International Civil Aviation Organization
North American, Central American and Caribbean Office

WORKING PAPER

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Thirty Seventh MEVA Technical Management Group Meeting
(MEVA/TMG/37)
Mexico City, Mexico, 8 to 10 August 2022

Agenda Item 3: **CANSNET Project**
3.3 Assessment of Regional Requirements and Integration to Other Global Aviation Networks.

EXPECTATIONS FOR THE CANSNET ARCHITECTURE

(Presented by the United States)

EXECUTIVE SUMMARY	
The Working Paper contrasts CANSNET with the current MEVA and comments on the advantages of the expected architecture.	
Action:	Suggested actions are presented in Section 4.
Strategic Objectives:	• Safety • Air Navigation Capacity and Efficiency • Economic Development of Air Transport
References:	• Thirty Sixth MEVA Technical Management Group Meeting (MEVA/TMG/36), June 2021 - https://bit.ly/3zCZUq3

1. Introduction

1.1 There is an increasing demand for data communications to support automation and collaboration in Air Traffic Management (ATM). This leads to requirements for increased capacity and reliability.

1.2 The past 25 years of MEVA have seen a dramatic expansion in the telecommunications infrastructure worldwide, to support public and private data communications, with a corresponding decrease in cost. The environment that led to requirements for the MEVA architecture must now be reassessed as we consider the network requirements to support ATM needed for the next ten years.

1.3 This paper presents some considerations for CANSNET and comments on similar efforts in other regions.

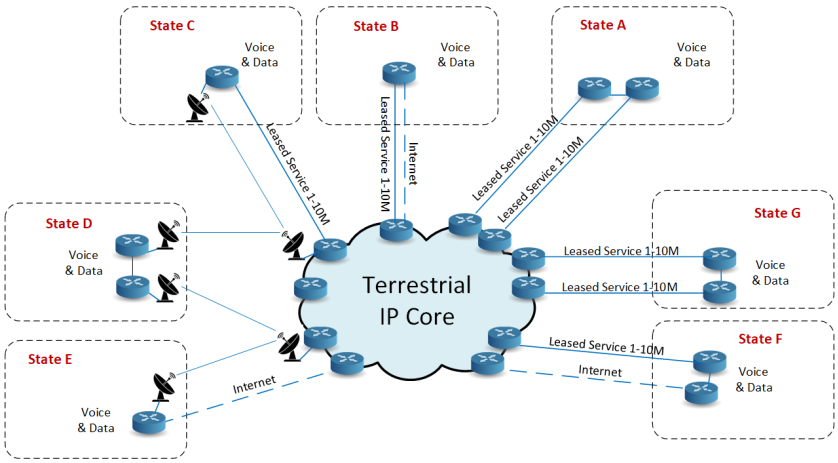
2. Discussion

Core Network

2.1 Time Division Multiplexing (TDM), the telecommunications technology that supported previous point-to-point circuits, is being obsoleted in favour of packet-based networks. Both voice and data communications, necessary for ATM, can now readily be supported by IP networking. Telecommunications providers are able to implement highly reliable, high bandwidth, multi-path IP-based Virtual Private Networks (VPNs) within their infrastructures that offer a new environment for international air traffic communications.

Access

2.2 Instead of implementing interconnecting circuits with dedicated bandwidth, either physical or logical, States should now establish access to the telecommunications provider's network and hence to a private IP network core. Different options for access may be available: terrestrial, satellite, wireless LTE, Internet VPN, etc.



2.3 States can choose the best access options suitable for their environment without consideration for the technologies used by other States. All communications should traverse the terrestrial core IP network independent of the access technology used.

Redundancy

2.4 A similar argument applies to redundancy and reliability. States can choose combinations of access technologies to achieve the desired reliability depending on their local circumstances, e.g. dual terrestrial geographically separated access; terrestrial and satellite; terrestrial and Internet backup, etc. This has proven quite successful in the Asia Pacific Common Aeronautical Virtual Private Network (CRV) where States can choose from a number of 'packages' with different access combinations. The choice is made without regard to packages chosen by corresponding States, thus allowing a high-degree of independence for customization. Subsequently, States may choose to independently upgrade or change their redundancy architecture, according to new requirements.

ATM Service Providers

2.5 A core network offers efficiencies for access to ATM Service Providers. Organizations such as SITA and Collins Aerospace (formerly ARINC), that provide Air/Ground data communications, can provide services to States via a common access to the core network. The same is true for Space-Based Surveillance, a concept that has already been implemented in the existing MEVA network. An interesting idea being discussed in Asia, is offering SWIM functionality as a networked service to States that do not wish to implement or support a local SWIM capability.

Other Regional Networks

2.5 States with a common FIR boundary, that may potentially share surveillance, should use the same network for efficiency and to minimize troubleshooting coordination. There has been discussion of using a Network-to-Network Interface (NNI) to interface private virtual networks in different regions but, so far, the telecommunications providers have not readily offered this functionality. Alternatives should be considered where using the same network is not achievable.

3. Conclusions

3.1 Developments in telecommunications infrastructure make it feasible to provide a core terrestrial IP network with States implementing different technologies for access and redundancy. Such an architecture offers efficiencies for communication between States and access to ATM service providers.

3.2 An alternative to regional networks interconnection by NNI should be considered as requirements are developed for CANSNET.

4. Suggested actions

4.1 The meeting is respectfully encouraged to:

a) review the information presented in this Working Paper; and
b) discuss its contents and take appropriate action regarding the CANSNET RFP.

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