INTERNATIONAL CIVIL AVIATION ORGANIZATION
WESTERN AND CENTRAL AFRICAN OFFICE

Second Meeting of the Central Atlantic FIR Satellite Network Management Committee (CNMC/2)
(Dakar, Senegal, 6 to 8 November 2012)

Agenda Item 4: Interconnection and interoperability of CAFSAT with its neighbouring networks (CAFSAT, NAFISAT, SADC2)

Summary of discussions of the AFI Aeronautical VSAT Networks Managers Meeting (Technical Team) and applicable APIRG/18 approvals

(Presented by ATNS)

SUMMARY

The working paper provides background information regarding the work completed by the AFI Aeronautical VSAT Networks Managers Meeting and approved by APIRG/18 that will have an impact on it's neigbouring VSAT networks with specific reference to CAFSAT.

Reference Material : APIRG 18 Report

1 Introduction

1.1 The AFI RAN meeting held in Durban, South Africa from 24 to 29 November 2008 formulated Conclusion 6/19: Planning, implementation and operation of very small aperture terminal (VSAT) networks in the AFI Region that calls for regular meetings of all AFI networks managers. affect

1.2 Since this meeting a great deal of work has been completed and two meetings of the AFI Aeronautical VSAT Networks Managers have taken place. Some of the activities of these meetings are summarized below.

2 Discussion

2.1 During the first meeting (AFI VSAT/1) held in Kwa-Zulu Natal, South Africa, from 13 to 15 June 2011 the following objectives were drafted, which were subsequently approved by APIRG/18:

2.1.1 Develop sustainable and integrated/interoperable VSAT networks to provide aeronautical telecommunications services in AFI region;

2.1.2 Upgrade technical capabilities of the networks to comply with the ICAO SARPs and guidance material, user requirements and global best practices;

2.1.3 Ensure financial sustainability of the networks through equitable and fair allocation of costs to states and users;

2.1.4 Create harmonious and seamless administrative oversights for the networks;

2.1.5 Enlist states' commitment to this initiative;

2.1.6 Achieve the ATN concept for AFI; and

2.1.7 Apply appropriate costs-effective technologies;

2.2 A Task Force for the development of a Regional project of an AFI integrated aeronautical telecommunication infrastructure was developed that consisted of a Technical-, Financial- and Administrative Team. This Task Force was consequently approved by APIRG/18 and full details are contained in Conclusion 18/28 and Appendix 3.4H of the APIRG/18 report.

2.3 During the second meeting held in Douala, Cameroon, from 28 February – 01 March 2012, further work was carried out by the AFI Aeronautical VSAT Networks Managers and they formulated amendment proposals to the ATN architecture, based on the existing VSAT network infrastructure. The proposed changes are reflected in the finalized Draft AFI ATN Architecture Plan, as approved by APIRG/18:

Conclusion 18/20: AFI ATN ARCHITECTURE PLAN:

That AFI States adopt and implement the AMHS Strategy shown at Appendix 3.4A to this report.

The attached chart at Annexure A shows the configuration of the AFI routing architecture, as approved by APIRG/18.

2.4 The proposed solution of the Technical Team is based on the following fundamental requirements:

2.4.1 All four networks i.e. AFISNET, SADC2, NAFISAT and CAFSAT have made substantial investment in their existing infrastructure, which have not yet reached the end of operational life.

2.4.2 Three of the networks operate on the same satellite i.e. IS 10-02. The exception is CAFSAT, however connectivity can be establish between this network and the AFI Region by obtaining spectrum on e.g. the EH and WH transponders of IS 10-02.

2.4.3 It will be endeavored to establish a single satellite access method for the proposed technical solution to provide the most cost effective solution, while taking into account operational and financial aspects.

2.4.4 Existing infrastructure will be utilized where possible to reduce the cost of implementing the AFI ATN network.

2.4.5 Although the new solution will mainly support IP based applications, provision must still be made for services based on legacy protocols for the foreseeable future.

2.4.6 The network must be secure and not dependent on terrestrial services located outside the security areas of the ANSP's, in other words where the ANSP does not have any control over its availability, management, etc.

2.5 It was envisaged by the Technical Team that by implementing the revised ATN connectivity requirements as an "overlay" on top of the existing networks the above fundamental requirements will be complied with i.e.

2.5.1 The investment in all four networks will be retained in the short/medium term. The services can be transferred to the upper layer as and when required.

2.5.2 It is the intention to operate all four networks on the same satellite thereby ensuring interoperability.

2.5.3 Establishing the same satellite access method will ensure seamless operation.

2.5.4 The implementation of the ATN overlay will be cost-effective as existing infrastructure will be utilized.

2.5.5 The bottom layers (existing networks) will continue to support applications based on legacy protocols, while the new upper (overlay) network will support all IP based applications.

2.6 Another conclusion of APIRG 18 involves the Best Practices for AFI VSAT Networks:

Conclusion 18/24: Adoption of Best Practices for AFI VSAT Networks:

That the AFI States and Air Navigation Services Providers (ANSPs) operating aeronautical VSAT Networks adopt the best practices stated at Appendix 3.4G to this report, as well as any other best practices to be developed or adopted by APIRG.

2.6.1 The Best Practices are contained in the APIRG/18 report and includes the following Best Practices, amongst others:

2.6.1.1 Item 8: Satellite access method

Multiple Frequency – Time Division Multiple Access (MF-TDMA)

2.6.1.2 Item 12: Network control centre (NCC)

Network control centre (NCC) should be implemented for all networks.

2.6.1.3 Item 18: Connectivity (internal connectivity and interconnections with other networks)

Full connectivity is required within and between all the networks.

3 Conclusion

3.1 The meeting is requested to take note of the work done by the Technical Team of the AFI Managers Meeting and the recommendations approved by APIRG/20.

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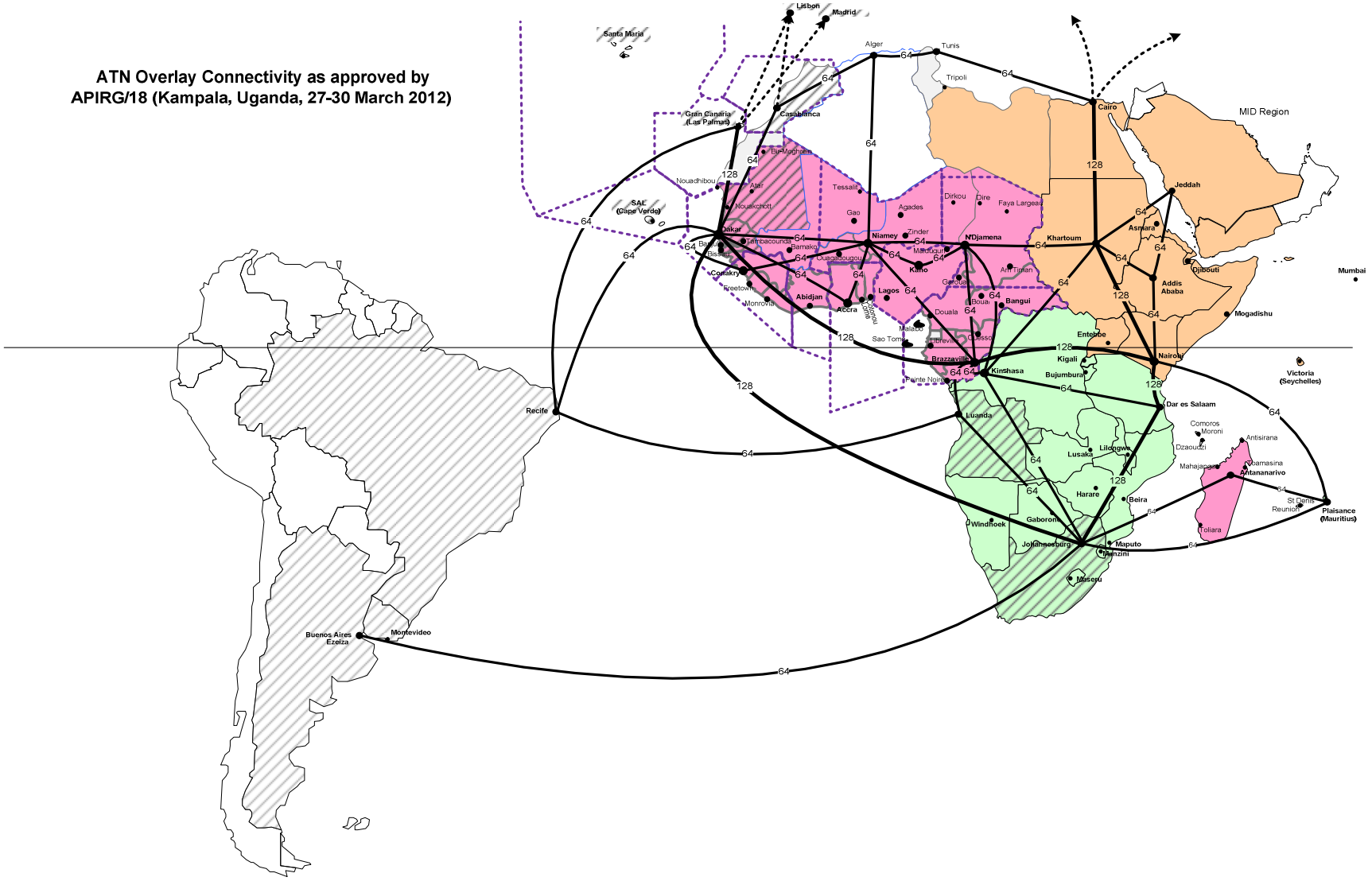
ATN Overlay Connectivity as approved by
APIRG/18 (Kampala, Uganda, 27-30 March 2012)
Lisbon
Madrid
Santa Maria
Gran Canaria (Las Palmas)
Casablanca
Alger
Tunis
Tripoli
Cairo
MID Region
Jeddah
Asmara
Djibouti
Addis Ababa
Mogadishu
Khartoum
Mumbai
Victoria (Seychelles)
Nouadhibou
Nouakchott
SAL (Cape Verde)
Dakar
Banjul
Bissau
Conakry
Freetown
Monrovia
Abidjan
Accra
Lagos
Niamey
Tessalit
Gao
Agades
Dirkou
Dire
Faya Largeau
Zinder
Tambacounda
Bamako
Ouagadougou
Kano
Abuja
Garoua
Douala
Malabo
Sao Tome
Libreville
Brazzaville
Pointe Noire
N'Djamena
Bouar
Bangui
Entebbe
Kigali
Bujumbura
Nairobi
Kinshasa
Luanda
Dar es Salaam
Comoros
Moroni
Dzaoudzi
Antisirana
Mahajanga
Toamasina
Antananarivo
Toliara
St Denis
Reunion
Plaisance (Mauritius)
Lusaka
Lilongwe
Harare
Beira
Gaborone
Windhoek
Johannesburg
Maputo
Manzini
Maseru
Recife
Buenos Aires Ezeiza
Montevideo
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128