



INTERNATIONAL CIVIL AVIATION ORGANIZATION

**REPORT OF THE THIRD MEETING OF THE
AERONAUTICAL TELECOMMUNICATION NETWORK/
INTERNET PROTOCOL SUITE WORKING GROUP**

ATN/IPS WG/3

(Cairo, Egypt, 17-19 July 2011)

The views expressed in this Report should be taken as those of the MIDANPIRG Aeronautical Telecommunication Network/Internet Protocol Suite Working Group and not of the Organization. This Report will, however, be submitted to the MIDANPIRG/13 and any formal action taken will be included in the Report of the MIDANPIRG/13.

Approved by the Meeting
and published by authority of the Secretary General

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History of the Meeting

PART I – HISTORY OF THE MEETING

1. PLACE AND DURATION

1.1 The Third Meeting of Aeronautical Telecommunication Network/Internet Protocol Suite Working Group (ATN/IPS WG/3) was convened at the ICAO MID Regional Office in Cairo, Egypt, 17-19 July 2011.

2. OPENING

2.1 The Meeting was opened by Mr. Mohamed R.M.Khonji, ICAO Regional Director, Middle East Office who welcomed the delegates to Cairo. In his welcome speech he highlighted that the communication technology is advancing at an extremely rapid rate. New products and services are constantly being offered to the public with unprecedented capabilities, performance and capacity with decreasing costs. He urged the meeting to discuss the various difficulties faced in the Region for the implementation of ATN and IPS protocols to come up with solutions that will benefit the Region. Mr. Khonji, further guided the meeting on the considerable benefits of the Internet protocols, where ICAO developed SARPS and guidance materials for the use of IPS in the ATN and SARPS are in Annex 10.

3. ATTENDANCE

3.1 The meeting was attended by a total of thirteen (13) participants from six (6) States (Bahrain, Egypt, Jordan, Lebanon, Saudi Arabia and Sudan). The list of participants is at **Attachment A** to the Report.

4. OFFICERS AND SECRETARIAT

4.1 The Rapporteur of the meeting was Mr. Mohamed Ali Saleh, Head, Aeronautical Communication, Civil Aviation Affairs of Bahrain. Mr. Raza Gulam, Regional Officer, Communications, Navigation and Surveillance (RO/CNS), acted as secretary of the meeting.

5. LANGUAGE

5.1 The discussions were conducted in the English language and documentation was issued in English.

6. AGENDA

6.1 The following Agenda was adopted:

- Agenda Item 1: Adoption of Provisional Agenda
- Agenda Item 2: Follow-up on MIDANPIRG/12 and other meeting Conclusions and Decisions relevant to ATN/IPS WG TOR
- Agenda Item 3: Review update of MID ATN plans and implementation issues

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Agenda Item 4: Review of Public Internet usage in the MID Region

Agenda Item 5: Future work programme

Agenda Item 6: Any other business

7. CONCLUSIONS AND DECISIONS – DEFINITION

7.1 The MIDANPIRG records its actions in the form of Conclusions and Decisions with the following significance:

- a) **Conclusions** deal with matters that, according to the Group's terms of reference, merit directly the attention of States, or on which further action will be initiated by the Secretary in accordance with established procedures; and
- b) **Decisions** relate solely to matters dealing with the internal working arrangements of the Group and its Sub-Groups.

8. LIST OF CONCLUSIONS AND DECISIONS

DRAFT CONCLUSION 3/1: UPDATE THE AMC SYSTEM

DRAFT CONCLUSION 3/2: SUPPORT FROM EUROCONTROL TO ESTABLISH MID AMC

DRAFT CONCLUSION 3/3: MID IP NETWORK SURVEY

DRAFT CONCLUSION 3/4: DEVELOPMENT OF IP BASED MID NETWORKS

DRAFT DECISION 3/5: REVISED TOR OF THE ATN/IPS WORKING GROUP

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Report on Agenda Item 1

PART II: REPORT ON AGENDA ITEMS

REPORT ON AGENDA ITEM 1: ADOPTION OF THE PROVISIONAL AGENDA

1.1 The meeting reviewed and adopted the provisional agenda as at paragraph 6 of the history of the meeting.

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**REPORT ON AGENDA ITEM 2: FOLLOW-UP ON MIDANPIRG/12 AND OTHER MEETINGS
CONCLUSIONS AND DECISIONS RELEVANT TO ATN/IPS TOR**

2.1 The meeting noted that in accordance with the ICAO Business Plan and the requirements for performance monitoring, the MIDANPIRG Conclusions/Decisions and associated follow-up action plan should be formulated with clear tasks, specific deliverables and defined target dates. Accordingly, those statements without requirement for specific follow-up activities should be reflected in the report and should not be formulated in the form of Conclusion or Decision.

2.2 The meeting recalled that it has been agreed by MIDANPIRG/10 (Doha, Qatar 15-19 April 2007) that each subsidiary body review the Conclusions and Decisions related to its terms of reference and decide whether to maintain or replace by an updated Conclusions and Decisions, in order not to have too many Conclusions and Decisions which are ongoing.

2.3 Based on the above, the meeting noted the follow-up actions taken by concerned parties as **Appendix 2A** to the Report on Agenda Item 2.

2.4 The meeting agreed in its deliberation to review the Conclusions and Decisions which are still current under the relevant Agenda Item.

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Appendix 2A to the Report on Agenda Item 2

FOLLOW-UP ON MIDANPIRG/12 AND DGCA-MID/1 MEETING CONCLUSIONS AND DECISIONS RELATED TO ATN/IPS

CONCLUSIONS AND DECISIONS	FOLLOW-UP	TO BE INITIATED BY	DELIVERABLE	TARGET DATE	REMARKS
<p>CONC. 12/2: INCREASING THE EFFICIENCY OF THE MIDANPIRG SUBSIDIARY BODIES</p> <p>That, with a view to maintain the continuity in the activity of the MIDANPIRG subsidiary bodies and increase their efficiency:</p> <p>a) States be invited to nominate for each MIDANPIRG subsidiary body Experts/Specialists as Members of the body concerned to fully contribute to the work of this body; and</p> <p>b) the specialists nominated for membership in a MIDANPIRG subsidiary body, act as focal points within their Civil Aviation Administration for all issues and follow-up activities related to the Work Programme of that body.</p>	Implementation of the Conclusion	ICAO States	State Letter Nomination of Experts/Specialist	January 2011	Ongoing SL Ref.: ME 3/56 - 11/041 dated 7 March 2011 4 States replied
<p>DEC.12/33: TERMS OF REFERENCE OF THE AIS AUTOMATION ACTION GROUP</p> <p>That, the Terms of Reference of the AIS Automation Action Group (AISA AG) be updated as at Appendix 5.3H to the Report on Agenda Item 5.3.</p>	Implement the Decision	MIDANPIRG	Updated TOR	October 2010	Completed
<p>CONC. 12/38: POSTING OF AMHS PLANS IN AMC</p> <p>That, MID States be encouraged to post their AMHS implementation plans on the European ATS Messaging Management Centre (AMC).</p>	Follow-up the posting of Plan on AMC	ICAO States	State Letter AMHS plans Posted	February 2011	Ongoing SL AN 7/5.1 – 11/016 Dated 20 January 2011
<p>CONC. 12/39: MID IP NETWORK SURVEY</p> <p>That, MID States be urged to complete the MID IP Network survey as at Appendix 5.4A to the Report on Agenda Item 5.4 and send to ICAO MID Regional Office by February 2011.</p>	Follow-up in IP Network in MID Region	ICAO States	State Letter Completed survey	February 2011	Ongoing SL AN 7/5.1 – 11/016 Dated 20 January 2011

CONCLUSIONS AND DECISIONS	FOLLOW-UP	TO BE INITIATED BY	DELIVERABLE	TARGET DATE	REMARKS
					ATN/IPS WG/3 meeting rescheduled to 17-19 July 2011
<p>CONC.12/40: USE OF PUBLIC INTERNET IN THE MID REGION</p> <p>That MID States be encouraged to:</p> <p>a) follow the guidance Appendix 5.4B to the Report on Agenda Item 5.4, when using the public internet for critical aeronautical communication; and</p> <p>b) provide to the ICAO MID Regional Office, the inventory on the public internet usage ; as at Appendix 5.4C to the Report on Agenda Item 5.4 by 20 February 2011.</p>	Implement the Conclusion	States	State Letter Inventory of public internet ATN/IPS WG report	February 2011 March 2011	Ongoing AN 7/5.1 – 11/016 Dated 20 January 2011 ATN/IPS WG meeting rescheduled 17-19 July 2011
<p>DEC. 12/41: REVISED NAME AND TOR OF THE IPS WG</p> <p>That, the IPS WG is renamed as ATN/IPS WG with same members; and its terms of reference and work programme of the ATN/IPS Working Group be updated as at Appendix 5.4D to the Report on Agenda Item 5.4.</p>	Implement the Decision	MIDANPIRG/12	Revised TOR	October 2010	Completed
<p>CONC. 12/44: UPDATING THE AFTN/CIDIN DIRECTORY</p> <p>That, ICAO MID Regional Office request Authorization from EUROCONTROL to provide the routing function and any additional functions available in AMC to the MID Region.</p>	Follow-up with EUROCONTROL for additional fun	ICAO	State Letter	February 2011	Ongoing AN 7/5.1 – 11/011 Dated 19 January 2011

CONCLUSIONS AND DECISIONS	FOLLOW-UP	TO BE INITIATED BY	DELIVERABLE	TARGET DATE	REMARKS
<p>CONC. 12/46: EXCHANGE OF SURVEILLANCE DATA</p> <p>That, MID States be encouraged, to share ATS surveillance data in order to improve surveillance coverage in the MID Region, which will enhance safety, efficiency, capacity and could be used as back-up where feasible.</p>	<p>Implement the Conclusion</p>	<p>ICAO States</p>	<p>State Letter Exchange Surveillance data</p>	<p>February 2011</p>	<p>Ongoing</p> <p>SL AN 7/5.9 – 11/025 Dated 16 February 2011</p>
<p>CONC. 12/47: MID REGION PERFORMANCE METRICS</p> <p>That:</p> <p>a) the following MID Region Metrics be adopted for performance monitoring of the air navigation systems:</p> <p>MID Metric 1: Number of accidents per 1,000 000 departures;</p> <p>MID Metric 2: Percentage of certified international aerodromes;</p> <p>MID Metric 3: Number of Runway incursions and excursions per year;</p> <p>MID Metric 4: Number of States reporting necessary data to the MIDRMA on regular basis and in a timely manner;</p> <p>MID Metric 5: The overall collision risk in MID RVSM airspace;</p> <p>MID Metric 6: Percentage of air navigation deficiencies priority “U” eliminated;</p> <p>MID Metric 7: Percentage of instrument Runway ends with RNP/RNAV approach procedure; and</p> <p>MID Metric 8: Percentage of en-route PBN routes implemented in accordance with the regional PBN plan.</p> <p>b) the MIDANPIRG subsidiary bodies monitor the Metrics related to their work programmes; develop associated performance targets and provide feed-back to MIDANPIRG.</p>	<p>Monitor performance of ANS using the endorsed metrics</p>	<p>MIDANPIRG & subsidiary bodies</p>	<p>Develop performance targets</p>	<p>2011</p>	<p>Ongoing</p> <p>SL Ref.: AN 7/26.1-11/121 dated 24 May 2011</p>

CONCLUSIONS AND DECISIONS	FOLLOW-UP	TO BE INITIATED BY	DELIVERABLE	TARGET DATE	REMARKS
<p>CONC. 12/48: DATA COLLECTION FOR MID REGION PERFORMANCE METRICS</p> <p>That, States be invited to:</p> <ul style="list-style-type: none"> a) incorporate the agreed MID Region Performance Metrics into their National performance monitoring process; b) collect and process relevant data necessary for performance monitoring of the air navigation systems to support the regional Metrics adopted by MIDANPIRG; and c) submit this data to the ICAO MID Regional Office on a regular basis. 	<p>Implement the Conclusion</p>	<p>ICAO States</p>	<p>State Letter</p> <p>Include metrics into national performance monitoring</p> <p>Submit data to ICAO</p>	<p>January 2011</p>	<p>Ongoing</p> <p>SL Ref.: AN 7/26.1-11/121 dated 24 May 2011</p>
<p>DEC. 12/49: REVIEW OF THE MID AIR NAVIGATION PLAN (ANP)</p> <p>That, in support to ICAO efforts to improve regional ANPs, the MIDANPIRG subsidiary bodies:</p> <ul style="list-style-type: none"> a) carry out a complete review of the MID Basic ANP and FASID parts related to their Terms of Reference (TOR) and Work Programme; b) develop revised draft structure and content of the Basic ANP in order to reconcile it with the ATM Operational Concept, the Global Plan provisions and the performance based approach; c) identify the need for and development of those FASID Tables necessary to support the implementation of a performance-based global air navigation systems; and d) report progress to MIDANPIRG/13. 	<p>Implement the Decision</p>	<p>ICAO States Users</p>	<p>New structure, format & content of ANP/FASID</p>	<p>2012</p>	<p>Ongoing</p>

CONCLUSIONS AND DECISIONS	FOLLOW-UP	TO BE INITIATED BY	DELIVERABLE	TARGET DATE	REMARKS
<p>CONC.12/75: ELIMINATION OF AIR NAVIGATION DEFICIENCIES IN THE MID REGION</p> <p>That, MID States be urged to:</p> <p>a) review their respective lists of identified deficiencies, define their root causes and forward an action plan for rectification of outstanding deficiencies to the ICAO MID Regional Office prior to 31 March 2011;</p> <p>b) use the online facility offered by the ICAO MID Air Navigation Deficiency Database (MANDD) for submitting online requests for addition, update, and elimination of air navigation deficiencies;</p> <p>c) accord high priority to eliminate all air navigation deficiencies with emphasis on those with priority “U”; in particular by allocating the necessary budget to ensure that their Civil Aviation Authorities have and retain a sufficient number of qualified technical personnel, who are provided with appropriate initial, on-the-job and recurrent training; and</p> <p>d) seek support from regional and international organizations (i.e. ACAC, GCC, etc.) for the elimination of identified air navigation deficiencies.</p>	<p>Implement the Conclusion</p>	<p>ICAO States</p>	<p>State Letter Feedback from States</p>	<p>January 2011</p>	<p>Ongoing</p> <p>SL Ref.: AN2/2 – 11/123 dated 25 May 2011</p>
<p><u>DGCA-MID/1</u></p> <p>CONC. 1/2: ELIMINATION OF AIR NAVIGATION DEFICIENCIES IN THE MID REGION</p> <p>That, States:</p> <p>a) accord high priority to the elimination of air navigation deficiencies; in particular by allocating the necessary budget to ensure that their Civil Aviation Authorities have and retain a sufficient number of qualified technical personnel, and provide appropriate initial, on-the-job and recurrent training;</p>					

CONCLUSIONS AND DECISIONS	FOLLOW-UP	TO BE INITIATED BY	DELIVERABLE	TARGET DATE	REMARKS
b) work cooperatively towards the elimination of common deficiencies; and c) consider the use of the Regional Safety Oversight Organizations (RSOs) as an efficient mechanism for, inter-alia, the provision of appropriate training to technical staff and elimination of common deficiencies.					

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REPORT ON AGENDA ITEM 3: REVIEW AND UPDATE OF MID ATN PLANS AND IMPLEMENTATION ISSUES

3.1 The meeting noted the outcome of the thirteenth meeting of Aeronautical Communication Panel (ACP) Working Group I – Internet Protocol Suite (ACP-WG-I 13), and the Seventeenth Meeting ACP Working Group on Maintenance of Air - Ground and Ground - Ground Communication (ACP-WG-M 17) held in Bangkok from 27 to 28 January and 31 January to 1 February 2011 respectively.

3.2 The meeting noted the Action Items from the ACP-WG-I 13, which are significant and of relevance to the meeting which are as follows:

Action Item 11-3: Approach the internet Corporation for Assigned Names and Numbers (ICANN) to investigate the possibility of acquiring a top level domain name for ICAO. The Action Item is yet to be completed.

Action Item 12-1: Update 9896 (Doc) and produce Rev 19. The Doc 9896 is still being amended.

Action Item 12-2: Develop an amendment proposal to update Network Mobility capability in Doc 9896. This has been developed during ACP-WG-I 13.

3.3 The ACP-WG-I 13 discussed the Voice over IP (VoIP) and noted the updates to EUROCAE Documents on VoIP in ATM. The ACP-WG-I 13 agreed to update the reference to ED 137A in Edition 2 of ICAO Doc 9896, for future publications.

3.4 The meeting noted that ICAO *Manual on the ATN using Internet Protocol Suite (IPS) Standards and Protocol* (Doc 9896) and the *Manual on Detailed Technical Specifications for the ATN using ISO/OSI Standards and Protocols* (Doc 9880) were officially published in the second half 2010 and that the *Manual of Technical Provisions for the Aeronautical Telecommunication Network (ATN)* (Doc 9705) and the *Comprehensive ATN Manual* (Doc 9739) were withdrawn.

3.5 The meeting noted that ACP-WG-M 17 had decided to allow ICAO GIS Portal to be used as a means to timely capture information on bilateral AMHS connections and other CNS developments. This included the possibility of integrating some of the existing EUROCONTROL/ICAO EUR Region on-line database with the ICAO GIS Portal. It was also noted that EUROCONTROL AMC could be used as an alternative to the GIS Portal for the purpose of indicating implementation status.

3.6 The meeting noted that ACP-WG-M 17 discussed VoIP Standards Development Status and issues related to maintenance of ICAO documents which make reference to industry standards and identified two different processes depending on whether changes were being supported by the States or by the industry. Following significant issues were noted related to the processing of changes:

- a) the industry bodies today do not have an established Configuration Control Board or similar process. This is necessary as their committees are disbanded once their deliverables have been completed;

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- b) there is no forum for Industry Standards bodies and ICAO to coordinate their work. This is being worked on by the “Standards Roundtable” group however and is still “work in progress”; and
- c) most industry bodies are driven by industry however RTCA is driven by the FAA.

3.7 The meeting was informed about the Global Air Navigation Industry Symposium (GANIS) which is to be convened by ICAO from 20 to 23 September 2011 in Montréal, were invitation has been sent under ICAO State Letter AN 7/59-11/15 dated 25 March 2011.

3.8 The meeting noted that ICAO is organizing this event in an effort to facilitate greater integration and harmonization of air navigation system improvement programmes of States and service providers. The Symposium, while emphasizing the need for global harmonization, will identify ways and means to ensure interoperability and maximize utilization of available and emerging technologies.

3.9 The meeting was informed that this effort will lay the foundation for the Twelfth Air Navigation Conference to be held in November 2012, which will serve as the next critical global milestone and which will result in agreements and recommendations to pave the way toward large-scale global implementation efforts. It was noted that as part of this effort, ICAO is developing the global CNS Roadmap to be eventually endorsed by the 12th ANC.

3.10 The meeting recalled that the ATN activities have been on going in the MID Region for some years and the ATN application for ground messaging i.e. the AMHS has being implemented largely in the MID Region. In this regard, the meeting revised the “MID REGIONAL ATN PLANNING AND IMPLEMENTATION DOCUMENT” which was developed by IPS WG/2 (Cairo, 11-12 October 2009), as at **Appendix 3A** to the Report on Agenda Item 3.

3.11 The meeting was of the view that the development of the complete MID Regional document will be very extensive although IPS WG/1 and 2 has started the work, based on the other Regions’ documents and experience gained from the current ATN implementation. The ATN-IPS WG agreed that mature plan and guidance material concerning the AMHS implementation is to be extracted from the MID REGIONAL ATN PLANNING AND IMPLEMENTATION DOCUMENT and updated in order to be a usable document for the MID Region. Accordingly, the meeting developed the AMHS part as at **Appendix 3B** to the Report on Agenda Item 3.

3.12 MIDANPIRG/12 meeting noted that a periodical data collection and publication in the MID ANP and FASID for the AFTN/CIDIN/AMHS circuits and other related information is a human resource extensive task and would need to be supported by electronic tools, e.g. centralized database. Where these information are maintained in ICAO EURO Region through the AMC.

3.13 The meeting received presentation on the AMC and noted that MID Region could utilize the AMC to obtain this information. Consequently, the meeting urged MID State to access the AMC website <http://www.eurocontrol.int/amc> and keep all information related to their States updated. Accordingly, the meeting agreed to the following draft Conclusion:

DRAFT CONCLUSION 3/I: UPDATE THE AMC SYSTEM

That, MID States be urged to keep the data related to their COM CENTER updated in the AMC system.

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3.14 The meeting was informed that MIDANPIRG/12 was apprised on the status of transition from AFTN to AMHS and noted that for the orderly operation of the AMHS on a global scale, it is necessary to coordinate and synchronize the allocation of AMHS addresses. In response to this requirement, ICAO is utilizing the European ATS Messaging Management Centre (AMC), in cooperation with the European Organization for the Safety of Air Navigation (EUROCONTROL), which established the procedures for coordination and synchronization of AMHS addresses in the short-to medium-term.

3.15 The meeting noted that a State Letter AN 7/49.1-09/34 was sent to States indicating the above agreement with EUROCONTROL, also mentioning that in order to use the AMC it is necessary for the users to be trained before they are actually allowed to enter data in the AMC. In order to foster timely implementation of AMHS, ICAO MID Regional Office had organized a three days training (13-15 October 2009).

3.16 The meeting recalled MIDANPIRG/12 Conclusion 12/38: *POSTING OF AMHS PLANS IN AMC*, and as follow-up to the conclusion, the meeting noted that ICAO MID Regional Office, sent State Letter AN 7/5.1 – 11/016 dated 20 January 2011, requesting MID States to take necessary action to expedite the posting of their AMHS plans in the AMC and start using the AMC. It was further noted that some MID States have not accessed the AMC application and no details are being updated by States.

3.17 The meeting noted that MID COM Centres participate in EUR-AMC as external COM operators that have access to some of the AMF-O functions, but they cannot use an important function like routing management which is currently available to EUR CCC operators. Therefore, during the second meeting of ATN/IPS WG, Jordan proposed to establish and host a MID AMC. In view of this, the meeting recommended that Jordan should provide a complete project plan with details, on hardware, software and the daily operation of the AMC to the next ATN/IPS WG meeting, where ICAO MID Regional Office will help and facilitate the use of the AMC software from EUROCONTROL to Jordan, if needed.

3.18 The meeting further noted that MIDANPIRG/12 was in agreement that the manual “Maintenance of the Routing Directory” is becoming difficult and complicated and agreed that, ICAO MID Regional Office request EUROCONTROL to extend the Routing Table function provided by the AMC system to the MID Region.

3.19 Based on above, ICAO MID Regional Office has sent an official letter requesting provision of the routing function and any additional function to the MID Region. Accordingly, a meeting between EUROCONTROL and Jordan took place in EUROCONTROL Headquarters on 5 July 2011, during which the requirements for a Network Management Center for the MID Region, was discussed. The summary of discussion of the meeting between EUROCONTROL and Jordan is at **Appendix 3C** to the Report on Agenda Item 3.

3.20 The meeting noted from the summary that three options have been identified concerning the possibility of EUROCONTROL support, as follows:

a) **Provision of AMC Routing Management Function to the MID Region**

This option is considered short term, easy to implement and no modification will be required in the AMC. Only additional AMC operational effort will be required to carry out the routing management function for MID Region. It is estimated that this effort would cost approximately EUR €50,000 per year. The current AMC

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operator contract will be renewed in the last quarter of 2011. This option can be included in that contract.

b) Modification of AMC, so that each region manages its own data

Major modification would be needed for the AMC architecture, including modification of the functions, procedures, documents, training materials and the AMC application. This is considered the most complex solution and may take one year or one and half years to implement. In this option since each region manages its own data, no additional AMC operator cost will be required for Europe. However, there would be additional development and implementation costs. The related development and implementation costs for this option could be estimated by EUROCONTROL if this option is selected.

c) Supporting the MID Region to develop its own AMC

This is a long term option; EUROCONTROL will be able to provide development, implementation and operational support on request. This includes:

- Support /Interpretation of ATS Messaging Management Manual
- Support /Interpretation of AMC Implementation Specification
- Support for development of MID Region AMC Application
- Setting up of the AMC infrastructure, including LAN/WAN and Application Server, Database Server, Web Server, firewalls etc...
- Support for setting up the organization including the steering group and technical support group
- Possible provision of AMC application with or without source code
- Support for development of synchronization functions and procedures between the regions
- Training the AMC operators and the users
- etc...

3.21 The meeting discussed in detail the three options and was in total agreement with option c for Supporting the MID Region to develop its own AMC. In this regard, the meeting requested Jordan to provide an official letter to ICAO MID Regional Office confirming their full commitment as was explained during MIDANPIRG/12 meeting.

3.22 Based on the above, the meeting agreed that following the receipt of the official commitment from Jordan, the ICAO MID Regional Office is to request the support from EUROCONTROL. Accordingly, the meeting agreed to the following draft Conclusion:

*DRAFT CONCLUSION 3/2: SUPPORT FROM EUROCONTROL TO ESTABLISH
MID AMC*

That, ICAO MID Regional Office request EUROCONTROL's support for the establishment of MID AMC by providing needed documents, AMC operation training and other related issues.

3.23 The meeting was informed that since 2008 the new Jordanian integrated AFTN/AMHS system started its operation, and an international AMHS link between Jordan and the United Arab Emirates (UAE) using VPN has been operational efficiently since 3 March 2010. AMHS Interoperability and Pre-Operational Tests were successfully carried out with Egypt as well as with Saudi Arabia in June 2010. These links were put into operations in September and November 2010.

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3.24 The meeting was also informed on the Bilateral AMHS Interoperability Tests based on ICAO EUR Doc 020 – EUR AMHS Manual - Version 4.0, Appendix E were performed on 21 and 22 February 2010 for Jordan and UAE systems, which were configured according to an agreed configuration document specifying all address and connection parameters necessary for the tests. The excellent results of the Interoperability Tests encouraged both States to start AMHS Pre-Operational Tests according to Appendix F of the EUR AMHS Manual on 23 February 2010. As a consequence of the error free Pre-Operational Tests, the cutover to operational use of the new AMHS link was done on 3 March 2010. It is also the first international AMHS via VPN implementation worldwide. The connection has been very stable and reliable.

3.25 The meeting noted with appreciation the Trilateral Tests that have been performed between Amman, Cairo, and Jeddah in November 2010 according to appendix E of ICAO EUR Doc 020, which contains test cases for message submission, transfer, delivery and relay operation in addition to Alternative MTA routing and loop detection.

3.26 As a result of the successful tests, the AMHS triangle was put into operational use, being the first AMHS triangle world-wide that uses static routing with pre-defined routing tables.

3.27 The meeting noted that conducting a timely and thorough post-implementation review (PIR) helps identifying lessons learned which will assist in planning, managing, and meeting the objectives of future AMHS projects. In this regard, it is important to note that Asymmetric routing may cause loss of messages due to the fact that a gateway cannot map a Non-Delivery Report to a subject message. Furthermore, Singular AMHS diversion for an area representing several PRMDs is substantial and cannot be performed by one letter as used in AFTN, to facilitate a diversion from AFTN to AMHS and vice versa.

3.28 Based on the above, the meeting urge MID AMHS COM Centres to review the current routing tables and make sure of deploying symmetric routes where possible, also encouraged MID States to make use of the corresponding PRMDs table to facilitate diversion from AFTN to AMHS and vice versa. Furthermore the meeting was of the opinion that States start the PRMD with the first two letters for their location indicator.

3.29 The meeting noted that Jordan has detected an inconsistency between the activation procedure that was described in ICAO EUR Doc 021–ATS Messaging Management Manual and the commonly used procedure as described in AMC training courses. Accordingly, Jordan has submitted Defect Report (DR) for ICAO EUR Doc 021–ATS Messaging Management Manual to the AFSG Operation Group. The DR has been accepted and at the AFSG/15 meeting, the proposed changes were reviewed, adopted and approved by the AFSG Group.

3.30 The meeting noted that MIDANPIRG/12 was informed on the developments within the global ICAO framework mainly Amendment 83 which introduced, among other issues, the Internet Protocol Suite (IPS) technology to the Aeronautical Telecommunication Network (ATN), and the Manual for the ATN using IPS Standards Protocols (Doc 9896).

3.31 MIDANPIRG/12 was apprised on the Internet Engineering Task Force (IETF) activities and noted that IETF, established 2 working groups: Address Lifetime Expectations (ALE) and IPng (IP next generation) to make recommendations for the IP Next Generation Protocol. The IETF produced specifications for Internet Protocol, Version 6 (IPv6) under RFC 2460. The specification has much larger address space (2¹²⁸), and also supports additional features like mechanism for auto-configuration of network interfaces, encapsulation of itself and other protocols, built in authentication and encryption etc.

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3.32 Based on the above, MIDANPIRG/12 meeting was in alignment with the global view, that the complete implementation of IPv6 will take time and consequently, there will be a long period until the co-exist of both protocols, IPv4 and IPv6.

3.33 MIDANPIRG/12 supported the CNS Sub-Group and IPS Working Group agreement that careful attention is required to the current implementation of AFTN, CIDIN and ISO/OSI based ATN, and the Provisions for continuation of CIDIN, AFTN and ISO/OSI should continue to be developed to secure these implementations. The meeting agreed that the MID ATN implementation should take place on the basis of regionally agreed requirements, taking into consideration, the System Wide Information Management concept and any new developments.

3.34 The meeting recalled that MIDANPIRG/12 was updated on the Europe's Pan European Network (PEN) based on IPv6, that has been initiated by EUROCONTROL. PEN will be implemented in Europe to meet the ATM requirements for a cost-effective, international communications network with the ability to support existing as well as future services. In its initial form, PEN is planned as a ground-ground IP network serving data communications between ANSPs and between ANSPs and EUROCONTROL.

3.35 Based on the above, MIDANPIRG/12 agreed with the views of concerned MIDANPIRG subsidiary bodies for the development of the MID IP Network that should benefit the MID Region. In this regard the MIDANPIRG/12 agreed that an IP Network survey be conducted to obtain first hand information from MID States, and had accordingly agreed to Conclusion 12/39 *MID IP NETWORK SURVEY*.

3.36 As a follow-up to the above conclusion, ICAO MID Regional Office sent State Letter AN 7/5.1 – 11/016 dated 20 January 2011, requesting MID States to complete the survey and provide any information about existing IP infrastructure and IP Networks implemented within their State.

3.37 The meeting noted that only 5 States (Bahrain, Egypt, Iran, Jordan and Saudi Arabia) provided the replies as at **Appendix 3D** to the Report on Agenda Item 3. Furthermore the meeting performed analysis on the replies as at **Appendix 3E** to the Report on Agenda Item 3.

3.38 The meeting reiterated MIDANPIRG/12 Conclusion 12/39 and urged MID State to submit their replies before the CNS SG/4 Meeting which was tentatively planned for 25-27 September 2011, since further action on the establishment of MID IP Network is dependent on the analysis of the survey. Accordingly, the meeting revised the IP Network survey and agreed to the following draft Conclusion:

DRAFT CONCLUSION 3/3: MID IP NETWORK SURVEY

*That, MID States complete the MID IP Network survey as at **Appendix 3F** to the Report on Agenda Item 3 and send to ICAO MID Regional Office by 01 September 2011.*

3.39 The meeting further noted that some MID States had already developed domestic networks based on IP network, while other States are in the process of developing them. Consequently, the meeting was of the view that for harmonization and compatibility issues these networks be based according to ICAO standards as outlined in Doc 9896. Accordingly, the meeting agreed to the following draft conclusion:

ATN-IPS WG/3
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DRAFT CONCLUSION 3/4: DEVELOPMENT OF IP BASED MID NETWORKS

That, MID States be urged to:

- a) *develop national plans, in line with the ICAO Manual on the Aeronautical Telecommunication Network (ATN) using Internet Protocol Suite (IPS) Standards and Protocols (Doc 9896), for migration to IPv6 taking the existing IPv4 based aeronautical systems into account;*
- b) *consider the use of IPv4/IPv6 protocol translation devices only as a provisional solution during the migration; and*
- c) *include a requirement for both IPv4 and IPv6 in their ongoing Air Traffic Services (ATS) Message Handling System (AMHS) implementation programmes in order to ensure seamless transition and interoperability.*

3.40 The meeting received presentation from Saudi Arabia on their National Air Navigation Network (NAN).

ATN/IPS WG/3
Appendix 3A to the Report on Agenda Item 3



MID REGIONAL ATN PLANNING AND IMPLEMENTATION DOCUMENT

Document Reference:	MIDANPIRG IPS/ WG
Author:	ATN Planning and IPS WG
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EXECUTIVE SUMMARY

This transition plan provides technical guidance on the transition from the ground infrastructure support of the Aeronautical Fixed Telecommunication Network (AFTN) and the Common ICAO Data Interchange Network (CIDIN) services to the Aeronautical Telecommunication Network (ATN) for the Middle East Region.

The Middle East ATN Ground Transition Plan outlines the requirements to increase bandwidth and upgrade protocols for those trunks that will support the main data flow of traffic through the Middle East Region. The plan also provides target dates in which these trunks and implementation of BBISs and BISs will need to occur to ensure a smooth transition of the ATN within the region, taking into account proper interface with adjacent regions.

This document explain the plan on the ATN ground transition activities applicable to the Middle East Region. The ATN Transition Plan includes information about the implementation of Regional ATN Routing Architecture as presented in this document and development of naming and addressing plan.

This document is also updated with other ATN related material useful for the ATN implementation such as

- MID ATN IP based Strategy
- MID AMHS implementation
- MID AMHS testing
-

This document is live document which will keep developing and other parts will be added to the document also will be amended as and when deemed necessary as appropriate upon approval of the appropriate MIDANPIRG subsidiary bodies. In that respect comments from States will be appreciated and could be addressed through the appropriate MIDANPIRG subsidiary body.

Any references to this manual should be interpreted as also referring to Annex 10 and misinterpretation Annex 10 and the relevant ICAO documents will supersede this documents .

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CHAPTER ONE

ATN Transition Plan

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1. INTRODUCTION

This chapter presents a plan on the ATN ground activities applicable to the ICAO MID Region. It provides also information on the ground infrastructures required to support the ATN and to take into consideration progressively the ATN air-to-ground requirements of the Region.

1.1 Objective

1.2 Scope

The scope of the chapter one includes:

- A brief description of the current ground infrastructure and upgrade plans based on AFTN/CIDIN;
- The types of ATN applications that will be used over the ground infrastructure;
- The types of trunks that will need to be upgraded to cater for ATN traffic; and
- A proposed implementation schedule on how the ATN should be transitioned within the region.

1.3 References

- Reference 1 Annex 10
 Reference 2 Manual of Technical Provisions for the ATN (Doc 9705-AN/956) Second Edition 1999 (in process to be withdrawn and material to move to 9880)
 Reference 3 Comprehensive Aeronautical Telecommunication Network (ATN) Manual (Doc 9739-AN/961) First Edition 2000
 Reference 4 Manual on the ATN using IPS standards and protocols (Doc 9896 AN/469)
 Reference 5 Middle East AFTN/CIDIN Routing Directory
 Reference 6 ICAO Location Indicators – Document 7910
 Reference 7 MID Air Navigation Plan and Facilities and Services Implementation Document (ANP- FASID – Doc. 9708)
 Reference 8 ASIA/PAC Regional Aeronautical Telecommunication Network (ATN) Planning Documents
 Reference 9 EUR AMHS Manual - 4th Edition - April 2009

2. CURRENT GROUND INFRASTRUCTURE AND UPGRADE PLANS

2.1 The present ground-ground data communications system in the Middle Region comprises AFTN circuits and centers (tributary and main) that allow the exchange of ATS and other operational messages.

2.2 Five States of the Region already implemented the Common ICAO Data Interchange Network (CIDIN) as an upgrade of the low speed AFTN circuits to improve the efficiency and reliability of message exchange. These CIDIN circuits are operating at 9600Bps and the remaining circuits at 50 Bps to 300 Bps, using asynchronous protocols.

2.3 The detail of international circuits operating within the Region and between neighboring regions. is documented in Table CNS 1A of the ICAO MID CNS Facilities and Services Implementation Document (FASID).

2.4 The current AFTN topology in the Region shows that the majority of circuits will not be suitable to be used for the ATN without some form of upgrade. In later stage, it will be necessary to identify those circuits that need to be upgraded in both bandwidth and protocols.

2.5 With regard to bandwidth requirements, it is assumed that 64Kbps or higher shall

be used for Intra-regional connections while 64Kbps (based on agreement with other regions) or higher speed could be preferred for Inter-Regional connections when full ATN is implemented.

2.6 It is important to note that some States have already started the establishment of a communication infrastructure that would serve the ATN. There have been implementations of high speed point-to-point digital links operating at 64KBPS and carrying voice and data traffic.

2.7 In respect to the upgrade of protocols, it is expected that they will be implemented on a bilateral arrangements between States according to the preferred protocols: preferably TCP/IP V.6. **Frame Relay or Asynchronous Transfer Mode (ATM) or any other protocol that will be included in the ICAO Standards in future.**

2.8 It can happen that due to different planning activities, by States, not all States within the MID Region will be migrating to the ATN at the same time. Therefore, there will be a need to maintain the existing AFTN circuits to operate in parallel with any new implementation of high-speed links to meet ATN requirements and could migrate the AFTN.

3. ATN END SYSTEM APPLICATIONS

3.1 According to the Manual of Technical Provisions for ATN (Doc. 9705- AN/956) and Comprehensive Aeronautical Telecommunication Network (ATN) Manual (Doc 9739-AN/961), it is to be taken into consideration that 9739 will be with drawn also ATSMHS part is obsolete in doc 9705 and Superseded by Doc 9880. There are currently six end system applications. The table below lists these applications and provides a brief summary of their functions:

Applications	Functions
Context Management (CM)	An ATN application that provides a logon service allowing initial aircraft introduction into the ATN and provides also a directory of all other data link applications on the aircraft.
Automatic Dependent Surveillance (ADS)	An ATN application that provides data from the aircraft to the ATS unit(s) for surveillance purpose.
Controller Pilot Data Link Communication (CPDLC)	An ATN application that provides a means of ATC data communication between controlling, receiving or downstream ATS units and the aircraft, using air-ground and ground-ground sub-networks.
Flight Information Service (FIS)	An ATN application that provides to aircraft information and advice those are useful for the safe and efficient conduct of flight.
ATS Message Handling Service (ATSMHS)	A set of computing and communication resources that are implemented by ATS organizations to provide the ATS message service.
ATS Inter-facility Data Communication (AIDC) and On-Line Date Interchange (OLDI)	An ATN application dedicated to exchanges between ATS units of ATC information in support of flight notification, flight coordination, transfer of control, transfer of communication, transfer of surveillance data and transfer of general data. OLDI is seen as a subset of AIDC

4. ATN TRAFFIC

4.1 Ground-Ground Traffic

4.1.1 ATS Message Handling System (AMHS)

4.1.1.1 With the introduction of AMHS as the replacement for AFTN/CIDIN, a number of AFTN circuit links between centers will need to be upgraded to cater for the increase of traffic load generated by AMHS overheads. Analysis carried out in other Regions showed that there will be significant overheads generated by AMHS for a typical message of about 250 bytes. As the message size increases the amount of overheads generated becomes less significant to the size of the body of the message. In transitioning from AFTN/CIDIN to AMHS, States will have to anticipate this increase in bandwidth to accommodate AMHS traffic so as to maintain current or better performance of traffic delivery.

4.1.2 ATS Interfacility Data Communication (AIDC)

4.1.2.1 It is also important to note that there will also be an increase in other forms of data traffic due to implementation of other ATN applications such as the ATS Inter-facility Data Communication (AIDC) application. AIDC will generally be used by Flight Data Processors (FDP) to communicate between each other, which are normally established in each Flight Information Region (FIR). It can therefore be expected that data generated by this application will increase bandwidth requirements on those links that are required to pass this information between FIRs.

4.1.2.2 States will need to ensure that not only are the links that are established between States are capable of transferring data in a timely manner but also for those links that provide an alternate path for the applications to use in times of disruption to the primary links.

4.2 Air-Ground Traffic

4.2.1 With the implementation of the air-ground applications it is important to ensure that transit response times are kept to a minimum level so as not to affect the overall response time that it takes for traffic such as ADS reports and CPDLC messages to be delivered to their final destination. This again reflects the need to ensure that critical ground links within the Region are capable of handling this information efficiently.

4.2.2 Another important factor with air-ground traffic is the generation of routing information that is caused by aircraft that will move between various ATN routing domains. To maintain this information in a defined area requires a minimum number of backbone routers to be implemented which protects the majority of all other ATN routers from being flooded with routing information.

5. ATN ROUTING ARCHITECTURE

5.1 The ATN infrastructure can be divided into two main areas to support both the air-ground and ground-ground applications that will operate over the ATN.

5.2 For air-ground support the ATN needs to support an ATN Routing Backbone network so that routing information about where an aircraft is can be maintained by this backbone. As aircraft move through various coverage media and FIR boundaries the ATN Routing Backbone will be notified of the changing routing data for each mobile aircraft in the region. The type of ATN Routing Backbone architecture for the Middle East Region is documented in the Middle East ATN Routing Architecture Plan (Reference 4 Manual on the ATN using IPS standards and protocols (Doc 9896 AN/469)

5.3 Reference) and is summarized in Figure 5-1 of this document.

5.4 It is anticipated that the trunks used for the ATN Routing Backbone will also be used to carry ground-ground application data such as the AMHS. This of course depends upon the routing policies set up between each router, which determine which links are to be used for the different classes of traffic that can be expected to transverse the network.

5.5

5.6 **Figure 5-1** shows the proposed ATN Routing Backbone for ICAO MID Region.

The ATN Router Backbone tries to use existing trunks that have already been established between the nominated States who will operate the backbone that is currently used for the AFTN. Virtually these trunks will need to be upgraded to cater for the increase in traffic load that will be handled by the ATN. Further details about these trunks are documented in Section 6.

5.7 To improve the resilience and redundancy aspects of the ATN routing backbone, it is proposed that additional trunks be incorporated to ensure minimal disruption to the air-ground applications. This effectively ensures that the Middle East Region can function on its own without support from other regions relaying information on behalf of a failed router or trunk service within the ICAO MID Region. These additional trunks have been shown as dashed lines in Figure 5-1. Also shown are the inter-regional connections between the Middle Region and its neighboring Regions. Additional inter-regional connections are also proposed and are further documented in Section 6.

5.8 It is important to note that costs will may increase due to implementing higher bandwidth links (In some States only high bandwidth are avialable and cost less than the TTY circuits due to new technologies). Therefore the region should review its requirements in having to use point to point circuits every where when a number of strategically placed links may suffice with alternate dial up or IP VPN over secured channels on demand capabilities being deployed between key sites. This may help to offset the costs and still provide for an efficient ground-ground network for the ATN.

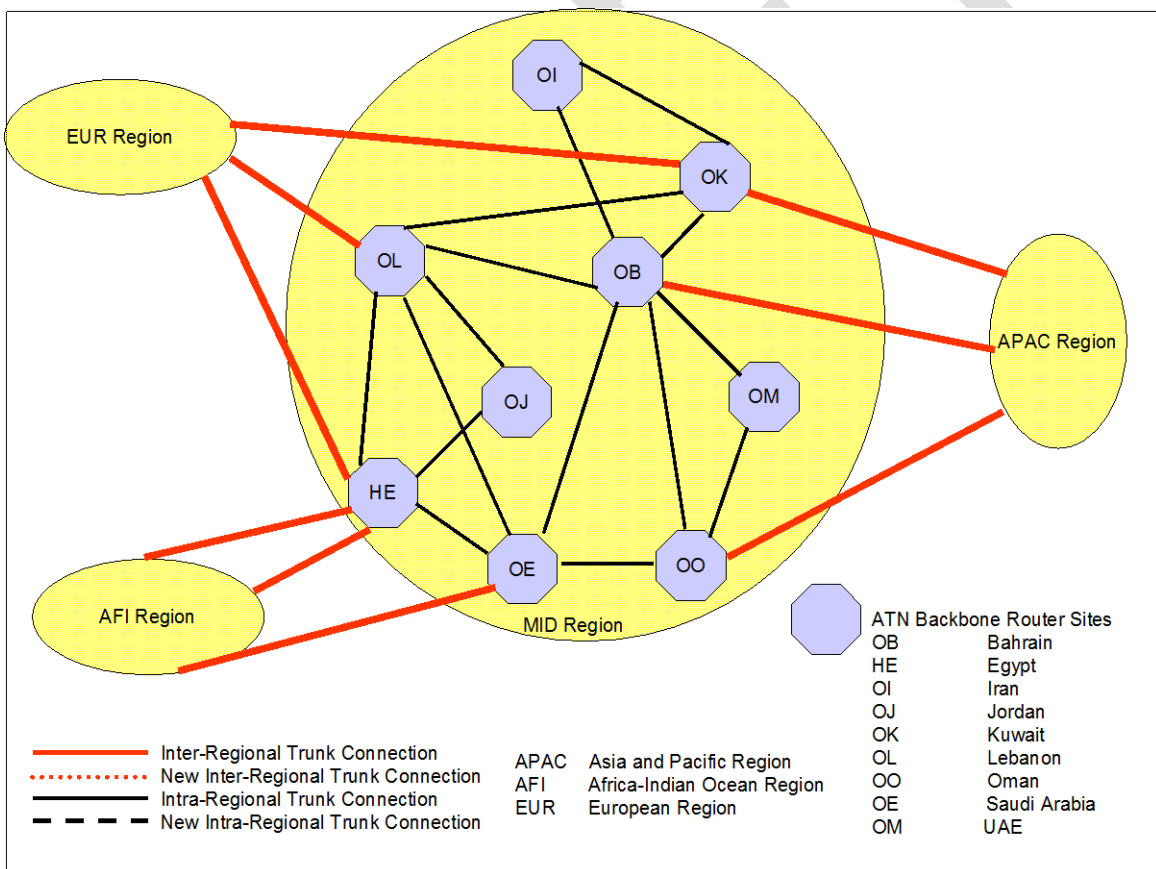


Figure 5-1 MID ATN Backbone Routing Architecture

6. ATN BACKBONE TRUNKS

6.1 Table 6-1 provides a list of existing or proposed upgrading of AFTN/CIDIN circuits that have been selected for the transition to the ATN routing backbone. Also provided in the table are proposed additional new trunks that should be considered to provide the necessary redundancy and backup services for the ATN for the region.

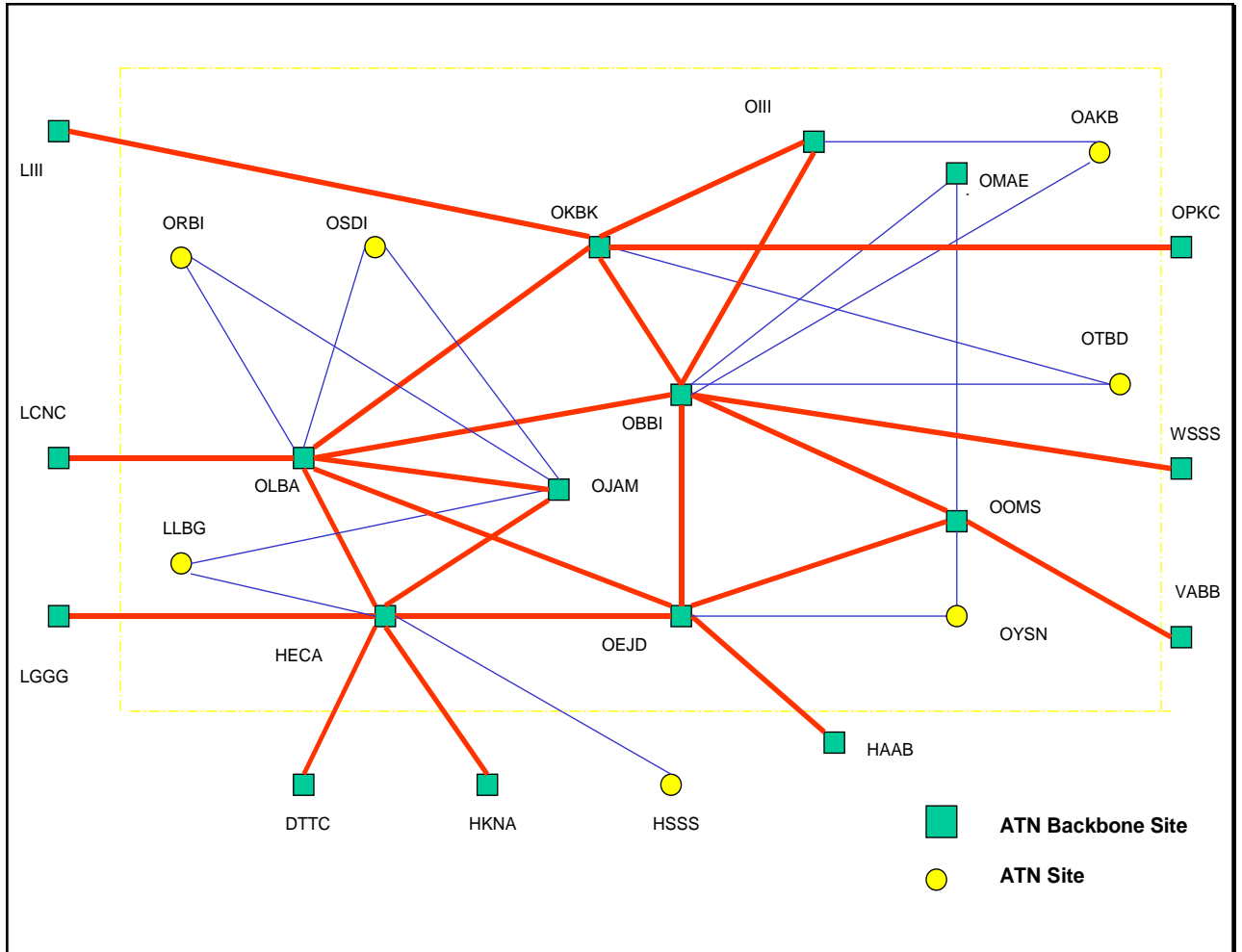
6.2 As part of the transition from AFTN to the ATN, the existing link capacity, especially those using CIDIN Protocol must be able to handle both AFTN and ATN for those States who do not intent to migrate to AMHS straight away. It is assumed that States that have been nominated to provide the ATN backbone routing environment will do so in a timely manner so as to allow those States who are ready to start their implementation programs can do so without too much restriction within the region. Where a nominated State cannot provide the ATN backbone then an alternative arrangement should be put in place for another State, who is willing to provide the service (e.g Jordan UAE IP VPN connection).

Table 6.1 AFTN Circuit Upgrade and Backbone BIS Implementation

Nominated State	ATN Backbone Connection		Target Date Of Implementation		Trunk Type	Comments
	Speed	Protocol	Circuit	BBIS		
Bahrain				2009		
Singapore	19200 bps		2009		Inter-Regional	Upgrade of circuit
Egypt				2009		
Greece	64000bps	TBD	2009		Inter-Regional	Upgrade of circuit
Kenya	19200 bps	TBD	2009		Inter-Regional	Upgrade of circuit
Tunisia	19200 bps	TBD	2009		Inter-Regional	Upgrade of circuit
Kuwait				2009		
Italy (check EUR)	19200 bps	TBD	2009		Inter-Regional	Upgrade of circuit
Pakistan (check ASIA/PAC)	64000bps	TBD	2009		Inter-Regional	Upgrade of circuit
Lebanon				2009		
Cyprus	64000bps	TBD	2009		Inter-Regional	Upgrade of circuit
Oman				2009		
Mumbai	64000bps	X.25	2009		Inter-Regional	Upgrade of circuit
Saudi Arabia				2009		
Ethiopia	64000bps	xxxx			Inter-Regional	Circuit is upgraded

7. INTERCONNECTION OF ATN ROUTERS

7.1 This section describes the interconnection requirements for ATN routers for the Middle East Region. Table 7-1 shows a pictorial view of the interconnection between various States in the Region.



Libya to be added as ATN site (HECA – HLLL)

Figure 7-1 MID ATN Router Interconnection
 (This needs to be updated based on the proposed additional intra-regional trunk)

7.2 It is proposed that all existing AFTN circuits are upgraded as soon as practicable to CIDIN or other modern protocols that are compatible with the ATN Lower Layers. In doing so, these links would be sized to cater for both AFTN and ATN. This would allow the region to set-up a sub-network that could support current operational requirements for AFTN and to allow trials and operation services of the ATN to be implemented at minimal cost to the region.

7.3 Further details have been provided in Table 7-1, which lists all international connections between countries and their proposed bandwidth requirements and implementation dates.

MID Region BIS Routing Interconnections

Backbone State	ATN Interconnection		Target Date Of Implementation		Connection Type	Comments
	Speed	Protocol	Circuit	BIS		
Bahrain				2010		
Abu Dhabi	64Kbps	TBD	2003	2010	Intra-Regional	Circuit upgraded
Beirut	9600bps	TBD	2000	2010	Intra-Regional	Circuit upgraded
Doha	64Kbps	TBD	2003	2010	Intra-Regional	Circuit upgraded
Jeddah	64Kbps	TBD	2004	2010	Intra-Regional	Circuit upgraded
Kabul	9600bps	TBD	2005	2010	Intra-Regional	Upgrade of circuit required Upgrade of BIS required
Kuwait	64Kbps	TBD	2004	2010	Intra-Regional	Circuit upgraded
Muscat	9600bps	TBD	2005	2010	Intra-Regional	Upgrade of circuit required Upgrade of BIS required
Tehran	9600bps	TBD	2005	2010	Intra-Regional	Upgrade of circuit required Upgrade of BIS required
Egypt				2007		
Amman	64Kbps	TBD	2005	2007	Intra-Regional	Egypte to update
Ben Gurion	9600bps	TBD	2005	2007	Intra-Regional	Upgrade of circuit required
Beirut	9600bps	TBD	2000	2007	Intra-Regional	Circuit upgraded
Jeddah	9600bps	TBD	2003	2007	Intra-Regional	Circuit upgraded
Iran				2007		
Bahrain	9600bps	TBD	2004	2007	Intra-Regional	Upgrade of circuit required
Kuwait	9600bps	TBD	2005	2007	Intra-Regional	Circuit upgraded
Jordan						
Baghdad	9600bps	TBD	2005	2007	Intra-Regional	Upgrade of circuit required
Ben Gurion	9600bps	TBD	2003	2007	Intra-Regional	Circuit upgraded
Beirut	9600bps	TBD	2005	2007	Intra-Regional	Upgrade of circuit required
Cairo	9600bps	TBD	2005	2007	Intra-Regional	Upgrade of circuit required
Damascus	9600bps	TBD	2005	2007	Intra-Regional	Upgrade of circuit required
Kuwait				2007		
Baghdad	9600bps	TBD	2005	2007	Intra-Regional	Upgrade of circuit required
Bahrain	64Kbps	TBD	2005	2007	Intra-Regional	Circuit upgraded
Beirut	9600bps	TBD	2005	2007	Intra-Regional	Upgrade of circuit required
Tehran	9600bps	TBD	2005	2007	Intra-Regional	Upgrade of circuit required
Lebanon				2007		
Amman	9600bps	TBD	2005	2007	Intra-Regional	Upgrade of circuit required
Baghdad	9600bps	TBD	2005	2007	Intra-Regional	Upgrade of circuit required
Bahrain	9600bps	TBD	2000	2007	Intra-Regional	Circuit upgraded
Cairo	9600bps	TBD	2000	2007	Intra-Regional	Circuit upgraded

Backbone State	ATN Interconnection		Target Date Of Implementation		Connection Type	Comments
	Speed	Protocol	Circuit	BIS		
Damascus	9600bps	TBD	2005	2007	Intra-Regional	Upgrade of circuit required
Kuwait	9600bps	TBD	2005	2007	Intra-Regional	Upgrade of circuit required
Jeddah	9600bps	TBD	2004	2007	Intra-Regional	Upgrade of circuit required
Oman				2007		
Abu Dhabi	9600bps	TBD	2005	2007	Intra-Regional	Upgrade of circuit required
Bahrain	9600bps	TBD	2005	2007	Intra-Regional	Upgrade of circuit required
Jeddah	9600bps	TBD	2005	2007	Intra-Regional	Upgrade of circuit required
Sana'a	9600bps	TBD	2005	2007	Intra-Regional	Upgrade of circuit required
Saudi Arabia				2007		
Bahrain	64Kbps	TBD	2007	2007	Intra-Regional	Circuit upgraded
Beirut	9600bps	TBD	2004	2007	Intra-Regional	Upgrade of circuit required
Cairo	9600bps	TBD	2003	2007	Intra-Regional	Circuit upgraded
Muscat	9600bps	TBD	2005	2007	Intra-Regional	Upgrade of circuit required
Sana'a	9600bps	TBD	2005	2007	Intra-Regional	Upgrade of circuit required
UAE				2007		
Bahrain	9600bps	TBD	2003	2007	Intra-Regional	Circuit upgraded
Muscat	9600bps	TBD	2005	2007	Intra-Regional	Upgrade of circuit required

Table 7 - 1 – MID Region BIS Routing Interconnections

Note: Speed requirements are an indication only and may vary between sites to meet different performance requirements for the type of ATN services and applications that are operating over each link.

8. TRANSITION ACTIVITIES

It is recommended that there will be three phases in the implementation of the ATN infrastructure.

- Phase 1, Upgrade of existing sub network infrastructures to support the Backbone BISs (BBISs);
- Phase 2, Implementation of the ATN Regional BBISs; and
- Phase 3, Implementation of supporting ATN BISs.

8.1 Phase 1

8.1.1 This phase consists of upgrading existing AFTN circuits where possible that will support the introduction of the ATN Backbone BISs. Table 6-1 identifies those circuits that will need to be upgraded in both bandwidth and protocols.

8.1.2 In regards to bandwidth requirements, Table 6-1 proposes a preferred speed that will be required when full ATN is implemented. However, lower speeds may be introduced in the initial implementation phases between some locations by bilateral arrangements between States. States will be expected to monitor the performance of these links and increase bandwidth requirements as traffic load increases.

8.1.3 Where new circuits have been identified these will only need to be introduced on a case-by-case basis as BBISs are implemented.

8.1.4 In respect to the upgrade of protocols between States, it is recommend that any efficient Wide Area Network protocols is implemented in ATN routers such as TCP/IP, Frame Relay and Asynchronous Transfer Mode (ATM). This implementation of these protocols will be done on a bilateral arrangement between States.

8.2 Phase 2

8.2.1 Phase 2 consists of implementing the Backbone BISs (BBISs) that will support the MID Region. The BBISs are important to the success of the ATN implementation program for the region and will need to be reviewed regularly to determine if contingency arrangements should be put in place where nominated States fail to provide the infrastructure in a timely manner.

Note: Implementation of Inter-Regional BBIS connections between MID Region and neighboring regions will also need to be determined and encouraged during this phase.

8.3 Phase 3

8.3.1 Phase 3 is the implementation of all other BISs that will connect to the Backbone BISs.

Further information including initial target dates for the upgrade of the sub-network links and protocols and implementation of the BISs for each State can be found in the table CNS 1B – ATN Router Plan of the FASID. Refinement of the target dates will continue to be updated as States start to develop their implementation programs and can provide feedback to the ICAO MID Regional Office.

CHAPTER TWO

Routing Architecture Plan

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EXECUTIVE SUMMARY

This document provides technical guidance on the Planning and Implementation of the transition to the Aeronautical Telecommunication Network (ATN) for the ground data communications of the ICAO MID Region.

The material presented here is technical in nature. The ATN Transition Plan includes information about the implementation of Regional ATN Routing Architecture as presented in this document.

The routing architecture is based upon the need for a ground-ground infrastructure to eventually replace the existing AFTN/CIDIN infrastructure. For this reason, the routing architecture uses the existing AFTN/CIDIN infrastructure as a guideline for the positioning of ATN equipment.

The routing architecture is designed primarily for the ground-ground environment. It is intended that this architecture will also be suitable as the routing architecture for the introduction of the air-ground communication requirements.

1. INTRODUCTION

This initial plan provides technical guidance on the routing architecture for the Middle East Region.

1.1 Terms used

1.1.1 **Aeronautical Fixed Telecommunication Network (AFTN)**: a low-speed network providing the majority of ground-ground data communication services within the ICAO realm. This term is defined in ICAO Annex 10.

1.1.2 **Boundary Intermediate Systems (BIS)**: a router that supports IDRP and routes PDUs to more than one routing domain. This term is defined in ICAO Doc. 9705-AN/956 and 9739-AN/961.

1.1.3 **Backbone Boundary Intermediate Systems (BBIS)**: a router that primarily routes PDUs between routing domains and does not support End Systems.

Note: This definition is similar to that found in ICAO Doc. 9705 and is meant to be consistent with that definition. This definition is made on the assumption that this version of the routing architecture is limited to the ground-ground infrastructure.

1.1.4 **Common ICAO Data Interchange Network (CIDIN)**: a part of the aeronautical fixed service which uses bit-oriented procedures and packet switching techniques.

1.1.5 **End Boundary Intermediate Systems (EBIS)**: a router that primarily routes PDUs between routing domains and connected End Systems.

1.1.6 **End Systems (ES)**: an ATN system that supports one or more applications and that is a source and/or destination for PDUs.

1.1.7 **Inter Regional Boundary Intermediate Systems (IRBIS)**: a router that routes PDUs between systems (both End Systems and Boundary Intermediate Systems) within the Region with routers outside of the Region. These routers are the entry points into the Region and exit points from the Region for PDUs.

1.1.8 **Network Service Access Point (NSAP) address**: a 20-octet value that uniquely identifies an interface between the Transport Layer and the Network Layer. In the ATN it provides the address of transport entity providing ATN Internet services.

1.2 Acronyms used

AFTN	-	Aeronautical Fixed Telecommunication Network
BIS	-	Boundary Intermediate Systems
BBIS	-	Backbone Boundary Intermediate Systems
CIDIN	-	Common ICAO Data Interchange Network
CLNP	-	Connectionless Network Protocol
EBIS	-	End Boundary Intermediate Systems
ES	-	End System
IDRP	-	Inter-Domain Routing Protocol
IS	-	Intermediate System
PDU	-	Protocol Data Unit

2. ROUTING DOMAIN FUNDZAMENTALS

The ATN consists of a set of End-Systems (ESs) and a set of Intermediate Systems (ISs). ESs are the source and destination of all data and are where the applications reside. ISs are better known as routers and relay PDUs from one system to another.

The ISs and ESs are organized into *Routing Domains*. Routing Domains are used to define sets of systems (that typically operate together) into clusters. These clusters have two major properties:

- they are controlled by a single organization, and
- a significant amount of the traffic is internal to the cluster.

The single most important characteristic is that they are controlled by a single organization. This characteristic is manifested in technical terms by mutual trust between all routers in a routing domain. Routing protocols are based on the fact that the information exchanged between *intra*-domain routers can be trusted. No special reliability or trust is required to accept information about advertised routes.

The second characteristic, most traffic is internal to a routing domain, is more an artifact of proper network engineering. Routing domains are established through the NSAP addressing conventions established for the ATN in Doc. 9705, Sub-Volume 5. All systems with NSAP addresses defined with the same address prefix are by definition in the same routing domain.

2.1 Intra-Domain Routing

2.1.1 Intra-domain routing is the routing of PDUs from the source to destination where both are in the same domain. Intra-domain routing implies one or more ISs capable of routing PDUs across the domain. Examples of intra-domain routing would be CLNP-capable routers exchanging PDUs between two Local Area Networks.

2.1.2 Since the ATN is specified across State boundaries, there are no SARPs developed for intra-domain routing. The choice and configuration of internal routers is a local matter.

2.2 Inter-Domain Routing

2.2.1 The central definition of routing in the ATN is concerned with inter-domain routing. This is a particularly difficult problem since by the very nature of inter-domain routing; the information received cannot be fully trusted.

2.2.2 Inter-domain routing is based upon the mutual distrust of the received routing information. First, reliability mechanisms must be built-in to ensure the reliable transfer of the information. Second, the received information must be filtered to ensure that it meets the suitability constraints of the received system (in other words, can it be believed).

2.2.3 After receiving the routing information, the inter-domain router must build routing tables based upon its internal policy about routing its data.

2.3 Types of Routing Domains

2.3.1 There are two basic types of routing domains: end routing domains, and transit routing domains. An end routing domain routes PDUs to and from end-systems within its routing domain. Figure 1 shows an end routing domain.

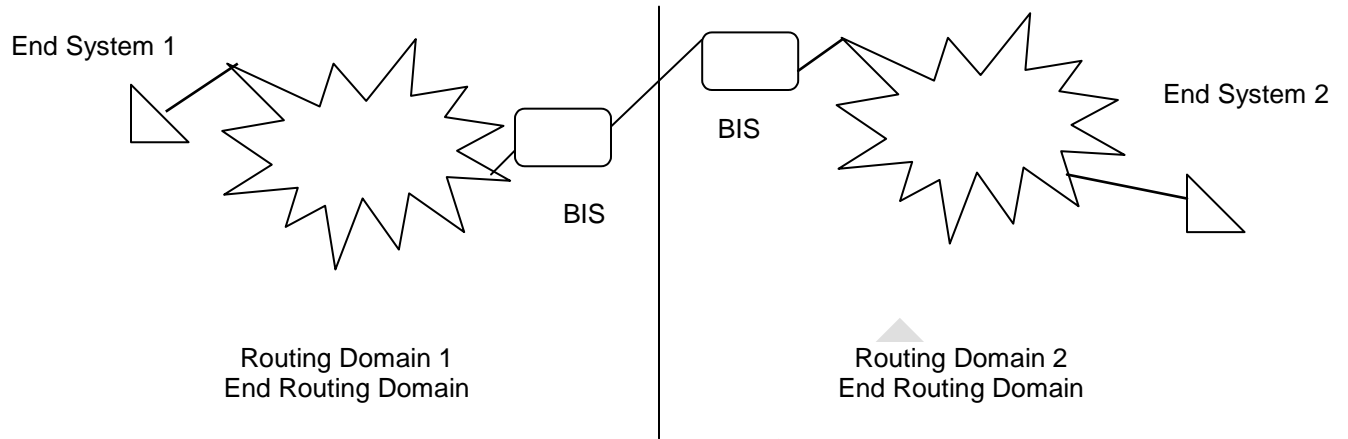


Figure 1 – End Routing Domains

A transit routing domain routes PDUs between two or more routing domains, and may as an option also act as an end routing domain. An example of a transit domain is where a set of backbone routers is configured in their own routing domain with all of the end systems in end routing domains attached to the backbone.

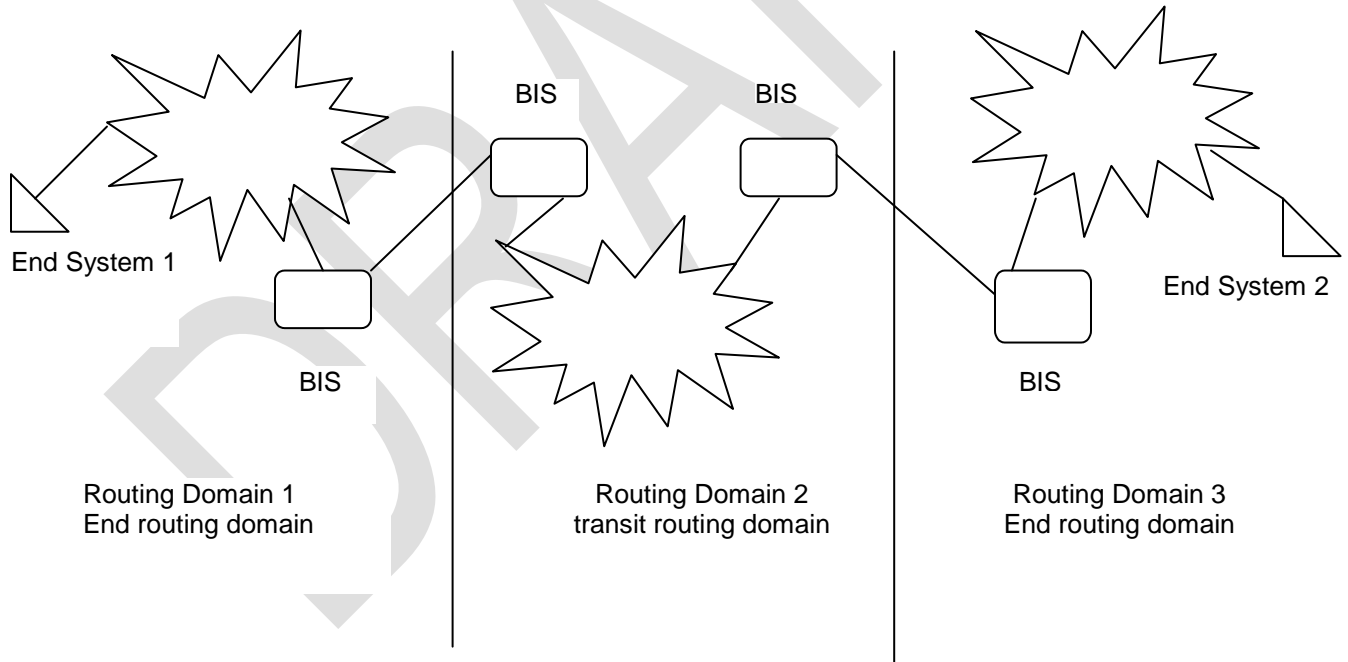


Figure 2 – Transit Routing Domains

Note: A transit routing domain may or may not be part of the backbone. A transit routing domain may consist of BISs none of which are backbone routers.

2.4 Routing Domain Construction

2.4.1 Based on the above, a routing domain consists of at least one inter-domain router.

Note: There must be at least one BIS. There is no requirement for any other equipment. Routing domains are elements of the physical structure of the ATN.

3. ROUTER FUNDAMENTALS

All routers discussed within this document are ICAO Doc. 9705 and 9739 compliant Boundary Intermediate Systems (BISs).

NOTE: INDIVIDUAL STATES MAY ELECT TO USE OTHER ROUTERS THAT DO NOT COMPLY WITH THE ATN IDRP REQUIREMENTS AS FOUND IN ICAO DOC. 9705 WITHIN THE LIMITS OF THEIR OWN STATES. THESE ROUTER ARE INTERNAL STATE ISSUES AND OUTSIDE THE SCOPE OF THIS DOCUMENT.

3.1 Boundary Intermediate System Overview

3.1.1 Boundary Intermediate Systems comprise the interfaces between networks, and in particular, between different routing domains. The term “Boundary Intermediate System” can often be replaced with the more common term “router”.

3.1.2 An important consideration in developing the routing architecture is the different roles that routers take within the ATN environment.

3.2 Router Types

There will be two primary types of BISs employed within the Region:

- Backbone BISs (BBISs), and
- End BISs (EBISs).

Note: A third type of BIS is supported within this routing architecture but since its use is subject primarily to bi-lateral agreements between States and Organizations, it is not fully described here. This third type of BIS is non-BBIS that acts as a transit router between two RDs but is not part of the Regional backbone.

3.2.1 Backbone BISs

3.2.1.1 A BBIS is a router that primarily routes PDUs between routing domains. These routers are typically higher performance routers that aid in the efficient flow of data between domains. BBISs may have End-Systems connected to them, but often are limited to only router-to-router connections.

3.2.1.2 Within the context of the MID Region, BBISs can be further subdivided into Regional BBISs, and Inter-Regional BBISs. Regional BBISs are backbone routers that only connect to routers within the Region. Inter-regional Backbone BBISs are those backbone routers that connect to BBISs in other Regions.

Note: A single, high-performance router may act as both a Regional BBIS and an Inter-Regional BBIS based upon meeting the requirements for performance and reliability.

Note: For completeness of the routing architecture, it must be mentioned that the routers out-side of the Region to which Inter-Regional Backbone BISs attach are, in fact, Inter-Regional Backbone BISs in the other Region.

Note: The interconnections of backbone BISs typically require higher capacity communication lines based on the consolidation of traffic through those backbone routers. Even though the architecture takes into account existing AFTN infrastructure facilities, the need to upgrade the communication facilities as traffic through the backbone increases may be necessary.

Note: It is possible for some States to provide transit routing from its routing domain(s) to the routing domains of other States using BISs that are not backbone routers. For the purposes of this routing architecture, it is not possible to distinguish between these transit routing domain routers and BBISs.

3.2.2 END BISs

3.2.2.1 End BISs are connected to one or more BBISs and provide routing services to a single routing domain. Further, End BISs do not act as a transit router for passing PDUs between other routing domains.

4. MID REGION ROUTING ARCHITECTURE

The MID Region routing architecture is based upon several concepts:

1. From a routing domain point of view, the Region can be considered an “autonomous” area, that is, there is a difference between routers located within the Region and outside the Region.
2. Routing domains and confederations of routing domains may be applied to areas within the Region.
3. States will make their own implementation and transition decisions.

The routing architecture can be divided into several distinct parts:

- the definition of the backbone routing structure for passing information between routing domains within the Region;
- the definition of the routing structure between routing domains not on the backbone;
- the definition of the routing structure for use in end-routing domains; and
- the definition of the routing structure for passing information from this Region to other Regions.

The first component is the definition of the backbone routing structure that supports the exchange of data within the Region. This part defines the interconnection of the major communication facilities in the Region and how they cooperate to link all of the systems in the Region.

The second component is the definition of the structure that allows end routing domains to exchange data across the backbone to another end routing domain. This part defines how the end routing domains connect through the backbone.

The third component defines the routing structure that is used within an end routing domain. This part defines how the individual routing domains may be used to pass data.

The fourth part is needed to define how data will be routed between the systems within the Region with those systems outside the Region. More importantly, the structure describes how all-global ATN systems are accessible from systems in the Region.

4.1 MID Region Backbone

4.1.1 Regional Backbone

4.1.1.1 The definition of a Regional Backbone is based upon the efficiencies that may be realized by concentrating ATN traffic at major communication centers and using the economy of scale in passing this information between major communication centers.

4.1.1.2 The rationale for defining Regional Backbone sites is based upon existing major AFTN center sites and on the flow of both AFTN traffic and possible future air-ground ATN traffic.

4.1.1.3 Within the Region there do exist main AFTN communication centers that can be used to simplify the definition of backbone architecture.

4.1.1.4 However, it must be understood that the expected growth in communication traffic over the ATN could quickly exceed the capabilities of the existing communication infrastructure.

Planning for the increased traffic loads will be needed as soon as ATN traffic begins to flow.

4.1.1.5 The architecture and communication requirements define a routing plan that incorporates alternate routing and communication paths so that no single router or communication failure can isolate major parts of the Region.

4.1.1.6 The nine (9) BBIS sites defined in Table 4.1-1 are based on the expected traffic flows. A current AFTN center site identified as a potential backbone router site. This site is listed first and in bold text as follows:

ATN Backbone router site	State
1	BAHRAIN (Bahrain)
2	EGYPT (Cairo)
3	IRAN (Tehran)
4	JORDAN (Amman)
5	KUWAIT (Kuwait)
6	LEBANON (Beirut)
7	OMAN (Muscat)
8	SAUDI ARABIA (Jeddah)
9	UAE (Abu Dhabi)

Table 4.1-1 – Definition of MID Region Backbone Sites

4.1.1.7 At each ATN Backbone router site, there should be at least one BBIS. States committing to operate backbone routers are presented in the table above.

4.1.1.8 Summarizing the information presented above, the MID Region Backbone network will consist of at least one BBIS router at each of the backbone sites identified above. The actual location of the routers will be based upon implementation schedules and the choices of States.

4.1.2 Backbone Router Requirements

The definition of BBIS and the location of these routers may be affected by the requirements for backbone routers. A backbone router must meet several performance and reliability requirements:

- Availability,
- Reliability,
- Capacity, and
- Alternative routing

4.1.2.1 Availability

A backbone router must provide a high-level of availability (24 hours a day, 7 days a week).

4.1.2.2 Reliability

A backbone router must be a very reliable system that may require either redundant hardware or more than one router per site.

4.1.2.3 Capacity

As a communication concentrator site, backbone routers must be capable of supporting significantly more traffic than other ATN routers.

4.1.2.4 Alternative Routing

Based upon the need for continuity of service, backbone routers will require multiple communication links with a minimum of two and preferably three or more other backbone routers to guarantee alternate routing paths in case of link or router failure.

4.1.3 Routing Policies

4.1.3.1 States providing Regional BBISs must be capable of supporting routing policies that allow for Regional transit traffic and for dynamic re-routing of traffic based upon loading or link/router failures.

4.2 Inter-Regional Backbone

The second component of the MID Region Routing Architecture is the definition and potential location of Inter-Regional Backbone Routers. The manner in which this architecture was developed was to ensure that the use of the existing communication infrastructure is possible to the greatest degree. The use of the existing communication infrastructure should reduce the overall cost of transitioning to the ATN.

As already indicated, the Inter-Regional BBISs provide communication from routers within the MID Region to routers in other regions. These Inter-Regional BBISs provide vital communications across regions and therefore need to have redundant communication paths and high availability. (Note: This can be accomplished through multiple routers at different locations.)

Based upon the current AFTN circuit environment, the following States have been identified as potential sites for Inter-Regional BBISs. The States currently have circuits with States outside of the MID Region are found in Table 4.2-1 below.

State	Neighboring Region	Current circuit
Bahrain	Asia-Pac	upgraded
Egypt	Africa Europe	To be upgraded Circuit upgraded
Kuwait	Asia-Pac Europe	to be upgraded No updated information
Lebanon	Europe	Circuit upgraded
Oman	Asia-Pac	No updated information
Saudi Arabia	Africa	Asmara Circuit upgraded Adis ababa upgraded

Table 4.2-1 Table of Circuits with other ICAO Regions

For the transition to the ATN, connectivity to the other Regions should be a priority. This is especially important as other Regions begin the transition to the ATN and begin deploying ATN BISSs.

4.2.1 Long Term Implementation

4.2.1.1 The transition to a fully implemented ATN requires that connectivity amongst the IACO Regions be robust. That is, there is the need to ensure alternate paths and reliable communication. Table 4.2-1 presents a minimal Inter-Regional Backbone that provides a minimum of 2 circuits to other ICAO Regions that communicate directly with the MID Region. For the long-term implementation of ATN, it would be advisable to have 3 circuits to each Region. The addition of circuits to Africa should be considered.

Note: Information is needed on States Plan in implementing ATN.

4.2.2 Initial Implementation

4.2.2.1 The initial implementation of the ATN, outside of the MID Region, will most likely be in ASIA/PAC and Europe. Therefore, initial transition planning may focus on those locations.
 Note: Information is needed on States Plan in implementing ATN.

4.2.2.2 For connecting to other Regions, there should be a minimum of two (2) Inter-Regional BBISs. The location of these Inter-Regional BBISs may be located at the centers where the AFTN/CIDIN centers already exist.

Note: The locations presented above are examples of possible router sites. The selection of actual locations will be based on implementation schedules and circuit availabilities.

Note: For additional reliability, a third Inter-Regional BBIS would be preferred.

4.2.2.3 For connecting to Africa, an Inter-Regional BBISs may be located at the location of the existing AFTN centers: Cairo or Jeddah. However, this router would not be needed until such time as ATN traffic is destined for that Region and the location of the router would be determined at that time.

Note: Future work is still required for the definition of policy descriptions for the backbone architecture.

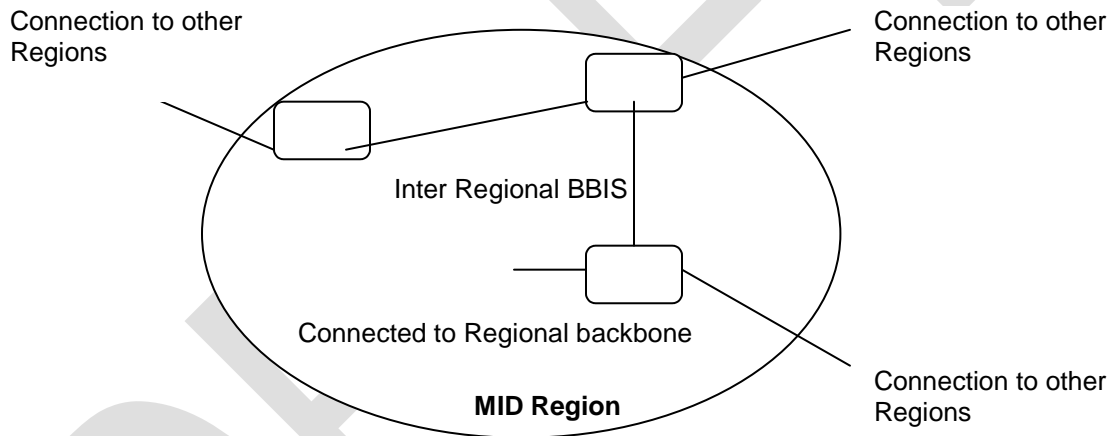


Figure 3 – Inter-Regional Backbone Routers

4.2.3 Transition Issues

4.2.3.1 The transition issues relating to the regional routing architecture is described in the ATN Transition Plan.

4.3 End BISs

4.3.1 It is assumed that naming and addressing (and routing domain definition) will be done on a Regional basis. Further, that for areas within the Region that may utilize an End BIS serving more than one State, the naming structure will be based on the Regional NSAP format defined in Doc. 9880 9705. Further, States may choose to either implement the Regional (or Sub-Regional) NSAP format or the State NSAP format based on whether it installs a BIS.

5. ROUTING DOMAINS

5.1 Each State is expected to have one or more routing domains. Where a State

chooses not to implement an ATN BIS, it may choose to incorporate its systems into a routing domain of another State.

5.2 The MID Regional ATN Backbone will consist of routers from the selected States. Each of these routers will be part of its State's routing domain.

Note: This means that the backbone will not be configured with its own routing domain. Routing to the backbone and between backbone routers will be controlled through IDRP routing policies.

5.3 Each State will be responsible for the designation of routing policies for its End Systems and End BISs. Individual States will also be responsible for establishing routing policies for routing to its designated BBIS.

The use of routing confederations is for further study.

6. ATN TRANSITION

Based upon the previous sections, the implementation of the ATN within the MID Region may require considerable planning for the transition of the AFTN/CIDIN.

6.1 Initial Regional Implementations

6.1.1 The very beginning of ATN implementation will be bilateral testing between States. for this scenario, each State will need at a minimum:

- an ATN router,
- a means for managing the router,
- an ATN application, and
- a circuit connecting the States.

6.1.2 States involved in bilateral ATN trials should consider the use of the trial infrastructure in expanding the ATN throughout the Region.

6.1.3 The below should provide the creterias required for testing:

Rashid and Mahmood Ramadan to provide the full testing creteria.
Mohamed Ali to provide the OLDI testing creteria

6.2 Regional ATN Implementation

6.2.1 At a certain time, sufficient bilateral trials will be underway to permit a Region-wide ATN network based upon the plan presented above. As each State implements the ATN applications and network infrastructure, it will be added to the Regional infrastructure according to this plan.

CHAPTER THREE

AMHS

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Executive Summary

This document provides technical guidance on the naming convention for the transition of ground Aeronautical Fixed Telecommunication Network (AFTN) services to the ATS Message Handling System (AMHS) within the MID region.

Based upon the ATN SARPs as published in ICAO Annex 10 and ICAO Doc. 9880, Manual of technical provisions for the ATN (Doc 9705) ATSMHS part is obsolete Superseded by Doc 9880, the Regions are advised to develop naming and addressing plans. These Regional Plans may be used to guide States in the assignment and registration of addresses and names to be used for the Aeronautical Telecommunication Network (ATN).

An extract of the AMHS Register from the main ICAO register for the MID States is provided in this part for planning and implementation

This document presents the draft from other region which the IPS Working Group shall update.

1. Introduction

This document presents the naming assignment conventions for allocating Originator/Recipient (O/R) names to be used for the ATS Message Handling System (AMHS) in the MID Region.

The information contained in this document is drawn from a number of developments and will be continued to be updated by the IPS Working group members

1.1 Objectives

The objective of the document is to provide guidance in the naming convention to be used for the AMHS in the MID Region.

1.2 Scope

The scope of the document includes:

- Describing the attributes of the AMHS address format, and
- Recommending the values for the relevant attributes that are to be used in the AMHS address.

The MID Regional ATN AMHS naming convention presented here will comply with the relevant formats as specified in ICAO Doc. 9705 (Reference 1). The MID Regional ATN AMHS Naming Plan defines the method for assigning values to each of the relevant attributes of the AMHS address. States within the Region may choose to assign their AMHS addresses based upon the recommendations found here.

1.3 References

Reference 1 Manual of Technical Provisions for the ATN (Doc 9880 9705-AN/956) First Edition 1998.

Reference 2 ICAO Location Indicators – Document 7910/94

1.4 Abbreviations

The following abbreviations are used in this document:

ADMD	Administration Management Domain
AFTN	Aeronautical Fixed Telecommunication Network
AMHS	ATS Message Handling System
MIDANPIRG	Middle East Air Navigation Planning and Implementation Regional Group
ATN	Aeronautical Telecommunication Network
ATNTTF	ICAO ATN Transition Task Force
ATS	Air Traffic Service
ATSO	Air Traffic Service Organizations
ICAO	International Civil Aviation Organization
ITU-T	International Telecommunication Union Telecommunication Standardization Sector
MHS	Message Handling Service
MTA	Message Transfer Agent
O/R	Originator/Recipient
PRMD	Private Management Domain
SARP	Standards and Recommended Practices

2. AMHS NAMING CONVENTION

To ensure continuity and compatibility with other AMHS naming conventions developed by other regions, it is proposed that the MID Region's AMHS naming convention should be based upon coordination using the Europe ATS message Management Center AMC as recommended by the ICAO State letter AN 7/49.1-09/34, .

2.1 MF-Addressing Format

ICAO Document 9705 (Reference 1) states that the AMHS shall be composed of AMHS Management Domains. These AMHS Management Domains may elect to operate as either an Administration Management Domain (ADMD) or a Private Management domain (PRMD), depending on the national telecommunications regulation in force in the country where it operates and on its relationships with other Management Domains. Each AMHS user within an AMHS Management Domain is assigned an Originator/Recipient (O/R) name, which is also referred to as a MF-address. The attributes of a MF-address are described in the table below.

Table 2.1-1 MF-Address Attributes

Attribute	Notation	Comment
Country-name	C	
AFMD	A	
PRMD	P	
Organization-name	O	
Organizational Unit name	OUN	n = 1 -4
Common name		
Personal name	S G I GQ	Surname Given name Initials Generation Qualifier
Domain-defined-attributes	DDA	(DDA type) = (DDA Value), up to 4 attributes

It is recommended that States who are about to start their AMHS implementation programs should use the MF-Address format structure.

¹ SPACE (Study and Planning of AMHS Communications in Europe) is a project supported by the European Commission and is the combined efforts of the participating countries and organizations from EUROCONTROL, France, Germany, Spain and the United Kingdom.

2.2 XF-Addressing Scheme

In addition to the MF-address, the ATN SARPs have defined an XF-address format. ICAO Document 9705 (Reference 1) stipulates that the XF-address of a direct or indirect AMHS user shall be composed exclusively of the following:

2.2.1 An AMHS Management Domain,

- 2.2.2 An organization-name attribute set to the 4-character value "AFTN" and encoded as a Printable String,
- 2.2.3 An organizational-unit-names attribute, which comprises the 8-character alphabetical value of the AFTN address indicator of the user, encoded as a Printable String.

It is recommended that States who have already started implementing the XF-Address format can do so but should consider migrating to the MF-Address format as soon as is practical.

2.3 Naming Convention For MF-Address Format

At the third ATN Panel meeting it was recommended that ICAO register with the ITU-T the ADMD name "ICAO" as an international ADMD under the "XX" country code. It was also recommended that ICAO establishes and maintains a register of PRMDs allocated by air traffic service providers according to the "XX" + "ICAO" address structure. The management of this register would be established and maintained in the same way as the Location Indicators (Doc 7910) and Designators for Aircraft Operating Agencies, Aeronautical Authorities and Services (Doc 8585).

The Air Navigation Commission on the 1st of June 2000 approved these recommendations. It is therefore recommended that the MID region accept the format for the allocation of the first two attributes used in the O/R name.

It has been proposed in the ATN Panel working groups that a common naming convention be used worldwide to help stream line the addressing scheme and to ensure compatibility and consistency with other neighboring regions. This scheme would be based on the work that has been ongoing in Europe. It was also stressed that if States have not already started their implementation programs for AMHS that when planning to do so that they should adopt the MF-Address format over the XF-Address format.

It is therefore recommended for the MID region to adopt the proposed worldwide MF-Address format, which uses the following attributes to define the O/R name during the transition phase from AFTN to AMHS:

1. Country-name;
2. ADMD;
3. PRMD;
4. Organization-name;
5. Organizational-unit-name 1; and
6. Common Name.

2.3.1 Country Name

The country name is a mandatory requirement and shall consist of the two alphanumeric ISO 3166 Country Code "XX" encoded as a Printable String. ICAO has been requested by the ATN Panel to use the country code "XX" as this is a special code registered by the ITU-T for the purpose of allocation to international organizations, which do not reside within any particular country.

2.3.2 ADMD

The administrative domain is a mandatory requirement and shall consist of the Printable String "ICAO". ICAO has registered "ICAO" as the ADMD with the ITU-T. By providing the "ICAO" ADMD will allow the addressing schemes to be independent of any constraints that may be imposed by management domains in the global MHS or national regulations that may vary from region to region.

2.3.3 PRMD

The private management domain is an optional requirement but recommended to be implemented by States in the MID Region as part of the worldwide MF-Address format scheme.

The contents of this field can contain the ICAO Country Indicator specified by ICAO Document 9710 [Reference 2] or the name of the Air Traffic Service Organization (ATSO) that has been registered with ICAO. Where an ATSO has not yet assigned their PRMD then a default value will be allocated, which will use either one, two or three letters of the ICAO Country Indicator specified in ICAO Document 9710 [Reference 2]. This has been chosen for its simplistic and non-ambiguous format, which is already managed by ICAO. Hence providing an easier management role for ICAO who will be responsible for maintaining the register of all PRMDs allocated under the ADMD of "ICAO".

2.3.4 Organization Name

The organization name is used for defining the local or national geographical routing information. This information is to be assigned by the ATSO and for example can be based on the ICAO location indicator as specified in ICAO Document 9710 or some other value determined by an ATSO and published with ICAO. Figure 2.3.4-1 provides a pictorial view of how the organization name can be used in relation with the lower attribute structure.

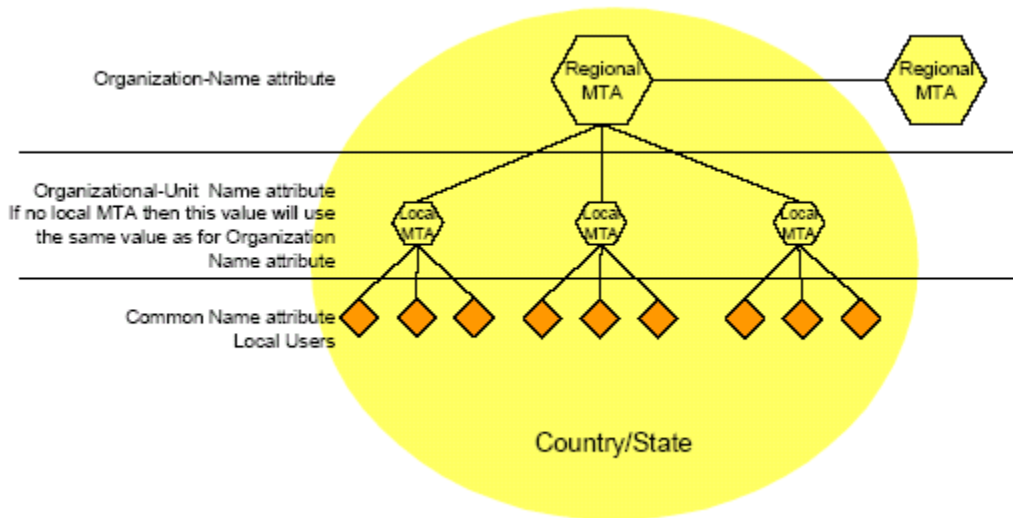


Figure 2.3.4-1 Lower Attribute Structure

2.3.5 Organizational Unit Name OU1

Each State or organization is allocated a unique ATS message organizational name. As all States are familiar with the ICAO four character location indicator defined in ICAO document 7910 (Reference 2), it is proposed that the organization unit name 1 use the location indicator to identify the Message Transfer Agent (MTA) site, encoded as a Printable String.

Note: The MTA site may be the MTA name of the server. However there are security issues that need to be addressed to ensure that this arrangement does not cause any unnecessary concerns with service providers that allow the MTA name to be broadcast in this fashion.

2.3.6 Common Name

It is proposed that during the AFTN transition to AMHS that the common name attribute be used to contain the 8-character alphabetical value of the AFTN address indicator of the user, encoded as a Printable String.

Possible example of an O/R address is shown in Table 2.3.6-1.

Table 2.3.6-1 Example of a MF-Address AMHS Naming Convention

Attribute	Assign By	Value	Comment
Country-name (C)	ITU-T	XX	International Organization
ADMD (A)	ICAO	ICAO	ICAO Responsibility to register
PRMD (P)	ATSO		ATSO registered private domain
Organization name (O)	ATSO		Local/national geographical information, which can be based on ICAO Location Indicators (Doc 7910)
Organizational-Unit name (OU1)	ATSO		ICAO Location Indicator (Doc 7910)
Common Name (CN)	ATSO		AFTN indicator address

MID Region AMHS addresses

State	AMHS Address Specification							
	State Name	Nationality Letters or Designator	Country-name attribute	ADMD-name attribute	PRMD-name attribute	Addressing scheme	ATN Directory naming context	Organization-name (for CAAS only) single value or reference to the CAAS Table	Comments
Bahrain	OB	XX	ICAO	OB	CAAS		see Table OB	confirmed by SL
Egypt	HE	XX	ICAO	HE	CAAS		HECA	confirmed by SL
Iran (Islamic Republic of)	OI	XX	ICAO	OI	XF			confirmed by SL
Iraq	OR	XX	ICAO	OR	XF			
Israel	LL	XX	ICAO	LL	XF			

Jordan	OJ	XX	ICAO	OJ	CAAS		OJAC	confirmed by SL
Kuwait	OK	XX	ICAO	OK	XF			
Lebanon	OL	XX	ICAO	OL	XF			
Oman	OO	XX	ICAO	OO	XF			
Qatar	OT	XX	ICAO	OT	XF			
Saudi Arabia	OE	XX	ICAO	OE	XF			confirmed by SL
Syrian Arab Republic	OS	XX	ICAO	OS	XF			
UAE	OM	XX	ICAO	OM	XF			confirmed by SL
Yemen	OY	XX	ICAO	OY	XF			

2.4.5 Organizational Unit Name OU1

The organizational unit name 1 attribute is used to contain the 8-character alphabetical value of the AFTN address indicator of the user, encoded as a Printable String.

Possible example of an O/R address is shown in Table 2.4-1.

Table 2.4.5-1 Example of a XF-Address AMHS Naming Convention

Attribute	Assigned By	Value	Comment
Country-name (C)	ITU-T	XX	International Organization
ADMD (P)	ICAO	ICAO	ICAO Responsibility to register
PRMD (P)	ATSO	e.g. Australia	ICAO Country Indicator or ATSO registered private domain with ICAO.
Organization-name	ATSO	AFTN	AFTN name
Organization-Unit Name (OUI)	ATSO	e.g. YBBBYFYX	AFTN indicator address

2.5 General Use of X.400 O/R Addresses

Note: The address format of X.400 O/R address attributes for sending general nonoperational AMHS traffic is a local matter for States to implement if they wish to do so and no further advice is given in this plan.

3. Conclusions

The MID Region ATN AMHS Naming Plan aligns itself with the global AMHS naming scheme as proposed by the ATN Panel working groups. Also to maintain compatibility with in the region it is proposed that the MF-Address format should be adopted where a State has not yet started its

AMHS implementation program. This will ensure compatibility with the proposed global AMHS naming scheme.

4. MID AHMS Implementation

Com Center	Installation	Operation	MTA Name	AFTN /AMHS Gateway	ATS Message UA	ATS service level	Protocol (IPS, ATN)	Remarks
Bahrain		-	MTA-OB-1	Y	Y	Extended	Dual Stack	Support IPv4 only
Egypt	2008	-	MTA-HE-1	Y	N	Extended	Dual Stack	Support IPv4 only
Iran	-	-	-	-	-	-	-	-
Iraq	-	-	-	-	-	-	-	-
Israel	-	-	-	-	-	-	-	-
Jordan	2008	2010	MTA-OJ-1	Y	Y	Extended	Dual Stack	Support IPv4 only
Kuwait		-	MTA-OK-1	Y	Y	Extended		Support IPv4 only
Lebanon	-	-	-	-	-	-	-	-
Oman	2008	2009	MTA-OO-1	Y	Y	Extended		Support IPv4 only
Qatar		-	MTA-OT-1	Y	Y			Support IPv4 only
Saudi	2008	-	MTA-OE-1	Y	Y	Extended	Dual Stack	Support IPv4 only
Syria	-	-	-	-	-	-	-	-
UAE	2006	2009	MTA-OM-1	Y	Y	Basic		Support IPv4 only
Yemen	-	-	-	-	-	-	-	-

The MID Region shall use the Europe EUR AMHS Manual EUR Doc 020 and all its Appendices for the implementation of AMHS

CHAPTER FOUR

NSAP Addressing Plan

1. NSAP Addressing Plan

Introduction

The MID Regional ATN Addressing Plan provides guidance to the States within the Region in assigning NSAP addresses to their ATN systems. The Plan addresses the need for consistency within the Region for address assignment.

To find a suitable ATN addressing convention that would be acceptable for use in the MID region requires a routing architecture that minimizes routing updates and overheads within the ground ATN infrastructure for both ground-ground and air-ground services and applications.

The ATN addressing convention must allow for an addressing scheme that is:

- Practical - to provide autonomous administration of ATN addresses for States and Organizations, and
- Flexible - to allow for future expansion and/or routing re-configuration of the ground ATN infrastructure with minimal re-assigning of ATN addresses.

The recommendations proposed in the MID Regional ATN Addressing Plan take advantage of the work performed by the European ACCESS1 Project (Reference 3).

1 ACCESS (ATN Compliant Communications European Strategy Study) is a project funded by the European Commission and jointly produced by the following companies and administrations: National Air Traffic Services (NATS), Deutsche Flugsicherung (DFS) and Service Technique de la Navigation Aérienne (STNA).

2. NSAP Address Format

The NSAP address format is defined in ICAO Doc. 9705 (Reference 1), Sub-Volume 5. The format is based upon the requirements specified in the base standard (ISO/IEC 8348) and incorporates the specific ATN requirements for addressing both ground and mobile systems.

The structure of the Network Service Access Point (NSAP) address is depicted in Figure 5.

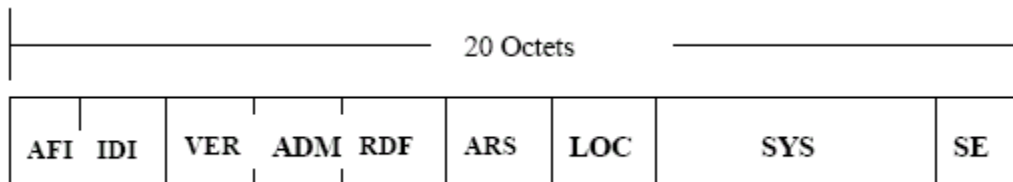


Figure 5 NSAP Address Format

The NSAP address structure contains 9 fields, which are described in Table 4.2-1.

Field Name	Field Description	Size	Syntax	Number of Characters/Digits	Field Encoding
AFI	Authority and format Identifier	1 Octet	Decimal	2 Digits	BDC
IDI	Initial domain Identifier	2 Octets	Decimal	4 Digits	BCD
VER	Version	1 Octet	Hex	2 Digits	Binary
ADM	Administration Identifier	3 Octets	Alpha or Hex/Alpha	3 Characters 2 Digits/ 2 Characters	IA-5 Binary/ IA-5
RDF	Routing Domain Format	1 Octet	Hex	2 Digits	Binary
ARS	Administration Region Selector	3 Octets	Hex	6 Digits	Binary
LOC	Location	2 Octets	Hex	4 Digits	Binary
SYS	System Identifier	6 Octets	Hex	12 Digits	Binary
SEL	NSAP Selector	1 Octet	Hex	2 Digits	Binary

Table 4.2-1 - Encoding Rules for the ATN NSAP

3 Recommendations For NSAP Address Fields Assignments

3.1 The AFI and IDI Fields

The ATN Internet SARPs (Reference 1) require allocation of the following values:

- Decimal for the AFI field to indicate the type of NSAP being used. This value has been assigned the character sequence "47".
- Decimal for the IDI field to designate ICAO. This value has been assigned the character sequence "0027".

As recommended in Reference 1, ATN NSAP addresses and NETs will be written as the character sequence "470027+" where the "+" is used to separate the Binary Coded Decimal (BCD) fields from subsequent Hexadecimal fields.

Hence the AFI and IDI fields will be set to 470027 for fixed ATSC systems/domains and for mobile ATSC systems/domains.

3.2 The VER Field

The VER field is used to partition the ATN Network Addressing domain into a number of subordinate Addressing Domains.

The values currently specified in Reference 1 for the VER field are summarized in Table 3.2-1.

VER Field Value	Network Addressing Domain	Common NSAP Address Prefix for Domain	Value to be used by States of MID region
[0000 0001]	Fixed AINSC	470027+01	
[0100 0001]	Mobile AINSC	470027+41	
[1000 0001]	Fixed ATSC	470027+81	470027+81 (ATSO Iss and Ess)
[1100 0001]	Mobile ATSC	470027+C1	470027+C1 (General Aviation)

Table 3.2-1 - Defined Values for the VER Field

3.3 The ADM Field

The ADM field is used to further partition the ATN Network Addressing Domain. The field designates a single State or Organization. Depending on what the VER field is set to will determine what values should be used in the ADM field.

When the VER field is set to “81” (Fixed ATSC), the ATN SARPs permits two possible ways for encoding the ADM field.

The first method recommends that the State’s three character alphanumeric ISO country code is used, as defined in ISO 3166. States may choose this method, however it will provide less flexibility than the second method for the addressing of regional entities (e.g. regional RDCs or regional organizations that are not country specific).

The second method that is recommended for use in the MID region is to use the first octet of the field to define the ICAO region. This would permit the reduction of the routing information that would otherwise be generated. It is recommended that the remaining two octets of the field will further identify the country, RDCs and the regional organizations that are not country specific as follows:

- For the identification of a country, it is recommended that States use the ICAO two letter location indicator (Reference 4) instead of the two character alphanumeric ISO 3166 country code. The structure of the ICAO two letter location indicator allows for a more efficient identification of a location. For example, indicators starting with the same letter “V” designate several countries in the same local region (e.g. Thailand, Sri Lanka, India, Cambodia etc.). The second letter will actually define the specific country within this local region (e.g. “VT” for Thailand, “VC” for Sri Lanka etc.). Where a country has several ICAO two letter location indicators allocated to it, the assigning authority of the ADM field will be responsible in determining the preferred location indicator to represent that country. For example, the indicators “VA”, “VI”, “VO”, “VE” are assigned to India and one of these indicators will be selected to represent India. The encoding of the ICAO two letter location indicators will be upper case alphanumeric values.

- For regional organizations that are not country specific, it is recommended to allocate a lower case alphanumeric value so as there will be no conflict with the ICAO two letter location indicators.
- For the addressing of RDCs (e.g. Island RDCs, Backbone RDCs), in particular for those that are not country specific, it is recommended to allocate codes with the most significant bit set to 1 in the second octet. Valid values would be in the hexadecimal range [8000 – FFFF].

ICAO MID Regional group would be the allocation authority of the ADM field.

In summary, the values allocated for the ADM field is indicated in Table 3.3-1.

VER Field Network Addressing Domain	ADM Field Values
Fixed AINSC	Derived from the set of three-character alphanumeric characters representing an IATA airline or an Aeronautical Stakeholder Designator.
Mobile AINSC	Derived from the set of three-character alphanumeric characters representing an IATA airline or an Aeronautical Stakeholder Designator.
Fixed ATSC	<p>To allow for efficient routing information to be exchanged, it is proposed that the ICAO Regional code be used in the first octet of the ADM field followed by the ICAO two-letter location indicator for countries.</p> <p>The Regional codes are shown below. Regional Codes: [1000 0000] Africa [1000 0001] Asia [1000 0010] Caribbean [1000 0011] Europe [1000 0100] Middle East [1000 0101] North America [1000 0110] North Atlantic [1000 0111] Pacific [1000 1000] South America</p> <p>For example Thailand would be represented by the following hexadecimal sequence: 815654. Table 4.3.3-2 provides further examples for a selected number of countries.</p> <p>Where a two letter country code is not applicable, the following rules would apply:</p> <p>ICAO would assign lower case alphanumeric characters using a two letter value to organizations that wish to be based in a particular region. For example, if an organization is to be based in the Pacific region and wanted to be represented by the characters 'sa', this would be represented by the following hexadecimal sequence: 877361</p> <p>ICAO would assign regional codes for RDCs where a country</p>

	code or organization code is not applicable. Values would be assigned with the most significant bit set to 1 in the second octet. For example a RDC established in the Pacific region would be represented by the following hexadecimal sequence: 878100.
Mobile ATSC	As for Fixed ATSC

Table 3.3-1 - Defined Values for the ADM Field

Fixed or Mobile MID ATSC Addressing Domain	Hexadecimal Code of the ADM Field	Comment
Australia	875942	Pacific Region + 'YB'
China	815A42	Asia Region + 'ZB'
India	815649	Asia region + 'VI'
Fiji	874E46	Pacific Region + 'NF'
Japan	81524A	Asia Region + 'RJ'
New Zealand	874E5A	Pacific Region + 'NZ'
Singapore	815753	Asia Region + 'WS'
Thailand	815654	Asia Region + 'VT'
Viet Nam	815656	Asia Region + 'VV'

Table 3.3-2 – Example of Proposed ADM Value Assignment for Selected Asia/Pacific Entities

3.4 The RDF Field

The RDF field is historical and is not used. Therefore the RDF field shall be set to [0000 0000].

3.5 The ARS Field

The ARS field is used to:

- Distinguish Routing Domains operated by the same State or Organization (in Fixed Network Addressing domains); and
- Identify the aircraft on which the addressed system is located (in Mobile Network Addressing Domains).

Each State or Organization identified in the ADM field will be responsible for assigning the values for the ARS field.

In accordance with the SARPs, for a Mobile Network Addressing Domain, the 24-bit ICAO Aircraft Identifier is inserted in the ARS field. However, no specific values have been specified for Fixed Network Addressing Domains.

The ARS field shall be assigned in a manner that simplifies the routing of data and makes provision for any potential lower level organizational units that could, in the future, operate an ATN Routing Domain.

The MID Regional ATN Addressing Plan recommends the ARS field be decomposed into three subfields as shown in Figure 4.3.5-1: Network ID, Network Group ID and Domain ID.

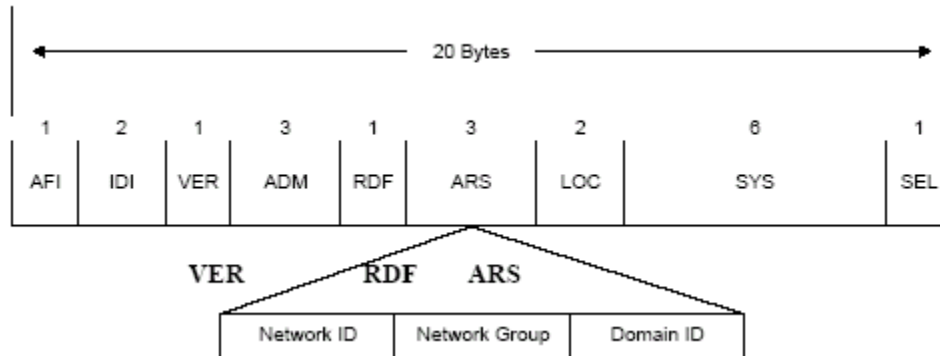


Figure 4.3.5-1 Proposed ARS Field Format

3.5.1 Network ID

Potential future operators of an ATN Routing Domain could be:

- A national Air Traffic Service Organization(s) (ATSO);
- A national military organization;
- A national meteorological organization; and
- An airport operator.

At present it is assumed that military organizations and meteorological organizations will not start up their own ATN Routing Domains and will be located within a national ATSO ATN Routing Domain. The same may apply to airport operators.

However in planning for the long term it is deemed necessary that provision is made available for these future possibilities.

In allowing for this possible expansion, it is recommended that the different ranges of values for the Network ID subfield be allocated to the different national organizations as follows:

- Hexadecimal values [00 – 1F] of the first octet of the ARS field be reserved for the addressing of domains and systems operated by the national ATSO.
- Hexadecimal values [20 – 3F] of the first octet of the ARS field be reserved for the addressing of domains and systems operated by the national military organization.
- Hexadecimal values [40 – 5F] of the first octet of the ARS field be reserved for the addressing of domains and systems operated by the national airport operators. (Note: this range matches the ASCII range of alphabetical upper case characters).
- Hexadecimal values [60 – 7F] of the first octet of the ARS field is reserved for the addressing of domains and systems operated by the national meteorological organization.
- Hexadecimal values [80 – FF] are reserved.

A national organization would then be able to register one or several values for the Network ID subfield within the range that has been reserved for its organization category.

In addition to the Network ID subfield being used for distinguishing the different national organizations, it is proposed that this subfield also be used for the identification of the particular role of the addressed domain. For example, setting the Network ID subfield to the hexadecimal value "01" would represent the set of operational Routing Domains of the national ATSO. Setting

the Network ID subfield to hexadecimal “11” would represent the set of non-operational Routing Domains of the national ATSO. In using the Network ID subfield in this manner, allows national ATSOs to provide for a duplicate non-operational network to be used for trials and pre-operational testing. Similar arrangements could be used for the other national organizations.

3.5.2 Network Group ID

This subfield can be used to subdivide a ground ATN network into smaller groups. This field is unique within a particular network. This may be useful for future expansion by allowing regions to be formed within a particular network as defined by the Network ID. The formation of regions may be useful in helping contain the routing traffic exchanged within the network.

This subfield is also used to designate an RDC. RDCs can also be used to assist in the formation of regions within an Administrative Domain and they offer an additional level of flexibility when used to combine RDs into a confederation. RDCs are designated by setting the uppermost bit of this subfield to “1”.

3.5.3 Domain ID

This subfield is a unique identifier assigned to each Routing Domain in the Network Group.

Table 3.5.3-1 shows possible examples on how the ARS field could be used. In the table two Network Groups “01” and “02” are defined. These two Network Groups can for example represent two FIRs in a country. One of the two Network Group contains two RDs and the other one contains three RDs. These two Network Groups can also address the initial RDs in a country (i.e. two RDs) with a planned expansion towards five RDs.

Network ID	Network Group ID	Domain ID	Comment
01	01	01	Network ID “01” indicates an ATSO operational network that contain two Network Groups “01” and “02”. Network Group “01” contains two RDs “01” and “02”. Network Group “02” contains three RDs “01”, “02” and “03”.
		02	
	02	01	
		02	
		03	

Table 3.5.3-1 – Example of ARS Value Assignment

3.5.4 Addressing RDCs in the ARS field

The Network Group ID subfield is used to segregate the addressing space of actual RDs and RDCs. When the uppermost bit of the Network Group ID subfield is set to “1” the second and third octets of the ARS field are assigned from the RDC addressing space (i.e., 8000-FFFF) and must be unique within that addressing domain. Otherwise, the subfields are assigned from the NSAP Address Space as described above for the Network Group ID and Domain ID subfields.

Similar principles as explained in sections 3.5.2 and 3.5.3 for the addressing of RDs can be applied to the addressing of RDCs, as required:

- The second octet of the ARD field may identify a group of RDCs.
- The third octet of the ARS field identifies RDCs.

3.6 The LOC Field

The LOC field is used to:

- Distinguish Routing Areas within Fixed Routing Domains, identified by the ARS field; and
- Distinguish Routing Areas and Routing domains within aircraft identified by the ARS field.

The assignment of the LOC field value is the responsibility of the State or organization that is the addressing authority for the routing domain in which the identified routing area is contained.

To assist States or organizations, it is recommended that the LOC field be decomposed into two subfields as shown in Figure 3.6-1: Subdomain Group ID and Subdomain ID.

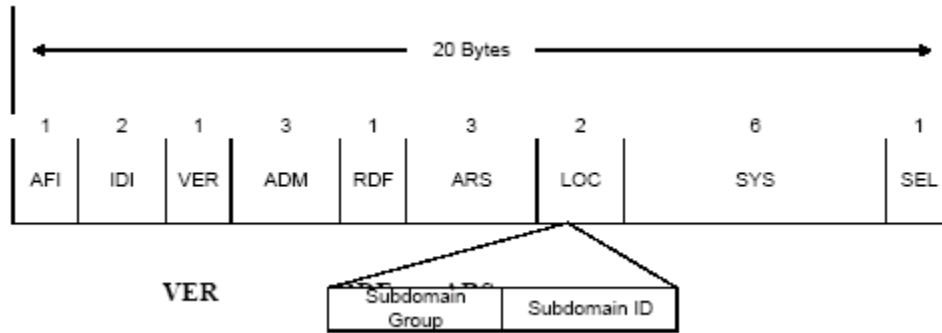


Figure 3.6-1 Proposed LOC Field Format

3.6.1 Subdomain Group ID

This subfield can be used to subdivide a domain into separate groups. For example, each control centre could be defined as a routing domain. A control centre may contain an EnRoute facility, Terminal facilities, and Tower facilities. Each of these facilities can be classified as a different Subdomain Group allowing addressing to be delegated to each facility, if desired. For this example, this subfield can be assigned as shown in the Table 3.6.1-1.

Value (hex)	Description
00	Reserved
01	No specific group. Used for RDs that do not require subdivision
02	EnRoute Subdomain
03 - FF	Assigned as required

Table 3.6.1-1 – Example of Subdomain Group ID Value Assignment

3.6.2 Subdomain ID

This subfield is a unique identifier assigned to each routing area within a Subdomain Group. This subfield allows multiple areas to exist within a subdomain group and must be unique within the subdomain. This subfield could be assigned as shown in the Table 4.3.6.2-1.

Value (hex)	Description
00	Reserved
01	No specific area. Used for Subdomains that do not require subdivision
02 - FF	Assigned as required by the Subdomain Group Addressing Authority

Table 3.6.2-1 – Example of Subdomain ID Value Assignment

3.7 The SYS Field

The SYS field is used to uniquely identify an End-System or Intermediate-System. The allocation of the SYS field value is the responsibility of the organization that is the addressing authority for the routing area that contains the identified ATN End-System or Intermediate-System.

The type of values or structure for the SYS field is for individual authorities to choose, as appropriate.

It has been suggested that the 48-bit LAN address of a device attached to an IEEE 802 local area network that is being used as an ATN ES or IS, could be used in this field. However, this may have ramification if the SYS field is tied to a subnetwork dependent information such as the physical network address (e.g. 48-bit LAN address) that is associated with a particular device. The problem will occur when the device is replaced by another device which will use a different 48-bit LAN address, requiring the NSAP address of the ATN ES or IS to be changed.

It is therefore recommended that the SYS field be used to identify the system without any dependency on physical information. Possible examples of this is to define whether the system is an IS or an ES, the type of function or role the system is used for (e.g. primary system, hot standby system, cold standby system, etc.), or the type of applications that are running on the system (e.g. AMHS, AIDC, ADS, CPDLC, Network Management, etc.). A requirement found in Section 7.1.4.b.1 of ISO 10589 IS-IS states that all Level 2 ISs within a Routing Domain must have a unique SYS field value. In order to enforce this requirement related to IS-IS Level 2 addressing, it is recommended that the values assigned to the LOC subfields also be assigned to the upper two octets of the SYS field. Using this approach enables the addressing authority for each Subdomain Group the flexibility to assign addresses without conflicting with addresses of other groups within the same Routing Domain.

3.8 The SEL Field

The SEL field is used to identify the End-System or Intermediate-System network entity or network service user process responsible for originating or receiving Network Service Data Units (NSDUs).

Table 3.8-1 identifies the defined values that shall be used in this field in accordance with Reference 1.

SEL Field Value	Used
[0000 0000]	Used for an IS network entity except in the case of an airborne IS implementing the procedures for the optional non-use of IDRP.
[0000 0001]	Used for the ISO 8073 COTP protocol in the Ground or Airborne End-Systems.
[0000 0010]	Used for the ISO 8602 CLTP protocol in the Ground or Airborne End-Systems.
[1111 1110]	Used for an IS network entity belonging to an airborne IS implementing the procedures for the optional non-use of IDRP.
[1111 1111]	Reserved

Table 3.8-1 - Defined Values for the SEL Field

4. Conclusions

The MID Regional ATN Addressing Plan consists of a set of recommendations for each State to assign regional NSAP addresses in a consistent manner. Using these recommendations, it should be possible to develop efficient routing policies that limit the amount of information exchange while providing comprehensive ATN services. Further, the application of this plan will permit simplified ATN service growth with a minimum of router re-configuration.

5. Recommendations

The members of the IPS Working group to review and comment on the MID Regional ATN Addressing Plan as presented above.

CHAPTER FIVE

ATN using IPS standard:

ATN using IPS standard:

The Internet Protocol suite (IPS) is made of four layers: media access,

network, transport and application. There are three major physical components of the ATN/IPS: IPS host, IPS router and interconnecting sub networks.

IPV6 internetworking

The Internet Protocol (IP) is an unreliable and connectionless protocol that is performed across various technologies of subnetworks. ATN/IPS makes use of IP version 6 (IPv6) (RFC 2640). In comparison with the preceding IPv4, the IP address space has been expanded and more flexibility is provided with additional features.

Mobile (airborne) nodes in the ATN/IPS shall implement Mobile IPv6 (RFC 3775) that allows IPS host to move in the internet from one network to another. Mobile host has two IP addresses , its original address, called home address and a temporary address, called the care-of address.

Interior and exterior routing

To provide sufficient flexibility for the establishment of routing policy in large TCP/IP environment, the Internet is divided into autonomous systems (AS), AS are uniquely identified by AS numbers in Doc 9896, Table 1-1 show the AS number of countries in MID region:

Country	AS Number	Country	AS Number
Bahrain	64590	Lebanon	64596
Egypt	64559	Oman	65256
Iran, Islamic Republic of	64582	Qatar	65269
Iraq	64583	Saudi Arabia	65278
Israel	64584	Syria	65290
Jordan	64588	United Arab Emirates	65299
Kuwait	64593	Yemen	65309

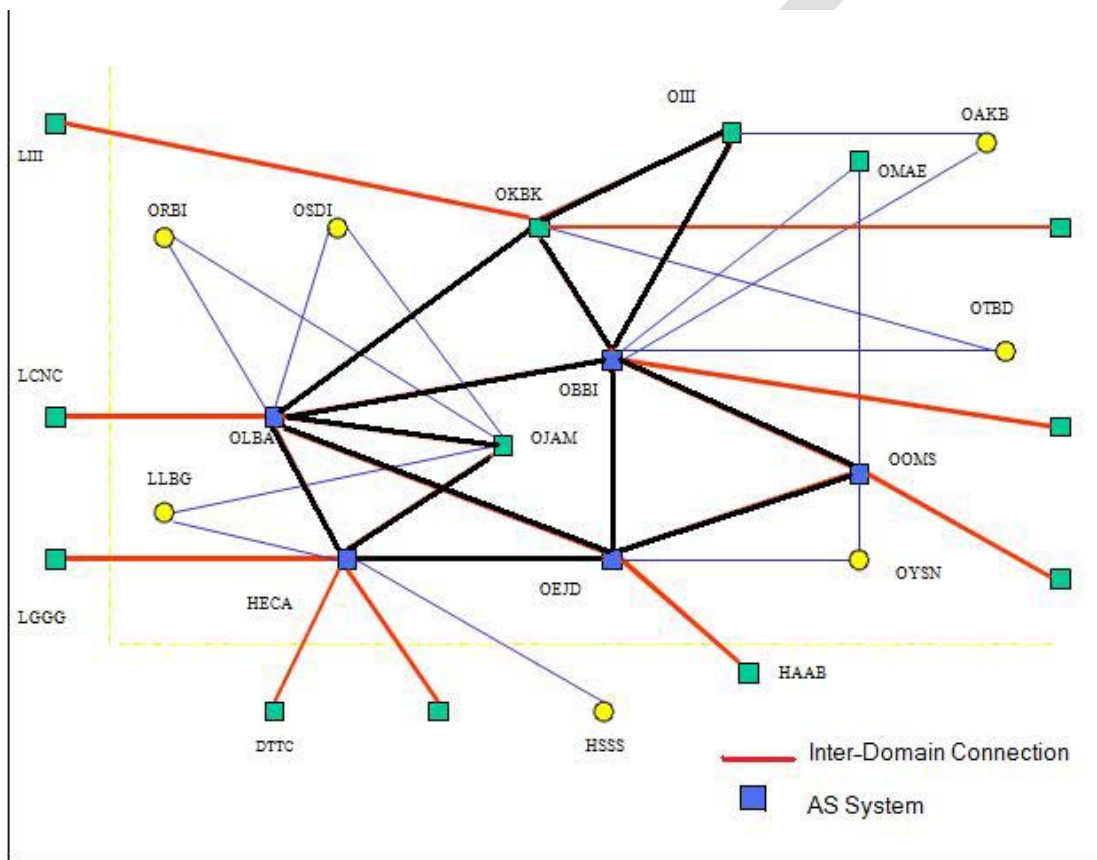
Table 1-1

Mid Region Main centers shall use dual stack IPS router which support IPv6 and IPv4 , IPS routers which support inter-domain dynamic routing shall implement the Border Gateway Protocol (BGP-4), and Static routes can be used with point-to-point Intra-domain connection or RIP routing protocol.

Border Gateway Protocol (BGP)

The border Gateway protocol is the de facto standard exterior routing protocol in Internet, which allows routers in different Ass to cooperate in the exchange of routing information by means of message which are sent over TCP connections.

The BGP-4 algorithm has been expanded to solve the "multi-homing" issue of an AS, that means an AS can have multiple network interfaces so that the connectivity between Ass becomes fault-tolerant incase of network failure.



Transport Protocols

IPS host shall implement the Transmission Control Protocol (TCP) and the User Datagram Protocol (UDP), Furthermore ATN/IPS hosts are required to supporting the following registered port numbers:

- ✚ tcp 102 for ATSMHS
- ✚ tcp 8500 for FMTP
- ✚ tcp/udp 5910 for CM
- ✚ tcp/udp 5911 for CPDLC
- ✚ tcp/udp 5912 for FIS
- ✚ tcp/udp 5913 for ADS

Transition Activities:

In addition to what is mentioned in 1.8

- ✚ Implementation of IPS Router that support IPv4 and IPv6 .
- ✚ Upgrade all systems to support IPv6.
- ✚ Implementation of Network Transition Mechanism.

Network Transition Mechanism

Three transitions mechanisms can assist countries to deploy the ATN IPS in a heterogeneous environment:

o Tunnelling: IPv6 has been specified to operate over a variety of lower layer interfaces such as Frame Relay, ATM, HDLC, PPP and LAN technologies. Tunnelling implies that a given protocol is encapsulated into another, meaning that IPv6 would be encapsulated into another functionally equivalent network protocol.

o Dual stack: The dual stack mechanism implies that an implementation handles more than one communications protocol for a given application or function by supporting both IPv4 and IPv6 protocols.

o Translation: Translation mechanisms imply the conversion from one protocol to another. Network Address Translation Protocol Translation (NAT-PT), have been developed in the context of the transition from IPv4 to IPv6 as both versions share a number of common features.

**MID AMHS Implementation plan and
guidance**

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EXECUTIVE SUMMARY

(To be developed)

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References

- Reference 1 Annex 10
- Reference 2 **Manual of Detailed Technical Specifications for ATN using ISO/OSI standards and Protocols Doc 9880**
- Reference 4 Manual on the ATN using IPS standards and protocols (Doc 9896 AN/469)
- Reference 5 Middle East AFTN/CIDIN Routing Directory
- Reference 6 ICAO Location Indicators – Document 7910
- Reference 7 **MID Air Navigation Plan and Facilities and Services Implementation Document (ANP- FASID – Doc. 9708)**
-
- Reference 8 ASIA/PAC Regional Aeronautical Telecommunication Network (ATN) Planning Documents
- Reference 9 EUR AMHS Manual DOC 020 - 4th Edition - April 2009

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Abbreviations

The following abbreviations are used in this document:

ADMD	Administration Management Domain
AFTN	Aeronautical Fixed Telecommunication Network
AMHS	ATS Message Handling System
MIDANPIRG	Middle East Air Navigation Planning and Implementation Regional Group
ATN	Aeronautical Telecommunication Network
ATNTTF	ICAO ATN Transition Task Force
ATS	Air Traffic Service
ATSO	Air Traffic Service Organizations
ICAO	International Civil Aviation Organization
ITU-T	International Telecommunication Union Telecommunication Standardization Sector
MHS	Message Handling Service
MTA	Message Transfer Agent
MTCU	Message Transfer and Control Unit
MS	Message store
O/R	Originator/Recipient
PRMD	Private Management Domain
SARP	Standards and Recommended Practices
UA	ATS UserAgent

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Chapter 1

Introduction

ATN/IPS WG/3
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ATN/IPS WG/3
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1.1 AFS

Annex 10 defines the aeronautical fixed service that shall comprise the following systems and applications that are used for ground ground (i.e. point-to-point and/or point-to-multipoint) communications in the international aeronautical telecommunication service:

- a) ATS direct speech circuits and networks;
- b) meteorological operational circuits, networks and broadcast systems;
- c) the aeronautical fixed telecommunications network (AFTN);
- d) the common ICAO data interchange network (CIDIN);
- e) the air traffic services (ATS) message handling services;
- f) the inter-centre communications (ICC).

1.1

1.1.1 The operational requirements for such an information exchange were met by the development of the Aeronautical Fixed Telecommunications Network. The AFTN provides a store-and-forward messaging service for the conveyance of text messages in ITA-2 or IA-5 format, using character-oriented procedures.

1.1.2 Although AFTN served its purpose well for many years, AFTN technology has become outdated due to the fact that it remains bound to its telex/telegraphic origins. One major step towards overcoming the limitations of the AFTN was taken with the introduction of the Common ICAO Data Interchange Network, which is based on packet switching techniques. The CIDIN provides a common transport service for the conveyance of binary or text application messages in an expeditious and reliable manner.

1.2 ATSMHS Overview

1.2.1 The ATN SARPs for the Air Traffic Services Message-Handling Service (ATSMHS) define the ICAO store and forward messaging service used to exchange ATS messages between users over the ATN internet.

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1.2.2 The set of computing and communication resources implemented by Air Navigation Service Providers (ANSP) to provide the ATS Message Handling Service is commonly referred to as AMHS (ATS Message Handling System). The ATS Message Handling System SARPs are compliant with mature message handling systems standards such as ITU-T X.400.

1.2.3 ATSMHS End Systems:

Four End systems comprising ATSMHS system:

1. ATS Message User Agent: The component provides the user interface for message submission to the AMHS and message delivery from the AMHS. For the ~~AFTN/CIDIN~~ support of the extended ATSMHS, an ATS message user agent shall include a DUA.
2. ATS Message Server: The component accepts, relays and delivers messages in a store-and-forward fashion and serves attached ATS Message User Agents. An ATS message server shall include an MTA and optionally one or several MS, For the support of the extended ATSMHS, an ATS message server shall include a DUA.
3. AFTN/AMHS Gateway: The gateway serves as a bridge between the AFTN and AMHS by performing mutual conversions between AMHS and AFTN information objects.

1.2.4 Functional Objects

The systems comprising the AMHS shall themselves be comprised of the following functional objects:

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- a) Message Transfer Agent(s) (MTA); which performs the function of the message switch.
- b) User Agent(s) (UA); which performs the user access to the MTA and provides an appropriate user interface.
- c) Message Store(s) (MS); which provides the intermediary storage between MTA and UA and is usually co-located with the MTA.
- d) Access Unit(s) (AU); which provides for intercommunication with other Messaging Systems.

Chapter 2

Topology & Routing strategy

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INTRODUCTION

This chapter presents a plan on the ATN ground activities applicable to the ICAO MID Region. It provides also information on the ground infrastructures required to support the ATN and to take into consideration progressively the ATN air-to-ground requirements of the Region.

2.1 The current ground infrastructure

2.1.1 The present ground-ground data communications system in the Middle Region comprises AFTN circuits and centers (tributary and main) that allow the exchange of ATS and other operational messages.

2.1.2 Five States of the Region already implemented the Common ICAO Data Interchange Network (CIDIN) as an upgrade of the low speed AFTN circuits to improve the efficiency and reliability of message exchange. These CIDIN circuits are operating at 9600Bps and the remaining circuits at 50 Bps to 300 Bps, using asynchronous protocols.

2.1.3 The detail of international circuits operating within the Region and between neighboring regions. is documented in Table CNS 1A of the ICAO MID CNS Facilities and Services Implementation Document (FASID). And provided by AMC.

2.1.4 The current AFTN topology in the Region shows that the majority of circuits will not be suitable to be used for the ATN without some form of upgrade. In later stage, it will be necessary to identify those circuits that need to be upgraded in both bandwidth and protocols.

2.1.5 With regard to bandwidth requirements, it is assumed that 64Kbps or higher shall be used for Intra-regional connections while 64Kbps (based on agreement with other regions) or higher speed could be preferred for Inter-Regional connections when full ATN is implemented.

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2.1.6 It is important to note that some States have already started the establishment of a communication infrastructure that would serve the ATN. There have been implementations of high speed point-to-point digital links operating at 64KBPS and carrying voice and data traffic.

2.1.7 In respect to the upgrade of protocols, it is expected that they will be implemented on a bilateral arrangements between States according to the preferred protocols: preferably TCP/IP V.6. Frame Relay or Asynchronous Transfer Mode (ATM) or any other protocol that will be included in the ICAO Standards in future.

2.1.8 It can happen that due to different planning activities, by States, not all States within the MID Region will be migrating to the ATN at the same time. Therefore, there will be a need to maintain the existing AFTN circuits as well as a provision for an AMHS/AFTN Gateway; to operate in parallel with any new implementation of high-speed links to meet ATN requirements and could migrate the AFTN.

2.1.9 With the introduction of AMHS as the replacement for AFTN/CIDIN, a number of AFTN circuit links between centers will need to be upgraded to cater for the increase of traffic load generated by AMHS overheads. Analysis carried out in other Regions showed that there will be significant overheads generated by AMHS for a typical message of about 250 bytes. As the message size increases the amount of overheads generated becomes less significant to the size of the body of the message. In transitioning from AFTN/CIDIN to AMHS, States will have to anticipate this increase in bandwidth to accommodate AMHS traffic so as to maintain current or better performance of traffic delivery.

2.1.10 States will need to ensure that not only are the links that are established between States are capable of transferring data in a timely manner but also for those links

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that provide an alternate path for the applications to use in times of disruption to the primary links.

2.2 Target AMHS Topology

There are many possibilities how to interconnect a given set of nodes, The fully meshed topology can fulfill the maximum performance, various network topologies can be implemented, ATN/IPS WG members tasked to study different solutions.

- To be developed -

2.3 AMHS Routing

Routing to a destination which is adjacent to the source is referred to as *direct routing*. Routing to a more distant destination is called *indirect routing* (in the above figure from A to B).

2.3.1 Static and dynamic routing

Static routing is based on fixed paths across a given topology; in the event of topology changes pre-defined, alternative paths may be used. In contrast, with *adaptive* or *dynamic* routing, routing paths are updated by means of an algorithm when the topology or traffic load distribution change. AMHS routing is considered as "static.

2.3.2 The nature of MHS (AMHS) routing

Message Handling Systems transfer messages between users (UAs) in a store-and-forward manner. A message submitted by the originator will be transferred through one or more MTAs and delivered to one or more recipients (UAs). The originator does not specify the route (i.e. the MTAs to be passed) but identifies a recipient by means of its OR-address (or directory name). It is the responsibility of each routing MTA to determine

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the next MTA to which the message should be transferred to progress its journey to its recipient(s).

The connections between MTAs are, from the MHS point of view, realised by pair-wise established application associations. We can also interpret such an association between a pair of MTAs as "logical link" as an established association is not of physical nature.

2.3.3 Interrelations with underlying network services

In implementations, logical links (or associations) make use of underlying network services offered by an appropriate network infrastructure.

- 1) A meshed *MHS network (topology)* allows alternate MHS routing paths between an originating UA and a recipient's UA by passing alternate MTAs and logical links;
- 2) a meshed *Internet* allows alternate network paths between a pair of MTAs by using alternate routers and subnetworks; and
- 3) general-topology sub networks allow alternate sub network paths between given pairs of routers by using alternate switching nodes and physical links.

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Chapter 3

Addressing and Naming Plan

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3.1 Introduction

This chapter provides technical guidance on the addressing and naming convention for the transition of ground Aeronautical Fixed Telecommunication Network (AFTN) services to the ATS Message Handling System (AMHS) within the MID region.

An extract of the AMHS Register from the main ICAO register for the MID States is provided in this part for planning and implementation.

This document presents the naming assignment conventions for allocating Originator/Recipient (O/R) names to be used for the ATS Message Handling System (AMHS) in the MID Region.

The information contained in this document is drawn from a number of developments and will be continued to be updated by the IPS Working group members

The scope of this chapter includes:

- Describing the attributes of the AMHS address format, and
- Recommending the values for the relevant attributes that are to be used in the AMHS address.

The MID Regional ATN AMHS naming convention presented here will comply with the relevant formats as specified in ICAO Doc. 9880 (Reference 1). The MID Regional ATN AMHS Naming Plan defines the method for assigning values to each of the relevant attributes of the AMHS address. States within the Region may choose to assign their AMHS addresses based upon the recommendations found here.

3.2 MF-Addressing Format

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ICAO Document 9880 (Reference 1) states that the AMHS shall be organizationally composed of AMHS Management Domains. These AMHS Management Domains may elect to operate as either an Administration Management Domain (ADMD) or a Private Management domain (PRMD), depending on the national telecommunications regulation in force in the country where it operates and on its relationships with other Management Domains.

Each AMHS user within an AMHS Management Domain is assigned an Originator/Recipient (O/R) name, which is also referred to as a MHS-form address (MF-address). The attributes of a MF-address shall comprise an AMHS management domain identifier (which known as a high level addressing) and low level attributes either XF or CAAS scheme.

The attributes of an AMHS management domain identifier are described in the table below.

Table 2.1-1 AMHS Management Domain Identifier Attributes

Attribute	Notation	Value
Country-name	C	XX
Administrative Domain Name (ADMD)	A	ICAO
Private Domain name (PRMD)	P	

3.3 MF-Addressing Scheme

An AMHS management domain should avoid deviating from the common AMHS addressing scheme and refrain from implementing a locally defined AMHS addressing scheme unless specific unavoidable constraints (e.g. regulatory) apply to the AMHS management domain.

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The ATN SARPs have defined two addressing schemes format.

3.3.1 XF Addressing Scheme (translated Form Address)

ICAO Document 9880(Reference 1) stipulates that the XF-address of a direct or indirect AMHS user shall be composed exclusively of the following:

- A) An AMHS Management Domain,as described in 2.1
- B) An Organization-name Attribute (O):
 Taking the four-character value "AFTN"
- C) An Organizational-unit-name Attribute (OU): comprising a sequence of one single element, which takes the 8-character alphabetical value of the AF-address (AFTN-form address) of the user.

Attribute	Notation	Value
Country-name	C	XX
Administrative Domain Name (ADMD)	A	ICAO
Private Domain name (PRMD)	P	ATSO registered private domain
Organization-name Attribute	O	AFTN
Organizational-unit-name	OU	8-letters AFTN address

It is recommended that States who have already started implementing the XF-Address format can do so but should consider migrating to the MF-Address format as soon as is practical.

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3.3.2 Common AMHS Addressing Scheme (CAAS)

common AMHS addressing scheme shall be composed exclusively of:

2.2.7.1.1.1 an AMHS management domain identifier as specified in 2.1

2.2.7.1.1.2 an *organization-name (O)* attribute taking a value representing a geographical unit

2.2.7.1.1.3 An organizational-unit-names (OU) attribute comprising a sequence of a single element which takes the four-character alphabetical value of the location indicator included in the AF-address of the user.

2.2.7.1.1.4 a *common-name* attribute (CN) which takes the eight-character alphabetical value of the AF-address of the user

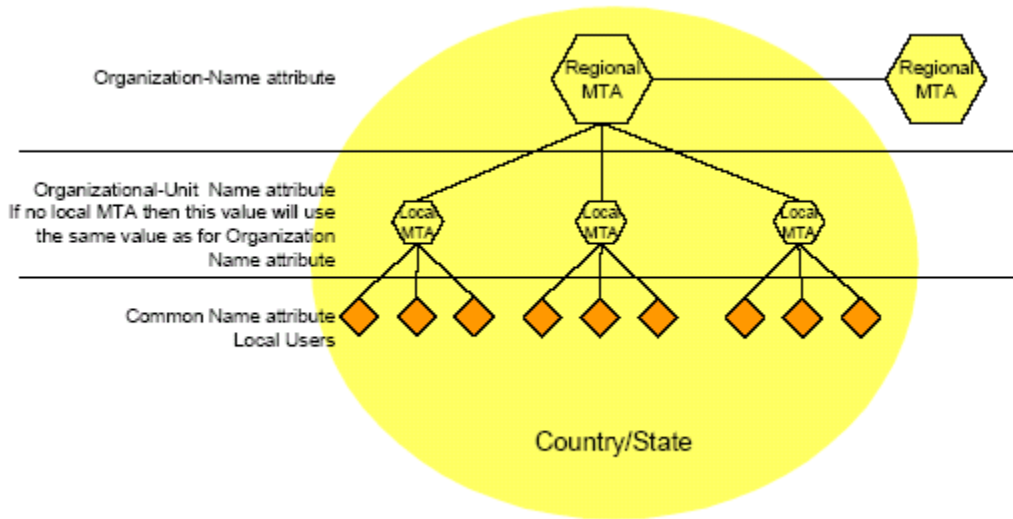
Attribute	Notation	Assign By	Value
Country-name	C	ITU-T	XX
Administrative Domain Name (ADMD)	A	ICAO	ICAO
Private Domain name (PRMD)	P	ATSO	ATSO registered private domain
Organization-name Attribute	O	ATSO	A value representing a geographical unit
Organizational-unit-name	OU	ATSO	four-character alphabetical value of

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			the location indicator included in the AF-address of the user.
Common Name	CN	ATSO	8-letters AFTN address

It has been proposed in the ATN Panel working groups that a common naming convention be used worldwide to help stream line the addressing scheme and to ensure compatibility and consistency with other neighboring regions. This scheme would be based on the work that has been ongoing in Europe. It was also stressed that if States have not already started their implementation programs for AMHS that when planning to do so that they should adopt the MF-Address format over the XF-Address format.

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A complete list of attributes with different information concerning on the maximum length and type of allowed characters for each attribute type is provided in the following Table:

O/R address Attributes	Max Length
Country name	2 alpha or 3 numeric
ADMD name	24 PrintableString
PRMD name	24 PrintableString
Organisation name	64 PrintableString
Organisational unit name	32 PrintableString
Common name	64 PrintableString

Table XX: Mnemonic O/R address attributes maximum length and types

MID Region AMHS addresses

State	ATS Address
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State Name	Nationality Letters or Designator	C	ADMD	PRMD	Addressing scheme	OU (for CAAS only)	Comments
Bahrain	OB	XX	ICAO	OB	CAAS	see Table OB	confirmed by SL
Egypt	HE	XX	ICAO	HE	CAAS	HECA	confirmed by SL
Iran	OI	XX	ICAO	OI	XF		confirmed by SL
Iraq	OR	XX	ICAO	OR	XF		
Jordan	OJ	XX	ICAO	OJ	CAAS	OJAC	confirmed by SL
Kuwait	OK	XX	ICAO	OK	XF		
Lebanon	OL	XX	ICAO	OL	XF		
Oman	OO	XX	ICAO	OO	XF		
Qatar	OT	XX	ICAO	OT	XF		
Saudi Arabia	OE	XX	ICAO	Saudi Arabia	CAAS	OEJN	confirmed by SL
Syrian Arab Republic	OS	XX	ICAO	OS	XF		
UAE	OM	XX	ICAO	UAE	CAAS	OMAE	confirmed by SL
Yemen	OY	XX	ICAO	OY	XF		

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2.3 AMHS Naming scheme

For the support of the extended ATSMHS, the directory name of an AMHS user shall comply with the provisions of Part IV of ICAO doc 9880.

- To be developed -

MID AHMS Implementation

Com Center	Installation	Operation	MTA Name	AFT N/A MHS Gateway	ATS UA	ATS service level	Protocol (IPS, ATN)	Remarks
Bahrain	2008	-	MTA-OBBI-1	Y	Y	Extended	Dual Stack	Support IPv4 only
Egypt	2008	2010	MTA-HECA-1	Y	N	Extended	Dual Stack	Support IPv4 only
Iran	-	-	-	-	-	-	-	-
Iraq	-	-	-	-	-	-	-	-
Jordan	2008	2010	MTA-OJAM-1	Y	Y	Extended	Dual Stack	Support IPv4 only
Kuwait		-	MTA-OK-1	Y	Y	Extended		Support IPv4 only
Lebanon	-	-	-	-	-	-	-	-
Oman	2008	2009	MTA-OOMS-1	Y	Y	Extended		Support IPv4 only
Qatar		-	MTA-OTBD-1	Y	Y			Support IPv4 only
Saudi	2008	2010	MTA-OEJN-	Y	Y	Extend	Dual Stack	Support IPv4

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			1			ed		only
Syria	-	-	-	-	-	-	-	-
UAE	2006	2009	MTA- OMEA-1	Y	Y	Basic		Support IPv4 only
Yemen	-	-	-	-	-	-	-	-

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CHAPTER FOUR

Testing Strategy

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4.1 Introduction

MID region adopted European AMHS testing strategy, to ensure common interpretation of the SARPs and reduce the changes of implementation, European Experience has shown that, although it is claimed that systems have been implemented according to the one set of protocol specifications, they are often not capable of inter-working. This is due to errors in implementation or to different interpretations of the specifications(SARPs). Testing and validation of systems according to the same set of principles aims at the detection of such errors and the prevention of incompatibility instances.

4.2AMHS testing Phases:

4.2.1 AMHS Conformance testing:

Conformance testing is recommended and can be performed in parallel with or after the acceptance testing of a new system, the main AMHS functional areas covered by conformance testing are:

- ✚ Transfer of messages probes and reports.
- ✚ Submission of messages and probes/ delivery of messages and reports
- ✚ Intercommunication with AFTN.
- ✚ Naming and addressing
- ✚ System Management functions

The Conformance testing methodologies, configurations and procedures are defined in Appendix D of EUR DOC 020 (AMHS Manual).

4.2.2 Underlying Network Testing.

Before starting doing testing with adjacent center, its recommended to test the infrastructure network, assigning IP address, take all security measure, permit access via port 102 only.

4.2.3 AMHS Interoperability testing:

Interoperability testing considered Mandatory testing in order to ensure the end-to-end interoperability between AMHS systems under test. First step to this testing the interconnection between pairs of systems should be established and checked. AT bilateral level, the following functional area should be covered:

- ✚ Submission, Transfer and delivery operation (AMHS to AMHS)
- ✚ Gateway operations (AFTN to AMHS, AMHS to AFTN and AFTN to AMHS to AFTN)
- ✚ Stress traffic situations
- ✚ Submission /Transfer/Delivery and relay operations.

The Interoperability testing methodologies, configurations and procedures are defined in Appendix E of EUR DOC 020 (AMHS Manual).

Additional functions can tested with trilateral test.

Configuration and report templates are at Appendix A of this doc.

4.2.4 AMHS Pre-operational testing:

Pre-operational testing should be carried out between the AMHS systems concerned before going into operation. The objectives of the AMHS Pre-operational Tests are:

1. To test the interoperability between the AMHS systems in an operational environment.
2. To test the integrity of the messages exchanged.
3. To test the message exchange after a disturbance (e.g. queued messages).

The messages used in the AMHS Pre-operational Tests are generated either:

- Manually; or
- using parallel duplicated traffic;

The preoperational testing methodologies, configurations and procedures are defined in Appendix F of EUR DOC 020 (AMHS Manual).

Configuration and report templates are at Appendix B of this doc.

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Chapter 5

Underlying Network

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5.1 Background

The designers of OSI assumed that this model (and the protocols developed within the framework of this model) would come to dominate computer communications, eventually replacing proprietary protocol implementations and rival multi-vendor models as the Internet Protocol Suite (IPS). This has not happened. Although many useful protocols have been developed in the context of OSI, the overall seven-layer model has not flourished. Instead, the IPS architecture has become dominate. There are a number of reasons for this outcome. Perhaps the most important is that the key IPS protocols were mature and well tested at a time when similar OSI protocols were in the development stage. Another reason is that the OSI model is unnecessarily complex.

At the time of starting the ATN specifications in the early 90ties, there was a common believe that the OSI model would become the ultimate standard for data communication. In this view, the high level technical requirement was set up that the ATN shall use ISO communication standards

5.2 OSI/ISO Standard

MID Region states agreed to deploy ATN/IPS as a standard network in the region, and in order to ensure interoperability with Adjacent Region, its recommended that all centres have connection with ICAO Region utilising ATN/OSI, should have the capability to use this protocol.

5.2.1 NSAP Addressing Plan

To find a suitable ATN addressing convention that would be acceptable for use in the MID region requires a routing architecture that minimizes routing updates and overheads within the ground ATN infrastructure for both ground-ground and air-ground services and applications.

The ATN addressing convention must allow for an addressing scheme that is:

- Practical - to provide autonomous administration of ATN addresses for States and Organizations, and
- Flexible - to allow for future expansion and/or routing re-configuration of the ground ATN infrastructure with minimal re-assigning of ATN addresses.

The recommendations proposed in the MID Regional ATN Addressing Plan take advantage of the work performed by the European ACCESS1 Project (Reference 3).

1 ACCESS (ATN Compliant Communications European Strategy Study) is a project funded by the European Commission and jointly produced by the following companies and administrations: National Air Traffic Services (NATS), Deutsche Flugsicherung (DFS) and Service Technique de la Navigation Aérienne (STNA).

5.2.1.1 NSAP Address Format

The structure of the Network Service Access Point (NSAP) address is depicted in Figure 5.

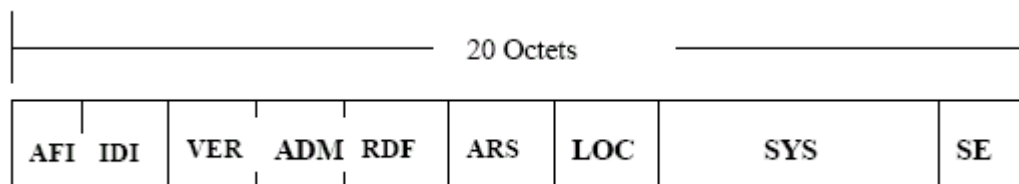


Figure 5 NSAP Address Format

The NSAP address structure contains 9 fields, which are described in Table 4.2-1.

Field Name	Field Description	Size	Syntax	Number of Characters/Digits	Field Encoding
AFI	Authority and format Identifier	1 Octet	Decimal	2 Digits	BDC
IDI	Initial domain Identifier	2 Octets	Decimal	4 Digits	BCD
VER	Version	1 Octet	Hex	2 Digits	Binary
ADM	Administration Identifier	3 Octets	Alpha or Hex/Alpha	3 Characters 2 Digits/ 2 Characters	IA-5 Binary/ IA-5
RDF	Routing Domain Format	1 Octet	Hex	2 Digits	Binary
ARS	Administration Region Selector	3 Octets	Hex	6 Digits	Binary
LOC	Location	2 Octets	Hex	4 Digits	Binary
SYS	System Identifier	6 Octets	Hex	12 Digits	Binary
SEL	NSAP Selector	1 Octet	Hex	2 Digits	Binary

Table 4.2-1 - Encoding Rules for the ATN NSAP

3 Recommendations For NSAP Address Fields Assignments

5.2.1.2 The AFI and IDI Fields

The ATN Internet SARPs (Reference 1) require allocation of the following values:

- Decimal for the AFI field to indicate the type of NSAP being used. This value has been assigned the character sequence “47”.
- Decimal for the IDI field to designate ICAO. This value has been assigned the character sequence “0027”.

As recommended in Reference 1, ATN NSAP addresses and NETs will be written as the character sequence “470027+” where the “+” is used to separate the Binary Coded Decimal (BCD) fields from subsequent Hexadecimal fields.

Hence the AFI and IDI fields will be set to 470027 for fixed ATSC systems/domains and for mobile ATSC systems/domains.

5.2.1.3 The VER Field

The VER field is used to partition the ATN Network Addressing domain into a number of subordinate Addressing Domains.

The values currently specified in Reference 1 for the VER field are summarized in Table

3.2-1.

VER Field Value	Network Addressing	Common NSAP	Value to be used by
-----------------	--------------------	-------------	---------------------

	Domain	Address Prefix for Domain	States of MID region
[0000 0001]	Fixed AINSC	470027+01	
[0100 0001]	Mobile AINSC	470027+41	
[1000 0001]	Fixed ATSC	470027+81	470027+81 (ATSO Iss and Ess)
[1100 0001]	Mobile ATSC	470027+C1	470027+C1 (General Aviation)

Table 3.2-1 - Defined Values for the VER Field

5.2.1.4 The ADM Field

The ADM field is used to further partition the ATN Network Addressing Domain. The field designates a single State or Organization. Depending on what the VER field is set to will determine what values should be used in the ADM field.

When the VER field is set to “81” (Fixed ATSC), the ATN SARPs permits two possible ways for encoding the ADM field.

The first method recommends that the State’s three character alphanumeric ISO country code is used, as defined in ISO 3166. States may choose this method, however it will provide less flexibility than the second method for the addressing of regional entities (e.g. regional RDCs or regional organizations that are not country specific).

The second method that is recommended for use in the MID region is to use the first octet of the field to define the ICAO region. This would permit the reduction of the routing information that would otherwise be generated. It is recommended that the remaining two octets of the field will further identify the country, RDCs and the regional organizations that are not country specific as follows:

- For the identification of a country, it is recommended that States use the ICAO two letter location indicator (Reference 4) instead of the two character alphanumeric ISO 3166 country code. The structure of the ICAO two letter location indicator allows for a more efficient identification of a location. For example, indicators starting with the same letter “V” designate several countries in the same local region (e.g. Thailand, Sri Lanka, India, Cambodia etc.). The second letter will actually define the specific country within this local region (e.g. “VT” for Thailand, “VC” for Sri Lanka etc.). Where a country has several ICAO two letter location indicators allocated to it, the assigning authority of the ADM field will be responsible in determining the preferred location indicator to represent that country. For example, the indicators “VA”, “VI”, “VO”, “VE” are assigned to India and one of these indicators will be selected to represent India. The encoding of the ICAO two letter location indicators will be upper case alphanumeric values.
- For regional organizations that are not country specific, it is recommended to allocate a lower case alphanumeric value so as there will be no conflict with the ICAO two letter location indicators.

- For the addressing of RDCs (e.g. Island RDCs, Backbone RDCs), in particular for those that are not country specific, it is recommended to allocate codes with the most significant bit set to 1 in the second octet. Valid values would be in the hexadecimal range [8000 – FFFF].

ICAO MID Regional group would be the allocation authority of the ADM field.

In summary, the values allocated for the ADM field is indicated in Table 3.3-1.

VER Field Network Addressing Domain	ADM Field Values
Fixed AINSC	Derived from the set of three-character alphanumeric characters representing an IATA airline or an Aeronautical Stakeholder Designator.
Mobile AINSC	Derived from the set of three-character alphanumeric characters representing an IATA airline or an Aeronautical Stakeholder Designator.
Fixed ATSC	<p>To allow for efficient routing information to be exchanged, it is proposed that the ICAO Regional code be used in the first octet of the ADM field followed by the ICAO two-letter location indicator for countries.</p> <p>The Regional codes are shown below.</p> <p>Regional Codes:</p> <ul style="list-style-type: none"> [1000 0000] Africa [1000 0001] Asia [1000 0010] Caribbean [1000 0011] Europe [1000 0100] Middle East [1000 0101] North America [1000 0110] North Atlantic [1000 0111] Pacific [1000 1000] South America <p>For example Thailand would be represented by the following</p>

	<p>hexadecimal sequence: 815654. Table 4.3.3-2 provides further examples for a selected number of countries.</p> <p>Where a two letter country code is not applicable, the following rules would apply:</p> <p>ICAO would assign lower case alphanumeric characters using a two letter value to organizations that wish to be based in a particular region. For example, if an organization is to be based in the Pacific region and wanted to be represented by the characters 'sa', this would be represented by the following hexadecimal sequence: 877361</p> <p>ICAO would assign regional codes for RDCs where a country code or organization code is not applicable. Values would be assigned with the most significant bit set to 1 in the second octet. For example a RDC established in the Pacific region would be represented by the following hexadecimal sequence: 878100.</p>
Mobile ATSC	As for Fixed ATSC

Table 3.3-1 - Defined Values for the ADM Field

Fixed or Mobile MID ATSC Addressing Domain	Hexadecimal Code of the ADM Field	Comment
Australia	875942	Pacific Region + 'YB'
China	815A42	Asia Region + 'ZB'
India	815649	Asia region + 'VI'
Fiji	874E46	Pacific Region + 'NF'
Japan	81524A	Asia Region + 'RJ'
New Zealand	874E5A	Pacific Region + 'NZ'
Singapore	815753	Asia Region + 'WS'
Thailand	815654	Asia Region + 'VT'
Viet Nam	815656	Asia Region + 'VV'

Table 3.3-2 – Example of Proposed ADM Value Assignment for Selected MID Region Entities

5.2.1.5 The RDF Field

The RDF field is historical and is not used. Therefore the RDF field shall be set to [0000 0000].

5.2.1.6 The ARS Field

The ARS field is used to:

- Distinguish Routing Domains operated by the same State or Organization (in Fixed Network Addressing domains); and
- Identify the aircraft on which the addressed system is located (in Mobile Network Addressing Domains).

Each State or Organization identified in the ADM field will be responsible for assigning the values for the ARS field.

In accordance with the SARPs, for a Mobile Network Addressing Domain, the 24-bit ICAO Aircraft Identifier is inserted in the ARS field. However, no specific values have been specified for Fixed Network Addressing Domains.

The ARS field shall be assigned in a manner that simplifies the routing of data and makes provision for any potential lower level organizational units that could, in the future, operate an ATN Routing Domain.

The MID Regional ATN Addressing Plan recommends the ARS field be decomposed into three subfields as shown in Figure 4.3.5-1: Network ID, Network Group ID and Domain ID.

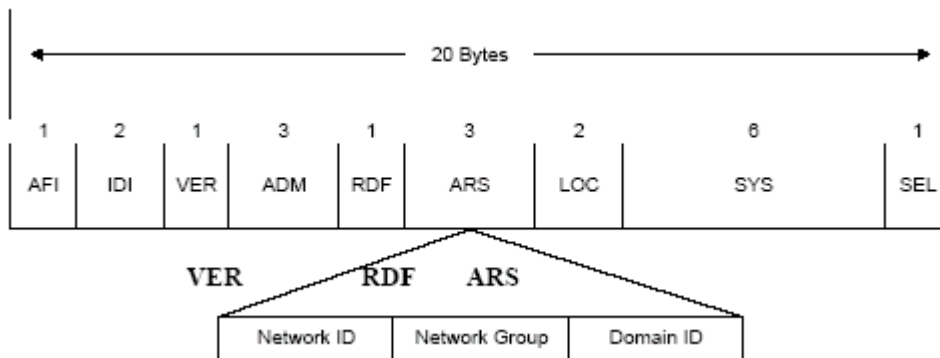


Figure 4.3.5-1 Proposed ARS Field Format

5.2.1.5.1 Network ID

Potential future operators of an ATN Routing Domain could be:

- A national Air Traffic Service Organization(s) (ATSO);
- A national military organization;
- A national meteorological organization; and
- An airport operator.

At present it is assumed that military organizations and meteorological organizations will not start up their own ATN Routing Domains and will be located within a national ATSO ATN Routing Domain. The same may apply to airport operators.

However in planning for the long term it is deemed necessary that provision is made available for these future possibilities.

In allowing for this possible expansion, it is recommended that the different ranges of values for the Network ID subfield be allocated to the different national organizations as follows:

- Hexadecimal values [00 – 1F] of the first octet of the ARS field be reserved for the addressing of domains and systems operated by the national ATSO.
- Hexadecimal values [20 – 3F] of the first octet of the ARS field be reserved for the addressing of domains and systems operated by the national military organization.
- Hexadecimal values [40 – 5F] of the first octet of the ARS field be reserved for the addressing of domains and systems operated by the national airport operators. (Note: this range matches the ASCII range of alphabetical upper case characters).
- Hexadecimal values [60 – 7F] of the first octet of the ARS field is reserved for the addressing of domains and systems operated by the national meteorological organization.
- Hexadecimal values [80 – FF] are reserved.

A national organization would then be able to register one or several values for the Network ID subfield within the range that has been reserved for its organization category.

In addition to the Network ID subfield being used for distinguishing the different national organizations, it is proposed that this subfield also be used for the identification of the particular role of the addressed domain. For example, setting the Network ID subfield to the hexadecimal value “01” would represent the set of operational Routing Domains of the national ATSO. Setting the Network ID subfield to hexadecimal “11” would represent the set of non-operational Routing Domains of the national ATSO. In using the Network ID subfield in this manner, allows national ATSOs to provide for a duplicate non-operational network to be used for trials and pre-operational testing. Similar arrangements could be used for the other national organizations.

- **NETWORK GROUP ID**

This subfield can be used to subdivide a ground ATN network into smaller groups. This field is unique within a particular network. This may be useful for future expansion by allowing regions to be formed within a particular network as defined by the Network ID. The formation of regions may be useful in helping contain the routing traffic exchanged within the network.

This subfield is also used to designate an RDC. RDCs can also be used to assist in the formation of regions within an Administrative Domain and they offer an additional level of flexibility when used to combine RDs into a confederation. RDCs are designated by setting the uppermost bit of this subfield to “1”.

- **Domain ID**

This subfield is a unique identifier assigned to each Routing Domain in the Network Group.

Table 3.5.3-1 shows possible examples on how the ARS field could be used. In the table two Network Groups “01” and “02” are defined. These two Network Groups can for example represent two FIRs in a country. One of the two Network Group contains two RDs and the other one contains three RDs. These two Network Groups can also address the initial RDs in a country (i.e. two RDs) with a planned expansion towards five RDs.

Network ID	Network Group ID	Domain ID	Comment
01	01	01	Network ID “01” indicates an ATSO operational network that contain two Network Groups “01” and “02”. Network Group “01” contains two RDs “01” and “02”. Network Group “02” contains three RDs “01”, “02” and “03”.
		02	
		01	
		02	
	02	03	

Table 3.5.3-1 – Example of ARS Value Assignment

3.5.4 Addressing RDCs in the ARS field

The Network Group ID subfield is used to segregate the addressing space of actual RDs and RDCs. When the uppermost bit of the Network Group ID subfield is set to “1” the second and third octets of the ARS field are assigned from the RDC addressing space (i.e., 8000-FFFF) and must be unique within that addressing domain. Otherwise, the subfields are assigned from the NSAP Address Space as described above for the Network Group ID and Domain ID subfields.

Similar principles as explained in sections 3.5.2 and 3.5.3 for the addressing of RDs can be applied to the addressing of RDCs, as required:

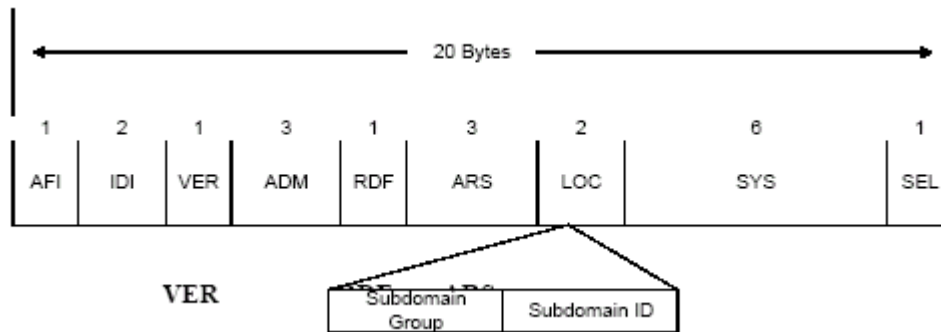
- The second octet of the ARD field may identify a group of RDCs.
- The third octet of the ARS field identifies RDCs.
 - **The LOC Field**

The LOC field is used to:

- Distinguish Routing Areas within Fixed Routing Domains, identified by the ARS field; and
- Distinguish Routing Areas and Routing domains within aircraft identified by the ARS field.

The assignment of the LOC field value is the responsibility of the State or organization that is the addressing authority for the routing domain in which the identified routing area is contained.

To assist States or organizations, it is recommended that the LOC field be decomposed into two subfields as shown in Figure 3.6-1: Subdomain Group ID and Subdomain ID.

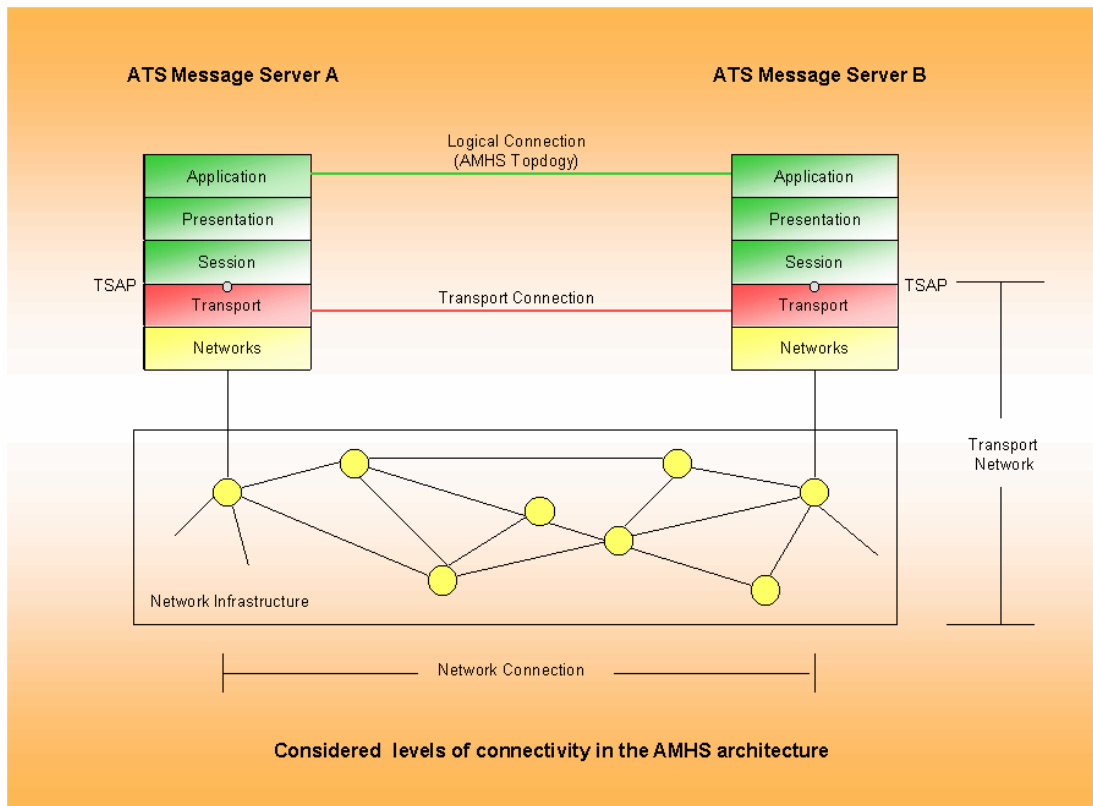


5.3 ATN using IPS standard:

The Internet Protocol suite (IPS) is made of four layers: media access, network, transport and application. There are three major physical components of the ATN/IPS: IPS host, IPS router and interconnecting sub networks.

5.3.1 Overview

The logical connection (links) of the AMHS topology implemented by means of a transport service could make use of the physical connectivity provided by a layer-3 network infrastructure.



5.3.2 IPV6 internetworking

The Internet Protocol (IP) is an unreliable and connectionless protocol that is performed across various technologies of subnetworks. ATN/IPS makes use of IP version 6 (IPv6) (RFC 2640). In comparison with the preceding IPv4, the IP address space has been expanded and more flexibility is provided with additional features.

Mobile (airborne) nodes in the ATN/IPS shall implement Mobile IPv6 (RFC 3775) that allows IPS host to move in the internet from one network to another. Mobile host has two IP addresses, its original address, called home address and a temporary address, called the care-of address.

5.3.3. Interior and exterior routing

To provide sufficient flexibility for the establishment of routing policy in large TCP/IP environment, the Internet is divided into autonomous systems (AS), AS are uniquely identified by AS numbers in Doc 9896, Table 1-1 show the AS number of countries in MID region:

Country	AS Number	Country	AS Number
Bahrain	64590	Lebanon	64596
Egypt	64559	Oman	65256
Iran, Islamic Republic of	64582	Qatar	65269
Iraq	64583	Saudi Arabia	65278
Israel	64584	Syria	65290
Jordan	64588	United Arab Emirates	65299
Kuwait	64593	Yemen	65309

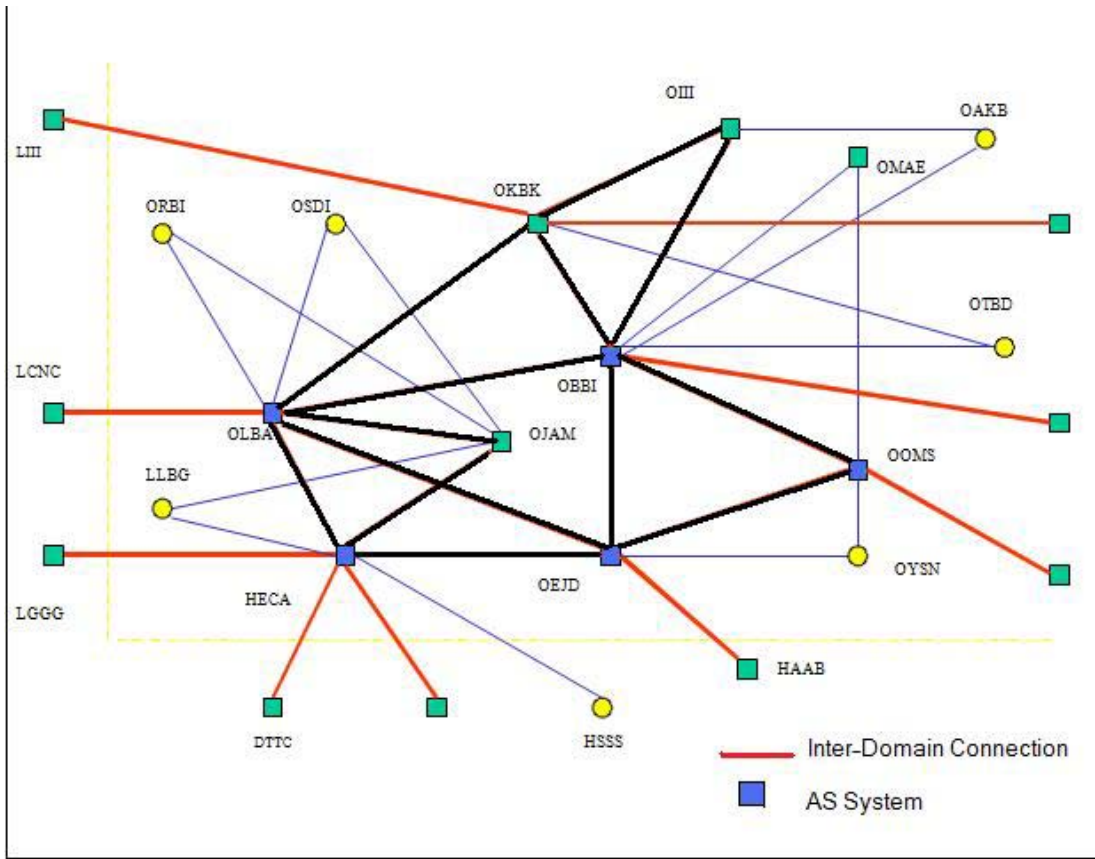
Table 1-1

Mid Region Main centers shall use dual stack IPS router which support IPv6 and IPv4 , IPS routers which support inter-domain dynamic routing shall implement the Border Gateway Protocol (BGP-4), and Static routes can be used with point-to-point Intra-domain connection or RIP routing protocol.

5.3.4 Border Gateway Protocol (BGP)

The Border Gateway protocol is the de facto standard exterior routing protocol in Internet, which allows routers in different Ass to cooperate in the exchange of routing information by means of message which are sent over TCP connections.

The BGP-4 algorithm has been expanded to solve the "multi-homing" issue of an AS, that means an AS can have multiple network interfaces so that the connectivity between Ass becomes fault-tolerant incase of network failure.



5.3.5 Transport Protocols

IPS host shall implement the Transmission Control Protocol (TCP) and the User Datagram Protocol (UDP), Furthermore ATN/IPS hosts are required to supporting the following registered port numbers:

- ✚ tcp 102 for ATSMHS

5.3.6 Transition Activities:

In addition to what is mentioned in 1.8

- ✚ Implementation of IPS Router that support IPv4 and IPv6 .
- ✚ Upgrade all systems to support IPv6.
- ✚ Implementation of Network Transition Mechanism.

5.3.7 Network Transition Mechanism

Three transitions mechanisms can assist countries to deploy the ATN IPS in a heterogeneous environment:

- o Tunnelling: IPv6 has been specified to operate over a variety of lower layer interfaces such as Frame Relay, ATM, HDLC, PPP and LAN technologies. Tunnelling implies that a given protocol is encapsulated into another, meaning that IPv6 would be encapsulated into another functionally equivalent network protocol.
- o Dual stack: The dual stack mechanism implies that an implementation handles more than one communications protocol for a given application or function by supporting both IPv4 and IPv6 protocols.
- o Translation: Translation mechanisms imply the conversion from one protocol to another. Network Address Translation Protocol Translation (NAT-PT), have been developed in the context of the transition from IPv4 to IPv6 as both versions share a number of common features.

Appendix A

Example of Interoperability Test

Configuration and report Templates

DRAFT



AMHS Interoperability Tests Jordan - United Arab Emirates

Configuration

CARC

GCAA

Document ID	: AMHS_INTEROP_CONF_JO-UAE_001
Created / updated	: Eng. Mona An-Naddaf (CARC)
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Change History

Version	Change	Date	Page(s)
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0.2	IP address and tsel of the UAE system updated, Agreement upon real addresses	2010-02-04	all
0.3	Section 3.6.6 TCP parameters appended	2010-02-12	12
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0.6	Isode Release updated, Table 3-7 updated	2010-02-20	7 10
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0.9	Phrase from section 3.6.6 removed, Section 1.2 updated	2010-04-22	12 5
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1 INTRODUCTION

1.1 Purpose and Scope

This document contains a description of the configuration for bilateral AMHS Interoperability Tests according to /1/ between the AFTN/AMHS operational switch of the Jordanian CARC and the AFTN/AMHS test system of the General Civil Aviation Agency (GCAA) of the United Arab Emirates (UAE).

In /1/ the two systems under test are named IUT-A and IUT-B. It is agreed between both test partners that

- **IUT-A is the Jordanian system, and**
- **IUT-B is the system of the U.A.E..**

The setup of the test systems will be as depicted in /1/, section 2.1, figure 1. Additional AMHS User Agents and/or AFTN User Terminals may be provided on either side.

Wherever possible, the parameters defined in /1/ are used. Additionally, configuration parameters to achieve connectivity on the network, transport, session and application layer are defined. Both partners agree to use real addresses, MTA names, passwords instead of those including the placeholders IUTA, IUTB.

1.2 Referenced Documents

Reference	Title, Document No.	Date of Issue
/1/	ICAO EUR Doc 020 – EUR AMHS Manual, Version 4.0, Appendix E	2009-04-02
/2/	AMHS Interoperability Tests Jordan – United Arab Emirates, Test Report	2010-04-26

1.3 Abbreviations

ACC	Area Control Centre
ADAMS	Aeronautical Data And Messaging System
ADMD	Administration Management Domain
AFTN	Aeronautical Fixed Telecommunication Network
AIRAC	Aeronautical Information Regulation and Control
AMC	ATS Messaging Management Centre
AMHS	ATS Message Handling System
ATN	Aeronautical Telecommunication Network



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ATS	Air Traffic Services
C	Country
CAAS	Common ICAO AMHS Addressing Scheme
CARC	Civil Aviation Regulatory Commission
COM	Communication
CN	Common Name
DSA	Directory System Agent
DUA	Directory User Agent
DL	Distribution List
GCAA	General Civil Aviation Authority
HP	Hewlett Packard
ICAO	International Civil Aviation Organisation
IP	Internet Protocol
iSCSI	Internet Small Computer System Interface
IUT	Implementation under Test
LAN	Local Area Network
MCP	Monitoring and Control Position
MS	Message Store
MTA	Message Transfer Agent
MTCU	Message Transfer and Control Unit
MTS	Message Transfer System
O	Organisation
O/R	Originator / Recipient
OU	Organisational Unit
PRMD	Private Management Domain
PSAP	Presentation Service Access Point
SSAP	Session Service Access Point
TCP	Transmission Control Protocol
TSAP	Transport Service Access Point
UA	User Agent
U.A.E.	United Arab Emirates
XF	Translated Form



2 SHORT DESCRIPTIONS OF BOTH SYSTEMS AND THE NETWORK INFRASTRUCTURE

2.1 Short Description of IUT-A

IUT-A is the fully integrated ADAMS AFTN/AMHS system of the International COM Centre of Jordan in Amman/Marka. The system is operationally used since 04-Dec-2008. It currently serves 4 international AFTN links and more than 30 domestic AFTN users or systems.

The switch is composed of 2 HP ProLiant BL 460 Linux servers and 2 iSCSI SB 600 servers which form a high-available 2-node cluster. RedHat 5.0 ES is the employed Linux Operating System. An AFTN switch, an X.400 MTA based on an X.500 Directory Server and an MTCU are the main functional components of the switch. The switch is monitored and controlled by means of 4 Microsoft Windows based MCP working positions.

Avitech AFTN Stations and legacy systems are connected to the switch via asynchronous lines or TCP/IP connections. Furthermore, currently 4 AMHS User Agents AMHS@AviSuite are connected to the MTA by use of the P3 MTS Access Protocol via TCP/IP.

In addition to the MD and CAAS Address Look-Up Tables described in 3.3 the operationally used MD, CAAS and User Address Look-Up table entries as provided by the AMC for the AIRAC cycle "OPER.81", of 11-02-2010, are configured.

The User Agents include Directory User Agents (DUA) supporting automatic translation of AFTN addresses into AMHS addresses and vice-versa.

Component	Release
ADAMS Integrated AFTN/AMHS system	MHS r3.42.00
MTA, DSA and MS	Isode Rel. 14.4v4
AMHS User Agent	Avitech AMHS@AviSuite jamhs-t1-atu-2.0.1-01-SNAPSHOT-install
AFTN Station	Avitech AFTN Station, Rel. 6.6.4.5

Table 2-1: Components of IUT-A

2.2 Short Description of IUT-B

Component	Release
ADAMS Integrated AFTN/AMHS system	AIDA-NG V2.79.0002
MTA, DSA and MS	Isode-MTA, integrated in AIDA-NG
AMHS User Agent	AMHS-Mailbox, Integrated in AIDA-NG
AFTN Station	AFTN Mailbox, Integrated in AIDA-NG

Table 2-2: Components of IUT-B

2.3 Network infrastructure

The two systems are interconnected by means of an IP SEC tunnel through the public internet as depicted in Figure 2-1:

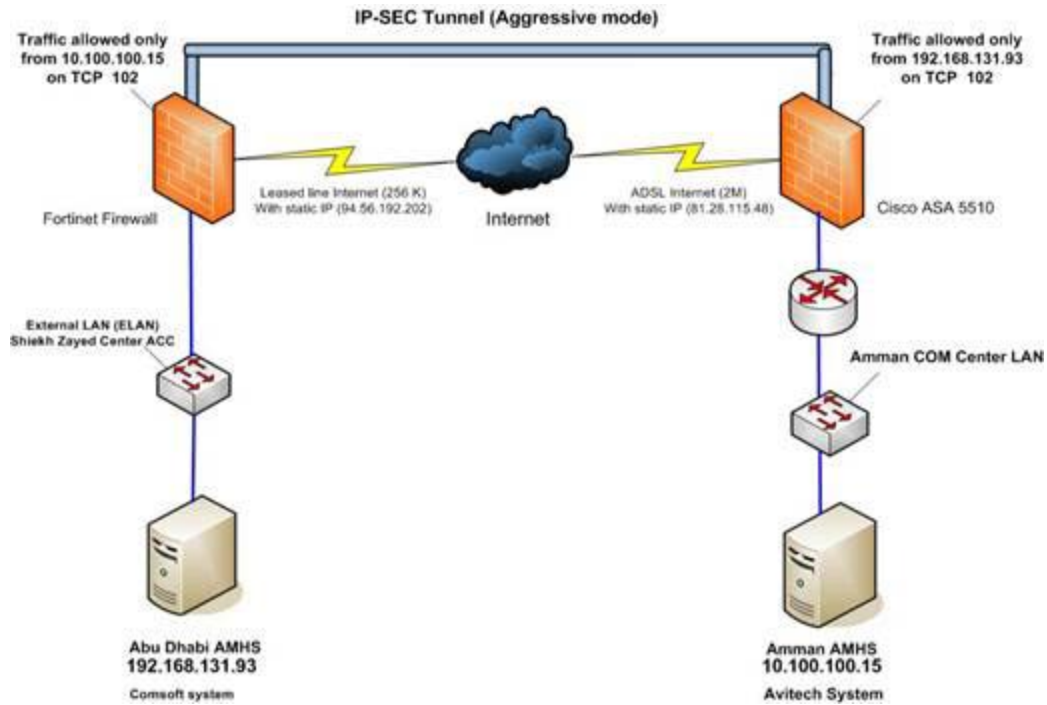


Figure 2-1: Network Infrastructure

3 CONFIGURATION OF BOTH SYSTEMS

3.1 Addressing Schemes

IUT-A implements the CAAS addressing scheme and IUT-B implements the XF addressing scheme.

3.2 User and DL Addresses

The test user and DL addresses used are derived from /1/, sections 3.1 and 3.2. In IUT-A the following address space is used:

O/R Address Component	Value
C	XX
ADMD	ICAO
PRMD	OJ
O	OJAC
OU1	OJAM
CN	OJAMFTNA
	...
	OJAMMHS
	...

Table 3-1: User Addresses in IUT-A

In IUT-A the following DLs are used:

Distribution List Name	Member Addresses included in the DL
OJAMDLO	OMAEFTNA, OMAEFTNB, OMAEMHSA
OJAMDLRE	OJAMFTNA, OJAMFTNB, OJAMMHS

Table 3-2: Distribution Lists in IUT-A

In IUT-B the following address space is used:

O/R Address Component	Value
C	XX
ADMD	ICAO
PRMD	OM
O	AFTN
OU1	OMAEFTNA
	...
	OMAEMHSA
	...

Table 3-3: User Addresses in IUT-B



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In IUT-B the following DLs are used:

Distribution List Name	Member Addresses included in the DL
OMAEDLLO	OJAMFTNA, OJAMFTNB, OJAMMHTSA
OMAEDLRE	OMAFTNA, OMAFTNB, OMAEMHTSA

Table 3-4: Distribution Lists in IUT-B

3.3 Address Look-Up Table

In order to ensure correct translation of AFTN addresses into AMHS addresses and vice versa, the address look-up tables in both systems have to include the following entries:

Name	Nationality Letters	Country Name	ADMD Name	PRMD Name	Address scheme	ATNDir
Jordan	OJ	XX	ICAO	OJ	CAAS	C=JO
U.A.E.	OM	XX	ICAO	OM	XF	

Table 3-5: MD Look-Up Table

country-name	ADMD-name	PRMD-name	organization-name	organizational-unit-name
XX	ICAO	OJ	OJAC	OJAM

Table 3-6: CAAS Look-Up Table

Both IUT-A and IUT-B import the look-up tables AIRAC cycle “OPER.81” of 11.02.2010 which include the converting entries as specified in Table 3-5 and Table 3-6.

Note: With these tables the values of the “generic” look-up table as described in /1/, 3.4.1 are implicitly configured.

3.4 Routing Tables

The AFTN and AMHS routing tables must be in accordance with /1/, 3.3.1 (for IUT-A) and 3.3.2 (for IUT-B). Additionally, it must be ensured that operationally used addresses are not affected.

AFTN Routing Indicator	Routing Direction
OM	AFTN Circuit to JEDDAH
OMAEFT	MTCU
OMAEDL	MTCU
OMAEMH	MTCU
OJAMFT	AFTN Terminal(s)
OJAMD L	MTCU
OJAMMH	MTCU

Table 3-7: AFTN Routing Table in IUT-A

X.400 Routing Indicator	Routing Direction
/C=XX/ADMD=ICAO/PRMD=OJ	MTCU
/C=XX/ADMD=ICAO/PRMD=OJ/O=OJAC/OU1=OJAM/CN=OJAMM HSA	UA in IUT-A



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X.400 Routing Indicator	Routing Direction
/C=XX/ADMD=ICAO/PRMD=OJ/O=OJAC/OU1=OJAM/CN=OJAMMHSB	UA in IUT-A
/C=XX/ADMD=ICAO/PRMD=OJ/O=OJAC/OU1=OJAM/CN=OJAMMHSB	UA in IUT-A
/C=XX/ADMD=ICAO/PRMD=OJ/O=OJAC/OU1=OJAM/CN=OJAMDLLD	DL
/C=XX/ADMD=ICAO/PRMD=OJ/O=OJAC/OU1=OJAM/CN=OJAMDLRE	DL
/C=XX/ADMD=ICAO/PRMD=OM	MTA-OMAE-1

Table 3-8: X.400 Routing Table in IUT-A

AFTN Routing Indicator	Routing Direction
* (default route)	AFTN_BOX
OMAEMHS	AFTN_MTCU
OMAEYFYX	SVC_BOX
OJ	AFTN_MTCU

Table 3-9: AFTN Routing Table in IUT-B

X.400 Routing Indicator	Routing Direction
/C=XX/ADMD=ICAO/PRMD=OM	X400_MTCU
/C=XX/ADMD=ICAO/PRMD=OM/O=AFTN/OU1=OMAEMHSA	X400_ASDU
/C=XX/ADMD=ICAO/PRMD=OM/O=AFTN/OU1=OMAEMHSB	X400_ASDU
/C=XX/ADMD=ICAO/PRMD=OM/O=AFTN/OU1=OMAEMHSC	X400_ASDU
/C=XX/ADMD=ICAO/PRMD=OM/O=AFTN/OU1=OMAEDLLO	DL
/C=XX/ADMD=ICAO/PRMD=OM/O=AFTN/OU1=OMAEDLRE	DL
/C=XX/ADMD=ICAO/PRMD=OJ	MTA-OJAM-1

Table 3-10: X.400 Routing Table in IUT-B

3.5 Local User Address Book

An address book for local use in any UA is defined in /1/, section 3.5.1. Alternatively, a UA may use the directory service, if implemented, for the automatic translation of AFTN addresses entered by the user into AMHS O/R addresses and vice versa.

3.6 General Parameters

The following general parameters are agreed between both test partners.

3.6.1 MTA Authentication Parameters

	IUT-A	IUT-B
MTA Name	MTA-OJAM-1	MTA-OMAE-1
Password	ICAO-OJAM-1	ICAO-OMAE-1
Authentication	simple	simple
Check Network Address	Yes	Yes

Table 3-11: MTA Authentication Parameters

3.6.2 X.400 Protocol Type

	IUT-A	IUT-B
X.400 Protocol Type	X.400 (1988)	X.400 (1988)

Table 3-12: X.400 Protocol Type

3.6.3 Dialogue Mode, Type and Number of Associations

	IUT-A	IUT-B
Dialogue Mode	monologue	monologue
Type	permanent	on demand with idle time of 30 seconds
Number	3, one association reserved for messages of MTS – Priority URGENT, one association reserved for messages of MTS – Priorities URGENT and NORMAL	3

Table 3-13: Dialogue Mode, Type and number of associations

3.6.4 Service Access Points

	IUT-A	IUT-B
PSAP	---	---
SSAP	---	---
TSAP	MHS	P1

Table 3-14: Service Access Points

3.6.5 Network Addresses

It is agreed that IPv4 is used on the network layer.

	IUT-A	IUT-B
IPv4 Address	10.100.100.15	192.168.131.93
Port No.	102	102

Table 3-15: Network addresses

3.6.6 TCP Parameters

	IUT-A	IUT-B
tcp_keepalive_time	60 seconds	60 seconds
tcp_keepalive_intvl	5 seconds	5 seconds
tcp_keepalive_probes	3	3

Table 3-16: TCP Parameters



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4 TEST RESULTS

The test results will be documented in a separate test report /2/.

End of document

ATN/IPS WG/3
Appendix 3C to the Report on Agenda Item 3



Meeting on additional functions for MID Region in the EUR-AMC

Objective: To discuss the possibilities of providing full AMC Service or support the ICAO MID Region as requested by the Regional Director of the ICAO Cairo Office.

Participants:

Mr. Yuksel Eyuboglu, EUROCONTROL
Mr. Dimitris Apsouris, EUROCONTROL
Mr. Yaser Ziad JORDAN
Mrs. Muna Annaddaf, JORDAN

Meeting Venue: EUROCONTROL HQ, Brussels

Meeting Date: 5th July, 2011

Agenda:

1. Welcome and Introduction.
2. Approval of Agenda.
3. Presentation of ATS activities in MID Region and EUR/NAT Region.
4. Discussion on the requirements for Network Management Center for MID Region.
5. Identifications of options concerning possible EUROCONTROL support.
6. Recommendation on the way forward.
7. AOB

Discussion:

1. Under Agenda Item 3, the AMHS implementation activities in both EUR/NAT and MID regions were presented briefly.

ATN/IPS WG/3

Appendix 3C to the Report on Agenda Item 3

2. Concerning item 4, with respect to the network management requirements of the MID Region, EUROCONTROL was informed that the MID Region needs one additional function (Routing Management) not the full AMC service. The Routing Management Function is currently provided only to the EUR/NAT States.
3. Under agenda item 5 possible options were discussed to satisfy the needs of the MID Region as follows:

3.1 Provision of AMC Routing Management Function to the MID Region.

This option is considered short term, easy to implement and no modification will be required in the AMC. Only additional AMC operational effort will be required to carry out the routing management function for MID Region. It is estimated that this effort would be approximately 50k€ per year. The current AMC operator contract will be renewed in the last quarter of 2011. This option can be included in that contract.

3.2 Modification of AMC, so that each region manages its own data.

Major modification would be needed for the AMC architecture, including modification of the functions, procedures, documents, training materials and the AMC application. This is considered the most complex solution and may take 1 or 1.5 year to implement. In this option since each region manages its own data no additional AMC operator costs required for Europe, however there would be additional development and implementation costs. The related development and implementation costs for this option could be estimated by EUROCONTROL if this option is selected.

3.3 Supporting the MID Region to develop its own AMC.

This is a long term option; EUROCONTROL will be able to provide development, implementation and operational support on request. This includes:

- Support / Interpretation of ATS Messaging Management Manual,
- Support / Interpretation of AMC Implementation Specification,
- Support for development of MID Region AMC Application,
- Setting up of the AMC infrastructure, including LAN/WAN and Application Server, Database Server, Web Server, firewalls etc...
- Support for setting up the organization including the steering group and technical support group,
- Possible provision of AMC application with or without source code,
- Support for development of synchronization functions and procedures between the regions.
- Training the AMC operators and the users.
- etc...

4. under agenda item 6,

Action 1: it was decided that EUROCONTROL will provide more information concerning the contents, time scales and costs especially for option 3.

Action 2: In parallel, the MID Region, via Cairo Office Regional Director (preferably ICAO HQ), will send an official request to the DG of EUROCONTROL indicating the option(s) they intend to implement.

5. Next meeting is not planned; the work will be carried out by e-mail or teleconference if required.

-- END --

Introduction

This survey has been developed for the purpose of collecting information about the existing IP infrastructure between the states in-order to come with a unified IP scheme plan for the ICAO MID Region ATN.

General Information:

State:	.....Bahrain		
Does IP network existing in place?			
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No			
Is Aviation systems connected together over IP?			
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No			
Who to contact if more details or clarification is required?			
Name:	... Hussain Ebrahim		
Title:	... Senior Network Engineer		
Email:	... hebrahim@caa.gov.bh		
Telephone:	...+973 39653659	Fax:	...+973 17321992

Link Specific Information:

Please fill the following form **for each link** between your State and neighboring State within ICAO MID-Region and other ICAO Regions.

1	Connection From:	State: ... Bahrain	Location: ... Manama
2	Connection To:	State: ... KSA	Location: ... Riyadh
3	Service Provider:	Batelco	
4	Link Speed:	... 64 ... Kbps	
5	Link Type:	<input checked="" type="checkbox"/> Leased Circuit <input type="checkbox"/> Frame-relay <input type="checkbox"/> V-SAT <input type="checkbox"/> MPLS <input type="checkbox"/> Other	
6	IP version:	<input checked="" type="checkbox"/> IPv4 <input type="checkbox"/> IPv6	
7	IP Subnet:	<input checked="" type="checkbox"/> 10.61.11.12 Netmask: 255.255.255.252 <input type="checkbox"/> 172.____.____ Netmask: _____.____.____. <input type="checkbox"/> 192.168.____.____ Netmask: _____.____.____. <input type="checkbox"/> Other: Netmask: _____.____.____.	
8	Router	Manufacturer: ... Motorola Model: VanGuard 6435	
9	Router Interfaces Supported*:	<input checked="" type="checkbox"/> Async Serial <input checked="" type="checkbox"/> Sync Serial <input checked="" type="checkbox"/> Ethernet <input type="checkbox"/> Other:	
10	Supported Routing Protocols*:	<input checked="" type="checkbox"/> RIP <input checked="" type="checkbox"/> OSPF <input type="checkbox"/> BGP <input type="checkbox"/> IS-IS <input type="checkbox"/> Other:	
11	Supported Voice Signaling on router*:	<input type="checkbox"/> SIP <input checked="" type="checkbox"/> H.323 <input type="checkbox"/> Other:	
12	Data Applications in use*:	<input type="checkbox"/> AFTN <input type="checkbox"/> AMHS <input type="checkbox"/> OLDI <input type="checkbox"/> Other:	
13	Voice Applications in use*:	<input checked="" type="checkbox"/> ATC Voice <input type="checkbox"/> VHF Voice <input type="checkbox"/> Other Voice:	
14	Data end user interface:	<input type="checkbox"/> Serial <input type="checkbox"/> IP based (Answer Below) <input type="checkbox"/> Other:	
15	Security measures between LAN and WAN*:	<input type="checkbox"/> Single-firewall (Type:) <input type="checkbox"/> IPS (Type:) <input type="checkbox"/> Dual-firewall (Types:) <input type="checkbox"/> Other:	
16	Voice end user interface*:	<input checked="" type="checkbox"/> FXS/FXO <input type="checkbox"/> ISDN <input type="checkbox"/> VoIP <input type="checkbox"/> Other:	

* Choose all that apply

Introduction

This survey has been developed for the purpose of collecting information about the existing IP infrastructure between the states in-order to come with a unified IP scheme plan for the ICAO MID Region ATN.

General Information:

State:	.....Bahrain		
Does IP network existing in place?			
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No			
Is Aviation systems connected together over IP?			
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No			
Who to contact if more details or clarification is required?			
Name:	... Hussain Ebrahim		
Title:	... Senior Network Engineer		
Email:	... hebrahim@caa.gov.bh		
Telephone:	...+973 39653659	Fax:	...+973 17321992

Link Specific Information:

Please fill the following form **for each link** between your State and neighboring State within ICAO MID-Region and other ICAO Regions.

1	Connection From:	State: ... Bahrain	Location: ... Manama
2	Connection To:	State: ... Iran	Location: ... Tehran
3	Service Provider:	Batelco	
4	Link Speed:	... 64 ... Kbps	
5	Link Type:	<input checked="" type="checkbox"/> Leased Circuit <input type="checkbox"/> Frame-relay <input type="checkbox"/> V-SAT <input type="checkbox"/> MPLS <input type="checkbox"/> Other	
6	IP version:	<input checked="" type="checkbox"/> IPv4 <input type="checkbox"/> IPv6	
7	IP Subnet:	<input checked="" type="checkbox"/> 10.x.x.x Netmask: x.x.x.x <input type="checkbox"/> 172..... Netmask: <input type="checkbox"/> 192.168..... Netmask: <input type="checkbox"/> Other: Netmask:	
8	Router	Manufacturer: ... Cisco Model: 2800 series	
9	Router Interfaces Supported*:	<input checked="" type="checkbox"/> Async Serial <input checked="" type="checkbox"/> Sync Serial <input checked="" type="checkbox"/> Ethernet <input type="checkbox"/> Other:	
10	Supported Routing Protocols*:	<input checked="" type="checkbox"/> RIP <input checked="" type="checkbox"/> OSPF <input checked="" type="checkbox"/> BGP <input type="checkbox"/> IS-IS <input type="checkbox"/> Other:	
11	Supported Voice Signaling on router*:	<input type="checkbox"/> SIP <input checked="" type="checkbox"/> H.323 <input type="checkbox"/> Other:	
12	Data Applications in use*:	<input checked="" type="checkbox"/> AFTN <input type="checkbox"/> AMHS <input type="checkbox"/> OLDI <input type="checkbox"/> Other:	
13	Voice Applications in use*:	<input checked="" type="checkbox"/> ATC Voice <input type="checkbox"/> VHF Voice <input type="checkbox"/> Other Voice:	
14	Data end user interface:	<input checked="" type="checkbox"/> Serial <input type="checkbox"/> IP based (Answer Below) <input type="checkbox"/> Other:	
15	Security measures between LAN and WAN*:	<input type="checkbox"/> Single-firewall (Type:) <input type="checkbox"/> IPS (Type:) <input type="checkbox"/> Dual-firewall (Types:) <input type="checkbox"/> Other:	
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General Information:

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Email:	... hebrahim@caa.gov.bh		
Telephone:	...+973 39653659	Fax:	...+973 17321992

Link Specific Information:

Please fill the following form **for each link** between your State and neighboring State within ICAO MID-Region and other ICAO Regions.

1	Connection From:	State: ... Bahrain	Location: ... Manama
2	Connection To:	State: ... Kuwait	Location: ... Kuwait
3	Service Provider:	Batelco	
4	Link Speed:	... 64 ... Kbps	
5	Link Type:	<input checked="" type="checkbox"/> Leased Circuit <input type="checkbox"/> Frame-relay <input type="checkbox"/> V-SAT <input type="checkbox"/> MPLS <input type="checkbox"/> Other	
6	IP version:	<input checked="" type="checkbox"/> IPv4 <input type="checkbox"/> IPv6	
7	IP Subnet:	<input checked="" type="checkbox"/> 10.61.11.8 Netmask: 255.255.255.252 <input type="checkbox"/> 172.____.____ Netmask: _____.____.____. <input type="checkbox"/> 192.168.____.____ Netmask: _____.____.____. <input type="checkbox"/> Other: Netmask: _____.____.____.	
8	Router	Manufacturer: ... Motorola Model: VanGuard 6435	
9	Router Interfaces Supported*:	<input checked="" type="checkbox"/> Async Serial <input checked="" type="checkbox"/> Sync Serial <input checked="" type="checkbox"/> Ethernet <input type="checkbox"/> Other:	
10	Supported Routing Protocols*:	<input checked="" type="checkbox"/> RIP <input checked="" type="checkbox"/> OSPF <input type="checkbox"/> BGP <input type="checkbox"/> IS-IS <input type="checkbox"/> Other:	
11	Supported Voice Signaling on router*:	<input type="checkbox"/> SIP <input checked="" type="checkbox"/> H.323 <input type="checkbox"/> Other:	
12	Data Applications in use*:	<input checked="" type="checkbox"/> AFTN <input type="checkbox"/> AMHS <input type="checkbox"/> OLDI <input checked="" type="checkbox"/> Other: ... Radar	
13	Voice Applications in use*:	<input checked="" type="checkbox"/> ATC Voice <input type="checkbox"/> VHF Voice <input type="checkbox"/> Other Voice:	
14	Data end user interface:	<input checked="" type="checkbox"/> Serial <input type="checkbox"/> IP based (Answer Below) <input type="checkbox"/> Other:	
15	Security measures between LAN and WAN*:	<input type="checkbox"/> Single-firewall (Type:) <input type="checkbox"/> IPS (Type:) <input type="checkbox"/> Dual-firewall (Types:).	
16	Voice end user interface*:	<input checked="" type="checkbox"/> FXS/FXO <input type="checkbox"/> ISDN <input type="checkbox"/> VoIP <input type="checkbox"/> Other:	

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State: Bahrain		
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<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No			
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Email:	... hebrahim@caa.gov.bh		
Telephone:	...+973 39653659	Fax:	...+973 17321992

Link Specific Information:

Please fill the following form **for each link** between your State and neighboring State within ICAO MID-Region and other ICAO Regions.

1	Connection From:	State: ... Bahrain	Location: ... Manama
2	Connection To:	State: ... KSA	Location: ... Jeddah
3	Service Provider:	Batelco	
4	Link Speed:	... 64 ... Kbps	
5	Link Type:	<input checked="" type="checkbox"/> Leased Circuit <input type="checkbox"/> Frame-relay <input type="checkbox"/> V-SAT <input type="checkbox"/> MPLS <input type="checkbox"/> Other	
6	IP version:	<input checked="" type="checkbox"/> IPv4 <input type="checkbox"/> IPv6	
7	IP Subnet:	<input checked="" type="checkbox"/> 10.61.11.48 Netmask: 255.255.255.252 <input type="checkbox"/> 172.____.____ Netmask: _____.____.____. <input type="checkbox"/> 192.168.____.____ Netmask: _____.____.____. <input type="checkbox"/> Other: Netmask: _____.____.____.	
8	Router	Manufacturer: ... Motorola Model: VanGuard 6435	
9	Router Interfaces Supported*:	<input checked="" type="checkbox"/> Async Serial <input checked="" type="checkbox"/> Sync Serial <input checked="" type="checkbox"/> Ethernet <input type="checkbox"/> Other:	
10	Supported Routing Protocols*:	<input checked="" type="checkbox"/> RIP <input checked="" type="checkbox"/> OSPF <input type="checkbox"/> BGP <input type="checkbox"/> IS-IS <input type="checkbox"/> Other:	
11	Supported Voice Signaling on router*:	<input type="checkbox"/> SIP <input checked="" type="checkbox"/> H.323 <input type="checkbox"/> Other:	
12	Data Applications in use*:	<input type="checkbox"/> AFTN <input type="checkbox"/> AMHS <input type="checkbox"/> OLDI <input checked="" type="checkbox"/> Other: ... CIDIN	
13	Voice Applications in use*:	<input checked="" type="checkbox"/> ATC Voice <input type="checkbox"/> VHF Voice <input type="checkbox"/> Other Voice:	
14	Data end user interface:	<input checked="" type="checkbox"/> Serial <input type="checkbox"/> IP based (Answer Below) <input type="checkbox"/> Other:	
15	Security measures between LAN and WAN*:	<input type="checkbox"/> Single-firewall (Type:) <input type="checkbox"/> IPS (Type:) <input type="checkbox"/> Dual-firewall (Types:) <input checked="" type="checkbox"/> Other:	
16	Voice end user interface*:	<input checked="" type="checkbox"/> FXS/FXO <input type="checkbox"/> ISDN <input type="checkbox"/> VoIP <input type="checkbox"/> Other:	

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- END -

Attachment B

Introduction

This survey has been developed for the purpose of collecting information about the existing IP infrastructure between the states in-order to come with a unified IP scheme plan for the ICAO MID Region ATN.

General Information:

State: Bahrain		
Does IP network existing in place?			
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<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No			
Who to contact if more details or clarification is required?			
Name:	... Hussain Ebrahim		
Title:	... Senior Network Engineer		
Email:	... hebrahim@caa.gov.bh		
Telephone:	...+973 39653659	Fax:	...+973 17321992

Link Specific Information:

Please fill the following form **for each link** between your State and neighboring State within ICAO MID-Region and other ICAO Regions.

1	Connection From:	State: ... Bahrain	Location: ... Manama
2	Connection To:	State: ... Qatar	Location: ... Doha - 2
3	Service Provider:	Batelco	
4	Link Speed:	... 64 ... Kbps	
5	Link Type:	<input checked="" type="checkbox"/> Leased Circuit <input type="checkbox"/> Frame-relay <input type="checkbox"/> V-SAT <input type="checkbox"/> MPLS <input type="checkbox"/> Other	
6	IP version:	<input checked="" type="checkbox"/> IPv4 <input type="checkbox"/> IPv6	
7	IP Subnet:	<input checked="" type="checkbox"/> 10.61.11.56 Netmask: 255.255.255.252 <input type="checkbox"/> 172.____.____ Netmask: _____.____.____. <input type="checkbox"/> 192.168.____.____ Netmask: _____.____.____. <input type="checkbox"/> Other: Netmask: _____.____.____.	
8	Router	Manufacturer: ... Motorola Model: VanGuard 6455	
9	Router Interfaces Supported*:	<input checked="" type="checkbox"/> Async Serial <input checked="" type="checkbox"/> Sync Serial <input checked="" type="checkbox"/> Ethernet <input type="checkbox"/> Other:	
10	Supported Routing Protocols*:	<input checked="" type="checkbox"/> RIP <input checked="" type="checkbox"/> OSPF <input type="checkbox"/> BGP <input type="checkbox"/> IS-IS <input type="checkbox"/> Other:	
11	Supported Voice Signaling on router*:	<input type="checkbox"/> SIP <input checked="" type="checkbox"/> H.323 <input type="checkbox"/> Other:	
12	Data Applications in use*:	<input checked="" type="checkbox"/> AFTN <input type="checkbox"/> AMHS <input type="checkbox"/> OLDI <input type="checkbox"/> Other:	
13	Voice Applications in use*:	<input checked="" type="checkbox"/> ATC Voice <input type="checkbox"/> VHF Voice <input type="checkbox"/> Other Voice:	
14	Data end user interface:	<input checked="" type="checkbox"/> Serial <input type="checkbox"/> IP based (Answer Below) <input type="checkbox"/> Other:	
15	Security measures between LAN and WAN*:	<input type="checkbox"/> Single-firewall (Type:) <input type="checkbox"/> IPS (Type:) <input type="checkbox"/> Dual-firewall (Types:) <input type="checkbox"/> Other:	
16	Voice end user interface*:	<input checked="" type="checkbox"/> FXS/FXO <input type="checkbox"/> ISDN <input type="checkbox"/> VoIP <input type="checkbox"/> Other:	

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Attachment B

Introduction

This survey has been developed for the purpose of collecting information about the existing IP infrastructure between the states in-order to come with a unified IP scheme plan for the ICAO MID Region ATN.

General Information:

State:	.....Bahrain		
Does IP network existing in place?			
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No			
Is Aviation systems connected together over IP?			
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No			
Who to contact if more details or clarification is required?			
Name:	... Hussain Ebrahim		
Title:	... Senior Network Engineer		
Email:	... hebrahim@caa.gov.bh		
Telephone:	...+973 39653659	Fax:	...+973 17321992

Link Specific Information:

Please fill the following form **for each link** between your State and neighboring State within ICAO MID-Region and other ICAO Regions.

1	Connection From:	State: ... Bahrain	Location: ... Manama
2	Connection To:	State: ... Qatar	Location: ... Doha - 1
3	Service Provider:	Batelco	
4	Link Speed:	... 64 ... Kbps	
5	Link Type:	<input checked="" type="checkbox"/> Leased Circuit <input type="checkbox"/> Frame-relay <input type="checkbox"/> V-SAT <input type="checkbox"/> MPLS <input type="checkbox"/> Other	
6	IP version:	<input checked="" type="checkbox"/> IPv4 <input type="checkbox"/> IPv6	
7	IP Subnet:	<input checked="" type="checkbox"/> 10.61.11.32 Netmask: 255.255.255.252 <input type="checkbox"/> 172.____.____ Netmask: _____.____.____. <input type="checkbox"/> 192.168.____.____ Netmask: _____.____.____. <input type="checkbox"/> Other: Netmask: _____.____.____.	
8	Router	Manufacturer: ... Motorola Model: VanGuard 6455	
9	Router Interfaces Supported*:	<input checked="" type="checkbox"/> Async Serial <input checked="" type="checkbox"/> Sync Serial <input checked="" type="checkbox"/> Ethernet <input type="checkbox"/> Other:	
10	Supported Routing Protocols*:	<input checked="" type="checkbox"/> RIP <input checked="" type="checkbox"/> OSPF <input type="checkbox"/> BGP <input type="checkbox"/> IS-IS <input type="checkbox"/> Other:	
11	Supported Voice Signaling on router*:	<input type="checkbox"/> SIP <input checked="" type="checkbox"/> H.323 <input type="checkbox"/> Other:	
12	Data Applications in use*:	<input type="checkbox"/> AFTN <input type="checkbox"/> AMHS <input type="checkbox"/> OLDI <input checked="" type="checkbox"/> Other: ... Radar	
13	Voice Applications in use*:	<input checked="" type="checkbox"/> ATC Voice <input type="checkbox"/> VHF Voice <input type="checkbox"/> Other Voice:	
14	Data end user interface:	<input checked="" type="checkbox"/> Serial <input type="checkbox"/> IP based (Answer Below) <input type="checkbox"/> Other:	
15	Security measures between LAN and WAN*:	<input type="checkbox"/> Single-firewall (Type:) <input type="checkbox"/> IPS (Type:) <input type="checkbox"/> Dual-firewall (Types:) <input checked="" type="checkbox"/> Other:	
16	Voice end user interface*:	<input checked="" type="checkbox"/> FXS/FXO <input type="checkbox"/> ISDN <input type="checkbox"/> VoIP <input type="checkbox"/> Other:	

* Choose all that apply

Attachment B

Introduction

This survey has been developed for the purpose of collecting information about the existing IP infrastructure between the states in-order to come with a unified IP scheme plan for the ICAO MID Region ATN.

General Information:

State:	.....<u>Bahrain</u>		
Does IP network existing in place?			
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No			
Is Aviation systems connected together over IP?			
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No			
Who to contact if more details or clarification is required?			
Name:	... <u>Hussain Ebrahim</u>		
Title:	... <u>Senior Network Engineer</u>		
Email:	... <u>hebrahim@caa.gov.bh</u>		
Telephone:	... <u>+973 39653659</u>	Fax:	... <u>+973 17321992</u>

Link Specific Information:

Please fill the following form **for each link** between your State and neighboring State within ICAO MID-Region and other ICAO Regions.

1	Connection From:	State: ... <u>Bahrain</u>	Location: ... <u>Manama</u>
2	Connection To:	State: ... <u>KSA</u>	Location: ... <u>Dammam</u>
3	Service Provider:	<u>Batelco</u>	
4	Link Speed:	... <u>64</u> ... Kbps	
5	Link Type:	<input checked="" type="checkbox"/> Leased Circuit <input type="checkbox"/> Frame-relay <input type="checkbox"/> V-SAT <input type="checkbox"/> MPLS <input type="checkbox"/> Other	
6	IP version:	<input checked="" type="checkbox"/> IPv4 <input type="checkbox"/> IPv6	
7	IP Subnet:	<input checked="" type="checkbox"/> <u>10.61.11.44</u> Netmask: <u>255.255.255.252</u> <input type="checkbox"/> 172.____.____.____ Netmask: _____.____.____.____ <input type="checkbox"/> 192.168.____.____ Netmask: _____.____.____.____ <input type="checkbox"/> Other: Netmask: _____.____.____.____	
8	Router	Manufacturer: ... <u>Motorola</u> Model: <u>VanGuard 6435</u>	
9	Router Interfaces Supported*:	<input checked="" type="checkbox"/> Async Serial <input checked="" type="checkbox"/> Sync Serial <input checked="" type="checkbox"/> Ethernet <input type="checkbox"/> Other:	
10	Supported Routing Protocols*:	<input checked="" type="checkbox"/> RIP <input checked="" type="checkbox"/> OSPF <input type="checkbox"/> BGP <input type="checkbox"/> IS-IS <input type="checkbox"/> Other:	
11	Supported Voice Signaling on router*:	<input type="checkbox"/> SIP <input checked="" type="checkbox"/> H.323 <input type="checkbox"/> Other:	
12	Data Applications in use*:	<input type="checkbox"/> AFTN <input type="checkbox"/> AMHS <input type="checkbox"/> OLDI <input type="checkbox"/> Other:	
13	Voice Applications in use*:	<input checked="" type="checkbox"/> ATC Voice <input type="checkbox"/> VHF Voice <input type="checkbox"/> Other Voice:	
14	Data end user interface:	<input type="checkbox"/> Serial <input type="checkbox"/> IP based (Answer Below) <input type="checkbox"/> Other:	
15	Security measures between LAN and WAN*:	<input type="checkbox"/> Single-firewall (Type:) <input type="checkbox"/> IPS (Type:) <input type="checkbox"/> Dual-firewall (Types:) <input type="checkbox"/> Other:	
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* Choose all that apply

Attachment B

Introduction

This survey has been developed for the purpose of collecting information about the existing IP infrastructure between the states in-order to come with a unified IP scheme plan for the ICAO MID Region ATN.

General Information:

State:	.....Bahrain		
Does IP network existing in place?			
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No			
Is Aviation systems connected together over IP?			
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Who to contact if more details or clarification is required?			
Name:	... Hussain Ebrahim		
Title:	... Senior Network Engineer		
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Telephone:	...+973 39653659	Fax:	...+973 17321992

Link Specific Information:

Please fill the following form **for each link** between your State and neighboring State within ICAO MID-Region and other ICAO Regions.

1	Connection From:	State: ... Bahrain	Location: ... Manama
2	Connection To:	State: ... UAE	Location: ... Abu Dhabi - 2 ...
3	Service Provider:	Batelco	
4	Link Speed:	... 64 ... Kbps	
5	Link Type:	<input checked="" type="checkbox"/> Leased Circuit <input type="checkbox"/> Frame-relay <input type="checkbox"/> V-SAT <input type="checkbox"/> MPLS <input type="checkbox"/> Other	
6	IP version:	<input checked="" type="checkbox"/> IPv4 <input type="checkbox"/> IPv6	
7	IP Subnet:	<input checked="" type="checkbox"/> 10.61.11.16 Netmask: 255.255.255.252 <input type="checkbox"/> 172.____.____ Netmask: _____.____.____. <input type="checkbox"/> 192.168.____.____ Netmask: _____.____.____. <input type="checkbox"/> Other: Netmask: _____.____.____.	
8	Router	Manufacturer: ... Motorola Model: VanGuard 6455	
9	Router Interfaces Supported*:	<input checked="" type="checkbox"/> Async Serial <input checked="" type="checkbox"/> Sync Serial <input checked="" type="checkbox"/> Ethernet <input type="checkbox"/> Other:	
10	Supported Routing Protocols*:	<input checked="" type="checkbox"/> RIP <input checked="" type="checkbox"/> OSPF <input type="checkbox"/> BGP <input type="checkbox"/> IS-IS <input type="checkbox"/> Other:	
11	Supported Voice Signaling on router*:	<input type="checkbox"/> SIP <input checked="" type="checkbox"/> H.323 <input type="checkbox"/> Other:	
12	Data Applications in use*:	<input type="checkbox"/> AFTN <input type="checkbox"/> AMHS <input type="checkbox"/> OLDI <input checked="" type="checkbox"/> Other: ... CIDIN	
13	Voice Applications in use*:	<input checked="" type="checkbox"/> ATC Voice <input type="checkbox"/> VHF Voice <input type="checkbox"/> Other Voice:	
14	Data end user interface:	<input checked="" type="checkbox"/> Serial <input type="checkbox"/> IP based (Answer Below) <input type="checkbox"/> Other:	
15	Security measures between LAN and WAN*:	<input type="checkbox"/> Single-firewall (Type:) <input type="checkbox"/> IPS (Type:) <input type="checkbox"/> Dual-firewall (Types:) <input checked="" type="checkbox"/> Other:	
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Please fill the following form **for each link** between your State and neighboring State within ICAO MID-Region and other ICAO Regions.

1	Connection From:	State: ... Bahrain	Location: ... Manama
2	Connection To:	State: ... UAE	Location: ... Abu Dhabi - 1 ...
3	Service Provider:	Batelco	
4	Link Speed:	... 64 ... Kbps	
5	Link Type:	<input checked="" type="checkbox"/> Leased Circuit <input type="checkbox"/> Frame-relay <input type="checkbox"/> V-SAT <input type="checkbox"/> MPLS <input type="checkbox"/> Other	
6	IP version:	<input checked="" type="checkbox"/> IPv4 <input type="checkbox"/> IPv6	
7	IP Subnet:	<input checked="" type="checkbox"/> 10.61.11.12 Netmask: 255.255.255.252 <input type="checkbox"/> 172.____.____ Netmask: _____.____.____. <input type="checkbox"/> 192.168.____.____ Netmask: _____.____.____. <input type="checkbox"/> Other: Netmask: _____.____.____.	
8	Router	Manufacturer: ... Motorola Model: VanGuard 6435	
9	Router Interfaces Supported*:	<input checked="" type="checkbox"/> Async Serial <input checked="" type="checkbox"/> Sync Serial <input checked="" type="checkbox"/> Ethernet <input type="checkbox"/> Other:	
10	Supported Routing Protocols*:	<input checked="" type="checkbox"/> RIP <input checked="" type="checkbox"/> OSPF <input type="checkbox"/> BGP <input type="checkbox"/> IS-IS <input type="checkbox"/> Other:	
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Link Specific Information:

Please fill the following form **for each link** between your State and neighboring State within ICAO MID-Region and other ICAO Regions.

1	Connection From:	State: ... Bahrain	Location: ... Manama
2	Connection To:	State: ... Iran	Location: ... Tehran
3	Service Provider:	Batelco	
4	Link Speed:	... 64 ... Kbps	
5	Link Type:	<input checked="" type="checkbox"/> Leased Circuit <input type="checkbox"/> Frame-relay <input type="checkbox"/> V-SAT <input type="checkbox"/> MPLS <input type="checkbox"/> Other	
6	IP version:	<input checked="" type="checkbox"/> IPv4 <input type="checkbox"/> IPv6	
7	IP Subnet:	<input checked="" type="checkbox"/> ____ . ____ . ____ . ____ Netmask: ____ . ____ . ____ . ____ <input type="checkbox"/> 172.16.10.2 Netmask: 255.255.255.0 <input type="checkbox"/> 192.168. ____ . ____ Netmask: ____ . ____ . ____ . ____ <input type="checkbox"/> Other: Netmask: ____ . ____ . ____ . ____	
8	Router	Manufacturer: ... Cisco Model: 2800 series	
9	Router Interfaces Supported*:	<input checked="" type="checkbox"/> Async Serial <input checked="" type="checkbox"/> Sync Serial <input checked="" type="checkbox"/> Ethernet <input type="checkbox"/> Other:	
10	Supported Routing Protocols*:	<input checked="" type="checkbox"/> RIP <input checked="" type="checkbox"/> OSPF <input checked="" type="checkbox"/> BGP <input type="checkbox"/> IS-IS <input type="checkbox"/> Other:	
11	Supported Voice Signaling on router*:	<input type="checkbox"/> SIP <input checked="" type="checkbox"/> H.323 <input type="checkbox"/> Other:	
12	Data Applications in use*:	<input checked="" type="checkbox"/> AFTN <input type="checkbox"/> AMHS <input type="checkbox"/> OLDI <input type="checkbox"/> Other:	
13	Voice Applications in use*:	<input checked="" type="checkbox"/> ATC Voice <input type="checkbox"/> VHF Voice <input type="checkbox"/> Other Voice:	
14	Data end user interface:	<input checked="" type="checkbox"/> Serial <input type="checkbox"/> IP based (Answer Below) <input type="checkbox"/> Other:	
15	Security measures between LAN and WAN*:	<input type="checkbox"/> Single-firewall (Type:) <input type="checkbox"/> IPS (Type:) <input type="checkbox"/> Dual-firewall (Types:) <input type="checkbox"/> Other:	
16	Voice end user interface*:	<input checked="" type="checkbox"/> FXS/FXO <input type="checkbox"/> ISDN <input type="checkbox"/> VoIP <input type="checkbox"/> Other:	

* Choose all that apply

Attachment B

Introduction

This survey has been developed for the purpose of collecting information about the existing IP infrastructure between the states in-order to come with a unified IP scheme plan for the ATN in the MID Region.

General Information:

State:	.....Egypt.....		
Does IP network existing in place?			
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No			
Is Aviation systems connected together over IP?			
<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No			
Who to contact if more details or clarification is required?			
Name:	Mahmoud Aly Ramadan.....		
Title:	Information Systems. G.D.....		
Email:	Mahmoud.ramadan53@gmail.com.....		
Telephone:	0020106541506.....	Fax	002022685293.....

Link Specific Information:

Please fill the following form **for each link** between your State and neighboring State within ICAO MID-Region and other ICAO Regions.

1	Connection From:	State: ...Egypt...	Location: .....Cairo.....
2	Connection To:	State: ...Jordan...	Location: .....Amman.....
3	Service Provider:	Telecom Egypt (ATM)	
4	Link Speed:	...64..... Kbps	
5	Link Type:	<input checked="" type="checkbox"/> Leased Circuit <input checked="" type="checkbox"/> Frame-relay <input type="checkbox"/> V-SAT <input type="checkbox"/> MPLS <input type="checkbox"/> Other	
6	IP version:	<input checked="" type="checkbox"/> IPv4 <input type="checkbox"/> IPv6	
7	IP Subnet:	<input type="checkbox"/> 10.10.10.1 Netmask: 255.255.255.0 <input type="checkbox"/> 172..... Netmask: <input type="checkbox"/> 192.168..... Netmask: <input type="checkbox"/> Other: Netmask:	
8	Router	Manufacturer: .....Vanguard..... Model: .....6800.....	
9	Router Interfaces Supported*:	<input checked="" type="checkbox"/> Async Serial <input checked="" type="checkbox"/> Sync Serial <input checked="" type="checkbox"/> Ethernet <input type="checkbox"/> Other:	
10	Supported Routing Protocols*:	<input checked="" type="checkbox"/> RIP <input checked="" type="checkbox"/> OSPF <input type="checkbox"/> BGP <input type="checkbox"/> IS-IS <input type="checkbox"/> Other:	
11	Supported Voice Signaling on router*:	<input checked="" type="checkbox"/> SIP <input checked="" type="checkbox"/> H.323 <input type="checkbox"/> Other:	
12	Data Applications in use*:	<input checked="" type="checkbox"/> AFTN <input type="checkbox"/> AMHS <input type="checkbox"/> OLDI <input type="checkbox"/> Other:	
13	Voice Applications in use*:	<input checked="" type="checkbox"/> ATC Voice <input type="checkbox"/> VHF Voice <input checked="" type="checkbox"/> Other Voice: .....HOT LINE.....	
14	Data end user interface:	<input checked="" type="checkbox"/> Serial <input type="checkbox"/> IP based (Answer Below) <input type="checkbox"/> Other:	
15	Security measures between LAN and WAN*:	<input checked="" type="checkbox"/> Single-firewall (Type:) <input type="checkbox"/> IPS (Type:) <input type="checkbox"/> Dual-firewall (Types:) <input type="checkbox"/> Other:	
16	Voice end user interface*:	<input checked="" type="checkbox"/> FXS/FXO <input type="checkbox"/> ISDN <input type="checkbox"/> VoIP <input type="checkbox"/> Other:	

* Choose all that apply

Attachment B

Introduction

This survey has been developed for the purpose of collecting information about the existing IP infrastructure between the states in-order to come with a unified IP scheme plan for the ATN in the MID Region.

General Information:

State:	.....Cairo.....		
Does IP network existing in place?			
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No			
Is Aviation systems connected together over IP?			
<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No			
Who to contact if more details or clarification is required?			
Name:	Mahmoud Aly Ramadan.....		
Title:	Information Systems. G.D.....		
Email:	Mahmoud.ramadan53@gmail.com.....		
Telephone:	0020106541506.....	Fax	002022685293...

Link Specific Information:

Please fill the following form **for each link** between your State and neighboring State within ICAO MID-Region and other ICAO Regions.

1	Connection From:	State: ...Egypt.....	Location: .....Cairo...
2	Connection To:	State: ...Greece.....	Location: Athens.....
3	Service Provider:	Telecom Egypt (ATM)	
4	Link Speed:	.....64..... Kbps	
5	Link Type:	<input checked="" type="checkbox"/> Leased Circuit <input checked="" type="checkbox"/> Frame-relay <input type="checkbox"/> V-SAT <input type="checkbox"/> MPLS <input type="checkbox"/> Other	
6	IP version:	<input checked="" type="checkbox"/> IPv4 <input type="checkbox"/> IPv6	
7	IP Subnet:	<input type="checkbox"/> 10..10.10.1 Netmask: _____._____._____._____ <input type="checkbox"/> 172.____.____.____ Netmask: _____._____._____._____ <input type="checkbox"/> 192.168.____.____ Netmask: _____._____._____._____ <input type="checkbox"/> Other: Netmask: _____._____._____._____	
8	Router	Manufacturer: .....Cisco..... Model: .....2850.....	
9	Router Interfaces Supported*:	<input checked="" type="checkbox"/> Async Serial <input checked="" type="checkbox"/> Sync Serial <input checked="" type="checkbox"/> Ethernet <input type="checkbox"/> Other:	
10	Supported Routing Protocols*:	<input checked="" type="checkbox"/> RIP <input checked="" type="checkbox"/> OSPF <input type="checkbox"/> BGP <input type="checkbox"/> IS-IS <input type="checkbox"/> Other:	
11	Supported Voice Signaling on router*:	<input checked="" type="checkbox"/> SIP <input checked="" type="checkbox"/> H.323 <input type="checkbox"/> Other:	
12	Data Applications in use*:	<input checked="" type="checkbox"/> AFTN <input type="checkbox"/> AMHS <input type="checkbox"/> OLDI <input checked="" type="checkbox"/> Other: .....CIDIN.....	
13	Voice Applications in use*:	<input checked="" type="checkbox"/> ATC Voice <input type="checkbox"/> VHF Voice <input checked="" type="checkbox"/> Other Voice: .....HotLine.....	
14	Data end user interface:	<input checked="" type="checkbox"/> Serial <input type="checkbox"/> IP based (Answer Below) <input type="checkbox"/> Other:	
15	Security measures between LAN and WAN*:	<input checked="" type="checkbox"/> Single-firewall (Type:) <input type="checkbox"/> IPS (Type:) <input type="checkbox"/> Dual-firewall (Types:) <input type="checkbox"/> Other:	
16	Voice end user interface*:	<input checked="" type="checkbox"/> FXS/FXO <input type="checkbox"/> ISDN <input type="checkbox"/> VoIP <input type="checkbox"/> Other:	

* Choose all that apply

Attachment B

Introduction

This survey has been developed for the purpose of collecting information about the existing IP infrastructure between the states in-order to come with a unified IP scheme plan for the ATN in the MID Region.

General Information:

State:	.....Egypt.....		
Does IP network existing in place?			
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No			
Is Aviation systems connected together over IP?			
<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No			
Who to contact if more details or clarification is required?			
Name:	Mahmoud Aly Ramadan.....		
Title:	Information Systems. G.D.....		
Email:	Mahmoud.ramadan53@gmail.com.....		
Telephone:	0020106541506...	Fax	002022685293.....

Link Specific Information:

Please fill the following form **for each link** between your State and neighboring State within ICAO MID-Region and other ICAO Regions.

1	Connection From:	State: ...Egypt.....	Location: ...Cairo.....
2	Connection To:	State: ...Saudi Arabia	Location: ....Jeddah....
3	Service Provider:	Telecom Egypt (ATM)	
4	Link Speed:	.....128..... Kbps	
5	Link Type:	<input checked="" type="checkbox"/> Leased Circuit <input checked="" type="checkbox"/> Frame-relay <input type="checkbox"/> V-SAT <input type="checkbox"/> MPLS <input type="checkbox"/> Other	
6	IP version:	<input checked="" type="checkbox"/> IPv4 <input type="checkbox"/> IPv6	
7	IP Subnet:	<input type="checkbox"/> 10..... Netmask: <input type="checkbox"/> 172..... Netmask: <input type="checkbox"/> 192.168.12.244 Netmask: 255.255.255.0 <input type="checkbox"/> Other: Netmask:	
8	Router	Manufacturer: ...Vanguard	
		Model: .....6450.....	
9	Router Interfaces Supported*:	<input checked="" type="checkbox"/> Async Serial <input checked="" type="checkbox"/> Sync Serial <input checked="" type="checkbox"/> Ethernet <input type="checkbox"/> Other:	
10	Supported Routing Protocols*:	<input checked="" type="checkbox"/> RIP <input checked="" type="checkbox"/> OSPF <input type="checkbox"/> BGP <input type="checkbox"/> IS-IS <input type="checkbox"/> Other:	
11	Supported Voice Signaling on router*:	<input checked="" type="checkbox"/> SIP <input checked="" type="checkbox"/> H.323 <input type="checkbox"/> Other:	
12	Data Applications in use*:	<input checked="" type="checkbox"/> AFTN <input type="checkbox"/> AMHS <input type="checkbox"/> OLDI <input checked="" type="checkbox"/> Other: .....CIDIN.....	
13	Voice Applications in use*:	<input checked="" type="checkbox"/> ATC Voice <input type="checkbox"/> VHF Voice <input checked="" type="checkbox"/> Other Voice: .....HotLine.....	
14	Data end user interface:	<input checked="" type="checkbox"/> Serial <input type="checkbox"/> IP based (Answer Below) <input type="checkbox"/> Other:	
15	Security measures between LAN and WAN*:	<input checked="" type="checkbox"/> Single-firewall (Type:) <input type="checkbox"/> IPS (Type:) <input type="checkbox"/> Dual-firewall (Types:	
16	Voice end user interface*:	<input checked="" type="checkbox"/> FXS/FXO <input type="checkbox"/> ISDN <input type="checkbox"/> VoIP <input type="checkbox"/> Other:	

* Choose all that apply

Attachment B

Introduction

This survey has been developed for the purpose of collecting information about the existing IP infrastructure between the states in-order to come with a unified IP scheme plan for the ATN in the MID Region.

General Information:

State:	.....Egypt.....		
Does IP network existing in place?			
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No			
Is Aviation systems connected together over IP?			
<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No			
Who to contact if more details or clarification is required?			
Name:	Mahmoud Aly Ramadan.....		
Title:	Information Systems. G.D.....		
Email:	Mahmoud.ramadan53@gmail.com.....		
Telephone:	0020106541506...	Fax	002022685293.....

Link Specific Information:

Please fill the following form **for each link** between your State and neighboring State within ICAO MID-Region and other ICAO Regions.

1	Connection From:	State: ...Egypt.....	Location: ...Cairo.....
2	Connection To:	State: ...Saudi Arabia	Location: ....Riyad....
3	Service Provider:	Telecom Egypt (ATM)	
4	Link Speed:	.....64..... Kbps	
5	Link Type:	<input checked="" type="checkbox"/> Leased Circuit <input checked="" type="checkbox"/> Frame-relay <input type="checkbox"/> V-SAT <input type="checkbox"/> MPLS <input type="checkbox"/> Other	
6	IP version:	<input checked="" type="checkbox"/> IPv4 <input type="checkbox"/> IPv6	
7	IP Subnet:	<input type="checkbox"/> 10.10.10.1 Netmask: 255.255.255.0 <input type="checkbox"/> 172.____.____ Netmask: _____.____._____ <input type="checkbox"/> 192.168..... Netmask: ... <input type="checkbox"/> Other: Netmask: _____.____._____	
8	Router	Manufacturer: ...Cisco Model: .....2850.....	
9	Router Interfaces Supported*:	<input checked="" type="checkbox"/> Async Serial <input checked="" type="checkbox"/> Sync Serial <input checked="" type="checkbox"/> Ethernet <input type="checkbox"/> Other:	
10	Supported Routing Protocols*:	<input checked="" type="checkbox"/> RIP <input checked="" type="checkbox"/> OSPF <input type="checkbox"/> BGP <input type="checkbox"/> IS-IS <input type="checkbox"/> Other:	
11	Supported Voice Signaling on router*:	<input checked="" type="checkbox"/> SIP <input checked="" type="checkbox"/> H.323 <input type="checkbox"/> Other:	
12	Data Applications in use*:	<input type="checkbox"/> AFTN <input type="checkbox"/> AMHS <input checked="" type="checkbox"/> OLDI <input type="checkbox"/> Other:	
13	Voice Applications in use*:	<input checked="" type="checkbox"/> ATC Voice <input type="checkbox"/> VHF Voice <input type="checkbox"/> Other Voice:	
14	Data end user interface:	<input checked="" type="checkbox"/> Serial <input type="checkbox"/> IP based (Answer Below) <input type="checkbox"/> Other:	
15	Security measures between LAN and WAN*:	<input checked="" type="checkbox"/> Single-firewall (Type:) <input type="checkbox"/> IPS (Type:) <input type="checkbox"/> Dual-firewall (Types:	
16	Voice end user interface*:	<input checked="" type="checkbox"/> FXS/FXO <input type="checkbox"/> ISDN <input type="checkbox"/> VoIP <input type="checkbox"/> Other:	

* Choose all that apply

Attachment B

Introduction

This survey has been developed for the purpose of collecting information about the existing IP infrastructure between the states in-order to come with a unified IP scheme plan for the ATN in the MID Region.

General Information:

State:	.....Egypt.....		
Does IP network existing in place?			
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No			
Is Aviation systems connected together over IP?			
<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No			
Who to contact if more details or clarification is required?			
Name:	Mahmoud Aly Ramadan.....		
Title:	Information Systems. G.D.....		
Email:	Mahmoud.ramadan53@gmail.com.....		
Telephone:	0020106541506.....	Fax	002022685293...

Link Specific Information:

Please fill the following form **for each link** between your State and neighboring State within ICAO MID-Region and other ICAO Regions.

1	Connection From:	State: ...Egypt.....	Location: .....Cairo...
2	Connection To:	State: ...Libya.....	Location: Tripoli.....
3	Service Provider:	TEDATA Network	
4	Link Speed:	.....64..... Kbps	
5	Link Type:	<input checked="" type="checkbox"/> Leased Circuit <input type="checkbox"/> Frame-relay <input type="checkbox"/> V-SAT <input type="checkbox"/> MPLS <input type="checkbox"/> Other	
6	IP version:	<input checked="" type="checkbox"/> IPv4 <input type="checkbox"/> IPv6	
7	IP Subnet:	<input type="checkbox"/> 10..10.10.1 Netmask: 255.255.255.0 <input type="checkbox"/> 172..... Netmask: <input type="checkbox"/> 192.168..... Netmask: <input type="checkbox"/> Other: Netmask:	
8	Router	Manufacturer: .....Cisco..... Model: .....1700.....	
9	Router Interfaces Supported*:	<input checked="" type="checkbox"/> Async Serial <input checked="" type="checkbox"/> Sync Serial <input checked="" type="checkbox"/> Ethernet <input type="checkbox"/> Other:	
10	Supported Routing Protocols*:	<input checked="" type="checkbox"/> RIP <input checked="" type="checkbox"/> OSPF <input type="checkbox"/> BGP <input type="checkbox"/> IS-IS <input type="checkbox"/> Other:	
11	Supported Voice Signaling on router*:	<input checked="" type="checkbox"/> SIP <input checked="" type="checkbox"/> H.323 <input type="checkbox"/> Other:	
12	Data Applications in use*:	<input checked="" type="checkbox"/> AFTN <input type="checkbox"/> AMHS <input type="checkbox"/> OLDI <input type="checkbox"/> Other:	
13	Voice Applications in use*:	<input type="checkbox"/> ATC Voice <input type="checkbox"/> VHF Voice <input type="checkbox"/> Other Voice:	
14	Data end user interface:	<input checked="" type="checkbox"/> Serial <input type="checkbox"/> IP based (Answer Below) <input type="checkbox"/> Other:	
15	Security measures between LAN and WAN*:	<input checked="" type="checkbox"/> Single-firewall (Type:) <input type="checkbox"/> IPS (Type:) <input type="checkbox"/> Dual-firewall (Types:) <input type="checkbox"/> Other:	
16	Voice end user interface*:	<input type="checkbox"/> FXS/FXO <input type="checkbox"/> ISDN <input type="checkbox"/> VoIP <input type="checkbox"/> Other:	

* Choose all that apply

Introduction

This survey has been developed for the purpose of collecting information about the existing IP infrastructure between the states in-order to come with a unified IP scheme plan for the MID-Region ATN.

General Information:

State:	SAUDI ARABIA.....		
Does IP network existing in place?			
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No			
Is Aviation systems connected together over IP?			
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No			
Who to contact if more details or clarification is required?			
Name:	AHMAD.....J.....MANNAN.....		
Title:	MANAGER, CEB.....		
Email:	amannan@qaca.gov.sa.....		
Telephone:	9662-6-717717x1254	Fax:	X 1885.....

Link Specific Information:

Please fill the following form for each link between you state and neighboring state within MID-Region:

1	Connection From:	State: SAUDI ARABIA	Location: JEDDAH.....
2	Connection To:	State: EGYPT.....	Location: CAIRO.....
3	Service Provider:	STC	
4	Link Speed:	128 Kbps	
5	Link Type:	<input checked="" type="checkbox"/> Leased Circuit <input type="checkbox"/> Frame-relay <input type="checkbox"/> V-SAT <input type="checkbox"/> MPLS <input type="checkbox"/> Other.....	
6	IP version:	<input checked="" type="checkbox"/> IPv4 <input type="checkbox"/> IPv6	
7	IP Subnet:	<input type="checkbox"/> 10..... Netmask:..... <input type="checkbox"/> 172..... Netmask:..... <input type="checkbox"/> 192.168.12.0 Netmask: 255.255.255.0 <input type="checkbox"/> Other:..... Netmask:.....	
8	Router	Manufacturer: MOTOROLA..... Model: VANGUARD 6455.....	
9	Router Interfaces Supported*:	<input type="checkbox"/> Async Serial <input checked="" type="checkbox"/> Sync Serial <input checked="" type="checkbox"/> Ethernet <input type="checkbox"/> Other:.....	
10	Supported Routing Protocols*:	<input checked="" type="checkbox"/> RIP <input type="checkbox"/> OSPF <input type="checkbox"/> BGP <input type="checkbox"/> IS-IS <input type="checkbox"/> Other:.....	
11	Supported Voice Signaling on router*:	<input type="checkbox"/> SIP <input checked="" type="checkbox"/> H.323 <input type="checkbox"/> Other:.....	
12	Data Applications in use*:	<input type="checkbox"/> AFTN <input checked="" type="checkbox"/> AMHS <input type="checkbox"/> OLDI <input type="checkbox"/> Other:.....	
13	Voice Applications in use*:	<input checked="" type="checkbox"/> ATC Voice <input type="checkbox"/> VHF Voice <input checked="" type="checkbox"/> Other Voice: COMM CENTRE	

14	Data end user interface:	<input type="checkbox"/> Serial	<input checked="" type="checkbox"/> IP based (Answer Below)
		<input type="checkbox"/> Other:	
15	Security measures between LAN and WAN*:	<input type="checkbox"/> Single-firewall (Type:)	
		<input type="checkbox"/> IPS (Type:)	
		<input checked="" type="checkbox"/> Dual-firewall (Types:)	
16	Voice end user interface*:	<input checked="" type="checkbox"/> FXS/FXO	<input type="checkbox"/> ISDN
		<input type="checkbox"/> VoIP	
		<input type="checkbox"/> Other:	

* Choose all that apply

Introduction

This survey has been developed for the purpose of collecting information about the existing IP infrastructure between the states in-order to come with a unified IP scheme plan for the MID-Region ATN.

General Information:

State:	SAUDI ARABIA		
Does IP network existing in place?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		
Is Aviation systems connected together over IP?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		
Who to contact if more details or clarification is required?	Name: AHMAD J. MANNAN		
Title:	MANAGER, CEB		
Email:	amannan@gaca.gov.sa		
Telephone:	9626717717x1254	Fax:	x 1885

Link Specific Information:

Please fill the following form for each link between you state and neighboring state within MID-Region:

1	Connection From:	State: SAUDI ARABIA	Location: JEDDAH
2	Connection To:	State: JORDAN	Location: AMMAN
3	Service Provider:	STC	
4	Link Speed:	64 Kbps	
5	Link Type:	<input checked="" type="checkbox"/> Leased Circuit <input type="checkbox"/> MPLS	<input type="checkbox"/> Frame-relay <input type="checkbox"/> Other <input type="checkbox"/> V-SAT
6	IP version:	<input checked="" type="checkbox"/> IPv4	<input type="checkbox"/> IPv6
7	IP Subnet:	<input type="checkbox"/> 10. <input type="checkbox"/> 172. <input checked="" type="checkbox"/> 192.168.12.0 <input type="checkbox"/> Other:	Netmask: Netmask: Netmask: 255.255.255.0 Netmask:
8	Router	Manufacturer: MOTOROLA Model: VANGUARD 6455	
9	Router Interfaces Supported*:	<input type="checkbox"/> Async Serial <input type="checkbox"/> Other:	<input checked="" type="checkbox"/> Sync Serial <input checked="" type="checkbox"/> Ethernet
10	Supported Routing Protocols*:	<input checked="" type="checkbox"/> RIP <input type="checkbox"/> Other:	<input type="checkbox"/> OSPF <input type="checkbox"/> BGP <input type="checkbox"/> IS-IS
11	Supported Voice Signaling on router*:	<input type="checkbox"/> SIP <input checked="" type="checkbox"/> H.323	<input type="checkbox"/> Other:
12	Data Applications in use*:	<input type="checkbox"/> AFTN <input type="checkbox"/> Other:	<input checked="" type="checkbox"/> AMHS <input type="checkbox"/> OLDI
13	Voice Applications in use*:	<input checked="" type="checkbox"/> ATC Voice <input type="checkbox"/> Other Voice:	<input type="checkbox"/> VHF Voice

14	Data end user interface:	<input type="checkbox"/> Serial	<input checked="" type="checkbox"/> IP based (Answer Below)	
		<input type="checkbox"/> Other:		
15	Security measures between LAN and WAN*:	<input type="checkbox"/> Single-firewall (Type:)		
		<input type="checkbox"/> IPS (Type:)		
		<input type="checkbox"/> Dual-firewall (Types:)		
16	Voice end user interface*:	<input checked="" type="checkbox"/> FXS/FXO	<input type="checkbox"/> ISDN	<input type="checkbox"/> VoIP
		<input type="checkbox"/> Other:		

* Choose all that apply

Introduction

This survey has been developed for the purpose of collecting information about the existing IP infrastructure between the states in-order to come with a unified IP scheme plan for the MID-Region ATN.

General Information:

State:	SAUDI ARABIA		
Does IP network existing in place?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		
Is Aviation systems connected together over IP?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		
Who to contact if more details or clarification is required?	Name: AHMAD I. MANNAN		
Title:	MANAGER, CEB		
Email:	amannan@gaca.gov.sa		
Telephone:	962-671-7717-x1254	Fax:	x1885

Link Specific Information:

Please fill the following form for each link between you state and neighboring state within MID-Region:

1	Connection From:	State: SAUDI ARABIA	Location: JEDDAH
2	Connection To:	State: OMAN	Location: MUSCAT
3	Service Provider:	STC	
4	Link Speed:	64 Kbps	
5	Link Type:	<input checked="" type="checkbox"/> Leased Circuit <input type="checkbox"/> MPLS	<input type="checkbox"/> Frame-relay <input type="checkbox"/> Other <input type="checkbox"/> V-SAT
6	IP version:	<input checked="" type="checkbox"/> IPv4	<input type="checkbox"/> IPv6
7	IP Subnet:	<input type="checkbox"/> 10. <input type="checkbox"/> 172. <input checked="" type="checkbox"/> 192.168.12.0 <input type="checkbox"/> Other:	Netmask: Netmask: Netmask: 255.255.255.0 Netmask:
8	Router	Manufacturer: CISCO Model: 2811 ISR	
9	Router Interfaces Supported*:	<input type="checkbox"/> Async Serial <input checked="" type="checkbox"/> Sync Serial <input checked="" type="checkbox"/> Ethernet <input type="checkbox"/> Other:	
10	Supported Routing Protocols*:	<input checked="" type="checkbox"/> RIP <input checked="" type="checkbox"/> OSPF <input checked="" type="checkbox"/> BGP <input type="checkbox"/> IS-IS <input type="checkbox"/> Other:	
11	Supported Voice Signaling on router*:	<input type="checkbox"/> SIP <input checked="" type="checkbox"/> H.323 <input type="checkbox"/> Other:	
12	Data Applications in use*:	<input checked="" type="checkbox"/> AFTN <input type="checkbox"/> AMHS <input type="checkbox"/> OLDI <input type="checkbox"/> Other:	
13	Voice Applications in use*:	<input type="checkbox"/> ATC Voice <input type="checkbox"/> VHF Voice <input checked="" type="checkbox"/> Other Voice: COMM CENTRE	

14	Data end user interface:	<input type="checkbox"/> Serial	<input checked="" type="checkbox"/> IP based (Answer Below)	
		<input type="checkbox"/> Other:		
15	Security measures between LAN and WAN*:	<input type="checkbox"/> Single-firewall (Type:)		
		<input type="checkbox"/> IPS (Type:)		
		<input type="checkbox"/> Dual-firewall (Types:)		
16	Voice end user interface*:	<input checked="" type="checkbox"/> FXS/FXO	<input type="checkbox"/> ISDN	<input type="checkbox"/> VoIP
		<input type="checkbox"/> Other:		

* Choose all that apply

Attachment B

Introduction

This survey has been developed for the purpose of collecting information about the existing IP infrastructure between the states in-order to come with a unified IP scheme plan for the ICAO MID Region ATN.

General Information:

State:	Tehran – Bahrain 64K.....		
Does IP network existing in place?			
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No			
Is Aviation systems connected together over IP?			
<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No			
Who to contact if more details or clarification is required?			
Name:	BAHMAN BAGHERI		
Title:	Manager Aeronautical Com Dept. IRAN IAC		
Email:	b.bagheri.iac@gmail.com		
Telephone :	+98 21 66025408..... ...	Fax:	Fax:+98 21 44665478..... ...

Link Specific Information:

Please fill the following form **for each link** between your State and neighboring State within ICAO MID-Region and other ICAO Regions.

1	Connection From:	State: Tehran	Location: ACC.....
2	Connection To:	State: Bahrain	Location: ACC.....
3	Service Provider:	Iranian Tele-communication Company	
4	Link Speed:	...64... Kbps	
5	Link Type:	<input type="checkbox"/> Leased Circuit <input type="checkbox"/> Frame-relay <input type="checkbox"/> V-SAT <input checked="" type="checkbox"/> MPLS <input checked="" type="checkbox"/> Other ...Point-To-Point VPN	
6	IP version:	<input checked="" type="checkbox"/> IPv4 <input type="checkbox"/> IPv6	
7	IP Subnet:	<input type="checkbox"/> 10..... Netmask: <input checked="" type="checkbox"/> 172.16.10.0 Netmask: 255.255.255.0 <input type="checkbox"/> 192.168..... Netmask: <input type="checkbox"/> Other: Netmask:	
8	Router	Manufacturer: ...Cisco..... Model: .....2811.....	
9	Router Interfaces Supported*:	<input checked="" type="checkbox"/> Async Serial <input type="checkbox"/> Sync Serial <input type="checkbox"/> Ethernet <input type="checkbox"/> Other:	
10	Supported Routing Protocols*:	<input checked="" type="checkbox"/> RIP <input type="checkbox"/> OSPF <input type="checkbox"/> BGP <input type="checkbox"/> IS-IS <input checked="" type="checkbox"/> Other: ...Static.....	
11	Supported Voice Signaling on router*:	<input checked="" type="checkbox"/> SIP <input type="checkbox"/> H.323 <input type="checkbox"/> Other:	
12	Data Applications in use*:	<input checked="" type="checkbox"/> AFTN <input checked="" type="checkbox"/> AMHS <input checked="" type="checkbox"/> OLDI <input checked="" type="checkbox"/> Other: OLDI & AMHS are developed.....	
13	Voice Applications in use*:	<input checked="" type="checkbox"/> ATC Voice <input type="checkbox"/> VHF Voice <input type="checkbox"/> Other Voice:	
14	Data end user interface:	<input checked="" type="checkbox"/> Serial <input type="checkbox"/> IP based (Answer Below) <input type="checkbox"/> Other:	
15	Security measures between LAN and WAN*:	<input type="checkbox"/> Single-firewall (Type:) <input checked="" type="checkbox"/> IPS (Type:) <input type="checkbox"/> Dual-firewall (Types:	
16	Voice end user interface*:	<input checked="" type="checkbox"/> FXS/FXO <input type="checkbox"/> ISDN <input type="checkbox"/> VoIP	

	<input type="checkbox"/> Other:
--	---------------------------------------

* Choose all that apply

- END -

Attachment B

Introduction

This survey has been developed for the purpose of collecting information about the existing IP infrastructure between the states in-order to come with a unified IP scheme plan for the ICAO MID Region ATN.

General Information:

State:	Tehran – Baghdad 32K.....		
Does IP network existing in place?			
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No			
Is Aviation systems connected together over IP?			
<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No			
Who to contact if more details or clarification is required?			
Name:	BAHMAN BAGHERI		
Title:	Manager Aeronautical Com Dept. IRAN IAC		
Email:	b.bagheri.iac@gmail.com		
Telephone:	+98 21 66025408.....	Fax:	Fax:+98 21 44665478.....

Link Specific Information:

Please fill the following form **for each link** between your State and neighboring State within ICAO MID-Region and other ICAO Regions.

1	Connection From:	State: Tehran	Location: ACC.....
2	Connection To:	State:Baghdad	Location: ACC.....
3	Service Provider:	Iranian Tele-communication Company	
4	Link Speed:	...32... Kbps	
5	Link Type:	<input type="checkbox"/> Leased Circuit <input type="checkbox"/> Frame-relay <input checked="" type="checkbox"/> V-SAT <input type="checkbox"/> MPLS <input type="checkbox"/> Other	
6	IP version:	<input checked="" type="checkbox"/> IPv4 <input type="checkbox"/> IPv6	
7	IP Subnet:	<input type="checkbox"/> 10..... Netmask: <input type="checkbox"/> 172.16..... Netmask: <input type="checkbox"/> 192.168..... Netmask: <input type="checkbox"/> Other: Netmask:	
8	Router	Manufacturer: ...Cisco..... Model: .....2811.....	
9	Router Interfaces Supported*:	<input type="checkbox"/> Async Serial <input type="checkbox"/> Sync Serial <input checked="" type="checkbox"/> Ethernet <input type="checkbox"/> Other:	
10	Supported Routing Protocols*:	<input checked="" type="checkbox"/> RIP <input type="checkbox"/> OSPF <input type="checkbox"/> BGP <input type="checkbox"/> IS-IS <input checked="" type="checkbox"/> Other: ...Static.....	
11	Supported Voice Signaling on router*:	<input checked="" type="checkbox"/> SIP <input type="checkbox"/> H.323 <input type="checkbox"/> Other:	
12	Data Applications in use*:	<input checked="" type="checkbox"/> AFTN <input checked="" type="checkbox"/> AMHS <input checked="" type="checkbox"/> OLDI <input checked="" type="checkbox"/> Other: OLDI & AMHS are developed.....	
13	Voice Applications in use*:	<input checked="" type="checkbox"/> ATC Voice <input type="checkbox"/> VHF Voice <input type="checkbox"/> Other Voice:	
14	Data end user interface:	<input checked="" type="checkbox"/> Serial <input type="checkbox"/> IP based (Answer Below) <input type="checkbox"/> Other:	
15	Security measures between LAN and WAN*:	<input type="checkbox"/> Single-firewall (Type:) <input checked="" type="checkbox"/> IPS (Type:) <input type="checkbox"/> Dual-firewall (Types:)	
16	Voice end user interface*:	<input checked="" type="checkbox"/> FXS/FXO <input type="checkbox"/> ISDN <input type="checkbox"/> VoIP <input type="checkbox"/> Other:	

* Choose all that apply

- END -

Attachment B

Introduction

This survey has been developed for the purpose of collecting information about the existing IP infrastructure between the states in-order to come with a unified IP scheme plan for the ICAO MID Region ATN.

General Information:

State:	Tehran – Ankara 64K (ongoing).....		
Does IP network existing in place?			
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No			
Is Aviation systems connected together over IP?			
<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No			
Who to contact if more details or clarification is required?			
Name:	Bahman BAGHERI.....		
Title:	Manager Aeronautical Com Dept. IRAN IAC		
Email:	b.bagheri.iac@gmail.com		
Telephone:	+9821 66025408.....	Fax:	Fax:+98 21 44665478.....

Link Specific Information:

Please fill the following form **for each link** between your State and neighboring State within ICAO MID-Region and other ICAO Regions.

1	Connection From:	State: Tehran	Location: ACC.....
2	Connection To:	State: Ankara	Location: ACC.....
3	Service Provider:	Iranian Tele-communication Company	
4	Link Speed:	...64... Kbps	
5	Link Type:	<input type="checkbox"/> Leased Circuit <input type="checkbox"/> Frame-relay <input type="checkbox"/> V-SAT <input checked="" type="checkbox"/> MPLS <input checked="" type="checkbox"/> Other ...Point-To-Point VPN	
6	IP version:	<input checked="" type="checkbox"/> IPv4 <input type="checkbox"/> IPv6	
7	IP Subnet:	<input type="checkbox"/> 10..... Netmask: <input checked="" type="checkbox"/> 172.16.13.0 Netmask: 255.255.255.0 <input type="checkbox"/> 192.168..... Netmask: <input type="checkbox"/> Other: Netmask:	
8	Router	Manufacturer: ...Cisco..... Model: .....2811.....	
9	Router Interfaces Supported*:	<input checked="" type="checkbox"/> Async Serial <input type="checkbox"/> Sync Serial <input type="checkbox"/> Ethernet <input type="checkbox"/> Other:	
10	Supported Routing Protocols*:	<input checked="" type="checkbox"/> RIP <input type="checkbox"/> OSPF <input type="checkbox"/> BGP <input type="checkbox"/> IS-IS <input checked="" type="checkbox"/> Other: ...Static.....	
11	Supported Voice Signaling on router*:	<input checked="" type="checkbox"/> SIP <input type="checkbox"/> H.323 <input type="checkbox"/> Other:	
12	Data Applications in use*:	<input checked="" type="checkbox"/> AFTN <input checked="" type="checkbox"/> AMHS <input checked="" type="checkbox"/> OLDI <input checked="" type="checkbox"/> Other: OLDI & AMHS are developed.....	
13	Voice Applications in use*:	<input checked="" type="checkbox"/> ATC Voice <input type="checkbox"/> VHF Voice <input type="checkbox"/> Other Voice:	
14	Data end user interface:	<input checked="" type="checkbox"/> Serial <input type="checkbox"/> IP based (Answer Below) <input type="checkbox"/> Other:	
15	Security measures between LAN and WAN*:	<input type="checkbox"/> Single-firewall (Type:) <input checked="" type="checkbox"/> IPS (Type:) <input type="checkbox"/> Dual-firewall (Types:)	
16	Voice end user interface*:	<input checked="" type="checkbox"/> FXS/FXO <input type="checkbox"/> ISDN <input type="checkbox"/> VoIP <input type="checkbox"/> Other:	

* Choose all that apply

- END -

Attachment B

Introduction

This survey has been developed for the purpose of collecting information about the existing IP infrastructure between the states in-order to come with a unified IP scheme plan for the ICAO MID Region ATN.

General Information:

State:	Tehran – Kabul 32K.....		
Does IP network existing in place?			
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No			
Is Aviation systems connected together over IP?			
<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No			
Who to contact if more details or clarification is required?			
Name:	BAHMAN BAGHERI		
Title:	Manager Aeronautical Com Dept. IRAN IAC.....		
Email:	b.bagheri.iac@gmail.com		
Teleph one:	+98 21 66025408.....	Fax:	... Fax:+98 21 44665478.....

Link Specific Information:

Please fill the following form **for each link** between your State and neighboring State within ICAO MID-Region and other ICAO Regions.

1	Connection From:	State: Tehran	Location: ACC.....
2	Connection To:	State: Kabul	Location: ACC.....
3	Service Provider:	Iranian Tele-communication Company	
4	Link Speed:	...32... Kbps	
5	Link Type:	<input type="checkbox"/> Leased Circuit <input type="checkbox"/> Frame-relay <input checked="" type="checkbox"/> V-SAT <input type="checkbox"/> MPLS <input type="checkbox"/> Other	
6	IP version:	<input checked="" type="checkbox"/> IPv4 <input type="checkbox"/> IPv6	
7	IP Subnet:	<input type="checkbox"/> 10..... Netmask: <input type="checkbox"/> 172.16..... Netmask: <input type="checkbox"/> 192.168..... Netmask: <input type="checkbox"/> Other: Netmask:	
8	Router	Manufacturer: ...Cisco..... Model: .....2811.....	
9	Router Interfaces Supported*:	<input type="checkbox"/> Async Serial <input type="checkbox"/> Sync Serial <input checked="" type="checkbox"/> Ethernet <input type="checkbox"/> Other:	
10	Supported Routing Protocols*:	<input checked="" type="checkbox"/> RIP <input type="checkbox"/> OSPF <input type="checkbox"/> BGP <input type="checkbox"/> IS-IS <input checked="" type="checkbox"/> Other: ...Static.....	
11	Supported Voice Signaling on router*:	<input checked="" type="checkbox"/> SIP <input type="checkbox"/> H.323 <input type="checkbox"/> Other:	
12	Data Applications in use*:	<input checked="" type="checkbox"/> AFTN <input checked="" type="checkbox"/> AMHS <input checked="" type="checkbox"/> OLDI <input checked="" type="checkbox"/> Other: OLDI & AMHS are developed.....	
13	Voice Applications in use*:	<input checked="" type="checkbox"/> ATC Voice <input type="checkbox"/> VHF Voice <input type="checkbox"/> Other Voice:	
14	Data end user interface:	<input checked="" type="checkbox"/> Serial <input type="checkbox"/> IP based (Answer Below) <input type="checkbox"/> Other:	
15	Security measures between LAN and WAN*:	<input type="checkbox"/> Single-firewall (Type:) <input checked="" type="checkbox"/> IPS (Type:) <input type="checkbox"/> Dual-firewall (Types:)	

16	Voice end user interface*:	<input checked="" type="checkbox"/> FXS/FXO	<input type="checkbox"/> ISDN	<input type="checkbox"/> VoIP
		<input type="checkbox"/> Other:		

* Choose all that apply

- END -

Attachment B

Introduction

This survey has been developed for the purpose of collecting information about the existing IP infrastructure between the states in-order to come with a unified IP scheme plan for the ICAO MID Region ATN.

General Information:

State:	Tehran – Karachi 64K.....		
Does IP network existing in place?			
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No			
Is Aviation systems connected together over IP?			
<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No			
Who to contact if more details or clarification is required?			
Name:	... BAHMAN BAGHERI		
Title:	Manager Aeronautical Com Dept. IRAN IAC.....		
Email:	b.bagheri.iac@gmail.com.....		
Telephone:	...+98 21 66025408.....	Fax:	Fax:+98 21 44665478.....

Link Specific Information:

Please fill the following form **for each link** between your State and neighboring State within ICAO MID-Region and other ICAO Regions.

1	Connection From:	State: Tehran	Location: ACC.....
2	Connection To:	State: Karachi	Location: ACC.....
3	Service Provider:	Iranian Tele-communication Company	
4	Link Speed:	...64... Kbps	
5	Link Type:	<input type="checkbox"/> Leased Circuit <input type="checkbox"/> Frame-relay <input type="checkbox"/> V-SAT <input checked="" type="checkbox"/> MPLS <input checked="" type="checkbox"/> Other ...Point-To-Poin VPN	
6	IP version:	<input checked="" type="checkbox"/> IPv4 <input type="checkbox"/> IPv6	
7	IP Subnet:	<input type="checkbox"/> 10..... Netmask: <input checked="" type="checkbox"/> 172.16.11.0 Netmask: 255.255.255.0 <input type="checkbox"/> 192.168..... Netmask: <input type="checkbox"/> Other: Netmask:	
8	Router	Manufacturer: ...Cisco..... Model: .....2811.....	
9	Router Interfaces Supported*:	<input checked="" type="checkbox"/> Async Serial <input type="checkbox"/> Sync Serial <input type="checkbox"/> Ethernet <input type="checkbox"/> Other:	
10	Supported Routing Protocols*:	<input checked="" type="checkbox"/> RIP <input type="checkbox"/> OSPF <input type="checkbox"/> BGP <input type="checkbox"/> IS-IS <input checked="" type="checkbox"/> Other: ...Static.....	
11	Supported Voice Signaling on router*:	<input checked="" type="checkbox"/> SIP <input type="checkbox"/> H.323 <input type="checkbox"/> Other:	
12	Data Applications in use*:	<input checked="" type="checkbox"/> AFTN <input checked="" type="checkbox"/> AMHS <input checked="" type="checkbox"/> OLDI <input checked="" type="checkbox"/> Other: OLDI & AMHS are developed.....	
13	Voice Applications in use*:	<input checked="" type="checkbox"/> ATC Voice <input type="checkbox"/> VHF Voice <input type="checkbox"/> Other Voice:	
14	Data end user interface:	<input checked="" type="checkbox"/> Serial <input type="checkbox"/> IP based (Answer Below) <input type="checkbox"/> Other:	
15	Security measures between LAN and WAN*:	<input type="checkbox"/> Single-firewall (Type:) <input checked="" type="checkbox"/> IPS (Type:) <input type="checkbox"/> Dual-firewall (Types:	
16	Voice end user interface*:	<input checked="" type="checkbox"/> FXS/FXO <input type="checkbox"/> ISDN <input type="checkbox"/> VoIP	

		<input type="checkbox"/> Other:
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* Choose all that apply

- END -

Attachment B

Introduction

This survey has been developed for the purpose of collecting information about the existing IP infrastructure between the states in-order to come with a unified IP scheme plan for the ICAO MID Region ATN.

General Information:

State:	Tehran – Kuwait 64K.....		
Does IP network existing in place?			
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No			
Is Aviation systems connected together over IP?			
<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No			
Who to contact if more details or clarification is required?			
Name:	BAHMAN BAGHERI		
Title:	Manager Aeronautical Com Dept. IRAN IAC.....		
Email:	b.bagheri.iac@gmail.com.....		
Telephone :	+98 21 66025408..... ...	Fax:	Fax:+98 21 44665478..... ...

Link Specific Information:

Please fill the following form **for each link** between your State and neighboring State within ICAO MID-Region and other ICAO Regions.

1	Connection From:	State: Tehran	Location: ACC.....
2	Connection To:	State: Kuwait	Location: ACC.....
3	Service Provider:	Iranian Tele-communication Company	
4	Link Speed:	...64... Kbps	
5	Link Type:	<input type="checkbox"/> Leased Circuit <input type="checkbox"/> Frame-relay <input type="checkbox"/> V-SAT <input checked="" type="checkbox"/> MPLS <input checked="" type="checkbox"/> Other ...Point-To-Point VPN	
6	IP version:	<input checked="" type="checkbox"/> IPv4 <input type="checkbox"/> IPv6	
7	IP Subnet:	<input type="checkbox"/> 10..... Netmask: <input checked="" type="checkbox"/> 172.16.12.0 Netmask: 255.255.255.0 <input type="checkbox"/> 192.168..... Netmask: <input type="checkbox"/> Other: Netmask:	
8	Router	Manufacturer: ...Cisco..... Model: .....2811.....	
9	Router Interfaces Supported*:	<input checked="" type="checkbox"/> Async Serial <input type="checkbox"/> Sync Serial <input type="checkbox"/> Ethernet <input type="checkbox"/> Other:	
10	Supported Routing Protocols*:	<input checked="" type="checkbox"/> RIP <input type="checkbox"/> OSPF <input type="checkbox"/> BGP <input type="checkbox"/> IS-IS <input checked="" type="checkbox"/> Other: ...Static.....	
11	Supported Voice Signaling on router*:	<input checked="" type="checkbox"/> SIP <input type="checkbox"/> H.323 <input type="checkbox"/> Other:	
12	Data Applications in use*:	<input checked="" type="checkbox"/> AFTN <input checked="" type="checkbox"/> AMHS <input checked="" type="checkbox"/> OLDI <input checked="" type="checkbox"/> Other: OLDI & AMHS are developed.....	
13	Voice Applications in use*:	<input checked="" type="checkbox"/> ATC Voice <input type="checkbox"/> VHF Voice <input type="checkbox"/> Other Voice:	
14	Data end user interface:	<input checked="" type="checkbox"/> Serial <input type="checkbox"/> IP based (Answer Below) <input type="checkbox"/> Other:	
15	Security measures between LAN and WAN*:	<input type="checkbox"/> Single-firewall (Type:) <input checked="" type="checkbox"/> IPS (Type:) <input type="checkbox"/> Dual-firewall (Types:	
16	Voice end user interface*:	<input checked="" type="checkbox"/> FXS/FXO <input type="checkbox"/> ISDN <input type="checkbox"/> VoIP	

		<input type="checkbox"/> Other:
--	--	---------------------------------------

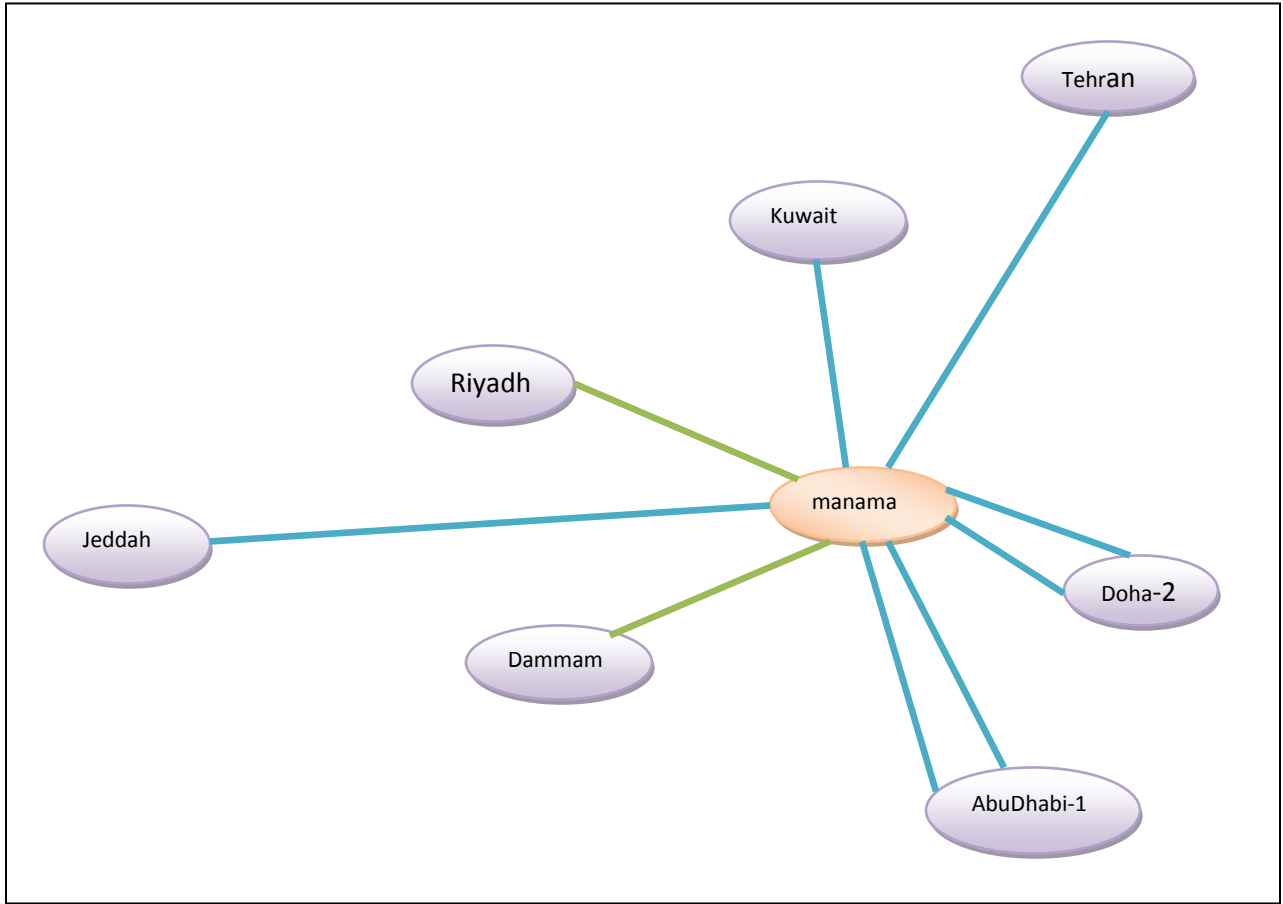
* Choose all that apply

- END -

ATN/IPS WG/3
 Appendix 3E to the Report on Agenda Item 3

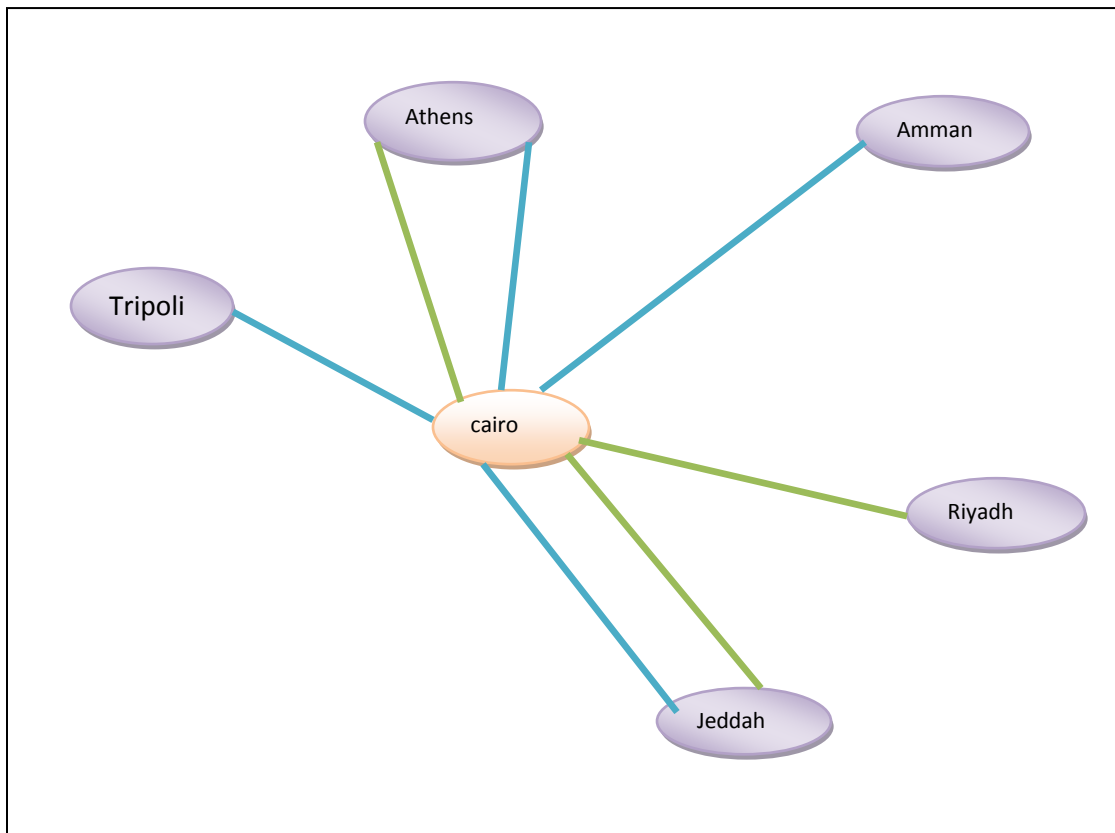
State Bahrain (Manama)

State	Speed	Protocol	IP Address	Net Mask	Router Type	IP.V	
Riyadh	64k	Leased line	10.61.11.12	255.255.255.252	Motorola Vangurd 6435	IPV4	Voice
Tehran	64k	Leased line	172.16.10.2	255.255.255.0	Cisco2800	IPV4	AFTN,Voice
Kuwait	64k	Leased line	10.61.11.8	255.255.255.252	Motorola Vangurd 6435	IPV4	AFTN,Radar, Voice
Jeddah	64k	Leased line	10.61.11.48	255.255.255.252	Motorola Vangurd 6435	IPV4	CIDIN,Voice
Doha-1	64k	Leased line	10.61.11.32	255.255.255.252	Motorola Vangurd 6455	IPV4	Radar,Voice
Doha-2	64k	Leased line	10.61.11.56	255.255.255.252	Motorola Vangurd 6455	IPV4	AFTN,Voice
Dammam	64k	Leased line	10.61.11.44	255.255.255.252	Motorola Vangurd 6435	IPV4	Voice
AbuDhabi-1	64k	Leased line	10.61.11.12	255.255.255.252	Motorola Vangurd 6435	IPV4	Radar,Voice
AbuDhabi-2	64k	Leased line	10.61.11.16	255.255.255.252	Motorola Vangurd 6435	IPV4	CIDIN,Voice



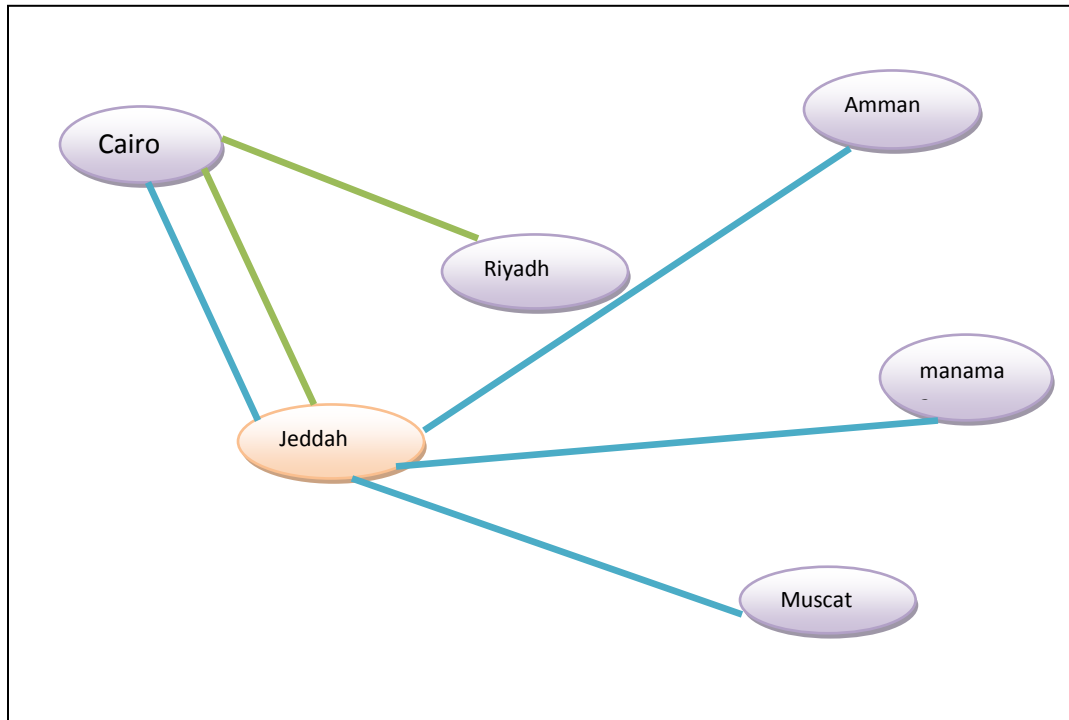
State Egypt (Cairo)

State	Speed		IP Address	Net Mask	Router Type	IP.V	
Amman	64k	Leased line	10.10.10.2 192.168.12.7	255.255.255.0	Motorola Vangurd 6800	IPV4	AMHS, Voice
Athens	64k	Leased line	192.168.80.2	255.255.255.0	Cisco2800	IPV4	Voice
Athens	64k	Leased line	10.10.10.1	255.255.255.0	Cisco2800	IPV4	CIDIN, Voice
Jeddah	64k	Leased line	192.168.80.2	255.255.255.25 2	Cisco2800	IPV4	Voice
Jeddah	128k	Leased line	192.168.12.2 44	255.255.255.0	Motorola Vangurd 6455	IPV4	AMHS, Voice
Riyadh	64k	Leased line	192.168.80.2	255.255.255.0	Cisco2800	IPV4	Voice
Tripoli	64k	Leased line	10.10.10.1	255.255.255.0	Cisco1700	IPV4	AFTN



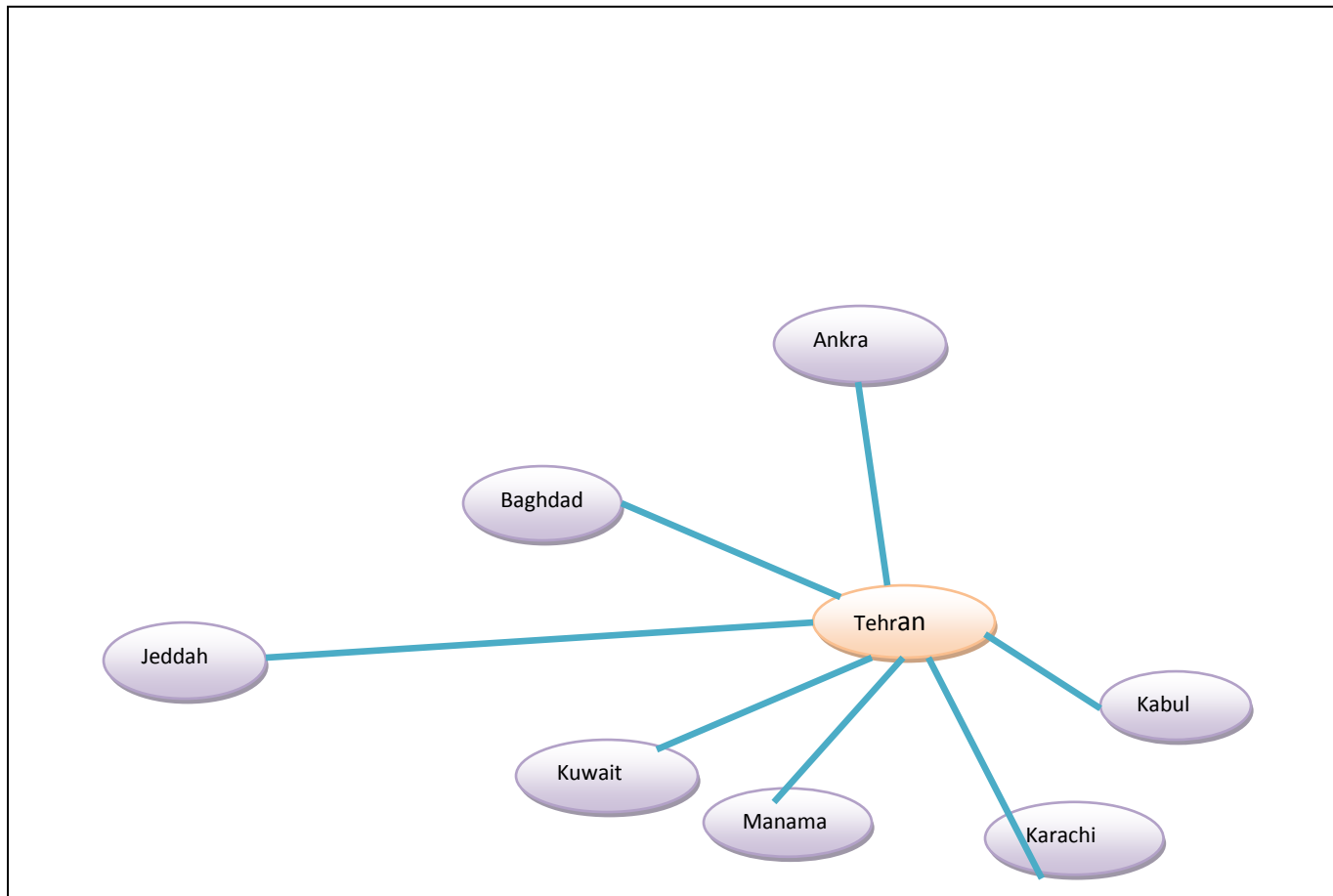
State Saudi Arabia(Jeddah)

State	Speed		IP Address	Net Mask	Router Type	IP.V	
Cairo	128k	Leased line	192.168.12.0	255.255.255.0	Motorola Vangurd 6455	IPV4	AMHS,Voice
Amman	64k	Leased line	192.168.12.0	255.255.255.0	Motorola Vangurd 6455	IPV4	AMHS,Voice
Muscat	64k	Leased line	192.168.12.0	255.255.255.0	Cisco 2811	IPV4	AFTN,Voice
Manama	64k	Leased line	TBD	TBD	Motorola Vangurd 6435	IPV4	CIDIN,Voice



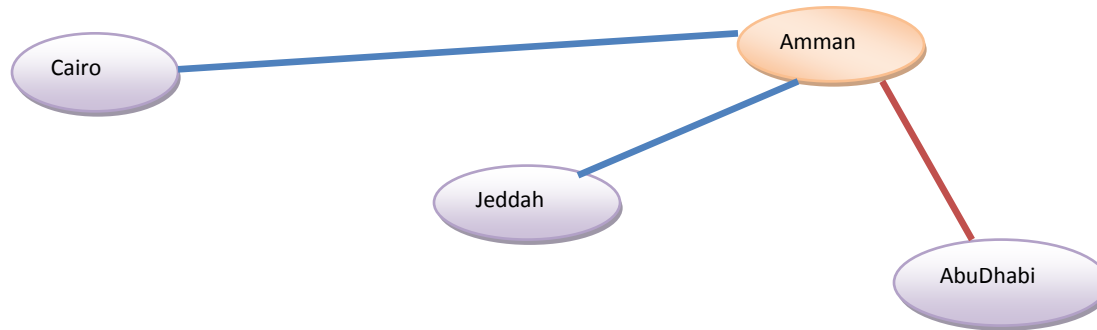
State IRAN(Tehran)

State	Speed		IP Address	Net Mask	Router Type	IP.V	
Manama	64k	MPLS	172.16.10.0	255.255.255.0	Cisco2811	IPV4	AFTN,Voice
Baghdad	32k	V-SAT	TBD	TBD	Cisco2811	IPV4	AFTN,Voice
Ankra	64k	MPLS	172.16.13.0	255.255.255.0	Cisco2811	IPV4	AFTN,Voice
Kabul	32k	V-SAT	TBD	TBD	Cisco2811	IPV4	AFTN,Voice
Karachi	64k	MPLS	172.16.11.0	255.255.255.0	Cisco2811	IPV4	AFTN,Voice
Kuwait	64k	MPLS	172.16.12.0	255.255.255.0	Cisco2811	IPV4	AFTN,Voice



State Jordan(Amman)

State	Speed		IP Address	Net Mask	Router Type	IP.V	
Cairo	64k	Leased line	10.10.10.1	255.255.255.0	Vanguard	IPV4	AMHS,Voice
Jeddah	64k	Leased line	10.10.10.1	255.255.255.0	Vanguard	IPV4	AMHS,Voice
Abu Dhabi	2M	Public internet	TBD	TBD	Cisco 5510	IPV4	AMHS



State Iraq

State	Speed		IP Address	Net Mask	Router Type	IP.V	

Iraq did not submit -IP network Survey

State Kuwait

State	Speed		IP Address	Net Mask	Router Type	IP.V	

Kuwait did not submit -IP network Survey

State Oman

State	Speed		IP Address	Net Mask	Router Type	IP.V	

Oman did not submit -IP network Survey

State Qatar

State	Speed		IP Address	Net Mask	Router Type	IP.V	

Qatar did not submit -IP network Survey

State Syria

State	Speed		IP Address	Net Mask	Router Type	IP.V	

Syria did not submit -IP network Survey

State UAE

State	Speed		IP Address	Net Mask	Router Type	IP.V	

UAE did not submit -IP network Survey

State Yemen

State	Speed		IP Address	Net Mask	Router Type	IP.V	

Yemen did not submit -IP network Survey

ATN/IPS WG/3
 Appendix 3F to the Report on Agenda Item 3

Introduction

This survey has been redeveloped while analyzing the previous version. The purpose is for collecting information about the existing IP infrastructure between the states in-order to come with a unified IP scheme plan for the MID-Region IP network.

General Information:

State:	.....
Does IP network existing in place?	
<input type="checkbox"/> Yes <input type="checkbox"/> No	
Is Aviation systems connected together over IP?	
<input type="checkbox"/> Yes <input type="checkbox"/> No	
Who to contact if more details or clarification is required?	
Name:	.....
Title:	.....
Email:	.....
Telephone:	.....
Fax:	.....

Link Specific Information:

Please fill the following form **for each link** between you state and neighboring state within MID-Region:

1	Connection From:	State:	Location:
2	Connection To:	State:	Location:
3	Service Provider:		
4	Link Speed:	..... Kbps	
5	Link Type:	<input type="checkbox"/> Leased Circuit <input type="checkbox"/> Frame-relay <input type="checkbox"/> V-SAT <input type="checkbox"/> MPLS <input type="checkbox"/> Other	
6	IP version:	<input type="checkbox"/> IPv4 <input type="checkbox"/> IPv6	
7	IP Subnet:	<input type="checkbox"/> 10..... Netmask: <input type="checkbox"/> 172..... Netmask: <input type="checkbox"/> 192.168..... Netmask: <input type="checkbox"/> Other: Netmask:	
8	Router / other	Manufacturer: Model:	
9	Router Interfaces Supported*:	<input type="checkbox"/> Async Serial <input type="checkbox"/> Sync Serial <input type="checkbox"/> Ethernet <input type="checkbox"/> Other:	
	Router Interfaces Implemented	<input type="checkbox"/> Async Serial <input type="checkbox"/> Sync Serial <input type="checkbox"/> Ethernet <input type="checkbox"/> Other:	
10	Supported Routing Protocols*:	<input type="checkbox"/> RIP <input type="checkbox"/> OSPF <input type="checkbox"/> BGP <input type="checkbox"/> IS-IS <input type="checkbox"/> Other:	
	Supported Routing Implemented	<input type="checkbox"/> RIP <input type="checkbox"/> OSPF <input type="checkbox"/> BGP <input type="checkbox"/> IS-IS <input type="checkbox"/> Other:	
11	Supported Voice	<input type="checkbox"/> SIP <input type="checkbox"/> H.323 <input type="checkbox"/> Other:	

	Signaling on router*:	
	Supported Voice Implemented	<input type="checkbox"/> SIP <input type="checkbox"/> H.323 <input type="checkbox"/> Other:
12	Data Applications in use*:	<input type="checkbox"/> AFTN/CIDIN <input type="checkbox"/> AMHS <input type="checkbox"/> <input type="checkbox"/> OLDI/AIDC <input type="checkbox"/> Other:
13	Voice Applications in use*:	<input type="checkbox"/> ATC Voice <input type="checkbox"/> VHF Voice <input type="checkbox"/> Other Voice:
14	Data end user interface:	<input type="checkbox"/> Serial <input type="checkbox"/> IP based (Answer Below) <input type="checkbox"/> Other:
15	Security measures between LAN and WAN*:	<input type="checkbox"/> Single-firewall (Type:) <input type="checkbox"/> IPS (Type:) <input type="checkbox"/> Dual-firewall (Types:
16	Voice end user interface*:	<input type="checkbox"/> FXS/FXO <input type="checkbox"/> ISDN <input type="checkbox"/> VoIP <input type="checkbox"/> Other:
	Optional cost in USD	
	Additional Info	

* Choose all that apply

ATN-IPS WG/3
Report on Agenda Item 4

REPORT ON AGENDA ITEM 4: REVIEW OF PUBLIC INTERNET USAGE IN THE MID REGION

4.1 The meeting noted that MIDANPIRG/12 (Amman, 17-21 October 2010) was appraised on the IPS Working Group development of the strategy for the public internet usage and guidance material.

4.2 The meeting recalled that MIDANPIRG/12 tasked the ATN-IPS WG to document the inventory of public internet usage for aeronautical purposes in the MID Region which is to be appended to the strategy for the public internet usage and guidance material.

4.3 The meeting was informed that MIDANPIRG/12 noted that IPS WG developed the public internet usage survey which could be used for developing the required documentation of the public internet usage in the MID Region. The meetings attention was drawn to the view of MIDANPIRG/12 which considered IP VPN as a powerful tool already operational in some MID States.

4.4 The meeting noted that MIDANPIRG/12 agreed to the following Conclusion:

CONCLUSION 12/40: USE OF PUBLIC INTERNET IN THE MID REGION

That, MID States be encouraged to:

- a) follow the guidance Appendix 5.4B to the Report on Agenda Item 5.4, when using the public internet for critical aeronautical communication; and*
- b) provide the inventory on the public internet usage ; as at Appendix 5.4C to the Report on Agenda Item 5.4 by 20 February 2010.*

4.5 As a follow-up to the above conclusion, the meeting noted that the ICAO MID Regional Office, sent State Letter AN 7/5.1 – 11/016 dated 20 January 2011, requesting MID States to complete the survey and provide any observation regarding the implementation of the Public Internet usage strategy and guidance.

4.6 The meeting noted that only 4 MID States replied (Bahrain, Egypt, Iran, and Jordan) as at **Appendix 4A** to the Report on Agenda Item 4.

4.7 The meeting reviewed the public internet usage and guidance material and the replies from the five MID States and agreed that the public internet usage and guidance material as approved by MIDANPIRG/12 is sufficient.

4.8 The meeting agreed to consider the replies to the survey as being the documentation for the public internet use. Accordingly, the meeting urged MID States that had not replied to the survey to, expedite their replies and requested the ICAO MID Regional Office to publish the public internet usage and guidance material along with the States replies on MID Regional Office website. The compiled material that is to be published on the website is as at Appendix 4A to the Report on Agenda Item 4.

4.9 Based on the above, the meeting considered that the task concerning the use of public Internet is complete, since the public internet usage and guidance material and the survey for inventory have been approved by MIDANPIRG/12.

Introduction:

The purpose of this survey is documenting the public internet use in the field of aviation in ICAO MID-Region. Please fill the following survey accordingly for each aviation application that is served over the public internet

General Information:

State:	... Bahrain		
Does IP network existing in place?			
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No			
Is Aviation systems connected together over IP?			
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No			
Is the Aviation systems connected on a separate network from other general systems (such as email, internet)?			
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No			
Who to contact if more details or clarification is required?			
Name:	... Hussain Ebrahim		
Title:	... Senior Network Engineer		
Email:	... hebrahim@caa.gov.bh		
Telephone:	... +973 39653659	Fax:	... +973 17321992

Internet for Aviation Systems Information:

Aviation Application:	.....AFTN (e.g. AFTN, MET messages, Flight plans)		
Type of Internet Protocol:	<input type="checkbox"/> HTTP	<input type="checkbox"/> FTP	<input checked="" type="checkbox"/> SMTP
<input type="checkbox"/> Other:			
Who is accessing the service over the internet?			
(e.g. Remote airport, backup for conventional leased circuit) ... Remote airlines office with low traffic			
Internet user privileges:	<input checked="" type="checkbox"/> Receive data only	<input type="checkbox"/> Send data only	<input type="checkbox"/> Full control of service
<input type="checkbox"/> Send/Receive data			
How can you describe the class of service?			
<input type="checkbox"/> Users and operation rely on the service <input checked="" type="checkbox"/> Low traffic application with no high importance <input type="checkbox"/> Backup method in case of main system failure <input type="checkbox"/> Non-operation traffic and data only			
What types of network defense measure are in use?			
<input checked="" type="checkbox"/> Single Firewall (Type: ... Cisco FWSM) <input checked="" type="checkbox"/> IPS (Type: Cisco ISDM-2) <input type="checkbox"/> Dual-layer firewall (Type:) <input type="checkbox"/> Content-Inspection (Type:.....) <input type="checkbox"/> Other			
Is anonymous access allowed?		<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
What type of user authentication is used?			
<input checked="" type="checkbox"/> Username/password <input type="checkbox"/> Certificates <input type="checkbox"/> Other:			

Is data integrity is verified?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
If yes, what type of message digest used?		
	<input type="checkbox"/> MD5	<input type="checkbox"/> SHA <input type="checkbox"/> Other:.....
What data encryption is used if any?		
	<input type="checkbox"/> DES <input type="checkbox"/> 3DES	<input type="checkbox"/> AES128 <input type="checkbox"/> AES256
	<input type="checkbox"/> None <input type="checkbox"/> Other:	
Are the Internet links redundant?		
	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
Is the internet service provider accredited as mention in ICAO Doc XXXX?		
	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
How the Internet users connect to the aviation systems?		
	<input type="checkbox"/> Traffic directly routed to the aviation system (via firewall or gateway) <input checked="" type="checkbox"/> Traffic is sent to an intermediate proxy <input type="checkbox"/> User has to go via VPN tunnel first to reach system	

Attachment A

Introduction:

The purpose of this survey is documenting the public internet use in the field of aviation in ICAO MID-Region. Please fill the following survey accordingly for each aviation application that is served over the public internet

General Information:

State:	...Egypt.....		
Does IP network existing in place?			
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No			
Is Aviation systems connected together over IP?			
<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No			
Is the Aviation systems connected on a separate network from other general systems (such as email, internet)?			
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No			
Who to contact if more details or clarification is required?			
Name:	Mahmoud Aly Ramadan.....		
Title:	Information Systems. G.D.....		
Email:	Mahmoud.ramadan53@gmail.com.....		
Telephone:	0020106541506.....	Fax:	002022685293.....

Internet for Aviation Systems Information:

Aviation Application:	...Remote Access..... (e.g. AFTN, MET messages, Flight plans)		
Type of Internet Protocol:	<input type="checkbox"/> HTTP	<input type="checkbox"/> FTP	<input type="checkbox"/> SMTP
<input checked="" type="checkbox"/> Other: ...SSH.....			
Who is accessing the service over the internet?			
(e.g. Remote airport, backup for conventional leased circuit) .....COMSOFT Company (for Remote Access & Change setting)			
Internet user privileges:	<input type="checkbox"/> Receive data only	<input type="checkbox"/> Send data only	<input checked="" type="checkbox"/> Full control of service
<input type="checkbox"/> Send/Receive data			
How can you describe the class of service?			
<input type="checkbox"/> Users and operation relay on the service <input type="checkbox"/> Low traffic application with no high importance <input type="checkbox"/> Backup method in case of main system failure <input checked="" type="checkbox"/> Non-operation traffic and data only			
What types of network defense measure are in use?			
<input checked="" type="checkbox"/> Single Firewall (Type: .....Cisco 2800 series) <input type="checkbox"/> IPS (Type:) <input type="checkbox"/> Dual-layer firewall (Type:) <input type="checkbox"/> Content-Inspection (Type:.....) <input type="checkbox"/> Other			
Is anonymous access allowed?		<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No

What type of user authentication is used?	
<input checked="" type="checkbox"/> Username/password	<input type="checkbox"/> Certificates
<input type="checkbox"/> Other:	
Is data integrity is verified?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
If yes, what type of message digest used?	
<input type="checkbox"/> MD5	<input type="checkbox"/> SHA <input type="checkbox"/> Other
What data encryption is used if any?	
<input type="checkbox"/> DES <input type="checkbox"/> 3DES	<input type="checkbox"/> AES128 <input type="checkbox"/> AES256
<input type="checkbox"/> None <input type="checkbox"/> Other:	
Are the Internet links redundant?	
<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
Is the internet service provider accredited as mention in ICAO Doc XXXX?	
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
How the Internet users connect to the aviation systems?	
<input type="checkbox"/> Traffic directly routed to the aviation system (via firewall or gateway) <input type="checkbox"/> Traffic is sent to an intermediate proxy <input checked="" type="checkbox"/> User has to go via VPN tunnel first to reach system	

Attachment A

Introduction:

The purpose of this survey is documenting the public internet use in the field of aviation in ICAO MID-Region. Please fill the following survey accordingly for each aviation application that is served over the public internet

General Information:

State:	Islamic Republic of Iran		
Does IP network existing in place?			
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No			
Is Aviation systems connected together over IP?			
<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No			
Is the Aviation systems connected on a separate network from other general systems (such as email, internet)?			
<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No			
Who to contact if more details or clarification is required?			
Name:	Gholamali Barzegari Naeini.....		
Title:	Manager of Aeronautical Messages Network.....		
Email:	barzegari@airport.ir.....		
Telephone:	098 216604796.....	Fax:	098216625101.....

Internet for Aviation Systems Information:

Aviation Application:	AFTN, OPMET, ATS Messages, AIS Messages. (e.g. AFTN, MET messages, Flight plans)		
Type of Internet Protocol:	<input type="checkbox"/> HTTP	<input checked="" type="checkbox"/> FTP	<input type="checkbox"/> SMTP
<input type="checkbox"/> Other:			
Who is accessing the service over the internet?			
(e.g. Low Traffic Remote airport, backup for conventional leased circuit) Remote Airport, Airlines, backup for conventional leased circuit			
Internet user privileges:	<input type="checkbox"/> Receive data only	<input type="checkbox"/> Send data only	
	<input checked="" type="checkbox"/> Send/Receive data	<input checked="" type="checkbox"/> Full control of service	
How can you describe the class of service?			
<input checked="" type="checkbox"/> Users and operation relay on the service			
<input checked="" type="checkbox"/> Low traffic application with no high importance			
<input checked="" type="checkbox"/> Backup method in case of main system failure			
<input type="checkbox"/> Non-operation traffic and data only			
What types of network defense measure are in use?			
<input checked="" type="checkbox"/> Single Firewall (Type: ...PKI.....)			
<input type="checkbox"/> IPS (Type:			
<input type="checkbox"/> Dual-layer firewall (Type:			
<input type="checkbox"/> Content-Inspection (Type:.....)			
<input checked="" type="checkbox"/> Other (Serial connection & Asynchrony)			
Is anonymous access allowed?			
		<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
What type of user authentication is used?			
<input checked="" type="checkbox"/> Username/password		<input type="checkbox"/> Certificates	

<input type="checkbox"/> Other:
Is data integrity is verified? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
If yes, what type of message digest used?
<input checked="" type="checkbox"/> MD5 <input type="checkbox"/> SHA <input type="checkbox"/> Other:.....
What data encryption is used if any?
<input type="checkbox"/> DES <input type="checkbox"/> 3DES <input type="checkbox"/> AES128 <input checked="" type="checkbox"/> AES256 <input type="checkbox"/> None <input type="checkbox"/> Other:
Are the Internet links redundant?
<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Is the internet service provider accredited as mention in ICAO Doc XXXX?
<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
How the Internet users connect to the aviation systems?
<input type="checkbox"/> Traffic directly routed to the aviation system (via firewall or gateway) <input checked="" type="checkbox"/> Traffic is sent to an intermediate proxy <input type="checkbox"/> User has to go via VPN tunnel first to reach system

SURVEY ON PUBLIC INTERNET USAGE IN AVIATION

Introduction:

The purpose of this survey is documenting the internet use in the field of aviation in MID-Region. Accordingly new application could be added.

Please fill the following survey accordingly for each aviation application that is served over the public internet

General Information:

State: ..Jordan.....	
Does IP network existing in place?	
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Is Aviation systems connected together over IP?	
<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Is the Aviation systems connected on a separate network from other general systems (such as email, internet)?	
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Who to contact if more details or clarification is required?	
Name:	Eng. Yassir Zayyad
Title:	Communication Engineer
Email:	Aftn_sup@carc.gov.jo
Telephone:	+962795781882
Fax:	+962-6-4891653

Internet for Aviation Systems Information:

Aviation Application:	AFTN , AMHS (e.g. AFTN, MET messages, Flight plans)
Type of Internet Protocol:	<input type="checkbox"/> HTTP <input type="checkbox"/> FTP <input type="checkbox"/> SMTP <input checked="" type="checkbox"/> Other: ,
Who is accessing the service over the internet? (e.g. Remote airport, backup for conventional leased circuit) Remote Technical Support Remote Airlines Offices & Academies , International Circuit	
Internet user privileges:	<input type="checkbox"/> Receive data only <input type="checkbox"/> Send data only <input checked="" type="checkbox"/> Send/Receive data <input type="checkbox"/> Full control of service
How can you describe the class of service?	
<input checked="" type="checkbox"/> Users and operation relay on the service <input type="checkbox"/> Low traffic application with no high importance <input type="checkbox"/> Backup method in case of main system failure <input type="checkbox"/> Non-operation traffic and data only	
What types of network defense measure are in use?	
<input checked="" type="checkbox"/> Single Firewall (Type: Cisco ASA Firewall) <input type="checkbox"/> IPS (Type:) <input type="checkbox"/> Dual-layer firewall (Type:) <input type="checkbox"/> Content-Inspection (Type:.....) <input type="checkbox"/> Other	

Is anonymous access allowed?		<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
What type of user authentication is used?			
<input checked="" type="checkbox"/> Username/password		<input type="checkbox"/> Certificates	
<input type="checkbox"/> Other:			
Is data integrity is verified?		<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
If yes, what type of message digest used?			
<input type="checkbox"/> MD5		<input checked="" type="checkbox"/> SHA	<input type="checkbox"/> Other:.....
What data encryption is used if any?			
<input type="checkbox"/> DES		<input checked="" type="checkbox"/> 3DES	<input type="checkbox"/> AES128
<input type="checkbox"/> None		<input type="checkbox"/> AES256	
<input type="checkbox"/> Other:			
Are the Internet links redundant?			
<input type="checkbox"/> Yes		<input checked="" type="checkbox"/> No	
Is the internet service provider accredited as mention in ICAO Doc 9855			
<input checked="" type="checkbox"/> Yes		<input type="checkbox"/> No	
How the Internet users connect to the aviation systems?			
<input type="checkbox"/> Traffic directly routed to the aviation system (via firewall or gateway)			
<input type="checkbox"/> Traffic is sent to an intermediate proxy			
<input checked="" type="checkbox"/> User has to go via VPN tunnel first to reach system			

ATN/IPS WG/3
Report on Agenda Item 5

REPORT ON AGENDA ITEM 5: FUTURE WORK PROGRAMME

5.1 The meeting recalled that the CNS SG/3 meeting (Cairo, 10-12 May 2010) recommended that the IPS Working Group be renamed the ATN-IPS Working Group. Accordingly MIDANPIRG/12 renamed the Working Group as the ATN-IPS WG under Decision 12/41 and also approved the Terms of Reference (TOR) and Work Programme for the ATN-IPS Working Group.

5.2 The meeting was of the view that ATN include subjects/applications which are not currently covered by TOR and Work Programme, of the Group. Accordingly, the meeting agreed to develop a task list in order to prioritize the work of the Group as at **Appendix 5A** to the Report on Agenda Item 5.

5.3 Based on the above, the meeting reviewed the TOR and work programme of the Group and developed an updated version as at **Appendix 5B** to Report on Agenda Item 5 and agreed to the following draft decision:

DRAFT DECISION 3/5: REVISED TOR OF THE ATN-IPS WORKING GROUP

*That, the Terms of Reference and Work Programme of the ATN-IPS Working-Group be updated as at **Appendix 5B** to the Report on Agenda Item 5.*

5.4 The meeting reviewed the current list of the members in the Working Group and revised the list of members as at **Appendix 5C** to the Report on Agenda item 5. However, the meeting was informed that the new updated list will not be considered official, until an official notification is received for the changes from the authority of the concerned State.

5.5 In accordance with the MIDANPIRG Procedural Handbook, the Working Group is expected to decide on the dates and venue of its next meeting. Accordingly, in order to assist the Working Group decide on the dates and venue of its next meeting, information related to the ICAO MID Regional Office tentative schedule for meetings, seminar and workshops including other activities relevant to the ATN-IPS Working Group, were highlighted, as follows:

- CNS SG/4 (Cairo, 25-27 September 2011)
- MSG/3 meeting (Tehran, Iran, 10-12 October 2011)
- WRC/12 (Geneva, February 2012)
- Establishment of the MID AMC in Jordan

5.6 Based on the above, the meeting agreed that the ATN-IPS WG/4 meeting be held in first quarter of 2012. The venue will be Cairo, unless a State would be willing to host the meeting.

ATN/IPS WG/3
Appendix 5A to the Report on Agenda Item 5

NO	Description	Deliverables	Target date	Responsibility
1	Review of implementation problems and develop coordinated solutions	Updated the information in the ATN Router and AMHS planning tables and the implementation status		Members
2	Coordinate/compile the regional implementation schedule	maintain the AMHS Implementation Plan		ATN-IPS WG
3	Monitor Implementation			ATN-IPS WG
4	Development of Interim Database for routing tables	Database	AIRAC	Jordan/
5	MID - AMC			ATN-IPS Jordan
6	MID ATN AMHS will adopt IPv4 address assignment proposed by as an interim measure and will transit to IPv6 after the related implementation issues are resolved. This approach will be based on point-to-point IP network	Guidance Doc on IPv4 addressing plan to be developed		Egypt Haitham/ Lebanon/Mohammed Saad
7	facilitate implementation of VoIP in MID	develop the required guidance	July 2012	Mohammed (Bahrain)
8	develop a list of the documents which are need for MID-ATN Implementation	List of documents	Sep 2011	All
9	IP Network plan Analysis/requirement/financial/design		15 Sep 2011	Abdulla / Mona / Yasser
10	Proposal from PTT for IP network for the region		15/sep 2011	Mohammed (Bahrain)
11	Coordination for presentation from suppliers		1qtr 2012	Mohammed (Bahrain)

ATN/IPS WG/3
Appendix 5B to the Report on Agenda Item 5

ATN/IPS WORKING GROUP

1. Terms of Reference

1.1 The Terms of Reference of the ATN/IPS Working Group (ATN/IPS WG) are:

- a) To promote regionally harmonized and agreed approach to transition planning to ATN in order for MID States to work collaboratively in developing their future transition arrangements towards the ATM system envisioned in the Global ATM Operational Concept; and
- b) address regional planning and implementation issues, related to AFTN/CIDIN/AMHS and networking issues including the usage of the public internet and development of MID IP NET standards

1.2 In order to meet the Terms of Reference, the ATN/IPS WG shall:

- a) Follow up on public Internet usage in the MID Region and document all Internet usage with particular attention to the safety/security of the data exchanged over the public internet;
- b) development of the ATN planning and implementation document to be main source for planning and implementation guidance;
- c) review and analyze the MID Region AFTN/CIDIN/AMHS plans and make suggestion for the improvement in accordance with the new development in the MID Region and coordinate the AMHS implementation;
- d) develop MID IP Network common specification and implementation guidance;
- e) develop AMHS implementation plan for the MID and related AMC implementation related materials;
- f) develop task list for the work programme and provide updates to CNS SG; and
- g) Provide the necessary support for the implementation of the IPS in the MID Region.

2. Composition

ATN/IPS Group will be composed of experts nominated by MIDANPIRG Provider States.

Other representatives, who could contribute to the activity of the Group, could be invited to participate as observers.

ATN/IPS WG/3
Appendix 5C to the Report on Agenda Item 5

ATN/IPS Working Group Members

No.	Name	Full Address	Email Address	Office Number	Mobile Number	Fax Number
1	Mr. Mohamed Ali Saleh RAPPORTEUR	Head Aeronautical Communication Civil Aviation Affair P.O.Box 586 BAHRAIN	masaleh@caa.gov.bh	(973) 17 321 187	(973) 3962 2202	(973) 17 329966
2	Mr. Yaseen Hassan Ebrahim	Senior Network Engineer Civil Aviation Affair P.O.Box 586 BAHRAIN	y.alsayed@caa.gov.bh	(973) 17 321 183	(973) 39520025	(973) 17 329966
3	Mr. Mahmoud Aly Mohamed Ramadan	National Air Navigation Services Company (NANSC) Cairo Airport Road Cairo - EGYPT	mahmoud.ramadan53@gmail.com	(202) 2265 7959	(2010) 654 1506	(202) 2268 9837
4	Mr. Haytham Mohammed Eldosouky	Computer Engineer National Air Navigation Services Company (NANSC) Cairo Airport Road Cairo - EGYPT	Haitham.eldosoki@gmail.com	20 2 22657959	(2010) 7810781	202) 2268 5293
	Hiba Mustafa Mohammed	Technical Coordinator Ministry of Civil Aviation Cairo Airport Road Cairo - EGYPT	Hiba.mustafa1@hotmail.com	20 2 26838147	20 1047222395	20 2 2685420
5	Mr. Gholam Ali Barzegari- Naeini	Aeronautical Messages Network Manager Mehrabad Int'l Airport Iranian Airport Company (IAC) Tehran, IRAN	barzegari@airport.ir	(98-21) 6603 6645	(98-91) 2390 6063	(98-21) 6602 5101
6	Mr. Esfandiar Nopourashrafi	Chief of Messages Network Department Mehrabad Int'l Airport	nopour.ipsir@yahoo.com	(98-21) 6604 6645	(98-91) 2243 9459	(98-21) 4466 5101

No.	Name	Full Address	Email Address	Office Number	Mobile Number	Fax Number
		Iranian Airport Company (IAC) Tehran, IRAN				
7	Mr. Yasser Ziad	AFTN AMHS systems Engineer Civil Aviation Regulatory Commision P.O.Box 7547 Amman, JORDAN	Aftn_sub@carc.gov.jo	(962-6) 489 2282	(962-79)5781882	(962-6) 4891708 (962-6) 4891653
8	Ms. Muna Ribhi Naddaf	Head of AFTN/AIS/AMHS Civil Aviation Regulatory Commission P.O. Box 7547 Postal 11110 Amman – JORDAN	aftn_ais@carc.gov.jo	(962-6) 489 1473	(962-77) 939 5224	(962-6) 489 1653
	Eid Othman	AFTN AMHS systems Engineer Civil Aviation Regulatory Commision P.O.Box 7547 Amman, JORDAN	aftn_ais@carc.gov.jo	(962-6) 489 2282	(962-79)5195617	(962-6) 489 1653
9	Mr. Muhannad Falah Al Khurafi	Khaldiya St. Block , House #27, P.O.Box 17767 Zip Code 72458 – KUWAIT	muhannad@alkhurafi.com	(965) 2472 1279	(965) 99610401	(965) 431 9232
10	Mr. Abdallah A. Bin Saleh	Computer Networking Engineer General Authority of Civil Aviation Air Navigation Service SAUDI ARABIA	abinsaleh@gmail.com abinsaleh@gaca.gov.sa	(966-2) 671 7717	(966-50) 484 3757	(966-2) 6719 041
11	Mr. Hani Abdallah Gari	Software Engineer General Authority of Civil Aviation Air Navigation Service SAUDI ARABIA	hgari@gaca.gov.sa	(966-2) 671 7717	(966-50) 370 3772	(966-2) 6719 041
	Modhish A Algarni	Communication Specialist General Authority of Civil Aviation Air Navigation Service SAUDI ARABIA	modgarni@yahoo.com			
12	Mr. Abdul Hadi Kabalan	Chief of AFTN and Head of Information Department	comm-dir@scaasy.com	(963-11) 540 0571	(963) 966 851162	(963-11) 540 0571

No.	Name	Full Address	Email Address	Office Number	Mobile Number	Fax Number
		Al Najma Square Damascus - SYRIA				
	Mr. Elias Elkhoury	Head of Telecommunication Department Directoirate general of Civil Aviation Rafic Hariri Int'l Airport-Beirut Beirut- Lebanon	khouryeli@beirutairport.gov.lb	961 1 628150	9613998823	9611629035
	Mr. Mohamad Saad	Chief of Networking and communication Equipment Directoirate general of Civil Aviation Rafic Hariri Int'l Airport-Beirut Beirut- Lebanon	msaad@beirutairport.gov.lb	961 1 628151	9613280299	9611629031
	Mr. Rabee El Harakeh	Chief of Telecommunication monitoring t Directoirate general of Civil Aviation Rafic Hariri Int'l Airport-Beirut Beirut- Lebanon	rabeeharakeh@hotmail.com	961 1 628161	9613719944	9611629035

ATN/IPS WG/3
Report on Agenda Item 6

REPORT ON AGENDA ITEM 6: ANY OTHER BUSINESS

6.1 Nothing has been discussed under this Agenda Item.

ATN/IPS WG/3
Attachment A to the Report

NAME	TITLE & ADDRESS
STATES BAHRAIN Mr. Mohamed Ali Saleh	Head, Aeronautical Communication Civil Aviation Affairs P.O.Box 586 KINGDOM OF BAHRAIN Fax: (973) 17 329 966 Tel: (973) 17 321 187 Mobile: (973) 3962 2202 Email: masaleh@caa.gov.bh
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Mr. Mahmoud Aly Ramadan	General Director of Information Computers National Air Navigation Services Company Egyptian Civil Aviation Authority Cairo Airport Road Cairo - Egypt Fax: (202) 2268 9837 Tel: (202) 2265 7959 Mobile: (2010) 654 1506 Email: mahmoud.ramadan53@gmail.com
Ms. Heba Mostafa Mohamed	Supervisor AIS Unit and Technical Coordinator Ministry of Civil Aviation Cairo Airport Road Cairo - EGYPT Fax: (202) 2268 5420 Tel: (202) 2417 5389 Mobile: (2014) 7222 395 Email: heba.mostafa1@hotmail.com

NAME	TITLE & ADDRESS
JORDAN Mr. Eid Mohammad A. Othman	AFTN/AMHS/AIS System Engineer Civil Aviation Regulatory Commission P.O.Box 7547 Postal 11110 Amman - JORDAN Fax: (962-6) 489 1653 Tel: (962-6) 489 1473 Mobile: (962-6) 519 5617 Email: eido8@yahoo.com
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Mr. Yaser Mustafa Issa Ziad	AFTN/AMHS/AIS System Engineer Civil Aviation Regulatory Commission P.O.Box 7547 Postal 11110 Amman - JORDAN Fax: (962-6) 489 1653 Tel: (962-6) 489 1473 Mobile: (962-79) 578 1882 Email: aftn_sup@carc.gov.jo
LEBANON Mr. Elias Elkhoury	Head of Telecommunications Department Directorate General of Civil Aviation Beirut Airport Beirut – LEBANON Fax: (961-1) 629 035 Tel: (961-1) 628 150 Mobile: (961-3) 998 823 Email: khouryeli@beirutairport.gov.lb
Mr. Rabee Harakeh	Telecommunications Supervisor Directorate General of Civil Aviation Beirut Airport Beirut – LEBANON Fax: (961-1) 629 035 Tel: (961-1) 628 161 Mobile: (961-3) 719 944 Email: rabeeharakeh@hotmail.com

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