Flight Software Branch

FSW Version Description Document

Core Flight Software System (CFS) Stored Command (SC)

Build: 2.4.0.0

Release Date: 01/22/2015

1.0 FSW Version Description

1.1 purpose and summary

The purpose of this build is to continue to refine the CFS Stored Command (SC) application product. This build provides various bug fixes and a few minor requirement updates. This document serves as the notification of the Build 2.4.0.0 release of the CFS SC application.

SC version 2.4.0.0 is compatible with cFE builds 6.4.1.0 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 |
| --- | --- | --- | --- |
| N/A |  |  | None |

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 |
| --- | --- | --- | --- |
| 1 | 17270 | N/A | SC does not produce compiler warnings when compiling default tables |
| 2 | 19196 | N/A | SC reports the correct number of RTS’s loaded at startup |
| 3 | 19212 | SC1002 | SC verifies the message length of housekeeping requests |
| 4 | 20976 | N/A | SC does not produce compiler warnings for uninitialized variables |
| 5 | 21740 | N/A | Incorrect RTP Control Table handle is being used in the table manage command. This prevents the table from being dumped. |
| 6 | 22621 | SC4001.4 | RTS event message text is inconsistent. The SC application generates three events related to RTS status that spell out the term “Relative Time Sequence”. All other RTS related events use the term “RTS”. Text searches are often used during FSW development, testing, and operations. Inconsistent use of terms will affect the results of these searches. All RTS related event messages will be updated to use the term “RTS”. |
| 7 | 22836 | N/A | SC default tables are now supported on both little endian and big endian platforms. |

1.3 MISSING Planned FEATURES AND KNOWN PROBLEMS

Table 1.3-1 identifies the functions and known discrepancies that are absent from SC Build 2.4.0.0. Any workarounds that may apply are identified.

Information on currently open DCRs is available at <http://tlserver3.gsfc.nasa.gov:7001/index.html>. 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 SC 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 # | Description | Reason for Absence | Affected Requirement or Component | Workaround | Planned Delivery |
| --- | --- | --- | --- | --- | --- | --- |
| 1 | 7337 | There is no notification when application data and table data stored in the CDS are not restored following a reset | It is questionable whether or not large amounts of data should be kept in the CDS. This feature may be removed in a future release. | N/A | None | Not Determined |
| 2 | 7338 | ATS and RTS Table data is restored across a reset when it has been corrupted | It is questionable whether or not large amounts of data should be kept in the CDS. This feature may be removed in a future release. | N/A | None | Not Determined |
| 3 | 7339 | When Table or application CDS data is not restored after a reset, the ATS and RTS tables are restored which can lead to confusion. | It is questionable whether or not large amounts of data should be kept in the CDS. This feature may be removed in a future release. | N/A | None | Not Determined |
| 4 | 14339 | ATS and RTS status information is not saved across a reset. | Lower priority than other 2.4 issues | SC9002 | None | Not Determined |
| 5 | 21109 | Startup time with a large number of RTS tables can be extensive. The startup time on MMS with 320 RTS tables is nearly 2 minutes. | Lower priority than other 2.4 issues | N/A | None | Not Determined |
| 6 | 22014 | SC - 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 |
| 7 | 22593 | SC does not allow duplicate command numbers in an ATS. | Implementation is dependent on customer needs. | SC2001 | None | Not Determined |
| 8 | 22714 | Add ATS filename to housekeeping telemetry | Lower priority than other 2.4 issues | SC8000 | 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 | 6.4.1.0 |
| 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 | 2.4.0.0 | 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 (tlserver3.gsfc.nasa.gov) |
| Source Code of this FSW Build | Yes | 2.4.0.0 | Tlserver3.gsfc.nasa.gov  MKS label SC-All-Build2.4.0.0 |
| 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 | Tlserver3.gsfc.nasa.gov |
| Ground System Scripts developed by FSB | No | N/A | Tlserver3.gsfc.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 | Tlserver3.gsfc.nasa.gov |
| Unit Test Data | Yes | N/A | Tlserver3.gsfc.nasa.gov |
| Unit Test Results | Yes | N/A | Tlserver3.gsfc.nasa.gov |
| FSW Make Files | No | N/A | Tlserver3.gsfc.nasa.gov |
| Linker & Compiler Configuration Files | No | N/A | Tlserver3.gsfc.nasa.gov |
| Requirements version (from MKS) | Yes | 1.5 | Tlserver3.gsfc.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 Tlserver3.ndc.nasa.gov |

4.0 Configuration summary and version identification

SC Build 2.4.0.0 can be found on tlserver3.gsfc.nasa.gov. Verification of the version can be done by sending a SC 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

CDS…………………………………………………………………………………………..……Critical Data Store

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

CFS………………………………………………………………………………………Core Flight Software System

CM Configuration Management

COTS Commercial Off-The-Shelf

DCR Discrepancy/Change Request

ETU Engineering Test Unit

FSB Flight Software Branch

FSW Flight Software

I&T Integration & Test

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

RTOS Real-Time Operating System

SC………………………………………………………………………………………………...…...Stored Command

T&C Telemetry and Command

URL Universal Resource Locator

VDD Version Description Document

ATTACHMENT 1 – CFS Stored Command build 2.4.0.0 DCRs

| **Dec 29, 2014** | | | | | |
| --- | --- | --- | --- | --- | --- |
|  | | | | | |
| **ID** | **DCR\_Type** | **DCR\_Title** | **State** | **DCR\_Build Found** | **DCR\_Build Target** |
|  | | | | | |
|  | | | | | |
|  | | | | | |
| 17270 | Change Request | SC - Remove Table Compiler Warning from Default Table(s) | Test Completed | 2.2.1.0 | 2.4.0.0 |
| 19196 | Defect | SC - Reports Incorrect Number of RTS's Loaded at Startup | Test Completed | 2.3.0.0 | 2.4.0.0 |
| 19212 | Defect | GPM-IVV-1281 - SC - Not Consistently Verifying Message Length | Test Completed | 2.1.1.0 | 2.4.0.0 |
| 19213 | Defect | GPM-IVV-1315 - SC2005.1 Not Implemented Correctly | Ready For Closure | 2.1.1.0 | 2.4.0.0 |
| 19500 | Defect | SC - Update Design Charts to Reflect Removal of Pad Words from ATS and RTS Command Table Entries | Test Completed | 2.1.0.0 | 2.4.0.0 |
| 20974 | Change Request | SC - Add User Guide Word and .pdf Documents to SC Repository Trunk | Ready For Closure | 2.3.0.0 | 2.4.0.0 |
| 20976 | Defect | SC - Uninitialized Variable Causes Compiler Warning | Test Completed | 2.3.0.0 | 2.4.0.0 |
| 20982 | Change Request | Update CFS/SC to verify HK command packet length | Ready For Closure | 2.1.1.0 | 2.4.0.0 |
| 21200 | Change Request | Update CFS/SC documentation to reflect secret pad byte needed in RTSs and ATSs for odd length commands | Test Completed |  | 2.4.0.0 |
| 21538 | Change Request | IV&V Requirements Validation Findings - SC4000 Items b) and c) Should be Clairified | Ready For Closure | 2.1.1.0 | 2.4.0.0 |
| 21590 | Change Request | SC - Users Guide Does Not Provide Critical ATS Table Information | Test Completed | 2.3.0.0 | 2.4.0.0 |
| 21740 | Defect | SC - Incorrect RTP Ctrl Table Handle Used in Table Manage Command | Test Completed | 2.3.0.0 | 2.4.0.0 |
| 22621 | Change Request | SC - RTS Event Message Text is Inconsistent | Test Completed | 2.3.0.0 | 2.4.0.0 |
| 22723 | Change Request | SC - Requirement SC2005.1 is Misleading | Ready For Closure | 2.1.1.0 | 2.4.0.0 |
| 22836 | Defect | SC tables have CCSDS primary packet headers that must be Big Endian on Little Endian platforms | Test Completed |  | 2.4.0.0 |