



International Civil Aviation Organization

MID ATS Message Management Center Steering Group

Third Meeting (MIDAMC STG/3)
(Cairo, Egypt 26 - 28 January 2016)

Agenda Item 3: MIDAMC and AMHS Implementation in the MID Region

AMHS IMPLEMENTATION IN LEBANON

(Presented by Lebanon)

SUMMARY

This paper presents the AMHS Implementation in Lebanon and present a plan to migrate

Action by the meeting is at paragraph 3.

REFERENCES

- MIDANPIRG/15 Report
- MSG/4 Report

1. INTRODUCTION

1.1 The Fifteenth meeting of the Middle East Air Navigation Planning and Implementation regional Group (MIDANPIRG/15) was held in Bahrain from 8-11 June, 2015.

1.2 The Fourth Meeting of MIDANPIRG Steering Group (MSG/4) was held in Cairo, from 24-26, November, 2014.

2. DISCUSSION

2.1 The First AMSS has been installed at Beirut Rafic Hariri International Airport in 1995 according to the International Civil Aviation (ICAO), ANNEX 10, VOLUME II, communication procedures. Beirut COM Center has international connection with Damascus, Jeddah, Cairo, Nicosia and Bahrain COM Centers.

2.2 In September 2013, the AMSS system has been upgraded by THALES from AFTN/CIDIN to AFTN/CIDIN/AMHS in order to support the AMHS services, and the application software named AERMAC.

2.3 The AERMAC server application running on two AERMAC servers in pilot-stand-by including the following software modules:

- AMHS switch module (Message Transfer Agent (MTA)) is in charge of AMHS traffic and X500 Directory.
- AFTN switch module is in charge of AFTN traffic switching and related Gateways (AMHS and CIDIN).

2.4 The New System also includes:

- ROBEX function
- AFTN/CIDIN/AMHS Gateway
- Email Gateway and FAX capability
- Three supervision A2M workstations
- Intelligent AFTN Terminals (IAT)
- User Agent terminals (AMATIS).

2.5 The training has been conducted by THALES for engineers and operators on site.

- Thales will provide support during migration of the AFTN/CIDIN circuits to the AMHS circuits.

2.6 Lebanese delegation has attended in January 2015 the MIDAMC training courses in Jordan.

2.7 The communication between the AERMAC client applications (A2M,AMATIS) and the AERMAC AMHS server application are based on "Client server architecture". All AMSS components (A2M, AMATIS, IAT, switches, routers, terminal servers) are connected to AERMAC server via duplicated LAN.

2.8 Beirut COM Centre has seven International Circuits and nine National Circuits:

- 2 AMHS: JEDDAH and AMMAN
- 3 CIDIN: CYPRUS, BAHRAIN and CAIRO
- 2 AFTN: KUWAIT and DAMASCUS
- 9 National Circuits

2.9 Lebanon has tested and operated the AMHS circuit Between Beirut and Jeddah. The line put into operation since July 2015.

2.10 Lebanon has conducted Interoperability and Pre-operational test with Amman COM Centers, the link has been in operation since in 28/5/2015.

2.11 In July 2015, AMHS implementation between Beirut and Bahrain COM Centers started, but we faced some difficulties by the Ministry of Communications between countries "Software compatibility", finally we decided to upgrade the same CIDIN Circuit to AMHS, this is possible and will be operated quickly by the end of February 2016.

2.12 In September 2015, coordination has been started with Cairo to migrate to AMHS, we are in process to setup an IP infrastructure between two countries.

2.13 New IP link has been established with Kuwait, 64 KBS Circuit, and Beirut is ready to upgrade to AMHS.

2.14 With NICOSIA we have analog 64 KBS and Beirut waiting NICOSIA to be ready in order to start process for upgrade. The Architecture and the details for the Contingency Plan is at **Appendix A** and the AMHS Migration Plan for Lebanon is at **Appendix B**.

AMHS Post Implementation Review

2.15 After more than six months of AMHS Operation with Jeddah and Amman COM Center, we found the following enhancement:

- 1- The AFS operator received less service messages requesting missing or repetition, AMHS enhanced the quality of message exchange.
- 2- Line failure detection became better, as we don't need to wait to the next channel check to detect the outage.
- 3- The IP infrastructure reducing operations and maintenance costs, provide more flexibility in configuration and operation, integrate many features that prevent data loss and recovery quickly from outages compared with old technologies.

3. ACTION BY THE MEETING

3.1 The meeting is invited to:

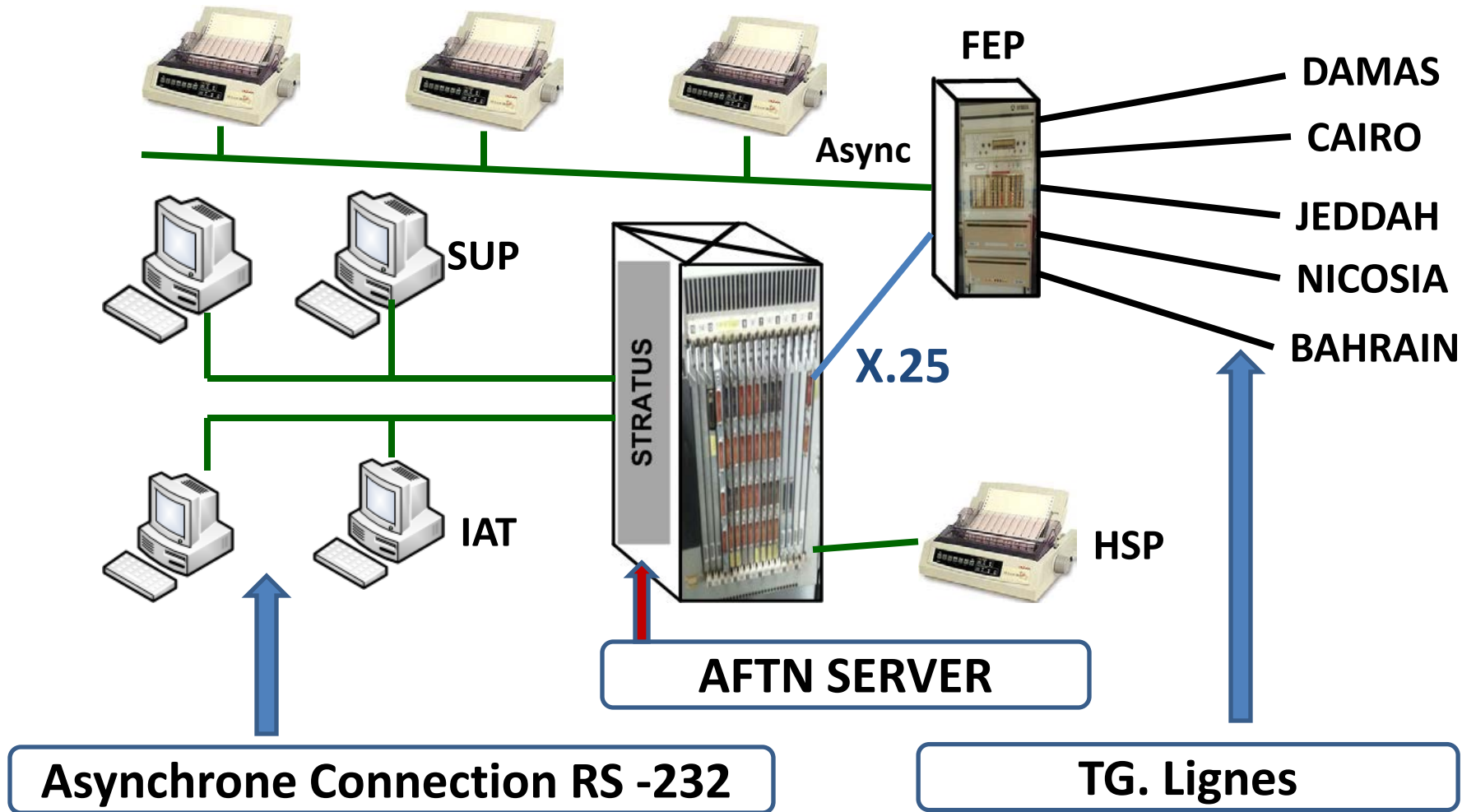
- a) note the information in this working paper; and
- b) urge States to complete the AMHS migration with Beirut COM Centers and to remove the CIDIN links.

MIDAMC STG/3-WP/13

Appendix A

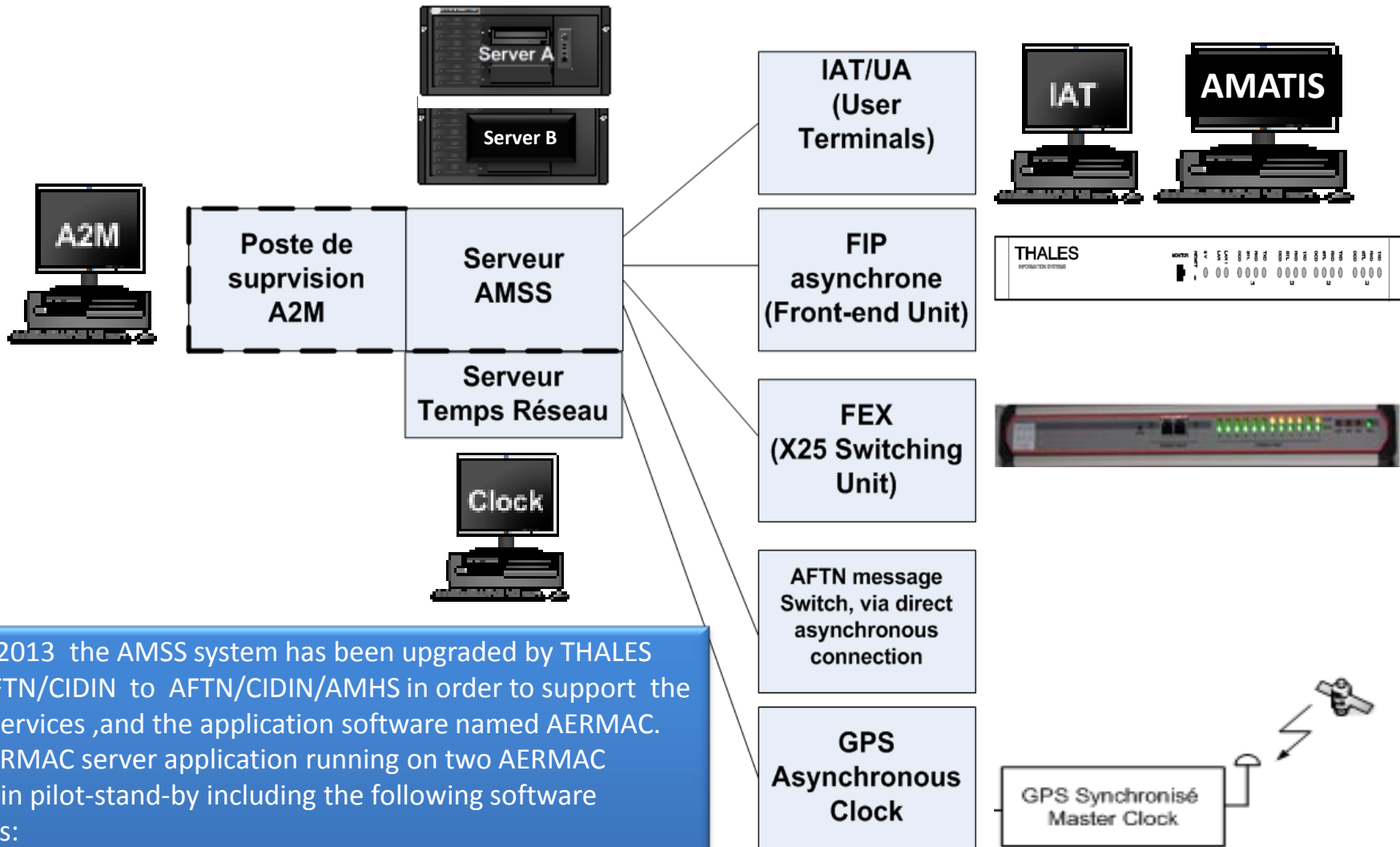
- INTRODUCTION ABOUT COM CENTRE AT BEIRUT AIRPORT.
- CONTINGENY PLAN
- MAJOR EVENTS OCCURRED IN 2015
- CONTACTS

FIRST AMSS SYSTEM INSTALLED AT BEIRUT AIRPORT IN 1995



The First AMSS has been installed at Beirut Rafic Hariri International Airport in 1995 according to The International Commun Aeronautical Organization (ICAO) , (ANNEX 10, VOLUME II, communication procedures).

Architecture of New AMSS

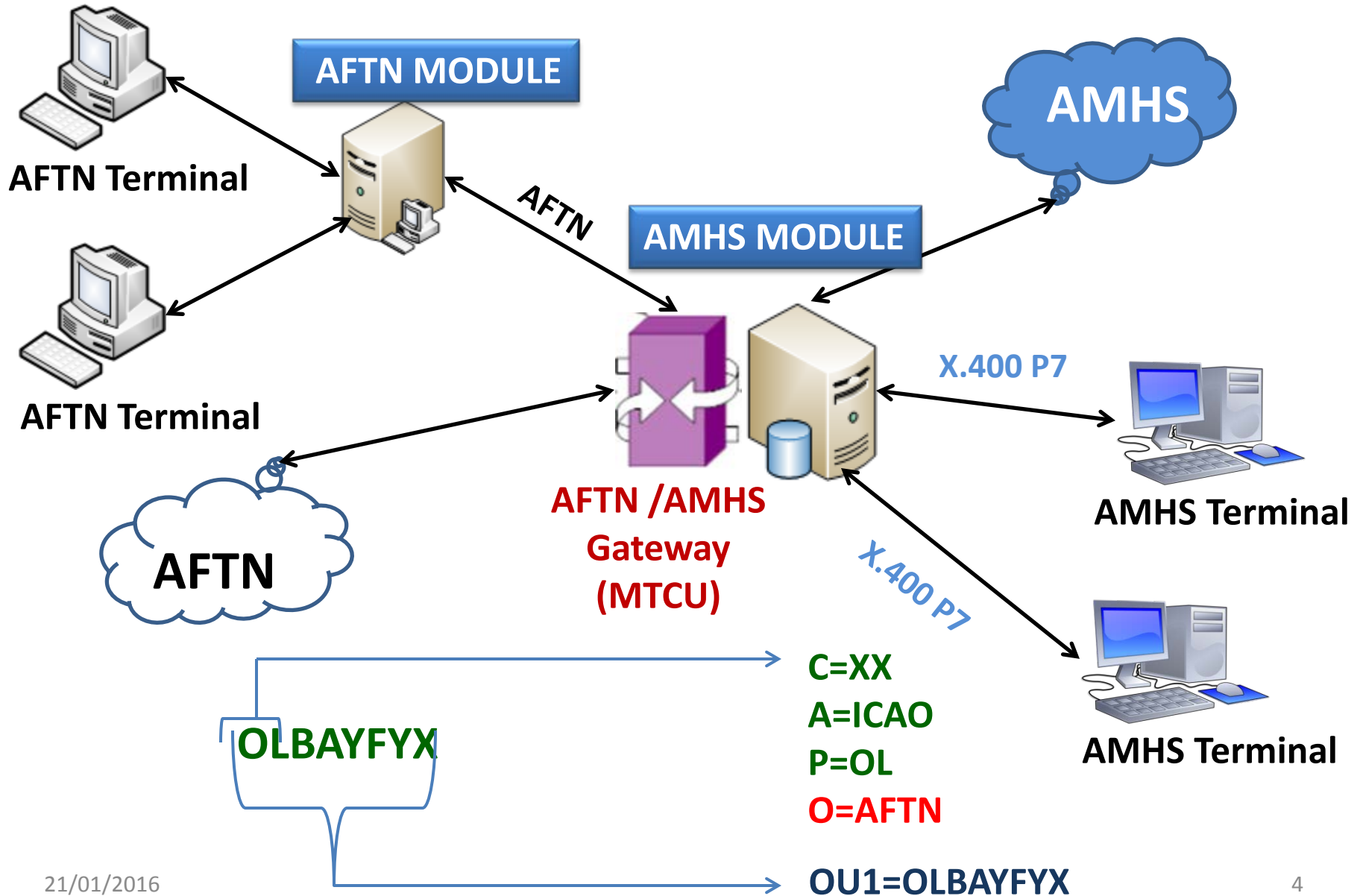


-In sep,2013 the AMSS system has been upgraded by THALES from AFTN/CIDIN to AFTN/CIDIN/AMHS in order to support the AMHS services ,and the application software named AERMAC.

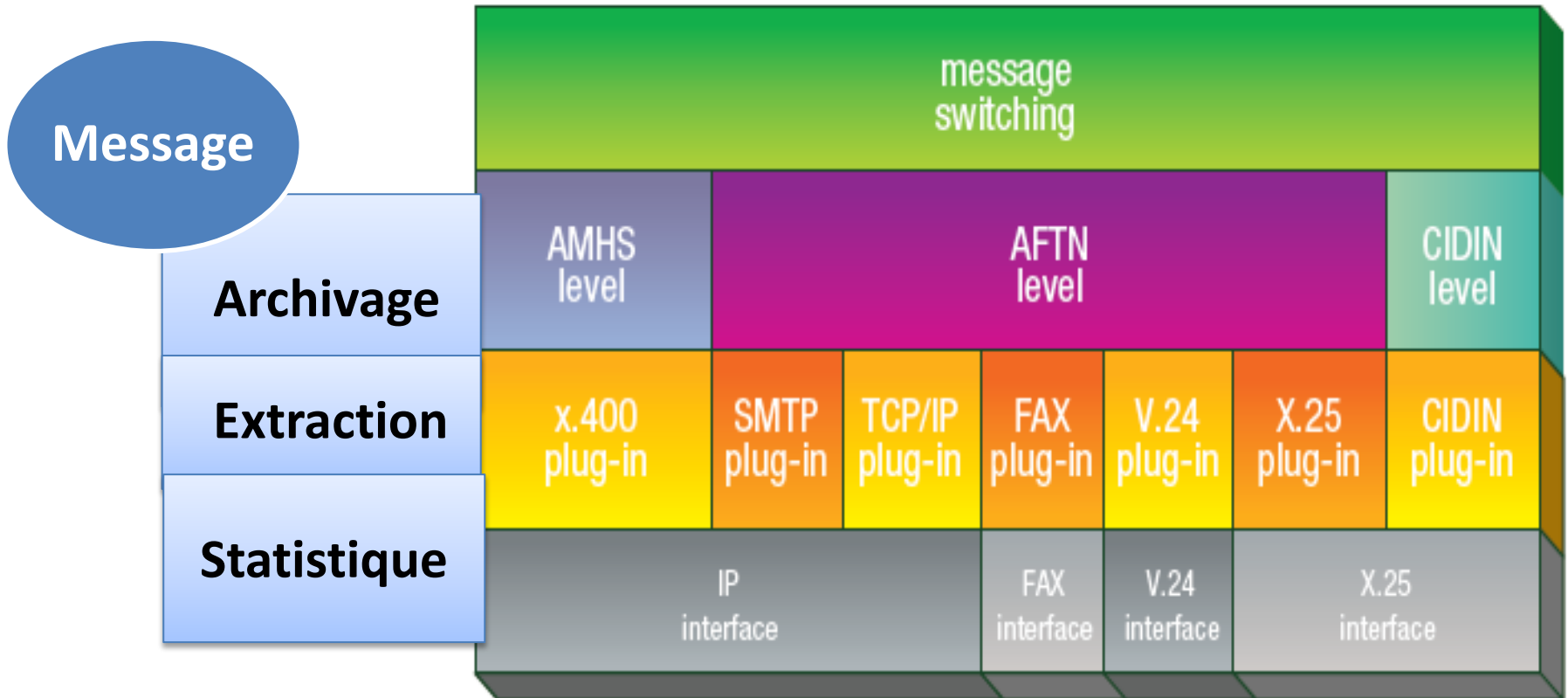
-The AERMAC server application running on two AERMAC servers in pilot-stand-by including the following software modules:

- AMHS switch module (Message Transfer Agent (MTA)) is in charge of AMHS traffic and X500 Directory.
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AFTN/AMHS Gateway



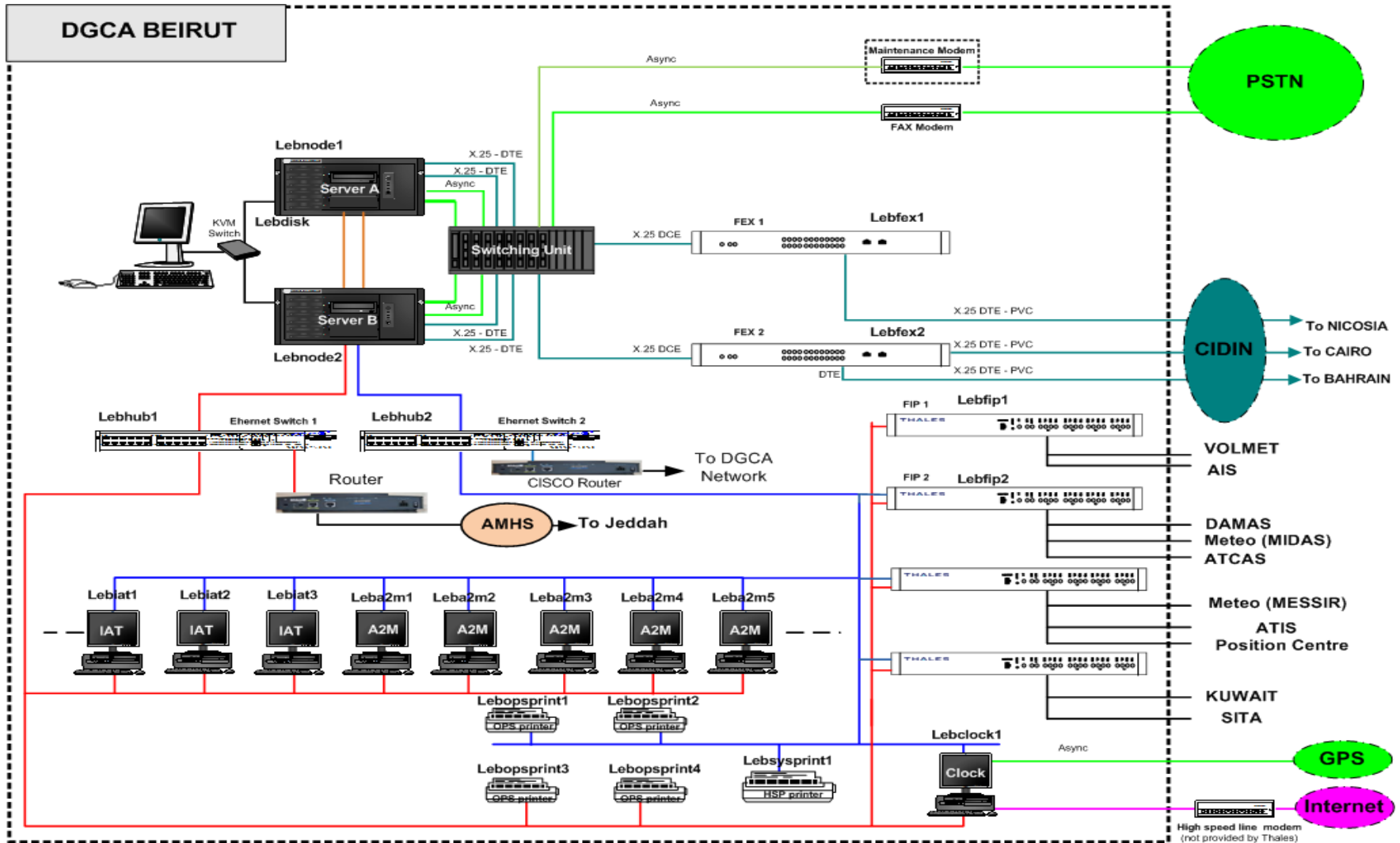
Beirut (Aeronautical Message Switching System)



Beirut AMSS system includes:

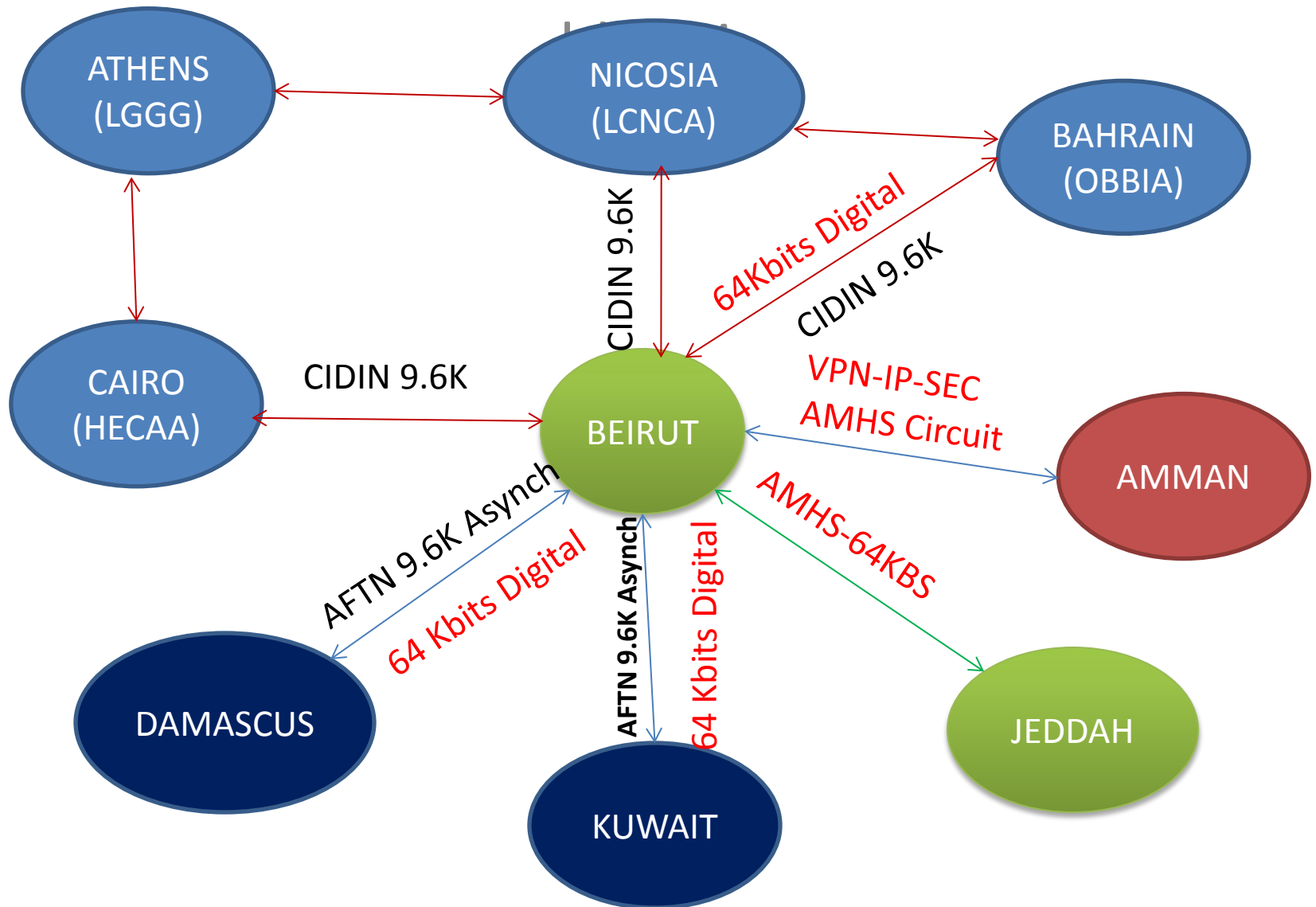
- ROBEX function
- AFTN/CIDIN/AMHS Gateway
- Email Gateway and FAX capability
- Three supervision A2M workstations
- Many Intelligent AFTN Terminals (IAT)
- Many User Agent terminals (AMATIS).

Hardware Configuration

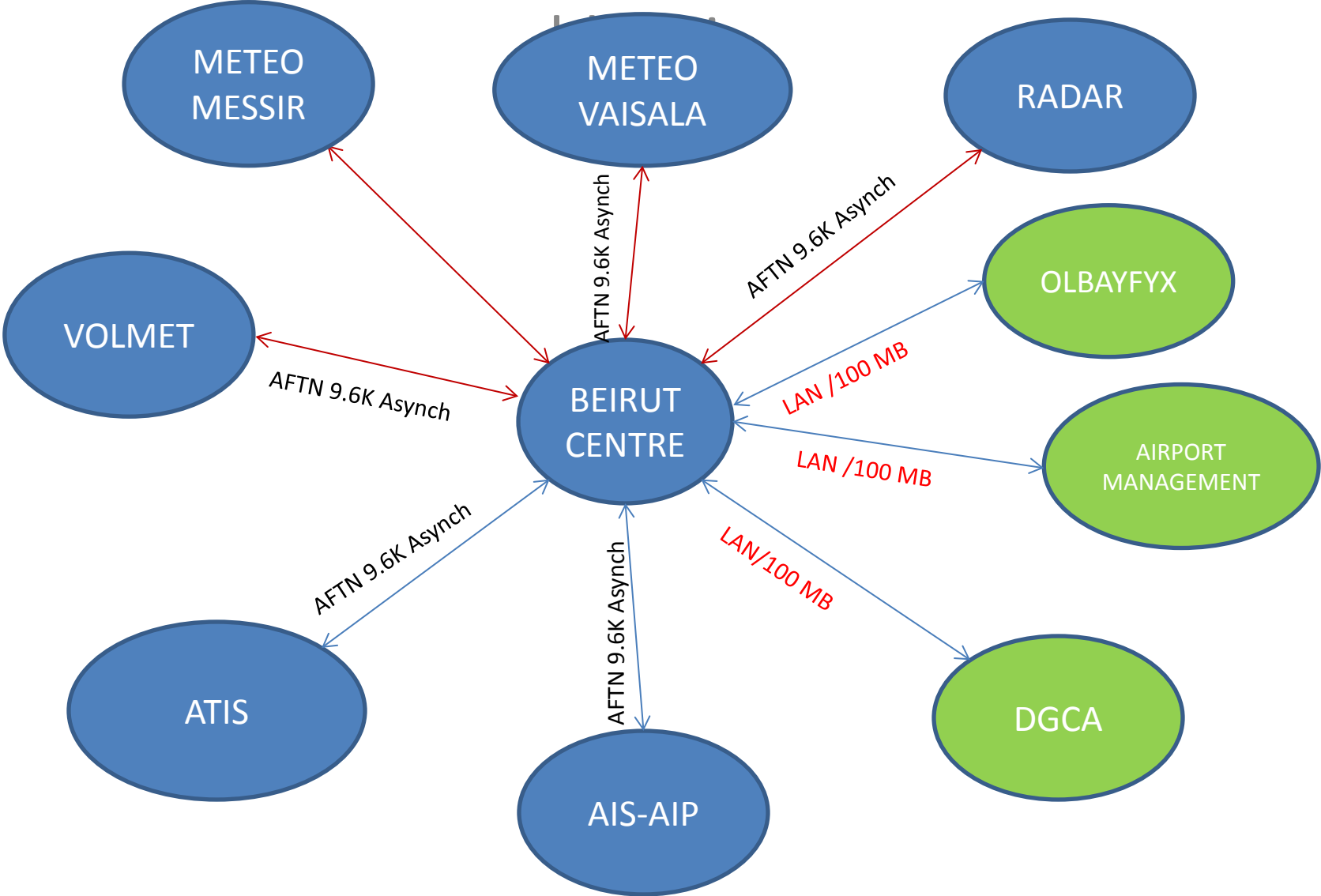


The communication between the AERMAC client applications (A2M,AMATIS) and the AERMAC AMHS server application are based on "Client server architecture".
 All AMSS components (A2M,AMATIS,IAT,,switches ,routers ,Terminal servers) are connected to AERMAC server via duplicated LAN.

BEIRUT International Circuits Chart



BEIRUT National Circuits Chart



National operating Circuits

AFTN Circuits	Type and Alphabet	Current Circuits speed
RADAR	AFTN -IA5	A-synch - 9.6K
METEO (MESSIR)	AFTN -IA5	A-synch- 9.6K
METEO (VAISALA)	AFTN -IA5	A-synch- 9.6K
AIS-AIP	AFTN -IA5	A-synch- 9.6K
ATIS	AFTN -IA5	A-synch- 9.6K
VOLMET	AFTN -IA5	A-synch- 9.6K
DGCA	AFTN-IA5	TCP/IP (IAT)
AIRPORT MANAGEMENT	AFTN-IA5	TCP/IP (IAT)
SITA	AFTN-ITA2-5	Will up to AMHS soon
E-mail Gateway	AFTN-IA5	Mail Server for AFTN msg By using TCP/IP connectivity

Beirut Contingency plan

1- Normal operation

- Use the existing Routing Directory (AFTN/CIDIN/AMHS) of Beirut Communication Center(P.D.R)

- VIA AMHS X400: OLBA/OEJN

-VIA CIDIN X25 : OLBA/HECA,OLBA/OBBI and OLBA/LCNC

-VIA AFTN RS232: OLBA/OKBK AND OLBA/OSDI

2- Emergency situations

A- Partial failure:

- Equipment failure :use the redundancy equipment
- Circuit failure :use P.D.R Traffic Diversion
- Back to operation : Average of 30 minutes

B-Complete failure :

- Switch to the old AFTN/CIDIN servers (continue operation without AMHS)
- Back to operation :Average of 4 hours

CONTINGENCY PLAN IN OPERATION MODE

We have triangle between OLBA-OBBI-LCNC by using (CIDIN) Circuits over X25 protocol

Automatic Diversion take place by using the Alternate circuit in case of failure

Traffic DIVERSION	AFTN	CIDIN	AMHS	Maximum time taking by operator for diversion
AFTN	By operator	By operator	By operator	5-10 minute
CIDIN	By operator	Automatic	By operator	5 -10 minute
AMHS	By operator	By operator	Automatic	5-10 minute

Major events occurred during 2015

- In 23 OCT, 2015 (BERYTAR) Submarine cable out of service
 - All traffic from/to HE/OB/OE were affected
- Taken actions by Beirut Com centre :
- 1-OB traffic automatically diverted to OBBIA via LCNCA
 - 2-HE Traffic manually diverted to HECAA via LCNCA
 - 3- OE Traffic manually diverted to OEJN via LCNCA
- The problem fixed by concerned providers in 24 hours
- Outage :1397 minutes

Beirut Contingency contact points

1-Communication Centre	2-Maintenance Department
AFTN ADDRESS:OLBAYFYX Email : khouryelic@beirutairport.gov.lb Fax :+961-1-629035 Tel :+961-1-628150	Email : msaad@beirutairport.gov.lb Fax :+961-1-629021 Tel :+961-1-628151
3-Air Navigation Department	4-Airport Management
AFTN ADDRESS:OLBAZQZX Email : Fax :+961-1-629078 Tel :	AFTN ADDRESS:OLBAYAYD Email : tco@beirutairport.gov.lb Fax :+961-1-628186 Tel :+961-1-628190

APPENDIX B

AMHS MIGRATION PLAN

Implementation steps	Beirut-Jeddah	Beirut-Jordan	Beirut-Bahrain	Beirut-Cairo	Beirut-Kuwait	Beirut-Nicosia	Beirut-Damascus	Beirut-Baghdad
Circuit type	Leased Line Digital 64 KBS	VPN IP-SEC	Leased Line Digital 64 KBS	Leased Line In process To be digital	Leased Line	Leased Line	Leased Line	VPN IP-SEC
IP Infrastructure Test	June 2015 Done	June 2015 Done	In process	Not yet	Digital64 Kbits	Analog 9.6 KBS	Digital 64 Kbits	Done
AMHS Inter-operability Test	June 2015 Done	August 2015 Done	In Feb, 2016	Not yet	In process	Waiting Nicosia to be ready for AMHS	Waiting Damascus to be ready for AMHS	Waiting Baghdad to be ready
Pre-Operation Test	June 2015 Done	August 2015 Done	In Feb, 2016	Not yet				
AMC-AIRAC cycle and operation	July 2015 done	Operational	By the end of February will be operated	Not yet	-	-	-	-

-END-