



Agenda Item 2: Review of Air Navigation Matters
2.2 Air Navigation specific activities:
2.2.2 Communications, Navigation and Surveillance (CNS)

FINAL REPORT OF THE 5TH CAR/SAM GREPECAS ATN TASK FORCE

(Presented by the United States of America)

SUMMARY

This Information Paper presents a summary of the 5th CAR/SAM CNS ATN Task Force Working Group Meeting Report (Mexico City, 12-13 June 2009).

***Strategic
Objectives***

This working paper is related to Strategic Objectives A and D.

1. Introduction

1.1 The CAR/SAM GREPECAS ATN Task Force met in ICAO Office, Mexico City on 12-13 June 2009. The purpose of the meeting was to review and complete several of the ATN CAR/SAM Planning / Implementation activities, taking in consideration the updates on ICAO Doc 9880/9896 and the experience of activities being carried out in other ICAO Regions. A more completed CAR/SAM Air Traffic Services (ATS) Message Handling System (AMHS) Implementation Plan was to be achieved and a work programme proposal for the new CNS/ATM/SG was to be agreed to continue the ATN implementation activities in the CAR/SAM Region.

2. Discussion

2.1 The following ATN CAR/SAM Planning / Implementation Activities were reviewed during the meeting:

- CAR/SAM Backbone of Internetwork ATN Routers
- Table CNS 1Ba – CAR/SAM regional Plan of ground to ground applications
- CAR/SAM ATN Ground / Ground – FASID Table CNS 1Bb
- Internet Protocol (IP) Regional Plan
- IP Routing Policy
- IP Router Interface Control Document (ICD)
- IP Security
- IP Test Procedures
- Results of IP communication trials

2.1.1 **CAR/SAM Backbone of Internetwork ATN Routers** - The Meeting agreed that common criteria of updating the backbone for ATN in the CAR/SAM Region must be developed and proposed the following:

- Continue with the trials to determine the amount of bandwidth required for Ground to Ground applications. The trial should consider the peak-hour traffic scenario. Consider all services that could be implemented such as ATS Interfacility Data Communication (AIDC), Radar Data Sharing, etc.
- Conduct a cost/benefit analysis with respect to the existing satellite service with the local service provider taking into consideration the bandwidth improvement.
- Study the terrestrial alternative backbone with regards to the satellite.

2.1.2 **Regional CAR/SAM Router Plan - FASID Table CNS 1Ba** – After analyzing the Internetwork ATN Routers for CAR/SAM Backbone, the meeting considered that changes to the ATN CAR/SAM backbone were not necessary.

2.1.3 **CAR/SAM ATN Ground / Ground - FASID Table CNS 1Bb** - Table CNS 1Bb for CAR and SAM Region was updated and will be presented to the CNS/ATM/SG as a proposal for its final approval.

2.1.4 **IP Regional Plan** - The Eight Meeting of Group I – Internet Protocol Suite of the Aeronautical Communications Panel (ACP) (Montreal, Canada, 25 to 29 August 2008) reviewed a working paper presenting information on the CAR/SAM IPv4 addressing scheme proposal elaborated during the ATN/TF/04 meeting. The ACP Group I made the following comments:

- The IPv4 addressing scheme contained in the proposal overlaps with existing ANSP IPv4 private assignments in other regions.
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- The proposed private address space is also in conflict with ARINC-664 aircraft addressing, which is currently in use in the Airbus 380/350 and Boeing 787/747-8.
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- The WG-I is currently developing a Draft ICAO Doc 9896 which specifies that States shall request official globally unique IPv6 address space from their Regional or Local Internet Registry for ground-to-ground assignments, as already performed by another region. In addition, the Secretariat is investigating the allocation of an IPv6 prefix to further facilitate this procedure and to ease airborne assignments.

2.1.4.1 After discussing the operation foreseen with the private IPv4 proposal, the group took the following into consideration:

- no access to the public internet will be needed nor allowed
- NAT service RFC 1006 will be used on the CAR/SAM regions
- Registration of IP addresses is needed when public internet is to be used
- and considering the comments of ACP WG I on the CAR/SAM private IPv4 addressing scheme proposal

The meeting considered that the use of IPv4 in the CAR/SAM ATN AMHS/ground to ground applications should not be in conflict with existing ANSP IPv4 private assignments and ARINC-664

aircraft addressing because the IPv4 addressing scheme will be applied in a private and closed network. Meeting considered nonviable to apply this proposed IPv4 addressing scheme at a global level but to use it only in the CAR/SAM Region. It was considered that the proposed IPv4 address scheme is not a problem. This scheme will only be implemented at a regional level.

2.1.4.2 Base on the information provided the Meeting agreed on the following conclusion:

CONCLUSION 5/1 PROPOSED ADDRESSING SCHEME FOR IPv4 ATN GROUND TO GROUND APPLICATIONS INTRA REGIONAL DOMAIN

That the CAR/SAM Region shall use the addressing scheme presented under Annex 2 of WP-03 of this meeting for implementation of IPv4 ATN Ground to Ground applications for intra regional domain.

2.1.4.3 ICAO indicated that, according to the ACP Panel, Internet Assigned Numbers Authority (IANA) was willing to provide a block of addressing for Air to Ground applications only. It was noted that IANA can only assign IPv6 addressing scheme when using Public Internet. IANA does not have to assign IPv6 when using a private network because they are not monitoring the network.

2.1.5 **IP Routing Policy** - The proposed Routing Policy was updated with the following comments:

- The region has already proposed and is in the process to finalize IPv4 addressing scheme. This is a closed and private network that is based on MEVA II and REDDIG Networks. Therefore, coordination with IANA for this IPv4 issue is not necessary
- IPV6 is not considered in the immediate future per the regional planning. IPv4 addressing schemes has been proposed and in the process to be adopted by the region.
- Additionally, a review is needed for the security requirement such as authentication or verifying network (establishing Virtual Private Network or using dedicated circuits/channels)

2.1.6 **IP Router ICD** - This IPv4 Router ICD document was finalized and adopted by the meeting. This will be incorporated in the Initial CAR/SAM AMHS Transition Plan as its Appendix V.

2.1.7 **IP Security** - A proposed draft Security Guidance Document for the CAR/SAM Region and guidance on the implementation of security for States and organizations operating in the Region is being reviewed by the Working Group. This document also includes Contingency Plan Outline and Incident Response Plan Outline. Once finalized, this document it will be incorporated into the Initial CAR/SAM AMHS Transition Plan.

2.1.8 **IP Test Procedures** - The AMHS system for the Atlanta National Network Control Center (NNCC) is currently undergoing internal test, and is expected to be installed by the end of the third quarter of 2009. These test activities will consist of an initial application test, followed by connectivity test of the actual circuit to be used, and finally implementation. These phases are described in detail below:

- Message Transfer Agent (MTA) to MTA Application Test - Initial AMHS testing can be conducted using the FAA's AMHS test facility, located at the Williams J Hughes Technical Center in Atlantic City, NJ. This facility can be accessed via an internet connection, as the goal of this test is not to verify circuit connectivity but rather to ensure successful MTA to MTA application level operability. The FAA can provide a template and plan for this phase of testing. The template provides for the exchange of test and implementation parameters such as AMHS addressing schemes, timers, and Originator/Recipient information. The plan provides the set of functionality to be verified at this stage. Concurrently with this phase, the FAA and the adjacent member can initiate the process to request telecommunications service, if not already in place. This will ensure that service is available when required for site test and implementation.
- Connectivity Test - Following the successful completion of MTA to MTA application test, activities can be scheduled to provide for verification of AMHS circuit connectivity. This will confirm the integrity of the circuit which will carry AMHS messages from the FAA's Atlanta NNCC to the adjacent site. As in the previous phase, the FAA can provide a plan for this phase of testing, which primarily involves the exchange of test messages between the facilities.
- AMHS Implementation - Following the successful completion of circuit test between the AMHS facilities, cutover activities can be scheduled. These activities will provide for the introduction of live AMHS traffic to be exchanged over the circuit.

2.1.9 **Results of IP communication trials** - Testing between Manaus and Brasilia, Brazil were conducted between MTAs using different bandwidths for AMHS trials used 19.2 Kbps and 64 Kbps bandwidth. The test indicated that 19.2 Kbps was not sufficient bandwidth for the connection processing 1,000,000 messages per month. Taking into consideration that other applications such as AIDC and Radar Data will be included, it is suggested that 32Kbps should be used between MTAs.

2.1.10 **VoIP trials** - VoIP trial between Brazil and Argentina over the REDDIG Network were conducted. The test shows that VoIP in the REDDIG Network is possible with a maximum of two hops using CODEX G.729 with a fair voice quality. For an IP ATN Network, voice will be transmitted as packets that could have more than two hops. Because of the nature of VSAT communications the delay on each satellite hop affects the quality of the final voice result. Based on the results of the test of VoIP over the REDDIG network Brazil recommended that voice be kept on Frame Relay and Data over IP.

2.1.11 The next GREPECAS ATN Task Force meeting is scheduled for the first Quarter of 2010.

3. Conclusion

3.1 The Meeting is invited to note the information in this paper.