AMHS Implementation Workshop #2

Operational Considerations for AMHS

Miami, Florida, USA

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Federal Aviation Administration

Operational Considerations - Key Issues

- ✓ Training
- ✓ AMC Process/Coordination
- ✓ Troubleshooting
- ✓ Fallback options
- ✓ Introduction of new connections to the operational system
- ✓ Upgrades

Training

- ✓ **Transition to AMHS entails significant changes in system and operation : Network , Protocol, Terminology**
  - **Network – New or modified links to adjacent systems. Using either an ATN/IPS (IP) network infrastructure or an ATN/OSI (CLNP) network infrastructure**
  - **Protocol – IP vs X25 at the network level**
  - **Protocol – X.400 messaging vs AFTN character oriented**
  - **Terminology – standard MHS/X.400 messaging terminology**
- ✓ **It is a long-term migration process, with varying degrees of progress among states. Ongoing.**
- ✓ **Resources**
- ✓ **Training lab that is representative of the proposed operational configuration. Could become part of a 'Dual Feed' solution.**

AMC Process/Coordination

- ✓ **AMC (ATS Messaging Management Centre)- Overall framework for ATS Messaging Management, including Address Management, routing, network inventory, etc.**
  - **Offline AMHS Address Management.**
  - **Files exported in Comma Separated Value (.csv) format**
  - **Sharing and synchronization of common data**
- ✓ **AMHS Management Domain and CAAS Addressing files in a global centralized repository.**
- ✓ **Need to process and implement the data into the Operational system. Include fall back procedures.**
- ✓ **Resource(s) to register as AMC users and engage in AMHS address management coordination process.**
- ✓ **This is a 28 day cycle, with Proposed updates at day 14 and Release updates at day 24. Implementation at day 28.**

AMC Process/Coordination- sample files

- ✓ **Amhs Management Domain file sample: showing an XF and a CAAS address**
  - United Kingdom;EG;XX;ICAO;EG;**XF**;;
  - Portugal ;LP;XX;ICAO;PORTUGAL;**CAAS**;;
- ✓ **CAAS Table file sample: showing a country with 2 organizational values, which allows the country to split the responsibility into distinct geographical areas, with an MTA component at each area. Very large number of users.**
  - XX;ICAO;PORTUGAL;**LPAZ;**LPCR
  - XX;ICAO;PORTUGAL;LPAZ; LPFL
  - XX;ICAO;PORTUGAL;LPAZ; LPGR
  - …..
  - XX;ICAO;PORTUGAL;**LPPT;**LP**

Troubleshooting

- ✓ AMHS monitoring and management
  - AMHS vendor products
  - Incorporate into currently used AFTN products
- ✓ Network monitoring and management
  - Currently used products
- ✓ Purchase third party products
- ✓ Freeware, like Wireshark, for x400 decoding
- ✓ Operations - Visual and audio
- ✓ Security constraints
- ✓ Resources
- ✓ Training
- ✓ Cost

Fallback

- ✓ Critical step in the planning process
- ✓ Alternate routing through legacy AFTN paths- implies retention of AFTN circuit for a period of time
- ✓ Use of AFTN diversion routing lists which have been agreed to by the Administrations operating the communication centers
- ✓ Manually though adjacent AMHS countries
- ✓ Eventually will become automatic when more AMHS systems become operational. Configured as secondary routing lists

Introduction of new connections

- ✓ **Introduction of new connections through a non-operational system vs through your operational system.**
- ✓ **Non-operational system acts as a test system for the next implementation.**
- ✓ **Somewhat determined by the security needs of the your environment.**
- ✓ **Significant testing.**
- ✓ **Never want to have a negative impact on existing AFTN operations in other states.**
- ✓ **Address Management is not effected by new implementations, as all Management Domains and addressing schemes are published in AMC, prior to implementation.**
- ✓ **Routing needs to be considered.**

Introduction of new connections

- ✓ **User Agents in operational use. This can introduce enhanced features that are include in ATS Extended service attributes – increased message size, complex message structures(body parts), extended character sets and encoding, and use of security attributes.**
- ✓ **Browser based User Agents need careful, strict testing of the character sets.**
- ✓ **AFTN is strictly IA-5 character set. If new connections implement additional character set encoding, you must be account.**
- ✓ **Not all users support extended character sets, ISO 8859-1 character set.**
- ✓ **All of the above will be evident during a period of Dual Feed operation.**

Introduction of new connections

- ✓ **Migrate operational flows progressively to the AMHS connection**
  - **Facilitate operational validation**
  - **Reduce the number/extent of changes at each step**
  - **Facilitate the analysis of behaviour/results**
  - **Enable easy rollback**
  - **Limits the impact on COM Centers other than those directly involved**
- ✓ **Update the AMHS Implementation Planning section on AMC. Includes types of connection, format specification, etc.**

Upgrades

- ✓ Update the AMHS Implementation Planning ,Capabilities , Format specifications, or Address Management section on AMC
- ✓ Minor enhancements requiring only local testing.
- ✓ Major - implementation of some features of ATS Extended services. Change of addressing scheme from XF to CAAS addressing.
- ✓ Comprehensive interoperability testing between the MTAs with direct connections
- ✓ Use of a non operational system to receive operational traffic
- ✓ Coordination and detailed cutover procedures.
- ✓ Fall back options

Operational Considerations - Conclusion

- ✓ **Wow – lots to look forward to.**
- ✓ **Transition to AMHS is the eventual, worldwide replacement of AFTN by AMHS.**
- ✓ **Both systems (AFTN & AMHS) will need to co-exist, even if your states transition is complete.**
- ✓ **Transition will be gradual and lengthy. Phased planning is critical.**
- ✓ **'New' will always bring challenges.**
- ✓ **Keep in mind all the benefits – enhanced reliability, extended functionality, interoperability with other global messaging services, security capabilities, use of COTS equipment and services.**
- ✓ **Thanks for your time.**

Review Slides

- ✓ AMHS Addressing
- ✓ AMHS Components
- ✓ AMHS/AFTN Gateway Components

AMHS Addressing

There are 2 types of ICAO recommended Addressing Schemes:

XF Addressing Scheme

C = XX

A = ICAO

P = *'2-letters ICAO Country Designator'*

O = AFTN

OU1 = *'AFTN address'*

Common AMHS Addressing Scheme (CAAS)

C = XX

A = ICAO

P = *'State Identifier'* (*)

O = *'Geographical Info'* (*)

OU1 = *'4-Letter ICAO loc. indic.'* (**)

CN = *'AFTN address'*

(*): Chosen by each ATSO (**): From the AFTN address

C - Country Name

A or ADMD - Administrative Management Domain

P or PRMD - Private Management Domain

O - Organization

OU1 - Organizational Unit

CN - Common Name

AMHS Components

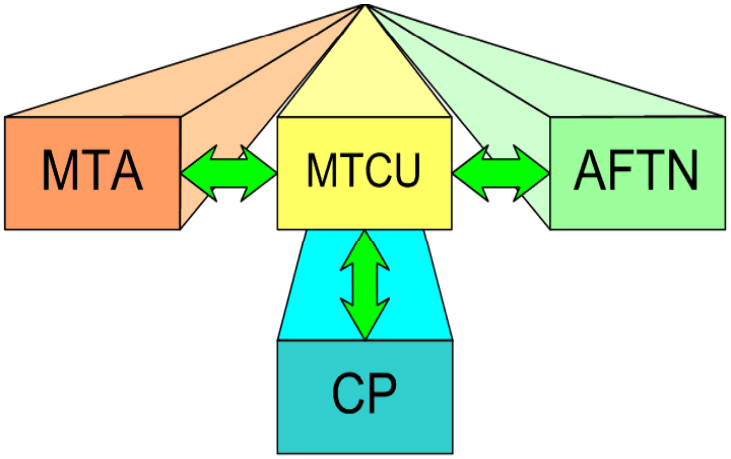
Message Transfer Agents (MTA) – provides submission, forward, and delivery function. Handles the Message Transfer System (MTS) Transfer Protocol (P1) for message exchange between MTAs. Performs the function of a Message Switch.

Message Store – provides intermediate storage between a User Agent and MTA. Offers the User Agent the ability to retrieve messages at its convenience.

User Agent – user access to the MTS for message submission and reception.

Access Unit (AU) – provides conversion between messaging systems. The AU is the AMHS/AFTN Gateway.

AMHS/AFTN Gateway Components



AMHS Gateway Components

MTA = Message Transfer Agent

MTCU = Message Transfer Control Unit

AFTN = Aeronautical Fixed Telecommunications Network

CP = Control Position