



International Civil Aviation Organization

MID ATS Message Management Center Steering Group

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

Agenda Item 5: MIDAMC Functions and Tools

DYNAMIC ROUTING PROPOSAL IN THE MID NETWORK

(Presented by I.R. Iran)

<p style="text-align: center;">SUMMARY</p> <p>This paper presents proposed Dynamic routing in the MID Network to enhance the reliability of the AFS Network in the Region.</p> <p>Action by the meeting is at paragraph 3.</p>
<p style="text-align: center;">REFERENCES</p> <p>- MIDAMC STG/2 Report</p>

1. INTRODUCTION

1.1 The Aeronautical fixed Telecommunication Network (AFTN) as a legacy system is being migrated to ATS Message Handling System (AMHS), which has many new features that need to be explored and tested for use.

2. DISCUSSION

2.1 AMHS Implementation in the MID Region makes use of the RFC1006 to provide (TCP/IP) the Internet Protocol Suite (IPS).

2.2 The outdated Aeronautical Fixed Network (AFTN) used a pre-defined routing, it cannot handle failures in external networks well because any route that is configured manually must be updated or reconfigured manually to fix or repair any lost connectivity.

2.3 Routing to a destination which is adjacent called direct routing, while routing to a more distant destination called indirect Routing.

2.4 According to ICAO Documents, There are two categories of users in terms of routing of aeronautical messages: Direct AMHS users (In AMHS COM Centers) and Indirect AMHS users (In AFTN COM Centers).

2.5 Dynamic routing shall be considered for the routing of the messages between the users.

Current Routing in the MID Region

2.6 The routing in the AFTN/AMHS/CIDIN network is performed using static routes, fixed paths, in the event of topology changes; pre-defined alternative paths may be used.

2.7 The Routing operation is done at the application layer, and messages transferred with the store-and-forward manner.

2.8 Moreover, the Routing change should be proceeding with manual correspondence and agreement on the diversion of the traffic.

Proposed Routing Mechanism

2.9 To enhance the reliability of the AFS Network in the MID, and minimize downtime to the minimum, Dynamic Routing can be deployed.

2.10 The Aeronautical Fixed Services network in the MID Region is a hybrid network, where there is meshed network and Star topologies.

2.11 The concept of dynamic routing based on IP links is considered. So for other than links could not be included in this concept.

2.12 Dynamic routing protocols can update routing tables in the event of device or interface failure, so if there are multiple possible paths, these protocols will continue to allow data flow. Static routes do not allow for this automatic failover or redundant paths, so if you have a failure, you must manually adjust routes to move data through an alternative path.

2.13 Furthermore, the Dynamic Routing algorithm can performs two major functions:

- a) Determination of routes between pairs of source/destination.
- b) Corresponding selections of the appropriate next node in the switching nodes along routes.

2.14 Dynamic routing should be considered from two aspects: a) Interconnections between AFTN/AMHS COM Center with adjacent COM Centers in the Middle East and b) Interconnections with other Regions.

2.15 From the AFS operator point of view, using dynamic routing has a drawback, that is, the Operator will not be notified about link failure to fix it. Using of an IT Infrastructure Monitoring/Dashboard Software like Nagios or Uptime can solve this issue.

2.16 From the MID Region point of view, considering the two AFTN/AMHS communication Centers (main and backup) as Regional Dynamic Routing Centers (DRC) managed by MID-AMC for the Middle East in order to control, Monitoring and manage dynamic routing is necessary.

2.17 The Communication Centers should have the following Specifications:

- a) The AFTN/AMHS COM Center with IP-based links (At the beginning the Centers should not necessarily be the AMHS Centers).
- b) Communication links with other Regions.

- c) Human resources (Network Expert, system engineer, AFS Operator) and Training on Network Communication.

Note: the Centers are preferred to have vendor support.

3. ACTION BY THE MEETING

3.1 The meeting is invited to:

- a) note the information in this working paper;
- b) provide comments on paragraphs 2.15 to 2.17; and
- c) Tehran AFTN/AMHS COM Center declares its readiness to become a regional DRC.

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