AERONAUTICAL TELECOMMUNICATION NETWORK PANEL

WORKING GROUP 3 (APPLICATIONS AND UPPER LAYERS)

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VALIDATION RESULTS FOR THE CONTEXT MANAGEMENT SARPS

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SUMMARY

This document presents details on the FAA sponsored validation of the Context Management SARPs.

1. Introduction

The FAA is sponsoring the implementation and testing of the four air-ground application SARPs for the purpose of validation the technical specifications. This paper describes the implementation and interoperabililty testing of the Context Management (CM) SARPs.

2. Background

The CM application was implemented using the already tested ULCS software and commercial lower layers. The implementation was based on the post-Montreal ATNP/2 specifications and included all functions in the CM SARPs.

3. Implementation Architecture

The ONS implementations operate on the Sun Solaris system. The OSI communication software and X.25 software are standard SunLink products and not ATN compliant. The applications operate over the ONS Upper Layer Communication System (ULCS) that implements the Dialogue Service, ACSE, fast byte Presentation Layer, and fast byte Session Layer. The ONS ULCS is compliant with the draft ULCS SARPs as approved at the Montreal ANTP/2 meeting.

All implementations of the air - ground applications are based on the SARPs documents presented as the output of the Montreal ATNP/2 meeting.

4. Current Status

At the present time, ONS has completed the implementation of the CM application, has complete local "loop-back" testing, and has started interoperability testing with Eurocontrol.

5. Interoperability Testing

During the month of February, ONS has been performing interoperability testing with Eurocontrol.

5.1 Testing Set-up

The test set-up consisted of an X.25 link provided by SITA. This link directly connected the ONS end-system to the Eurocontrol ATN router.

Both ONS and Eurocontrol used commercial non-ATN compliant lower layers.

5.2 Testing Program

5.2.1 Test 1 - ONS as air system, Eurocontrol as ground system, CM Logon Request

This test involved sending an AARQ pdu from the ONS system to the Eurocontrol system. The AARQ user information field contained the CM Logon pdu. Since the AARQ was too large for the T-connect user data, the transport connection was opened and the AARQ was sent as the first T-user data.

The first time this test was run it was discovered that the Eurocontrol system could not decode the AARQ pdu. It responded correctly with a T-disconnect with a provider abort indicated. The analysis showed that there was a mismatch in the PER encoding used in the two implementation.

The implementations were modified to 1) match the appropriate AARQ encoding; and 2) to match the appropriate user-information encoding. After these changes, the Eurocontrol implementation would accept the AARQ and tried to process the CM Logon.

The Eurocontrol implementation could not decode the ONS CM Logon pdu. It was discovered that the Eurocontrol implementation used the post-Munich specification and the ONS implementation used the post-Montreal specification. The small changes in the ASN.1 caused the pdus to be sufficiently different to affect the ability of the implementation to decode CM pdus.

5.2.2 Results

As a result of testing, the Eurocontrol implementation could receive a CM Logon pdu and partially process.

5.2.3 Test 2 - Eurocontrol as air system, ONS as ground system, CM Logon Request

This test involved sending an AARQ pdu from the Eurocontrol system to the ONS system. The AARQ user information field contained the CM Logon pdu. Since the AARQ was too large for the T-connect user data, the transport connection was opened and the AARQ was sent as the first T-user data.

The first time this test was run it was discovered that the ONS system could not decode the user-information field. This was due to errors in the ONS implementation. After the encoding of the user-information decoding was fixed, the CM Logon pdu could be recovered.

The ONS implementation could not decode the Eurocontrol CM Logon pdu. It was discovered that the Eurocontrol implementation used the post-Munich specification and the ONS implementation used the post-Montreal specification. The small changes in the ASN.1 caused the pdus to be sufficiently different to affect the ability of the implementation to decode CM pdus.

5.2.4 Results

As a result of testing, the ONS implementation could receive a CM Logon pdu and partially process.

5.2.5 Test 3 - ONS as air system, Eurocontrol as ground system, CM Logon Request with CM Logon Response

This test involved sending an AARQ pdu from the ONS system to the Eurocontrol system. The AARQ user information field contained the CM Logon pdu. Since the AARQ was too large for the T-connect user data, the transport connection was opened and the AARQ was sent as the first T-user data. The Eurocontrol system returned a CM Logon Response pdu.

5.2.5.1 Without Maintain_Dialogue

After the previous changes to the application, reception of the CM Logon Response was accepted. The release of the Dialogue was achieved according to the specification

5.2.5.2 With Maintain_Dialogue

The encoding of the result field of the AARE pdu by Eurocontrol was not correct and could not be decoded.

5.2.6 Results

The results showed the proper functioning of the state tables. There is still a need for the Eurocontrol implementation to encode the result and diagnostic fields of the AARE pdu.

5.2.7 Test 4 - Eurocontrol as air system, ONS as ground system, CM Logon Request with CM Logon Response

This test involved sending an AARQ pdu from the Eurocontrol system to the ONS system. The AARQ user information field contained the CM Logon pdu. Since the AARQ was too large for the T-connect user data, the transport connection was opened and the AARQ was sent as the first T-user data. The ONS system returned a CM Logon Response pdu.

5.2.7.1 Without Maintain_Dialogue

After the previous changes to the application, reception of the CM Logon Response was accepted. The release of the Dialogue was achieved according to the specification

5.2.7.2 With Maintain_Dialogue

The encoding of the result field of the AARE pdu could not be decoded by Eurocontrol.

5.2.8 Results

The results showed the proper functioning of the state tables. There is still a need for the Eurocontrol implementation to decode the result and diagnostic fields of the AARE pdu.

5.2.9 Test 4 - Sending and Receiving other pdus

This test involved the attempt to send other CM pdus as D-Data. It was quickly discovered that the Eurocontrol implementation did not encode/decode presentation data with the PDV code as specified in the ULCS SARPs. This made further testing impossible.

6. Conclusions

The interoperability testing showed that the basic state tables and protocol were correct. The operation of the protocol during "loop-back" testing showed that an implementation of the CM will operate correctly.

The interoperabilitly testing uncovered significant PER encoding/decoding problems which should be the subject of significant additions to all application Guidance Material.