International Civil Aviation Organization

**SEVENTEENTH MEETING OF THE
COMMUNICATIONS/NAVIGATION/SURVEILLANCE
SUB-GROUP (CNS SG/17) OF APANPIRG**

Bangkok, Thailand, 13 – 17 May 2013

Agenda Item 4:   Aeronautical Fixed Service

**PROPOSED ASIA/PACIFIC INTERNET PROTOCOL (IP)
VIRTUAL PRIVATE NETWORK (VPN)**

(Developed by Australia, China, Fiji, Hong Kong, China, Japan,
New Zealand, Republic of Korea, Singapore and Thailand)

(Presented by USA)

SUMMARY

This paper presents a proposal for an IP VPN using a private commercial network to provide service for Air Traffic Service Message Handling System (AMHS) and possible future IP-based services. This proposed VPN would be dedicated to the Asia/Pacific Region and USA only.

1.   Introduction

1.1   Currently, Aeronautical Fixed Telecommunication Network (AFTN) and Air Traffic Service Message Handling System (AMHS) services in the Asia/Pacific Region operate over point-to-point international leased circuits. This bilateral point-to-point circuit would not support dynamic routing for AMHS or a true System Wide Information System (SWIM) environment.

1.2   As AMHS continues to replace AFTN, a more advanced and cost effective method of providing network services to the region should be considered.

1.3   A private, common network is an approach that has successfully been employed in other regions (e.g. PENS in the EUR Region and MEVA in the CAR Region).

1.4   A preliminary finding concludes that using an IP VPN could result in 30% cost saving and significant additional bandwidth when compared to point-to-point circuits.

2.   Discussion

2.1   Proposed Solution

At ATNICG/8, two working papers were presented regarding the potential for creation of a common Asia/Pacific IP network; these papers were presented by Japan and the United States. Each of these papers described the use of a MultiProtocol Label Switching (MPLS) network to provide a private, common network for the region. The paper from Japan described a possible network implementation from KDDI while the USA paper described a possible implementation from Harris Corp. An example of such a network implementation is shown in Attachment A.

Each of these implementations describes a similar solution; it should also be noted that other members are invited to suggest additional proposals.

An ad hoc group was formed with members from Australia, China, Fiji, Hong Kong, China, Japan, New Zealand, Republic of Korea, Singapore and Thailand to discuss the feasibility of such a concept. It was determined that the establishment of such a network requires careful consideration of all issues involved as well as the evaluation of common network proposals as compared to the current point-to-point configuration.

2.2   Issues to be Considered

Issues to be considered include, but are not limited to, the following:

- Technical requirements

- Cost, including arrangement for division/allocation of cost

- Methods of billing and payment

- Process for contract award

- Responsibility for network administration

- Need for single point of contact to deal with service provider

- Handling of network service issues

- Performance specifications

- Network security issues

- Network redundancy issues

- Capacity for growth and expansion

- Required lead time for implementation

- Business Continuity / Disaster Recovery issues relating to the network

- Performance management, measurement, monitoring, reporting and control

2.3   Proposed Plan of Action

The ad hoc working group suggested that a number of steps should be taken to further pursue this issue. These steps include:

- Obtain further information regarding the networks proposed by Japan and USA so that details regarding administration and pricing can be provided to other members

- Allow other member states to confer with service providers to determine additional options that may be considered

- Contact representatives of the Pan-European Network Service (PENS) to request information regarding their network

- Investigate the issues noted in the previous section of this paper

- Develop a Request for Information (RFI) and evaluate responses

With information gathered from Japan, USA and other potential service providers, and with information based upon experience from other regions (e.g. PENS / MEVA), members may take note of all the strengths and weaknesses and assess all proposals with such factors in mind so that appropriate discussions are held to determine the preferred options. This will lead to better decisions being made as the preferred proposal moves forward.

The creation of a regional Task Force should be considered to further address this topic.

2.4   Conclusion

That the meeting make a recommendation to APANPIRG to adopt the creation of a regional body (e.g. Task Force or Working Group) of Subject Matter Experts (SMEs) that will further consider and investigate the proposed solution and issues described above, and generate a detailed proposal.

3. Action by the Meeting

3.1   The meeting is invited to:

a) Note the recommendation to replace the point-to-point circuit arrangement by a regional common virtual private network (VPN);

b) Recommend to APANPIRG to designate a regional Task Force or Working Group of SMEs to develop a plan for regional VPN implementation by 2016; and

c) Provide guidance as needed.

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ATTACHMENT A

An Example of an Asia/Pacific MPLS Network: The figure below depicts an example of an MPLS network connecting Japan, Hong Kong, China, Singapore, Australia, New Zealand, Fiji, and the United States.
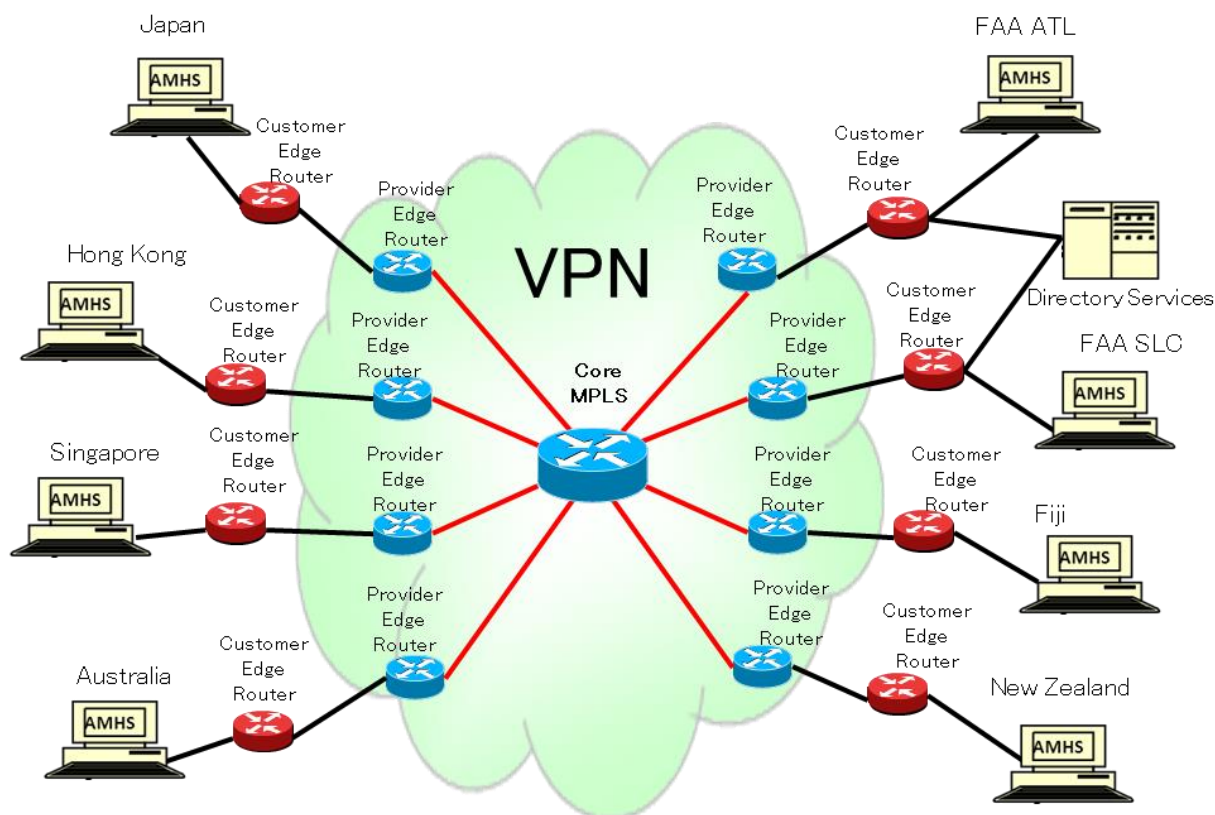
The Core MPLS Provider (P) Router in the diagram is actually a network of P Routers connecting to the Provider Edge (PE) Routers. The PE Routers are shown in a one-to-one relationship with the Customer Edge (CE) Routers, but this is not necessarily always the case. It is expected that Asia/Pacific members of the "private" network might use the VPN capabilities of the CE Router to create traditional VPNs over the MPLS network to each of the FAA connections (FAA ATL and FAA SLC) for redundancy and security. For example, Hong Kong, China could establish a Primary VPN to FAA SLC for exchange of Air Traffic Service Message Handling System (AMHS) data, with a Secondary VPN connection to FAA ATL. Similarly, Australia and New Zealand could create a traditional VPN between their respective CE Routers for exchange of their own AMHS data. This network can be easily extended to additional interested countries by agreement with the MPLS vendor to connect a new CE Router to a PE Router in the network.

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