Flight Software Branch

FSW Version Description Document

Core Flight Software System (cFS) Data Storage (DS)

Build: 2.4.1.0

Release Date: 08/03/2015

1.0 FSW Version Description

1.1 purpose and summary

The purpose of this build is to continue to refine the cFS Data Storage (DS) application product. This build provides a new configuration parameter to allow restoration of the DS packet processing enable/disable startup state over a processor reset and a few minor requirements updates. This document serves as the notification of the Build 2.4.1.0 release of the cFS DS application.

DS version 2.4.1.0 is compatible with cFE builds 6.3.1.0 and above and OSAL 3.4.0.0 and above.

1.2 new/Changed functionality in this VERSION

Table 1.2-1 identifies new FSW functionality that has been implemented and is integrated into this FSW version Requirement references are included.

Table 1.2-1 – New Functionality in this Version

| No. | FSB DCR # (or N/A ) | Requirements | High Level Description of Functionality |
| --- | --- | --- | --- |
| 1 | 23050 | DS2000 DS5000 DS5001 DS9003 DS9004 DS9008 | A new configuration parameter, DS\_CDS\_ENABLE\_STATE, was added to allow the previous DS packet processor enable/disable state to be restored after a processor reset. |

Table 1.2-2 identifies changes to FSW functionality from a previously delivered FSW version and the DCRs associated with these changes.

Table 1.2-2 – Changes to Previously Delivered Functionality

| No. | FSB DCR # (or N/A ) | Requirements | Functionality or Change Description |
| --- | --- | --- | --- |
| N/A | N/A | None | None |

1.3 MISSING Planned FEATURES AND KNOWN PROBLEMS

Table 1.3-1 identifies the functions and known discrepancies that are absent from DS Build 2.4.1.0. Any workarounds that may apply are identified.

Information on currently open DCRs is available at http://gs580v-fsbmks10.ndc.nasa.gov:7001. Note that this is a restricted website that requires a server account. Additional DCRs may have been submitted after preparation of this VDD. A cFS DS DCR report containing a listing of open DCRs is available on request for customers who do not have access to tlserver3. Please contact Susanne Strege, susie.strege@nasa.gov.

Table 1.3-1 – Functions absent from this Release

| No. | FSB DCR # (or N/A ) | Description | Reason for Absence | Affected Requirement or Component | Workaround | Planned Delivery |
| --- | --- | --- | --- | --- | --- | --- |
| 1 | 18529 | DS includes a file status record in its housekeeping telemetry packet. This inclusion (with the default configuration settings) makes DS HK expensive (in terms of bandwidth) to downlink | Implementation is dependent on customer needs. | DS8000 | Update default configuration settings.  Or  Split DS HK packet into two fast and slow packets. | Not Determined |
| 2 | 22007 | DS - Add Trick Simulation Support (JSC Request) | Implementation is dependent on customer needs. Community input is needed. | N/A | Add required ifdef statements to header files | Not Determined |
| 3 | 22023 | When a new filter table is loaded, DS unsubscribes to all packets in the old table and then subscribes to all packets in the new table. This is true even if the message IDs in question are present in both the old and new filter tables. If packets are being generated at the time DS is unsubscribing and DS is the only application that has subscribed to a packet, the system could be flooded with SB no subscriber events. | More analysis is needed to determine if this a FSW Systems issue or a DS application issue. | N/A | Disable scheduling of packets that DS only subscribes to when loading new DS Filter Tables. | Not Determined |
| 4 | 22104 | In sequence-based filenames the sequence count always rolls over to zero. The initial value of the counter however, is specified in the Destination File Table. If a mission preferred to have the counter start at 1, for example, it would make more sense to have the counter roll over to the initial value specified in the table. It should be noted that the sequence counter may never roll over during the life of a mission. If the default configuration parameters are used, the sequence counter will need to get significantly large before the counter rolls over. | Implementation is dependent on customer needs. | N/A | None | Not Determined |
| 5 | 22879 | When using a DS configuration with Critical Tables, the Filter Table Filename is cleared when DS is restarted after a Processor and Application Reset AND the table is restored from the CDS. This was not expected. Dumping the Table Registry after such a restart confirmed that the Last Loaded file is cleared from the Table Registry which could be the cause of this problem. | Implementation is dependent on customer needs. | DS8000 | None | Not Determined |

1.4 Development Tool Versions Associated with this FSW Version

Table 1.4-1 identifies the versions of development tools used to generate this FSW version:

Table 1.4-1 – Development Tool Versions Associated with this FSW Version

| Tool Type. | Tool Name | Version Used |
| --- | --- | --- |
| RTOS | BVTed with VxWorks 6.4, however, OSAL provides ability to use multiple OSes | 6.4 |
| Compiler | GNU | 3.3.2 |
| cFE | Core Flight Executive | 6.4.2.0 |
| cFE-PSP | cFE Platform Support Package | 1.2.0.0 |
| OSAL | Operating System Abstraction Layer | 4.1.1 |

2.0 Delivered products

Table 2-1 identifies the locations of FSW products relevant to this FSW Build. The version or date of the Build and where the product can be located are provided. Changes from a previous VDD are identified.

Table 2-1 – Delivered Products and their Locations

| Software Element | Changed with this Version? | New Version or Date | Location |
| --- | --- | --- | --- |
| Executable for this build | Yes | 2.4.1.0 | Not applicable. Executables must be created for the specific mission/platform |
| Installation Procedures & Special Instructions **(See Section 3.0)** | No | 3.0 | See cFS Deployment Guide (gs580v-fsbmks10.ndc.nasa.gov) |
| Source Code of this FSW Build | Yes | 2.4.1.0 | gs580v-fsbmks10.ndc.nasa.gov  MKS label DS-ALL-Build2.4.0.0-JAN26-2015 |
| FSW Build Plan | N/A | N/A | None |
| Annotated S/W Detailed Design Docs | No | N/A | fsb.gsfc.nasa.gov/cFS |
| Ground System T&C Database | No | N/A | gs580v-fsbmks10.ndc.nasa.gov |
| Ground System Scripts developed by FSB | No | N/A | gs580v-fsbmks10.ndc.nasa.gov |
| Simulator and Test Data Generator Software | No | N/A | None |
| Executable - Ground Tools associated with FSW (tools to build stored command loads, etc.) | No | N/A | None |
| Source Code - Ground Tools associated with FSW (tools to build stored command loads, etc.) | No | N/A | Perl scripts to generate ground database and build verification procedures from templates (see cFS Deployment Guide) |
| Unit Test Procedures | No | N/A | gs580v-fsbmks10.ndc.nasa.gov |
| Unit Test Data | No | N/A | gs580v-fsbmks10.ndc.nasa.gov |
| Unit Test Results | No | N/A | gs580v-fsbmks10.ndc.nasa.gov |
| FSW Make Files | No | N/A | gs580v-fsbmks10.ndc.nasa.gov |
| Linker & Compiler Configuration Files | No | N/A | gs580v-fsbmks10.ndc.nasa.gov |
| Requirements version (from MKS) | No | 1.3 | gs580v-fsbmks10.ndc.nasa.gov |

3.0 INSTALLATION PROCEDURES

Table 3-1 identifies the nominal FSW Installation Procedure(s) for this FSW Build onto the intended target system (including the commercial applications used and the configuration settings). The procedure version identifier, the date of the procedure and where it can be located are also provided.

Table 3-1 FSW Installation Procedure(s)

| Destination  (Target System) | Filename | Version and Date | Location |
| --- | --- | --- | --- |
| N/A | See cFS Deployment Guide | Version 3.0 | Available with cFE open source release:  <http://sourceforge.net/projects/coreflightexec/>  and on gs580v-fsbmks10.ndc.nasa.gov |

4.0 Configuration summary and version identification

DS Build 2.4.1.0 can be found on gs580v-fsbmks10.ndc.nasa.gov. Verification of the version can be done by sending a DS Noop command which produces an event message containing the version. In addition, the initialization event message generated during the application startup provides the version.

5.0 Software CopyRight Notice

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Acronyms

ACS Attitude Control System

C&DH Command and Data Handling

cFE…………………………………………………………………………………………..……Core Flight Executive

cFS………………………………………………………………………………………Core Flight Software System

CM Configuration Management

COTS Commercial Off-The-Shelf

DCR Discrepancy/Change Request

DS Data Storage

ETU Engineering Test Unit

FSB Flight Software Branch

FSW Flight Software

HS Health and Safety

I&T Integration & Test

OSAL……………………………………………………………………………Operating System Abstraction Layer

RTOS Real-Time Operating System

T&C Telemetry and Command

URL Universal Resource Locator

VDD Version Description Document

ATTACHMENT 1 – cFS Data storage build 2.4.1.0 DCRs

| **Aug 3, 2015** | | | | | |
| --- | --- | --- | --- | --- | --- |
|  | | | | | |
| **ID** | **DCR\_Type** | **DCR\_Title** | **State** | **DCR\_Build Found** | **DCR\_Build Target** |
|  | | | | | |
|  | | | | | |
|  | | | | | |
| 23050 | Change Request | DS - add the DS application enable state to the data stored in the Critical Data Store | Test Completed | 2.4.0.0 | 2.4.1.0 |
| 23055 | Change Request | DS - Update Requirements to Include Enable State Restoration from the CDS | Test Completed | 2.4.0.0 | 2.4.1.0 |