



International Civil Aviation Organization

**FOURTEENTH MEETING OF THE
COMMUNICATIONS/NAVIGATION/SURVEILLANCE
AND METEOROLOGY SUB-GROUP OF
APANPIRG (CNS/MET SG/14)**



Jakarta, Indonesia, 19 – 22 July 2010

Agenda Item 3: Aeronautical Fixed Service (AFS)

2) Discuss other AFS related issues

NETWORK PROTOCOLS INCOMPATIBILITY ISSUES AND SOLUTIONS

(Presented by United States of America)

SUMMARY

The issue of network incompatibility was presented in CNS/MET SG/13. The meeting requested that a solution be developed in ATNICG/5 and report back to CNS/MET SG/14. The ATNICG recommends using Application to overcome network incompatibility.

This paper relates to:

Strategic Objectives:

D – Efficiency

Global Plan Initiatives:

GPI 22 – Communication Infrastructure

1. Introduction

1.1 The European Region has adopted the AMHS based on RFC1006 which utilizes the IP routing network using Network Address Translation - Protocol Translation (NAT-PT) to convert IPv4 to IPv6.

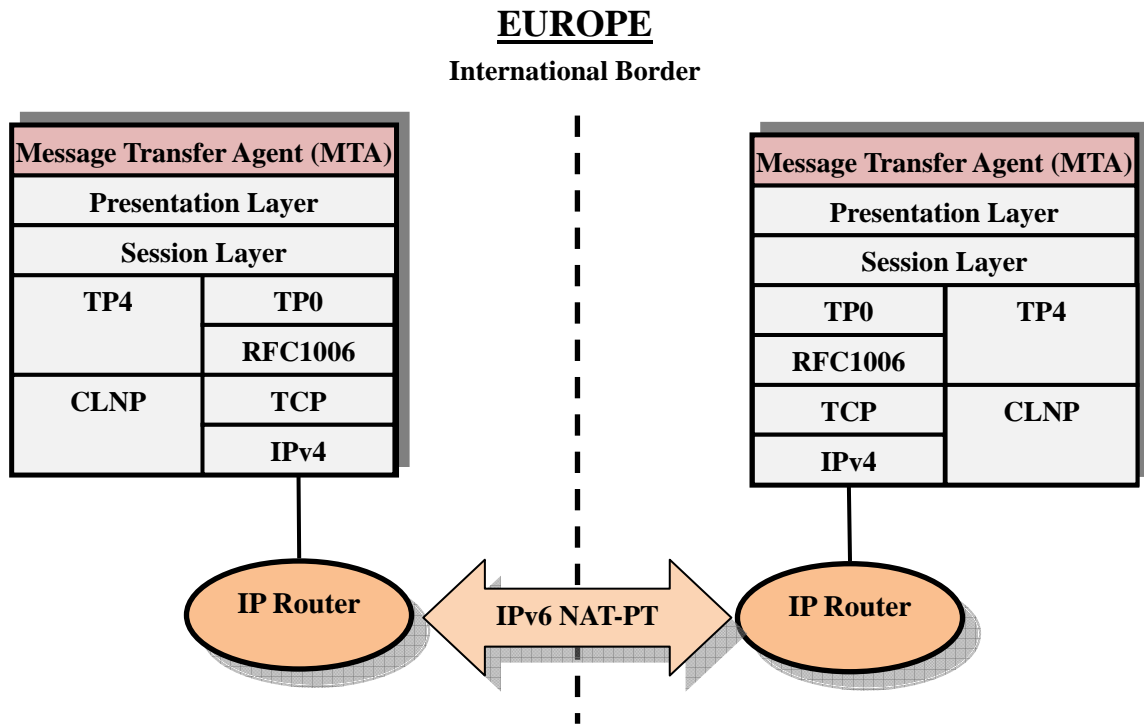


Figure 1 European AMHS configuration

1.2 The Caribbean and South American Region (CAR/SAM) has adopted the AMHS based on RFC1006, which utilizes the IP routing network using IPv4.

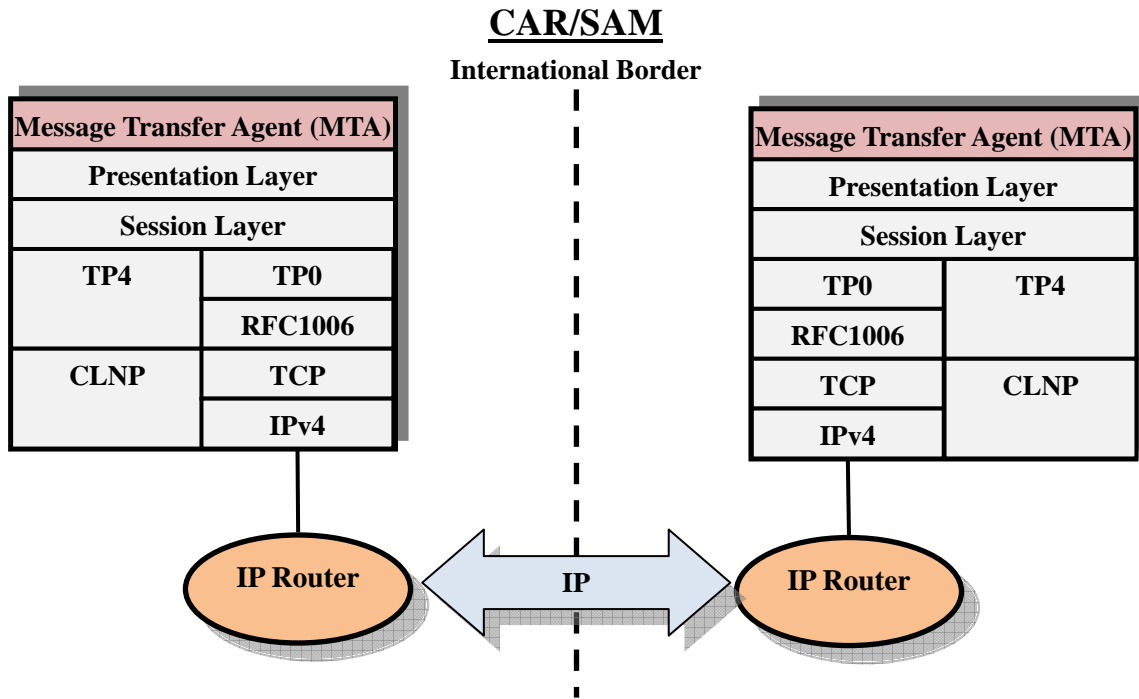


Figure 2 CAR/SAM AMHS Configuration

1.3 The Asia/Pacific Region has adopted AMHS based on OSI interface which utilizes the ATN router over X.25 sub-network. The region is in the process of implementing an IP sub-network using IPv4.

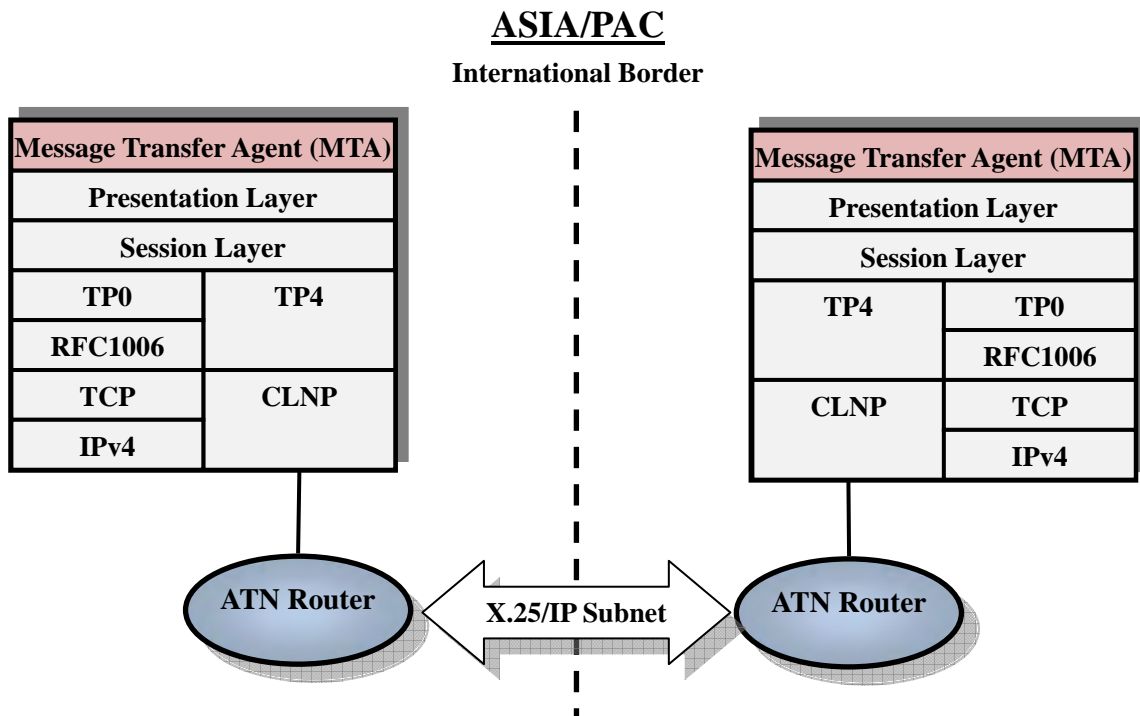


Figure 3 AMHS Configuration in Asia Pacific

A/G Configuration

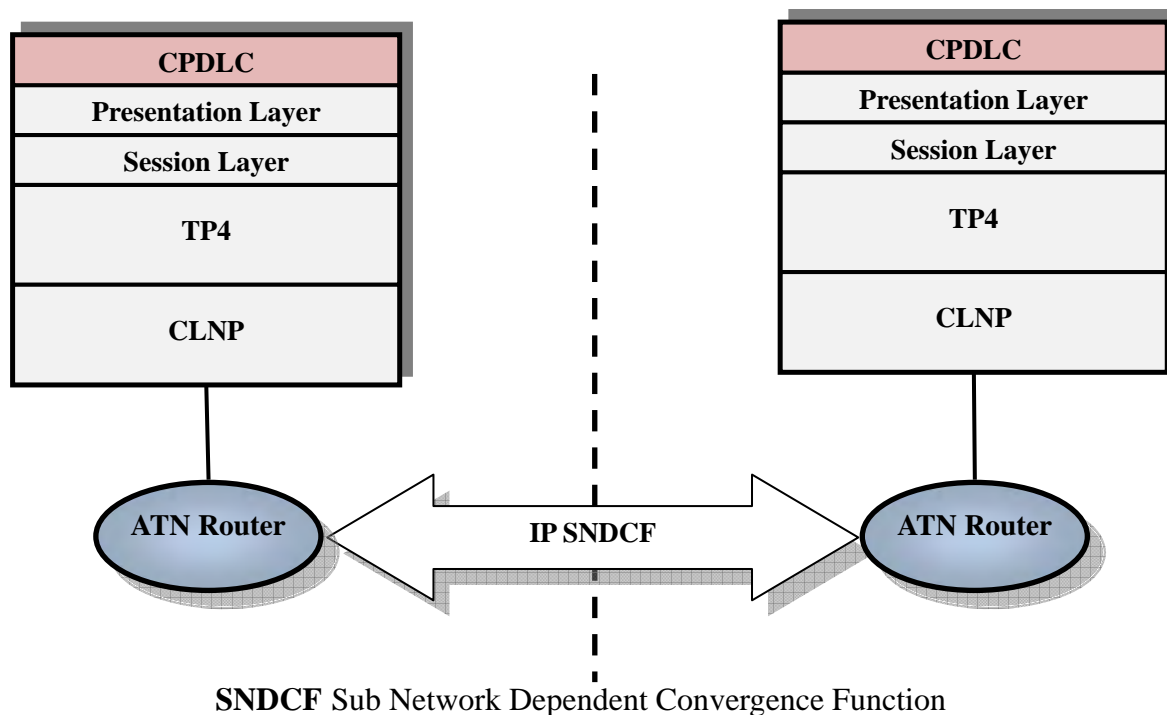


Figure 4 A/G Configurations

1.4. The Link 2000+ program and the FAA's Data Comm program are using ATN routers over IP sub-networks for ground-ground communications.

1.5. The Operational Meteorological Data (OPMET) has been considering the use of Extensible Markup Language (XML) for distributing OPMET data. Some AFTN platforms are able to transmit OPMET data in XML format. A plan to use the AMHS platform for testing OPMET data in XML format is planned between Hong Kong, China, Singapore, and USA.

1.6 The use of public internet has been adopted by ICAO for accessing the Air Traffic Service Management Center (AMC) and the World Area Forecast System (WAFS) Internet File Service (WIFS) for WIFS distribution.

1.7. Virtual Private Network (VPN) over public internet has been used by States in the Middle East (MID) Region for AMHS service.

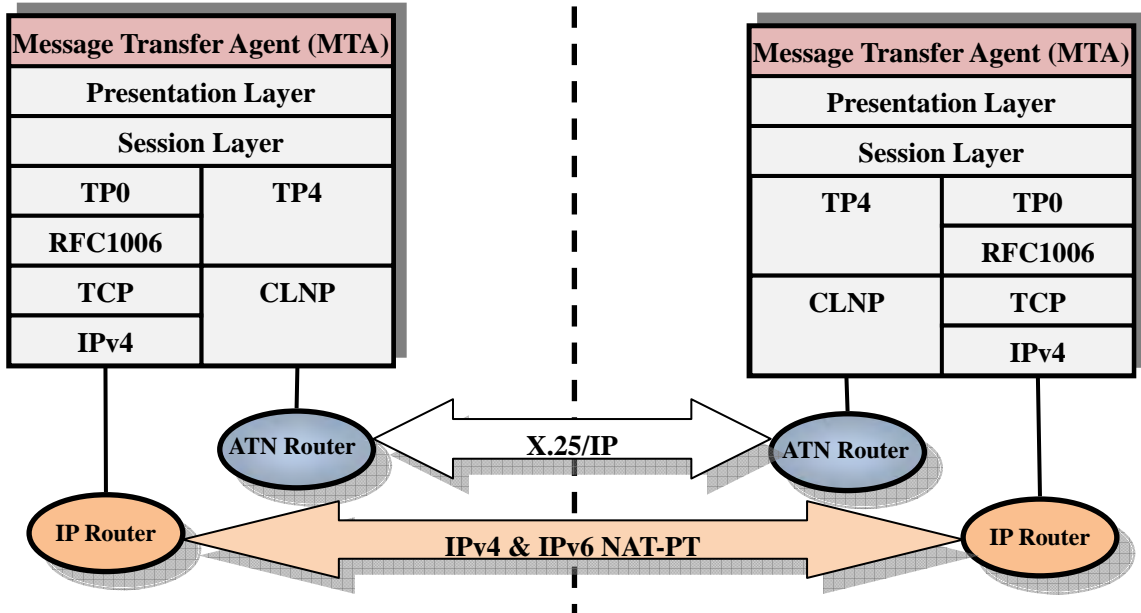
1.8. The use of public internet has been adopted by ICAO for accessing the Air Traffic Service Management Center (AMC).

2. Discussion

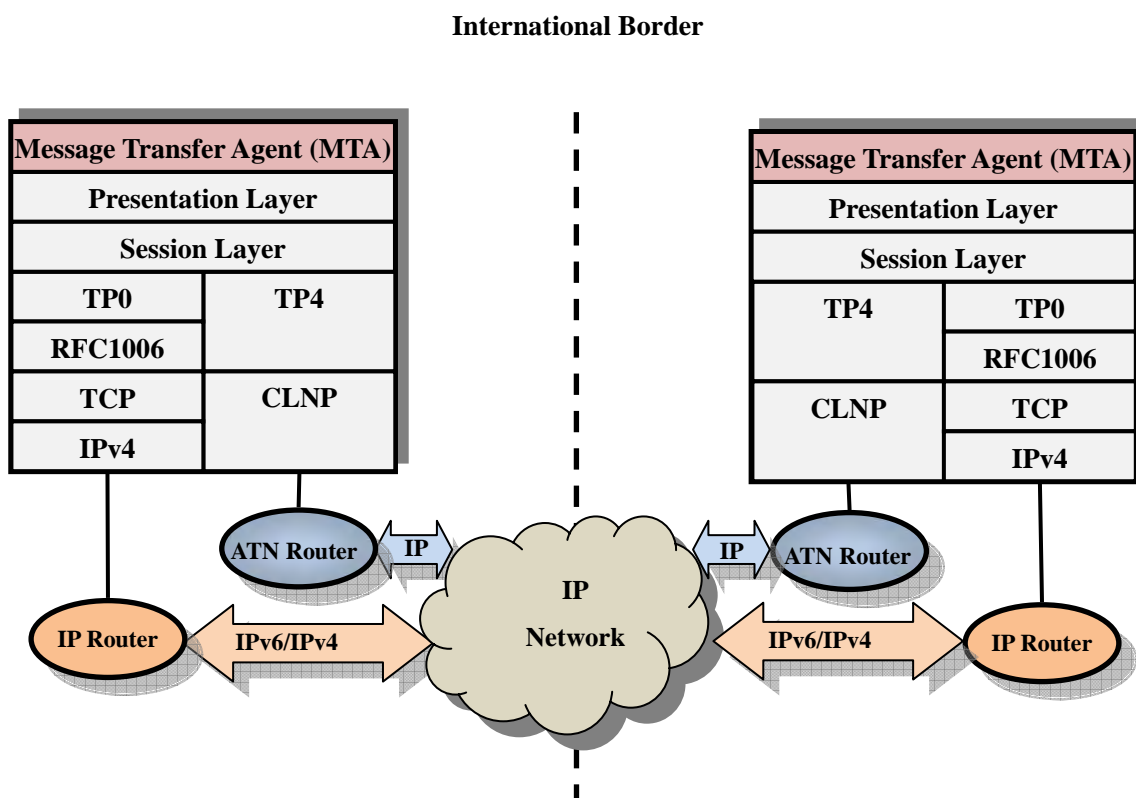
2.1 During transition from AFTN to an AMHS environment, the use of an AFTN gateway and an AMHS MTA to route traffic is acceptable and performs like an AFTN environment. The routers are limited to point-to-point routing and any alternative routing is based on bilateral agreements.

Message level routing follows the AFTN scheme.

International Border



2.2 Asia-Pac is phasing out an X.25 sub-network and implementing an IP sub-network to support AMHS. The strategy is to first use IP as a sub-network, and eventually support a direct IP interface using IP as routed network.



2.3 The Asia-Pac Region should move forward to using XML formatted data over AMHS to support OPMET data and other traffic. XML is platform independent that can be easily supported by the AMHS network.

2.4 The use of the public internet should continue to be separate from AFS. However, States can take advantage of public internet to improve network performance using IP security, such as VPN, on a case by case basis. The States with Backbone Boundary Intermediate System (BBIS) responsibility should not use public internet to interface with other BBIS.

3. Action required by the Meeting

3.1 The current network protocol used by various ICAO regional AFS networks will continue to evolve into an IP based network. During transition from AFTN to an AMHS environment, the use of an AFTN gateway and an AMHS MTA to route traffic between different network protocols will be sufficient. AMHS may be used to provide additional services such as use XML to transport OPMET data and other ATC related messages.

3.2 The meeting is invited to note the information under Section 2 and take appropriate action to expedite transition to AMHS.

ACRONYMS

AFTN	Aeronautical Fixed Telecommunication Network
AFS	Aeronautical Fixed Services
AMC	Air Traffic Service Management Center
AMHS	Air Traffic Service Message Handling System
APANPIRG	Asia Pacific Air Navigation Planning and Implementation Regional Group
ATC	Air Traffic Control
ATN	Aeronautical Telecommunication Network
ATNICG	Aeronautical Telecommunication Network Implementation Coordination Group
BBIS	Backbone Boundary Intermediate System
CAR/SAM	Caribbean and South America
CLNP	Connectionless Network Protocol
CPDLC	The Controller-Pilot Data Link Communications
HTML	Hyper Text Markup Language
ICAO	International Civil Aviation Organization
IP	Internet Protocol
IPv4	Internet Protocol Version 4
IPv6	Internet Protocol Version 6
IPS	Internet Protocol Suite
MTA	Message Transfer Agent
NAT-PT	Network Address Translation - Protocol Translation
OSI	Open System Interface
OPMET	Operational Meteorological Data
SNDCF	Sub Network Dependent Convergence Function
VDL	Very high frequency Data Link
VHF	Very High Frequency
WAFS	World Area Forecast System
WIFS	WAFS Internet File Service
XML	Extensible Markup Language