Flight Software Branch

FSW Version Description Document

Core Flight Software System (CFS) File Manager (FM)

Build: 2.4.2.0

Release Date: 01/24/15

1.0 FSW Version Description

1.1 purpose and summary

The purpose of this build is to continue to refine the CFS File Manager (FM) application product. This build provides various bug fixes and a few minor requirement updates. This document serves as the notification of the Build 2.4.2.0 release of the CFS FM application. The FM Build 2.4.2 release contains the changes associated with Builds 2.4.0.0, 2.4.1.0, and 2.4.2.0. The 2.4.1.0 and 2.4.2.0 are revisions that include bug fixes found during FM Builds 2.4.0.0 and 2.4.1.0 Build Verification Testing.

FM version 2.4.2.0 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 |
| --- | --- | --- | --- |
| N/A |  |  |  |

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 | 22748 | N/A | The “SetTableState” command previously resulted in a checksum error if the Free Space Table was being checksummed. FM now notifies Table Services when the “SetTableState” command successfully changes the state of a Free Space Table entry. |
| 2 | 22722 | N/A | The FM child task creates a semaphore. The semaphore value, when taken by the parent, is checked by the parent. The invalid semaphore value what changed from zero to FM\_CHILD\_SEM\_INVALID (0xFFFFFFFF) |
| 3 | 22216 | FM1003 | FM was updated to send DEBUG events for successful completion of the following commands: Copy, Move, Rename, Delete, Delete All, Decompress, Concat, Create Directory, Delete Directory, Directory Listing to File, and Directory Listing to Packet. Previously these commands sent INFORMATIONAL event messages upon successful completion. Event message processing is very resource intensive. Event messages should only be sent when needed. The FM command success counter is ample information to notify FOT of the success of these commands. |
| 4 | 19422 | N/A | FM commands no longer get stuck in child task command processing queue. If commands were sent too fast to FM, a command would get stuck in the child task command processing queue. |
| 5 | 19421 | N/A | FM child task termination (from an error condition) no longer blocks other applications using the CFE\_ES\_LockSharedData() API from running. |
| 6 | 18985 | FM1003 | File Information Command child processing function “FM\_ChildFileInfoCmd”, was updated to increment the Child Command Success Counter upon command success. |
| 7 | 18983 | FM2007.1  FM2007.1.1  FM2007.2  FM2007.2.1 | The DeleteAllFiles command was updated to:   * Skip open files * Skip sub-directories * Issue one event message for any skipped sub-directories * Issue one event message for any skipped open files or other files that could not be deleted |
| 8 | 22872 | N/A | The child task initialization function was updated to create the child task semaphores before the child task is started. |

1.3 MISSING Planned FEATURES AND KNOWN PROBLEMS

Table 1.3-1 identifies the functions and known discrepancies that are absent from FM Build 2.4.2.0. 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 FM 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 Require-ment or Compon-ent | Workaround | Planned Delivery |
| --- | --- | --- | --- | --- | --- | --- |
| 1 | 19149 | On GPM, when given a directory argument "/", the FM\_DirListTlm command lists the files in the /ram directory, but without file size and timestamp information (as is done when the command argument is "/ram"). The FM\_DirListFile command should also be checked. | Implementation is dependent on customer needs. | FM3003  FM3002 | None | Not Determined |
| 2 | 19183 | FM - Consider Removing Child Task Priority and Pipe Depth Checks from verify.h | Implementation is dependent on customer needs. Community input is needed. | N/A | Remove unwanted checks from verify.h | Not Determined |
| 3 | 19239 | GPM-IVV-1340 - FM requirements do not capture overwrite capability | Lower priority than other 2.4 issues | FM2002  FM2004 | None | Not Determined |
| 4 | 19814 | The FM application currently will only provide file system disk free space information via command. Disk space is often monitored by applications such as LC for appropriate action to be taken if a file system/disk free space falls below a certain amount. For future FM releases consider adding platform configuration option for having free space sent in telemetry (or not). | Implementation is dependent on customer needs. | FM4001 | None | Not Determined |
| 5 | 21933 | FM CRC Tool Displays Output in Hexidecimal Only | Lower priority than other 2.4 issues | FM CRC Tool | None | Not Determined |
| 6 | 22008 | FM - 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 | 22589 | The child task command processing in the FM application is hard coded. During the Flight Software Systems Branch Internal CDR of the CFS FM application questions came up as to whether or not child task command processing should be configurable, if all FM commands should be processed by the child, or if the decision should be made in real time (RFA #4). | Implementation is dependent on customer needs. Community input is needed. | FM App | None | Not Determined |
| 8 | 22827 | FM application has several lines of source code that are not covered by unit tests | Lower priority than other 2.4 issues | FM unit test | None | Not Determined |
| 9 | 22858 | FM\_GlobalData.ChildQueueCountSem is created and used without any checks that the create was successful. FM will continue to run even when shared memory protection for ChildQueueCount is not available. | Lower priority than other 2.4 issues | FM App | 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 | 4.1.1.0 |

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 | N/A | 2.4.2.0 | Not applicable. Executables must be created for the specific misison/platform |
| Installation Procedures & Special Instructions **(See Section 3.0)** | No | 3.0 | See CFS Deployment Guide (tlserver3.ndc.nasa.gov) |
| Source Code of this FSW Build | Yes | 2.4.2.0 | Tlserver3.ndc.nasa.gov  MKS label FM-All-Build2.4.2.0 |
| 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.ndc.nasa.gov |
| Ground System Scripts developed by FSB | No | N/A | Tlserver3.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 | Yes | N/A | Tlserver3.ndc.nasa.gov |
| Unit Test Data | Yes | N/A | Tlserver3.ndc.nasa.gov |
| Unit Test Results | Yes | N/A | Tlserver3.ndc.nasa.gov |
| FSW Make Files | No | N/A | Tlserver3.ndc.nasa.gov |
| Linker & Compiler Configuration Files | No | N/A | Tlserver3.ndc.nasa.gov |
| Requirements version (from MKS) | Yes | 1.4 | Tlserver3.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.

[Add a line to this table for each target that has a unique installation procedure]

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

FM Build 2.4.2.0 can be found on tlserver3.ndc.nasa.gov. Verification of the version can be done by sending a FM 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

ETU Engineering Test Unit

FSB Flight Software Branch

FSW Flight Software

FM…………………………………………………………………………………………………….File Manager

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 File manager buildS 2.4.0.0, 2.4.1.0, and 2.4.2.0 DCRs

|  | | | | | |
| --- | --- | --- | --- | --- | --- |
| **Dec 22, 2014** | | | | | |
|  | | | | | |
| **ID** | **DCR\_Type** | **DCR\_Title** | **State** | **DCR\_Build Found** | **DCR\_Build Target** |
|  | | | | | |
|  | | | | | |
|  | | | | | |
| 17265 | Change Request | FM - Remove Table Compiler Warning from Default Table(s) | Test Completed | 2.2.1.0 | 2.4.0.0 |
| 18561 | Defect | GPM-IVV-1360 - FM - Event message specified in FM3002.1 not completely implemented | Ready For Closure | 2.2.0.0 | 2.4.0.0 |
| 18961 | Change Request | FM Requirements Do Not Support Fix to Delete All Files Command | Test Completed | 2.3.0.0 | 2.4.0.0 |
| 19151 | Defect | FM - RDL Template Contains Command that Does Not Exist | Test Completed | 2.2.1.0 | 2.4.0.0 |
| 19237 | Change Request | GPM-IVV-1341 - Inconsistency between FM2008.1 and implementation | Test Completed | 2.2.1.0 | 2.4.0.0 |
| 19421 | Defect | FM Child Task Termination Blocks Other Applications from Running - LADEE Ticket #1655 | Test Completed | 2.3.1.0 | 2.4.0.0 |
| 19422 | Defect | FM - Child Task Commands Get Stuck in Queue - LADEE Ticket 1654 | Test Completed | 2.3.1.0 | 2.4.0.0 |
| 20960 | Defect | FM hk variable CommandWarnCounter is unused | Test Completed | 2.3.1.0 | 2.4.0.0 |
| 21534 | Defect | IV&V CFS BVT Findings - FMFM3002.1 Item d) Not Implemented | Test Completed | 2.2.1.0 | 2.4.0.0 |
| 22105 | Defect | FM - Unprotected Shared Variable | Test Completed | 2.3.1.0 | 2.4.0.0 |
| 22138 | Change Request | FM: remove include statement for osapi-os-filesys.h from fm\_cmd\_utils.c | Test Completed |  | 2.4.0.0 |
| 22216 | Change Request | FM - Update Command Completion Event Messages from Info to Debug | Test Completed | 2.3.1.0 | 2.4.0.0 |
| 22722 | Defect | FM - Does not allow for ChildSemaphore value of 0. | Test Completed | 2.3.1.0 | 2.4.0.0 |
| 22748 | Defect | FM - Set Table State Command Results in Table Checksum Error | Test Completed | 2.3.1.0 | 2.4.0.0 |
| 22848 | Change Request | Remove Item d) from Requirement FM3002.1 | Test Completed | 2.2.0.0 | 2.4.0.0 |
| 22864 | Change Request | FM - Child Initialization Does Not Create Semaphores Properly | Test Completed | 2.4.0.0 | 2.4.1.0 |
| 22868 | Change Request | FM – Application Startup Should Complete Before Child Task Creation | Test Completed | 2.4.1.0 | 2.4.2.0 |
| 22869 | Defect | FM - Event ID 42 Doxygen Type is Incorrect | Test Completed | 2.4.1.0 | 2.4.2.0 |
| 22870 | Change Request | FM - Child Task Priority Configuration Should be Higher | Test Completed | 2.4.1.0 | 2.4.2.0 |
| 22872 | Defect | FM - Parent/Child task interface semaphores are created after the child task is started | Test Completed | 2.4.1.0 | 2.4.2.0 |
| 22874 | Change Request | FM – Increase Child Task Priority | Test Completed | 2.4.2.0 | 2.4.2.0 |