International Civil Aviation Organization

MID ATS Message Management Center Steering Group

Third Meeting (MIDAMC STG/3)
(Cairo, Egypt 26- 28January 2016)

Agenda Item 4:   Enhancement of the MID AFS Network Services

ATS EXTENDED SERVICES AND DYNAMIC ROUTING

(Presented by Jordan/MIDAMC)

SUMMARY
This paper presents a test document of FTBP trial and updates the meeting about progress toward implementing the European Directory Service. Moreover, this paper proposes withdrawn of implementing dynamic Routing in the MID Region Action by the meeting is at paragraph 3.

REFERENCES
- MIDANPIRG/15 Report - MSG/4 Report

1.   INTRODUCTION

1.1   The Basic ATS Message Service was primarily conceived for easy intercommunication with users at the AFTN by the gateway facility. However, it includes some enhancement over the legacy AFTN; like length of message, Character set, reliability and integrity of data user.

1.2   In 1996 the ATN Panel identified at its second meeting a number of future work items aiming at enhancements of the basic ATS Message services. The work items addressed three areas; Improvement in the AMHS user services; integration of the AMHS in the ATN Directory service and the provisions for ATN systems Management.

2.   DISCUSSION

File Transfer Body Part (FTBP) Trial

2.1   The World Metrological Organization (WMO) initially decided to migrate from alphanumeric codes to BUFR for the representation of Meteorological data; therefore, ATS Extended service was introduced to meet the Metrological requirement. At a later stage, the WMO decided to use Extensible Markup Language (XML).

2.2   The meeting may wish to recall that most of the ATS systems in the MID Region can run the extended services and especially File Transfer Body Part (FTBP), and these services can provide significant operational improvements. Accordingly, the MIDANPIRG/15 meeting agreed that trials be conducted for the use of extended services, and encouraged all States to support the ATS Extended Trial Team and requested the secretariat to facilitate the trials.

2.3   Based on the above, a trial will be conducted between Jordan and Sudan. However, since these trials have significant impact on the network, these trials be conducted on predefined conditions and scenarios.

2.4   The meeting may wish to recall that ATS Extended Trial Team has been formed and composed of volunteer experts from (Egypt, Jordan, Kuwait, Iran, Oman, Saudi Arabia, Sudan and UAE). The names of the experts who will participate in the Teleconference and developing of the plans is at **Appendix A**.

2.5   Accordingly, the MIDAMC developed a draft testing document for the FTBP trial, the doc is at **Appendix B**.

European Directory Service (EDS)

2.6   The use of ATN Directory services is tailored to the establishment of repositories for distribution lists, public keys to support secure messaging, and correspondent AMHS and non-AMHS user address.

2.7   EUROCONTROL was invited by the ICAO AFSG to take actions for development, implementation and operation of directory service. The agency started working on the subject in 2011 in close cooperation with the AFSG.

2.8   In the framework of the project the following tasks have been carried out the Development of EDS Operational Concept, Installation and testing two central DSAs (test, operational), Development of EDS Documentations, Integration of the EDS in ICAO documents including ICAO Doc 9880, EUR Doc 020 (EUR/AMHS Manual) and EUR Doc 021 (ATS Messaging Management Manual) and training all European COM Centres on EDS. Moreover, The Validation of the EDS Operational Concept has been carried out in 2014.

2.9   Following the AFSG18 decision, EUROCONTROL performed the following tasks for EDS operation:

- The operational central DSA is setup and configured
- The central DSA at EUROCONTROL was connected to the operational PENS Messaging VPN,
- All EDS documents have been updated, including EDS User Interface Document, EDS Test Document and Appendix B/Appendix G of EUR/AMHS Manual,
- Three dedicated AMC/EDS training sessions have been scheduled for 2015, 2016 and 2017,
- Since the 3rd Q of 2015, all AMC operational data (AMHS addresses, user capabilities, user lookup tables and routing tables) has been copied to the EDS in each AIRAC cycle.
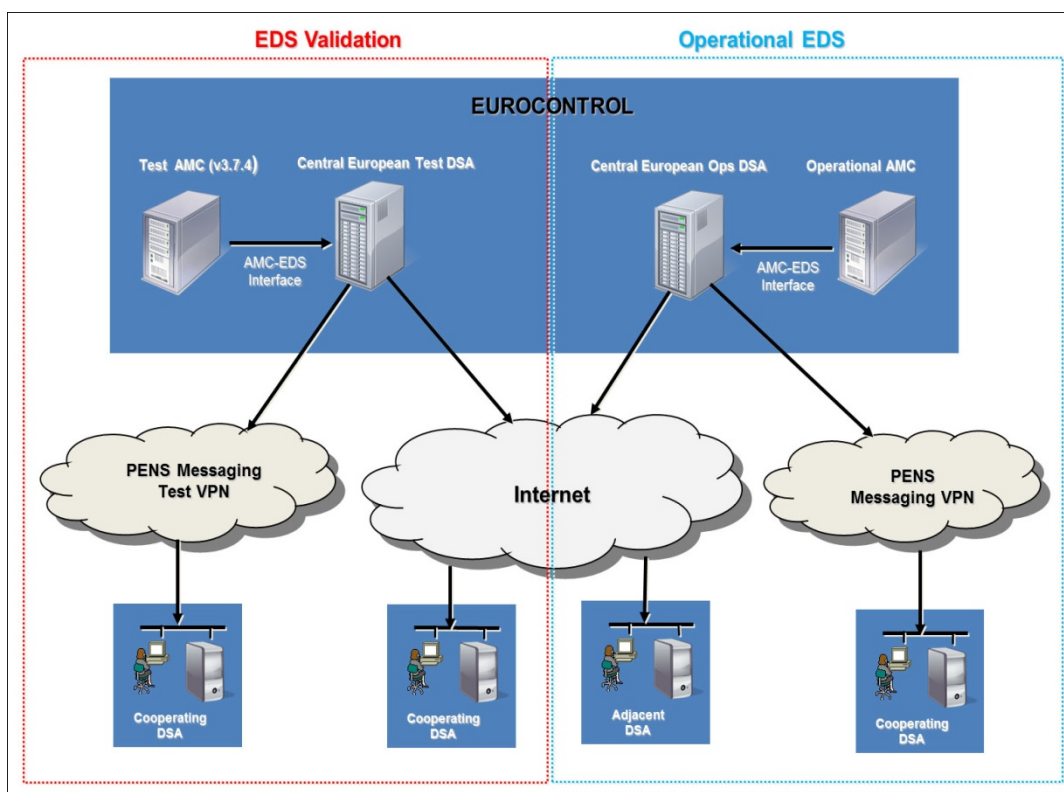
2.10   The EDS currently is only open to all States in the EUR/NAT, moreover, Pre-requirements for EDS operations have been defined:

> ✈ Participate to AMC/EDS Training,
> ✈ Setup local DSA infrastructure following system and network requirements specified in EDS User Interface Document,
> ✈ Validate the local DSA using the EUROCONTROL validation platform and test process.

Dynamic Routing

2.11   The current static routes in AFS that do not allow for the automatic failover or redundant paths, thus if failure occurs, operators must manually adjust the routes to move data through an alternate path.

2.12   During MIDANPIRG/14, the meeting noted that in order to enhance the availability, reliability of the AFS Network and minimize downtime to the minimum, dynamic routing can be deployed. Dynamic routing protocols can update routing tables in the event of device or interface failure, thus if there are multiple possible paths, these protocols will continue to allow data flow. However, to achieve this stage detailed studies and trials are needed.

2.13   Furthermore, it was noted that, in order to participate in these trials the States should have, among others Backup/Test AMHS System, operational AMHS Link, Human resources (Network Expert, system engineer, AFS Operator) and Vendor support preferable.

2.14   Based on above, a survey has been circulated in order to decide further actions on the trials based on the survey results. Three States respond to the survey. The Survey at **Appendix C**.

2.15   Taking into consideration the initiative of join the CRV project with ASIA/PAC, and that both projects can provide same Network performance in terms of availability, quality and reliability. And in order not to duplicate efforts toward similar outcome, the MIDAMC proposes withdrawn of dynamic routing initiative.

3.   ACTION BY THE MEETING

3.1   The meeting is invited to**:**

   a)   review and Comment on the ATS Extended Services testing document, **Appendix B**;

   b)   urge States to support the ASTT trial; and

   c)   agree on para 2.15.

APPENDIX A

ATS EXTENDED SERVICES TRIAL TEAM

(ASTT)

S/N	State	Name	Title	Email	Tel.	Mobile
1	Egypt	Mohamed Ramzy Mohamed	Director of AFTN/AMHS	mrma_eg@yahoo.com	+2022657981	+201007736780
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APPENDIX B

ATS Extended Services Trial
File Transfer Body Part (FTBP) Testing Document

Author: **ATS extended Services Trial Team (ASTT)**
Date: **10/1/2016**
Version: **0.1 (Initial Draft)**

Table of Contents

References

[1] ICAO Annex 10 – Aeronautical Telecommunication; Vol.II, Communication Procedure

[2] ICAO doc 9880- Manual on Detailed Technical Specifications for the Aeronautical Telecommunication Network (ATN) using ISO/OSI Standards and Protocols, Part II – Ground-Ground Applications - Air Traffic Services Message Handling Services (ATSMHS), First Edition – 2010

[3] EUR Doc 020 – AMHS Manual

1. Introduction

The Message Handling service provided in the ATN is called the ATS Message Handling Service (ATSMHS). This service is specified using X.400 standards. There are two levels of ATSMHS service: Basic ATS Message Service and Extended ATS Message Service. Basic ATS Message Service provides a nominal capability equivalent from a user perspective to those provided by AFTN. And Extended ATS Message Service provides enhanced features such as supporting transfer of more complex message structures (body parts), use of the directory service, and support for security.

The purpose of this document is to define the functional tests for ATS Extended Service handling specially File Transfer body part (FTBP) in order to ensure the end-to-end capability of AMHS systems and network to exchange this type of messages. These tests are performed after the successful operation of AMHS basic services, through which the compliance of all systems to the AMHS technical specifications has been demonstrated and proved.

2. Test Environment

Both test systems should have operational AMHS link, and P1 connection setup. Two User Agents should be used to exchange traffic with File Transfer Body Part. The testing environment is as shown in the figure below:
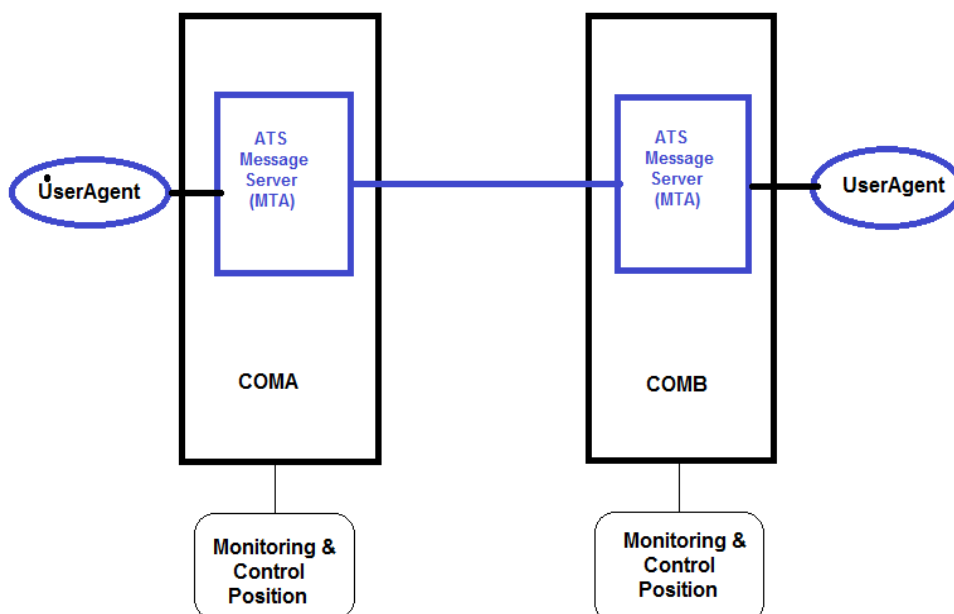
The test can be performed in AMHS Network and unnecessary to have direct AMHS link between the two COM centers, the traffic can be exchanged via intermediary(ies) COM center(s), which should be involved in the test activities.

The User Agent address at COM A could be "COMAASTT", and at COM B "COMBASTT". The User Agent can be either P3 or P7 User Agent.

Network Analysis software can be used to monitor X.400 traffic and its effect on network Bandwidth. The software can be agreed on prior the test.

3. Test Procedure

Before the tests, the test partners should coordinate and document the type of body part used in IPMs submitted by their User Agents when submitting text messages, either as:

- IPMs containing a basic ia5-text body part, or
- IPMs containing an extended ia5-text body part, or

- IPMs containing a general-text body part with ISO646 repertoire.

3.1 Submission, Transfer and Delivery of a message including Binary file from UserAgent to UserAgent.

Test01	Submission of Binary file
Test Criteria	**The Test is successful if COMB receive the message with Binary file attached with text message from COMA**
Scenario Description	From the UA of COMA send a sequence of five ATS messages (IPMs) to the COMB addressing the COMBASTT. • Message 1 (Test011) shall have ATS-message-priority KK and binary file • Message 2 (Test012) shall have ATS-message-priority GG and binary file • Message 3 (Test013) shall have ATS-message-priority FF and binary file • Message 4 (Test014) shall have ATS-message-priority DD and binary file attached • Message 5 (Test015) shall have ATS-message-priority SS and binary file attached Each message shall have different ATS-filing-time and ATS-message-text. Verify the messages received by the remote UA. In particular, verify: • ATS-message-priority, • ATS-message-filing-time, • ATS-message-text. • The Binary file
Reference	**9880**

Test02	Submission of Binary file
Test Criteria	**The Test is successful if COMA receive the message with Binary file attached with text message from COMB**
Scenario Description	From the UA of COMB send a sequence of five ATS messages (IPMs) to the COMA addressing the COMAASTT.
	• Message 1 (Test021) shall have ATS-message-priority KK and binary file
	• Message 2 (Test022) shall have ATS-message-priority GG and binary file
	• Message 3 (Test023) shall have ATS-message-priority FF and binary file
	• Message 4 (Test024) shall have ATS-message-priority DD and binary file attached
	• Message 5 (Test025) shall have ATS-message-priority SS and binary file attached
	Each message shall have different ATS-filing-time and ATS-message-text.
	Verify the messages received by the remote UA.
	In particular, verify:
	• ATS-message-priority,
	• ATS-message-filing-time,
	• ATS-message-text.
	• The Binary file
Reference	**9880**

3.2 Submission, Transfer and Delivery of a message including Binary file from UserAgent to AFTN User

Test031	Submission of Binary file to AFTN User
Test Criteria	**The Test is successful if COMA receive Non Delivery report (NDR) from the Gateway of COMB**
Scenario Description	From the UA of COMB send a an ATS messages (IPMs) with binary file attached to the COMA addressing an AFTN user like the control tower COMAZTZX. • Message 1 (Test031) shall have ATS-message-priority FF and binary file Verify the messages not received by the remote AFTN User and that the sender receive NDR
Reference	**9880**

Test032	Submission of Binary file to AFTN User
Test Criteria	**The Test is successful if COMB receive Non Delivery report (NDR) from the Gateway of COMA**
Scenario Description	From the UA of COMA send a an ATS messages (IPMs) with binary file attached to the COMB addressing an AFTN user like the control tower COMBZTZX. • Message 1 (Test032) shall have ATS-message-priority FF and binary file Verify the messages not received by the remote AFTN User and that the sender receive NDR
Reference	**9880**

4. Test Summary

Use the Network Analysis software to analyze the traffic overhead occurred when sending binary files with the message. Also document the message size on system hard disks. Monitor any warning message or alarm during the tests.

Stress tests can be performed, by sending 20, 50 messages repeating test Test01 and Test02. Network and system response should be carefully monitored in order not affecting the life traffic.

5. ATS Extended Services Trial Team (ASTT)

S/N	State	Name	Title	Email	Tel.	Mobile

APPENDIX C

Survey on Dynamic Routing

The Aeronautical Fixed Services (AFS) Network uses pre-defined routes to exchange traffic, the static routing applied at the obsolete technology AFTN, and currently AMHS Network uses the same mechanism for Routing.

To enhance the network Availability and make use of the AMHS capabilities, dynamic Routing can be applied in the ICAO MID Region. However, no Region has not yet deployed dynamic Routing, therefore the second meeting of the MID AMC steering Group agreed on the necessity to conduct a trial to identify the technical requirements and operational consequences. Moreover, the meeting agreed to launch this survey to identify states position to the new concept and their capabilities to participate in the trial

Current Routing Mechanism Performance		
1- How long usually does the Operator need to detect a line outage?		
a) Immediately	b)less than 10 minutes	c) until the time of channel check
d) Other, please specify …………..		

2- How long does the Operator need to activate new route (alternative route) including line failure detection time, diversion Request, diversion approval and diversion activation?		
a) Less than 10 mins	b) Less than 30 mins	c) Less than 1 hour
d) Other, please specify …………..		

3- How does the operator get aware of Line failure/resuming normal?	
a) System alarm	b) Continuous Traffic Monitoring
c) Using Dashboard software Like Nagios, uptime, …, etc	
d) Other, please specify …………..	

4- How do you rate the current Diversion Mechanism using static routes?
a) Efficient
b) Satisfied
c) Neutral
d) Bad
e) Very bad

COM centers Capabilities
5- Do you have Backup/ Test AMHS System?
☐ Yes   ☐ No

6- How many operational AMHS Links do you have?

☐ No AMHS Links ☐ One ☐ Two or more

Dynamic Routing Trial

7- Do you agree with principle of Dynamic Routing?

☐ Yes ☐ No

8- Would you like to participate/get involved in the Dynamic Routing trial?

☐ Yes ☐ No

9- If you answer (8) is Yes, please assign a point of contact:
Name:
Position
Email:
Telephone:

Comments *(if any)*:--

Thank you for your time, it's of great help!

-END-