

Core Flight Software System (cFS)

Memory Manager (MM) Application

Build: 2.4.1.0

FSW Version Description Document

Release Date: 11/17/2016

Signatures

Approved by:



1.0 FSW Version Description

1.1 purpose and summary

The purpose of this build is to continue to refine the cFS Memory Manager (MM) application product. This build provides very minor bug fixes and enhancements and new assert based unit tests. This document serves as the notification of the Build 2.4.1.0 release of the cFS MM application.

MM version 2.4.1.0 is compatible with cFE builds 6.5.0 and above and OSAL 4.2.0 and above. It is recommended to run this version of MM with the latest releases of the cFE and OSAL which were used in build testing the application.

1.2 new functionality/Features 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/Features 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. See attachment 1 for a full listing of the DCRs and Trac Tickets included in this release.

**Table 1.2-3 – Changes to Previously Delivered Functionality**

Note: Trac ticket references are proceeded with a ‘#’ character.

| No. | FSB DCR # (or N/A ) | Requirements | Functionality or Change Description |
| --- | --- | --- | --- |
| 1 | 141142 | MM1010 | Incorrect error event message in mm\_dump.c. The function MM\_DumpMemToFile generates an error message that reports the incorrect value of the variable BytesRemaining. The variable BytesRemaining is set to 0 in response to the error condition prior to the generation of the event message. The event message has been updated to report the correct value of SegmentSize. |
| 2 | 4076 | N/A | MM file subtype definition and file description have been moved from private header file to the public platform configuration header file. |
| 3 | #32 | N/A | Fixed potential buffer overruns in mm\_dump.c. |
| 4 | #33 | N/A | mm\_load.c was updated to work correctly when using the new OSAL 4.2.0 filesystem abstractions. |

1.3 MISSING Planned FEATURES AND KNOWN PROBLEMS

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

Information on currently open DCRs is available at <http://tlserver3.ndc.nasa.gov:7001/index.html>. Information on currently open Trac tickets is available at <https://babelfish.arc.nasa.gov/trac/cfs_apps/report/1>. Note that these are restricted websites that requires a server account. Additional DCRs and/or Trac Tickets may have been submitted after preparation of this VDD. A cFS MM DCR report containing a listing of open DCRs and Trac tickets is available on request for customers who do not have access to the restricted servers. Please contact Susanne Strege, [susie.strege@nasa.gov](mailto: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 | 4122 | Consider allowing files to be loaded to an address other than that specified in the file | Implementation is dependent on customer needs. Community input is needed. |  | None | Not Determined |
| 2 | 4119 | Add Trick Simulation Support | Implementation is dependent on customer needs. Community input is needed. | N/A | Add required ifdef statements to header files | Not Determined |
| 3 | 4094 | Add Cache Flushing Support | Implementation is dependent on customer needs. Community input is needed. | N/A | None | Not Determined |
| 4 | 3976 | Add EEPROM write enable flag to housekeeping telemetry | Implementation is dependent on PSP | MM8000 | None | Not Determined |
| 5 | 3975 | Add support for reading/writing to registers and hardware I/O | Implementation is dependent on PSP memory type definitions | N/A | None | Not Determined |
| 6 | 3816 | Add command to get EEPROM write enable/disable status | Implementation is dependent on PSP | N/A | 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 6.9, however, OSAL provides ability to use multiple OSes | 6.9 |
| Compiler | GNU | 3.3.2 |
| cFE | Core Flight Executive | 6.5.0.0 |
| OSAL | Operating System Abstraction Layer | 4.2.0.0 |
| cFE-PSP | cFE Platform Specific Package | 1.3.0.0 |

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 | 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 | 3.1 | See cFS Deployment Guide    babelfish.arc.nasa.gov (in git system TOOLS master branchs)  and  <http://sourceforge.net/projects/coreflightexec> |
| Source Code of this FSW Build | Yes | 2.4.1.0 | Tlserver3.ndc.nasa.gov. MKS label MM-ALL-Build2.4.1.0-NOV17-2016  babelfish.arc.nasa.gov (in git system mm\_app\_master branch)  and  <http://sourceforge.net/projects/cfs-mm> |
| 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. MKS label MM-ALL-Build2.4.1.0-NOV17-2016  babelfish.arc.nasa.gov (in git system mm\_app\_master branch)  and  <http://sourceforge.net/projects/cfs-mm> |
| Ground System Scripts developed by FSB | No | N/A | Tlserver3.ndc.nasa.gov. MKS label MM-ALL-Build2.4.1.0-NOV17-2016  babelfish.arc.nasa.gov (in git system mm\_app\_master branch)  and  <http://sourceforge.net/projects/cfs-mm> |
| 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 | 2.4.1.0 | Tlserver3.ndc.nasa.gov. MKS label MM-ALL-Build2.4.1.0-NOV17-2016  babelfish.arc.nasa.gov (in git system mm\_app\_master branch)  and  <http://sourceforge.net/projects/cfs-mm> |
| Unit Test Data | Yes | 2.4.1.0 | Tlserver3.ndc.nasa.gov. MKS label MM-ALL-Build2.4.1.0-NOV17-2016  babelfish.arc.nasa.gov (in git system mm\_app\_master branch)  and  <http://sourceforge.net/projects/cfs-mm> |
| Unit Test Results | Yes | 2016/10/31 | Tlserver3.ndc.nasa.gov. MKS label MM-ALL-Build2.4.1.0-NOV17-2016  babelfish.arc.nasa.gov (in git system mm\_app\_master branch)  and  <http://sourceforge.net/projects/cfs-mm> |
| FSW Make Files | No | 2.4.1.0 | Tlserver3.ndc.nasa.gov. MKS label MM-ALL-Build2.4.1.0-NOV17-2016  babelfish.arc.nasa.gov (in git system mm\_app\_master branch)  and  <http://sourceforge.net/projects/cfs-mm> |
| Linker & Compiler Configuration Files | Yes | 2.4.1.0 | Tlserver3.ndc.nasa.gov. MKS label MM-ALL-Build2.4.1.0-NOV17-2016  babelfish.arc.nasa.gov (in git system mm\_app\_master branch)  and  http://sourceforge.net/projects/cfs-mm |
| Requirements version (from MKS) | No | 1.3 | Tlserver3.ndc.nasa.gov. MKS label MM-ALL-Build2.4.1.0-NOV17-2016  babelfish.arc.nasa.gov (in git system mm\_app\_master branch)  and  <http://sourceforge.net/projects/cfs-mm> |

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 3.1 | Available with cFE open source release:  <http://sourceforge.net/projects/coreflightexec/>  babelfish.arc.nasa.gov (in git system TOOLS master branch)  and on Tlserver3.ndc.nasa.gov |

4.0 Configuration summary and version identification

MM Build 2.4.1.0 can be found on tlserver3.gsfc.nasa.gov. Verification of the version can be done by sending a MM 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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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

MM…………………………………………………………………………………………………….Memory 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 Memory Manager build 2.4.1.0 DCRs/Trac Tickets

Trac ticket references are proceeded with a ‘#’ character.

|  | | | |
| --- | --- | --- | --- |
| **No.** | **DCR/Trac Ticket #** | **Description** | **Type** | | **Priority** | **State** | **Date Reported** | **Build Target** |
| 1 | #32 | MM: Fix potential buffer overruns in mm\_dump.c | defect | | major | Test Complete | 06/29/2015 | 2.4.1.0 |
| 2 | #33 | MM: Update to work with new OSAL abstractions | defect | | minor | Test Complete | 06/29/2015 | 2.4.1.0 |
| 3 | #39 | Allow C99 code in APPS | defect | | minor | Test Complete | 01/28/2016 | 2.4.1.0 |
| 4 | 4076 | Move MM file subtype and file description definitions from private header file to public platform configuration header file | enhancement | | medium | Test Complete | 09/17/2012 | 2.4.1.0 |
| 5 | 141142 | Incorrect Error Message in mm\_dump.c | defect | | minor | Test Complete | 12/04/2015 | 2.4.1.0 |
| 6 | 141232 | Move function prototypes from .c files to .h files. Prototypes need to be accessed by unit tests | enhancement | | minor | Test Complete | 12/18/2015 | 2.4.1.0 |
| 7 | 141233 | Implement assert based MM unit tests | enhancement | | major | Test Complete | 12/18/2015 | 2.4.1.0 |
| 8 | 145435 | Use Constants for Version Number Checks. Some assert statements check the version number using a hard-coded value. These should be replaced with the version number constants in mm\_version.h so they don't need to be updated for every release. | enhancement | | minor | Test Complete | 03/03/2016 | 2.4.1.0 |
| 9 | 145496 | Update MM unit tests to utilize new UT-Assert PSP library additions | enhancement | | medium | Test Complete | 04/10/2016 | 2.4.1.0 |
| 10 | 145674 | MM Unit Tests: Add C Macro Definition to Makefile for New cFE. With the new version of cFE (6.5.0), changes were made that caused the HK application unit tests to generate warning messages when calling CFE\_EVS\_SendEvent and CFE\_ES\_WriteSysLog. It was determined these messages were being generated because the constant OSAPI\_NO\_SPECIAL\_ATTRIBS was not being defined. This definition was placed in the unit test suite's makefile. | enhancement | | minor | Test Complete | 06/22/2016 | 2.4.1.0 |
| 11 | 145729 | MM Unit Test Makefile: Replace hard-coded paths with environment variables set in setvars.sh | enhancement | | minor | Test Complete | 07/22/2016 | 2.4.1.0 |
| 12 | 145879 | MM - UT-Assert Unit Tests - Code Walkthrough Updates | enhancement | | moderate | Test Complete | 09/22/2016 | 2.4.1.0 |
| 13 | 145913 | MM: Switch Statement in mm\_dump.c missing default case | defect | | minor | Test Complete | 10/18/2016 | 2.4.1.0 |
| 14 | 145917 | MM - CFE\_EVS\_SendEvent Format Warnings | defect | | minor | Test Complete | 10/24/2016 | 2.4.1.0 |
| 15 | 145932 | HK Requirement Document Format Issues | enhancement | | major | Test Complete |  | 2.4.1.0 |