CNS/COMM/6 - WP/10
International Civil Aviation Organization 28/06/08
CAR/SAM Regional Planning Implementation Group (GREPECAS)
Sixth Meeting of the CNS Committee of the GREPECAS ATM/CNS Subgroup (CNS/COMM/6)
Santo Domingo, Dominican Republic, 30 June to 4 July 2008

Agenda Item 3: Communication systems developments
1.3 Follow up to the implementation of ATN and its applications

REPORT OF THE CNS ATN TASK FORCE

(Presented by the Rapporteur of the ATN Task Force)

SUMMARY

This Working Paper presents a report of the work carried out by the CNS ATN Task Force

1.0 Introduction

1.1 The third meeting of the CNS -ATN Task Force took place in Miami, FL on 20-22 March 2007 with representatives from Brazil, Dominican Republic, COCESNA, Haiti, Trinidad & Tobago, Jamaica, United States, Belgium, Germany and Spain.

1.2 The fourth meeting of the ATN Task Force took place in Santo Domingo, Dominican Republic on 27-28 June 2008 with representatives from Trinidad & Tobago, Brazil, Argentina, United States, Jamaica, COCESNA, Dominican Republic, Haiti, SITA and ICAO CNS Officers from the NACC and SAM Offices.

1.3 This Task Force was created in accordance with *Decision CNS/2/6 – Creation of the ATN Task Force in the CNS Committee.*

2.0 Discussion

Modification to Initial Transition Plan for the Evolutionary Development of the ATN in the CAR/SAM Regions

2.1 During the third meeting of the CNS ATN Task Force the group reviewed the existing Initial transition Plan for the Evolutionary Development of the ATN in the CAR/SAM Regions and proposed the modification of such plan to incorporate the CAR/SAM ATN Ground/Ground and AMHS Transition Plans. These Plans shall provide the proposal for the ATN in the regions, as well as clear guidance to implement the ATN in the CAR/SAM regions. It was agreed under *CONCLUSION 3/1* that the Initial Transition Plan be modified to incorporate the following documents:

a) Caribbean/South America (CAR/SAM) Regional ATN Ground-to-Ground Transition Plan

b) Caribbean/South America (CAR/SAM) ATN Implementation Plan, and

c) Caribbean/South America (CAR/SAM) AMHS Transition Plan

2.2 During the 4th meeting of the ATN Task Force the Meeting updated the initial Transition Plan for the ATN based on the above mentioned ATN/TF/3 Conclusion 3/1, in which the advances in the guidance material for ATN/IPS (Doc. 9896) and the recent publication of ICAO Doc. 9880 Part II B for AMHS were considered. The CAR/SAM Regional AMHS Transition Plan will limit its scope to implementing the AMHS and AFTN/AMHS Gateway as specified in ICAO Doc. 9880 Part IIB to replace the existing AFTN. It will cover the operational procedures and temporary measures necessary during the transition period. The security and protection of the network will be addressed to prevent AMHS TCP/IP dedicated circuits network from interfacing with public internet.

2.3 It was agreed during the review of such document that the following appendices should be incorporated in the document. Some of the appendices are completed and others have to be developed by the Task Force:

Appendix I	CAR/SAM AMHS Network Status Table
Appendix II	CAR/SAM AMHS Network Backbone Trunks
Appendix III	CAR/SAM TCP/IP v4 Routing Policy
Appendix IV	IPv4 Addressing Scheme
Appendix V	IP Router Interface Control Document
Appendix VI	MTA Routing Policy
Appendix VII	AMHS Address Designation
Appendix VIII	CAR/SAM Directory Service
Appendix IX	AMHS and IP Router Compatibility Test Procedure
Appendix X	AMHS IP Security
Appendix XI	CAR/SAM ATN Task Force Task Assignment
Appendix XII	CAR/SAM AFTN Infrastructure

2.4 The meeting was informed that Internet Assigned Numbers Authority (IANA) can't support ICAO's request for IPv6 address assignment because it does not meet the requirement of the minimum number of users. As a result, the meeting considered that IPv4 should be implemented for the short term until receiving further guidelines from the Aeronautical Communications Panel (ACP) of ICAO. However, IPv6 will be considered for Inter-regional interfaces.

2.5 The meeting discussed the importance of establishing an entity to manage the AMHS addressing scheme and coordinate this work with other ICAO regions. It was also noted that EUROCONTROL already has an Administrative Management Center (AMC) and extended an offer to the CAR/SAM Region States that already have AMHS implemented to use their services in order to become familiar with their program.

2.6 Based on the above mentioned information, the meeting agreed on the following draft conclusion :

DRAFT
CONCLUSION 4/1 ESTABLISHMENT OF AN ENTITY TO MANAGE AMHS ADDRESSING

That in preparation for establishing an entity to manage the CAR/SAM AMHS Addressing:

a) States that have AMHS implemented should participate with EUROCONTROL Automatic Management Center (AMC) to become familiar with the managing and updating of the database, and

b) ICAO should coordinate and invite EUROCONTROL to the next ATN Task Force meeting for a demonstration on the AMC program.

Review of the ATN CAR/SAM Planning / Implementation Activities –

2.7 The Meeting reviewed the ATN CAR/SAM planning/implementation Activities. This included the completion of Table CNS 1Ba considering the CAR/SAM ATN network arquitecture; review and update of Table CNS 1Bb taking in considerations the revision of the ATN network arquitecture; the new ICAO IPS SARPS; and ATN (Routers and applications) implementation in the CAR/SAM Regions.

2.8 Based on the agreed above, the Meeting proposed changing in the CNS 1Ba, IPv-4 instead of IPv-6 for all CAR/SAM States under column 6 titled “Link Protocol” and included updates provided by the Delegate from COCESNA. Table 1Bb was updated to reflect ATN/IPS under column 4 title “Used Standard”.

2.9 The meeting created an ad-hoc group to review and update the CNS table 1Ba Routers Regional Plan. Representatives from Argentina, Trinidad & Tobago, Brazil and COCESNA participated in the ad-hoc group.

2.10 The ad-hoc group determined that the concept of the ATN network is the implementation of voice and data applications on the same communications equipment and infrastructure. Some of the links (circuits) in the CAR/SAM Region’s backbone are satellite links and could have VoIP communications with two hops, therefore before modifying the topology the ad-hoc group suggests the following:

a) Maintain the current topology (Table CNS 1Ba)

b) The REDDIG and MEVA II members should carry out tests to determine the performance of the circuits using the IP protocol over the Ethernet interface of FRADs and the modem Linkway in the following order:

1. Test MTA to MTA = Argentina / Paraguay and COCESNA / USA

2. Test MTA to UA = Argentina / Peru

3. RADAR = Brazil / Venezuela and Jamaica / COCESNA

4. VoIP = Brazil / Argentina

2.11 The results of such tests would be used to analyze whether the topology could be modified and also determine its economical impact.

2.12 It was agreed that test should be done within the REDDIG and MEVA II Network independently and its results be reported to the ATN Task Force. The test will be done to verify the infrastructure functionality. It was also agreed that a common test plan should be implemented in the CAR and SAM Region. These tasks were assigned in the work program of the ATN Task Force.

Review of the Regional Plan for the implementation of the AMHS in the CAR/ SAM Regions

2.13 Information on alternatives for the CAR/SAM TCP/IP implementation identifying the options available to assist in the transition of AMHS service to an Internet Protocol (IP) network was reviewed. This is configured according to the ICAO Document 9880 Part IIB.

2.14 Four options under ICAO documents that were presented for review. The meeting agreed on two viable options for the implementation of TCP/IP

a) AMHS using RFC1006 over TCP/IP Router (IPv4) using RFC1006 incorporated in the AMHS to allow AMHS interface directly with IPv4 based Router for intra-regional connections

b) AMHS configuration as specified in a) with added capability for IPv4 to IPv6 translation by implementing an IP gateway router function for inter-regional connections.

The Task Force also considered the use of public internet for cutover testing.

2.15 The proposed CAR/SAM Internet Protocol (IP) Addressing Plan was reviewed by the Task Force. The meeting discussed whether to use private or public addresses taking into consideration that private addresses can be used if coordinated by all participating States and Organization; public addresses must be obtained from a Regional Internet Registry (RIR). The Internet Assigned Numbers Authority (IANA) has delegated responsibility for administration of internet numbering to the Latin American and Caribbean Internet Address Registry (LACNIC). The meeting noted that the addressing plan should only be for boundary connections and that internal connections should not interfere with each others.

2.16 The Proposed CAR/SAM IP Addressing Plan recommends that for IPv4 private address space be used within the region because of the limited availability of public IPv4 addresses and the planned eventual transition to IPv6.

2.17 The Meeting was informed of some possible range of addresses for private networking on the IPv4. A 24-bit block of private addresses should be used. The 1st byte of the address will contain the fixed decimal value 10. Part of the 2nd byte should be used for identification of Regions; part of the 2nd and part of the 3rd bytes should be used for State identification. The 4th and part of the 3rd byte should be used for hosts. The proposed CAR/SAM IPv4 address format is depicted below:

1st BYTE	2nd BYTE		3rd BYTE		4th BYTE
8 bits	4 bits	4 bits	4 bits	4 bits	8 bits
00001010	Region	State		Host's	

2.18 Based on the above mentioned information, the Task Force agreed on the following draft Conclusion:

DRAFT CONCLUSION 4/2 IPv4 ADDRESING PLAN

That the following structure for IPv4 private address scheme could be used for the CAR/SAM IP Addressing Plan:

IP address 10.XXXX YYYY.YYYYZZZZ.ZZZZZZZZ
Sub net mask 255.255.240.0
X= Region (16 regions allowed)
Y= States/Territories (256 states/territories allowed)
Z= host (4096 hosts allowed)

2.19 The meeting was informed of a draft Interface Control Document (ICD) for ATN Ground to Ground Router in the CAR/SAM Region and so it was also reviewed. The document provides ATN Ground to Ground router ICD guidelines for the routers that are used on the nodes of the CAR/SAM regional network Backbone. This ICD addresses the physical, link, and Internet layers of the ATN G/G router using the TCP/IP model.

2.20 The general requirements for the ATN G/G router cover the lower three layers of the TCP/IP four-layer model. The TCP/IP model defines a four-layer network model which is Application, Transport, Internet and Network Interface. The ICD document only covers the lower three layer.

2.21 The Task Force agreed that documents covering Application, Transport, Internet, and Network Interface should be develop.

ATN Task Force Work Program

2.22 The ATN Task Force Work Program was updated accordingly. Some actions were completed and new ones added. A copy of the Task Force Work Program is attached as **Appendix** at this working paper.

2.23 The next Task Force Meeting could be held in ICAO NACC Office in Mexico City, Mexico.

3 Suggested actions

3.1 The Meeting is invited to:

a) Take note of the information supplied;

b) Analyze the modification of the ATN initial transition Plan presented from paragraph 2.1 to 2.6 including the draft conclusion 4/1;

c) Analyze the ATN CAR/SAM Planning / Implementation Activities presented from paragraph 2.7 to 2.12;

d) Analyze the Regional Plan for the implementation of the AMHS in the CAR/ SAM Regions from paragraph 2.13 to paragraph 2.21 including draft Conclusion 4/2; and

e) Analyze the updated and reviewed ATN Task Force Work Program presented in the Appendix of this working paper.

f) Recommend any actions accordantly.

- - - - -

Reference	Title/Description/Updates	Deliverables	Action by	Target Dates	Last Activities
Work Programme	Keep up-to-date the Work Programme	Work Programme	Rapporteur	On-Going	
AMHS over TCP/IP	Study TCP/IP a protocol for the intra-regional connections	Recommendation to CNS on TCP/IP	Colombia, COCESNA	**Completed**	Nov-06
CAR/SAM ATN Transition Plan	Update the Initial Transition Plan for the Evolutionary Development of the ATN in the CAR/SAM Regions to integrate the CAR/SAM ground-ground Transition, air-ground Transition, and ATN Implementation Plan Updated on March 2007 to add the following documents: a) Caribbean/South America (CAR/SAM) Regional ATN Ground-to-Ground Transition Plan b) Caribbean/South America (CAR/SAM) ATN Implementation Plan c) Caribbean/South America (CAR/SAM) AMHS Transition Plan	CAR/SAM ATN Plan	Dulce Roses ATN Task Force Rapporteur	On-Going	Jun-08
AMHS Guidance Transition Material	Strategy and guidance to transition from AFTN to AMHS environment utilizing IPS	ATN Task Force	Noel Ellis Jamaica	**Completed**	Nov-06
ATN Routing Policy	Develop the MTA Routing Policy - June 08 - Document will review and results will be presented during the next Task Force Meeting based on Table CNS 1Ba	Initial ATN Routing Policy	Brazil / Argentina / COCESNA	Feb-09	28-Jun
IP Addressing Scheme	Develop the IP addressing scheme – **June 2008** - The Plan was presented and will be reviewed.	Initial IP Addressing Scheme Plan	Argentina	Feb-09	Jun-08
IP Security	Develop guidelines for IP security (Note: FAA will provide information on Security to Task Force before this is assigned.)	IP Security Guidelines	Vic Patel FAA/USA	2009	07-Mar
IP Routing Policy	Develop a routing policy for IP – **June-08** Draft IP Routing Policy document will be distributed to the ATN Task Force Member for review	IP Routing Policy Document	Hoang Tran T. McParland FAA/USA	2008	Jul-08
IP ICD	Create an IP Interface Control Document – **June-08** Document was presented for review and comments by the Task Force. Response should be in by November 2008	IP Interface Document	USA/FAA (Roberto Delgado)	2008	Feb-09

Reference	Title/Description/Updates	Deliverables	Action by	Target Dates	Last Activities
Develop Test Procedures	June-08 Develop the test procedures for ATN applications and IP Router; (MTA-MTA, MTA-UA, Radar, and VoIP) Jamaica and COCESNA will develop the Radar test procedures. Argentina will do VOiP MTA-UA Testing between Argentina and Peru MTA-MTA Testing between Argentina and Paraguay Radar Testing between Brazil and Venezuela, Jamaica and COCESNA. MTA-MTA Testing between COCESNA and USA	ATN Applications and IP Router Test Procedures	Brazil / Argentina USA/FAA	Feb-09	Jun-08
CAR/SAM Major Hubs Backbone Note: This should be integrated to the ATN Routing Policy and Test Procedures	Update the CAR/SAM Regional Telecommunication Major Hub Backbone: a) Identify the Communication Centres that require AMHS or UA only b) Identify the circuits that need to be upgraded before the transition c)Develop waterfall schedule for transition for an entire region	ATN Task Force	Jamaica, COCESNA, T&T, Brazil	09-Feb	30-Jun
IPv4 vs. IPv6	Evaluate the IPv6 vs. IPv4 due to compatibility issues with European region	ATN Task Force		**Completed**	2007
Network Operation Procedures	Develop Network Operation Procedures **Note**: EUROCONTROL will host the meeting in June 2007	ATN Task Force	Dulce Roses ATN Task Force Rapporteur FAA/USA/ Aena / Eurocontrol	Completed	07-Mar
Management of AMHS Addressing Scheme	Develop an entity to manage AMHS Addressing Scheme and coordinate this work with other ICAO regions (Note: Those States that have already implemented AMHS should contact EUROCONTROL AMC to provide support in maintaining the data-base. Argentina is already doing this. EUROCONTROL will be invited to the next ATN Task Force for a briefing on AMC)		Reps from CAR/SAM Region		Feb-09
AMHS Addressing Scheme verification	ICAO Regional Offices to verify with States and update the addressing scheme accordingly. (ICAO adopt CAAS addressing scheme)	Update AMHS addressing table	ICAO	2009	Mar-09

- END -