



ICAO

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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
3.1 Review of the Draft Document of Technical Specifications of the CANSNET Network

**NEED TO BE ABLE TO COUNT ON THE REDUNDANCY OF DATA LINKS
FOR THE INTERCONNECTION OF THE NODES OF THE CANSNET NETWORK**

(Presented by Dominican Republic)

EXECUTIVE SUMMARY

The purpose of this Working Paper is to explain the need to be able to count on the redundancy of data links for the interconnection of the nodes of the CANSNET Network, it should be a mandatory requirement of the Caribbean Air Navigation Services Network (CANSNET), since its inception to implement a network 100% redundant and that as member States of the MEVA network, the failures that have occurred in the network and that have left the States without communications, causing a decrease in operational safety, are taken into account.

Action:	Suggested actions are presented in Section 3.
<i>Strategic Objectives:</i>	<ul style="list-style-type: none">• Safety• Air Navigation Capacity and Efficiency
<i>References:</i>	<ul style="list-style-type: none">• MEVA/TMG/36• Terms of reference (RFP) for CANSNET

1. Introduction

1.1 Redundancy in communication networks consists of ensuring the survival of the network by providing alternative mechanisms to provide continuity of services, ensuring that an optimal level of reliability is maintained. Additionally, when both are active they can share the traffic load and increase capacity.

1.2 There are basic configurations that can be applied to achieve the desired scenario.

1.3 Before the start-up of a new aeronautical communications network for the CAR Region, CANSNET, the incorporation of redundancy mechanisms is a high priority and the necessary decisions must be made so that the redundancy requirements are included in the terms of reference of the project.

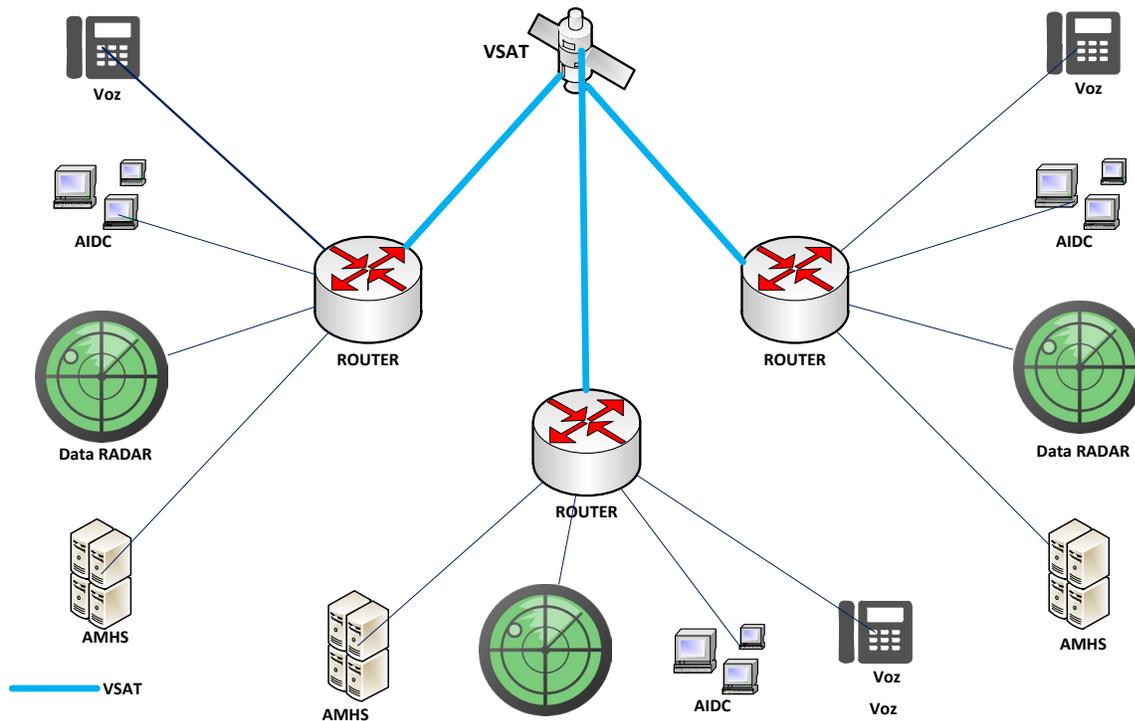
1.4 The need to have redundant links for each node in the network has become evident, due to the fact that it has experienced an increase in voice and data services that are transported through it, such as: Data RADAR, AIDC, ADS -B, AMHS, Shoutline and switched lines.

1.5 In recent months we have experienced service interruptions due to the failure of data links at the nodes, and even the entire MEVA Network, notably affecting the flow of aeronautical operations of all MEVA Member States, even more so those where the channel primary and sometimes unique is through the MEVA Network.

1.6 The active equipment of the MEVA network and the services provided through it have hardware redundancy; the idea is that if a component fails, the service remains online. In addition to the equipment, they also have electrical redundancy and additional backup equipment such as emergency generators and uninterruptible power supplies (UPS); however, for the transmission of data, they currently only have a single mean.

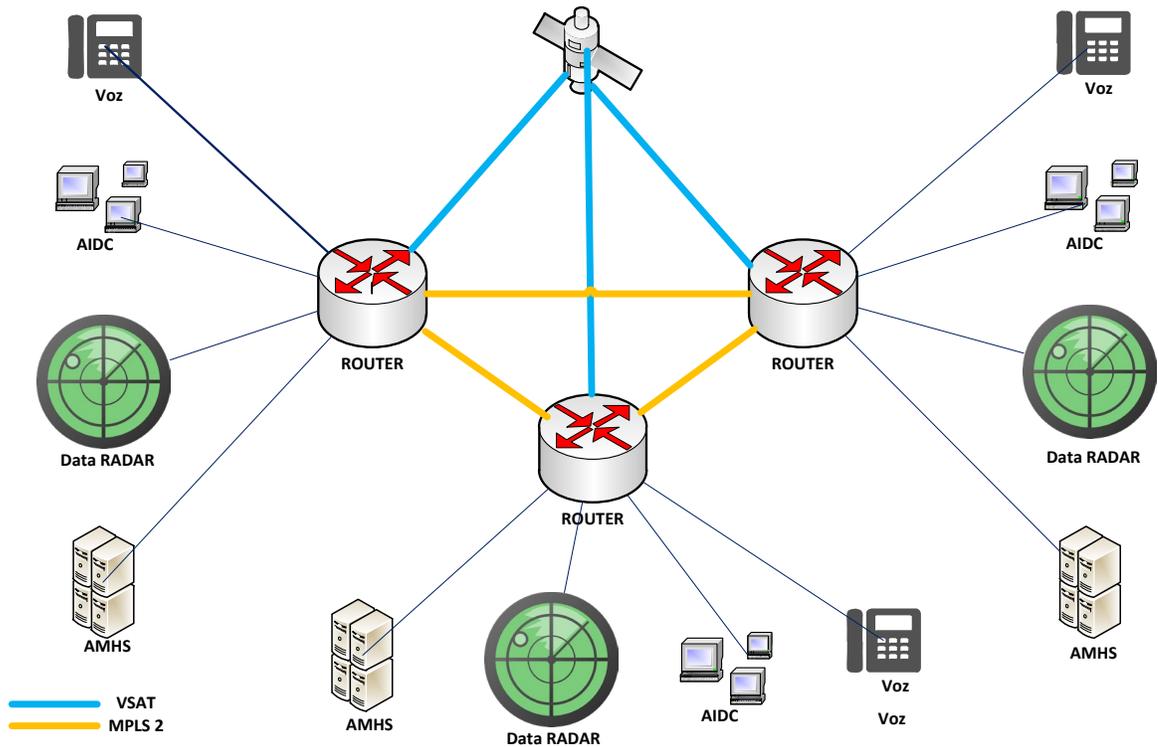
1.7 Work is currently under way to complete the development of the Terms of Reference (RFP) document for the new ATN network, which would be called CANSNET. We see the need to include data link redundancy for the interconnection of network nodes of the new network in order to mitigate these failures, with a technical solution at the redundant interconnection level that meets the present and future needs of the States, with a more modern, scalable, efficient, secure and reliable network.

1.8 At this time, we have a VSAT link in each node, which is very vulnerable to extreme atmospheric conditions, typical in our region and even so, under normal conditions, unlike terrestrial data links, the connection can oscillate depending on of the load, additionally this type of connection has more active elements which increases the failure points.

ESQUEMA ACTUAL VSAT

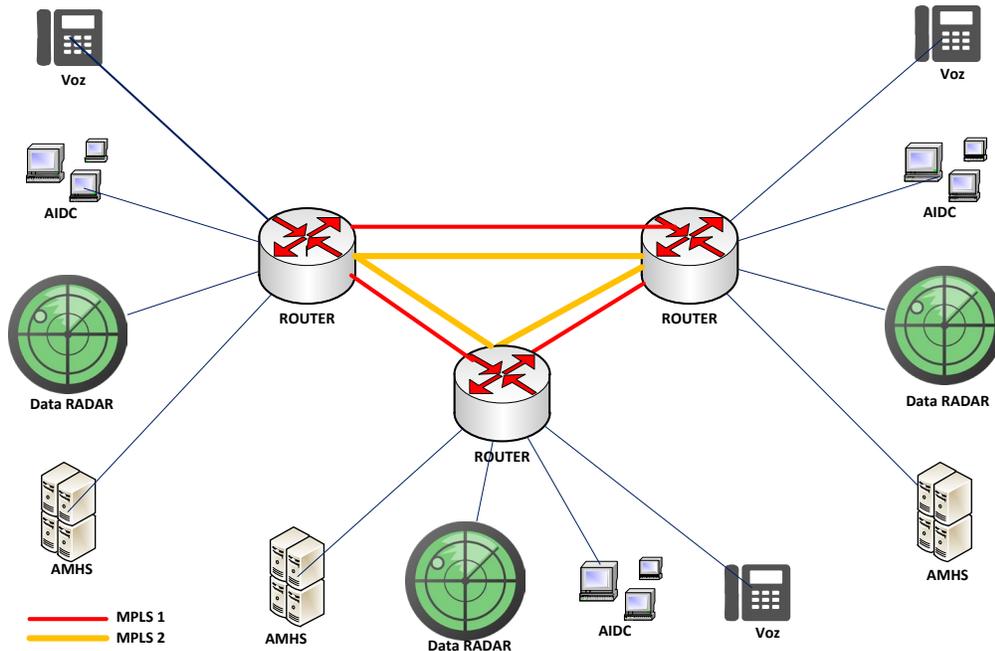
1.9 To achieve the desired redundancy that can guarantee a higher level of continuous operation and taking into account the growth of new technologies that will use CANSNET as a communication channel, we recommend the following:

- a) Integrate into the MEVA III, MPLS layer 2, Point Multi Point, terrestrial links that are capable of satisfying the needs, counting on the current VSAT link as the main one, once the stability and reliability of the terrestrial network is verified, Due to the great problem of the last mile, being these international links which can be made up of various operators in each of the nodes or in specific paths, it is proposed that it become the main link and the satellite become secondary, with balanced traffic when both are available.

ESQUEMA REDUNDANTE VSAT- MPLS

- b) If for the start-up of the new CANSNET telecommunications network, the stability and reliability of the terrestrial network have not been achieved, we initially propose that the same scheme explained in **point a** be maintained as a transmission channel.
- c) If it was possible to verify the stability and reliability of the terrestrial network, a third option would be to install two MPLS layer 2 links, Point Multi Point, in each node, redundant from different providers and that do not share any physical section or equipment, specifically taking into account the great problem of the last mile, since they can coincide in a common point of failure. We recommend focusing on placing requirements that the chosen company provide an alternate, verifiable and integrated backup connection to on-site testing of communications.

**ESQUEMA REDUNDANTE CON DOS ENLACES TERRESTRE MPLS DE
DIFERENTES PROVEEDORES**



1.10 The technical requirements for the new network must include the need for active support, including the peculiarities of each State.

2. Discussion

2.1 It is necessary to include in the RFP document that each node is redundant in the data transmission channels, since it is a critical component of the network with which high availability will be obtained, thereby achieving greater operational safety, capacity, and efficiency of air navigation.

3. Suggested actions

3.1 The Meeting is invited to:

- a) review the information presented in this working paper;
- b) conduct an analysis of the communications support needs of the States;
- c) your States to identify "high priority" services that should have redundancy;
- d) define during the meeting the general support requirements for the network; and
- e) other applicable action.