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North American, Central American and Caribbean Office

INFORMATION PAPER

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Third Meeting of Rapporteurs of the North American, Central American and Caribbean Working Group (NACC/WG/RAP/03)
(ICAO NACC Regional Office, from 24 to 27 March 2025)

Agenda Item 3: Update NAM/CAR regional needs and NACC/WG objectives, its structure and the review and reporting mechanisms

CARIBBEAN AIR NAVIGATION SERVICES NETWORK (CANSNET)

(Presented by COMM TF Rapporteur)

EXECUTIVE SUMMARY

This note provides an overview of the fundamental technical solutions to be implemented in the Caribbean Air Navigation Services Network (CANSNET) in order to efficiently and securely support the emerging data exchange and communications needs of the ANS in the CAR region

Strategic Objectives:	• Operational Safety • Air navigation capacity and efficiency • Aviation Security and Facilitation • Economic Development of Air Transport • Environmental Protection
References:	• Thirty-Eighth Meeting of the MEVA Technical Management Group (MEVA/TMG/38), Mexico City, Mexico, July 11-14, 2023 • Thirty-ninth Meeting of the Communications Task Force of the North America, Central America and Caribbean Working Group (NACC/WG/COMM/TF/39), Mexico City, Mexico, 07-10 May 2024 • Fortieth Meeting of the Communications Task Force of the North America, Central America and Caribbean Working Group (NACC/WG/COMM/TF/40) (Mexico City, Mexico, 23-26 July 2024)

1. Introduction

1.1. In 2018, during the MEVA/TMG/33 meeting, the MEVA III Network Central Caribbean Member States/Organizations identified the need to review the MEVA architecture and services to ensure that the network would support the emerging requirements in a cost-effective manner. They

agreed to create a MEVA Ad-Hoc Group with the objective of developing the technical/operational requirements for a new IP communication platform to support the new services.

1.2. ICAO's Capacity Development and Implementation Office (CDI) was invited to host the CANSNET bidding process. To this end, the project members and ICAO established a collective MANAGEMENT SERVICES AGREEMENT (MSA) and formed its annex document, Project Document (PRODOC) RLA22801 'Caribbean Air Navigation Services Network (CANSNET)', signed on 29 June, 2023.

1.3. Under the guidance of ICAO CDI, the Terms of Reference for CANSNET were developed. On 7 September, 2023, with a deadline of 30 November, 2023, ICAO CDI issued the Request for Proposals for the future CANSNET network (Ref. ICAO/00210).

1.4. The Technical Evaluation process of the proposals was carried out by the Technical Evaluation group, under the guidance of OACI CDI, according to the Evaluation Criteria approved by the project members. This task took place from 6 December, 2023 to 19 January, 2024, when the Technical Evaluation Report was signed.

1.5. During the NACC/WG/COMM/TF/39 meeting, OACI CDI presented and argued the final report of the CANSNET bidding process, and proceeded to recommend ***Frequentis*** as the winning company of the RLA22801 project bidding process. This recommendation was accepted and resulted in decision NACC/WG/COMM/39/04 '*APPROVAL OF THE CANSNET PROJECT TENDERING RESULTS REPORT SUBMITTED BY ICAO*'.

1.6. During the NACC/WG/COMM/TF/40 meeting, the winning bidder of the RLA22801 project 'Caribbean Air Navigation Services Network (CANSNET)' made a detailed analysis of its bid. CANSNET members made the confirmation/update of the requested services and contractual commercial terms that fit their States/Organizations for the new network implementation.

2. Discussion

2.1. The Caribbean Air Navigation Services Network (CANSNET), successor to the regional MEVA III network, will be a full IP network, with an MPLS terrestrial core, supporting data and voice telecommunication services, with different access technologies as best suited to each member's environment. With a fully meshed topology, it will allow any-to-any communication.

2.2. Its supplier, Frequentis, together with British Telecom (BT), on the basis of the Request for Proposals (RFP), have defined a solution comprising VSAT (Very Small Aperture Terminal) and terrestrial MPLS (Multiprotocol Label Switching) technologies. Their combinations, defined by the members according to various criteria, guarantee fully redundant access to the CANSNET core with 99.99% availability.

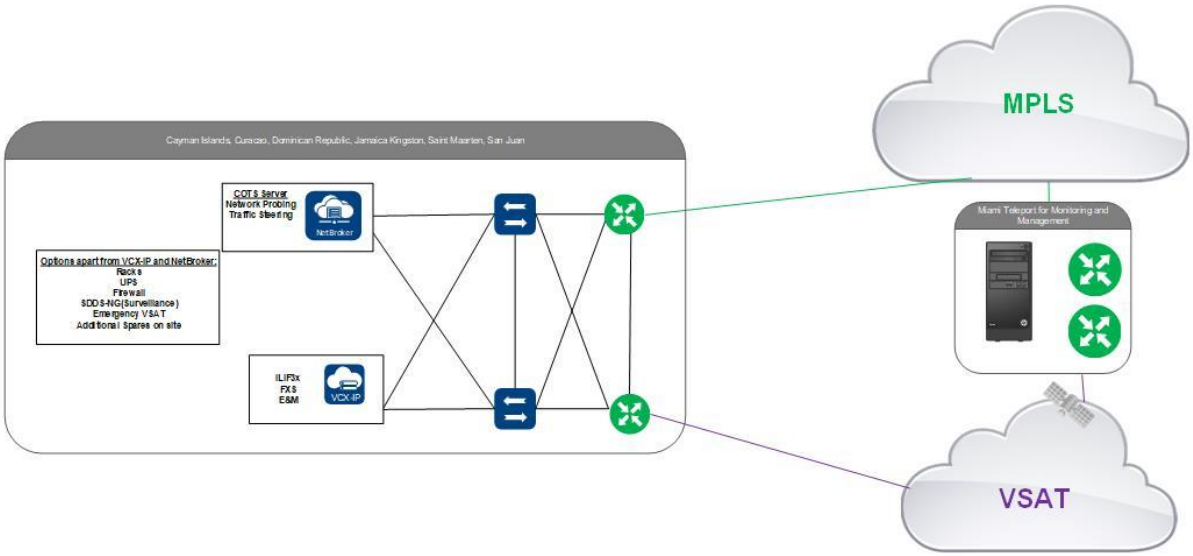

Fig.1 Redundant access to the CANSNET core through a combination of terrestrial and satellite access.

2.3. All MPLS access and the network core will be implemented over dedicated land lines ensuring that the bandwidth offered is fully guaranteed. The CANSNET links offered will be fully scalable, thus guaranteeing future bandwidth requirements for emerging services.

2.4. CANSNET's terrestrial infrastructure will be implemented over the British Telecoms (BT) global connection network. Among its main features are:

- Secure, reliable, and high speed MPLS based IP VPN multi-service core network
- Fully meshed topology
- Dual-core architecture that provides extremely high redundancy
- Six Classes of Service (CoS): Through differentiated performance levels and prioritization of sensitive traffic, it fully guarantees the requirements of both, critical applications, such as voice, and non-delay-sensitive applications.

2.5. Frequentis, as a CANSNET provider, has access to the monitoring of all terrestrial links that will be provided by BT, which will be equally available to each of its members.

2.6. CANSNET's VSAT infrastructure is based on the latest generation of satellite modems, the SkyWAN 5G. Among its main features are:

- Uses TCP/IP as standard transport protocol
- Fully meshed topology: Allows all network nodes to communicate with any node accessible from CANSNET through a single satellital hop.
- Highly flexible configuration: Allows changing, upgrading and modifying network operation without the need to replace station equipment. Facilitates the integration of new sites.
- Supports SKYWAN Master Station and Backup Master Station concept: Ensures maximum network availability

- Immediate assignment of master/backup roles through licenses: Taking into account their geographical locations, the master station was conceived at Miami Teleport and the backup station in Curacao, although this configuration is easily modifiable.

2.7. Miami Teleport is the central point of CANSNET where the MPLS terrestrial network is interconnected with the VSAT network through redundant MPLS links and redundant VSAT Modems. If one site has only VSAT connections and the remote site only has terrestrial connections, traffic will be transferred between the two networks at the Miami teleport with no change in protocol, allowing IP to IP data transfer.

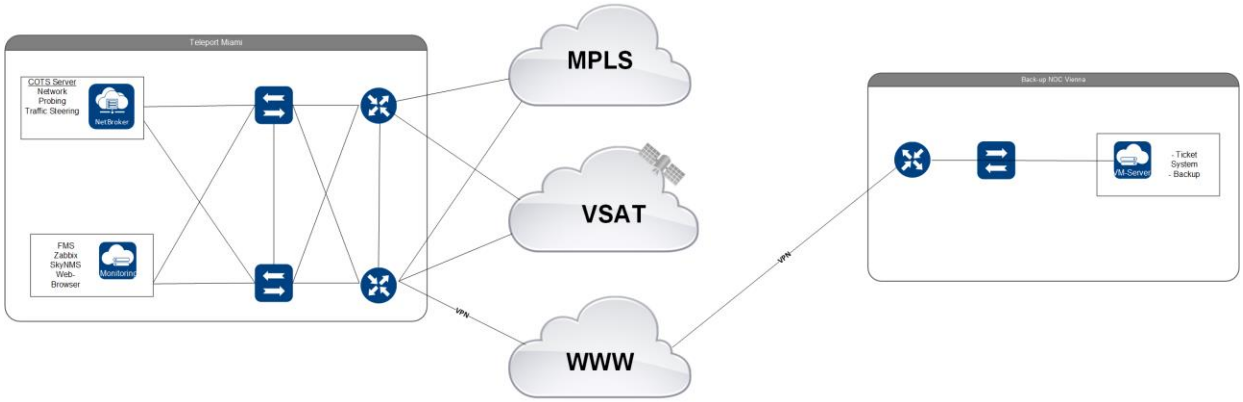

Fig 2. Miami Teleport Configuration

2.8. In case of Miami Teleport failure, the transfer function can be carry out by any CANSNET site where the redundant access paths have the combination shown in Fig.1.

2.9. VCX-IP is an advanced gateway for voice and data communications that ensures secure transport of legacy data from analog interfaces over the new full IP network. As part of the CANSNET solution, VCX-IP will allow all member States to continue using legacy equipment for voice and data, ensuring a smooth transition to a full IP environment by allowing a step-by-step migration at their own pace.

2.10. In order to perform ongoing optimization of routing automatically and in real-time, CANSNET will include NetBroker in all locations where more than one route for data is possible. NetBroker is a software-defined networking (SDN) controller based on open standards and tailored for air traffic management (ATM) networks which can detect degradation of performance and act on this information to select the best route.

2.11. CANSNET will have a main and a backup interconnection to the REDDIG network via two data centers to be located in sites that should be identified by the providers of both networks. These interconnections will be implemented through Network-to-Network Interfaces (NNI).

2.12. Interconnection to the E/CAR network will be implemented providing Automoatic Ring Down (ARD) connections from Sint Maarten to FXS interfaces at San Juan, Puerto Rico that are then interconnected to FXO interfaces provided by the E/CAR network.

2.13. The expansion of the network by additional sites does not cause any problem for the existing network. After changing to a new VSAT and/or MPLS configuration, which includes the additional station, the new station can become operational in the network. Similarly, the increase of data rates on existing or new connections can be accommodated by an according change of the VCX-IP configuration and the VSAT modem and/or MPLS configuration. If such an increase entails the need for additional satellite or MPLS bandwidth, this may cause some delay until the satellite/terrestrial operator can provide the additional bandwidth.

2.14. Taking into account the analyses and decisions of the NACC/WG/COMM/TF/40 Meeting, the supplier is currently in the process of preparing the contracts to be signed by each of the CANSNET members. It is expected that all can be signed by 30 May, 2025. Only once all members have signed their contracts can the CANSNET implementation process begin.

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