International Civil Aviation Organization

EIGHTEENTH MEETING OF THE COMMUNICATIONS/NAVIGATION AND SURVEILLANCE SUG-GROUP (CNS SG/18) OF APANPIRG

Asia and Pacific Regional Sub-Office, Beijing, China
(21 – 25 July 2014)

Agenda Item 4: **Aeronautical Fixed Service (AFS)**

**ASIA AND PACIFIC COMMON REGIONAL
VIRTUAL PRIVATE NETWORK (CRV) BENEFITS**

(Presented by Australia, Fiji, India, Japan, New Zealand, Singapore, Thailand and USA)

SUMMARY

This paper presents the benefits of the CRV to all Air Navigation Service Providers (ANSPs) in the region. This telecommunication service has been used worldwide to provide a private network for banking and oil industries and has proved its service is reliable and affordable. The CRV is the only economical means to provide a standard telecommunication interface between ANSPs to meet the challenge of supporting ever increasing demand in information exchange required by System Wide Information Management (SWIM) and other services.

1. **INTRODUCTION**

1.1   The CRV Task Force (CRV TF) was created by APANIRG in 2013 to develop a plan for procurement of the CRV by a common service provider.

1.2   The plan is to have ICAO Technical Cooperation Bureau (TCB) serve as the legal representative while the members of the CRV TF will provide technical support leading to contract award to a single service provider by 2016 or early 2017.

2. **DISCUSSION**

2.1   The European region has implemented the Pan-European Network Service (PENS) and North American region has FAA Telecommunication Infrastructure (FTI) to support Canada and USA to distribute AFS data. In other ICAO regions -- South America has REDDIG and Caribbean has MEVA.

2.2   Asia/Pacific region should establish its own telecommunication network to:

o   Reduce telecommunication cost
o   Enhance information security
o   Support new enhancements
o   Provide a dynamic network

    o Minimize coordination for network management and enhancement
    o Respond to Air Traffic requirements in a timely manner

2.3 In order to establish a private network, the following are required:

    o The cost has to be equal or less than the current cost by utilizing existing commercially available infrastructure
    o A common telecommunication network provider
    o A selected common telecommunication service provider will work with local provider for access

2.4 Any users of the network can be connected to one another as controlled by the Network Administrator. The CRV TF has been exploring options for creating for a Virtual Private Network. VPN is based on MultiProtocol Label Switching (MPLS). Note, this is a private network, not the public internet.

3. ACTION BY THE MEETING

3.1 The meeting is invited to:

  a) note the information contained in this paper; and

  b) take appropriate action to join CRV.

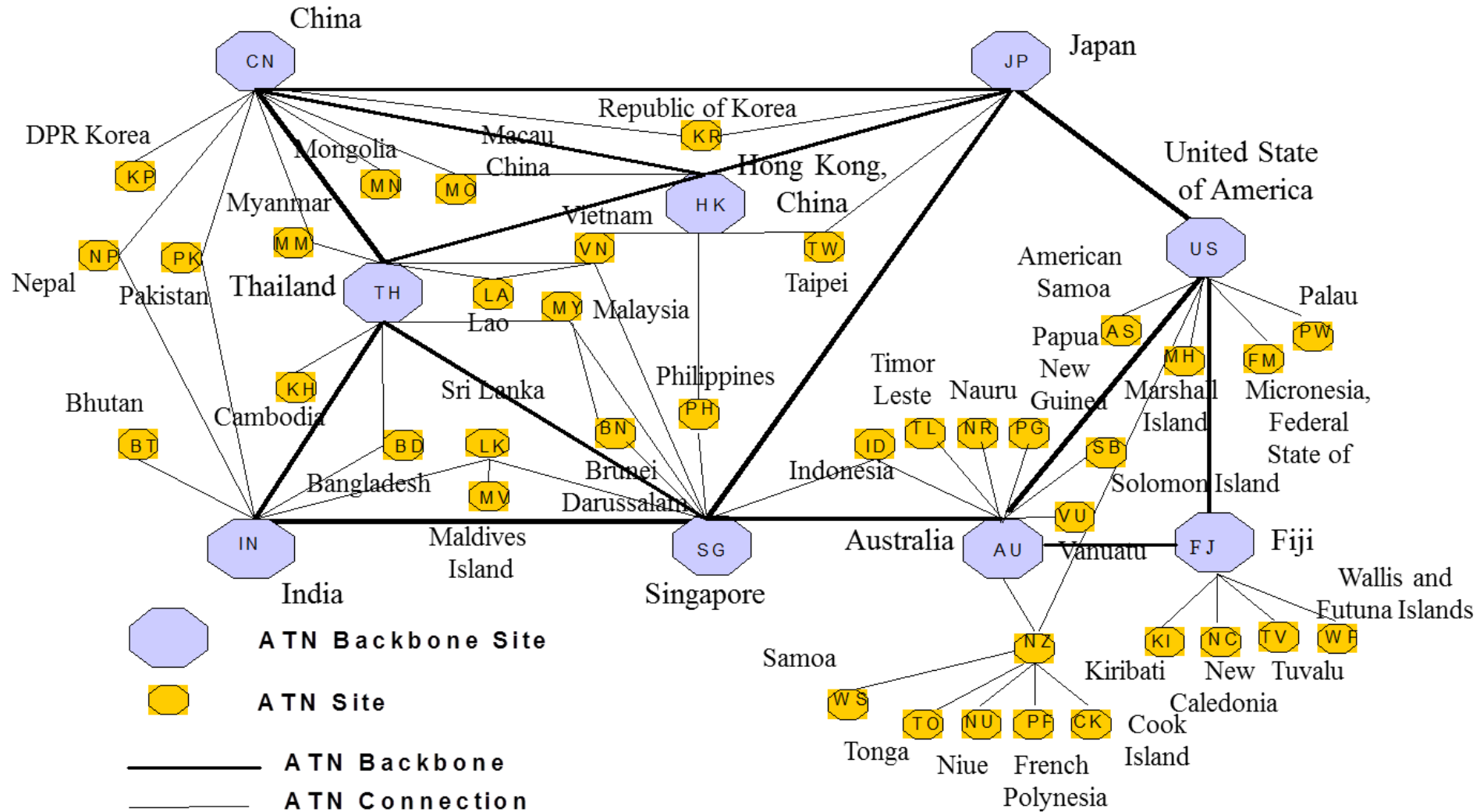   – – – – – – – – – – – –

ASIA/PACIFIC CRV Attachment

Issues Facing Aeronautical Fixed Service (AFS) Enhancement

- Current Point-to-Point circuit arrangement between States to support AFS has the following issues:
  - Half circuit arrangement between States is increasingly difficult to order and time consuming
  - Circuit upgrades between states is also impacted due to variable pricing and bandwidth availability of the half circuit at each State
  - Dynamic routing is not supported due to limited bandwidth and no central administration of the network
  - Incompatible network protocol does not support Extended Service as specified in ICAO Doc. 9880 and IPv6 addressing as specified in ICAO Doc. 9896
  - New features enhancement as recommended by ICAO 12th Air Navigation Conference, such as System Wide Information Management (SWIM), is not supported
  - Network security measures can not be implemented, which leads many States to implement their own security measures and policy, adding to overall costs
  - Different budget cycles and priorities between States make the synchronization of upgrades difficult and in turn limits the seamless distribution of Aeronautical Fixed Service (AFS) data
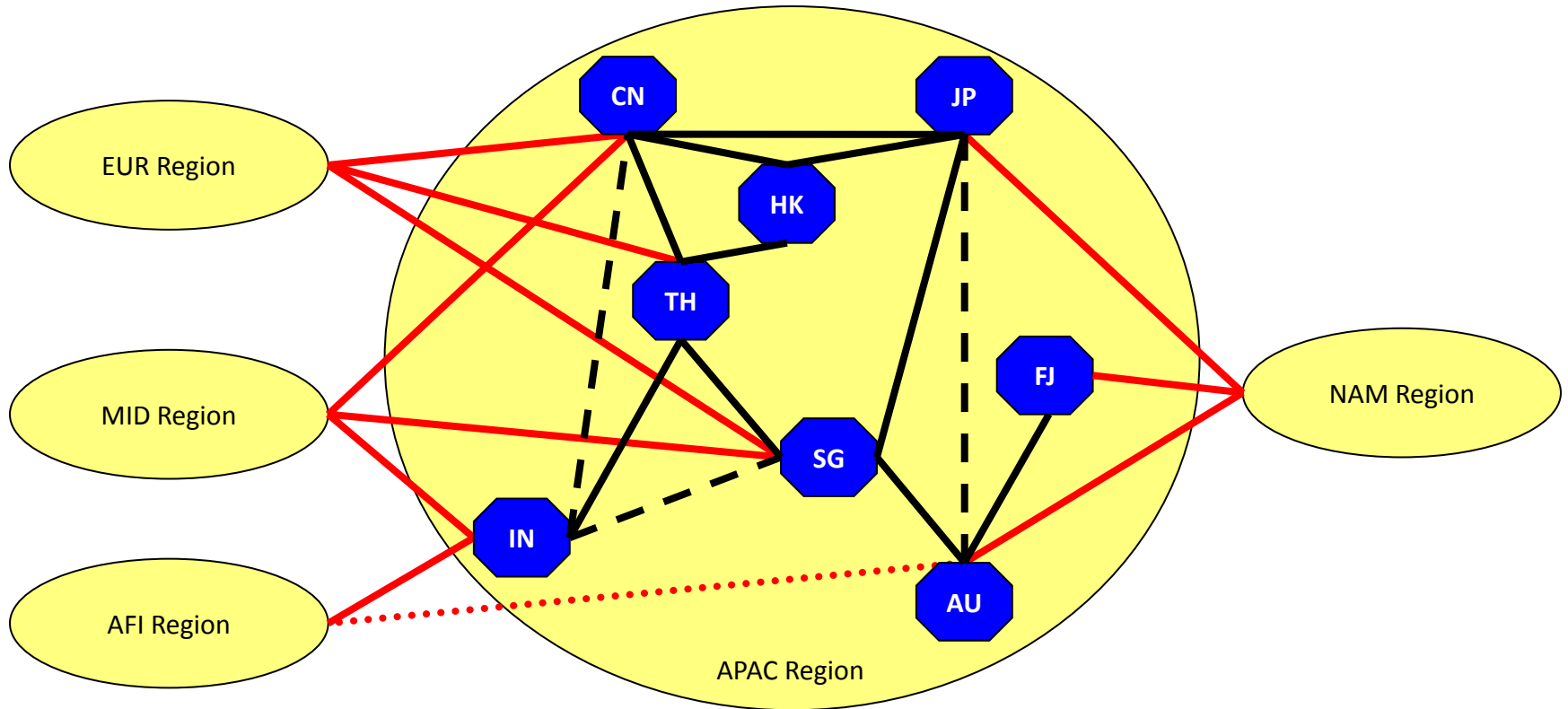
Asia/Pacific ATN Regional Router Plan

Asia/Pacific Regional ATN Backbone

Legend:
- Inter-Regional Trunk Connection
- New Inter-Regional Trunk Connection
- Intra-Regional Trunk Connection
- New Intra-Regional Trunk Connection

- US is North America Backbone

Discussion

- European region has implemented the Pan-European Network Service (PENS) and North American region has FAA Telecommunication Infrastructure (FTI) to support Canada and USA to distribute AFS data. In other ICAO regions -- South America has REDDIG and Caribbean has MEVA.

- Asia/Pacific region should establish its own telecommunication network to:
  – Reduce telecommunication cost
  – Enhance information security
  – Support new enhancements
  – Provide a dynamic network
  – Minimize coordination for network management and enhancement
  – Respond to Air Traffic requirements in a timely manner

Discussion (Cont'd)

- In order to establish a private network, the following are required:
  - The cost has to be equal or less than the current cost by utilizing existing commercially available infrastructure
  - A common telecommunication network provider
  - A selected common telecommunication service provider will work with local provider for access

- Any users of the network can be connected to one another as controlled by the Network Administrator. The CRV TF has been exploring options for creating a Virtual Private Network.

- This is a Private Network, not the public internet.

IP Connectivity

- Each access circuit will provide 1 unit of IP bandwidth
  - In many locations, 1 unit will be 2 Mbps
  - Some locations will have limitations and may not support 2 Mbps interface

- Each circuit provides a fully meshed network

- It will be possible to setup numerous VPN connections
  - Effectively creating virtual circuits between States
  - Each State will be free to interact with any other State passing data up to their bandwidth limit

- Should any States desire greater bandwidth, additional bandwidth increments can be ordered.

Example High-level Network Diagram
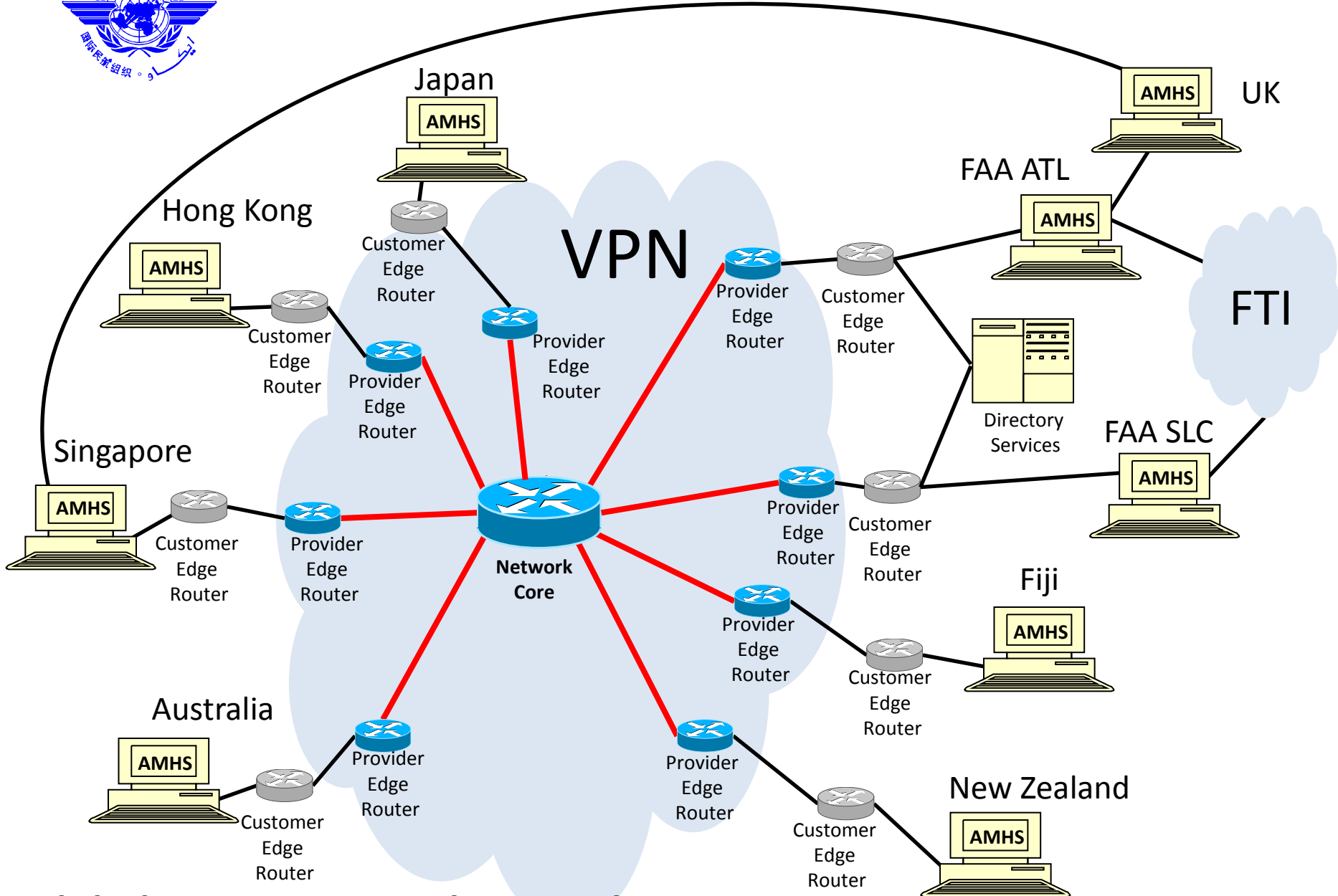
Global Private Network – Not the Internet

8

Recommendation

- States in the region should consider:
  - Replacing their dedicated point-to-point circuits due to maintenance support and inability to expand.
  - Joining the CRV TF "pioneer group" to review and adopt requirements and cost for CRV. This will ensure your requirements will be met and your cost issues addressed.
  - That this is the only option that allows States with only one connection to others to expand their network for diversity without cost increase.

- For States that decide not to join at this time, your response to the ICAO survey is critical for the option to join after contract award.