

**Thursday 18 November 2004 (ALL DAY)**

**Meeting Name: CFDP Interoperability Testing WG**

**Location: Toulouse, France**

**Participants:**

Mr. Massimiliano Ciccone (ESA)

Mr. Scott Burleigh (JPL)

Mr. Leigh Torgerson (JPL)

Mr. Robert C. Durst

Mr. Robert Romeau (CNES)

<b>Time</b>	<b>Subject</b>	<b>Discussion Lead</b>
0900	Presentation of Final Report on CFDP Interoperability Testing	Max Ciccone
0930	Discussion of Possible Further WG work items	Max Ciccone
1030	Discussion and Agreement on WG Termination date	Max Ciccone
1100	SFO Interoperability test workshop (ESA-JPL)	Max Ciccone
1800	Adjourn	Max Ciccone

**Meeting outcome:**

The interoperability (ESA-JPL) test of CFDP SFO and Extended procedures will be performed in the protocol-testing laboratory at JPL in “absentee owner” mode.

A special tool was developed by the ESA implementer, which allows receiving, via email, hex dumps of PDUs causing problems and re-inserting those PDUs into a local debugging system at ESA ESTEC in Noordwijk, Holland, thus exactly recreating the problem encountered in the Lab at JPL in Pasadena.

Such a tool enables a kind of “batch remote debugging” operation during the test phase.

CFDP interoperability test plan:

- SFO test series (F6 to F9) to be completed by end of 2004
- Extended test series to begin in mid January 2005
- Extended test series to be completed by end of March 2005
- New Pink Sheets for SFO and Extended to be requested at completion of test phase; including necessary changes spotted during interoperability tests.
- Final results on SFO and Extended interoperability tests presented at CCSDS meeting in Spring 2005

## INPUTS FOR PINK SHEETS:

1)

### **Motivation:**

The current description in the *Value* fields is unclear.

### **Required Changes:**

Table 5-9: “*Source Filename*” and “*Destination Filename*” entries. Value columns: “*When there is no associated file, e.g., messages used for Proxy operation, the LV Length field contains zero and the LV Value field is omitted*” (To be moved in *Comments* column?)

2)

### **Motivation:**

The Entity IDs in SFO messages are expressed in LV format. In order to allow interoperability the value field must contain the numerical value of the Entity ID itself and not, for example, the ASCII value of the characters representing the ID.

Note that this way we do NOT allow a CFDP entity to be identified as: “orbiter01” in the CFDP domain (unless we decide to use an ASCII representation)

### **Required Changes:**

General note in section 5.1 and individually in each table where an Entity ID appears:

- The *Comments* column of the *Fixed PDU Header Fields* Table (5-1) for the “Source Entity ID” and for the “Destination Entity ID” entries must specify it.
- The *Comments* column of the *Originating Transaction ID Message* Table (6-2) for the “Source Entity ID” entry must specify it.
- The *Comments* column of the *Proxy Put Request Message* Table (6-4) for the “Destination Entity ID” entry must specify it.
- The *Comments* column of the *Remote Status Report Request* Table (6-17) for the “Source Entity ID” entry must specify it.
- The *Comments* column of the *Remote Status Report Response* Table (6-18) for the “Source Entity ID” entry must specify it.
- The *Comments* column of the *Remote Suspend Request Message* Table (6-20) for the “Source Entity ID” entry must specify it.
- The *Comments* column of the *Remote Suspend Response Message* Table (6-21) for the “Source Entity ID” entry must specify it.
- The *Comments* column of the *Remote Resume Request Message* Table (6-23) for the “Source Entity ID” entry must specify it.
- The *Comments* column of the *Remote Resume Response Message* Table (6-24) for the “Source Entity ID” entry must specify it.
- The *Comments* column of the *SFO Request Message* Table (6-26) for the “Source Entity ID” and for the “Destination Entity ID” entries must specify it.
- The *Comments* column of the *SFO Report Message* Table (6-31) for the “Source Entity ID”, for the “Destination Entity ID” and for the “Reporting Entity ID” entries must specify it.

3)

**Motivation:**

To enforce interoperability, not specifying a file path in the destination filename of an SFO transmission FDU Metadata PDU will avoid conflicts between different naming conventions for operating systems running CFDP entities involved in an SFO transfer. The need to use an implementation-specific file name convention for temporary storage of files at a CFDP waypoint (SFO or Extended) has been discussed. Any reference to reusing original file path and name at CFDP SFO waypoints must be removed from the CFDP specs. Need for a “bad name” SFO report code as also been agreed.

**Required Changes:**

**“6.7.4.1.5** If the computed route contains one or more other CFDP entities (waypoints) in addition to the local CFDP entity and the final destination user’s CFDP entity, then the user application shall use the CFDP **Put.request** primitive to request delivery of an SFO transmission file delivery unit to the first waypoint in the route. The file transmitted in the SFO transmission FDU shall be the file that is to be delivered to the final destination user, if any. In order to allow interoperability, the destination filename specified in each Metadata PDU, for the entire sequence of related SFO transmission FDUs, must be the same from the SFO source up to the SFO agent. Such a filename shall be constructed by the SFO source according to the following naming convention:

**<SFO Source Entity ID>\_<SFO Request Label>.sfo**

**NOTE** – No path shall be specified in the filename in order to avoid mismatch with the file naming convention used at each SFO waypoint. It would be a good practice, for an SFO capable entity, to reserve a specific directory in the local filestore (with a limited amount of allocated space) for temporary storage of SFO files to be forwarded towards the final destination and to reject any further incoming SFO file if such a space is exceeded.

The SFO agent will then construct the Metadata PDU using the destination filename contained in the received “*SFO Request*” *Message to User* for issuing the *SFO final delivery transaction*.

The Metadata PDU of SFO transmission FDU shall comprise a single SFO Request message, defined in 6.7.4.2, together with zero or more of the Reserved CFDP Messages defined in 6.7.4.3 through 6.7.4.6.

**NOTE** - At any time after the transaction finishes, the user application may at its option delete its local copy of the transmitted file.”

**“6.7.5.4** If the computed route contains one or more waypoints in addition to the local CFDP entity and the final destination user’s CFDP entity, then a relay transaction is in order.

If the Prior Waypoints Count in the *SFO Request Message* is equal to the maximum possible value for this field (that is, 255), then relaying is disallowed. The CFDP user shall use the SFO Reporting procedure (see 6.7.6) to notify the original source user application that the maximum number of waypoints was exceeded for this request.

If the Destination Filename in the metadata of the received SFO transmission FDU is not compliant to the SFO naming convention specified in 6.7.4.1.5, then relaying is disallowed. The CFDP user shall use the SFO Reporting procedure (see 6.7.6) to notify the original source SFO user application that a wrong ‘intermediate’ SFO destination filename has been used.

Otherwise, the user application shall use the CFDP **Put.request** primitive to request delivery of the received file (if any) and all received SFO Request, SFO Flow Label, SFO Fault Handler Override, SFO Message to User, and SFO Filestore Request messages to the first waypoint in the route.

NOTE: Each SFO sender prior to the final SFO agent can use whatever transmission mode, segmentation control, fault handler overrides, and flow label make sense for the specific single-hop transmission at hand.

If the relay transaction finishes in any condition other than ‘No error’, then the CFDP user shall use the SFO Reporting procedure (see 6.7.6) to notify the original source and final destination user applications of the relay transaction failure.

If the relay transaction finishes in ‘No error’ condition, provided the Trace Control flag in the SFO Request Message is non-zero, the user application shall use the SFO Reporting procedure (see 6.7.6) to report to the original source and/or final destination user applications (as indicated by the value of the Trace Control flag) on the success of the relay transaction.

NOTE - At any time after the relay transaction finishes, the user application may at its option delete its local copy of the transmitted file.”

The Report Code entry of Table 6-31 shall be updates as follows:

Report code	8	1, 2, 3, 4, 5, 6 or 7	<ul style="list-style-type: none"> <li>1: final file delivery transaction completed.</li> <li>2: relay transaction failed.</li> <li>3: routing failed, relay was not possible.</li> <li>4: relay transaction succeeded.</li> <li>5: final file delivery transaction failed.</li> <li>6: maximum number of waypoints exceeded.</li> <li>7: wrong intermediate destination filename, relay was not possible.</li> </ul>
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4)

**Motivation:**

To support CFDP implementers.

**Required Changes:**

Note in the CFDP Green Book warning implementers of the risk of running out of resources for temporary storing of SFO files being forwarded.

Good practice would be to dedicate a specific directory (with a limited amount of space allocated) for temporary storage of SFO files being forwarded, and to reject any further incoming SFO file if such a space is exceeded.