



**International Civil Aviation Organization
South American Regional Office**

**FOURTH WORKSHOP/MEETING OF THE SAM IMPLEMENTATION GROUP
(SAM/IG/4)
REGIONAL PROJECT RLA/06/901**

Lima, Peru, 19 to 23 October 2009

**Agenda Item 6: Assessment of operational requirements in order to determine the
implementation of communications and surveillance (CNS) capabilities
improvement for en-route and terminal area operations**

**REQUIREMENT FOR A STUDY ON THE CURRENT CAPACITY OF THE SOUTH
AMERICAN DIGITAL NETWORK (REDDIG), AS WELL AS DEFINITION FOR A NEW
REGIONAL COMMUNICATIONS NETWORK**

(Working paper presented by the Secretariat)

SUMMARY	
This working paper presents a proposal to carry out a study on REDDIG's current capability to support new services to be implemented in the short and medium term in the SAM Region, as well as a study on a regional IP based ground network structure that, together with REDDIG, would define the probable regional ATN structure.	
References: <ul style="list-style-type: none">• Fifth meeting of the ATM/CNS/SG CNS/COMM ATN Task Force (ATN/TF/5), Mexico City, México, 12-13 June 2009; and• RLA/06/901 regional project.	
ICAO Strategic Objectives:	<i>D – Efficiency</i>

1. Background

1.1 THE SAM ATN network is scheduled to be implemented under IP configuration. The SAM ATN network architecture is presented in the **Appendix** to this working paper.

1.2 Table CNS 1Ba describes the CAR and SAM plan on ATN router requirements. As regards the requirements, it indicates that the routers shall be IP, and the protocol to initially use will be IPv4.

1.3 The regional ATN is initially based on REDDIG. The circuits established in REDDIG for the support of the aeronautical fixed service, as well as other services such as flight plans and radar data exchange and other applications, are carried out through the Frame Relay protocol.

1.4 For the interconnection of ATN ground-ground applications in the SAM Region, the use of protocol IP has been programmed. In this respect, the IP addressing plan (IPv4) between routers to be installed in each REDDIG node has already been defined. The communications means between routers is the REDDIG, through the implementation of permanent Frame Relay virtual circuits.

1.5 During the fifth meeting of the ATN Task Force (ATN/TF/5), held in Mexico from 12 to 13 June 2009, note was taken of the difficulty in having only one regional satellite platform (REDDIG) communications means. In this respect, the meeting took under consideration the importance of counting with a redundant ground network.

1.6 ATN/TF/5 meeting considered that, to update the regional ATN structure, the following activities should be carried out:

- a) Continue with the trials to determine the bandwidth required for ground-ground applications (AMHS, radar data exchange, AIDC, etc.).
- b) Conduct a cost-benefit analysis between the present and future services supported by the current satellite network (REDDIG) versus a ground network leased to Communications services provider to support the same services. The analysis would be principally based on cost and bandwidth limitations.
- c) Study of a ground-based ATN network structure.

2. **Analysis**

2.1 In view of the increase in the new services foreseen in the short and medium term in the Region, such as the interconnection of AMHS and automated systems (exchange of flight plans and radar data), the need arises to analyze the impact in the current regional network (REDDIG).

2.2 The study regarding the impact the implementation of new services will have in REDDIG (additional bandwidth, requirement for a technological change etc.), the need to count with a regional ground network that might serve as support to REDDIG, or that REDDIG might serve as support to the regional ground network, could be carried out through RLA/06/901 project. This activity would form part of the CNS improvements taken under consideration in RLA/06/901 project Objective No. 1.

2.3 To carry out this activity, the approval of a mission by an expert in communications networks would be required. The preliminary project document would be presented at SAM/IG/5 meeting (April 2010).

3. **Action suggested**

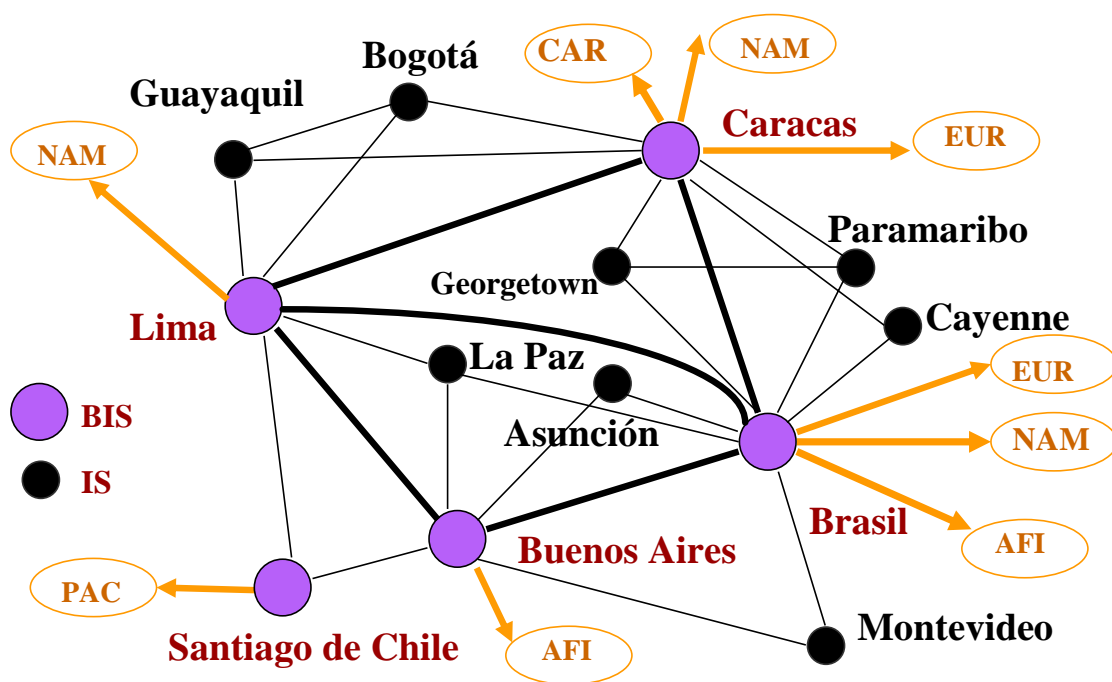
3.1 The Meeting is invited to:

- a) Take note of the information provided;
- b) Analyze the proposal of carrying out an analysis of REDDIG ability to support new air navigation services, as well as the implementation of a regional digital IP ground network that, together with REDDIG, would compose the regional ATN; and
- c) Analyze other considerations in this regard that the Meeting might deem necessary.

APPENDIX / APENDICE

DOMAINS AND BACKBONE OF THE CAR/SAM ATN NETWORK/ DOMINIOS Y RED TRONCAL ATN CAR/SAM

Backbone of Inter-network ATN Routers – SAM Region Red Troncal de Encaminadores para la inter-red ATN - Región SAM



**TABLE/TABLA CNS 1Ba –ROUTERS REGIONAL PLAN / PLAN REGIONAL DE ENCAMINADORES
REGION SAM/ SAM REGION**

Administration and Location/ Administración y Localidad	Type of Router / Tipo de Encaminador	Type of Interconnection/ Tipo de interconexión	Connected Router- Encaminador Conectado	Link Speed- Velocidad del enlace	Link Protocol- Protocolo del Enlace	Via Via	Target Date / Fecha Meta	Remarks Observaciones
1	2	3	4	5		7	8	9
Argentina /Buenos Aires	IP	Inter/Intra Regional	AFI(Johannesburgo), Bolivia (La Paz) , Chile (Santiago de Chile) , Brasil(Brasilia), Paraguay (Asunción) , Perú (Lima) y Uruguay (Montevideo)	TBD	IPv4	CAFSAT REDDIG	2008	
Bolivia /La Paz	IP	Intra Regional	Argentina (Buenos Aires), Brasil (Brasilia)y Perú (Lima)	TBD	IPv4	REDDIG	2010	
Brasil /Manaus	IP	Intra Regional	Colombia (Bogotá),Guyana (Georgetown), Guyana Francesa (Cayena), Perú (Lima), Surinam(Paramaribo) y Venezuela (Caracas)	TBD	IPv4	REDDIG	2009	
Brasil /Brasilia	IP	Inter/Intra Regional	AFI (Dakar),EUR(Madrid) NAM (Atlanta) via Bogotá, Argentina (Buenos Aires), Bolivia(La Paz), Paraguay(Asunción) y Uruguay (Montevideo)	TBD	IPv4	CAFSAT REDDIG	2009	
Chile/Santiago	IP	Inter/Intra Regional	PAC(Christchurch), Argentina (Buenos Aires) y Perú (Lima)	TBD	IPv4	PTT REDDIG	2008	
Colombia /Bogotá	IP	Inter/Intra Regional	NAM (Atlanta)*, Ecuador (Guayaquil), Brasil (Manaus) Perú (Lima), Venezuela (Caracas)	TBD	IPv4	*Interconexión MEVA II REDDIG REDDIG	2009	

Administration and Location/ Administración y Localidad	Type of Router / Tipo de Encaminador	Type of Interconnection/ Tipo de interconexión	Connected Router- Encaminador Conectado	Link Speed- Velocidad del enlace	Link Protocol- Protocolo del Enlace	Via Vía	Target Date / Fecha Meta	Remarks Observaciones
1	2	3	4	5		7	8	9
Ecuador/Guayaquil	IP	Intra Regional	Colombia (Bogotá) , Perú (Lima) y Venezuela (Caracas)	TBD	IPv4	REDDIG	2010	
Guyana Francesa/Cayenne	IP	Intra Regional	Brasil (Manaus) y Surinam (Paramaribo)	TBD	IPv4	REDDIG	2010	
Guyana /Georgetown	IP	Inter/Intra Regional	C-CAR (Piarco), Brasil (Manaos) , Surinam(Paramaribo) y Venezuela(Caracas)	TBD	IPv4	REDDIG	2010	
Panamá/Ciudad de Panamá	IP	Inter/Intra Regional	NAM (Atlanta) Colombia (Bogota)	TBD	IPv4	MEVA II Interconexi ón MEVA II REDDIG	2010	
Paraguay/Asunción	IP	Intra Regional	Argentina (Buenos Aires) Brasil (Brasilia)	TBD	IPv4	REDDIG	2008	
Perú/Lima	IP	Inter/Intra Regional	NAM(Atlanta),,Argenti na(BuenosAires),Boliv ia (La Paz),Brasil (Manaos),Chile(Santia go),Colombia (Bogotá),Ecuador (Guayaquil y Venezuela (Caracas),	TBD	IPv4	REDDIG	2009	
Suriname/Paramaribo	IP	Inter Regional	Brasil (Manaos), Guyana Francesa(Cayena) y Venezuela (Caracas)	TBD	IPv4	REDDIG	2010	
Uruguay /Montevideo	IP	Intra Regional	Argentina(Buenos Aires), Brasil (Brasilia)	TBD	IPv4	REDDIG	2010	

Administration and Location/ Administración y Localidad	Type of Router / Tipo de Encaminador	Type of Interconnection/ Tipo de interconexión	Connected Router- Encaminador Conectado	Link Speed- Velocidad del enlace	Link Protocol- Protocolo del Enlace	Via Vía	Target Date / Fecha Meta	Remarks Observaciones
1	2	3	4	5		7	8	9
Venezuela/Caracas	IP	Inter/Intra Regional	CAM (San Juan), EUR(Madrid), Brasil (Manaus), Colombia (Bogotá), Ecuador (Quito), Guyana(Georgetown), y Suriname (Paramaribo) y Trinidad&Tobago (Piarco)	TBD	IPv4	Interconexi ón MEVAIL REDDIG PTT REDDIG	2009	

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