



*International Civil Aviation Organization*

**MID ATS Message Management Center Steering Group**

**Second Meeting (MIDAMC STG/2)**  
*(Cairo, Egypt 10 - 12 March 2015)*

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**Agenda Item 4:           Enhancement of the MID AFS Network Services**

**THE DYNAMIC ROUTING IN THE MID NETWORK**

*(Presented by Jordan and Saudi Arabia)*

**SUMMARY**

This paper presents the current routing in the AFTN/AMHS/CIDIN network using static routes, fixed paths, and proposes extensive tests/trial for the dynamic routing to enhance the reliability of the AFS Network in the Region.

Action by the meeting is at paragraph 3.

**1.       INTRODUCTION**

1.1           The Aeronautical fixed 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 obsolete 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.

***Current Routing in the MID Region***

2.4           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.

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

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

2.7 Message handling system transfer messages between users (UAs). 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 routes but identify the recipients OR-address.

### ***Proposed Routing Mechanism***

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

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

2.10 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.

2.11 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.

2.12 The benefits of dynamic Routing are:

- a) More Automation: Routing updates are automatically sent to all other routers.
- b) Change Notification: The dynamic routing protocol may be able to reroute traffic around a link that is down or congested.
- c) Greater Uptime for users: Because the routing protocol has intelligence and can react faster, the users may see more uptime.
- d) Greater Network throughput: Because the routing protocol may be able to calculate the most responsive network link to use, the users may see less latency and more performance out of the network.
- e) Less work for AFS Operator.

2.13 From the AFS operator point of view, using dynamic routing has a drawback, that 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.

2.14 The meeting may wish to know that there is no deployment of the dynamic routing in the AFS network worldwide, using such a method requires careful preparation and study.

2.15 Therefore, conducting a trial on dynamic routing can facilitate and test this approach, State wish to participate in this trial should have, among others:

- 1) Backup/Test AMHS System
- 2) At least two operational AMHS Link
- 3) Human resources (Network Expert, system engineer, AFS Operator)
- 4) Vendor support preferable

**3. ACTION BY THE MEETING**

3.1 The meeting is invited to:

- a) note the information in this working paper; and
- b) provide comments on paragraph 2.15

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