality

Inappropriately setting the clock may result in other sub-systems performing incorrect time based calculations. The specific risk is dependent upon the behavior of those sub-systems.

See also

CFE_TIME_ADD_ADJUST_CC, CFE_TIME_SUB_ADJUST_CC, CFE_TIME_ADD_ONE_HZ_ADJUSTMENT_CC, CFE_TIME_SUB_ONE_HZ_ADJUSTMENT_CC

Definition at line 521 of file default_cfe_time_fcncodes.h.

12.157.2.2 CFE_TIME_ADD_DELAY_CC `#define CFE_TIME_ADD_DELAY_CC 5 /* add tone delay value */`

Name Add Time to Tone Time Delay

Description

This command is used to factor out a known, predictable latency between the Time Server and a particular Time Client. The correction is applied (added) to the current time calculation for Time Clients, so this command has no meaning for Time Servers. Each Time Client can have a unique latency setting. The latency value is a positive number of seconds and microseconds that represent the deviation from the time maintained by the Time Server.

Command Mnemonic(s) $sc_$cpu_TIME_AddClockLat

Command Structure

CFE_TIME_AddDelayCmd_t

Command Verification

Successful execution of this command may be verified with the following telemetry:

- **$sc_$cpu_TIME_CMDPC -** command execution counter will increment
- **$sc_$cpu_TIME_DLatentS,** $sc_$cpu_TIME_DLatentSs - Housekeeping Telemetry point indicating command specified values
- **$sc_$cpu_TIME_DLatentDir -** Diagnostic Telemetry point indicating commanded latency direction
- The CFE_TIME_DELAY_EID informational event message will be generated

Error Conditions

- An invalid number of microseconds was specified (must be less than 1 million)
- Platform receiving the command is not a Time Client

  Evidence of Failure may be found in the following telemetry:

- **$sc_$cpu_TIME_CMDEC -** command error counter will increment
- Error specific event messages will be issued (CFE_TIME_DELAY_CFG_EID or CFE_TIME_DELAY_ERR_EID)

Criticality

Inappropriately setting the clock may result in other sub-systems performing incorrect time based calculations. The specific risk is dependent upon the behavior of those sub-systems.

See also

CFE_TIME_SUB_DELAY_CC

Definition at line 290 of file default_cfe_time_fcncodes.h.

12.157.2.3 CFE_TIME_ADD_ONE_HZ_ADJUSTMENT_CC `#define CFE_TIME_ADD_ONE_HZ_ADJUSTMENT_CC 13 /* add 1Hz STCF adjustment */`

Name Add Delta to Spacecraft Time Correlation Factor each 1Hz

Description

This command has been updated to take actual sub-seconds (1/2^32 seconds) rather than micro-seconds as an input argument. This change occurred after the determination was made that one micro-second is too large an increment for a constant 1Hz adjustment.

This command continuously adjusts the Spacecraft Time Correlation Factor (STCF) every second, by adding the specified value. The adjustment to the STCF is applied in the Time Service local 1Hz interrupt handler. As the local 1Hz interrupt is not synchronized to the tone signal, one cannot say when the adjustment will occur, other than once a second, at about the same time relative to the tone.

There was some debate about whether the maximum 1Hz clock drift correction factor would ever need to exceed some small fraction of a second. But, the decision was made to provide the capability to make 1Hz adjustments greater than one second and leave it to the ground system to provide mission specific limits.

Command Mnemonic(s) $sc_$cpu_TIME_Add1HzSTCF

Command Structure

CFE_TIME_AddOneHzAdjustmentCmd_t

Command Verification

Successful execution of this command may be verified with the following telemetry:

- **`$sc_$cpu_TIME_CMDPC`** - command execution counter will increment
- **`$sc_$cpu_TIME_STCFSecs`** - Housekeeping Telemetry point indicating new STCF seconds value
- **`$sc_$cpu_TIME_STCFSubsecs`** - Housekeeping Telemetry point indicating new STCF subseconds value
- The CFE_TIME_ONEHZ_EID informational event message will be generated

Error Conditions

- Platform receiving the command is not a Time Server

  Evidence of Failure may be found in the following telemetry:
- **`$sc_$cpu_TIME_CMDEC`** - command error counter will increment
- Error specific event message will be issued (CFE_TIME_ONEHZ_CFG_EID)

Criticality

Inappropriately setting the clock may result in other sub-systems performing incorrect time based calculations. The specific risk is dependent upon the behavior of those sub-systems.

See also

CFE_TIME_ADD_ADJUST_CC, CFE_TIME_SUB_ADJUST_CC, CFE_TIME_SUB_ONE_HZ_ADJUSTMENT_CC

Definition at line 601 of file default_cfe_time_fcncodes.h.

12.157.2.4 CFE_TIME_NOOP_CC `#define CFE_TIME_NOOP_CC 0 /* no-op command */`

Name Time No-Op

Description

This command performs no other function than to increment the command execution counter. The command may be used to verify general aliveness of the Time Services task.

Command Mnemonic(s) $sc_$cpu_TIME_NOOP

Command Structure

CFE_TIME_NoopCmd_t

Command Verification

Successful execution of this command may be verified with the following telemetry:

- **`$sc_$cpu_TIME_CMDPC`** - command execution counter will increment
- The CFE_TIME_NOOP_EID informational event message will be generated

Error Conditions

There are no error conditions for this command. If the Time Services receives the command, the event is sent (although it may be filtered by EVS) and the counter is incremented unconditionally.

Criticality

None

See also

Definition at line 66 of file default_cfe_time_fcncodes.h.

12.157.2.5 CFE_TIME_RESET_COUNTERS_CC `#define CFE_TIME_RESET_COUNTERS_CC 1 /* reset counters */`

Name Time Reset Counters

Description

This command resets the following counters within the Time Services Housekeeping Telemetry :

- Command Execution Counter ($sc_$cpu_TIME_CMDPC)
- Command Error Counter ($sc_$cpu_TIME_CMDEC) This command also resets the following counters within the Time Services Diagnostic Telemetry :
- Tone Signal Detected Software Bus Message Counter ($sc_$cpu_TIME_DTSDetCNT)
- Time at the Tone Data Software Bus Message Counter ($sc_$cpu_TIME_DTatTCNT)
- Tone Signal/Data Verify Counter ($sc_$cpu_TIME_DVerifyCNT)
- Tone Signal/Data Error Counter ($sc_$cpu_TIME_DVerifyER)

- Tone Signal Interrupt Counter ($sc_$cpu_TIME_DTsISRCNT)
- Tone Signal Interrupt Error Counter ($sc_$cpu_TIME_DTsISRERR)
- Tone Signal Task Counter ($sc_$cpu_TIME_DTsTaskCNT)
- Local 1 Hz Interrupt Counter ($sc_$cpu_TIME_D1HzISRCNT)
- Local 1 Hz Task Counter ($sc_$cpu_TIME_D1HzTaskCNT)
- Reference Time Version Counter ($sc_$cpu_TIME_DVersionCNT)

Command Mnemonic(s) $sc_$cpu_TIME_ResetCtrs

Command Structure

CFE_TIME_ResetCountersCmd_t

Command Verification

Successful execution of this command may be verified with the following telemetry:

- **`$sc_$cpu_TIME_CMDPC`** - command execution counter will reset to 0
- **`$sc_$cpu_TIME_CMDEC`** - command error counter will reset to 0
- The CFE_TIME_RESET_EID informational event message will be generated

Error Conditions

There are no error conditions for this command. If the Time Services receives the command, the event is sent (although it may be filtered by EVS) and the counter is reset unconditionally.

Criticality

None

See also

Definition at line 111 of file default_cfe_time_fcncodes.h.

12.157.2.6 CFE_TIME_SEND_DIAGNOSTIC_CC `#define CFE_TIME_SEND_DIAGNOSTIC_CC 2 /* request diagnostic hk telemetry */`

Name Request TIME Diagnostic Telemetry

Description

This command requests that the Time Service generate a message containing various data values not included in the normal Time Service housekeeping message. The command requests only a single copy of the diagnostic message. Refer to CFE_TIME_DiagnosticTlm_t for a description of the Time Service diagnostic message contents.

Command Mnemonic(s) $sc_$cpu_TIME_RequestDiag

Command Structure

CFE_TIME_SendDiagnosticCmd_t

Command Verification

Successful execution of this command may be verified with the following telemetry:

- **$sc_$cpu_TIME_CMDPC** - command execution counter will increment
- Sequence Counter for CFE_TIME_DiagnosticTlm_t will increment
- The CFE_TIME_DIAG_EID debug event message will be generated

Error Conditions

There are no error conditions for this command. If the Time Services receives the command, the event and telemetry is sent (although one or both may be filtered by EVS and TO) and the counter is incremented unconditionally.

Criticality

None

See also

Definition at line 145 of file default_cfe_time_fcncodes.h.

12.157.2.7 CFE_TIME_SET_LEAP_SECONDS_CC `#define CFE_TIME_SET_LEAP_SECONDS_CC 10 /* set Leap Seconds */`

Name Set Leap Seconds

Description

This command sets the spacecraft Leap Seconds to the specified value. Leap Seconds may be positive or negative, and there is no limit to the value except, of course, the limit imposed by the 16 bit signed integer data type. The new Leap Seconds value takes effect immediately upon execution of this command.

Command Mnemonic(s) $sc_$cpu_TIME_SetClockLeap

Command Structure

CFE_TIME_SetLeapSecondsCmd_t

Command Verification

Successful execution of this command may be verified with the following telemetry:

- **$sc_$cpu_TIME_CMDPC** - command execution counter will increment
- **$sc_$cpu_TIME_LeapSecs** - Housekeeping Telemetry point indicating new Leap seconds value
- The CFE_TIME_LEAPS_EID informational event message will be generated

Error Conditions

- Platform receiving the command is not a Time Server

  Evidence of Failure may be found in the following telemetry:
- **$sc_$cpu_TIME_CMDEC** - command error counter will increment
- Error specific event messages will be issued (CFE_TIME_LEAPS_CFG_EID)

Criticality

Inappropriately setting the clock may result in other sub-systems performing incorrect time based calculations. The specific risk is dependent upon the behavior of those sub-systems.

See also

CFE_TIME_SET_TIME_CC, CFE_TIME_SET_MET_CC, CFE_TIME_SET_STCF_CC

Definition at line 485 of file default_cfe_time_fcncodes.h.

12.157.2.8 CFE_TIME_SET_MET_CC `#define CFE_TIME_SET_MET_CC 8 /* set MET */`

Name Set Mission Elapsed Time

Description

This command sets the Mission Elapsed Timer (MET) to the specified value.

Note that the MET (as implemented for cFE Time Service) is a logical representation and not a physical timer. Thus, setting the MET is not dependent on whether the hardware supports a MET register that can be written to.

Note also that Time Service "assumes" that during normal operation, the MET is synchronized to the tone signal. Therefore, unless operating in FLYWHEEL mode, the sub-seconds portion of the MET will be set to zero at the next tone signal interrupt.

The new MET takes effect immediately upon execution of this command.

Command Mnemonic(s) $sc_$cpu_TIME_SetClockMET

Command Structure

CFE_TIME_SetMETCmd_t

Command Verification

Successful execution of this command may be verified with the following telemetry:

- **`$sc_$cpu_TIME_CMDPC`** - command execution counter will increment
- **`$sc_$cpu_TIME_METSecs`** - Housekeeping Telemetry point indicating new MET seconds value
- **`$sc_$cpu_TIME_METSubsecs`** - Housekeeping Telemetry point indicating new MET subseconds value
- The CFE_TIME_MET_EID informational event message will be generated

Error Conditions

- An invalid number of microseconds was specified (must be less than 1 million)
- Platform receiving the command is not a Time Server

  Evidence of Failure may be found in the following telemetry:
- **`$sc_$cpu_TIME_CMDEC`** - command error counter will increment
- Error specific event messages will be issued (CFE_TIME_MET_CFG_EID or CFE_TIME_MET_ERR_EID)

Criticality

Inappropriately setting the clock may result in other sub-systems performing incorrect time based calculations. The specific risk is dependent upon the behavior of those sub-systems.

See also

CFE_TIME_SET_TIME_CC, CFE_TIME_SET_STCF_CC, CFE_TIME_SET_LEAP_SECONDS_CC

Definition at line 413 of file default_cfe_time_fcncodes.h.

12.157.2.9 CFE_TIME_SET_SIGNAL_CC `#define CFE_TIME_SET_SIGNAL_CC 15 /* set clock signal (pri vs red) */`

Name Set Tone Signal Source

Description

This command selects the Time Service tone signal source. Although the list of potential tone signal sources is mission specific, a common choice is the selection of primary or redundant tone signal. The selection may be available to both the Time Server and Time Clients, depending on hardware configuration.

Notes:

- This command is only valid when the CFE_PLATFORM_TIME_CFG_SIGNAL configuration parameter in the cfe_platform_cfg.h file has been set to true.

Command Mnemonic(s) $sc_$cpu_TIME_SetSignal

Command Structure

CFE_TIME_SetSignalCmd_t

Command Verification

Successful execution of this command may be verified with the following telemetry:

- **`$sc_$cpu_TIME_CMDPC`** - command execution counter will increment
- **`$sc_$cpu_TIME_DSignal`** - Diagnostic Telemetry point will indicate the command specified value
- The CFE_TIME_SIGNAL_EID informational event message will be generated

Error Conditions

- Invalid Signal selection (a value other than CFE_TIME_ToneSignalSelect_PRIMARY or CFE_TIME_ToneSignalSelect_REDUN was specified)
- Multiple Tone Signal Sources not available on this platform

  Evidence of failure may be found in the following telemetry:
- **`$sc_$cpu_TIME_CMDEC`** - Command Error counter will increment
- Error specific event message (either CFE_TIME_SIGNAL_CFG_EID or CFE_TIME_SIGNAL_ERR_EID)

Criticality

Although tone signal source selection is important, this command is not critical

See also

CFE_TIME_SET_STATE_CC, CFE_TIME_SET_SOURCE_CC

Definition at line 691 of file default_cfe_time_fcncodes.h.

12.157.2.10 CFE_TIME_SET_SOURCE_CC `#define CFE_TIME_SET_SOURCE_CC 3 /* set clock source (int vs ext) */`

Name Set Time Source

Description

This command selects the Time Service clock source. Although the list of potential clock sources is mission specific and defined via configuration parameters, this command provides a common method for switching between the local processor clock and an external source for time data.

When commanded to accept external time data (GPS, MET, spacecraft time, etc.), the Time Server will enable input via an API function specific to the configuration definitions for the particular source. When commanded to use internal time data, the Time Server will ignore the external data. However, the Time Server will continue to use the API function as the trigger to generate a "time at the tone" command packet regardless of the internal/external command selection.

Notes:

- Operating in FLYWHEEL mode is not considered a choice related to clock source, but rather an element of the clock state. See below for a description of the CFE_TIME_SET_STATE_CC command.
- This command is only valid when the CFE_PLATFORM_TIME_CFG_SOURCE configuration parameter in the cfe_platform_cfg.h file has been set to true.

Command Mnemonic(s) $sc_$cpu_TIME_SetSource

Command Structure

CFE_TIME_SetSourceCmd_t

Command Verification

Successful execution of this command may be verified with the following telemetry:

- **`$sc_$cpu_TIME_CMDPC`** - command execution counter will increment
- **`$sc_$cpu_TIME_DSource`** - Diagnostic Telemetry point will indicate the command specified value
- The CFE_TIME_SOURCE_EID informational event message will be generated

Error Conditions

- Invalid Source selection (a value other than CFE_TIME_SourceSelect_INTERNAL or CFE_TIME_SourceSelect_EXTERNAL was specified)
- Time source selection not allowed on this platform

  Evidence of failure may be found in the following telemetry:
- **`$sc_$cpu_TIME_CMDEC`** - Command Error counter will increment
- Error specific event message (either CFE_TIME_SOURCE_CFG_EID or CFE_TIME_SOURCE_ERR_EID)

Criticality

Although clock source selection is important, this command is not critical.

See also

CFE_TIME_SET_STATE_CC, CFE_TIME_SET_SIGNAL_CC

Definition at line 195 of file default_cfe_time_fcncodes.h.

12.157.2.11 CFE_TIME_SET_STATE_CC `#define CFE_TIME_SET_STATE_CC 4 /* set clock state */`

Name Set Time State

Description

This command indirectly affects the Time Service on-board determination of clock state. Clock state is a combination of factors, most significantly whether the spacecraft time has been accurately set, and whether Time Service is operating in FLYWHEEL mode.

This command may be used to notify the Time Server that spacecraft time is now correct, or that time is no longer correct. This information will be distributed to Time Clients, and in turn, to any interested sub-systems.

Also, this command may be used to force a Time Server or Time Client into FLYWHEEL mode. Use of FLYWHEEL mode is mainly for debug purposes although in extreme circumstances, it may be of value to force Time Service not to rely on normal time updates. Note that when commanded into FLYWHEEL mode, the Time Service will remain so until receipt of another "set state" command setting the state into a mode other than FLYWHEEL.

Note also that setting the clock state to VALID or INVALID on a Time Client that is currently getting time updates from the Time Server will have very limited effect. As soon as the Time Client receives the next time update, the VALID/INVALID selection will be set to that of the Time Server. However, setting a Time Client to FLYWHEEL cannot be overridden by the Time Server since the Time Client will ignore time updates from the Time Server while in FLYWHEEL mode.

Command Mnemonic(s) $sc_$cpu_TIME_SetState

Command Structure

CFE_TIME_SetStateCmd_t

Command Verification

Successful execution of this command may be verified with the following telemetry:

- **`$sc_$cpu_TIME_CMDPC`** - command execution counter will increment
- **`$sc_$cpu_TIME_StateFlg`**, $sc_$cpu_TIME_FlagSet, $sc_$cpu_TIME_FlagFly, $sc_$cpu_TIME_FlagSrc, $sc_$cpu_TIME_FlagPri, $sc_$cpu_TIME_FlagSfly, $sc_$cpu_TIME_FlagCfly, $sc_$cpu_TIME_FlagAdjd, $sc_$cpu_TIME_Flag1Hzd, $sc_$cpu_TIME_FlagClat, $sc_$cpu_TIME_FlagSorC, $sc_$cpu_TIME_FlagNIU - Housekeeping Telemetry point "may" indicate the command specified value (see above)
- The CFE_TIME_STATE_EID informational event message will be generated

Error Conditions

- Invalid State selection (a value other than CFE_TIME_ClockState_INVALID, CFE_TIME_ClockState_VALID or CFE_TIME_ClockState_FLYWHEEL was specified)
- Time source selection not allowed on this platform

  Evidence of failure may be found in the following telemetry:
- **`$sc_$cpu_TIME_CMDEC`** - Command Error counter will increment
- Error specific event message (CFE_TIME_STATE_ERR_EID)

Criticality

Setting Time Service into FLYWHEEL mode is not particularly hazardous, as the result may be that the calculation of spacecraft time is done using a less than optimal timer. However, inappropriately setting the clock state to V↩ ALID (indicating that spacecraft time is accurate) may result in other sub-systems performing incorrect time based calculations. The specific risk is dependent upon the behavior of those sub-systems.

See also

CFE_TIME_SET_SOURCE_CC, CFE_TIME_SET_SIGNAL_CC

Definition at line 252 of file default_cfe_time_fcncodes.h.

12.157.2.12 CFE_TIME_SET_STCF_CC `#define CFE_TIME_SET_STCF_CC 9 /* set STCF */`

Name Set Spacecraft Time Correlation Factor

Description

This command sets the Spacecraft Time Correlation Factor (STCF) to the specified value. This command differs from the previously described SET CLOCK in the nature of the command argument. This command sets the STCF value directly, rather than extracting the STCF from a value representing the total of MET, STCF and optionally, Leap Seconds. The new STCF takes effect immediately upon execution of this command.

Command Mnemonic(s) $sc_$cpu_TIME_SetClockSTCF

Command Structure

CFE_TIME_SetSTCFCmd_t

Command Verification

Successful execution of this command may be verified with the following telemetry:

- **`$sc_$cpu_TIME_CMDPC`** - command execution counter will increment
- **`$sc_$cpu_TIME_STCFSecs`** - Housekeeping Telemetry point indicating new STCF seconds value
- **`$sc_$cpu_TIME_STCFSubsecs`** - Housekeeping Telemetry point indicating new STCF subseconds value
- The CFE_TIME_STCF_EID informational event message will be generated

Error Conditions

- An invalid number of microseconds was specified (must be less than 1 million)
- Platform receiving the command is not a Time Server

  Evidence of Failure may be found in the following telemetry:
- **`$sc_$cpu_TIME_CMDEC`** - command error counter will increment
- Error specific event messages will be issued (CFE_TIME_STCF_CFG_EID or CFE_TIME_STCF_ERR_EID)

Criticality

Inappropriately setting the clock may result in other sub-systems performing incorrect time based calculations. The specific risk is dependent upon the behavior of those sub-systems.

See also

CFE_TIME_SET_TIME_CC, CFE_TIME_SET_MET_CC, CFE_TIME_SET_LEAP_SECONDS_CC

Definition at line 450 of file default_cfe_time_fcncodes.h.

12.157.2.13 CFE_TIME_SET_TIME_CC `#define CFE_TIME_SET_TIME_CC 7 /* set time */`

Name Set Spacecraft Time

Description

This command sets the spacecraft clock to a new value, regardless of the current setting (time jam). The new time value represents the desired offset from the mission-defined time epoch and takes effect immediately upon execution of this command. Time Service will calculate a new STCF value based on the current MET and the desired new time using one of the following:

If Time Service is configured to compute current time as TAI

- **STCF = (new time) - (current MET)**
- **(current time) = (current MET) + STCF**

If Time Service is configured to compute current time as UTC

- **STCF = ((new time) - (current MET)) + (Leap Seconds)**
- **(current time) = ((current MET) + STCF) - (Leap Seconds)**

Command Mnemonic(s) $sc_$cpu_TIME_SetClock

Command Structure

CFE_TIME_SetTimeCmd_t

Command Verification

Successful execution of this command may be verified with the following telemetry:

- **`$sc_$cpu_TIME_CMDPC`** - command execution counter will increment
- **`$sc_$cpu_TIME_STCFSecs`** - Housekeeping Telemetry point indicating newly calculated STCF seconds value
- **`$sc_$cpu_TIME_STCFSubsecs`** - Housekeeping Telemetry point indicating newly calculated STCF subseconds value
- The CFE_TIME_TIME_EID informational event message will be generated

Error Conditions

- An invalid number of microseconds was specified (must be less than 1 million)
- Platform receiving the command is not a Time Server

Evidence of Failure may be found in the following telemetry:

- **`$sc_$cpu_TIME_CMDEC`** - command error counter will increment
- Error specific event messages will be issued (CFE_TIME_TIME_CFG_EID or CFE_TIME_TIME_ERR_EID)

Criticality

Inappropriately setting the clock may result in other sub-systems performing incorrect time based calculations. The specific risk is dependent upon the behavior of those sub-systems.

See also

CFE_TIME_SET_MET_CC, CFE_TIME_SET_STCF_CC, CFE_TIME_SET_LEAP_SECONDS_CC

Definition at line 373 of file default_cfe_time_fcncodes.h.

12.157.2.14 CFE_TIME_SUB_ADJUST_CC `#define CFE_TIME_SUB_ADJUST_CC 12 /* subtract one time STCF adjustment */`

Name Subtract Delta from Spacecraft Time Correlation Factor

Description

This command adjusts the Spacecraft Time Correlation Factor (STCF) by subtracting the specified value. The new STCF takes effect immediately upon execution of this command.

Command Mnemonic(s) $sc_$cpu_TIME_SubSTCFAdj

Command Structure

CFE_TIME_SubAdjustCmd_t

Command Verification

Successful execution of this command may be verified with the following telemetry:

- **`$sc_$cpu_TIME_CMDPC`** - command execution counter will increment
- **`$sc_$cpu_TIME_STCFSecs`** - Housekeeping Telemetry point indicating new STCF seconds value
- **`$sc_$cpu_TIME_STCFSubsecs`** - Housekeeping Telemetry point indicating new STCF subseconds value
- The CFE_TIME_DELTA_EID informational event message will be generated

Error Conditions

- An invalid number of microseconds was specified (must be less than 1 million)
- Platform receiving the command is not a Time Server

  Evidence of Failure may be found in the following telemetry:
- **`$sc_$cpu_TIME_CMDEC`** - command error counter will increment
- Error specific event messages will be issued (CFE_TIME_DELTA_ERR_EID or CFE_TIME_DELTA_CFG_EID)

Criticality

Inappropriately setting the clock may result in other sub-systems performing incorrect time based calculations. The specific risk is dependent upon the behavior of those sub-systems.

See also

CFE_TIME_ADD_ADJUST_CC, CFE_TIME_ADD_ONE_HZ_ADJUSTMENT_CC, CFE_TIME_SUB_ONE_HZ_ADJUSTMENT_CC

Definition at line 555 of file default_cfe_time_fcncodes.h.

12.157.2.15 CFE_TIME_SUB_DELAY_CC `#define CFE_TIME_SUB_DELAY_CC 6 /* sub tone delay value */`

Name Subtract Time from Tone Time Delay

Description

This command is used to factor out a known, predictable latency between the Time Server and a particular Time Client. The correction is applied (subtracted) to the current time calculation for Time Clients, so this command has no meaning for Time Servers. Each Time Client can have a unique latency setting. The latency value is a positive number of seconds and microseconds that represent the deviation from the time maintained by the Time Server.

Note that it is unimaginable that the seconds value will ever be anything but zero.

Command Mnemonic(s) $sc_$cpu_TIME_SubClockLat

Command Structure

CFE_TIME_SubDelayCmd_t

Command Verification

Successful execution of this command may be verified with the following telemetry:

- **`$sc_$cpu_TIME_CMDPC`** - command execution counter will increment
- **`$sc_$cpu_TIME_DLatentS`**, $sc_$cpu_TIME_DLatentSs - Housekeeping Telemetry point indicating command specified values
- **`$sc_$cpu_TIME_DLatentDir`** - Diagnostic Telemetry point indicating commanded latency direction
- The CFE_TIME_DELAY_EID informational event message will be generated

Error Conditions

- An invalid number of microseconds was specified (must be less than 1 million)
- Platform receiving the command is not a Time Client

  Evidence of Failure may be found in the following telemetry:
- **`$sc_$cpu_TIME_CMDEC`** - command error counter will increment
- Error specific event messages will be issued (CFE_TIME_DELAY_CFG_EID or CFE_TIME_DELAY_ERR_EID)

Criticality

Inappropriately setting the clock may result in other sub-systems performing incorrect time based calculations. The specific risk is dependent upon the behavior of those sub-systems.

See also

CFE_TIME_ADD_DELAY_CC

Definition at line 328 of file default_cfe_time_fcncodes.h.

12.157.2.16 CFE_TIME_SUB_ONE_HZ_ADJUSTMENT_CC `#define CFE_TIME_SUB_ONE_HZ_ADJUSTMENT_CC 14 /* subtract 1Hz STCF adjustment */`

Name Subtract Delta from Spacecraft Time Correlation Factor each 1Hz

Description

This command has been updated to take actual sub-seconds (1/2^32 seconds) rather than micro-seconds as an input argument. This change occurred after the determination was made that one micro-second is too large an increment for a constant 1Hz adjustment.

This command continuously adjusts the Spacecraft Time Correlation Factor (STCF) every second, by subtracting the specified value. The adjustment to the STCF is applied in the Time Service local 1Hz interrupt handler. As the local 1Hz interrupt is not synchronized to the tone signal, one cannot say when the adjustment will occur, other than once a second, at about the same time relative to the tone.

There was some debate about whether the maximum 1Hz clock drift correction factor would ever need to exceed some small fraction of a second. But, the decision was made to provide the capability to make 1Hz adjustments greater than one second and leave it to the ground system to provide mission specific limits.

Command Mnemonic(s) $sc_$cpu_TIME_Sub1HzSTCF

Command Structure

CFE_TIME_SubOneHzAdjustmentCmd_t

Command Verification

Successful execution of this command may be verified with the following telemetry: Successful execution of this command may be verified with the following telemetry:

- **`$sc_$cpu_TIME_CMDPC`** - command execution counter will increment
- **`$sc_$cpu_TIME_STCFSecs`** - Housekeeping Telemetry point indicating new STCF seconds value
- **`$sc_$cpu_TIME_STCFSubsecs`** - Housekeeping Telemetry point indicating new STCF subseconds value
- The CFE_TIME_ONEHZ_EID informational event message will be generated

Error Conditions

- Platform receiving the command is not a Time Server

  Evidence of Failure may be found in the following telemetry:

- **`$sc_$cpu_TIME_CMDEC`** - command error counter will increment
- Error specific event message will be issued (CFE_TIME_ONEHZ_CFG_EID)

Criticality

Inappropriately setting the clock may result in other sub-systems performing incorrect time based calculations. The specific risk is dependent upon the behavior of those sub-systems.

See also

CFE_TIME_ADD_ADJUST_CC, CFE_TIME_SUB_ADJUST_CC, CFE_TIME_ADD_ONE_HZ_ADJUSTMENT_CC

Definition at line 649 of file default_cfe_time_fcncodes.h.

12.158 cfe/modules/time/config/default_cfe_time_interface_cfg.h File Reference

Macros

- #define CFE_MISSION_TIME_CFG_DEFAULT_TAI true
- #define CFE_MISSION_TIME_CFG_DEFAULT_UTC false
- #define CFE_MISSION_TIME_CFG_FAKE_TONE true
- #define CFE_MISSION_TIME_AT_TONE_WAS true
- #define CFE_MISSION_TIME_AT_TONE_WILL_BE false
- #define CFE_MISSION_TIME_MIN_ELAPSED 0
- #define CFE_MISSION_TIME_MAX_ELAPSED 200000
- #define CFE_MISSION_TIME_DEF_MET_SECS 1000
- #define CFE_MISSION_TIME_DEF_MET_SUBS 0
- #define CFE_MISSION_TIME_DEF_STCF_SECS 1000000
- #define CFE_MISSION_TIME_DEF_STCF_SUBS 0
- #define CFE_MISSION_TIME_DEF_LEAPS 37
- #define CFE_MISSION_TIME_DEF_DELAY_SECS 0
- #define CFE_MISSION_TIME_DEF_DELAY_SUBS 1000
- #define CFE_MISSION_TIME_EPOCH_YEAR 1980
- #define CFE_MISSION_TIME_EPOCH_DAY 1
- #define CFE_MISSION_TIME_EPOCH_HOUR 0
- #define CFE_MISSION_TIME_EPOCH_MINUTE 0
- #define CFE_MISSION_TIME_EPOCH_SECOND 0
- #define CFE_MISSION_TIME_EPOCH_MICROS 0
- #define CFE_MISSION_TIME_FS_FACTOR 789004800

12.158.1 Detailed Description

CFE Time Services (CFE_TIME) Application Public Definitions
This provides default values for configurable items that affect the interface(s) of this module. This includes the CMD/TLM message interface, tables definitions, and any other data products that serve to exchange information with other entities.

Note

This file may be overridden/superceded by mission-provided definitions either by overriding this header or by generating definitions from a command/data dictionary tool.

12.158.2 Macro Definition Documentation

12.158.2.1 CFE_MISSION_TIME_AT_TONE_WAS `#define CFE_MISSION_TIME_AT_TONE_WAS true`

Purpose Default Time and Tone Order

Description:

Time Services may be configured to expect the time at the tone data packet to either precede or follow the tone signal. If the time at the tone data packet follows the tone signal, then the data within the packet describes what the time "was" at the tone. If the time at the tone data packet precedes the tone signal, then the data within the packet describes what the time "will be" at the tone. One, and only one, of the following symbols must be set to true:

- CFE_MISSION_TIME_AT_TONE_WAS
- CFE_MISSION_TIME_AT_TONE_WILL_BE Note: If Time Services is defined as using a simulated tone signal (see CFE_MISSION_TIME_CFG_FAKE_TONE above), then the tone data packet must follow the tone signal.

Limits

Either CFE_MISSION_TIME_AT_TONE_WAS or CFE_MISSION_TIME_AT_TONE_WILL_BE must be set to true. They may not both be true and they may not both be false.

Definition at line 88 of file default_cfe_time_interface_cfg.h.

12.158.2.2 CFE_MISSION_TIME_AT_TONE_WILL_BE `#define CFE_MISSION_TIME_AT_TONE_WILL_BE false`

Definition at line 89 of file default_cfe_time_interface_cfg.h.

12.158.2.3 CFE_MISSION_TIME_CFG_DEFAULT_TAI `#define CFE_MISSION_TIME_CFG_DEFAULT_TAI true`

Purpose Default Time Format

Description:

The following definitions select either UTC or TAI as the default (mission specific) time format. Although it is possible for an application to request time in a specific format, most callers should use CFE_TIME_GetTime(), which returns time in the default format. This avoids having to modify each individual caller when the default choice is changed.

Limits

if CFE_MISSION_TIME_CFG_DEFAULT_TAI is defined as true then CFE_MISSION_TIME_CFG_DEFAULT_↩ UTC must be defined as false. if CFE_MISSION_TIME_CFG_DEFAULT_TAI is defined as false then CFE_MI↩ SSION_TIME_CFG_DEFAULT_UTC must be defined as true.

Definition at line 52 of file default_cfe_time_interface_cfg.h.

12.158.2.4 CFE_MISSION_TIME_CFG_DEFAULT_UTC `#define CFE_MISSION_TIME_CFG_DEFAULT_UTC false`

Definition at line 53 of file default_cfe_time_interface_cfg.h.

12.158.2.5 CFE_MISSION_TIME_CFG_FAKE_TONE `#define CFE_MISSION_TIME_CFG_FAKE_TONE true`

Purpose Default Time Format

Description:

The following definition enables the use of a simulated time at the tone signal using a software bus message.

Limits

Not Applicable

Definition at line 65 of file default_cfe_time_interface_cfg.h.

12.158.2.6 CFE_MISSION_TIME_DEF_DELAY_SECS `#define CFE_MISSION_TIME_DEF_DELAY_SECS 0`

Definition at line 147 of file default_cfe_time_interface_cfg.h.

12.158.2.7 CFE_MISSION_TIME_DEF_DELAY_SUBS `#define CFE_MISSION_TIME_DEF_DELAY_SUBS 1000`

Definition at line 148 of file default_cfe_time_interface_cfg.h.

12.158.2.8 CFE_MISSION_TIME_DEF_LEAPS `#define CFE_MISSION_TIME_DEF_LEAPS 37`

Definition at line 145 of file default_cfe_time_interface_cfg.h.

12.158.2.9 CFE_MISSION_TIME_DEF_MET_SECS `#define CFE_MISSION_TIME_DEF_MET_SECS 1000`

Purpose Default Time Values

Description:

Default time values are provided to avoid problems due to time calculations performed after startup but before commands can be processed. For example, if the default time format is UTC then it is important that the sum of MET and STCF always exceed the value of Leap Seconds to prevent the UTC time calculation `(time = MET + STCF - Leap Seconds)` from resulting in a negative (very large) number.

Some past missions have also created known (albeit wrong) default timestamps. For example, assume the epoch is defined as Jan 1, 1970 and further assume the default time values are set to create a timestamp of Jan 1, 2000. Even though the year 2000 timestamps are wrong, it may be of value to keep the time within some sort of bounds acceptable to the software.

Note: Sub-second units are in micro-seconds (0 to 999,999) and all values must be defined

Limits

Not Applicable

Definition at line 139 of file default_cfe_time_interface_cfg.h.

12.158.2.10 CFE_MISSION_TIME_DEF_MET_SUBS `#define CFE_MISSION_TIME_DEF_MET_SUBS 0`

Definition at line 140 of file default_cfe_time_interface_cfg.h.

12.158.2.11 CFE_MISSION_TIME_DEF_STCF_SECS `#define CFE_MISSION_TIME_DEF_STCF_SECS 1000000`

Definition at line 142 of file default_cfe_time_interface_cfg.h.

12.158.2.12 CFE_MISSION_TIME_DEF_STCF_SUBS `#define CFE_MISSION_TIME_DEF_STCF_SUBS 0`

Definition at line 143 of file default_cfe_time_interface_cfg.h.

12.158.2.13 CFE_MISSION_TIME_EPOCH_DAY `#define CFE_MISSION_TIME_EPOCH_DAY 1`

Definition at line 166 of file default_cfe_time_interface_cfg.h.

12.158.2.14 CFE_MISSION_TIME_EPOCH_HOUR `#define CFE_MISSION_TIME_EPOCH_HOUR 0`

Definition at line 167 of file default_cfe_time_interface_cfg.h.

12.158.2.15 CFE_MISSION_TIME_EPOCH_MICROS `#define CFE_MISSION_TIME_EPOCH_MICROS 0`

Definition at line 170 of file default_cfe_time_interface_cfg.h.

12.158.2.16 CFE_MISSION_TIME_EPOCH_MINUTE `#define CFE_MISSION_TIME_EPOCH_MINUTE 0`

Definition at line 168 of file default_cfe_time_interface_cfg.h.

12.158.2.17 CFE_MISSION_TIME_EPOCH_SECOND `#define CFE_MISSION_TIME_EPOCH_SECOND 0`

Definition at line 169 of file default_cfe_time_interface_cfg.h.

12.158.2.18 CFE_MISSION_TIME_EPOCH_YEAR `#define CFE_MISSION_TIME_EPOCH_YEAR 1980`

Purpose Default EPOCH Values

Description:

Default ground time epoch values Note: these values are used only by the CFE_TIME_Print() API function

Limits

Year - must be within 136 years Day - Jan 1 = 1, Feb 1 = 32, etc. Hour - 0 to 23 Minute - 0 to 59 Second - 0 to 59 Micros - 0 to 999999

Definition at line 165 of file default_cfe_time_interface_cfg.h.

12.158.2.19 CFE_MISSION_TIME_FS_FACTOR `#define CFE_MISSION_TIME_FS_FACTOR 789004800`

Purpose Time File System Factor

Description:

Define the s/c vs file system time conversion constant...

Note: this value is intended for use only by CFE TIME API functions to convert time values based on the ground system epoch (s/c time) to and from time values based on the file system epoch (fs time).
FS time = S/C time + factor S/C time = FS time - factor
Worksheet:
S/C epoch = Jan 1, 2005 (LRO ground system epoch) FS epoch = Jan 1, 1980 (vxWorks DOS file system epoch)
Delta = 25 years, 0 days, 0 hours, 0 minutes, 0 seconds
Leap years = 1980, 1984, 1988, 1992, 1996, 2000, 2004 (divisible by 4 – except if by 100 – unless also by 400)
1 year = 31,536,000 seconds 1 day = 86,400 seconds 1 hour = 3,600 seconds 1 minute = 60 seconds
25 years = 788,400,000 seconds 7 extra leap days = 604,800 seconds
total delta = 789,004,800 seconds

Limits

Not Applicable

Definition at line 208 of file default_cfe_time_interface_cfg.h.

12.158.2.20 CFE_MISSION_TIME_MAX_ELAPSED `#define CFE_MISSION_TIME_MAX_ELAPSED 200000`

Definition at line 114 of file default_cfe_time_interface_cfg.h.

12.158.2.21 CFE_MISSION_TIME_MIN_ELAPSED `#define CFE_MISSION_TIME_MIN_ELAPSED 0`

Purpose Min and Max Time Elapsed

Description:

Based on the definition of Time and Tone Order (CFE_MISSION_TIME_AT_TONE_WAS/WILL_BE) either the "time at the tone" signal or data packet will follow the other. This definition sets the valid window of time for the second of the pair to lag behind the first. Time Services will invalidate both the tone and packet if the second does not arrive within this window following the first.

For example, if the data packet follows the tone, it might be valid for the data packet to arrive between zero and 100,000 micro-seconds after the tone. But, if the tone follows the packet, it might be valid only if the packet arrived between 200,000 and 700,000 micro-seconds before the tone.
Note: units are in micro-seconds

Limits

0 to 999,999 decimal

Definition at line 113 of file default_cfe_time_interface_cfg.h.

12.159 cfe/modules/time/config/default_cfe_time_internal_cfg.h File Reference

Macros

- #define CFE_PLATFORM_TIME_CFG_SERVER true
- #define CFE_PLATFORM_TIME_CFG_CLIENT false
- #define CFE_PLATFORM_TIME_CFG_VIRTUAL true
- #define CFE_PLATFORM_TIME_CFG_SIGNAL false
- #define CFE_PLATFORM_TIME_CFG_SOURCE false
- #define CFE_PLATFORM_TIME_CFG_SRC_MET false
- #define CFE_PLATFORM_TIME_CFG_SRC_GPS false
- #define CFE_PLATFORM_TIME_CFG_SRC_TIME false
- #define CFE_PLATFORM_TIME_MAX_DELTA_SECS 0
- #define CFE_PLATFORM_TIME_MAX_DELTA_SUBS 500000
- #define CFE_PLATFORM_TIME_MAX_LOCAL_SECS 27
- #define CFE_PLATFORM_TIME_MAX_LOCAL_SUBS 0
- #define CFE_PLATFORM_TIME_CFG_TONE_LIMIT 20000
- #define CFE_PLATFORM_TIME_CFG_START_FLY 2
- #define CFE_PLATFORM_TIME_CFG_LATCH_FLY 8
- #define CFE_PLATFORM_TIME_START_TASK_PRIORITY 60
- #define CFE_PLATFORM_TIME_TONE_TASK_PRIORITY 25
- #define CFE_PLATFORM_TIME_ONEHZ_TASK_PRIORITY 25
- #define CFE_PLATFORM_TIME_START_TASK_STACK_SIZE CFE_PLATFORM_ES_DEFAULT_STACK_SIZE
- #define CFE_PLATFORM_TIME_TONE_TASK_STACK_SIZE 4096
- #define CFE_PLATFORM_TIME_ONEHZ_TASK_STACK_SIZE 8192

12.159.1 Detailed Description

CFE Time Service (CFE_TIME) Application Private Config Definitions
This provides default values for configurable items that are internal to this module and do NOT affect the interface(s) of this module. Changes to items in this file only affect the local module and will be transparent to external entities that are using the public interface(s).

Note

This file may be overridden/superceded by mission-provided definitions either by overriding this header or by generating definitions from a command/data dictionary tool.

12.159.2 Macro Definition Documentation

12.159.2.1 CFE_PLATFORM_TIME_CFG_CLIENT `#define CFE_PLATFORM_TIME_CFG_CLIENT false`

Definition at line 48 of file default_cfe_time_internal_cfg.h.

12.159.2.2 CFE_PLATFORM_TIME_CFG_LATCH_FLY `#define CFE_PLATFORM_TIME_CFG_LATCH_FLY 8`

Purpose Define Periodic Time to Update Local Clock Tone Latch

Description:

Define Periodic Time to Update Local Clock Tone Latch. Applies only when in flywheel mode. This define dictates the period at which the simulated 'last tone' time is updated. Units are seconds.

Limits

Not Applicable

Definition at line 205 of file default_cfe_time_internal_cfg.h.

12.159.2.3 CFE_PLATFORM_TIME_CFG_SERVER `#define CFE_PLATFORM_TIME_CFG_SERVER true`

Purpose Time Server or Time Client Selection

Description:

This configuration parameter selects whether the Time task functions as a time "server" or "client". A time server generates the "time at the tone" packet which is received by time clients.

Limits

Enable one, and only one by defining either CFE_PLATFORM_TIME_CFG_SERVER or CFE_PLATFORM_TI↩ ME_CFG_CLIENT AS true. The other must be defined as false.

Definition at line 47 of file default_cfe_time_internal_cfg.h.

12.159.2.4 CFE_PLATFORM_TIME_CFG_SIGNAL `#define CFE_PLATFORM_TIME_CFG_SIGNAL false`

Purpose Include or Exclude the Primary/Redundant Tone Selection Cmd

Description:

Depending on the specific hardware system configuration, it may be possible to switch between a primary and redundant tone signal. If supported by hardware, this definition will enable command interfaces to select the active tone signal. Both Time Clients and Time Servers support this feature. Note: Set the CFE_PLATFORM_TIME_↩ CFG_SIGNAL define to true to enable tone signal commands.

Limits

Not Applicable

Definition at line 95 of file default_cfe_time_internal_cfg.h.

12.159.2.5 CFE_PLATFORM_TIME_CFG_SOURCE `#define CFE_PLATFORM_TIME_CFG_SOURCE false`

Purpose Include or Exclude the Internal/External Time Source Selection Cmd

Description:

By default, Time Servers maintain time using an internal MET which may be a h/w register or software counter, depending on available hardware. The following definition enables command interfaces to switch between an internal MET, or external time data received from one of several supported external time sources. Only a Time Server may be configured to use external time data. Note: Set the CFE_PLATFORM_TIME_CFG_SOURCE define to true to include the Time Source Selection Command (command allows selection between the internal or external time source). Then choose the external source with the CFE_TIME_CFG_SRC_??? define.

Limits

Only applies if CFE_PLATFORM_TIME_CFG_SERVER is set to true.

Definition at line 115 of file default_cfe_time_internal_cfg.h.

12.159.2.6 CFE_PLATFORM_TIME_CFG_SRC_GPS `#define CFE_PLATFORM_TIME_CFG_SRC_GPS false`

Definition at line 132 of file default_cfe_time_internal_cfg.h.

12.159.2.7 CFE_PLATFORM_TIME_CFG_SRC_MET `#define CFE_PLATFORM_TIME_CFG_SRC_MET false`

Purpose Choose the External Time Source for Server only

Description:

If CFE_PLATFORM_TIME_CFG_SOURCE is set to true, then one of the following external time source types must also be set to true. Do not set any of the external time source types to true unless CFE_PLATFORM_TIME_CFG_SOURCE is set to true.

Limits

1. If CFE_PLATFORM_TIME_CFG_SOURCE is set to true then one and only one of the following three external time sources can and must be set true: CFE_PLATFORM_TIME_CFG_SRC_MET, CFE_PLATFORM_TIME_CFG_SRC_GPS, CFE_PLATFORM_TIME_CFG_SRC_TIME
2. Only applies if CFE_PLATFORM_TIME_CFG_SERVER is set to true.

Definition at line 131 of file default_cfe_time_internal_cfg.h.

12.159.2.8 CFE_PLATFORM_TIME_CFG_SRC_TIME `#define CFE_PLATFORM_TIME_CFG_SRC_TIME false`

Definition at line 133 of file default_cfe_time_internal_cfg.h.

12.159.2.9 CFE_PLATFORM_TIME_CFG_START_FLY `#define CFE_PLATFORM_TIME_CFG_START_FLY 2`

Purpose Define Time to Start Flywheel Since Last Tone

Description:

Define time to enter flywheel mode (in seconds since last tone data update) Units are microseconds as measured with the local clock.

Limits

Not Applicable

Definition at line 192 of file default_cfe_time_internal_cfg.h.

12.159.2.10 CFE_PLATFORM_TIME_CFG_TONE_LIMIT `#define CFE_PLATFORM_TIME_CFG_TONE_LIMIT 20000`

Purpose Define Timing Limits From One Tone To The Next

Description:

Defines limits to the timing of the 1Hz tone signal. A tone signal is valid only if it arrives within one second (plus or minus the tone limit) from the previous tone signal.Units are microseconds as measured with the local clock.

Limits

Not Applicable

Definition at line 180 of file default_cfe_time_internal_cfg.h.

12.159.2.11 CFE_PLATFORM_TIME_CFG_VIRTUAL `#define CFE_PLATFORM_TIME_CFG_VIRTUAL true`

Purpose Time Tone In Big-Endian Order

Description:

If this configuration parameter is defined, the CFE time server will publish time tones with payloads in big-endian order, and time clients will expect the tones to be in big-endian order. This is useful for mixed-endian environments. This will become obsolete once EDS is available and the CFE time tone message is defined.

Purpose Local MET or Virtual MET Selection for Time Servers

Description:

Depending on the specific hardware system configuration, it may be possible for Time Servers to read the "local" MET from a h/w register rather than having to track the MET as the count of tone signal interrupts (virtual MET)

Time Clients must be defined as using a virtual MET. Also, a Time Server cannot be defined as having both a h/w MET and an external time source (they both cannot synchronize to the same tone).
Note: "disable" this define (set to false) only for Time Servers with local hardware that supports a h/w MET that is synchronized to the tone signal !!!

Limits

Only applies if CFE_PLATFORM_TIME_CFG_SERVER is set to true.

Definition at line 80 of file default_cfe_time_internal_cfg.h.

12.159.2.12 CFE_PLATFORM_TIME_MAX_DELTA_SECS `#define CFE_PLATFORM_TIME_MAX_DELTA_SECS 0`

Purpose Define the Max Delta Limits for Time Servers using an Ext Time Source

Description:

If CFE_PLATFORM_TIME_CFG_SOURCE is set to true and one of the external time sources is also set to true, then the delta time limits for range checking is used.

When a new time value is received from an external source, the value is compared against the "expected" time value. If the delta exceeds the following defined amount, then the new time data will be ignored. This range checking is only performed after the clock state has been commanded to "valid". Until then, external time data is accepted unconditionally.

Limits

Applies only if both CFE_PLATFORM_TIME_CFG_SERVER and CFE_PLATFORM_TIME_CFG_SOURCE are set to true.

Definition at line 152 of file default_cfe_time_internal_cfg.h.

12.159.2.13 CFE_PLATFORM_TIME_MAX_DELTA_SUBS `#define CFE_PLATFORM_TIME_MAX_DELTA_SU↩ BS 500000`

Definition at line 153 of file default_cfe_time_internal_cfg.h.

12.159.2.14 CFE_PLATFORM_TIME_MAX_LOCAL_SECS `#define CFE_PLATFORM_TIME_MAX_LOCAL_SECS 27`

Purpose Define the Local Clock Rollover Value in seconds and subseconds

Description:

Specifies the capability of the local clock. Indicates the time at which the local clock rolls over.

Limits

Not Applicable

Definition at line 165 of file default_cfe_time_internal_cfg.h.

12.159.2.15 CFE_PLATFORM_TIME_MAX_LOCAL_SUBS `#define CFE_PLATFORM_TIME_MAX_LOCAL_SUBS 0`

Definition at line 166 of file default_cfe_time_internal_cfg.h.

12.159.2.16 CFE_PLATFORM_TIME_ONEHZ_TASK_PRIORITY `#define CFE_PLATFORM_TIME_ONEHZ_TASK_P↩ RIORITY 25`

Definition at line 222 of file default_cfe_time_internal_cfg.h.

12.159.2.17 CFE_PLATFORM_TIME_ONEHZ_TASK_STACK_SIZE `#define CFE_PLATFORM_TIME_ONEHZ_TASK↩ _STACK_SIZE 8192`

Definition at line 241 of file default_cfe_time_internal_cfg.h.

12.159.2.18 CFE_PLATFORM_TIME_START_TASK_PRIORITY

`#define CFE_PLATFORM_TIME_START_TASK_PRIORITY 60`

Purpose Define TIME Task Priorities

Description:

Defines the cFE_TIME Task priority. Defines the cFE_TIME Tone Task priority. Defines the cFE_TIME 1HZ Task priority.

Limits

There is a lower limit of zero and an upper limit of 255 on these configuration parameters. Remember that the meaning of each task priority is inverted – a "lower" number has a "higher" priority.

Definition at line 220 of file default_cfe_time_internal_cfg.h.

12.159.2.19 CFE_PLATFORM_TIME_START_TASK_STACK_SIZE

`#define CFE_PLATFORM_TIME_START_TASK_STACK_SIZE CFE_PLATFORM_ES_DEFAULT_STACK_SIZE`

Purpose Define TIME Task Stack Sizes

Description:

Defines the cFE_TIME Main Task Stack Size Defines the cFE_TIME Tone Task Stack Size Defines the cFE_TIME 1HZ Task Stack Size

Limits

There is a lower limit of 2048 on these configuration parameters. There are no restrictions on the upper limit however, the maximum stack size is system dependent and should be verified. Most operating systems provide tools for measuring the amount of stack used by a task during operation. It is always a good idea to verify that no more than 1/2 of the stack is used.

Definition at line 239 of file default_cfe_time_internal_cfg.h.

12.159.2.20 CFE_PLATFORM_TIME_TONE_TASK_PRIORITY

`#define CFE_PLATFORM_TIME_TONE_TASK_PRIORITY 25`

Definition at line 221 of file default_cfe_time_internal_cfg.h.

12.159.2.21 CFE_PLATFORM_TIME_TONE_TASK_STACK_SIZE

`#define CFE_PLATFORM_TIME_TONE_TASK_STACK_SIZE 4096`

Definition at line 240 of file default_cfe_time_internal_cfg.h.

12.160 cfe/modules/time/config/default_cfe_time_mission_cfg.h File Reference

`#include "cfe_time_interface_cfg.h"`

12.160.1 Detailed Description

CFE Time Services (CFE_TIME) Application Mission Configuration Header File
This is a compatibility header for the "mission_cfg.h" file that has traditionally provided public config definitions for each CFS app.

Note

This file may be overridden/superceded by mission-provided definitions either by overriding this header or by generating definitions from a command/data dictionary tool.

12.161 cfe/modules/time/config/default_cfe_time_msg.h File Reference

```
#include "cfe_mission_cfg.h"
#include "cfe_time_fcncodes.h"
#include "cfe_time_msgdefs.h"
#include "cfe_time_msgstruct.h"
```

12.161.1 Detailed Description

Specification for the CFE Time Services (CFE_TIME) command and telemetry message data types.
This is a compatibility header for the "cfe_time_msg.h" file that has traditionally provided the message definitions for cFS apps.

Note

This file may be overridden/superceded by mission-provided definitions either by overriding this header or by generating definitions from a command/data dictionary tool.

12.162 cfe/modules/time/config/default_cfe_time_msgdefs.h File Reference

```
#include "common_types.h"
#include "cfe_mission_cfg.h"
#include "cfe_time_extern_typedefs.h"
#include "cfe_time_fcncodes.h"
```

Data Structures

- struct CFE_TIME_LeapsCmd_Payload

  Set leap seconds command payload.
- struct CFE_TIME_StateCmd_Payload

  Set clock state command payload.
- struct CFE_TIME_SourceCmd_Payload

  Set time data source command payload.
- struct CFE_TIME_SignalCmd_Payload

  Set tone signal source command payload.
- struct CFE_TIME_TimeCmd_Payload

  Generic seconds, microseconds command payload.
- struct CFE_TIME_OneHzAdjustmentCmd_Payload

  Generic seconds, subseconds command payload.
- struct CFE_TIME_ToneDataCmd_Payload

  Time at tone data command payload.
- struct CFE_TIME_HousekeepingTlm_Payload
- struct CFE_TIME_DiagnosticTlm_Payload

Macros

- #define CFE_TIME_FLAG_CLKSET 0x8000

  The spacecraft time has been set.
- #define CFE_TIME_FLAG_FLYING 0x4000

  This instance of Time Services is flywheeling.
- #define CFE_TIME_FLAG_SRCINT 0x2000

  The clock source is set to "internal".
- #define CFE_TIME_FLAG_SIGPRI 0x1000

  The clock signal is set to "primary".
- #define CFE_TIME_FLAG_SRVFLY 0x0800

  The Time Server is in flywheel mode.
- #define CFE_TIME_FLAG_CMDFLY 0x0400

  This instance of Time Services was commanded into flywheel mode.
- #define CFE_TIME_FLAG_ADDADJ 0x0200

  One time STCF Adjustment is to be done in positive direction.
- #define CFE_TIME_FLAG_ADD1HZ 0x0100

  1 Hz STCF Adjustment is to be done in a positive direction
- #define CFE_TIME_FLAG_ADDTCL 0x0080

  Time Client Latency is applied in a positive direction.
- #define CFE_TIME_FLAG_SERVER 0x0040

  This instance of Time Services is a Time Server.
- #define CFE_TIME_FLAG_GDTONE 0x0020

  The tone received is good compared to the last tone received.
- #define CFE_TIME_FLAG_REFERR 0x0010

  GetReference read error, will be set if unable to get a consistent ref value.
- #define CFE_TIME_FLAG_UNUSED 0x000F

  Reserved flags - should be zero.

Typedefs

- typedef struct CFE_TIME_LeapsCmd_Payload CFE_TIME_LeapsCmd_Payload_t

  Set leap seconds command payload.
- typedef struct CFE_TIME_StateCmd_Payload CFE_TIME_StateCmd_Payload_t

  Set clock state command payload.
- typedef struct CFE_TIME_SourceCmd_Payload CFE_TIME_SourceCmd_Payload_t

  Set time data source command payload.
- typedef struct CFE_TIME_SignalCmd_Payload CFE_TIME_SignalCmd_Payload_t

  Set tone signal source command payload.
- typedef struct CFE_TIME_TimeCmd_Payload CFE_TIME_TimeCmd_Payload_t

  Generic seconds, microseconds command payload.
- typedef struct CFE_TIME_OneHzAdjustmentCmd_Payload CFE_TIME_OneHzAdjustmentCmd_Payload_t

  Generic seconds, subseconds command payload.
- typedef struct CFE_TIME_ToneDataCmd_Payload CFE_TIME_ToneDataCmd_Payload_t

  Time at tone data command payload.
- typedef struct CFE_TIME_HousekeepingTlm_Payload CFE_TIME_HousekeepingTlm_Payload_t
- typedef struct CFE_TIME_DiagnosticTlm_Payload CFE_TIME_DiagnosticTlm_Payload_t

12.162.1 Detailed Description

Specification for the CFE Time Services (CFE_TIME) command and telemetry message constant definitions.
For CFE_TIME this is only the function/command code definitions

12.162.2 Typedef Documentation

12.162.2.1 CFE_TIME_DiagnosticTlm_Payload_t `typedef struct CFE_TIME_DiagnosticTlm_Payload CFE_TIME_DiagnosticTlm`

Name Time Services Diagnostics Packet

12.162.2.2 CFE_TIME_HousekeepingTlm_Payload_t `typedef struct CFE_TIME_HousekeepingTlm_Payload CFE_TIME_HousekeepingTlm_Payload_t`

Name Time Services Housekeeping Packet

12.162.2.3 CFE_TIME_LeapsCmd_Payload_t `typedef struct CFE_TIME_LeapsCmd_Payload CFE_TIME_LeapsCmd_Payload_t`

Set leap seconds command payload.

12.162.2.4 CFE_TIME_OneHzAdjustmentCmd_Payload_t `typedef struct CFE_TIME_OneHzAdjustmentCmd_Payload CFE_TIME_OneHzAdjustmentCmd_Payload_t`

Generic seconds, subseconds command payload.

12.162.2.5 CFE_TIME_SignalCmd_Payload_t `typedef struct CFE_TIME_SignalCmd_Payload CFE_TIME_SignalCmd_Payload_t`

Set tone signal source command payload.

12.162.2.6 CFE_TIME_SourceCmd_Payload_t `typedef struct CFE_TIME_SourceCmd_Payload CFE_TIME_SourceCmd_Payload_t`

Set time data source command payload.

12.162.2.7 CFE_TIME_StateCmd_Payload_t `typedef struct CFE_TIME_StateCmd_Payload CFE_TIME_StateCmd_Payload_t`

Set clock state command payload.

12.162.2.8 CFE_TIME_TimeCmd_Payload_t `typedef struct CFE_TIME_TimeCmd_Payload CFE_TIME_TimeCmd_Payload_t`

Generic seconds, microseconds command payload.

12.162.2.9 CFE_TIME_ToneDataCmd_Payload_t `typedef struct CFE_TIME_ToneDataCmd_Payload CFE_TIME_ToneDataCmd_Pay`

Time at tone data command payload.

12.163 cfe/modules/time/config/default_cfe_time_msgids.h File Reference

```
#include "cfe_core_api_base_msgids.h"
#include "cfe_time_topicids.h"
```

Macros

- #define CFE_TIME_CMD_MID CFE_PLATFORM_CMD_TOPICID_TO_MIDV(CFE_MISSION_TIME_CMD_TOPICID) /* 0x1805 */
- #define CFE_TIME_SEND_HK_MID CFE_PLATFORM_CMD_TOPICID_TO_MIDV(CFE_MISSION_TIME_SEND_HK_TOPICID) /* 0x180D */
- #define CFE_TIME_TONE_CMD_MID CFE_PLATFORM_CMD_TOPICID_TO_MIDV(CFE_MISSION_TIME_TONE_CMD_TOPICI /* 0x1810 */
- #define CFE_TIME_ONEHZ_CMD_MID CFE_PLATFORM_CMD_TOPICID_TO_MIDV(CFE_MISSION_TIME_ONEHZ_CMD_TOP /* 0x1811 */
- #define CFE_TIME_DATA_CMD_MID CFE_GLOBAL_CMD_TOPICID_TO_MIDV(CFE_MISSION_TIME_DATA_CMD_TOPICID) /* 0x1860 */
- #define CFE_TIME_SEND_CMD_MID CFE_GLOBAL_CMD_TOPICID_TO_MIDV(CFE_MISSION_TIME_SEND_CMD_TOPICID) /* 0x1862 */
- #define CFE_TIME_HK_TLM_MID CFE_PLATFORM_TLM_TOPICID_TO_MIDV(CFE_MISSION_TIME_HK_TLM_TOPICID) /* 0x0805 */
- #define CFE_TIME_DIAG_TLM_MID CFE_PLATFORM_TLM_TOPICID_TO_MIDV(CFE_MISSION_TIME_DIAG_TLM_TOPICID) /* 0x0806 */
- #define CFE_TIME_1HZ_CMD_MID CFE_TIME_ONEHZ_CMD_MID

12.163.1 Detailed Description

CFE Time Services (CFE_TIME) Application Message IDs

12.163.2 Macro Definition Documentation

12.163.2.1 CFE_TIME_1HZ_CMD_MID

```
#define CFE_TIME_1HZ_CMD_MID CFE_TIME_ONEHZ_CMD_MID
```

Definition at line 55 of file default_cfe_time_msgids.h.

12.163.2.2 CFE_TIME_CMD_MID

```
#define CFE_TIME_CMD_MID CFE_PLATFORM_CMD_TOPICID_TO_MIDV(CFE_MISSION_TIME_CMD_TOP
/* 0x1805 */
```

Definition at line 32 of file default_cfe_time_msgids.h.

12.163.2.3 CFE_TIME_DATA_CMD_MID

```
#define CFE_TIME_DATA_CMD_MID CFE_GLOBAL_CMD_TOPICID_TO_MIDV(CFE_MISSION_TIM
/* 0x1860 */
```

Definition at line 40 of file default_cfe_time_msgids.h.

12.163.2.4 CFE_TIME_DIAG_TLM_MID

```
#define CFE_TIME_DIAG_TLM_MID CFE_PLATFORM_TLM_TOPICID_TO_MIDV(CFE_MISSION_TI
/* 0x0806 */
```

Definition at line 47 of file default_cfe_time_msgids.h.

12.163.2.5 CFE_TIME_HK_TLM_MID

```
#define CFE_TIME_HK_TLM_MID CFE_PLATFORM_TLM_TOPICID_TO_MIDV(CFE_MISSION_TIME_
/* 0x0805 */
```

Definition at line 46 of file default_cfe_time_msgids.h.

12.163.2.6 CFE_TIME_ONEHZ_CMD_MID

```
#define CFE_TIME_ONEHZ_CMD_MID CFE_PLATFORM_CMD_TOPICID_TO_MIDV(CFE_MISSIO
/* 0x1811 */
```

Definition at line 35 of file default_cfe_time_msgids.h.

12.163.2.7 CFE_TIME_SEND_CMD_MID

```
#define CFE_TIME_SEND_CMD_MID CFE_GLOBAL_CMD_TOPICID_TO_MIDV(CFE_MISSION_TIM
/* 0x1862 */
```

Definition at line 41 of file default_cfe_time_msgids.h.

12.163.2.8 CFE_TIME_SEND_HK_MID

```
#define CFE_TIME_SEND_HK_MID CFE_PLATFORM_CMD_TOPICID_TO_MIDV(CFE_MISSION_TIM
/* 0x180D */
```

Definition at line 33 of file default_cfe_time_msgids.h.

12.163.2.9 CFE_TIME_TONE_CMD_MID

```
#define CFE_TIME_TONE_CMD_MID CFE_PLATFORM_CMD_TOPICID_TO_MIDV(CFE_MISSION_T
/* 0x1810 */
```

Definition at line 34 of file default_cfe_time_msgids.h.

12.164 cfe/modules/time/config/default_cfe_time_msgstruct.h File Reference

```
#include "cfe_time_msgdefs.h"
#include "cfe_msg_hdr.h"
```

Data Structures

- struct CFE_TIME_NoopCmd
- struct CFE_TIME_ResetCountersCmd
- struct CFE_TIME_SendDiagnosticCmd
- struct CFE_TIME_OneHzCmd
- struct CFE_TIME_ToneSignalCmd
- struct CFE_TIME_FakeToneCmd
- struct CFE_TIME_SendHkCmd
- struct CFE_TIME_SetLeapSecondsCmd

  Set leap seconds command.
- struct CFE_TIME_SetStateCmd

  Set clock state command.
- struct CFE_TIME_SetSourceCmd

  Set time data source command.
- struct CFE_TIME_SetSignalCmd

  Set tone signal source command.
- struct CFE_TIME_AddDelayCmd
- struct CFE_TIME_SubDelayCmd
- struct CFE_TIME_SetMETCmd
- struct CFE_TIME_SetSTCFCmd
- struct CFE_TIME_AddAdjustCmd
- struct CFE_TIME_SubAdjustCmd
- struct CFE_TIME_SetTimeCmd
- struct CFE_TIME_AddOneHzAdjustmentCmd
- struct CFE_TIME_SubOneHzAdjustmentCmd

- struct CFE_TIME_ToneDataCmd

  Time at tone data command.
- struct CFE_TIME_HousekeepingTlm
- struct CFE_TIME_DiagnosticTlm

Typedefs

- typedef struct CFE_TIME_NoopCmd CFE_TIME_NoopCmd_t
- typedef struct CFE_TIME_ResetCountersCmd CFE_TIME_ResetCountersCmd_t
- typedef struct CFE_TIME_SendDiagnosticCmd CFE_TIME_SendDiagnosticCmd_t
- typedef struct CFE_TIME_OneHzCmd CFE_TIME_OneHzCmd_t
- typedef struct CFE_TIME_ToneSignalCmd CFE_TIME_ToneSignalCmd_t
- typedef struct CFE_TIME_FakeToneCmd CFE_TIME_FakeToneCmd_t
- typedef struct CFE_TIME_SendHkCmd CFE_TIME_SendHkCmd_t
- typedef struct CFE_TIME_SetLeapSecondsCmd CFE_TIME_SetLeapSecondsCmd_t

  Set leap seconds command.
- typedef struct CFE_TIME_SetStateCmd CFE_TIME_SetStateCmd_t

  Set clock state command.
- typedef struct CFE_TIME_SetSourceCmd CFE_TIME_SetSourceCmd_t

  Set time data source command.
- typedef struct CFE_TIME_SetSignalCmd CFE_TIME_SetSignalCmd_t

  Set tone signal source command.
- typedef struct CFE_TIME_AddDelayCmd CFE_TIME_AddDelayCmd_t
- typedef struct CFE_TIME_SubDelayCmd CFE_TIME_SubDelayCmd_t
- typedef struct CFE_TIME_SetMETCmd CFE_TIME_SetMETCmd_t
- typedef struct CFE_TIME_SetSTCFCmd CFE_TIME_SetSTCFCmd_t
- typedef struct CFE_TIME_AddAdjustCmd CFE_TIME_AddAdjustCmd_t
- typedef struct CFE_TIME_SubAdjustCmd CFE_TIME_SubAdjustCmd_t
- typedef struct CFE_TIME_SetTimeCmd CFE_TIME_SetTimeCmd_t
- typedef struct CFE_TIME_AddOneHzAdjustmentCmd CFE_TIME_AddOneHzAdjustmentCmd_t
- typedef struct CFE_TIME_SubOneHzAdjustmentCmd CFE_TIME_SubOneHzAdjustmentCmd_t
- typedef struct CFE_TIME_ToneDataCmd CFE_TIME_ToneDataCmd_t

  Time at tone data command.
- typedef struct CFE_TIME_HousekeepingTlm CFE_TIME_HousekeepingTlm_t
- typedef struct CFE_TIME_DiagnosticTlm CFE_TIME_DiagnosticTlm_t

12.164.1 Detailed Description

Purpose: cFE Executive Services (TIME) Command and Telemetry packet definition file.
References: Flight Software Branch C Coding Standard Version 1.0a cFE Flight Software Application Developers Guide
Notes:

12.164.2 Typedef Documentation

12.164.2.1 CFE_TIME_AddAdjustCmd_t `typedef struct CFE_TIME_AddAdjustCmd CFE_TIME_AddAdjustCmd_t`

12.164.2.2 CFE_TIME_AddDelayCmd_t `typedef struct CFE_TIME_AddDelayCmd CFE_TIME_AddDelayCmd_t`

12.164.2.3 CFE_TIME_AddOneHzAdjustmentCmd_t

`typedef struct CFE_TIME_AddOneHzAdjustmentCmd CFE_TIME_AddOneHzAdjustmentCmd_t`

12.164.2.4 CFE_TIME_DiagnosticTlm_t

`typedef struct CFE_TIME_DiagnosticTlm CFE_TIME_DiagnosticTlm_t`

12.164.2.5 CFE_TIME_FakeToneCmd_t

`typedef struct CFE_TIME_FakeToneCmd CFE_TIME_FakeToneCmd_t`

12.164.2.6 CFE_TIME_HousekeepingTlm_t

`typedef struct CFE_TIME_HousekeepingTlm CFE_TIME_HousekeepingTlm_t`

12.164.2.7 CFE_TIME_NoopCmd_t

`typedef struct CFE_TIME_NoopCmd CFE_TIME_NoopCmd_t`

12.164.2.8 CFE_TIME_OneHzCmd_t

`typedef struct CFE_TIME_OneHzCmd CFE_TIME_OneHzCmd_t`

12.164.2.9 CFE_TIME_ResetCountersCmd_t

`typedef struct CFE_TIME_ResetCountersCmd CFE_TIME_ResetCountersCmd_t`

12.164.2.10 CFE_TIME_SendDiagnosticCmd_t

`typedef struct CFE_TIME_SendDiagnosticCmd CFE_TIME_SendDiagnosticCmd_t`

12.164.2.11 CFE_TIME_SendHkCmd_t

`typedef struct CFE_TIME_SendHkCmd CFE_TIME_SendHkCmd_t`

12.164.2.12 CFE_TIME_SetLeapSecondsCmd_t

`typedef struct CFE_TIME_SetLeapSecondsCmd CFE_TIME_SetLeapSecondsCmd_`

Set leap seconds command.

12.164.2.13 CFE_TIME_SetMETCmd_t

`typedef struct CFE_TIME_SetMETCmd CFE_TIME_SetMETCmd_t`

12.164.2.14 CFE_TIME_SetSignalCmd_t

`typedef struct CFE_TIME_SetSignalCmd CFE_TIME_SetSignalCmd_t`

Set tone signal source command.

12.164.2.15 CFE_TIME_SetSourceCmd_t

`typedef struct CFE_TIME_SetSourceCmd CFE_TIME_SetSourceCmd_t`

Set time data source command.

12.164.2.16 CFE_TIME_SetStateCmd_t

`typedef struct CFE_TIME_SetStateCmd CFE_TIME_SetStateCmd_t`

Set clock state command.

12.164.2.17 CFE_TIME_SetSTCFCmd_t

`typedef struct CFE_TIME_SetSTCFCmd CFE_TIME_SetSTCFCmd_t`

12.164.2.18 CFE_TIME_SetTimeCmd_t

`typedef struct CFE_TIME_SetTimeCmd CFE_TIME_SetTimeCmd_t`

12.164.2.19 CFE_TIME_SubAdjustCmd_t

`typedef struct CFE_TIME_SubAdjustCmd CFE_TIME_SubAdjustCmd_t`

12.164.2.20 CFE_TIME_SubDelayCmd_t

`typedef struct CFE_TIME_SubDelayCmd CFE_TIME_SubDelayCmd_t`

12.164.2.21 CFE_TIME_SubOneHzAdjustmentCmd_t

`typedef struct CFE_TIME_SubOneHzAdjustmentCmd CFE_TIME_SubOneHzAdjustmentCmd_t`

12.164.2.22 CFE_TIME_ToneDataCmd_t

`typedef struct CFE_TIME_ToneDataCmd CFE_TIME_ToneDataCmd_t`

Time at tone data command.

12.164.2.23 CFE_TIME_ToneSignalCmd_t

`typedef struct CFE_TIME_ToneSignalCmd CFE_TIME_ToneSignalCmd_t`

12.165 cfe/modules/time/config/default_cfe_time_platform_cfg.h File Reference

```
#include "cfe_time_mission_cfg.h"
#include "cfe_time_internal_cfg.h"
```

12.165.1 Detailed Description

CFE Time Services (CFE_TIME) Application Platform Configuration Header File
This is a compatibility header for the "platform_cfg.h" file that has traditionally provided both public and private config definitions for each CFS app.
These definitions are now provided in two separate files, one for the public/mission scope and one for internal scope.

Note

> This file may be overridden/superceded by mission-provided definitions either by overriding this header or by generating definitions from a command/data dictionary tool.

12.166 cfe/modules/time/config/default_cfe_time_topicids.h File Reference

Macros

- #define CFE_MISSION_TIME_CMD_TOPICID 5
- #define CFE_MISSION_TIME_SEND_HK_TOPICID 13
- #define CFE_MISSION_TIME_TONE_CMD_TOPICID 16
- #define CFE_MISSION_TIME_ONEHZ_CMD_TOPICID 17
- #define CFE_MISSION_TIME_DATA_CMD_TOPICID 0
- #define CFE_MISSION_TIME_SEND_CMD_TOPICID 2
- #define CFE_MISSION_TIME_HK_TLM_TOPICID 5
- #define CFE_MISSION_TIME_DIAG_TLM_TOPICID 6

12.166.1 Detailed Description

CFE Time Services (CFE_TIME) Application Topic IDs

12.166.2 Macro Definition Documentation

12.166.2.1 CFE_MISSION_TIME_CMD_TOPICID `#define CFE_MISSION_TIME_CMD_TOPICID 5`

Purpose cFE Portable Message Numbers for Commands

Description:

Portable message numbers for the cFE command messages

Limits

Not Applicable

Definition at line 35 of file default_cfe_time_topicids.h.

12.166.2.2 CFE_MISSION_TIME_DATA_CMD_TOPICID `#define CFE_MISSION_TIME_DATA_CMD_TOPICID 0`

Purpose cFE Portable Message Numbers for Global Messages

Description:

Portable message numbers for the cFE global messages

Limits

Not Applicable

Definition at line 49 of file default_cfe_time_topicids.h.

12.166.2.3 CFE_MISSION_TIME_DIAG_TLM_TOPICID `#define CFE_MISSION_TIME_DIAG_TLM_TOPICID 6`

Definition at line 62 of file default_cfe_time_topicids.h.

12.166.2.4 CFE_MISSION_TIME_HK_TLM_TOPICID `#define CFE_MISSION_TIME_HK_TLM_TOPICID 5`

Purpose cFE Portable Message Numbers for Telemetry

Description:

Portable message numbers for the cFE telemetry messages

Limits

Not Applicable

Definition at line 61 of file default_cfe_time_topicids.h.

12.166.2.5 CFE_MISSION_TIME_ONEHZ_CMD_TOPICID `#define CFE_MISSION_TIME_ONEHZ_CMD_TOPICID 17`

Definition at line 38 of file default_cfe_time_topicids.h.

12.166.2.6 CFE_MISSION_TIME_SEND_CMD_TOPICID `#define CFE_MISSION_TIME_SEND_CMD_TOPICID 2`

Definition at line 50 of file default_cfe_time_topicids.h.

12.166.2.7 CFE_MISSION_TIME_SEND_HK_TOPICID `#define CFE_MISSION_TIME_SEND_HK_TOPICID 13`

Definition at line 36 of file default_cfe_time_topicids.h.

12.166.2.8 CFE_MISSION_TIME_TONE_CMD_TOPICID `#define CFE_MISSION_TIME_TONE_CMD_TOPICID 16`

Definition at line 37 of file default_cfe_time_topicids.h.

12.167 cfe/modules/time/fsw/inc/cfe_time_eventids.h File Reference

Macros

TIME event IDs

- #define CFE_TIME_INIT_EID 1

  TIME Initialization Event ID.
- #define CFE_TIME_NOOP_EID 4

  TIME No-op Command Success Event ID.
- #define CFE_TIME_RESET_EID 5

  TIME Reset Counters Command Success Event ID.
- #define CFE_TIME_DIAG_EID 6

  TIME Request Diagnostics Command Success Event ID.
- #define CFE_TIME_STATE_EID 7

  TIME Set Time State Command Success Event ID.
- #define CFE_TIME_SOURCE_EID 8

  TIME Set Time Source Command Success Event ID.
- #define CFE_TIME_SIGNAL_EID 9

  TIME Set Tone Source Command Success Event ID.
- #define CFE_TIME_DELAY_EID 11

  TIME Add or Subtract Delay Command Success Event ID.
- #define CFE_TIME_TIME_EID 12

  TIME Set Time Command Success Event ID.
- #define CFE_TIME_MET_EID 13

  TIME Set Mission Elapsed Time Command Success Event ID.
- #define CFE_TIME_STCF_EID 14

  TIME Set Spacecraft Time Correlation Factor Command Success Event ID.
- #define CFE_TIME_DELTA_EID 15

  TIME Add or Subtract Single STCF Adjustment Command Success Event ID.
- #define CFE_TIME_ONEHZ_EID 16

  TIME Add or Subtract STCF Adjustment Each Second Command Success Event ID.
- #define CFE_TIME_LEAPS_EID 17

  TIME Set Leap Seconds Command Success Event ID.
- #define CFE_TIME_FLY_ON_EID 20

  TIME Entered FLYWHEEL Mode Event ID.
- #define CFE_TIME_FLY_OFF_EID 21

  TIME Exited FLYWHEEL Mode Event ID.
- #define CFE_TIME_ID_ERR_EID 26

  TIME Invalid Message ID Received Event ID.
- #define CFE_TIME_CC_ERR_EID 27

  TIME Invalid Command Code Received Event ID.
- #define CFE_TIME_STATE_ERR_EID 30

  TIME Set Clock State Command Invalid State Event ID.

- #define CFE_TIME_SOURCE_ERR_EID 31
  TIME Set Clock Source Command Invalid Source Event ID.
- #define CFE_TIME_SIGNAL_ERR_EID 32
  TIME Set Clock Tone Source Command Invalid Source Event ID.
- #define CFE_TIME_DELAY_ERR_EID 33
  TIME Add or Subtract Tone Delay Command Invalid Time Value Event ID.
- #define CFE_TIME_TIME_ERR_EID 34
  TIME Set Spacecraft Time Command Invalid Time Value Event ID.
- #define CFE_TIME_MET_ERR_EID 35
  TIME Set Mission Elapsed Time Command Invalid Time Value Event ID.
- #define CFE_TIME_STCF_ERR_EID 36
  TIME Set Spacecraft Time Correlation Factor Command Invalid Time Value Event ID.
- #define CFE_TIME_DELTA_ERR_EID 37
  TIME Add or Subtract Single STCF Adjustment Command Invalid Time Value Event ID.
- #define CFE_TIME_SOURCE_CFG_EID 40
  TIME Set Clock Source Command Incompatible Mode Event ID.
- #define CFE_TIME_SIGNAL_CFG_EID 41
  TIME Set Clock Signal Command Incompatible Mode Event ID.
- #define CFE_TIME_DELAY_CFG_EID 42
  TIME Add or Subtract Tone Delay Command Incompatible Mode Event ID.
- #define CFE_TIME_TIME_CFG_EID 43
  TIME Set Spacecraft Time Command Incompatible Mode Event ID.
- #define CFE_TIME_MET_CFG_EID 44
  TIME Set Mission Elapsed Time Command Incompatible Mode Event ID.
- #define CFE_TIME_STCF_CFG_EID 45
  TIME Set Spacecraft Time Correlation Factor Command Incompatible Mode Event ID.
- #define CFE_TIME_LEAPS_CFG_EID 46
  TIME Set Leap Seconds Command Incompatible Mode Event ID.
- #define CFE_TIME_DELTA_CFG_EID 47
  TIME Add or Subtract Single STCF Adjustment Command Incompatible Mode Event ID.
- #define CFE_TIME_ONEHZ_CFG_EID 48
  TIME Add or Subtract STCF Adjustment Each Second Command Incompatible Mode Event ID.
- #define CFE_TIME_LEN_ERR_EID 49
  TIME Invalid Command Length Event ID.

12.167.1 Detailed Description

cFE Time Services Event IDs

12.167.2 Macro Definition Documentation

12.167.2.1 CFE_TIME_CC_ERR_EID `#define CFE_TIME_CC_ERR_EID 27`

TIME Invalid Command Code Received Event ID.

Type: ERROR

Cause:

Invalid command code for message ID CFE_TIME_CMD_MID received on the TIME message pipe.
Definition at line 232 of file cfe_time_eventids.h.

12.167.2.2 CFE_TIME_DELAY_CFG_EID `#define CFE_TIME_DELAY_CFG_EID 42`

TIME Add or Subtract Tone Delay Command Incompatible Mode Event ID.

Type: ERROR

Cause:

TIME Add Tone Delay Command OR TIME Subtract Tone Delay Command failure due to being in an incompatible mode.
Definition at line 364 of file cfe_time_eventids.h.

12.167.2.3 CFE_TIME_DELAY_EID `#define CFE_TIME_DELAY_EID 11`

TIME Add or Subtract Delay Command Success Event ID.

Type: INFORMATION

Cause:

TIME Add Time Delay Command OR a Subtract Time Delay Command success.
Definition at line 120 of file cfe_time_eventids.h.

12.167.2.4 CFE_TIME_DELAY_ERR_EID `#define CFE_TIME_DELAY_ERR_EID 33`

TIME Add or Subtract Tone Delay Command Invalid Time Value Event ID.

Type: ERROR

Cause:

TIME Add Tone Delay Command OR TIME Subtract Tone Delay Command failure due to an invalid time value.
Definition at line 278 of file cfe_time_eventids.h.

12.167.2.5 CFE_TIME_DELTA_CFG_EID `#define CFE_TIME_DELTA_CFG_EID 47`

TIME Add or Subtract Single STCF Adjustment Command Incompatible Mode Event ID.

Type: ERROR

Cause:

TIME Add Single STCF Adjustment Command OR TIME Subtract Single STCF Adjustment Command failure due to being in an incompatible mode.
Definition at line 425 of file cfe_time_eventids.h.

12.167.2.6 CFE_TIME_DELTA_EID `#define CFE_TIME_DELTA_EID 15`

TIME Add or Subtract Single STCF Adjustment Command Success Event ID.

Type: INFORMATION

Cause:

TIME Add Single STCF Adjustment Command OR TIME Subtract Single STCF Adjustment Command success.
Definition at line 165 of file cfe_time_eventids.h.

12.167.2.7 CFE_TIME_DELTA_ERR_EID `#define CFE_TIME_DELTA_ERR_EID 37`

TIME Add or Subtract Single STCF Adjustment Command Invalid Time Value Event ID.

Type: ERROR

Cause:

TIME Add Single STCF Adjustment Command OR TIME Subtract Single STCF Adjustment Command failure due to an invalid time value.
Definition at line 327 of file cfe_time_eventids.h.

12.167.2.8 CFE_TIME_DIAG_EID `#define CFE_TIME_DIAG_EID 6`

TIME Request Diagnostics Command Success Event ID.

Type: DEBUG

Cause:

TIME Request Diagnostics Command success.
Definition at line 75 of file cfe_time_eventids.h.

12.167.2.9 CFE_TIME_FLY_OFF_EID `#define CFE_TIME_FLY_OFF_EID 21`

TIME Exited FLYWHEEL Mode Event ID.

Type: INFORMATION

Cause:

TIME Exited FLYWHEEL Mode.
Definition at line 210 of file cfe_time_eventids.h.

12.167.2.10 CFE_TIME_FLY_ON_EID `#define CFE_TIME_FLY_ON_EID 20`

TIME Entered FLYWHEEL Mode Event ID.

Type: INFORMATION

Cause:

TIME Entered FLYWHEEL Mode.
Definition at line 199 of file cfe_time_eventids.h.

12.167.2.11 CFE_TIME_ID_ERR_EID `#define CFE_TIME_ID_ERR_EID 26`

TIME Invalid Message ID Received Event ID.

Type: ERROR

Cause:

Invalid message ID received on the TIME message pipe.
Definition at line 221 of file cfe_time_eventids.h.

12.167.2.12 CFE_TIME_INIT_EID `#define CFE_TIME_INIT_EID 1`

TIME Initialization Event ID.

Type: INFORMATION

Cause:

Time Services Task Initialization complete.
Definition at line 42 of file cfe_time_eventids.h.

12.167.2.13 CFE_TIME_LEAPS_CFG_EID `#define CFE_TIME_LEAPS_CFG_EID 46`

TIME Set Leap Seconds Command Incompatible Mode Event ID.

Type: ERROR

Cause:

TIME Set Leap Seconds Command failure due to being in an incompatible mode.
Definition at line 412 of file cfe_time_eventids.h.

12.167.2.14 CFE_TIME_LEAPS_EID `#define CFE_TIME_LEAPS_EID 17`

TIME Set Leap Seconds Command Success Event ID.

Type: INFORMATION

Cause:

TIME Set Leap Seconds Command success.
Definition at line 188 of file cfe_time_eventids.h.

12.167.2.15 CFE_TIME_LEN_ERR_EID `#define CFE_TIME_LEN_ERR_EID 49`

TIME Invalid Command Length Event ID.

Type: ERROR

Cause:

Invalid length for the command code in message ID CFE_TIME_CMD_MID received on the TIME message pipe.
Definition at line 450 of file cfe_time_eventids.h.

12.167.2.16 CFE_TIME_MET_CFG_EID `#define CFE_TIME_MET_CFG_EID 44`

TIME Set Mission Elapsed Time Command Incompatible Mode Event ID.

Type: ERROR

Cause:

TIME Set Mission Elapsed Time Command failure due to being in an incompatible mode.
Definition at line 388 of file cfe_time_eventids.h.

12.167.2.17 CFE_TIME_MET_EID `#define CFE_TIME_MET_EID 13`

TIME Set Mission Elapsed Time Command Success Event ID.

Type: INFORMATION

Cause:

TIME Set Mission Elapsed Time Command success.
Definition at line 142 of file cfe_time_eventids.h.

12.167.2.18 CFE_TIME_MET_ERR_EID `#define CFE_TIME_MET_ERR_EID 35`

TIME Set Mission Elapsed Time Command Invalid Time Value Event ID.

Type: ERROR

Cause:

TIME Set Mission Elapsed Time Command failure due to an invalid time value.
Definition at line 302 of file cfe_time_eventids.h.

12.167.2.19 CFE_TIME_NOOP_EID `#define CFE_TIME_NOOP_EID 4`

TIME No-op Command Success Event ID.

Type: INFORMATION

Cause:

TIME NO-OP Command success.
Definition at line 53 of file cfe_time_eventids.h.

12.167.2.20 CFE_TIME_ONEHZ_CFG_EID `#define CFE_TIME_ONEHZ_CFG_EID 48`

TIME Add or Subtract STCF Adjustment Each Second Command Incompatible Mode Event ID.

Type: ERROR

Cause:

TIME Add STCF Adjustment Each Second Command OR TIME Subtract STCF Adjustment Each Second Command failure due to being in an incompatible mode.
Definition at line 438 of file cfe_time_eventids.h.

12.167.2.21 CFE_TIME_ONEHZ_EID `#define CFE_TIME_ONEHZ_EID 16`

TIME Add or Subtract STCF Adjustment Each Second Command Success Event ID.

Type: INFORMATION

Cause:

TIME Add STCF Adjustment Each Second Command OR TIME Subtract STCF Adjustment Each Second Command success.
Definition at line 177 of file cfe_time_eventids.h.

12.167.2.22 CFE_TIME_RESET_EID `#define CFE_TIME_RESET_EID 5`

TIME Reset Counters Command Success Event ID.

Type: DEBUG

Cause:

TIME Reset Counters Command success.

Definition at line 64 of file cfe_time_eventids.h.

12.167.2.23 CFE_TIME_SIGNAL_CFG_EID `#define CFE_TIME_SIGNAL_CFG_EID 41`

TIME Set Clock Signal Command Incompatible Mode Event ID.

Type: ERROR

Cause:

TIME Set Clock Signal Command failure due to being in an incompatible mode.

Definition at line 351 of file cfe_time_eventids.h.

12.167.2.24 CFE_TIME_SIGNAL_EID `#define CFE_TIME_SIGNAL_EID 9`

TIME Set Tone Source Command Success Event ID.

Type: INFORMATION

Cause:

TIME Set Clock Tone Source Command success.

Definition at line 108 of file cfe_time_eventids.h.

12.167.2.25 CFE_TIME_SIGNAL_ERR_EID `#define CFE_TIME_SIGNAL_ERR_EID 32`

TIME Set Clock Tone Source Command Invalid Source Event ID.

Type: ERROR

Cause:

Set Clock Tone Source Command failed due to invalid source requested.

Definition at line 265 of file cfe_time_eventids.h.

12.167.2.26 CFE_TIME_SOURCE_CFG_EID `#define CFE_TIME_SOURCE_CFG_EID 40`

TIME Set Clock Source Command Incompatible Mode Event ID.

Type: ERROR

Cause:

TIME Set Clock Source Command failure due to being in an incompatible mode.

Definition at line 339 of file cfe_time_eventids.h.

12.167.2.27 CFE_TIME_SOURCE_EID `#define CFE_TIME_SOURCE_EID 8`

TIME Set Time Source Command Success Event ID.

Type: INFORMATION

Cause:

TIME Set Time Source Command success.

Definition at line 97 of file cfe_time_eventids.h.

12.167.2.28 CFE_TIME_SOURCE_ERR_EID `#define CFE_TIME_SOURCE_ERR_EID 31`

TIME Set Clock Source Command Invalid Source Event ID.

Type: ERROR

Cause:

TIME Set Clock Source Command failed due to invalid source requested.

Definition at line 254 of file cfe_time_eventids.h.

12.167.2.29 CFE_TIME_STATE_EID `#define CFE_TIME_STATE_EID 7`

TIME Set Time State Command Success Event ID.

Type: INFORMATION

Cause:

TIME Set Time State Command success.

Definition at line 86 of file cfe_time_eventids.h.

12.167.2.30 CFE_TIME_STATE_ERR_EID `#define CFE_TIME_STATE_ERR_EID 30`

TIME Set Clock State Command Invalid State Event ID.

Type: ERROR

Cause:

TIME Set Clock State Command failed due to invalid state requested.

Definition at line 243 of file cfe_time_eventids.h.

12.167.2.31 CFE_TIME_STCF_CFG_EID `#define CFE_TIME_STCF_CFG_EID 45`

TIME Set Spacecraft Time Correlation Factor Command Incompatible Mode Event ID.

Type: ERROR

Cause:

TIME Set Spacecraft Time Correlation Factor Command failure due to being in an incompatible mode.

Definition at line 400 of file cfe_time_eventids.h.

12.167.2.32 CFE_TIME_STCF_EID `#define CFE_TIME_STCF_EID 14`

TIME Set Spacecraft Time Correlation Factor Command Success Event ID.

Type: INFORMATION

Cause:

TIME Set Spacecraft Time Correlation Factor Command success.

Definition at line 153 of file cfe_time_eventids.h.

12.167.2.33 CFE_TIME_STCF_ERR_EID `#define CFE_TIME_STCF_ERR_EID 36`

TIME Set Spacecraft Time Correlation Factor Command Invalid Time Value Event ID.

Type: ERROR

Cause:

TIME Set Spacecraft Time Correlation Factor Command failure due to an invalid time value.

Definition at line 314 of file cfe_time_eventids.h.

12.167.2.34 CFE_TIME_TIME_CFG_EID `#define CFE_TIME_TIME_CFG_EID 43`

TIME Set Spacecraft Time Command Incompatible Mode Event ID.

Type: ERROR

Cause:

TIME Set Spacecraft Time Command failure due to being in an incompatible mode.
Definition at line 376 of file cfe_time_eventids.h.

12.167.2.35 CFE_TIME_TIME_EID `#define CFE_TIME_TIME_EID 12`

TIME Set Time Command Success Event ID.

Type: INFORMATION

Cause:

TIME Set Time Command success.
Definition at line 131 of file cfe_time_eventids.h.

12.167.2.36 CFE_TIME_TIME_ERR_EID `#define CFE_TIME_TIME_ERR_EID 34`

TIME Set Spacecraft Time Command Invalid Time Value Event ID.

Type: ERROR

Cause:

TIME Set Spacecraft Time Command failure due to an invalid time value.
Definition at line 290 of file cfe_time_eventids.h.

12.168 osal/docs/src/osal_frontpage.dox File Reference

12.169 osal/docs/src/osal_fs.dox File Reference

12.170 osal/docs/src/osal_timer.dox File Reference

12.171 osal/src/os/inc/common_types.h File Reference

```
#include <stdint.h>
#include <stddef.h>
#include <stdbool.h>
```

Macros

- #define CompileTimeAssert(Condition, Message) typedef char Message[(Condition) ? 1 : -1]
- #define _EXTENSION_
- #define OS_USED
- #define OS_PRINTF(n, m)
- #define OSAL_SIZE_C(X) ((size_t)(X))
- #define OSAL_BLOCKCOUNT_C(X) ((osal_blockcount_t)(X))
- #define OSAL_INDEX_C(X) ((osal_index_t)(X))
- #define OSAL_OBJTYPE_C(X) ((osal_objtype_t)(X))
- #define OSAL_STATUS_C(X) ((osal_status_t)(X))

Typedefs

- typedef int8_t int8
- typedef int16_t int16
- typedef int32_t int32
- typedef int64_t int64
- typedef uint8_t uint8
- typedef uint16_t uint16
- typedef uint32_t uint32
- typedef uint64_t uint64
- typedef intptr_t intptr
- typedef uintptr_t cpuaddr
- typedef size_t cpusize
- typedef ptrdiff_t cpudiff
- typedef uint32 osal_id_t
- typedef size_t osal_blockcount_t
- typedef uint32 osal_index_t
- typedef uint32 osal_objtype_t
- typedef int32 osal_status_t
- typedef void(∗ OS_ArgCallback_t) (osal_id_t object_id, void ∗arg)

  General purpose OSAL callback function.

Functions

- CompileTimeAssert (sizeof(uint8)==1, TypeUint8WrongSize)
- CompileTimeAssert (sizeof(uint16)==2, TypeUint16WrongSize)
- CompileTimeAssert (sizeof(uint32)==4, TypeUint32WrongSize)
- CompileTimeAssert (sizeof(uint64)==8, TypeUint64WrongSize)
- CompileTimeAssert (sizeof(int8)==1, Typeint8WrongSize)
- CompileTimeAssert (sizeof(int16)==2, Typeint16WrongSize)
- CompileTimeAssert (sizeof(int32)==4, Typeint32WrongSize)
- CompileTimeAssert (sizeof(int64)==8, Typeint64WrongSize)
- CompileTimeAssert (sizeof(cpuaddr) >=sizeof(void ∗), TypePtrWrongSize)

12.171.1 Detailed Description

Purpose: Unit specification for common types.
Design Notes: Assumes make file has defined processor family

12.171.2 Macro Definition Documentation

12.171.2.1 _EXTENSION_ `#define _EXTENSION_`

Definition at line 65 of file common_types.h.

12.171.2.2 CompileTimeAssert

```
#define CompileTimeAssert(
    Condition,
    Message ) typedef char Message[(Condition) ? 1 : -1]
```

Definition at line 48 of file common_types.h.

12.171.2.3 OS_PRINTF

```
#define OS_PRINTF(
    n,
    m )
```

Definition at line 67 of file common_types.h.

12.171.2.4 OS_USED `#define OS_USED`

Definition at line 66 of file common_types.h.

12.171.2.5 OSAL_BLOCKCOUNT_C

```
#define OSAL_BLOCKCOUNT_C(
    X ) ((osal_blockcount_t)(X))
```

Definition at line 172 of file common_types.h.

12.171.2.6 OSAL_INDEX_C

```
#define OSAL_INDEX_C(
    X ) ((osal_index_t)(X))
```

Definition at line 173 of file common_types.h.

12.171.2.7 OSAL_OBJTYPE_C

```
#define OSAL_OBJTYPE_C(
    X ) ((osal_objtype_t)(X))
```

Definition at line 174 of file common_types.h.

12.171.2.8 OSAL_SIZE_C

```
#define OSAL_SIZE_C(
    X ) ((size_t)(X))
```

Definition at line 171 of file common_types.h.

12.171.2.9 OSAL_STATUS_C

```
#define OSAL_STATUS_C(
    X ) ((osal_status_t)(X))
```

Definition at line 175 of file common_types.h.

12.171.3 Typedef Documentation

12.171.3.1 cpuaddr `typedef uintptr_t cpuaddr`

Definition at line 88 of file common_types.h.

12.171.3.2 cpudiff `typedef ptrdiff_t cpudiff`

Definition at line 90 of file common_types.h.

12.171.3.3 cpusize `typedef size_t cpusize`

Definition at line 89 of file common_types.h.

12.171.3.4 int16 `typedef int16_t int16`

Definition at line 80 of file common_types.h.

12.171.3.5 int32 `typedef int32_t int32`

Definition at line 81 of file common_types.h.

12.171.3.6 int64 `typedef int64_t int64`

Definition at line 82 of file common_types.h.

12.171.3.7 int8 `typedef int8_t int8`

Definition at line 79 of file common_types.h.

12.171.3.8 intptr `typedef intptr_t intptr`

Definition at line 87 of file common_types.h.

12.171.3.9 OS_ArgCallback_t `typedef void(* OS_ArgCallback_t) (osal_id_t object_id, void *arg)`

General purpose OSAL callback function.
This may be used by multiple APIS
Definition at line 143 of file common_types.h.

12.171.3.10 osal_blockcount_t `typedef size_t osal_blockcount_t`

A type used to represent a number of blocks or buffers
This is used with file system and queue implementations.
Definition at line 116 of file common_types.h.

12.171.3.11 osal_id_t `typedef uint32 osal_id_t`

A type to be used for OSAL resource identifiers. This typedef is backward compatible with the IDs from older versions of OSAL
Definition at line 108 of file common_types.h.

12.171.3.12 osal_index_t `typedef uint32 osal_index_t`

A type used to represent an index into a table structure

This is used when referring directly to a table index as opposed to an object ID. It is primarily intended for internal use, but is also output from public APIs such as OS_ObjectIdToArrayIndex().

Definition at line 126 of file common_types.h.

12.171.3.13 osal_objtype_t `typedef uint32 osal_objtype_t`

A type used to represent the runtime type or category of an OSAL object

Definition at line 131 of file common_types.h.

12.171.3.14 osal_status_t `typedef int32 osal_status_t`

The preferred type to represent OSAL status codes defined in osapi-error.h

Definition at line 136 of file common_types.h.

12.171.3.15 uint16 `typedef uint16_t uint16`

Definition at line 84 of file common_types.h.

12.171.3.16 uint32 `typedef uint32_t uint32`

Definition at line 85 of file common_types.h.

12.171.3.17 uint64 `typedef uint64_t uint64`

Definition at line 86 of file common_types.h.

12.171.3.18 uint8 `typedef uint8_t uint8`

Definition at line 83 of file common_types.h.

12.171.4 Function Documentation

12.171.4.1 CompileTimeAssert() [1/9]

```
CompileTimeAssert (
    sizeof(cpuaddr) >=sizeof(void *) ,
    TypePtrWrongSize  )
```

12.171.4.2 CompileTimeAssert() [2/9]

```
CompileTimeAssert (
    sizeof(int16)  = =2,
    Typeint16WrongSize  )
```

12.171.4.3 CompileTimeAssert() [3/9]

```
CompileTimeAssert (
    sizeof(int32)  = =4,
    Typeint32WrongSize  )
```

12.171.4.4 CompileTimeAssert() [4/9]

```
CompileTimeAssert (
    sizeof(int64)  = =8,
    Typeint64WrongSize  )
```

12.171.4.5 CompileTimeAssert() [5/9]

```
CompileTimeAssert (
    sizeof(int8)  = =1,
    Typeint8WrongSize  )
```

12.171.4.6 CompileTimeAssert() [6/9]

```
CompileTimeAssert (
    sizeof(uint16)  = =2,
    TypeUint16WrongSize  )
```

12.171.4.7 CompileTimeAssert() [7/9]

```
CompileTimeAssert (
    sizeof(uint32)  = =4,
    TypeUint32WrongSize  )
```

12.171.4.8 CompileTimeAssert() [8/9]

```
CompileTimeAssert (
    sizeof(uint64)  = =8,
    TypeUint64WrongSize  )
```

12.171.4.9 CompileTimeAssert() [9/9]

```
CompileTimeAssert (
    sizeof(uint8)  = =1,
    TypeUint8WrongSize  )
```

12.172 osal/src/os/inc/osapi-binsem.h File Reference

```
#include "osconfig.h"
#include "common_types.h"
```

Data Structures

- struct OS_bin_sem_prop_t

  OSAL binary semaphore properties.

Macros

- #define OS_SEM_FULL 1

  Semaphore full state.
- #define OS_SEM_EMPTY 0

  Semaphore empty state.

Functions

- int32 OS_BinSemCreate (osal_id_t *sem_id, const char *sem_name, uint32 sem_initial_value, uint32 options)

  Creates a binary semaphore.
- int32 OS_BinSemFlush (osal_id_t sem_id)

Unblock all tasks pending on the specified semaphore.

- int32 OS_BinSemGive (osal_id_t sem_id)

  Increment the semaphore value.

- int32 OS_BinSemTake (osal_id_t sem_id)

  Decrement the semaphore value.

- int32 OS_BinSemTimedWait (osal_id_t sem_id, uint32 msecs)

  Decrement the semaphore value with a timeout.

- int32 OS_BinSemDelete (osal_id_t sem_id)

  Deletes the specified Binary Semaphore.

- int32 OS_BinSemGetIdByName (osal_id_t *sem_id, const char *sem_name)

  Find an existing semaphore ID by name.

- int32 OS_BinSemGetInfo (osal_id_t sem_id, OS_bin_sem_prop_t *bin_prop)

  Fill a property object buffer with details regarding the resource.

12.172.1 Detailed Description

Declarations and prototypes for binary semaphores

12.173 osal/src/os/inc/osapi-bsp.h File Reference

```
#include "osconfig.h"
#include "common_types.h"
```

Functions

- void OS_BSP_SetResourceTypeConfig (uint32 ResourceType, uint32 ConfigOptionValue)
- uint32 OS_BSP_GetResourceTypeConfig (uint32 ResourceType)
- uint32 OS_BSP_GetArgC (void)
- char *const * OS_BSP_GetArgV (void)
- void OS_BSP_SetExitCode (int32 code)

12.173.1 Detailed Description

Declarations and prototypes for OSAL BSP

12.174 osal/src/os/inc/osapi-clock.h File Reference

```
#include "osconfig.h"
#include "common_types.h"
```

Data Structures

- struct OS_time_t

  OSAL time interval structure.

Macros

- #define OS_TIME_MAX ((OS_time_t) {INT64_MAX})

  The maximum value for OS_time_t.
- #define OS_TIME_ZERO ((OS_time_t) {0})

  The zero value for OS_time_t.
- #define OS_TIME_MIN ((OS_time_t) {INT64_MIN})

  The minimum value for OS_time_t.

Enumerations

- enum { OS_TIME_TICK_RESOLUTION_NS = 100, OS_TIME_TICKS_PER_SECOND = 1000000000 / OS_TI↩ ME_TICK_RESOLUTION_NS, OS_TIME_TICKS_PER_MSEC = 1000000 / OS_TIME_TICK_RESOLUTION_↩ NS, OS_TIME_TICKS_PER_USEC = 1000 / OS_TIME_TICK_RESOLUTION_NS }

  Multipliers/divisors to convert ticks into standardized units.

Functions

- int32 OS_GetLocalTime (OS_time_t *time_struct)

  Get the local time.
- int32 OS_SetLocalTime (const OS_time_t *time_struct)

  Set the local time.
- OS_time_t OS_TimeFromRelativeMilliseconds (int32 relative_msec)

  Gets an absolute time value relative to the current time.
- int32 OS_TimeToRelativeMilliseconds (OS_time_t time)

  Gets a relative time value from an absolute time.
- static int64 OS_TimeGetTotalSeconds (OS_time_t tm)

  Get interval from an OS_time_t object normalized to whole number of seconds.
- static OS_time_t OS_TimeFromTotalSeconds (int64 tm)

  Get an OS_time_t interval object from an integer number of seconds.
- static int64 OS_TimeGetTotalMilliseconds (OS_time_t tm)

  Get interval from an OS_time_t object normalized to millisecond units.
- static OS_time_t OS_TimeFromTotalMilliseconds (int64 tm)

  Get an OS_time_t interval object from a integer number of milliseconds.
- static int64 OS_TimeGetTotalMicroseconds (OS_time_t tm)

  Get interval from an OS_time_t object normalized to microsecond units.
- static OS_time_t OS_TimeFromTotalMicroseconds (int64 tm)

  Get an OS_time_t interval object from a integer number of microseconds.
- static int64 OS_TimeGetTotalNanoseconds (OS_time_t tm)

  Get interval from an OS_time_t object normalized to nanosecond units.
- static OS_time_t OS_TimeFromTotalNanoseconds (int64 tm)

  Get an OS_time_t interval object from a integer number of nanoseconds.
- static int64 OS_TimeGetFractionalPart (OS_time_t tm)

  Get subseconds portion (fractional part only) from an OS_time_t object.
- static uint32 OS_TimeGetSubsecondsPart (OS_time_t tm)

  Get 32-bit normalized subseconds (fractional part only) from an OS_time_t object.
- static uint32 OS_TimeGetMillisecondsPart (OS_time_t tm)

  Get milliseconds portion (fractional part only) from an OS_time_t object.
- static uint32 OS_TimeGetMicrosecondsPart (OS_time_t tm)

Get microseconds portion (fractional part only) from an OS_time_t object.

- static uint32 OS_TimeGetNanosecondsPart (OS_time_t tm)

  Get nanoseconds portion (fractional part only) from an OS_time_t object.
- static OS_time_t OS_TimeAssembleFromNanoseconds (int64 seconds, uint32 nanoseconds)

  Assemble/Convert a number of seconds + nanoseconds into an OS_time_t interval.
- static OS_time_t OS_TimeAssembleFromMicroseconds (int64 seconds, uint32 microseconds)

  Assemble/Convert a number of seconds + microseconds into an OS_time_t interval.
- static OS_time_t OS_TimeAssembleFromMilliseconds (int64 seconds, uint32 milliseconds)

  Assemble/Convert a number of seconds + milliseconds into an OS_time_t interval.
- static OS_time_t OS_TimeAssembleFromSubseconds (int64 seconds, uint32 subseconds)

  Assemble/Convert a number of seconds + subseconds into an OS_time_t interval.
- static OS_time_t OS_TimeAdd (OS_time_t time1, OS_time_t time2)

  Computes the sum of two time intervals.
- static OS_time_t OS_TimeSubtract (OS_time_t time1, OS_time_t time2)

  Computes the difference between two time intervals.
- static bool OS_TimeEqual (OS_time_t time1, OS_time_t time2)

  Checks if two time values are equal.
- static int8_t OS_TimeGetSign (OS_time_t time)

  Checks the sign of the time value.
- static int8_t OS_TimeCompare (OS_time_t time1, OS_time_t time2)

  Compares two time values.

12.174.1 Detailed Description

Declarations and prototypes for osapi-clock module

12.174.2 Macro Definition Documentation

12.174.2.1 OS_TIME_MAX `#define OS_TIME_MAX ((OS_time_t) {INT64_MAX})`

The maximum value for OS_time_t.
This is the largest positive (future) time that is representable in an OS_time_t value.
Definition at line 56 of file osapi-clock.h.

12.174.2.2 OS_TIME_MIN `#define OS_TIME_MIN ((OS_time_t) {INT64_MIN})`

The minimum value for OS_time_t.
This is the largest negative (past) time that is representable in an OS_time_t value.
Definition at line 71 of file osapi-clock.h.

12.174.2.3 OS_TIME_ZERO `#define OS_TIME_ZERO ((OS_time_t) {0})`

The zero value for OS_time_t.
This is a reasonable initializer/placeholder value for an OS_time_t
Definition at line 63 of file osapi-clock.h.

12.174.3 Enumeration Type Documentation

12.174.3.1 anonymous enum `anonymous enum`

Multipliers/divisors to convert ticks into standardized units.
Various fixed conversion factor constants used by the conversion routines
A 100ns tick time allows max intervals of about +/- 14000 years in a 64-bit signed integer value.

Note

Applications should not directly use these values, but rather use conversion routines below to obtain standardized units (seconds/microseconds/etc).

Enumerator

OS_TIME_TICK_RESOLUTION_NS	
OS_TIME_TICKS_PER_SECOND	
OS_TIME_TICKS_PER_MSEC	
OS_TIME_TICKS_PER_USEC	

Definition at line 84 of file osapi-clock.h.

12.175 osal/src/os/inc/osapi-common.h File Reference

```
#include "osconfig.h"
#include "common_types.h"
```

Typedefs

- typedef int32(∗ OS_EventHandler_t) (OS_Event_t event, osal_id_t object_id, void ∗data)

  A callback routine for event handling.

Enumerations

- enum OS_Event_t {
  OS_EVENT_RESERVED = 0, OS_EVENT_RESOURCE_ALLOCATED, OS_EVENT_RESOURCE_CREATED, OS_EVENT_RESOURCE_DELETED,
  OS_EVENT_TASK_STARTUP, OS_EVENT_MAX }

  A set of events that can be used with BSP event callback routines.

Functions

- void OS_Application_Startup (void)

  Application startup.
- void OS_Application_Run (void)

  Application run.
- int32 OS_API_Init (void)

  Initialization of API.
- void OS_API_Teardown (void)

  Teardown/de-initialization of OSAL API.
- void OS_IdleLoop (void)

  Background thread implementation - waits forever for events to occur.
- void OS_DeleteAllObjects (void)

  delete all resources created in OSAL.

- void OS_ApplicationShutdown (uint8 flag)

  Initiate orderly shutdown.
- void OS_ApplicationExit (int32 Status)

  Exit/Abort the application.
- int32 OS_RegisterEventHandler (OS_EventHandler_t handler)

  Callback routine registration.
- size_t OS_strnlen (const char *s, size_t maxlen)

  get string length

12.175.1 Detailed Description

Declarations and prototypes for general OSAL functions that are not part of a subsystem

12.175.2 Typedef Documentation

12.175.2.1 OS_EventHandler_t `typedef int32(* OS_EventHandler_t) (OS_Event_t event, osal_id_t object_id, void *data)`

A callback routine for event handling.

Parameters

in	*event*	The event that occurred
in	*object↩ _id*	The associated object_id, or 0 if not associated with an object
in,out	*data*	An abstract data/context object associated with the event, or NULL.

Returns

status Execution status, see OSAL Return Code Defines.

Definition at line 98 of file osapi-common.h.

12.175.3 Enumeration Type Documentation

12.175.3.1 OS_Event_t `enum OS_Event_t`

A set of events that can be used with BSP event callback routines.

Enumerator

OS_EVENT_RESERVED	no-op/reserved event id value
OS_EVENT_RESOURCE_ALLOCATED	resource/id has been newly allocated but not yet created. This event is invoked from WITHIN the locked region, in the context of the task which is allocating the resource. If the handler returns non-success, the error will be returned to the caller and the creation process is aborted.
OS_EVENT_RESOURCE_CREATED	resource/id has been fully created/finalized. Invoked outside locked region, in the context of the task which created the resource. Data object is not used, passed as NULL. Return value is ignored - this is for information purposes only.

Enumerator

OS_EVENT_RESOURCE_DELETED	resource/id has been deleted. Invoked outside locked region, in the context of the task which deleted the resource. Data object is not used, passed as NULL. Return value is ignored - this is for information purposes only.
OS_EVENT_TASK_STARTUP	New task is starting. Invoked outside locked region, in the context of the task which is currently starting, before the entry point is called. Data object is not used, passed as NULL. If the handler returns non-success, task startup is aborted and the entry point is not called.
OS_EVENT_MAX	placeholder for end of enum, not used

Definition at line 34 of file osapi-common.h.

12.176 osal/src/os/inc/osapi-condvar.h File Reference

```
#include "osconfig.h"
#include "common_types.h"
#include "osapi-clock.h"
```

Data Structures

- struct OS_condvar_prop_t

  OSAL condition variable properties.

Functions

- int32 OS_CondVarCreate (osal_id_t *var_id, const char *var_name, uint32 options)

  Creates a condition variable resource.
- int32 OS_CondVarLock (osal_id_t var_id)

  Locks/Acquires the underlying mutex associated with a condition variable.
- int32 OS_CondVarUnlock (osal_id_t var_id)

  Unlocks/Releases the underlying mutex associated with a condition variable.
- int32 OS_CondVarSignal (osal_id_t var_id)

  Signals the condition variable resource referenced by var_id.
- int32 OS_CondVarBroadcast (osal_id_t var_id)

  Broadcasts the condition variable resource referenced by var_id.
- int32 OS_CondVarWait (osal_id_t var_id)

  Waits on the condition variable object referenced by var_id.
- int32 OS_CondVarTimedWait (osal_id_t var_id, const OS_time_t *abs_wakeup_time)

  Time-limited wait on the condition variable object referenced by var_id.
- int32 OS_CondVarDelete (osal_id_t var_id)

  Deletes the specified condition variable.
- int32 OS_CondVarGetIdByName (osal_id_t *var_id, const char *var_name)

  Find an existing condition variable ID by name.
- int32 OS_CondVarGetInfo (osal_id_t var_id, OS_condvar_prop_t *condvar_prop)

  Fill a property object buffer with details regarding the resource.

12.176.1 Detailed Description

Declarations and prototypes for condition variables

12.177 osal/src/os/inc/osapi-constants.h File Reference

```
#include "osconfig.h"
#include "common_types.h"
```

Macros

- #define OS_PEND (-1)
- #define OS_CHECK (0)
- #define OS_OBJECT_ID_UNDEFINED ((osal_id_t) {0})

  Initializer for the osal_id_t type which will not match any valid value.
- #define OS_OBJECT_CREATOR_ANY OS_OBJECT_ID_UNDEFINED

  Constant that may be passed to OS_ForEachObject()/OS_ForEachObjectOfType() to match any creator (i.e. get all objects)
- #define OS_MAX_LOCAL_PATH_LEN (OS_MAX_PATH_LEN + OS_FS_PHYS_NAME_LEN)

  Maximum length of a local/native path name string.

12.177.1 Detailed Description

General constants for OSAL that are shared across subsystems

12.177.2 Macro Definition Documentation

12.177.2.1 OS_CHECK `#define OS_CHECK (0)`

Definition at line 35 of file osapi-constants.h.

12.177.2.2 OS_MAX_LOCAL_PATH_LEN `#define OS_MAX_LOCAL_PATH_LEN (OS_MAX_PATH_LEN + OS_FS_PHYS_NAME_LEN)`

Maximum length of a local/native path name string.
This is a concatenation of the OSAL virtual path with the system mount point or device name
Definition at line 54 of file osapi-constants.h.

12.177.2.3 OS_OBJECT_CREATOR_ANY `#define OS_OBJECT_CREATOR_ANY OS_OBJECT_ID_UNDEFINED`

Constant that may be passed to OS_ForEachObject()/OS_ForEachObjectOfType() to match any creator (i.e. get all objects)
Definition at line 46 of file osapi-constants.h.

12.177.2.4 OS_OBJECT_ID_UNDEFINED `#define OS_OBJECT_ID_UNDEFINED ((osal_id_t) {0})`

Initializer for the osal_id_t type which will not match any valid value.
Definition at line 40 of file osapi-constants.h.

12.177.2.5 OS_PEND `#define OS_PEND (-1)`

Definition at line 34 of file osapi-constants.h.

12.178 osal/src/os/inc/osapi-countsem.h File Reference

```
#include "osconfig.h"
#include "common_types.h"
```

Data Structures

- struct OS_count_sem_prop_t

  OSAL counting semaphore properties.

Functions

- int32 OS_CountSemCreate (osal_id_t *sem_id, const char *sem_name, uint32 sem_initial_value, uint32 options)

  Creates a counting semaphore.
- int32 OS_CountSemGive (osal_id_t sem_id)

  Increment the semaphore value.
- int32 OS_CountSemTake (osal_id_t sem_id)

  Decrement the semaphore value.
- int32 OS_CountSemTimedWait (osal_id_t sem_id, uint32 msecs)

  Decrement the semaphore value with timeout.
- int32 OS_CountSemDelete (osal_id_t sem_id)

  Deletes the specified counting Semaphore.
- int32 OS_CountSemGetIdByName (osal_id_t *sem_id, const char *sem_name)

  Find an existing semaphore ID by name.
- int32 OS_CountSemGetInfo (osal_id_t sem_id, OS_count_sem_prop_t *count_prop)

  Fill a property object buffer with details regarding the resource.

12.178.1 Detailed Description

Declarations and prototypes for counting semaphores

12.179 osal/src/os/inc/osapi-dir.h File Reference

```
#include "osconfig.h"
#include "common_types.h"
```

Data Structures

- struct os_dirent_t

  Directory entry.

Macros

- #define OS_DIRENTRY_NAME(x) ((x).FileName)

  Access filename part of the dirent structure.

Functions

- int32 OS_DirectoryOpen (osal_id_t *dir_id, const char *path)

  Opens a directory.
- int32 OS_DirectoryClose (osal_id_t dir_id)

  Closes an open directory.
- int32 OS_DirectoryRewind (osal_id_t dir_id)

  Rewinds an open directory.
- int32 OS_DirectoryRead (osal_id_t dir_id, os_dirent_t *dirent)

  Reads the next name in the directory.
- int32 OS_mkdir (const char *path, uint32 access)

  Makes a new directory.
- int32 OS_rmdir (const char *path)

  Removes a directory from the file system.

12.179.1 Detailed Description

Declarations and prototypes for directories

12.179.2 Macro Definition Documentation

12.179.2.1 OS_DIRENTRY_NAME `#define OS_DIRENTRY_NAME( x ) ((x).FileName)`

Access filename part of the dirent structure.
Definition at line 38 of file osapi-dir.h.

12.180 osal/src/os/inc/osapi-error.h File Reference

```
#include "common_types.h"
```

Macros

- #define OS_ERROR_NAME_LENGTH 35

  Error string name length.
- #define OS_STATUS_STRING_LENGTH 12

  Status converted to string length limit.
- #define OS_SUCCESS (0)

  Successful execution.
- #define OS_ERROR (-1)

  Failed execution.
- #define OS_INVALID_POINTER (-2)

  Invalid pointer.
- #define OS_ERROR_ADDRESS_MISALIGNED (-3)

  Address misalignment.
- #define OS_ERROR_TIMEOUT (-4)

  Error timeout.
- #define OS_INVALID_INT_NUM (-5)

  Invalid Interrupt number.

- #define OS_SEM_FAILURE (-6)

  Semaphore failure.
- #define OS_SEM_TIMEOUT (-7)

  Semaphore timeout.
- #define OS_QUEUE_EMPTY (-8)

  Queue empty.
- #define OS_QUEUE_FULL (-9)

  Queue full.
- #define OS_QUEUE_TIMEOUT (-10)

  Queue timeout.
- #define OS_QUEUE_INVALID_SIZE (-11)

  Queue invalid size.
- #define OS_QUEUE_ID_ERROR (-12)

  Queue ID error.
- #define OS_ERR_NAME_TOO_LONG (-13)

  name length including null terminator greater than OS_MAX_API_NAME
- #define OS_ERR_NO_FREE_IDS (-14)

  No free IDs.
- #define OS_ERR_NAME_TAKEN (-15)

  Name taken.
- #define OS_ERR_INVALID_ID (-16)

  Invalid ID.
- #define OS_ERR_NAME_NOT_FOUND (-17)

  Name not found.
- #define OS_ERR_SEM_NOT_FULL (-18)

  Semaphore not full.
- #define OS_ERR_INVALID_PRIORITY (-19)

  Invalid priority.
- #define OS_INVALID_SEM_VALUE (-20)

  Invalid semaphore value.
- #define OS_ERR_FILE (-27)

  File error.
- #define OS_ERR_NOT_IMPLEMENTED (-28)

  Not implemented.
- #define OS_TIMER_ERR_INVALID_ARGS (-29)

  Timer invalid arguments.
- #define OS_TIMER_ERR_TIMER_ID (-30)

  Timer ID error.
- #define OS_TIMER_ERR_UNAVAILABLE (-31)

  Timer unavailable.
- #define OS_TIMER_ERR_INTERNAL (-32)

  Timer internal error.
- #define OS_ERR_OBJECT_IN_USE (-33)

  Object in use.
- #define OS_ERR_BAD_ADDRESS (-34)

  Bad address.
- #define OS_ERR_INCORRECT_OBJ_STATE (-35)

Incorrect object state.

- #define OS_ERR_INCORRECT_OBJ_TYPE (-36)

  Incorrect object type.
- #define OS_ERR_STREAM_DISCONNECTED (-37)

  Stream disconnected.
- #define OS_ERR_OPERATION_NOT_SUPPORTED (-38)

  Requested operation not support on supplied object(s)
- #define OS_ERR_INVALID_SIZE (-40)

  Invalid Size.
- #define OS_ERR_OUTPUT_TOO_LARGE (-41)

  Size of output exceeds limit
- #define OS_ERR_INVALID_ARGUMENT (-42)

  Invalid argument value (other than ID or size)
- #define OS_FS_ERR_PATH_TOO_LONG (-103)

  FS path too long.
- #define OS_FS_ERR_NAME_TOO_LONG (-104)

  FS name too long.
- #define OS_FS_ERR_DRIVE_NOT_CREATED (-106)

  FS drive not created.
- #define OS_FS_ERR_DEVICE_NOT_FREE (-107)

  FS device not free.
- #define OS_FS_ERR_PATH_INVALID (-108)

  FS path invalid.

Typedefs

- typedef char os_err_name_t[OS_ERROR_NAME_LENGTH]

  For the OS_GetErrorName() function, to ensure everyone is making an array of the same length.
- typedef char os_status_string_t[OS_STATUS_STRING_LENGTH]

  For the OS_StatusToString() function, to ensure everyone is making an array of the same length.

Functions

- static long OS_StatusToInteger (osal_status_t Status)

  Convert a status code to a native "long" type.
- int32 OS_GetErrorName (int32 error_num, os_err_name_t *err_name)

  Convert an error number to a string.
- char * OS_StatusToString (osal_status_t status, os_status_string_t *status_string)

  Convert status to a string.

12.180.1 Detailed Description

OSAL error code definitions

12.180.2 Macro Definition Documentation

12.180.2.1 OS_ERROR_NAME_LENGTH `#define OS_ERROR_NAME_LENGTH 35`

Error string name length.
The sizes of strings in OSAL functions are built with this limit in mind. Always check the uses of os_err_name_t when changing this value.
Definition at line 35 of file osapi-error.h.

12.180.2.2 OS_STATUS_STRING_LENGTH `#define OS_STATUS_STRING_LENGTH 12`

Status converted to string length limit.
Used for sizing os_status_string_t intended for use in printing osal_status_t values Sized to fit LONG_MIN including NULL termination
Definition at line 55 of file osapi-error.h.

12.180.3 Typedef Documentation

12.180.3.1 os_err_name_t `typedef char os_err_name_t[OS_ERROR_NAME_LENGTH]`

For the OS_GetErrorName() function, to ensure everyone is making an array of the same length.
Implementation note for developers:
The sizes of strings in OSAL functions are built with this OS_ERROR_NAME_LENGTH limit in mind. Always check the uses of os_err_name_t when changing this value.
Definition at line 47 of file osapi-error.h.

12.180.3.2 os_status_string_t `typedef char os_status_string_t[OS_STATUS_STRING_LENGTH]`

For the OS_StatusToString() function, to ensure everyone is making an array of the same length.
Definition at line 61 of file osapi-error.h.

12.181 osal/src/os/inc/osapi-file.h File Reference

```
#include "osconfig.h"
#include "common_types.h"
#include "osapi-clock.h"
```

Data Structures

- struct OS_file_prop_t

  OSAL file properties.
- struct os_fstat_t

  File system status.

Macros

- #define OS_READ_ONLY 0
- #define OS_WRITE_ONLY 1
- #define OS_READ_WRITE 2
- #define OS_SEEK_SET 0
- #define OS_SEEK_CUR 1
- #define OS_SEEK_END 2
- #define OS_FILESTAT_MODE(x) ((x).FileModeBits)

  Access file stat mode bits.

- #define OS_FILESTAT_ISDIR(x) ((x).FileModeBits & OS_FILESTAT_MODE_DIR)

  File stat is directory logical.
- #define OS_FILESTAT_EXEC(x) ((x).FileModeBits & OS_FILESTAT_MODE_EXEC)

  File stat is executable logical.
- #define OS_FILESTAT_WRITE(x) ((x).FileModeBits & OS_FILESTAT_MODE_WRITE)

  File stat is write enabled logical.
- #define OS_FILESTAT_READ(x) ((x).FileModeBits & OS_FILESTAT_MODE_READ)

  File stat is read enabled logical.
- #define OS_FILESTAT_SIZE(x) ((x).FileSize)

  Access file stat size field.
- #define OS_FILESTAT_TIME(x) (OS_TimeGetTotalSeconds((x).FileTime))

  Access file stat time field as a whole number of seconds.

Enumerations

- enum { OS_FILESTAT_MODE_EXEC = 0x00001, OS_FILESTAT_MODE_WRITE = 0x00002, OS_FILESTAT_MODE_READ = 0x00004, OS_FILESTAT_MODE_DIR = 0x10000 }

  File stat mode bits.
- enum OS_file_flag_t { OS_FILE_FLAG_NONE = 0x00, OS_FILE_FLAG_CREATE = 0x01, OS_FILE_FLAG_TRUNCATE = 0x02 }

  Flags that can be used with opening of a file (bitmask)

Functions

- int32 OS_OpenCreate (osal_id_t *filedes, const char *path, int32 flags, int32 access_mode)

  Open or create a file.
- int32 OS_close (osal_id_t filedes)

  Closes an open file handle.
- int32 OS_read (osal_id_t filedes, void *buffer, size_t nbytes)

  Read from a file handle.
- int32 OS_write (osal_id_t filedes, const void *buffer, size_t nbytes)

  Write to a file handle.
- int32 OS_TimedReadAbs (osal_id_t filedes, void *buffer, size_t nbytes, OS_time_t abstime)

  File/Stream input read with a timeout.
- int32 OS_TimedRead (osal_id_t filedes, void *buffer, size_t nbytes, int32 timeout)

  File/Stream input read with a timeout.
- int32 OS_TimedWriteAbs (osal_id_t filedes, const void *buffer, size_t nbytes, OS_time_t abstime)

  File/Stream output write with a timeout.
- int32 OS_TimedWrite (osal_id_t filedes, const void *buffer, size_t nbytes, int32 timeout)

  File/Stream output write with a timeout.
- int32 OS_chmod (const char *path, uint32 access_mode)

  Changes the permissions of a file.
- int32 OS_stat (const char *path, os_fstat_t *filestats)

  Obtain information about a file or directory.
- int32 OS_lseek (osal_id_t filedes, int32 offset, uint32 whence)

  Seeks to the specified position of an open file.
- int32 OS_remove (const char *path)

  Removes a file from the file system.

- int32 OS_rename (const char *old_filename, const char *new_filename)

  Renames a file.
- int32 OS_cp (const char *src, const char *dest)

  Copies a single file from src to dest.
- int32 OS_mv (const char *src, const char *dest)

  Move a single file from src to dest.
- int32 OS_FDGetInfo (osal_id_t filedes, OS_file_prop_t *fd_prop)

  Obtain information about an open file.
- int32 OS_FileOpenCheck (const char *Filename)

  Checks to see if a file is open.
- int32 OS_CloseAllFiles (void)

  Close all open files.
- int32 OS_CloseFileByName (const char *Filename)

  Close a file by filename.

12.181.1 Detailed Description

Declarations and prototypes for file objects

12.181.2 Macro Definition Documentation

12.181.2.1 OS_FILESTAT_EXEC

```
#define OS_FILESTAT_EXEC(
    x ) ((x).FileModeBits & OS_FILESTAT_MODE_EXEC)
```

File stat is executable logical.
Definition at line 92 of file osapi-file.h.

12.181.2.2 OS_FILESTAT_ISDIR

```
#define OS_FILESTAT_ISDIR(
    x ) ((x).FileModeBits & OS_FILESTAT_MODE_DIR)
```

File stat is directory logical.
Definition at line 90 of file osapi-file.h.

12.181.2.3 OS_FILESTAT_MODE

```
#define OS_FILESTAT_MODE(
    x ) ((x).FileModeBits)
```

Access file stat mode bits.
Definition at line 88 of file osapi-file.h.

12.181.2.4 OS_FILESTAT_READ

```
#define OS_FILESTAT_READ(
    x ) ((x).FileModeBits & OS_FILESTAT_MODE_READ)
```

File stat is read enabled logical.
Definition at line 96 of file osapi-file.h.

12.181.2.5 OS_FILESTAT_SIZE

```
#define OS_FILESTAT_SIZE(
    x ) ((x).FileSize)
```

Access file stat size field.
Definition at line 98 of file osapi-file.h.

12.181.2.6 OS_FILESTAT_TIME `#define OS_FILESTAT_TIME( x ) (OS_TimeGetTotalSeconds((x).FileTime))`

Access file stat time field as a whole number of seconds.
Definition at line 100 of file osapi-file.h.

12.181.2.7 OS_FILESTAT_WRITE `#define OS_FILESTAT_WRITE( x ) ((x).FileModeBits & OS_FILESTAT_MODE_WRITE)`

File stat is write enabled logical.
Definition at line 94 of file osapi-file.h.

12.181.3 Enumeration Type Documentation

12.181.3.1 anonymous enum `anonymous enum`

File stat mode bits.
We must also define replacements for the stat structure's mode bits. This is currently just a small subset since the OSAL just presents a very simplified view of the filesystem to the upper layers. And since not all OS'es are POSIX, the more POSIX-specific bits are not relevant anyway.

Enumerator

OS_FILESTAT_MODE_EXEC	
OS_FILESTAT_MODE_WRITE	
OS_FILESTAT_MODE_READ	
OS_FILESTAT_MODE_DIR	

Definition at line 79 of file osapi-file.h.

12.181.3.2 OS_file_flag_t `enum OS_file_flag_t`

Flags that can be used with opening of a file (bitmask)

Enumerator

OS_FILE_FLAG_NONE	
OS_FILE_FLAG_CREATE	
OS_FILE_FLAG_TRUNCATE	

Definition at line 105 of file osapi-file.h.

12.182 osal/src/os/inc/osapi-filesys.h File Reference

```
#include "osconfig.h"
#include "common_types.h"
```

Data Structures

- struct os_fsinfo_t

  OSAL file system info.

- struct OS_statvfs_t

Macros

- #define OS_CHK_ONLY 0
- #define OS_REPAIR 1

Functions

- int32 OS_FileSysAddFixedMap (osal_id_t *filesys_id, const char *phys_path, const char *virt_path)

  Create a fixed mapping between an existing directory and a virtual OSAL mount point.
- int32 OS_mkfs (char *address, const char *devname, const char *volname, size_t blocksize, osal_blockcount_t numblocks)

  Makes a file system on the target.
- int32 OS_mount (const char *devname, const char *mountpoint)

  Mounts a file system.
- int32 OS_initfs (char *address, const char *devname, const char *volname, size_t blocksize, osal_blockcount_t numblocks)

  Initializes an existing file system.
- int32 OS_rmfs (const char *devname)

  Removes a file system.
- int32 OS_unmount (const char *mountpoint)

  Unmounts a mounted file system.
- int32 OS_FileSysStatVolume (const char *name, OS_statvfs_t *statbuf)

  Obtains information about size and free space in a volume.
- int32 OS_chkfs (const char *name, bool repair)

  Checks the health of a file system and repairs it if necessary.
- int32 OS_FS_GetPhysDriveName (char *PhysDriveName, const char *MountPoint)

  Obtains the physical drive name associated with a mount point.
- int32 OS_TranslatePath (const char *VirtualPath, char *LocalPath)

  Translates an OSAL Virtual file system path to a host Local path.
- int32 OS_GetFsInfo (os_fsinfo_t *filesys_info)

  Returns information about the file system.

12.182.1 Detailed Description

Declarations and prototypes for file systems

12.182.2 Macro Definition Documentation

12.182.2.1 OS_CHK_ONLY `#define OS_CHK_ONLY 0`

Unused, API takes bool
Definition at line 31 of file osapi-filesys.h.

12.182.2.2 OS_REPAIR `#define OS_REPAIR 1`

Unused, API takes bool
Definition at line 32 of file osapi-filesys.h.

12.183 osal/src/os/inc/osapi-heap.h File Reference

```
#include "osconfig.h"
#include "common_types.h"
```

Data Structures

- struct OS_heap_prop_t

  OSAL heap properties.

Functions

- int32 OS_HeapGetInfo (OS_heap_prop_t *heap_prop)

  Return current info on the heap.

12.183.1 Detailed Description

Declarations and prototypes for heap functions

12.184 osal/src/os/inc/osapi-idmap.h File Reference

```
#include "osconfig.h"
#include "common_types.h"
```

Macros

- #define OS_OBJECT_INDEX_MASK 0xFFFF

  Object index mask.
- #define OS_OBJECT_TYPE_SHIFT 16

  Object type shift.
- #define OS_OBJECT_TYPE_UNDEFINED 0x00

  Object type undefined.
- #define OS_OBJECT_TYPE_OS_TASK 0x01

  Object task type.
- #define OS_OBJECT_TYPE_OS_QUEUE 0x02

  Object queue type.
- #define OS_OBJECT_TYPE_OS_COUNTSEM 0x03

  Object counting semaphore type.
- #define OS_OBJECT_TYPE_OS_BINSEM 0x04

  Object binary semaphore type.
- #define OS_OBJECT_TYPE_OS_MUTEX 0x05

  Object mutex type.
- #define OS_OBJECT_TYPE_OS_STREAM 0x06

  Object stream type.
- #define OS_OBJECT_TYPE_OS_DIR 0x07

  Object directory type.
- #define OS_OBJECT_TYPE_OS_TIMEBASE 0x08

  Object timebase type.
- #define OS_OBJECT_TYPE_OS_TIMECB 0x09

Object timer callback type.

- #define OS_OBJECT_TYPE_OS_MODULE 0x0A

  Object module type.
- #define OS_OBJECT_TYPE_OS_FILESYS 0x0B

  Object file system type.
- #define OS_OBJECT_TYPE_OS_CONSOLE 0x0C

  Object console type.
- #define OS_OBJECT_TYPE_OS_CONDVAR 0x0D

  Object condition variable type.
- #define OS_OBJECT_TYPE_USER 0x10

  Object user type.

Functions

- static unsigned long OS_ObjectIdToInteger (osal_id_t object_id)

  Obtain an integer value corresponding to an object ID.
- static osal_id_t OS_ObjectIdFromInteger (unsigned long value)

  Obtain an osal ID corresponding to an integer value.
- static bool OS_ObjectIdEqual (osal_id_t object_id1, osal_id_t object_id2)

  Check two OSAL object ID values for equality.
- static bool OS_ObjectIdDefined (osal_id_t object_id)

  Check if an object ID is defined.
- int32 OS_GetResourceName (osal_id_t object_id, char ∗buffer, size_t buffer_size)

  Obtain the name of an object given an arbitrary object ID.
- osal_objtype_t OS_IdentifyObject (osal_id_t object_id)

  Obtain the type of an object given an arbitrary object ID.
- int32 OS_ConvertToArrayIndex (osal_id_t object_id, osal_index_t ∗ArrayIndex)

  Converts an abstract ID into a number suitable for use as an array index.
- int32 OS_ObjectIdToArrayIndex (osal_objtype_t idtype, osal_id_t object_id, osal_index_t ∗ArrayIndex)

  Converts an abstract ID into a number suitable for use as an array index.
- void OS_ForEachObject (osal_id_t creator_id, OS_ArgCallback_t callback_ptr, void ∗callback_arg)

  call the supplied callback function for all valid object IDs
- void OS_ForEachObjectOfType (osal_objtype_t objtype, osal_id_t creator_id, OS_ArgCallback_t callback_ptr, void ∗callback_arg)

  call the supplied callback function for valid object IDs of a specific type

12.184.1 Detailed Description

Declarations and prototypes for object IDs

12.184.2 Macro Definition Documentation

12.184.2.1 OS_OBJECT_INDEX_MASK `#define OS_OBJECT_INDEX_MASK 0xFFFF`

Object index mask.
Definition at line 32 of file osapi-idmap.h.

12.184.2.2 OS_OBJECT_TYPE_SHIFT `#define OS_OBJECT_TYPE_SHIFT 16`

Object type shift.
Definition at line 33 of file osapi-idmap.h.

12.185 osal/src/os/inc/osapi-macros.h File Reference

```
#include <stdio.h>
#include <stdlib.h>
#include <string.h>
#include "osconfig.h"
#include "common_types.h"
#include "osapi-printf.h"
```

Macros

- #define BUGREPORT(...) OS_printf(__VA_ARGS__)
- #define BUGCHECK(cond, errcode)

  Basic Bug-Checking macro.
- #define ARGCHECK(cond, errcode)

  Generic argument checking macro for non-critical values.
- #define LENGTHCHECK(str, len, errcode) ARGCHECK(memchr(str, '\0', len), errcode)

  String length limit check macro.
- #define BUGCHECK_VOID(cond) BUGCHECK(cond,)

  Bug-Check macro for void functions.

12.185.1 Detailed Description

Macro definitions that are used across all OSAL subsystems

12.185.2 Macro Definition Documentation

12.185.2.1 ARGCHECK `#define ARGCHECK(`

```
cond,
errcode )
```

Value:

```
if (!(cond))                \
{                           \
    return errcode;         \
}
```

Generic argument checking macro for non-critical values.
This macro checks a conditional that is expected to be true, and return a value if it evaluates false.
ARGCHECK can be used to check for out of range or other invalid argument conditions which may (validly) occur at runtime and do not necessarily indicate bugs in the application.
These argument checks are NOT considered fatal errors. The application continues to run normally. This does not report the error on the console.
As such, ARGCHECK actions are always compiled in - not selectable at compile-time.

See also

BUGCHECK for checking critical values that indicate bugs

Definition at line 131 of file osapi-macros.h.

12.185.2.2 BUGCHECK

```
#define BUGCHECK(
    cond,
    errcode )
```

Value:

```
if (!(cond))                                                                                    \
{                                                                                               \
    BUGREPORT("\n**BUG** %s():%d:check \'%s\' FAILED --> %s\n\n", __func__, __LINE__, #cond, #errcode); \
    return errcode;                                                                             \
}
```

Basic Bug-Checking macro.

This macro checks a conditional, and if it is FALSE, then it generates a report - which may in turn contain additional actions.

BUGCHECK should only be used for conditions which are critical and must always be true. If such a condition is ever false then it indicates a bug in the application which must be resolved. It may or may not be possible to continue operation if a bugcheck fails.

See also

ARGCHECK for checking non-critical values

Definition at line 105 of file osapi-macros.h.

12.185.2.3 BUGCHECK_VOID

```
#define BUGCHECK_VOID(
    cond ) BUGCHECK(cond, )
```

Bug-Check macro for void functions.

The basic BUGCHECK macro returns a value, which needs to be empty for functions that do not have a return value. In this case the second argument (errcode) is intentionally left blank.

Definition at line 155 of file osapi-macros.h.

12.185.2.4 BUGREPORT

```
#define BUGREPORT(
    ...  ) OS_printf(__VA_ARGS__)
```

Definition at line 88 of file osapi-macros.h.

12.185.2.5 LENGTHCHECK

```
#define LENGTHCHECK(
    str,
    len,
    errcode ) ARGCHECK(memchr(str, '\0', len), errcode)
```

String length limit check macro.

This macro is a specialized version of ARGCHECK that confirms a string will fit into a buffer of the specified length, and return an error code if it will not.

Note

this uses ARGCHECK, thus treating a string too long as a normal runtime (i.e. non-bug) error condition with a typical error return to the caller.

Definition at line 146 of file osapi-macros.h.

12.186 osal/src/os/inc/osapi-module.h File Reference

```
#include "osconfig.h"
#include "common_types.h"
```

Data Structures

- struct OS_module_address_t

  OSAL module address properties.
- struct OS_module_prop_t

  OSAL module properties.
- struct OS_static_symbol_record_t

  Associates a single symbol name with a memory address.

Macros

- #define OS_MODULE_FLAG_GLOBAL_SYMBOLS 0x00

  Requests OS_ModuleLoad() to add the symbols to the global symbol table.
- #define OS_MODULE_FLAG_LOCAL_SYMBOLS 0x01

  Requests OS_ModuleLoad() to keep the symbols local/private to this module.

Functions

- int32 OS_SymbolLookup (cpuaddr ∗symbol_address, const char ∗symbol_name)

  Find the Address of a Symbol.
- int32 OS_ModuleSymbolLookup (osal_id_t module_id, cpuaddr ∗symbol_address, const char ∗symbol_name)

  Find the Address of a Symbol within a module.
- int32 OS_SymbolTableDump (const char ∗filename, size_t size_limit)

  Dumps the system symbol table to a file.
- int32 OS_ModuleLoad (osal_id_t ∗module_id, const char ∗module_name, const char ∗filename, uint32 flags)

  Loads an object file.
- int32 OS_ModuleUnload (osal_id_t module_id)

  Unloads the module file.
- int32 OS_ModuleInfo (osal_id_t module_id, OS_module_prop_t ∗module_info)

  Obtain information about a module.

12.186.1 Detailed Description

Declarations and prototypes for module subsystem

12.186.2 Macro Definition Documentation

12.186.2.1 OS_MODULE_FLAG_GLOBAL_SYMBOLS `#define OS_MODULE_FLAG_GLOBAL_SYMBOLS 0x00`

Requests OS_ModuleLoad() to add the symbols to the global symbol table.
When supplied as the "flags" argument to OS_ModuleLoad(), this indicates that the symbols in the loaded module should be added to the global symbol table. This will make symbols in this library available for use when resolving symbols in future module loads.
This is the default mode of operation for OS_ModuleLoad().

Note

On some operating systems, use of this option may make it difficult to unload the module in the future, if the symbols are in use by other entities.

Definition at line 49 of file osapi-module.h.

12.186.2.2 OS_MODULE_FLAG_LOCAL_SYMBOLS `#define OS_MODULE_FLAG_LOCAL_SYMBOLS 0x01`

Requests OS_ModuleLoad() to keep the symbols local/private to this module.
When supplied as the "flags" argument to OS_ModuleLoad(), this indicates that the symbols in the loaded module should NOT be added to the global symbol table. This means the symbols in the loaded library will not be available for use by other modules.
Use this option is recommended for cases where no other entities will need to reference symbols within this module. This helps ensure that the module can be more safely unloaded in the future, by preventing other modules from binding to it. It also helps reduce the likelihood of symbol name conflicts among modules.

Note

> To look up symbols within a module loaded with this flag, use OS_SymbolLookupInModule() instead of OS_SymbolLookup(). Also note that references obtained using this method are not tracked by the OS; the application must ensure that all references obtained in this manner have been cleaned up/released before unloading the module.

Definition at line 71 of file osapi-module.h.

12.187 osal/src/os/inc/osapi-mutex.h File Reference

```
#include "osconfig.h"
#include "common_types.h"
```

Data Structures

- struct OS_mut_sem_prop_t

  OSAL mutex properties.

Functions

- int32 OS_MutSemCreate (osal_id_t *sem_id, const char *sem_name, uint32 options)

  Creates a mutex semaphore.
- int32 OS_MutSemGive (osal_id_t sem_id)

  Releases the mutex object referenced by sem_id.
- int32 OS_MutSemTake (osal_id_t sem_id)

  Acquire the mutex object referenced by sem_id.
- int32 OS_MutSemDelete (osal_id_t sem_id)

  Deletes the specified Mutex Semaphore.
- int32 OS_MutSemGetIdByName (osal_id_t *sem_id, const char *sem_name)

  Find an existing mutex ID by name.
- int32 OS_MutSemGetInfo (osal_id_t sem_id, OS_mut_sem_prop_t *mut_prop)

  Fill a property object buffer with details regarding the resource.

12.187.1 Detailed Description

Declarations and prototypes for mutexes

12.188 osal/src/os/inc/osapi-network.h File Reference

```
#include "osconfig.h"
#include "common_types.h"
```

Functions

- int32 OS_NetworkGetID (void)

  Gets the network ID of the local machine.
- int32 OS_NetworkGetHostName (char ∗host_name, size_t name_len)

  Gets the local machine network host name.

12.188.1 Detailed Description

Declarations and prototypes for network subsystem

12.189 osal/src/os/inc/osapi-printf.h File Reference

```
#include "osconfig.h"
#include "common_types.h"
```

Functions

- void OS_printf (const char ∗string,...) OS_PRINTF(1

  Abstraction for the system printf() call.
- void void OS_printf_disable (void)

  This function disables the output from OS_printf.
- void OS_printf_enable (void)

  This function enables the output from OS_printf.

12.189.1 Detailed Description

Declarations and prototypes for printf/console output

12.190 osal/src/os/inc/osapi-queue.h File Reference

```
#include "osconfig.h"
#include "common_types.h"
```

Data Structures

- struct OS_queue_prop_t

  OSAL queue properties.

Functions

- int32 OS_QueueCreate (osal_id_t ∗queue_id, const char ∗queue_name, osal_blockcount_t queue_depth, size↩_t data_size, uint32 flags)

  Create a message queue.
- int32 OS_QueueDelete (osal_id_t queue_id)

  Deletes the specified message queue.
- int32 OS_QueueGet (osal_id_t queue_id, void ∗data, size_t size, size_t ∗size_copied, int32 timeout)

  Receive a message on a message queue.
- int32 OS_QueuePut (osal_id_t queue_id, const void ∗data, size_t size, uint32 flags)

  Put a message on a message queue.

- int32 OS_QueueGetIdByName (osal_id_t *queue_id, const char *queue_name)

  Find an existing queue ID by name.
- int32 OS_QueueGetInfo (osal_id_t queue_id, OS_queue_prop_t *queue_prop)

  Fill a property object buffer with details regarding the resource.

12.190.1 Detailed Description

Declarations and prototypes for queue subsystem

12.191 osal/src/os/inc/osapi-select.h File Reference

```
#include "osconfig.h"
#include "common_types.h"
#include "osapi-clock.h"
```

Data Structures

- struct OS_FdSet

  An abstract structure capable of holding several OSAL IDs.

Enumerations

- enum OS_StreamState_t {
  OS_STREAM_STATE_BOUND = 0x01, OS_STREAM_STATE_CONNECTED = 0x02, OS_STREAM_STATE_READABLE = 0x04, OS_STREAM_STATE_WRITABLE = 0x08,
  OS_STREAM_STATE_LISTENING = 0x10 }

  For the OS_SelectSingle() function's in/out StateFlags parameter, the state(s) of the stream and the result of the select is a combination of one or more of these states.

Functions

- int32 OS_SelectMultipleAbs (OS_FdSet *ReadSet, OS_FdSet *WriteSet, OS_time_t abs_timeout)

  Wait for events across multiple file handles.
- int32 OS_SelectMultiple (OS_FdSet *ReadSet, OS_FdSet *WriteSet, int32 msecs)

  Wait for events across multiple file handles.
- int32 OS_SelectSingleAbs (osal_id_t objid, uint32 *StateFlags, OS_time_t abs_timeout)

  Wait for events on a single file handle.
- int32 OS_SelectSingle (osal_id_t objid, uint32 *StateFlags, int32 msecs)

  Wait for events on a single file handle.
- int32 OS_SelectFdZero (OS_FdSet *Set)

  Clear a FdSet structure.
- int32 OS_SelectFdAdd (OS_FdSet *Set, osal_id_t objid)

  Add an ID to an FdSet structure.
- int32 OS_SelectFdClear (OS_FdSet *Set, osal_id_t objid)

  Clear an ID from an FdSet structure.
- bool OS_SelectFdIsSet (const OS_FdSet *Set, osal_id_t objid)

  Check if an FdSet structure contains a given ID.

12.191.1 Detailed Description

Declarations and prototypes for select abstraction

12.191.2 Enumeration Type Documentation

12.191.2.1 OS_StreamState_t `enum OS_StreamState_t`

For the OS_SelectSingle() function's in/out StateFlags parameter, the state(s) of the stream and the result of the select is a combination of one or more of these states.

See also

OS_SelectSingle()

Enumerator

OS_STREAM_STATE_BOUND	whether the stream is bound
OS_STREAM_STATE_CONNECTED	whether the stream is connected
OS_STREAM_STATE_READABLE	whether the stream is readable
OS_STREAM_STATE_WRITABLE	whether the stream is writable
OS_STREAM_STATE_LISTENING	whether the stream is listening

Definition at line 56 of file osapi-select.h.

12.192 osal/src/os/inc/osapi-shell.h File Reference

```
#include "osconfig.h"
#include "common_types.h"
```

Functions

- int32 OS_ShellOutputToFile (const char *Cmd, osal_id_t filedes)

  Executes the command and sends output to a file.

12.192.1 Detailed Description

Declarations and prototypes for shell abstraction

12.193 osal/src/os/inc/osapi-sockets.h File Reference

```
#include "osconfig.h"
#include "common_types.h"
#include "osapi-clock.h"
```

Data Structures

- union OS_SockAddrData_t

  Storage buffer for generic network address.
- struct OS_SockAddr_t

  Encapsulates a generic network address.

- struct OS_socket_prop_t

  Encapsulates socket properties.

Macros

- #define OS_SOCKADDR_MAX_LEN 28

Enumerations

- enum OS_SocketDomain_t { OS_SocketDomain_INVALID, OS_SocketDomain_INET, OS_SocketDomain_INET6, OS_SocketDomain_MAX }

  Socket domain.
- enum OS_SocketType_t { OS_SocketType_INVALID, OS_SocketType_DATAGRAM, OS_SocketType_STREAM, OS_SocketType_MAX }

  Socket type.
- enum OS_SocketShutdownMode_t { OS_SocketShutdownMode_NONE = 0, OS_SocketShutdownMode_SHUT_READ = 1, OS_SocketShutdownMode_SHUT_WRITE = 2, OS_SocketShutdownMode_SHUT_READWRITE = 3 }

  Shutdown Mode.

Functions

- int32 OS_SocketAddrInit (OS_SockAddr_t *Addr, OS_SocketDomain_t Domain)

  Initialize a socket address structure to hold an address of the given family.
- int32 OS_SocketAddrToString (char *buffer, size_t buflen, const OS_SockAddr_t *Addr)

  Get a string representation of a network host address.
- int32 OS_SocketAddrFromString (OS_SockAddr_t *Addr, const char *string)

  Set a network host address from a string representation.
- int32 OS_SocketAddrGetPort (uint16 *PortNum, const OS_SockAddr_t *Addr)

  Get the port number of a network address.
- int32 OS_SocketAddrSetPort (OS_SockAddr_t *Addr, uint16 PortNum)

  Set the port number of a network address.
- int32 OS_SocketOpen (osal_id_t *sock_id, OS_SocketDomain_t Domain, OS_SocketType_t Type)

  Opens a socket.
- int32 OS_SocketBind (osal_id_t sock_id, const OS_SockAddr_t *Addr)

  Binds a socket to a given local address and enter listening (server) mode.
- int32 OS_SocketListen (osal_id_t sock_id)

  Places the specified socket into a listening state.
- int32 OS_SocketBindAddress (osal_id_t sock_id, const OS_SockAddr_t *Addr)

  Binds a socket to a given local address.
- int32 OS_SocketConnectAbs (osal_id_t sock_id, const OS_SockAddr_t *Addr, OS_time_t abs_timeout)

  Connects a socket to a given remote address.
- int32 OS_SocketConnect (osal_id_t sock_id, const OS_SockAddr_t *Addr, int32 timeout)

  Connects a socket to a given remote address.
- int32 OS_SocketShutdown (osal_id_t sock_id, OS_SocketShutdownMode_t Mode)

  Implement graceful shutdown of a stream socket.
- int32 OS_SocketAcceptAbs (osal_id_t sock_id, osal_id_t *connsock_id, OS_SockAddr_t *Addr, OS_time_t abs↩_timeout)

  Waits for and accept the next incoming connection on the given socket.
- int32 OS_SocketAccept (osal_id_t sock_id, osal_id_t *connsock_id, OS_SockAddr_t *Addr, int32 timeout)

Waits for and accept the next incoming connection on the given socket.

- int32 OS_SocketRecvFromAbs (osal_id_t sock_id, void *buffer, size_t buflen, OS_SockAddr_t *RemoteAddr, OS_time_t abs_timeout)

  Reads data from a message-oriented (datagram) socket.
- int32 OS_SocketRecvFrom (osal_id_t sock_id, void *buffer, size_t buflen, OS_SockAddr_t *RemoteAddr, int32 timeout)

  Reads data from a message-oriented (datagram) socket.
- int32 OS_SocketSendTo (osal_id_t sock_id, const void *buffer, size_t buflen, const OS_SockAddr_t *Remote↩ Addr)

  Sends data to a message-oriented (datagram) socket.
- int32 OS_SocketGetIdByName (osal_id_t *sock_id, const char *sock_name)

  Gets an OSAL ID from a given name.
- int32 OS_SocketGetInfo (osal_id_t sock_id, OS_socket_prop_t *sock_prop)

  Gets information about an OSAL Socket ID.

12.193.1 Detailed Description

Declarations and prototypes for sockets abstraction

12.193.2 Macro Definition Documentation

12.193.2.1 OS_SOCKADDR_MAX_LEN `#define OS_SOCKADDR_MAX_LEN 28`

Definition at line 46 of file osapi-sockets.h.

12.193.3 Enumeration Type Documentation

12.193.3.1 OS_SocketDomain_t `enum OS_SocketDomain_t`

Socket domain.

Enumerator

OS_SocketDomain_INVALID	Invalid.
OS_SocketDomain_INET	IPv4 address family, most commonly used)
OS_SocketDomain_INET6	IPv6 address family, depends on OS/network stack support.
OS_SocketDomain_MAX	Maximum.

Definition at line 61 of file osapi-sockets.h.

12.193.3.2 OS_SocketShutdownMode_t `enum OS_SocketShutdownMode_t`

Shutdown Mode.

Enumerator

OS_SocketShutdownMode_NONE	Reserved value, no effect.
OS_SocketShutdownMode_SHUT_READ	Disable future reading.
OS_SocketShutdownMode_SHUT_WRITE	Disable future writing.
OS_SocketShutdownMode_SHUT_READWRITE	Disable future reading or writing.

Definition at line 80 of file osapi-sockets.h.

12.193.3.3 OS_SocketType_t `enum OS_SocketType_t`

Socket type.

Enumerator

OS_SocketType_INVALID	Invalid.
OS_SocketType_DATAGRAM	A connectionless, message-oriented socket.
OS_SocketType_STREAM	A stream-oriented socket with the concept of a connection.
OS_SocketType_MAX	Maximum.

Definition at line 70 of file osapi-sockets.h.

12.194 osal/src/os/inc/osapi-task.h File Reference

```
#include "osconfig.h"
#include "common_types.h"
```

Data Structures

- struct OS_task_prop_t

  OSAL task properties.

Macros

- #define OS_MAX_TASK_PRIORITY 255

  Upper limit for OSAL task priorities.
- #define OS_FP_ENABLED 1

  Floating point enabled state for a task.
- #define OSAL_PRIORITY_C(X) ((osal_priority_t) {X})
- #define OSAL_STACKPTR_C(X) ((osal_stackptr_t) {X})
- #define OSAL_TASK_STACK_ALLOCATE OSAL_STACKPTR_C(NULL)

Typedefs

- typedef uint8_t osal_priority_t

  Type to be used for OSAL task priorities.
- typedef void * osal_stackptr_t

  Type to be used for OSAL stack pointer.
- typedef void osal_task

  For task entry point.

Functions

- typedef osal_task ((*osal_task_entry)(void))

  For task entry point.
- int32 OS_TaskCreate (osal_id_t *task_id, const char *task_name, osal_task_entry function_pointer, osal_stackptr_t stack_pointer, size_t stack_size, osal_priority_t priority, uint32 flags)

Creates a task and starts running it.

- int32 OS_TaskDelete (osal_id_t task_id)

  Deletes the specified Task.

- void OS_TaskExit (void)

  Exits the calling task.

- int32 OS_TaskInstallDeleteHandler (osal_task_entry function_pointer)

  Installs a handler for when the task is deleted.

- int32 OS_TaskDelay (uint32 millisecond)

  Delay a task for specified amount of milliseconds.

- int32 OS_TaskSetPriority (osal_id_t task_id, osal_priority_t new_priority)

  Sets the given task to a new priority.

- osal_id_t OS_TaskGetId (void)

  Obtain the task id of the calling task.

- int32 OS_TaskGetIdByName (osal_id_t *task_id, const char *task_name)

  Find an existing task ID by name.

- int32 OS_TaskGetInfo (osal_id_t task_id, OS_task_prop_t *task_prop)

  Fill a property object buffer with details regarding the resource.

- int32 OS_TaskFindIdBySystemData (osal_id_t *task_id, const void *sysdata, size_t sysdata_size)

  Reverse-lookup the OSAL task ID from an operating system ID.

12.194.1 Detailed Description

Declarations and prototypes for task abstraction

12.194.2 Macro Definition Documentation

12.194.2.1 OS_FP_ENABLED `#define OS_FP_ENABLED 1`

Floating point enabled state for a task.
Definition at line 35 of file osapi-task.h.

12.194.2.2 OS_MAX_TASK_PRIORITY `#define OS_MAX_TASK_PRIORITY 255`

Upper limit for OSAL task priorities.
Definition at line 32 of file osapi-task.h.

12.194.2.3 OSAL_PRIORITY_C `#define OSAL_PRIORITY_C( X ) ((osal_priority_t) {X})`

Definition at line 46 of file osapi-task.h.

12.194.2.4 OSAL_STACKPTR_C `#define OSAL_STACKPTR_C( X ) ((osal_stackptr_t) {X})`

Definition at line 53 of file osapi-task.h.

12.194.2.5 OSAL_TASK_STACK_ALLOCATE `#define OSAL_TASK_STACK_ALLOCATE OSAL_STACKPTR_C(NULL)`

Definition at line 54 of file osapi-task.h.

12.194.3 Typedef Documentation

12.194.3.1 osal_priority_t `typedef uint8_t osal_priority_t`

Type to be used for OSAL task priorities.
OSAL priorities are in reverse order, and range from 0 (highest; will preempt all other tasks) to 255 (lowest; will not preempt any other task).
Definition at line 44 of file osapi-task.h.

12.194.3.2 osal_stackptr_t `typedef void* osal_stackptr_t`

Type to be used for OSAL stack pointer.
Definition at line 51 of file osapi-task.h.

12.194.3.3 osal_task `typedef void osal_task`

For task entry point.
Definition at line 68 of file osapi-task.h.

12.194.4 Function Documentation

12.194.4.1 osal_task() `typedef osal_task ( (*)(void) osal_task_entry )`

For task entry point.

12.195 osal/src/os/inc/osapi-timebase.h File Reference

```
#include "osconfig.h"
#include "common_types.h"
```

Data Structures

- struct OS_timebase_prop_t

  Time base properties.

Typedefs

- typedef uint32(* OS_TimerSync_t) (osal_id_t timer_id)

  Timer sync.

Functions

- int32 OS_TimeBaseCreate (osal_id_t *timebase_id, const char *timebase_name, OS_TimerSync_t external_↩sync)

  Create an abstract Time Base resource.
- int32 OS_TimeBaseSet (osal_id_t timebase_id, uint32 start_time, uint32 interval_time)

  Sets the tick period for simulated time base objects.
- int32 OS_TimeBaseDelete (osal_id_t timebase_id)

  Deletes a time base object.

- int32 OS_TimeBaseGetIdByName (osal_id_t *timebase_id, const char *timebase_name)

  Find the ID of an existing time base resource.
- int32 OS_TimeBaseGetInfo (osal_id_t timebase_id, OS_timebase_prop_t *timebase_prop)

  Obtain information about a timebase resource.
- int32 OS_TimeBaseGetFreeRun (osal_id_t timebase_id, uint32 *freerun_val)

  Read the value of the timebase free run counter.

12.195.1 Detailed Description

Declarations and prototypes for timebase abstraction

12.195.2 Typedef Documentation

12.195.2.1 OS_TimerSync_t `typedef uint32(* OS_TimerSync_t) (osal_id_t timer_id)`

Timer sync.
Definition at line 34 of file osapi-timebase.h.

12.196 osal/src/os/inc/osapi-timer.h File Reference

```
#include "osconfig.h"
#include "common_types.h"
```

Data Structures

- struct OS_timer_prop_t

  Timer properties.

Typedefs

- typedef void(* OS_TimerCallback_t) (osal_id_t timer_id)

  Timer callback.

Functions

- int32 OS_TimerCreate (osal_id_t *timer_id, const char *timer_name, uint32 *clock_accuracy, OS_TimerCallback_t callback_ptr)

  Create a timer object.
- int32 OS_TimerAdd (osal_id_t *timer_id, const char *timer_name, osal_id_t timebase_id, OS_ArgCallback_t callback_ptr, void *callback_arg)

  Add a timer object based on an existing TimeBase resource.
- int32 OS_TimerSet (osal_id_t timer_id, uint32 start_time, uint32 interval_time)

  Configures a periodic or one shot timer.
- int32 OS_TimerDelete (osal_id_t timer_id)

  Deletes a timer resource.
- int32 OS_TimerGetIdByName (osal_id_t *timer_id, const char *timer_name)

  Locate an existing timer resource by name.
- int32 OS_TimerGetInfo (osal_id_t timer_id, OS_timer_prop_t *timer_prop)

  Gets information about an existing timer.

12.196.1 Detailed Description

Declarations and prototypes for timer abstraction (app callbacks)

12.196.2 Typedef Documentation

12.196.2.1 OS_TimerCallback_t `typedef void(* OS_TimerCallback_t) (osal_id_t timer_id)`

Timer callback.
Definition at line 34 of file osapi-timer.h.

12.197 osal/src/os/inc/osapi-version.h File Reference

```
#include "common_types.h"
```

Macros

- #define OS_BUILD_NUMBER 85
- #define OS_BUILD_BASELINE "equuleus-rc1"
- #define OS_BUILD_DEV_CYCLE "equuleus-rc2"

  Development: Release name for current development cycle.
- #define OS_BUILD_CODENAME "Equuleus"

  : Development: Code name for the current build
- #define OS_MAJOR_VERSION 5

  Major version number.
- #define OS_MINOR_VERSION 0

  Minor version number.
- #define OS_REVISION 0

  Revision version number. Value of 99 indicates a development version.
- #define OS_LAST_OFFICIAL "v5.0.0"

  Last official release.
- #define OS_MISSION_REV 0xFF

  Mission revision.
- #define OS_STR_HELPER(x) #x

  Helper function to concatenate strings from integer.
- #define OS_STR(x) OS_STR_HELPER(x)

  Helper function to concatenate strings from integer.
- #define OS_VERSION OS_BUILD_BASELINE "+dev" OS_STR(OS_BUILD_NUMBER)

  Development Build Version Number.
- #define OSAL_API_VERSION ((OS_MAJOR_VERSION * 10000) + (OS_MINOR_VERSION * 100) + OS_REVISION)

  Combines the revision components into a single value.
- #define OS_CFG_MAX_VERSION_STR_LEN 256

  Max Version String length.

Functions

- const char * OS_GetVersionString (void)
- const char * OS_GetVersionCodeName (void)
- void OS_GetVersionNumber (uint8 VersionNumbers[4])

  Obtain the OSAL numeric version number.
- uint32 OS_GetBuildNumber (void)

  Obtain the OSAL library numeric build number.

12.197.1 Detailed Description

Provide version identifiers for Operating System Abstraction Layer

Note

OSAL follows the same version semantics as cFS, which in turn is based on the Semantic Versioning 2.0 Specification. For more information, see the documentation provided with cFE.

12.197.2 Macro Definition Documentation

12.197.2.1 OS_BUILD_BASELINE `#define OS_BUILD_BASELINE "equuleus-rc1"`

Definition at line 38 of file osapi-version.h.

12.197.2.2 OS_BUILD_CODENAME `#define OS_BUILD_CODENAME "Equuleus"`

: Development: Code name for the current build

Definition at line 40 of file osapi-version.h.

12.197.2.3 OS_BUILD_DEV_CYCLE `#define OS_BUILD_DEV_CYCLE "equuleus-rc2"`

Development: Release name for current development cycle.

Definition at line 39 of file osapi-version.h.

12.197.2.4 OS_BUILD_NUMBER `#define OS_BUILD_NUMBER 85`

Definition at line 37 of file osapi-version.h.

12.197.2.5 OS_CFG_MAX_VERSION_STR_LEN `#define OS_CFG_MAX_VERSION_STR_LEN 256`

Max Version String length.

Maximum length that an OSAL version string can be.

Definition at line 154 of file osapi-version.h.

12.197.2.6 OS_LAST_OFFICIAL `#define OS_LAST_OFFICIAL "v5.0.0"`

Last official release.

Definition at line 52 of file osapi-version.h.

12.197.2.7 OS_MAJOR_VERSION `#define OS_MAJOR_VERSION 5`

Major version number.
Definition at line 45 of file osapi-version.h.

12.197.2.8 OS_MINOR_VERSION `#define OS_MINOR_VERSION 0`

Minor version number.
Definition at line 46 of file osapi-version.h.

12.197.2.9 OS_MISSION_REV `#define OS_MISSION_REV 0xFF`

Mission revision.
Reserved for mission use to denote patches/customizations as needed. Values 1-254 are reserved for mission use to denote patches/customizations as needed. NOTE: Reserving 0 and 0xFF for cFS open-source development use (pending resolution of nasa/cFS#440)
Definition at line 61 of file osapi-version.h.

12.197.2.10 OS_REVISION `#define OS_REVISION 0`

Revision version number. Value of 99 indicates a development version.
Definition at line 47 of file osapi-version.h.

12.197.2.11 OS_STR `#define OS_STR( x ) OS_STR_HELPER(x)`

Helper function to concatenate strings from integer.
Definition at line 67 of file osapi-version.h.

12.197.2.12 OS_STR_HELPER `#define OS_STR_HELPER( x ) #x`

Helper function to concatenate strings from integer.
Definition at line 66 of file osapi-version.h.

12.197.2.13 OS_VERSION `#define OS_VERSION OS_BUILD_BASELINE "+dev" OS_STR(OS_BUILD_NUMBER)`

Development Build Version Number.
Baseline git tag + Number of commits since baseline.

Definition at line 72 of file osapi-version.h.

12.197.2.14 OSAL_API_VERSION `#define OSAL_API_VERSION ((OS_MAJOR_VERSION * 10000) + (OS_MINOR_VERSION * 100) + OS_REVISION)`

Combines the revision components into a single value.
Applications can check against this number
e.g. "#if OSAL_API_VERSION >= 40100" would check if some feature added in OSAL 4.1 is present.
Definition at line 79 of file osapi-version.h.

12.197.3 Function Documentation

12.197.3.1 OS_GetBuildNumber() `uint32 OS_GetBuildNumber ( void )`

Obtain the OSAL library numeric build number.
The build number is a monotonically increasing number that (coarsely) reflects the number of commits/changes that have been merged since the epoch release. During development cycles this number should increase after each subsequent merge/modification.
Like other version information, this is a fixed number assigned at compile time.

Returns

The OSAL library build number

12.197.3.2 OS_GetVersionCodeName() `const char* OS_GetVersionCodeName ( void )`

Gets the OSAL version code name
All NASA CFE/CFS components (including CFE framework, OSAL and PSP) that work together will share the same code name.

Returns

OSAL code name. This is a fixed value string and is never NULL.

12.197.3.3 OS_GetVersionNumber() `void OS_GetVersionNumber ( uint8 VersionNumbers[4] )`

Obtain the OSAL numeric version number.
This retrieves the numeric OSAL version identifier as an array of 4 uint8 values.
The array of numeric values is in order of precedence: [0] = Major Number [1] = Minor Number [2] = Revision Number [3] = Mission Revision
The "Mission Revision" (last output) also indicates whether this is an official release, a patched release, or a development version. 0 indicates an official release 1-254 local patch level (reserved for mission use) 255 indicates a development build

Parameters

out	*VersionNumbers*	A fixed-size array to be filled with the version numbers

12.197.3.4 OS_GetVersionString() `const char* OS_GetVersionString ( void )`

Gets the OSAL version/baseline ID as a string
This returns the content of the OS_VERSION macro defined above, and is specifically just the baseline and development build ID (if applicable), without any extra info.

Returns

Basic version identifier. This is a fixed value string and is never NULL.

12.198 osal/src/os/inc/osapi.h File Reference

```
#include <stdio.h>
#include <stdlib.h>
#include <stdarg.h>
```

```
#include "common_types.h"
#include "osapi-version.h"
#include "osconfig.h"
#include "osapi-binsem.h"
#include "osapi-clock.h"
#include "osapi-common.h"
#include "osapi-condvar.h"
#include "osapi-constants.h"
#include "osapi-countsem.h"
#include "osapi-dir.h"
#include "osapi-error.h"
#include "osapi-file.h"
#include "osapi-filesys.h"
#include "osapi-heap.h"
#include "osapi-macros.h"
#include "osapi-idmap.h"
#include "osapi-module.h"
#include "osapi-mutex.h"
#include "osapi-network.h"
#include "osapi-printf.h"
#include "osapi-queue.h"
#include "osapi-select.h"
#include "osapi-shell.h"
#include "osapi-sockets.h"
#include "osapi-task.h"
#include "osapi-timebase.h"
#include "osapi-timer.h"
#include "osapi-bsp.h"
```

12.198.1 Detailed Description

Purpose: Contains functions prototype definitions and variables declarations for the OS Abstraction Layer, Core OS module

12.199 psp/fsw/inc/cfe_psp.h File Reference

```
#include "common_types.h"
#include "osapi.h"
#include "cfe_psp_error.h"
```

Macros

- #define CFE_PSP_PANIC_STARTUP 1
- #define CFE_PSP_PANIC_VOLATILE_DISK 2
- #define CFE_PSP_PANIC_MEMORY_ALLOC 3
- #define CFE_PSP_PANIC_NONVOL_DISK 4
- #define CFE_PSP_PANIC_STARTUP_SEM 5
- #define CFE_PSP_PANIC_CORE_APP 6
- #define CFE_PSP_PANIC_GENERAL_FAILURE 7
- #define BUFF_SIZE 256
- #define SIZE_BYTE 1
- #define SIZE_HALF 2

- #define SIZE_WORD 3
- #define CFE_PSP_MEM_RAM 1
- #define CFE_PSP_MEM_EEPROM 2
- #define CFE_PSP_MEM_ANY 3
- #define CFE_PSP_MEM_INVALID 4
- #define CFE_PSP_MEM_ATTR_WRITE 0x01
- #define CFE_PSP_MEM_ATTR_READ 0x02
- #define CFE_PSP_MEM_ATTR_READWRITE 0x03
- #define CFE_PSP_MEM_SIZE_BYTE 0x01
- #define CFE_PSP_MEM_SIZE_WORD 0x02
- #define CFE_PSP_MEM_SIZE_DWORD 0x04
- #define CFE_PSP_SOFT_TIMEBASE_NAME "cFS-Master"

  The name of the software/RTOS timebase for general system timers.

Reset Types

- #define CFE_PSP_RST_TYPE_PROCESSOR 1
- #define CFE_PSP_RST_TYPE_POWERON 2
- #define CFE_PSP_RST_TYPE_MAX 3

Reset Sub-Types

- #define CFE_PSP_RST_SUBTYPE_POWER_CYCLE 1

  Reset caused by power having been removed and restored.
- #define CFE_PSP_RST_SUBTYPE_PUSH_BUTTON 2

  Reset caused by reset button on the board.
- #define CFE_PSP_RST_SUBTYPE_HW_SPECIAL_COMMAND 3

  Reset was caused by a reset line having been stimulated by a hardware special command.
- #define CFE_PSP_RST_SUBTYPE_HW_WATCHDOG 4

  Reset was caused by a watchdog timer expiring.
- #define CFE_PSP_RST_SUBTYPE_RESET_COMMAND 5

  Reset was caused by cFE ES processing a Reset Command .
- #define CFE_PSP_RST_SUBTYPE_EXCEPTION 6

  Reset was caused by a Processor Exception.
- #define CFE_PSP_RST_SUBTYPE_UNDEFINED_RESET 7

  Reset was caused in an unknown manner.
- #define CFE_PSP_RST_SUBTYPE_HWDEBUG_RESET 8

  Reset was caused by a JTAG or BDM connection.
- #define CFE_PSP_RST_SUBTYPE_BANKSWITCH_RESET 9

  Reset reverted to a cFE POWERON due to a boot bank switch.
- #define CFE_PSP_RST_SUBTYPE_MAX 10

  Placeholder to indicate 1+ the maximum value that the PSP will ever use.

Functions

- void CFE_PSP_Main (void)

  PSP Entry Point to initialize the OSAL and start up the cFE.
- void CFE_PSP_GetTime (OS_time_t *LocalTime)

  Sample/Read a monotonic platform clock with normalization.
- void CFE_PSP_Restart (uint32 resetType)

  Entry point back to the BSP to restart the processor.
- uint32 CFE_PSP_GetRestartType (uint32 *restartSubType)

  Returns the last reset type.

- void CFE_PSP_FlushCaches (uint32 type, void ∗address, uint32 size)

  This is a BSP-specific cache flush routine.
- uint32 CFE_PSP_GetProcessorId (void)

  Returns the CPU ID as defined by the specific board and BSP.
- uint32 CFE_PSP_GetSpacecraftId (void)

  Returns the Spacecraft ID (if any)
- const char ∗ CFE_PSP_GetProcessorName (void)

  Returns the processor name.
- uint32 CFE_PSP_Get_Timer_Tick (void)

  Returns the underlying OS timer tick value.
- uint32 CFE_PSP_GetTimerTicksPerSecond (void)
- uint32 CFE_PSP_GetTimerLow32Rollover (void)
- void CFE_PSP_Get_Timebase (uint32 ∗Tbu, uint32 ∗Tbl)

  Sample/Read a monotonic platform clock without normalization.
- uint32 CFE_PSP_Get_Dec (void)

  CFE_PSP_Get_Dec.
- int32 CFE_PSP_GetCDSSize (uint32 ∗SizeOfCDS)

  Fetches the size of the OS Critical Data Store area.
- int32 CFE_PSP_WriteToCDS (const void ∗PtrToDataToWrite, uint32 CDSOffset, uint32 NumBytes)

  Writes to the CDS Block.
- int32 CFE_PSP_ReadFromCDS (void ∗PtrToDataToRead, uint32 CDSOffset, uint32 NumBytes)

  Reads from the CDS Block.
- int32 CFE_PSP_GetResetArea (cpuaddr ∗PtrToResetArea, uint32 ∗SizeOfResetArea)

  Returns the location and size of the ES Reset information area.
- int32 CFE_PSP_GetUserReservedArea (cpuaddr ∗PtrToUserArea, uint32 ∗SizeOfUserArea)

  Returns the location and size of the memory used for the cFE user-reserved area.
- int32 CFE_PSP_GetVolatileDiskMem (cpuaddr ∗PtrToVolDisk, uint32 ∗SizeOfVolDisk)

  Returns the location and size of the memory used for the cFE volatile disk.
- int32 CFE_PSP_GetKernelTextSegmentInfo (cpuaddr ∗PtrToKernelSegment, uint32 ∗SizeOfKernelSegment)

  Returns the location and size of the kernel memory.
- int32 CFE_PSP_GetCFETextSegmentInfo (cpuaddr ∗PtrToCFESegment, uint32 ∗SizeOfCFESegment)

  Returns the location and size of the kernel memory.
- void CFE_PSP_WatchdogInit (void)

  Configures the watchdog timer.
- void CFE_PSP_WatchdogEnable (void)

  Enables the watchdog timer.
- void CFE_PSP_WatchdogDisable (void)

  Disables the watchdog timer.
- void CFE_PSP_WatchdogService (void)

  Services the watchdog timer according to the value set in WatchDogSet.
- uint32 CFE_PSP_WatchdogGet (void)

  Gets the watchdog time in milliseconds.
- void CFE_PSP_WatchdogSet (uint32 WatchdogValue)

  Sets the watchdog time in milliseconds.
- void CFE_PSP_Panic (int32 ErrorCode)

  Aborts the cFE startup.
- int32 CFE_PSP_InitSSR (uint32 bus, uint32 device, char ∗DeviceName)

Initializes the Solid State recorder memory for a particular platform.

- int32 CFE_PSP_Decompress (char ∗srcFileName, char ∗dstFileName)

  Uncompresses the source file to the file specified in the destination file name.
- void CFE_PSP_AttachExceptions (void)

  Sets up the exception environment for the chosen platform.
- void CFE_PSP_SetDefaultExceptionEnvironment (void)

  Defines the CPU and FPU exceptions that are enabled for each cFE Task/App.
- uint32 CFE_PSP_Exception_GetCount (void)

  Returns the unread exception count.
- int32 CFE_PSP_Exception_GetSummary (uint32 ∗ContextLogId, osal_id_t ∗TaskId, char ∗ReasonBuf, uint32 ReasonSize)

  Retrieves a summary of an exception log entry.
- int32 CFE_PSP_Exception_CopyContext (uint32 ContextLogId, void ∗ContextBuf, uint32 ContextSize)

  Retrieves exception log entry context information.
- int32 CFE_PSP_PortRead8 (cpuaddr PortAddress, uint8 ∗ByteValue)

  Read one byte of memory.
- int32 CFE_PSP_PortWrite8 (cpuaddr PortAddress, uint8 ByteValue)

  Write one byte of memory.
- int32 CFE_PSP_PortRead16 (cpuaddr PortAddress, uint16 ∗uint16Value)

  Read 2 bytes of memory.
- int32 CFE_PSP_PortWrite16 (cpuaddr PortAddress, uint16 uint16Value)

  Write 2 bytes of memory.
- int32 CFE_PSP_PortRead32 (cpuaddr PortAddress, uint32 ∗uint32Value)

  Read 4 bytes of memory.
- int32 CFE_PSP_PortWrite32 (cpuaddr PortAddress, uint32 uint32Value)

  Write 4 bytes of memory.
- int32 CFE_PSP_MemRead8 (cpuaddr MemoryAddress, uint8 ∗ByteValue)

  Read one byte of memory.
- int32 CFE_PSP_MemWrite8 (cpuaddr MemoryAddress, uint8 ByteValue)

  Write one byte of memory.
- int32 CFE_PSP_MemRead16 (cpuaddr MemoryAddress, uint16 ∗uint16Value)

  Read 2 bytes of memory.
- int32 CFE_PSP_MemWrite16 (cpuaddr MemoryAddress, uint16 uint16Value)

  Write 2 bytes of memory.
- int32 CFE_PSP_MemRead32 (cpuaddr MemoryAddress, uint32 ∗uint32Value)

  Read 4 bytes of memory.
- int32 CFE_PSP_MemWrite32 (cpuaddr MemoryAddress, uint32 uint32Value)

  Write 4 bytes of memory.
- int32 CFE_PSP_MemCpy (void ∗dest, const void ∗src, uint32 n)

  Copy 'n' bytes from 'src' to 'dest'.
- int32 CFE_PSP_MemSet (void ∗dest, uint8 value, uint32 n)

  Copy 'n' bytes of value 'value' to 'dest'.
- int32 CFE_PSP_MemValidateRange (cpuaddr Address, size_t Size, uint32 MemoryType)

  Validates the memory range and type using the global CFE_PSP_MemoryTable.
- uint32 CFE_PSP_MemRanges (void)

  Returns the number of memory ranges in the CFE_PSP_MemoryTable.

- int32 CFE_PSP_MemRangeSet (uint32 RangeNum, uint32 MemoryType, cpuaddr StartAddr, size_t Size, size_t WordSize, uint32 Attributes)

  Populates one of the records in the CFE_PSP_MemoryTable.
- int32 CFE_PSP_MemRangeGet (uint32 RangeNum, uint32 *MemoryType, cpuaddr *StartAddr, size_t *Size, size_t *WordSize, uint32 *Attributes)

  Retrieves one of the records in the CFE_PSP_MemoryTable.
- int32 CFE_PSP_EepromWrite8 (cpuaddr MemoryAddress, uint8 ByteValue)

  Write one byte (ByteValue) to EEPROM address MemoryAddress.
- int32 CFE_PSP_EepromWrite16 (cpuaddr MemoryAddress, uint16 uint16Value)

  Write two bytes (uint16Value) to EEPROM address MemoryAddress.
- int32 CFE_PSP_EepromWrite32 (cpuaddr MemoryAddress, uint32 uint32Value)

  Write four bytes (uint32Value) to EEPROM address MemoryAddress.
- int32 CFE_PSP_EepromWriteEnable (uint32 Bank)

  Enable the EEPROM for write operation.
- int32 CFE_PSP_EepromWriteDisable (uint32 Bank)

  Disable the EEPROM from write operation.
- int32 CFE_PSP_EepromPowerUp (uint32 Bank)

  Power up the EEPROM.
- int32 CFE_PSP_EepromPowerDown (uint32 Bank)

  Power down the EEPROM.
- const char * CFE_PSP_GetVersionString (void)

  Obtain the PSP version/baseline identifier string.
- const char * CFE_PSP_GetVersionCodeName (void)

  Obtain the version code name.
- void CFE_PSP_GetVersionNumber (uint8 VersionNumbers[4])

  Retrieves the numeric PSP version identifier as an array of uint8 values.
- uint32 CFE_PSP_GetBuildNumber (void)

  Obtain the PSP library numeric build number.

12.199.1 Macro Definition Documentation

12.199.1.1 BUFF_SIZE `#define BUFF_SIZE 256`

Definition at line 62 of file cfe_psp.h.

12.199.1.2 CFE_PSP_MEM_ANY `#define CFE_PSP_MEM_ANY 3`

Definition at line 72 of file cfe_psp.h.

12.199.1.3 CFE_PSP_MEM_ATTR_READ `#define CFE_PSP_MEM_ATTR_READ 0x02`

Definition at line 79 of file cfe_psp.h.

12.199.1.4 CFE_PSP_MEM_ATTR_READWRITE `#define CFE_PSP_MEM_ATTR_READWRITE 0x03`

Definition at line 80 of file cfe_psp.h.

12.199.1.5 CFE_PSP_MEM_ATTR_WRITE `#define CFE_PSP_MEM_ATTR_WRITE 0x01`
Definition at line 78 of file cfe_psp.h.

12.199.1.6 CFE_PSP_MEM_EEPROM `#define CFE_PSP_MEM_EEPROM 2`
Definition at line 71 of file cfe_psp.h.

12.199.1.7 CFE_PSP_MEM_INVALID `#define CFE_PSP_MEM_INVALID 4`
Definition at line 73 of file cfe_psp.h.

12.199.1.8 CFE_PSP_MEM_RAM `#define CFE_PSP_MEM_RAM 1`
Definition at line 70 of file cfe_psp.h.

12.199.1.9 CFE_PSP_MEM_SIZE_BYTE `#define CFE_PSP_MEM_SIZE_BYTE 0x01`
Definition at line 85 of file cfe_psp.h.

12.199.1.10 CFE_PSP_MEM_SIZE_DWORD `#define CFE_PSP_MEM_SIZE_DWORD 0x04`
Definition at line 87 of file cfe_psp.h.

12.199.1.11 CFE_PSP_MEM_SIZE_WORD `#define CFE_PSP_MEM_SIZE_WORD 0x02`
Definition at line 86 of file cfe_psp.h.

12.199.1.12 CFE_PSP_PANIC_CORE_APP `#define CFE_PSP_PANIC_CORE_APP 6`
Definition at line 56 of file cfe_psp.h.

12.199.1.13 CFE_PSP_PANIC_GENERAL_FAILURE `#define CFE_PSP_PANIC_GENERAL_FAILURE 7`
Definition at line 57 of file cfe_psp.h.

12.199.1.14 CFE_PSP_PANIC_MEMORY_ALLOC `#define CFE_PSP_PANIC_MEMORY_ALLOC 3`
Definition at line 53 of file cfe_psp.h.

12.199.1.15 CFE_PSP_PANIC_NONVOL_DISK `#define CFE_PSP_PANIC_NONVOL_DISK 4`
Definition at line 54 of file cfe_psp.h.

12.199.1.16 CFE_PSP_PANIC_STARTUP `#define CFE_PSP_PANIC_STARTUP 1`
Definition at line 51 of file cfe_psp.h.

12.199.1.17 CFE_PSP_PANIC_STARTUP_SEM `#define CFE_PSP_PANIC_STARTUP_SEM 5`
Definition at line 55 of file cfe_psp.h.

12.199.1.18 CFE_PSP_PANIC_VOLATILE_DISK `#define CFE_PSP_PANIC_VOLATILE_DISK 2`

Definition at line 52 of file cfe_psp.h.

12.199.1.19 CFE_PSP_RST_SUBTYPE_BANKSWITCH_RESET `#define CFE_PSP_RST_SUBTYPE_BANKSWITCH↩_RESET 9`

Reset reverted to a cFE POWERON due to a boot bank switch.
Definition at line 122 of file cfe_psp.h.

12.199.1.20 CFE_PSP_RST_SUBTYPE_EXCEPTION `#define CFE_PSP_RST_SUBTYPE_EXCEPTION 6`

Reset was caused by a Processor Exception.
Definition at line 116 of file cfe_psp.h.

12.199.1.21 CFE_PSP_RST_SUBTYPE_HW_SPECIAL_COMMAND `#define CFE_PSP_RST_SUBTYPE_HW_SPEC↩IAL_COMMAND 3`

Reset was caused by a reset line having been stimulated by a hardware special command.
Definition at line 110 of file cfe_psp.h.

12.199.1.22 CFE_PSP_RST_SUBTYPE_HW_WATCHDOG `#define CFE_PSP_RST_SUBTYPE_HW_WATCHDOG 4`

Reset was caused by a watchdog timer expiring.
Definition at line 112 of file cfe_psp.h.

12.199.1.23 CFE_PSP_RST_SUBTYPE_HWDEBUG_RESET `#define CFE_PSP_RST_SUBTYPE_HWDEBUG_RESET 8`

Reset was caused by a JTAG or BDM connection.
Definition at line 120 of file cfe_psp.h.

12.199.1.24 CFE_PSP_RST_SUBTYPE_MAX `#define CFE_PSP_RST_SUBTYPE_MAX 10`

Placeholder to indicate 1+ the maximum value that the PSP will ever use.
Definition at line 124 of file cfe_psp.h.

12.199.1.25 CFE_PSP_RST_SUBTYPE_POWER_CYCLE `#define CFE_PSP_RST_SUBTYPE_POWER_CYCLE 1`

Reset caused by power having been removed and restored.
Definition at line 106 of file cfe_psp.h.

12.199.1.26 CFE_PSP_RST_SUBTYPE_PUSH_BUTTON `#define CFE_PSP_RST_SUBTYPE_PUSH_BUTTON 2`

Reset caused by reset button on the board.
Definition at line 108 of file cfe_psp.h.

12.199.1.27 CFE_PSP_RST_SUBTYPE_RESET_COMMAND `#define CFE_PSP_RST_SUBTYPE_RESET_COMMAND 5`

Reset was caused by cFE ES processing a Reset Command .
Definition at line 114 of file cfe_psp.h.

12.199.1.28 CFE_PSP_RST_SUBTYPE_UNDEFINED_RESET `#define CFE_PSP_RST_SUBTYPE_UNDEFINED_RE↩ SET 7`

Reset was caused in an unknown manner.
Definition at line 118 of file cfe_psp.h.

12.199.1.29 CFE_PSP_RST_TYPE_MAX `#define CFE_PSP_RST_TYPE_MAX 3`

Placeholder to indicate 1+ the maximum value that the PSP will ever use.
Definition at line 96 of file cfe_psp.h.

12.199.1.30 CFE_PSP_RST_TYPE_POWERON `#define CFE_PSP_RST_TYPE_POWERON 2`

All memory has been cleared
Definition at line 95 of file cfe_psp.h.

12.199.1.31 CFE_PSP_RST_TYPE_PROCESSOR `#define CFE_PSP_RST_TYPE_PROCESSOR 1`

Volatile disk, CDS and User Reserved memory may be valid
Definition at line 94 of file cfe_psp.h.

12.199.1.32 CFE_PSP_SOFT_TIMEBASE_NAME `#define CFE_PSP_SOFT_TIMEBASE_NAME "cFS-Master"`

The name of the software/RTOS timebase for general system timers.
This name may be referred to by CFE TIME and/or SCH when setting up its own timers.
Definition at line 132 of file cfe_psp.h.

12.199.1.33 SIZE_BYTE `#define SIZE_BYTE 1`

Definition at line 63 of file cfe_psp.h.

12.199.1.34 SIZE_HALF `#define SIZE_HALF 2`

Definition at line 64 of file cfe_psp.h.

12.199.1.35 SIZE_WORD `#define SIZE_WORD 3`

Definition at line 65 of file cfe_psp.h.

12.199.2 Function Documentation

12.199.2.1 CFE_PSP_AttachExceptions()

```
void CFE_PSP_AttachExceptions (
    void )
```

Sets up the exception environment for the chosen platform.
On a board, this can be configured to look at a debug flag or switch in order to keep the standard OS exception handlers, rather than restarting the system.

12.199.2.2 CFE_PSP_Decompress()

```
int32 CFE_PSP_Decompress (
    char * srcFileName,
    char * dstFileName )
```

Uncompresses the source file to the file specified in the destination file name.

Note

The Decompress uses the "gzip" algorithm. Files can be compressed using the "gzip" program available on almost all host platforms.

Parameters

srcFileName	Source file to decompress
dstFileName	Destination file name

12.199.2.3 CFE_PSP_EepromPowerDown()

```
int32 CFE_PSP_EepromPowerDown (
    uint32 Bank )
```

Power down the EEPROM.

Parameters

in	*Bank*	The bank of EEPROM to power down

Return values

CFE_PSP_SUCCESS	on success
CFE_PSP_ERROR_NOT_IMPLEMENTED	if not implemented

12.199.2.4 CFE_PSP_EepromPowerUp()

```
int32 CFE_PSP_EepromPowerUp (
    uint32 Bank )
```

Power up the EEPROM.

Parameters

in	*Bank*	The bank of EEPROM to power up

Return values

CFE_PSP_SUCCESS	on success
CFE_PSP_ERROR_NOT_IMPLEMENTED	if not implemented

12.199.2.5 CFE_PSP_EepromWrite16()

```
int32 CFE_PSP_EepromWrite16 (
    cpuaddr MemoryAddress,
    uint16 uint16Value )
```

Write two bytes (uint16Value) to EEPROM address MemoryAddress.

Parameters

out	*MemoryAddress*	Memory address to write to

Parameters

in	*uint16Value*	Value to write to memory

Return values

CFE_PSP_SUCCESS	on success
CFE_PSP_ERROR_TIMEOUT	write operation did not go through after a specific timeout.
CFE_PSP_ERROR_ADDRESS_MISALIGNED	if the address is not aligned to a 16-bit addressing scheme.
CFE_PSP_ERROR_NOT_IMPLEMENTED	if not implemented

12.199.2.6 CFE_PSP_EepromWrite32()

```
int32 CFE_PSP_EepromWrite32 (
    cpuaddr MemoryAddress,
    uint32 uint32Value )
```

Write four bytes (uint32Value) to EEPROM address MemoryAddress.

Parameters

out	*MemoryAddress*	Memory address to write to
in	*uint32Value*	Value to write to memory

Return values

CFE_PSP_SUCCESS	on success
CFE_PSP_ERROR_TIMEOUT	write operation did not go through after a specific timeout.
CFE_PSP_ERROR_ADDRESS_MISALIGNED	if the address is not aligned to a 16-bit addressing scheme.
CFE_PSP_ERROR_NOT_IMPLEMENTED	if not implemented

12.199.2.7 CFE_PSP_EepromWrite8()

```
int32 CFE_PSP_EepromWrite8 (
    cpuaddr MemoryAddress,
    uint8 ByteValue )
```

Write one byte (ByteValue) to EEPROM address MemoryAddress.

Parameters

out	*MemoryAddress*	Memory address to write to
in	*ByteValue*	Value to write to memory

Return values

CFE_PSP_SUCCESS	on success
CFE_PSP_ERROR_TIMEOUT	write operation did not go through after a specific timeout.
CFE_PSP_ERROR_ADDRESS_MISALIGNED	if the address is not aligned to a 16-bit addressing scheme.
CFE_PSP_ERROR_NOT_IMPLEMENTED	if not implemented

12.199.2.8 CFE_PSP_EepromWriteDisable()

```
int32 CFE_PSP_EepromWriteDisable (
    uint32 Bank )
```

Disable the EEPROM from write operation.

Parameters

in	*Bank*	The bank of EEPROM to disable

Return values

CFE_PSP_SUCCESS	on success
CFE_PSP_ERROR_NOT_IMPLEMENTED	if not implemented

12.199.2.9 CFE_PSP_EepromWriteEnable()

```
int32 CFE_PSP_EepromWriteEnable (
    uint32 Bank )
```

Enable the EEPROM for write operation.

Parameters

in	*Bank*	The bank of EEPROM to enable

Return values

CFE_PSP_SUCCESS	on success
CFE_PSP_ERROR_NOT_IMPLEMENTED	if not implemented

12.199.2.10 CFE_PSP_Exception_CopyContext()

```
int32 CFE_PSP_Exception_CopyContext (
    uint32 ContextLogId,
    void * ContextBuf,
    uint32 ContextSize )
```

Retrieves exception log entry context information.

Parameters

in	*ContextLogId*	ID of the exception log entry to copy
out	*ContextBuf*	Pointer to the buffer where the context information is to be copied to
in	*ContextSize*	Maximum size of context information data to copy

Returns

Size of the copied data

Return values

CFE_PSP_NO_EXCEPTION_DATA	if data has expired from the memory log

12.199.2.11 CFE_PSP_Exception_GetCount()

```
uint32 CFE_PSP_Exception_GetCount (
    void )
```

Returns the unread exception count.

Returns

The unread exception count

12.199.2.12 CFE_PSP_Exception_GetSummary()

```
int32 CFE_PSP_Exception_GetSummary (
    uint32 * ContextLogId,
    osal_id_t * TaskId,
    char * ReasonBuf,
    uint32 ReasonSize )
```

Retrieves a summary of an exception log entry.

Note

This function returns CFE_PSP_SUCCESS to indicate that an entry was popped from the queue. This doesn't necessarily mean that the output fields have valid data, but it does mean they are initialized to something.

Parameters

in	*ContextLogId*	ID of the exception log entry to get a summary for
in,out	*TaskId*	Pointer to the TaskID buffer
out	*ReasonBuf*	Pointer to the buffer that will store the exception summary string
in	*ReasonSize*	Maximum size of the summary string to retrieve

Return values

CFE_PSP_SUCCESS	on success (see note above)
CFE_PSP_NO_EXCEPTION_DATA	if no context available for reading

12.199.2.13 CFE_PSP_FlushCaches()

```
void CFE_PSP_FlushCaches (
    uint32 type,
    void * address,
    uint32 size )
```

This is a BSP-specific cache flush routine.
Provides a common interface to flush the processor caches. This routine is in the BSP because it is sometimes implemented in hardware and sometimes taken care of by the RTOS.

Parameters

in	*type*	
in	*address*	
in	*size*	

12.199.2.14 CFE_PSP_Get_Dec()

```
uint32 CFE_PSP_Get_Dec (
    void )
```

CFE_PSP_Get_Dec.

12.199.2.15 CFE_PSP_Get_Timebase()

```
void CFE_PSP_Get_Timebase (
    uint32 * Tbu,
    uint32 * Tbl )
```

Sample/Read a monotonic platform clock without normalization.
Provides a common interface to system timebase. This routine is in the BSP because it is sometimes implemented in hardware and sometimes taken care of by the RTOS.
This is defined as a free-running, monotonically-increasing tick counter. The epoch is not defined, but typically is the system boot time, and the value increases indefinitely as the system runs. The tick period/rate is also not defined.
Rollover events - where the range of representable values is exceeded - are theoretically possible, but would take many years of continuous uptime to occur (typically hundreds of years, if not thousands). System designers should ensure that the actual tick rate and resulting timebase range is sufficiently large to ensure that rollover is not a concern.

Note

This is a "raw" value from the underlying platform with minimal/no conversions or normalization applied. Neither the epoch nor the resolution of this tick counter is specified, and it may vary from platform to platform. Use the CFE_PSP_GetTime() function to sample the timebase and also convert the units into a normalized/more consistent form.

See also

CFE_PSP_GetTime()

Parameters

out	*Tbu*	Buffer to hold the upper 32 bits of a 64-bit tick counter
out	*Tbl*	Buffer to hold the lower 32 bits of a 64-bit tick counter

12.199.2.16 CFE_PSP_Get_Timer_Tick()

```
uint32 CFE_PSP_Get_Timer_Tick (
    void )
```

Returns the underlying OS timer tick value.
It is used for the performance monitoring software

12.199.2.17 CFE_PSP_GetBuildNumber()

```
uint32 CFE_PSP_GetBuildNumber (
    void )
```

Obtain the PSP library numeric build number.
The build number is a monotonically increasing number that (coarsely) reflects the number of commits/changes that have

been merged since the epoch release. During development cycles this number should increase after each subsequent merge/modification.
Like other version information, this is a fixed number assigned at compile time.

Returns

The OSAL library build number

12.199.2.18 CFE_PSP_GetCDSSize()

```
int32 CFE_PSP_GetCDSSize (
    uint32 * SizeOfCDS )
```

Fetches the size of the OS Critical Data Store area.

Parameters

out	*SizeOfCDS*	Pointer to the variable that will store the size of the CDS

Returns

0 (OS_SUCCESS or CFE_PSP_SUCCESS) on success, -1 (OS_ERROR or CFE_PSP_ERROR) on error

12.199.2.19 CFE_PSP_GetCFETextSegmentInfo()

```
int32 CFE_PSP_GetCFETextSegmentInfo (
    cpuaddr * PtrToCFESegment,
    uint32 * SizeOfCFESegment )
```

Returns the location and size of the kernel memory.
This function returns the start and end address of the CFE text segment. It may not be implemented on all architectures.

Parameters

out	*PtrToCFESegment*	Pointer to the variable that will store the location of the cFE text segment
out	*SizeOfCFESegment*	Pointer to the variable that will store the size of the cFE text segment

Returns

0 (OS_SUCCESS or CFE_PSP_SUCCESS) on success, -1 (OS_ERROR or CFE_PSP_ERROR) on error

12.199.2.20 CFE_PSP_GetKernelTextSegmentInfo()

```
int32 CFE_PSP_GetKernelTextSegmentInfo (
    cpuaddr * PtrToKernelSegment,
    uint32 * SizeOfKernelSegment )
```

Returns the location and size of the kernel memory.
This function returns the start and end address of the kernel text segment. It may not be implemented on all architectures.

Parameters

out	*PtrToKernelSegment*	Pointer to the variable that will store the location of the kernel text segment
out	*SizeOfKernelSegment*	Pointer to the variable that will store the size of the kernel text segment

Returns

0 (OS_SUCCESS or CFE_PSP_SUCCESS) on success, -1 (OS_ERROR or CFE_PSP_ERROR) on error or CFE_PSP_ERROR_NOT_IMPLEMENTED if not implemented

12.199.2.21 CFE_PSP_GetProcessorId()

```
uint32 CFE_PSP_GetProcessorId (
    void )
```

Returns the CPU ID as defined by the specific board and BSP.

Returns

The processor ID

12.199.2.22 CFE_PSP_GetProcessorName()

```
const char* CFE_PSP_GetProcessorName (
    void )
```

Returns the processor name.

Returns

The processor name

12.199.2.23 CFE_PSP_GetResetArea()

```
int32 CFE_PSP_GetResetArea (
    cpuaddr * PtrToResetArea,
    uint32 * SizeOfResetArea )
```

Returns the location and size of the ES Reset information area.
This area is preserved during a processor reset and is used to store the ER Log, System Log and reset-related variables

Parameters

out	*PtrToResetArea*	Pointer to the variable that will store the location of the reset area
out	*SizeOfResetArea*	Pointer to the variable that will store the reset area size

Returns

0 (OS_SUCCESS or CFE_PSP_SUCCESS) on success, -1 (OS_ERROR or CFE_PSP_ERROR) on error

12.199.2.24 CFE_PSP_GetRestartType()

```
uint32 CFE_PSP_GetRestartType (
    uint32 * restartSubType )
```

Returns the last reset type.

Note

If a pointer to a valid memory space is passed in, it returns the reset sub-type in that memory. Right now the reset types are application-specific. For the cFE they are defined in the cfe_es.h file.

Parameters

restartSubType	

12.199.2.25 CFE_PSP_GetSpacecraftId() `uint32 CFE_PSP_GetSpacecraftId ( void )`

Returns the Spacecraft ID (if any)

Returns

The Spacecraft ID

12.199.2.26 CFE_PSP_GetTime() `void CFE_PSP_GetTime ( OS_time_t * LocalTime )`

Sample/Read a monotonic platform clock with normalization.
Outputs an OS_time_t value indicating the time elapsed since an epoch. The epoch is not defined, but typically represents the system boot time. The value increases continuously over time and cannot be reset by software.
This is similar to the CFE_PSP_Get_Timebase(), but additionally it normalizes the output value to an OS_time_t, thereby providing consistent units to the calling application. Any OSAL-provided routine that accepts OS_time_t inputs may be used to convert this value into other standardized time units.

Note

This should refer to the same time domain as CFE_PSP_Get_Timebase(), the primary difference being the format and units of the output value.

See also

CFE_PSP_Get_Timebase()

Parameters

out	*LocalTime*	Value of PSP tick counter as OS_time_t

12.199.2.27 CFE_PSP_GetTimerLow32Rollover() `uint32 CFE_PSP_GetTimerLow32Rollover ( void )`

Provides the number that the least significant 32 bits of the 64-bit time stamp returned by CFE_PSP_Get_Timebase rolls over. If the lower 32 bits rolls at 1 second, then the CFE_PSP_TIMER_LOW32_ROLLOVER will be 1000000. If the lower 32 bits rolls at its maximum value (2^32) then CFE_PSP_TIMER_LOW32_ROLLOVER will be 0.

Returns

The number that the least significant 32 bits of the 64-bit time stamp returned by CFE_PSP_Get_Timebase rolls over.

12.199.2.28 CFE_PSP_GetTimerTicksPerSecond() `uint32 CFE_PSP_GetTimerTicksPerSecond ( void )`

Provides the resolution of the least significant 32 bits of the 64-bit time stamp returned by CFE_PSP_Get_Timebase in timer ticks per second. The timer resolution for accuracy should not be any slower than 1000000 ticks per second or 1 us (microsecond) per tick

Returns

The number of timer ticks per second of the time stamp returned by CFE_PSP_Get_Timebase

12.199.2.29 CFE_PSP_GetUserReservedArea()

```
int32 CFE_PSP_GetUserReservedArea (
    cpuaddr * PtrToUserArea,
    uint32 * SizeOfUserArea )
```

Returns the location and size of the memory used for the cFE user-reserved area.

Parameters

out	*PtrToUserArea*	Pointer to the variable that will store the location of the user-reserved area
out	*SizeOfUserArea*	Pointer to the variable that will store the size of the user-reserved area

Returns

0 (OS_SUCCESS or CFE_PSP_SUCCESS) on success, -1 (OS_ERROR or CFE_PSP_ERROR) on error

12.199.2.30 CFE_PSP_GetVersionCodeName()

```
const char* CFE_PSP_GetVersionCodeName (
    void )
```

Obtain the version code name.
This retrieves the PSP code name. This is a compatibility indicator for the overall NASA cFS ecosystem. All modular components which are intended to interoperate should report the same code name.

Returns

Code name. This is a fixed string and cannot be NULL.

12.199.2.31 CFE_PSP_GetVersionNumber()

```
void CFE_PSP_GetVersionNumber (
    uint8 VersionNumbers[4] )
```

Retrieves the numeric PSP version identifier as an array of uint8 values.
The array of numeric values is in order of precedence: [0] = Major Number [1] = Minor Number [2] = Revision Number [3] = Mission Revision
The "Mission Revision" (last output) also indicates whether this is an official release, a patched release, or a development version. 0 indicates an official release 1-254 local patch level (reserved for mission use) 255 indicates a development build

Parameters

out	*VersionNumbers*	A fixed-size array to be filled with the version numbers

12.199.2.32 CFE_PSP_GetVersionString()

```
const char* CFE_PSP_GetVersionString (
    void )
```

Obtain the PSP version/baseline identifier string.
This retrieves the PSP version identifier string without extra info

Returns

Version string. This is a fixed string and cannot be NULL.

12.199.2.33 CFE_PSP_GetVolatileDiskMem()

```
int32 CFE_PSP_GetVolatileDiskMem (
    cpuaddr * PtrToVolDisk,
    uint32 * SizeOfVolDisk )
```

Returns the location and size of the memory used for the cFE volatile disk.

Parameters

out	*PtrToVolDisk*	Pointer to the variable that will store the location of the cFE volatile disk
out	*SizeOfVolDisk*	Pointer to the variable that will store the size of the cFE volatile disk

Returns

0 (OS_SUCCESS or CFE_PSP_SUCCESS) on success, -1 (OS_ERROR or CFE_PSP_ERROR) on error

12.199.2.34 CFE_PSP_InitSSR()

```
int32 CFE_PSP_InitSSR (
    uint32 bus,
    uint32 device,
    char * DeviceName )
```

Initializes the Solid State recorder memory for a particular platform.

Note

For the MCP750, this simply initializes the Hard Disk device.

Parameters

in	*bus*	
in	*device*	
in	*DeviceName*	

Return values

CFE_PSP_SUCCESS	on success
CFE_PSP_ERROR	on error

12.199.2.35 CFE_PSP_Main()

```
void CFE_PSP_Main (
    void )
```

PSP Entry Point to initialize the OSAL and start up the cFE.
This is the entry point that the real-time OS calls to start our software. This routine will do any BSP/OS-specific setup, then call the entry point of the flight software (i.e. the cFE main entry point).

Note

The flight software (i.e. cFE) should not call this routine.

12.199.2.36 CFE_PSP_MemCpy()

```
int32 CFE_PSP_MemCpy (
    void * dest,
    const void * src,
    uint32 n )
```

Copy 'n' bytes from 'src' to 'dest'.
Copies 'n' bytes from memory address pointed to by 'src' to memory address pointed to by 'dest'.

Note

For now we are using the standard C library call 'memcpy' but if we find we need to make it more efficient then we'll implement it in assembly.

Parameters

out	*dest*	Pointer to the destination address to copy to
in	*src*	Pointer to the address to copy from
in	*n*	Number of bytes to copy

Returns

Always returns CFE_PSP_SUCCESS

12.199.2.37 CFE_PSP_MemRangeGet()

```
int32 CFE_PSP_MemRangeGet (
    uint32 RangeNum,
    uint32 * MemoryType,
    cpuaddr * StartAddr,
    size_t * Size,
    size_t * WordSize,
    uint32 * Attributes )
```

Retrieves one of the records in the CFE_PSP_MemoryTable.

Note

Because the table is fixed size, the entries are accessed by using the integer index.

Parameters

in	*RangeNum*	A 32-bit integer (starting with 0) specifying the MemoryTable entry.
out	*MemoryType*	A pointer to the 32-bit integer where the Memory Type is stored. Any defined CFE_PSP_MEM_∗ enumeration can be specified
out	*StartAddr*	Pointer to the 32-bit integer where the 32-bit starting address of the memory range is stored.
out	*Size*	A pointer to the 32-bit integer where the 32-bit size of the memory range is stored.
out	*WordSize*	A pointer to the 32-bit integer where the minimum addressable size of the range: (CFE_PSP_MEM_SIZE_BYTE, CFE_PSP_MEM_SIZE_WORD, CFE_PSP_MEM_SIZE_DWORD)
out	*Attributes*	The attributes of the Memory Range: (CFE_PSP_MEM_ATTR_WRITE, CFE_PSP_MEM_ATTR_READ, CFE_PSP_MEM_ATTR_READWRITE)

Return values

CFE_PSP_SUCCESS	Memory range returned successfully.
CFE_PSP_INVALID_POINTER	Parameter error
CFE_PSP_INVALID_MEM_RANGE	The index into the table is invalid

12.199.2.38 CFE_PSP_MemRanges()

```
uint32 CFE_PSP_MemRanges (
    void )
```

Returns the number of memory ranges in the CFE_PSP_MemoryTable.

Returns

Positive integer number of entries in the memory range table

12.199.2.39 CFE_PSP_MemRangeSet()

```
int32 CFE_PSP_MemRangeSet (
    uint32 RangeNum,
    uint32 MemoryType,
    cpuaddr StartAddr,
    size_t Size,
    size_t WordSize,
    uint32 Attributes )
```

Populates one of the records in the CFE_PSP_MemoryTable.

Note

Because the table is fixed size, the entries are set by using the integer index. No validation is done with the address or size.

Parameters

in	*RangeNum*	A 32-bit integer (starting with 0) specifying the MemoryTable entry.
in	*MemoryType*	The memory type to validate, including but not limited to: CFE_PSP_MEM_RAM, CFE_PSP_MEM_EEPROM, or CFE_PSP_MEM_ANY Any defined CFE_PSP_MEM_∗ enumeration can be specified
in	*StartAddr*	A 32-bit starting address of the memory range
in	*Size*	A 32-bit size of the memory range (Address + Size = End Address)
in	*WordSize*	The minimum addressable size of the range: (CFE_PSP_MEM_SIZE_BYTE, CFE_PSP_MEM_SIZE_WORD, CFE_PSP_MEM_SIZE_DWORD)
in	*Attributes*	The attributes of the Memory Range: (CFE_PSP_MEM_ATTR_WRITE, CFE_PSP_MEM_ATTR_READ, CFE_PSP_MEM_ATTR_READWRITE)

Return values

CFE_PSP_SUCCESS	Memory range set successfully.
CFE_PSP_INVALID_MEM_RANGE	The index into the table is invalid
FE_PSP_INVALID_MEM_ADDR	Starting address is not valid
CFE_PSP_INVALID_MEM_TYPE	Memory type associated with the range does not match the passed-in type.

Return values

CFE_PSP_INVALID_MEM_WORDSIZE	The WordSize parameter is not one of the predefined types.
CFE_PSP_INVALID_MEM_ATTR	The Attributes parameter is not one of the predefined types.
OP_INVALID_MEM_SIZE	The Memory range associated with the address is not large enough to contain Address + Size.

12.199.2.40 CFE_PSP_MemRead16()

```
int32 CFE_PSP_MemRead16 (
    cpuaddr MemoryAddress,
    uint16 * uint16Value )
```

Read 2 bytes of memory.

Parameters

in	*MemoryAddress*	Address to be read
out	*uint16Value*	The address content will be copied to the location pointed to by this argument

Return values

CFE_PSP_SUCCESS	on success
CFE_PSP_ERROR_ADDRESS_MISALIGNED	if the address is not aligned to a 16-bit addressing scheme.
CFE_PSP_ERROR_NOT_IMPLEMENTED	if not implemented

12.199.2.41 CFE_PSP_MemRead32()

```
int32 CFE_PSP_MemRead32 (
    cpuaddr MemoryAddress,
    uint32 * uint32Value )
```

Read 4 bytes of memory.

Parameters

in	*MemoryAddress*	Address to be read
out	*uint32Value*	The address content will be copied to the location pointed to by this argument

Return values

CFE_PSP_SUCCESS	on success
CFE_PSP_ERROR_ADDRESS_MISALIGNED	if the address is not aligned to a 16-bit addressing scheme.
CFE_PSP_ERROR_NOT_IMPLEMENTED	if not implemented

12.199.2.42 CFE_PSP_MemRead8()

```
int32 CFE_PSP_MemRead8 (
    cpuaddr MemoryAddress,
    uint8 * ByteValue )
```

Read one byte of memory.

Parameters

in	*MemoryAddress*	Address to be read
out	*ByteValue*	The address content will be copied to the location pointed to by this argument

Returns

Always returns CFE_PSP_SUCCESS (if implemented)

Return values

CFE_PSP_ERROR_NOT_IMPLEMENTED	if not implemented

12.199.2.43 CFE_PSP_MemSet()

```
int32 CFE_PSP_MemSet (
    void * dest,
    uint8 value,
    uint32 n )
```

Copy 'n' bytes of value 'value' to 'dest'.
Copies 'n' number of bytes of value 'value' to memory address pointed to by 'dest'.

Note

For now we are using the standard C library call 'memset' but if we find we need to make it more efficient then we'll implement it in assembly.

Parameters

out	*dest*	Pointer to the destination address to copy to
in	*value*	Value to set
in	*n*	Number of bytes to copy

Returns

Always returns CFE_PSP_SUCCESS

12.199.2.44 CFE_PSP_MemValidateRange()

```
int32 CFE_PSP_MemValidateRange (
    cpuaddr Address,
    size_t Size,
    uint32 MemoryType )
```

Validates the memory range and type using the global CFE_PSP_MemoryTable.

Parameters

in	*Address*	A 32-bit starting address of the memory range
in	*Size*	A 32-bit size of the memory range (Address + Size = End Address)
in	*MemoryType*	The memory type to validate, including but not limited to: CFE_PSP_MEM_RAM, CFE_PSP_MEM_EEPROM, or CFE_PSP_MEM_ANY Any defined CFE_PSP_MEM_* enumeration can be specified

Return values

CFE_PSP_SUCCESS	Memory range and type information is valid and can be used.
CFE_PSP_INVALID_MEM_ADDR	Starting address is not valid
CFE_PSP_INVALID_MEM_TYPE	Memory type associated with the range does not match the passed-in type.
CFE_PSP_INVALID_MEM_RANGE	The Memory range associated with the address is not large enough to contain Address + Size.

12.199.2.45 CFE_PSP_MemWrite16()

```
int32 CFE_PSP_MemWrite16 (
    cpuaddr MemoryAddress,
    uint16 uint16Value )
```

Write 2 bytes of memory.

Parameters

out	*MemoryAddress*	Address to be written to
in	*uint16Value*	The content pointed to by this argument will be copied to the address

Return values

CFE_PSP_SUCCESS	on success
CFE_PSP_ERROR_ADDRESS_MISALIGNED	if the address is not aligned to a 16-bit addressing scheme.
CFE_PSP_ERROR_NOT_IMPLEMENTED	if not implemented

12.199.2.46 CFE_PSP_MemWrite32()

```
int32 CFE_PSP_MemWrite32 (
    cpuaddr MemoryAddress,
    uint32 uint32Value )
```

Write 4 bytes of memory.

Parameters

out	*MemoryAddress*	Address to be written to
in	*uint32Value*	The content pointed to by this argument will be copied to the address

Return values

CFE_PSP_SUCCESS	on success
CFE_PSP_ERROR_ADDRESS_MISALIGNED	if the address is not aligned to a 16-bit addressing scheme.
CFE_PSP_ERROR_NOT_IMPLEMENTED	if not implemented

12.199.2.47 CFE_PSP_MemWrite8()

```
int32 CFE_PSP_MemWrite8 (
    cpuaddr MemoryAddress,
```

```
uint8 ByteValue )
```

Write one byte of memory.

Parameters

out	*MemoryAddress*	Address to be written to
in	*ByteValue*	The content pointed to by this argument will be copied to the address

Returns

Always returns CFE_PSP_SUCCESS (if implemented)

Return values

CFE_PSP_ERROR_NOT_IMPLEMENTED	if not implemented

12.199.2.48 CFE_PSP_Panic()

```
void CFE_PSP_Panic (
int32 ErrorCode )
```

Aborts the cFE startup.
Provides a common interface to abort the cFE startup process and return back to the OS.

Note

This is called by the cFE Core startup code when it needs to abort the cFE startup. This should not be called by applications.

Parameters

in	*ErrorCode*	Reason for exiting

12.199.2.49 CFE_PSP_PortRead16()

```
int32 CFE_PSP_PortRead16 (
cpuaddr PortAddress,
uint16 * uint16Value )
```

Read 2 bytes of memory.

Parameters

in	*PortAddress*	Address to be read
out	*uint16Value*	The address content will be copied to the location pointed to by this argument

Return values

CFE_PSP_SUCCESS	on success
CFE_PSP_ERROR_ADDRESS_MISALIGNED	if the address is not aligned to a 16-bit addressing scheme.
CFE_PSP_ERROR_NOT_IMPLEMENTED	if not implemented

12.199.2.50 CFE_PSP_PortRead32()

```
int32 CFE_PSP_PortRead32 (
    cpuaddr PortAddress,
    uint32 * uint32Value )
```

Read 4 bytes of memory.

Parameters

in	*PortAddress*	Address to be read
out	*uint32Value*	The address content will be copied to the location pointed to by this argument

Return values

CFE_PSP_SUCCESS	on success
CFE_PSP_ERROR_ADDRESS_MISALIGNED	if the address is not aligned to a 16-bit addressing scheme.
CFE_PSP_ERROR_NOT_IMPLEMENTED	if not implemented

12.199.2.51 CFE_PSP_PortRead8()

```
int32 CFE_PSP_PortRead8 (
    cpuaddr PortAddress,
    uint8 * ByteValue )
```

Read one byte of memory.

Parameters

in	*PortAddress*	Address to be read
out	*ByteValue*	The address content will be copied to the location pointed to by this argument

Returns

Always returns CFE_PSP_SUCCESS (if implemented)

Return values

CFE_PSP_ERROR_NOT_IMPLEMENTED	if not implemented

12.199.2.52 CFE_PSP_PortWrite16()

```
int32 CFE_PSP_PortWrite16 (
    cpuaddr PortAddress,
    uint16 uint16Value )
```

Write 2 bytes of memory.

Parameters

out	*PortAddress*	Address to be written to
in	*uint16Value*	the content pointed to by this argument will be copied to the address

Return values

CFE_PSP_SUCCESS	on success
CFE_PSP_ERROR_ADDRESS_MISALIGNED	if the address is not aligned to a 16-bit addressing scheme.
CFE_PSP_ERROR_NOT_IMPLEMENTED	if not implemented

12.199.2.53 CFE_PSP_PortWrite32()

```
int32 CFE_PSP_PortWrite32 (
    cpuaddr PortAddress,
    uint32 uint32Value )
```

Write 4 bytes of memory.

Parameters

out	*PortAddress*	Address to be written to
in	*uint32Value*	The content pointed to by this argument will be copied to the address

Return values

CFE_PSP_SUCCESS	on success
CFE_PSP_ERROR_ADDRESS_MISALIGNED	if the address is not aligned to a 16-bit addressing scheme.
CFE_PSP_ERROR_NOT_IMPLEMENTED	if not implemented

12.199.2.54 CFE_PSP_PortWrite8()

```
int32 CFE_PSP_PortWrite8 (
    cpuaddr PortAddress,
    uint8 ByteValue )
```

Write one byte of memory.

Parameters

out	*PortAddress*	Address to be written to
in	*ByteValue*	The content pointed to by this argument will be copied to the address

Returns

Always returns CFE_PSP_SUCCESS (if implemented)

Return values

CFE_PSP_ERROR_NOT_IMPLEMENTED	if not implemented

12.199.2.55 CFE_PSP_ReadFromCDS()

```
int32 CFE_PSP_ReadFromCDS (
    void * PtrToDataToRead,
    uint32 CDSOffset,
```

```
uint32 NumBytes )
```

Reads from the CDS Block.

Parameters

out	*PtrToDataToRead*	Pointer to the location that will store the data to be read from the CDS
in	*CDSOffset*	CDS offset
in	*NumBytes*	Number of bytes to read

Returns

0 (OS_SUCCESS or CFE_PSP_SUCCESS) on success, -1 (OS_ERROR or CFE_PSP_ERROR) on error

12.199.2.56 CFE_PSP_Restart()

```
void CFE_PSP_Restart (
uint32 resetType )
```

Entry point back to the BSP to restart the processor.
The flight software calls this routine to restart the processor.

Parameters

in	*resetType*	Type of reset

12.199.2.57 CFE_PSP_SetDefaultExceptionEnvironment()

```
void CFE_PSP_SetDefaultExceptionEnvironment
(
void )
```

Defines the CPU and FPU exceptions that are enabled for each cFE Task/App.
This function sets a default exception environment that can be used

Note

The exception environment is local to each task. Therefore, this must be Called for each task that wants to do floating point and catch exceptions.

12.199.2.58 CFE_PSP_WatchdogDisable()

```
void CFE_PSP_WatchdogDisable (
void )
```

Disables the watchdog timer.

12.199.2.59 CFE_PSP_WatchdogEnable()

```
void CFE_PSP_WatchdogEnable (
void )
```

Enables the watchdog timer.

12.199.2.60 CFE_PSP_WatchdogGet()

```
uint32 CFE_PSP_WatchdogGet (
void )
```

Gets the watchdog time in milliseconds.

Returns

The current watchdog value

12.199.2.61 CFE_PSP_WatchdogInit()

```
void CFE_PSP_WatchdogInit (
    void )
```

Configures the watchdog timer.
To set up the timer resolution and/or other settings custom to this platform.

12.199.2.62 CFE_PSP_WatchdogService()

```
void CFE_PSP_WatchdogService (
    void )
```

Services the watchdog timer according to the value set in WatchDogSet.
Load the watchdog timer with a count that corresponds to the millisecond time given in the parameter.

Note

Currently an ExpireTime value of zero will result in the minimum reset time of 4.5 seconds. All other ExpireTime values will result in a reset time of 5.5 seconds.

12.199.2.63 CFE_PSP_WatchdogSet()

```
void CFE_PSP_WatchdogSet (
    uint32 WatchdogValue )
```

Sets the watchdog time in milliseconds.

Parameters

in	*WatchdogValue*	New watchdog value to set

12.199.2.64 CFE_PSP_WriteToCDS()

```
int32 CFE_PSP_WriteToCDS (
    const void * PtrToDataToWrite,
    uint32 CDSOffset,
    uint32 NumBytes )
```

Writes to the CDS Block.

Parameters

in	*PtrToDataToWrite*	Pointer to the data that will be written to the CDS
in	*CDSOffset*	CDS offset
in	*NumBytes*	Number of bytes to write

Returns

0 (OS_SUCCESS or CFE_PSP_SUCCESS) on success, -1 (OS_ERROR or CFE_PSP_ERROR) on error

12.200 psp/fsw/inc/cfe_psp_error.h File Reference

cFE PSP Error header

```
#include "common_types.h"
```

Macros

- #define CFE_PSP_STATUS_C(X) ((CFE_PSP_Status_t)(X))

  PSP Status macro for literal.
- #define CFE_PSP_STATUS_STRING_LENGTH 12

  PSP Status converted to string length limit.
- #define CFE_PSP_SUCCESS (CFE_PSP_STATUS_C(0))
- #define CFE_PSP_ERROR (CFE_PSP_STATUS_C(-1))
- #define CFE_PSP_INVALID_POINTER (CFE_PSP_STATUS_C(-2))
- #define CFE_PSP_ERROR_ADDRESS_MISALIGNED (CFE_PSP_STATUS_C(-3))
- #define CFE_PSP_ERROR_TIMEOUT (CFE_PSP_STATUS_C(-4))
- #define CFE_PSP_INVALID_INT_NUM (CFE_PSP_STATUS_C(-5))
- #define CFE_PSP_INVALID_MEM_ADDR (CFE_PSP_STATUS_C(-21))
- #define CFE_PSP_INVALID_MEM_TYPE (CFE_PSP_STATUS_C(-22))
- #define CFE_PSP_INVALID_MEM_RANGE (CFE_PSP_STATUS_C(-23))
- #define CFE_PSP_INVALID_MEM_WORDSIZE (CFE_PSP_STATUS_C(-24))
- #define CFE_PSP_INVALID_MEM_SIZE (CFE_PSP_STATUS_C(-25))
- #define CFE_PSP_INVALID_MEM_ATTR (CFE_PSP_STATUS_C(-26))
- #define CFE_PSP_ERROR_NOT_IMPLEMENTED (CFE_PSP_STATUS_C(-27))
- #define CFE_PSP_INVALID_MODULE_NAME (CFE_PSP_STATUS_C(-28))
- #define CFE_PSP_INVALID_MODULE_ID (CFE_PSP_STATUS_C(-29))
- #define CFE_PSP_NO_EXCEPTION_DATA (CFE_PSP_STATUS_C(-30))

Typedefs

- typedef int32 CFE_PSP_Status_t

  PSP Status type for readability and potentially type safety.
- typedef char CFE_PSP_StatusString_t[CFE_PSP_STATUS_STRING_LENGTH]

  For the CFE_PSP_StatusToString() function, to ensure everyone is making an array of the same length.

Functions

- char * CFE_PSP_StatusToString (CFE_PSP_Status_t status, CFE_PSP_StatusString_t *status_string)

  Convert status to a string.

12.200.1 Detailed Description

cFE PSP Error header

12.200.2 Macro Definition Documentation

12.200.2.1 CFE_PSP_ERROR `#define CFE_PSP_ERROR (CFE_PSP_STATUS_C(-1))`

Definition at line 66 of file cfe_psp_error.h.

12.200.2.2 CFE_PSP_ERROR_ADDRESS_MISALIGNED `#define CFE_PSP_ERROR_ADDRESS_MISALIGNED (CFE_PSP_STATUS_C(-3)`

Definition at line 68 of file cfe_psp_error.h.

12.200.2.3 CFE_PSP_ERROR_NOT_IMPLEMENTED

```
#define CFE_PSP_ERROR_NOT_IMPLEMENTED (CFE_PSP_STATUS_C(-27))
```

Definition at line 77 of file cfe_psp_error.h.

12.200.2.4 CFE_PSP_ERROR_TIMEOUT

```
#define CFE_PSP_ERROR_TIMEOUT (CFE_PSP_STATUS_C(-4))
```

Definition at line 69 of file cfe_psp_error.h.

12.200.2.5 CFE_PSP_INVALID_INT_NUM

```
#define CFE_PSP_INVALID_INT_NUM (CFE_PSP_STATUS_C(-5))
```

Definition at line 70 of file cfe_psp_error.h.

12.200.2.6 CFE_PSP_INVALID_MEM_ADDR

```
#define CFE_PSP_INVALID_MEM_ADDR (CFE_PSP_STATUS_C(-21))
```

Definition at line 71 of file cfe_psp_error.h.

12.200.2.7 CFE_PSP_INVALID_MEM_ATTR

```
#define CFE_PSP_INVALID_MEM_ATTR (CFE_PSP_STATUS_C(-26))
```

Definition at line 76 of file cfe_psp_error.h.

12.200.2.8 CFE_PSP_INVALID_MEM_RANGE

```
#define CFE_PSP_INVALID_MEM_RANGE (CFE_PSP_STATUS_C(-23))
```

Definition at line 73 of file cfe_psp_error.h.

12.200.2.9 CFE_PSP_INVALID_MEM_SIZE

```
#define CFE_PSP_INVALID_MEM_SIZE (CFE_PSP_STATUS_C(-25))
```

Definition at line 75 of file cfe_psp_error.h.

12.200.2.10 CFE_PSP_INVALID_MEM_TYPE

```
#define CFE_PSP_INVALID_MEM_TYPE (CFE_PSP_STATUS_C(-22))
```

Definition at line 72 of file cfe_psp_error.h.

12.200.2.11 CFE_PSP_INVALID_MEM_WORDSIZE

```
#define CFE_PSP_INVALID_MEM_WORDSIZE (CFE_PSP_STATUS_C(-24))
```

Definition at line 74 of file cfe_psp_error.h.

12.200.2.12 CFE_PSP_INVALID_MODULE_ID

```
#define CFE_PSP_INVALID_MODULE_ID (CFE_PSP_STATUS_C(-29))
```

Definition at line 79 of file cfe_psp_error.h.

12.200.2.13 CFE_PSP_INVALID_MODULE_NAME

```
#define CFE_PSP_INVALID_MODULE_NAME (CFE_PSP_STATUS_C(-28))
```

Definition at line 78 of file cfe_psp_error.h.

12.200.2.14 CFE_PSP_INVALID_POINTER

```
#define CFE_PSP_INVALID_POINTER (CFE_PSP_STATUS_C(-2))
```

Definition at line 67 of file cfe_psp_error.h.

12.200.2.15 CFE_PSP_NO_EXCEPTION_DATA

```
#define CFE_PSP_NO_EXCEPTION_DATA (CFE_PSP_STATUS_C(-30))
```

Definition at line 80 of file cfe_psp_error.h.

12.200.2.16 CFE_PSP_STATUS_C

```
#define CFE_PSP_STATUS_C(
    X ) ((CFE_PSP_Status_t)(X))
```

PSP Status macro for literal.
Definition at line 36 of file cfe_psp_error.h.

12.200.2.17 CFE_PSP_STATUS_STRING_LENGTH

```
#define CFE_PSP_STATUS_STRING_LENGTH 12
```

PSP Status converted to string length limit.
Used for sizing CFE_PSP_StatusString_t intended for use in printing CFE_PSP_Status_t values Sized for ld (LONG↩ _MIN) including NULL
Definition at line 44 of file cfe_psp_error.h.

12.200.2.18 CFE_PSP_SUCCESS

```
#define CFE_PSP_SUCCESS (CFE_PSP_STATUS_C(0))
```

Definition at line 65 of file cfe_psp_error.h.

12.200.3 Typedef Documentation

12.200.3.1 CFE_PSP_Status_t

```
typedef int32 CFE_PSP_Status_t
```

PSP Status type for readability and potentially type safety.
Definition at line 31 of file cfe_psp_error.h.

12.200.3.2 CFE_PSP_StatusString_t

```
typedef char CFE_PSP_StatusString_t[CFE_PSP_STATUS_STRING_LENGTH]
```

For the CFE_PSP_StatusToString() function, to ensure everyone is making an array of the same length.
Definition at line 50 of file cfe_psp_error.h.

12.200.4 Function Documentation

12.200.4.1 CFE_PSP_StatusToString()

```
char* CFE_PSP_StatusToString (
    CFE_PSP_Status_t status,
    CFE_PSP_StatusString_t * status_string )
```

Convert status to a string.

Parameters

in	*status*	Status value to convert
out	*status_string*	Buffer to store status converted to string

Returns

Passed in string pointer

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