INTERNATIONAL CIVIL AVIATION ORGANIZATION
South American Regional Office

REGIONAL PROJECT RLA/03/901
REDDIG Administration and Satellite Segment Management System

THIRTEENTH MEETING OF THE COORDINATION COMMITTEE (RCC/13)
(Lima, Peru, 8 - 9 March 2010)

PROPOSAL FOR THE SAM ATN

(Presented by Brazil)

Summary

This working paper contains a proposal for the network infrastructure in support of ATN implementation in the SAM Region, through IP routers.

References:

- Final report of the RCC/12 meeting
- Final report of the ATN/TF5 meeting

1. Background

1.1 The fourth meeting of the ATN/TF, held in Santo Domingo, Dominican Republic, in 2008, assigned Brazil and Argentina the task of conducting trials between MTAs (AMHS) in order to determine the bandwidth required for the application.

1.2 It also agreed that tests on the use of VoIP should be conducted and their results, in terms of quality, compared with the VoFR currently in use.

1.3 Regarding radar data transmissions, studies had already been done showing that the 9600 bps speed was adequate for this application.

1.4 Furthermore, the REDDIG Administrator presented a working paper at the RCC/12 meeting showing an occupancy of almost 75% at peak hour.

1.5 In this regard, the RCC/12 meeting formulated Conclusion 12/2 establishing an *ad-hoc* group made up by Argentina, Brazil and the REDDIG Administration, with a view to analysing the necessary increase in bandwidth, taking into account the implementation of new services.

2. Discussion

2.1 In order to implement CNS/ATM applications based on an IP network, it is necessary to establish the topology, protocols and addresses that may result in a possible new configuration of satellite links, thus optimising the bandwidth used.

2.2 With IP technology, it is possible to have less links, but this would require greater capacity. Information is carried through the equipment of the network, with no need for direct connection between sites of interest. If all AFTN operating circuits were to be expanded to support AMHS, probably there would be no capacity available in the REDDIG.

2.3 According to the current multipoint access concept applied in the REDDIG, and in order to maintain interoperability among sites, it would be appropriate to use the IP network concept together with the Frame Relay technology of the REDDIG, through the establishment of permanent virtual circuits (PVC).

2.4 Regarding the routing protocol, it would be appropriate to use the OSPF protocol within the same autonomous system, providing a much better performance than RIP in terms of stability and scalability. For routing between different autonomous systems (countries), the BGP-4 protocol is more convenient.

2.5 It is suggested that, as long as States are using the IPV4 protocol, the address be provided using the network access translator technology, which would facilitate the loading of new systems. The plan approved at the ATN/TF4 meeting would address this need.

2.6 With the use of the virtual circuit concept in the REDDIG, communications are possible without the doble hop in the transmission. This is a key factor when using satellite media for voice communications. In a voice over IP network, two hops may occur when there is no direct connection between countries, thus significantly affecting voice quality.

2.7 Accordingly, a new topology is proposed that maintains VoFR technology in the REDDIG for voice services.

2.8 A simple example of a new configuration is shown in Figure 1. In the proposed topology, there are always 2 data links with any given State due to constant redundancy, although not all States with adjacent FIRs are included.

2.9 Of couse, the immediate consequence of a change in address configuration is the updating of FASID router Table 1B-a.

Figure 1: Possible routing configuration using IP

3. Suggested action

The Meeting is invited to:

a. take note of the information provided in this working paper.
b. review the routing example proposed for the REDDIG using IP.
c. analyse the consequences of maintaining the existing addressing bandwidth configuration when using IP.