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| DocCoverBackground | CORE FLIGHT SYSTEM  FILE MANAGER APPLICATION  BUILD 2.4.2.0  FLIGHT SOFTWARE BUILD VERIFICATON  TEST REPORT  Flight Software Branch – Code 582  Version 1.0 |

Signatures

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CFS Flight Software Product Development Lead

Plan Update History

| Version | Date | Description | Affected Pages |
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# Introduction

## Document Purpose

This Test Report describes the test results from the Core Flight System (CFS) File Manager (FM) Flight Software (FSW) Test Team build 2.4.2.0 verification testing. It is used to verify that the FM FSW has been tested in a manner that validates that it satisfies the functional and performance requirements defined within the CFS FM Requirements Document. This Test Report summarizes the FSW test history, the build verification process, the build test configuration, and the test execution and results.

## Applicable Documents

Unless otherwise stated, these documents refer to the latest version.

**Parent Documents** (Mission and FSW)

* 582-2007-032 CFS File Manager Requirements Document, Version 1.4
* 582-2008-012 CFS Deployment Guide, Version 3.0

**Reference Documents**

All of the references below can be found on the Code 582 internal website at <http://fsw.gsfc.nasa.gov/>

* 582-2003-001 FSB FSW Test Plan Template
* 582-2004-001 FSB FSW Test Description Template
* 582-2004-002 FSB FSW Test Scenario Template
* 582-2004-003 FSB FSW Test Procedure *Template*
* 582-2004-004 FSB FSW Test Execution Summary Template
* 582-2004-005 FSB Test Product Peer Review Form
* 582-2000-002 FSB FSW Unit Test Standard

## Document Organization

Section 1 of this document presents some introductory material.

Section 2 provides a flight software overview and context along with the test history and testing overview.

Section 3 describes the build verification process including procedure development and execution and test products produced.

Section 4 describes the build test configuration which includes an overview of the testbed and the requirements verification matrix.

Section 5 describes the test execution and results by subsystem.

Appendix A - provides the Requirements Traceability Matrix

Appendix B - provides the Command, Telemetry, and Events Verification Matrix

## Definitions

There were 3 verifications methods used during build verification testing. They were:

* Demonstration: Show compliance with system requirement by exhibiting the required capability (e.g. by demonstrating interactive capability, display capability, print capability, etc.
* Inspection: Show compliance with a system requirement by visual verification of the software (e.g. verifying preparation for delivery, proper interfacing)
* Analysis: Perform detailed analysis of code, generated data (both intermediate data and final output data), etc., to determine compliance with system requirements.

The fields in the Requirements Verification Matrix in Section 4.3 are defined as follows:

* Requirements Tested Passed: Requirement was fully tested in a build test procedure and passed all tests.
* Requirements Tested Failed: Requirement was fully tested in a build test procedure and failed one or more aspect of the testing.
* Requirements Tested Partially: Requirement was tested partially in a build test procedure. To be fully tested, the partially tested requirement is either tested additionally in one or more other test procedures within the same build and/or other aspects of the requirement must be tested in a later build, due to capabilities not present in the current build
* Total Tested: Total number of requirements fully tested in a build test procedure. Includes total passed and total failed, but does not include requirements tested partially, unles**s** (included as a separate entry) testing in multiple procedures within the same build constitutes total testing of a particular requirement. Total Requirements Tested is computed this way in order to avoid multiple counting of individual requirements that are tested partially in more than one procedure.
* Deferred: Number of requirements that were planned to be tested in current build, but were not tested due to some FSW capability or necessary system component not being present.
* Total: Total Requirements Tested + Number of Requirements Deferred

In each software test section in Section 5 there is a table of DCR’s. The state definitions are as follows:

* Opened: The DCR is currently being addressed
* Assigned: The DCR was accepted and the modification is being addressed
* InTest: The DCR was corrected and is currently in test
* Validated: The DCR was corrected and tested and have been validated, needs to have a CCB to close the DCR
* Closed: The DCR is closed and have been resolved and tested to satisfaction
* Closed with Defect: The DCR is closed and the defect is most likely assigned a differed DCR number associated with another subsystem.

# OVERVIEW

## Flight Data System Context

Figure 2-1 illustrates the CFS system context. The cFE interfaces to five external systems: an [Operating System](#Operating_System) (OS), a [Hardware Platform](#Hardware_Platform) (HP), an [Operational Interface](file:///C:\Users\wmoleski\Documents\Projects\cFE\CFS\File%20Manager\Testing\2.4.1.0\Operational_Interface) (OI), [Applications](#Application) (APP), and other cFE-based systems.

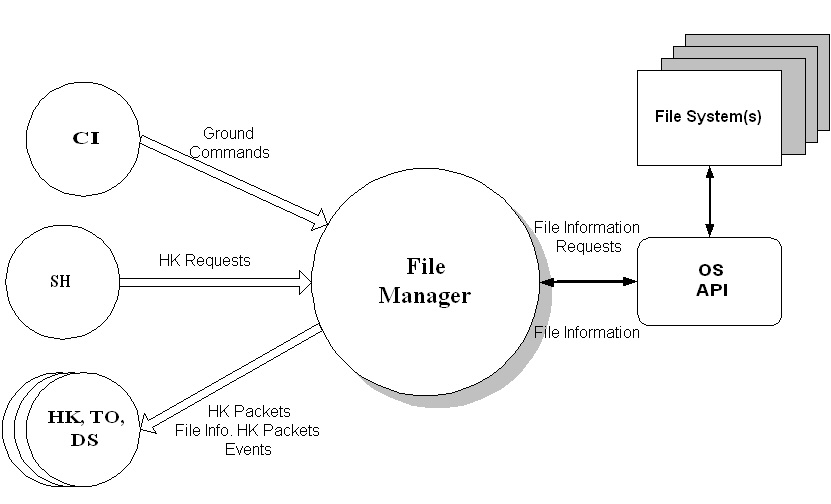


**Figure 2-1 CFS System Context**

The CFS File Manager (FM) application provides a ground interface for managing onboard file systems. The application file management services to the ground include copying files, moving or renaming files, deleting files, decompressing files, concatenating files, retrieving file and directory status information, creating directories, removing directories, and retrieving directory listings.

The CFS FM context shows use of a complete CFS, presenting interfaces with other CFS applications. SCH is the CFS scheduler application that submits periodic housekeeping requests to FM. Commands come from the CFS Command Ingest application (CI). Event messages and housekeeping packets are routed to the appropriate CFS output application, the Housekeeping (HK), Telemetry Output (TO), and/or Data Storage (DS) application. All accesses to the file system(s) are through the OS API layer of the cFE.

File systems can exist on RAM and EEPROM as well as custom devices such as a Solid State Recorder (SRR). The OSAL provides the interface to the file systems on any available devices. Custom devices such as SSRs will be handled outside of FM (potentially by another application).



**Figure 2.2 – CFS FM Context**

## Test History

FM 1.0.0.0 – Build Verification Testing completed 12/16/2008 by Damon Stewart

FM 2.0.0.0 – Build Verification Testing completed 9/25/2009 by Walt Moleski

FM 2.1.0.0 – Build Verification Testing completed 5/17/2010 by Walt Moleski

FM 2.2.0.0 – Build Verification Testing completed 8/24/2010 by Walt Moleski

FM 2.3.1.0 – Build Verification Testing completed 5/9/2012 by Walt Moleski

FM 2.4.1.0 – Build Verification Testing completed 1/12/2015 by Walt Moleski

FM 2.4.2.0 – Build Verification Testing completed 1/22/2015 by Walt Moleski

## Testing Overview

The FM application was tested during Build Verification testing using the following:

* 1 test application: TST\_FM
* 1 test procedure to start the FM and TST\_FM applications
* Header files used in procedures: tst\_fm\_events.h, fm\_events.h, fm\_platform\_cfg.h, fm\_defs.h, ut\_statusdefs.h, cfe\_evs\_events.h, cfe\_es\_events.h
* RDLs used: template\_cmd\_FM\_CMD.rdl, template\_file\_FM\_DIRLISTFILE.rdl, template\_table\_FM\_FREESPACE\_TBL.rdl, template\_tlm\_FM\_DIRLIST\_TLM.rdl, template\_tlm\_FM\_FILESTAT\_TLM.rdl, template\_tlm\_FM\_FREESPACE\_TLM.rdl, template\_tlm\_FM\_HK\_TLM.rdl, template\_tlm\_FM\_OPENFILELIST\_TLM.rdl, template\_cmd\_TST\_FM\_CMD.rdl, template\_tlm\_TST\_FM\_HK\_TLM.rdl
* Header files used in RDLs: osconfig.h, fm\_platform\_cfg.h, cfe\_file\_header.rdl, ccsds\_header.rdl

The tst\_fm test application is used to send schedule requests for the output of FM’s housekeeping data.

The following test procedure was used to test FM 2.4.2.0.

| **Procedure** | **Description** |
| --- | --- |
| fm\_startfmapps | Starts all needed applications and opens all FM Tlm pages |

The CFS Deployment Guide contains the instruction for how to set up both the CFS Flight and Ground test environment. The testers use a CFS Test Account for each build test. This account runs ASIST and is setup to contain all the files needed to test the application. These files are extracted from MKS, the source repository tool. Included in these files are test utilities. These utilities can be located in 2 places depending upon whether they are “local” or “global” utilities. The local utilities are extracted into the working prc directory ($WORK/prc). The global utilities are pointed to by ASIST in the global area defined on the test system. Additional tools utilized by the test procedures are located in the $TOOLS directory. It is assumed that test procedures and the ASIST telemetry database used for testing is built using procedure and database templates

The following utilities were used during testing:

| **Name** | **Description** |
| --- | --- |
| cfe\_startup | Directive combines the "start\_data\_center", "open\_tlm", and "open cmd <cpu>" ASIST startup commands. |
| cfe\_shutdown | Directive combines the "close\_data\_center" and "exit" ASIST shutdown commands. |
| FILE\_TO\_CVT | Directive that takes the contents of a file and associates it with a Current Value Table (CVT) for displaying in an ASIST Display page |
| ftp\_file | To ftp a file to/from the FSW/GSW. |
| load\_start\_app | Procedure to load and start a user application from the $WORK/apps/cpux directory. |
| ut\_runproc | Directive to formally run the procedure and capture the log file. |
| ut\_sendcmd | Directive to send EVS commands Verifies command processed and command error counters. |
| ut\_sendrawcmd | Send raw commands to the spacecraft. Verifies command processed and command error counters. |
| ut\_setrequirements | A directive to set the status of the cFE requirements array. |
| ut\_setupevents | Directive to look for multiple events and increment a value for each event to indicate receipt. |
| ut\_tlmupdate | Procedure to wait for a specified telemetry point to update. |
| ut\_tlmwait | Directive that waits for the specified telemetry condition to be met |

## Version Information

|  |  |
| --- | --- |
| Item | Version |
| FM Requirements | 1.4 |
| FM Application | 2.4.2.0 |
| TST\_FM Application | 2.4.2.0 |
| CFE | 6.4.1.0 |
| ASIST | 20.2 |
| VxWorks | 6.4 |

# Build Verification Test Preparation

## Scenerio Development

No new scenarios were developed for build verification test 2.4.2.0. All scenarios are stored on the MKS server, in CFS-Repository FM test-and-ground directory within the test-review-packages subdirectory in the Scenarios folder. It should be noted that as FM requirement evolve these scenarios are not updated to reflect any changes made.

## Procedure Development and Execution

This build test was completed by running a single procedure that starts up the FM and TST\_FM applications.

## Test Products

Four log files were generated for every procedure that was run. They are defined as follows:

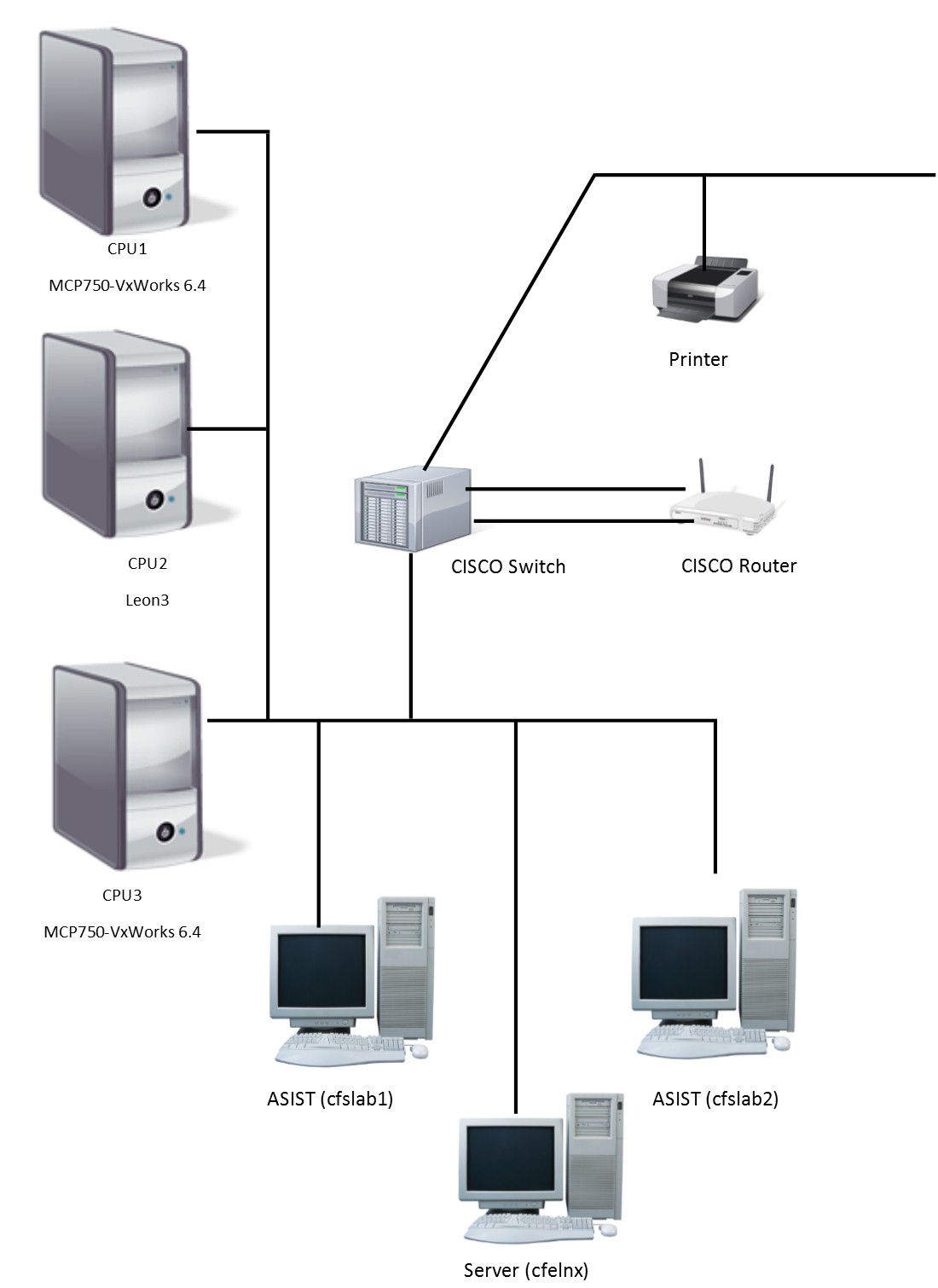
* Logs with the .loge extension list all events sent by the flight software
* Logs with the .logr extension list all requirements that passed validation by demonstration
* Logs with the .logp extension lists all prints that are generated by the test procedure
* Logs with the .logf extension lists everything from the other logs along with the steps in the test procedure
* Logs with the .logs extension lists the SFDU information (if applicable) contained in the full log.

A test summary report is developed in MKS for each procedure by the tester after build testing is completed. All test products are maintained on MKS in the CFS-Repository FM test-and-ground directory.

# Build Verification Test Execution

## Testbed Overview

FM FSW testing took place in the CFS FSW Development and Test Facility. A high level view of the CFS FSW Test Bed is shown in Figure 4-1. This facility is located in GSFC Building 23, Room N410. This facility consists of two ASIST workstations running ASIST version 20.2 and three MPC750 CPU boards running VxWorks 6.4. CPU1 is primarily used for development testing while CPU2 and CPU3 are used for build verification testing.



**Figure 4-1 CFS FSW Development and Testing Facility**

## Requirements Verification Matrix

No requirements were tested with FM 2.4.2.0.

## Requirements Partially Tested

No requirements were partially tested.

## Requirements/Functionality Deferred

No requirements were deferred for later build testing

## Requirements/Functionality Deferred For Mission Testing

No requirements were deferred for Mission Testing.

# Build VerIfication Test Results

## Overall Assessment

FM 2.4.2.0 testing was limited checking out the release and executing the application to address some minor issues found with FM 2.4.1.0.

During this build test of the FM Application, the software behaved as expected with several problems still outstanding from previous testing (see Section 5.5.2 Outstanding DCRs). Below is a summary of the results:

* 5 existing DCRs were validated

## Procedure Description

| **Procedure** | **Description** | **Requirements Tested** |
| --- | --- | --- |
| fm\_startfmapps | Starts all needed applications and opens all FM Tlm pages | None |

## Analysis Requirements Verification

No requirements were verified using analysis.

## Failed Requirements

No requirements failed during FM 2.4.2.0 testing.

## DCRs

No new DCRs were generated during FM 2.4.2.0 testing.

### DCRs Verified

The following DCRs were verified during testing:

| **DCR** | **Description** | **Test Method** | **Test Approach** |
| --- | --- | --- | --- |
| 22868 | FM – Application Startup Should Complete Before Child Task Creation | Inspection | Changes for this DCR were submitted with DCR 22872 |
| 22869 | FM – Event ID 42 Doxygen Type is Incorrect | Inspection | The dm\_events.h file was inspected and ID 42 is correctly identified as an Information event. |
| 22870 | FM – Child Task Priority Configuration Should be Higher | Test Procedure | The FM task was started and the Child Task Priority was set to the configuration parameter value. |
| 22872 | FM – Parent/Child task interface semaphores are created after the child task is started | Test Procedure | The FM application and its child task were started. The FM application’s initialization completed event was issued before the Child Task initialization completed event. This verifies DCR #22868 as well as this DCR. |
| 22874 | FM – Increase Child Task Priority | Test Procedure | The FM task was started and the Child Task Priority was set to the configuration parameter value. |

### Outstanding DCRs

|  |  |
| --- | --- |
| **DCR** | **Description** |
| 19149 | FM – Directory List Tlm command behavior when Directory argument is “/” |
| 19183 | FM – Consider removing Child Task Priority and Pipe Depth checks from verify.h |
| 19239 | GPM-IVV-1340 – FM Requirements do not capture overwrite capability |
| 19814 | FM- Sending Free Space Via Command Only Does Not Support FDC Operations |
| 21933 | FM CRC Tool Displays Output in Hexidecimal Only |
| 22008 | FM – Add Trick Simulation Support (JSC Request) |
| 22589 | FM – Child Task Command Processing is Hardcoded |
| 22827 | FM application has several lines of source code that are not covered by unit tests |
| 22858 | Verify result from OS\_MutSemCreate() before use of FM\_GlobalData ChildQueueCountSem |

## Notes

None.

## Follow-on

None

1. RTTM

The FM Build 2.4.2.0 testing did not generate an RTTM. Previous build test artifacts can be found on the MKS server, in CFS-Repository FM test-and-ground directory results folder.

1. Command, Telemetry, and Events Verification Matrix

| **Command** | **Test Procedure(s)** | **Notes/Comments** |
| --- | --- | --- |
| FM\_NoOp | gencmds |  |
| FM\_ResetCtrs | gencmds |  |
| FM\_FileCopy | filecopy\_basic, filecopy\_stress |  |
| FM\_FileMove | filemove\_basic, filemove\_stress |  |
| FM\_FileRename | filerename\_basic, filerename\_stress |  |
| FM\_Delete | dircmds\_basic, filecopy\_stress, filedelete\_stress, fileinfo\_basic,  openfiles |  |
| FM\_DeleteAll | filedelete\_stress, fileinfo\_basic,  openfiles |  |
| FM\_Decompress | filedecom\_basic, filedecom\_stress |  |
| FM\_FileCat | filecat\_basic, filecat\_stress |  |
| FM\_FileInfo | filecat\_basic, filecat\_stress,  filecopy\_basic, filecopy\_stress,  filedecom\_basic, filedecom\_stress, filedelete\_stress, fileinfo\_basic,  fileinfo\_stress, filemove\_basic,  filemove\_stress, filerename\_basic, filerename\_stress,  specialchars1 - 5 |  |
| FM\_ListOpenFiles | openfiles |  |
| FM\_DirCreate | dircmds\_basic, dircmds\_stress, filecat\_basic, filecat\_stress,  filecopy\_basic, filecopy\_stress,  filedecom\_basic, filedecom\_stress, filedelete\_stress, fileinfo\_basic,  fileinfo\_stress, filemove\_basic,  filemove\_stress, filerename\_basic, filerename\_stress, openfiles, specialchars1 – 5 |  |
| FM\_DirDelete | dircmds\_basic, dircmds\_stress,  specialchars1 - 4 |  |
| FM\_DirListFile | dircmds\_basic, dircmds\_stress; filedelete\_stress, specialchars1 - 5 |  |
| FM\_DirListTlm | dircmds\_basic, dircmds\_stress,  openfiles, specialchars1 - 5 |  |
| FM\_GetFreeSpace | gencmds |  |
| FM\_SetTblState | gencmds |  |

| **Telemetry** | **Test Procedure(s)** | **Notes/Comments** |
| --- | --- | --- |
| FM\_CMDPC | dircmds\_basic, dircmds\_stress, dirrename, filecat\_basic, filecat\_stress, filecopy\_basic, filecopy\_stress, filedecom\_basic, filedecom\_stress, filedelete\_stress, fileinfo\_basic, fileinfo\_stress, filemove\_basic, filemove\_stress, filerename\_basic, filerename\_stress, gencmds, openfiles, specialchars1 – 5 |  |
| FM\_CMDEC | dircmds\_basic, dircmds\_stress, dirrename, filecat\_basic, filecat\_stress, filecopy\_basic, filecopy\_stress, filedecom\_basic, filedecom\_stress, filedelete\_stress, fileinfo\_basic, fileinfo\_stress, filemove\_basic, filemove\_stress, filerename\_basic, filerename\_stress, gencmds, openfiles, specialchars1 – 5 |  |
| FM\_NumOpen | filecat\_basic, filecopy\_basic,  filedecom\_basic, fileinfo\_basic,  filemove\_basic, filerename\_basic |  |
| FM\_ChildCMDPC | dirfiledisplay, filecopy\_stress, filedecom\_stress |  |
| FM\_ChildCMDEC | dircmds\_basic, dircmds\_stress, filecat\_stress, filecopy\_stress, filedecom\_stress, filemove\_stress, filerename\_stress |  |
| FM\_ChildWarnCtr |  |  |
| FM\_ChildQueCnt |  |  |
| FM\_ChildCurrCC |  |  |
| FM\_ChildPrevCC |  |  |
| FM\_TotalOpenFiles | openfiles |  |
| FM\_OpenFileList[].FileName | openfiles |  |
| FM\_OpenFileList[].AppName |  |  |
| FM\_DirName | dircmds\_basic, dircmds\_stress, openfiles, specialchars1 - 5 |  |
| FM\_TotalFiles | dircmds\_basic, dircmds\_stress, openfiles, specialchars1 - 5 |  |
| FM\_PktFiles | dircmds\_basic, dircmds\_stress, openfiles, specialchars1 - 5 |  |
| FM\_DirOffset | dircmds\_basic, dircmds\_stress, openfiles, specialchars1 - 5 |  |
| FM\_DirList[].Name | dircmds\_basic, dircmds\_stress, openfiles, specialchars1 - 5 |  |
| FM\_DirList[].FileSize | dircmds\_basic, dircmds\_stress, openfiles, specialchars1 - 5 |  |
| FM\_DirList[].LastModTime | dircmds\_basic, dircmds\_stress, openfiles, specialchars1 - 5 |  |
| FM\_FileStatus | dirrename, filecat\_basic, filecat\_stress, filecopy\_basic, filecopy\_stress, filedecom\_basic, filedecom\_stress, filedelete\_stress, fileinfo\_basic, fileinfo\_stress, filemove\_basic, filemove\_stress  filerename\_basic, filerename\_stress, specialchars1 - 5 |  |
| FM\_ComputeCRC | dirrename, filecat\_basic, filecat\_stress, filecopy\_basic, filecopy\_stress, filedecom\_basic, filedecom\_stress, filedelete\_stress, fileinfo\_basic, fileinfo\_stress, filemove\_basic, filemove\_stress  filerename\_basic, filerename\_stress, specialchars1 - 5 |  |
| FM\_CRC | dirrename, filecat\_basic, filecat\_stress, filecopy\_basic, filecopy\_stress, filedecom\_basic, filedecom\_stress, filedelete\_stress, fileinfo\_basic, fileinfo\_stress, filemove\_basic, filemove\_stress  filerename\_basic, filerename\_stress, specialchars1 - 5 |  |
| FM\_InfoFileSize | dirrename, filecat\_basic, filecat\_stress, filecopy\_basic, filecopy\_stress, filedecom\_basic, filedecom\_stress, filedelete\_stress, fileinfo\_basic, fileinfo\_stress, filemove\_basic, filemove\_stress  filerename\_basic, filerename\_stress, specialchars1 - 5 |  |
| FM\_ModTime | dirrename, filecat\_basic, filecat\_stress, filecopy\_basic, filecopy\_stress, filedecom\_basic, filedecom\_stress, filedelete\_stress, fileinfo\_basic, fileinfo\_stress, filemove\_basic, filemove\_stress  filerename\_basic, filerename\_stress, specialchars1 - 5 |  |
| FM\_InfoFileName[] | dirrename, filecat\_basic, filecat\_stress, filecopy\_basic, filecopy\_stress, filedecom\_basic, filedecom\_stress, filedelete\_stress, fileinfo\_basic, fileinfo\_stress, filemove\_basic, filemove\_stress  filerename\_basic, filerename\_stress, specialchars1 - 5 |  |
| FM\_FreeSpacePkt[].Upper32 | gencmds |  |
| FM\_FreeSpacePkt[].Lower32 | gencmds |  |
| FM\_FreeSpacePkt[].Name | gencmds |  |

| **File and Table Telemetry** | **Test Procedure(s)** | **Notes/Comments** |
| --- | --- | --- |
| FM\_DirNameInFile | dircmds\_basic, dircmds\_stress, filedelete\_stress, specialchars1 – 5 |  |
| FM\_TotalFilesInDir | dircmds\_basic, dircmds\_stress, filedelete\_stress, specialchars1 – 5 |  |
| FM\_NumFilesWritten | dircmds\_basic, dircmds\_stress, filedelete\_stress, specialchars1 – 5 |  |
| FM\_FileListEntry[].Name | dircmds\_basic, dircmds\_stress, filedelete\_stress, specialchars1 – 5 |  |
| FM\_FileListEntry[].FileSize | dircmds\_basic, dircmds\_stress, filedelete\_stress, specialchars1 – 5 |  |
| FM\_FileListEntry[].LastModTime | dircmds\_basic, dircmds\_stress, filedelete\_stress, specialchars1 – 5 |  |
| FM\_FreeSpaceTBL[].State | badtblloadfile, gencmds, tableloadfile |  |
| FM\_FreeSpaceTBL[].Name | badtblloadfile, gencmds, tableloadfile |  |

| **Id** | **Event Message** | **Test Procedure(s)** | **Notes/Comments** |
| --- | --- | --- | --- |
| **1** | FM\_STARTUP\_EID | dircmds\_basic, dircmds\_stress, dirrename, filecat\_basic, filecat\_stress, filecopy\_basic, filecopy\_stress, filedecom\_basic,  filedecom\_stress, filedelete\_stress, fileinfo\_basic, fileinfo\_stress, filemove\_basic, filemove\_stress, filerename\_basic, filerename\_stress, gencmds, openfiles, specialchars1 - 5 |  |
| **2** | FM\_STARTUP\_EVENTS\_ERR\_EID |  |  |
| **3** | FM\_STARTUP\_CREAT\_PIPE\_ERR\_EID |  |  |
| **4** | FM\_STARTUP\_SUBSCRIB\_HK\_ERR\_EID |  |  |
| **5** | FM\_STARTUP\_SUBSCRIB\_GCMD\_ERR\_EID |  |  |
| **6** | FM\_STARTUP\_TABLE\_INIT\_ERR\_EID |  |  |
| **7** | FM\_SB\_RECEIVE\_ERR\_EID |  |  |
| **8** | FM\_EXIT\_ERR\_EID | gencmds |  |
| **9** | FM\_MID\_ERR\_EID |  |  |
| **10** | FM\_CC\_ERR\_EID | gencmds |  |
| **11** | FM\_HK\_REQ\_ERR\_EID |  |  |
| **12** | FM\_NOOP\_CMD\_EID | gencmds |  |
| **13** | FM\_NOOP\_PKT\_ERR\_EID | gencmds |  |
| **14** | FM\_RESET\_CMD\_EID | gencmds |  |
| **15** | FM\_RESET\_PKT\_ERR\_EID | gencmds |  |
| **16** | FM\_COPY\_CMD\_EID | dircmds\_stress, filecopy\_basic, filecopy\_stress, specialchars1 - 5 |  |
| **17** | FM\_COPY\_PKT\_ERR\_EID | filecopy\_stress |  |
| **18** | FM\_COPY\_OVR\_ERR\_EID |  |  |
| **19** | FM\_COPY\_SRC\_ERR\_EID | filecopy\_stress, specialchars1 - 5 |  |
| **20** | FM\_COPY\_TGT\_ERR\_EID | filecopy\_basic, filecopy\_stress, specialchars1 - 5 |  |
| **21** | FM\_COPY\_CHILD\_ERR\_EID |  |  |
| **22** | FM\_COPY\_OS\_ERR\_EID | dircmds\_stress, filecopy\_stress, specialchars1 - 5 |  |
| **23** | FM\_MOVE\_CMD\_EID | filemove\_basic, filemove\_stress, specialchars1 - 5 |  |
| **24** | FM\_MOVE\_PKT\_ERR\_EID | filemove\_stress |  |
| **25** | FM\_MOVE\_OVR\_ERR\_EID |  |  |
| **26** | FM\_MOVE\_SRC\_ERR\_EID | filemove\_basic, filemove\_stress, specialchars1 - 5 |  |
| **27** | FM\_MOVE\_TGT\_ERR\_EID | filemove\_basic, filemove\_stress, specialchars1 - 5 |  |
| **28** | FM\_MOVE\_CHILD\_ERR\_EID |  |  |
| **29** | FM\_MOVE\_OS\_ERR\_EID | filemove\_stress |  |
| **30** | FM\_RENAME\_CMD\_EID | filerename\_basic, filerename\_stress,  specialchars1 - 5 |  |
| **31** | FM\_RENAME\_PKT\_ERR\_EID | filerename\_stress |  |
| **32** | FM\_RENAME\_SRC\_ERR\_EID | dirrename, filerename\_stress,  specialchars1 - 5 |  |
| **33** | FM\_RENAME\_TGT\_ERR\_EID | filerename\_basic, filerename\_stress,  specialchars1 - 5 |  |
| **34** | FM\_RENAME\_CHILD\_ERR\_EID |  |  |
| **35** | FM\_RENAME\_OS\_ERR\_EID | filerename\_stress,  specialchars1 - 5 |  |
| **36** | FM\_DELETE\_CMD\_EID | dircmds\_basic, filecopy\_stress, filedelete\_stress, openfiles, specialchars1 - 5 |  |
| **37** | FM\_DELETE\_PKT\_ERR\_EID | filedelete\_stress |  |
| **38** | FM\_DELETE\_SRC\_ERR\_EID | filedelete\_stress, fileinfo\_basic, openfiles, specialchars1 - 5 |  |
| **39** | FM\_DELETE\_CHILD\_ERR\_EID |  |  |
| **40** | FM\_DELETE\_OS\_ERR\_EID |  |  |
| **41** | FM\_DELETE\_ALL\_CMD\_EID | dircmds\_stress, filedecom\_stress, filedelete\_stress, fileinfo\_basic, openfiles, specialchars1 - 4 |  |
| **42** | FM\_DELETE\_ALL\_WARNING\_EID | filedelete\_stress, fileinfo\_basic, openfiles |  |
| **43** | FM\_DELETE\_ALL\_PKT\_ERR\_EID | filedelete\_stress |  |
| **44** | FM\_DELETE\_ALL\_SRC\_ERR\_EID | filedelete\_stress,  specialchars1 - 4 |  |
| **45** | FM\_DELETE\_ALL\_CHILD\_ERR\_EID |  |  |
| **46** | FM\_DELETE\_ALL\_OS\_ERR\_EID |  |  |
| **47** | FM\_DECOM\_CMD\_EID | filedecom\_basic, filedecom\_stress,  specialchars1 - 5 |  |
| **48** | FM\_DECOM\_PKT\_ERR\_EID | filedecom\_stress |  |
| **49** | FM\_DECOM\_SRC\_ERR\_EID | filedecom\_basic, filedecom\_stress,  specialchars1 - 5 |  |
| **50** | FM\_DECOM\_TGT\_ERR\_EID | filedecom\_basic, filedecom\_stress,  specialchars1 - 5 |  |
| **51** | FM\_DECOM\_CHILD\_ERR\_EID |  |  |
| **52** | FM\_DECOM\_CFE\_ERR\_EID | filedecom\_stress |  |
| **53** | FM\_CONCAT\_CMD\_EID | filecat\_basic, filecat\_stress, specialchars1 - 5 |  |
| **54** | FM\_CONCAT\_PKT\_ERR\_EID | filecat\_stress |  |
| **55** | FM\_CONCAT\_SRC1\_ERR\_EID | filecat\_basic, filecat\_stress, specialchars1 - 5 |  |
| **56** | FM\_CONCAT\_SRC2\_ERR\_EID | filecat\_basic, filecat\_stress, specialchars1 - 5 |  |
| **57** | FM\_CONCAT\_TGT\_ERR\_EID | filecat\_basic, filecat\_stress, specialchars1 - 5 |  |
| **58** | FM\_CONCAT\_CHILD\_ERR\_EID |  |  |
| **59** | FM\_CONCAT\_OS\_ERR\_EID | filecat\_stress |  |
| **60** | FM\_GET\_FILE\_INFO\_CMD\_EID | dirrename, filecat\_basic, filecat\_stress, filecopy\_basic, filecopy\_stress, filedecom\_basic, filedecom\_stress, filedelete\_stress, fileinfo\_basic, fileinfo\_stress, filemove\_basic, filemove\_stress, filerename\_basic, filerename\_stress,  specialchars1 - 5 |  |
| **61** | FM\_GET\_FILE\_INFO\_PKT\_ERR\_EID | fileinfo\_stress |  |
| **62** | FM\_GET\_FILE\_INFO\_SRC\_ERR\_EID | fileinfo\_stress, specialchars1 - 5 |  |
| **63** | FM\_GET\_FILE\_INFO\_CHILD\_ERR\_EID |  |  |
| **64** | FM\_GET\_FILE\_INFO\_WARNING\_EID | fileinfo\_stress |  |
| **65** | FM\_GET\_OPEN\_FILES\_CMD\_EID | dirrename, openfiles |  |
| **66** | FM\_GET\_OPEN\_FILES\_PKT\_ERR\_EID | openfiles |  |
| **67** | FM\_CREATE\_DIR\_CMD\_EID | dircmds\_basic, dircmds\_stress, dirrename, filecat\_basic, filecat\_stress, filecopy\_basic, filecopy\_stress, filedecom\_basic,  filedecom\_stress, filedelete\_stress, fileinfo\_basic, fileinfo\_stress, filemove\_basic, filemove\_stress, filerename\_basic, filerename\_stress, openfiles, specialchars1 - 5 |  |
| **68** | FM\_CREATE\_DIR\_PKT\_ERR\_EID | dircmds\_stress |  |
| **69** | FM\_CREATE\_DIR\_SRC\_ERR\_EID | dircmds\_stress, specialchars1 - 5 |  |
| **70** | FM\_CREATE\_DIR\_CHILD\_ERR\_EID |  |  |
| **71** | FM\_CREATE\_DIR\_OS\_ERR\_EID | dircmds\_stress |  |
| **72** | FM\_DELETE\_DIR\_CMD\_EID | dircmds\_basic, dircmds\_stress, specialchars1 - 4 |  |
| **73** | FM\_DELETE\_DIR\_PKT\_ERR\_EID | dircmds\_stress |  |
| **74** | FM\_DELETE\_DIR\_SRC\_ERR\_EID | dircmds\_stress, specialchars1 - 4 |  |
| **75** | FM\_DELETE\_DIR\_CHILD\_ERR\_EID |  |  |
| **76** | FM\_DELETE\_DIR\_EMPTY\_ERR\_EID | dircmds\_basic, dircmds\_stress |  |
| **77** | FM\_DELETE\_DIR\_OS\_ERR\_EID |  |  |
| **78** | FM\_GET\_DIR\_FILE\_CMD\_EID | dircmds\_basic, dircmds\_stress, filedelete\_stress,  specialchars1 - 5 |  |
| **79** | FM\_GET\_DIR\_FILE\_PKT\_ERR\_EID | dircmds\_stress |  |
| **80** | FM\_GET\_DIR\_FILE\_SRC\_ERR\_EID | dircmds\_basic, dircmds\_stress, filedelete\_stress,  specialchars1 - 4 |  |
| **81** | FM\_GET\_DIR\_FILE\_TGT\_ERR\_EID | dircmds\_stress, specialchars1 - 5 |  |
| **82** | FM\_GET\_DIR\_FILE\_WARNING\_EID | dircmds\_stress, filedelete\_stress |  |
| **83** | FM\_GET\_DIR\_FILE\_CHILD\_ERR\_EID |  |  |
| **84** | FM\_GET\_DIR\_FILE\_OS\_ERR\_EID | dircmds\_stress |  |
| **85** | FM\_GET\_DIR\_PKT\_CMD\_EID | dircmds\_basic, dircmds\_stress, openfiles, specialchars1 - 4 |  |
| **86** | FM\_GET\_DIR\_PKT\_WARNING\_EID | dircmds\_stress |  |
| **87** | FM\_GET\_DIR\_PKT\_PKT\_ERR\_EID | dircmds\_stress |  |
| **88** | FM\_GET\_DIR\_PKT\_SRC\_ERR\_EID | dircmds\_basic, dircmds\_stress, specialchars1 - 4 |  |
| **89** | FM\_GET\_DIR\_PKT\_CHILD\_ERR\_EID |  |  |
| **90** | FM\_GET\_DIR\_PKT\_OS\_ERR\_EID |  |  |
| **91** | FM\_GET\_FREE\_SPACE\_CMD\_EID | gencmds, openfiles |  |
| **92** | FM\_GET\_FREE\_SPACE\_PKT\_ERR\_EID | gencmds |  |
| **93** | FM\_GET\_FREE\_SPACE\_TBL\_ERR\_EID |  |  |
| **94** | FM\_SET\_TABLE\_STATE\_CMD\_EID | gencmds |  |
| **95** | FM\_SET\_TABLE\_STATE\_PKT\_ERR\_EID | gencmds |  |
| **96** | FM\_SET\_TABLE\_STATE\_TBL\_ERR\_EID | gencmds |  |
| **97** | FM\_SET\_TABLE\_STATE\_ARG\_ERR\_EID | gencmds |  |
| **98** | FM\_SET\_TABLE\_STATE\_UNUSED\_ERR\_EID | gencmds |  |
| **99** | FM\_TABLE\_VERIFY\_ERR\_EID | gencmds |  |
| **100** | FM\_CHILD\_INIT\_EID | dircmds\_basic, dircmds\_stress, dirrename, filecat\_basic, filecat\_stress, filecopy\_basic, filecopy\_stress, filedecom\_basic,  filedecom\_stress, filedelete\_stress, fileinfo\_basic, fileinfo\_stress, filemove\_basic, filemove\_stress, filerename\_basic, filerename\_stress, gencmds, openfiles, specialchars1 - 5 |  |
| **101** | FM\_CHILD\_INIT\_ERR\_EID |  |  |
| **102** | FM\_CHILD\_TERM\_ERR\_EID |  |  |
| **103** | FM\_CHILD\_EXE\_ERR\_EID |  |  |
| **104** | FM\_TABLE\_VERIFY\_EID | dircmds\_basic, dircmds\_stress, dirrename, filecat\_basic, filecat\_stress, filecopy\_basic, filecopy\_stress, filedecom\_basic,  filedecom\_stress, filedelete\_stress, fileinfo\_basic, fileinfo\_stress, filemove\_basic, filemove\_stress, filerename\_basic, filerename\_stress, gencmds, openfiles, specialchars1 - 5 |  |