



**Fifth GREPECAS–RASG-PA Joint Meeting (GREPECAS-RASG-PA/5) and  
 Twenty-Third Meeting of the CAR/SAM Regional Planning and Implementation Group  
 (GREPECAS/23)**

Virtual Phase (Asynchronous, 19 January to 17 February 2026)

In-Person Phase (Mexico City, Mexico, 4 to 6 March 2026)

**Agenda Item 8: Implementation of CAR/SAM Air Navigation Services (ANS)**

**ATN-BR IMPLEMENTATION PROGRESS**

(Presented by Brazil)

<b>EXECUTIVE SUMMARY</b>	
<p>This paper presents the progress of the ATN-Br implementation since it was introduced in the 20<sup>th</sup> GREPECAS meeting in 2022 and an overview of the benefits it provided to the Air Navigation Services in Brazil.</p>	
<p><i>Strategic Objectives 2026-2050:</i></p>	<ul style="list-style-type: none"> <li>• Every flight is safe and secure</li> <li>• Aviation is environmentally sustainable</li> <li>• Aviation delivers seamless, accessible, and reliable mobility for all</li> <li>• No country left behind</li> <li>• The International Civil Aviation Convention and Other Treaties, Laws and Regulations Address All Challenges</li> <li>• The Economic Development of Air Transport Assures the Delivery of Economic Prosperity and Societal Well-Being for All</li> </ul>
<p><i>References:</i></p>	<ul style="list-style-type: none"> <li>• Doc 9750 – Global Air Navigation Plan. Sixth edition</li> <li>• Doc 9896 - Manual on the Aeronautical Telecommunication Network (ATN) using Internet Protocol Suite (IPS) Standards and Protocols</li> <li>• The European Organisation for Civil Aviation Equipment. Voice Over Internet Protocol (VoIP) Air Traffic Management (ATM) System Operational and Technical Requirements – ED136. 2009</li> <li>• The European Organisation for Civil Aviation Equipment. Interoperability Standards For VoIP ATM Components Volume 1: Radio – ED-137/1C. 2017</li> <li>• The European Organisation for Civil Aviation Equipment. Interoperability Standards For VoIP ATM Components Volume 2: Telephone – ED-137/2C. 2019</li> <li>• The European Organisation for Civil Aviation Equipment. Interoperability Standards For VoIP ATM Components Volume 4: Recording – ED-137/4C. 2019</li> </ul>

	<ul style="list-style-type: none"> <li>• The European Organisation for Civil Aviation Equipment. Interoperability Standards For VoIP ATM Components Volume 5: Supervision – ED-137/5C. 2019</li> <li>• The European Organisation for Civil Aviation Equipment. Interoperability Network Requirements and Performance for Voice over Internet Protocol (VoIP) Air Traffic Management (ATM) Systems (Part 1: Network Specification – Part 2: Network Design Guideline) ED-138. 2009</li> </ul>
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## 1. Introduction

1.1 ATN-Br (Air Traffic Network – Brazil) is a software-defined network (SDN) based on the IP suite and dedicated exclusively to supporting air traffic services and applications, such as radio communication (VHF) and RADAR. This Network is operational in 02 (two) of the 04 (four) ACCs in Brazil - ACC Recife, responsible for control in the Northeast region, and ACC Curitiba, responsible for the South and Southeast regions of the country – as well as in the corridor Rio de Janeiro – São Paulo, which carries more than 50% of Brazilian air traffic. Additionally, its implementation in ACC Brasilia, responsible for the central-western region, started in June 2025.

1.2 As it is an IP-based network, it enables the implementation of voice communication between centers using VoIP, migration of old AFTN circuits to AMHS and inter-center data communication, as foreseen in Blocks 0, 1 and 2 of the GANP’s Roadmap for ground-ground communications.

1.3 The ATN-Br Network was designed to offer greater availability, better use of long-distance means and flexibility in operation. To achieve this, the Network utilizes the multilink concept introduced in the latest Amendment to Annex 10, Vol III, to connect the Control Centers to the remote communication stations.

1.4 Initially, the priority order of the means is configured, but the decision on which link to use is based on the quality (delay, jitter and packet loss) required for each application. The means of communication are constantly monitored and, if one of the parameters suffers degradation, the application is switched to another means. This behaviour is called “brown-out”.

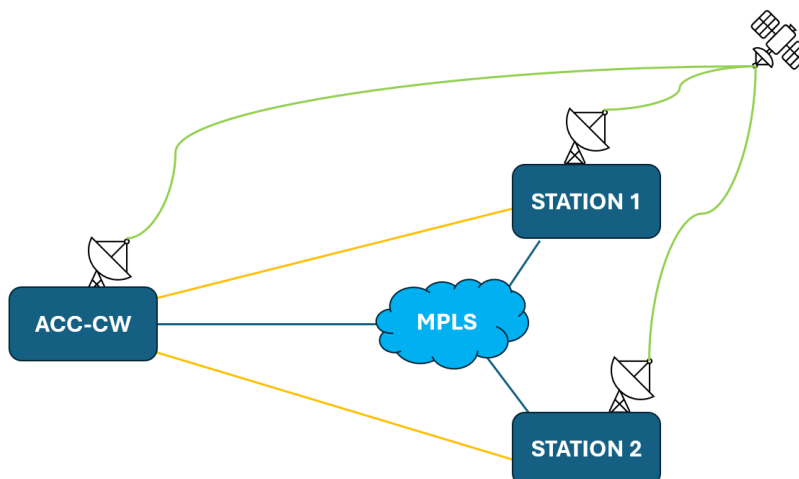


Figure 1: ATN-Br Network diagram

1.5 The configuration of the network, both the links to be used and the services which will use the network, is done centrally at the DECEA Technical Management Center (CGTEC).

1.6 This WP aims to present the progress in implementing the ATN-Br in Brazilian territory.

## **2. Implementation Progress**

2.1 Since Brazil introduced the ATN-Br concept during the twentieth meeting of GREPECAS, in 2022, we concluded its implementation in the corridor Rio de Janeiro – São Paulo, which covers around 50% of the Brazilian air traffic. Also, in June of 2025, we started implementing it in the third ACC, Brasilia, which is responsible for the central-western region in Brazil.

2.2 As mentioned before, the network uses the multilink concept, introduced in the Amendment 93 of Annex 10, Vol III, to provide better availability and performance to the ground-to-ground network, also in consonance with Doc 9896 – Manual on the Aeronautical Telecommunication Network (ATN) using Internet Protocol Suite (IPS) Standards and Protocols.

2.3 Initially, the network was conceived to operate using three long-distance means, being a MPLS network, a point-to-point E1 link and a geostationary satellite-based network. However, since E1 is an old technology which is being discontinued by the Telecommunication Network providers in Brazil, the link was not meeting the performance and availability requirements needed. Therefore, DECEA decided to migrate to a second MPLS network, provided by a different provider from the first one. This new topology was implemented in the corridor Rio de Janeiro – São Paulo and it was contracted at the end of 2025 to the remaining ACCs, and the migration of the services in ACC Recife and ACC Curitiba already started.

2.4 Additionally, the use of an SDN makes it possible for the network to take advantage of emerging technologies, such as LEO satellite constellations. Recently, Brazil conducted a proof of concept to integrate this kind of constellation to the ATN-Br. It was done in ACC Recife and 3 remote stations (Natal, Fortaleza and Salvador) and the results were promising. Based on those results, Brazil started defining the technical specifications to include this technology as a long-distance mean, considering that some remote stations, mainly in the Northern region, are not supported by non-satellite communications.

## **3. Benefits**

3.1 The use of an IP based SDWAN provides a wide range of benefits to the overall network. One of those is having a high availability despite the low performance of the individual long-distance communications.

3.2 In Brazil, the telecommunications service providers, due to several reasons, usually provide links that present performance levels that are not compatible with the safety level required for Air Traffic Services. This can be shown on Figure 2, which presents the availability of the E1 and MPLS links between ACC-Recife and some of its remote stations in November of 2025.

OM origem	Q	OM destino	Q	Disp. Max	Disp. E1	Disp. MPLS
Total				91,5%	67,3%	89,1%
DACTA III		DTCEA-AR		96,7%	81,5% ●	96,7% ●
DACTA III		DTCEA-FN		93,0%	57,4% ●	93,0% ●
DACTA III		DTCEA-FZ		97,2%	71,4% ●	81,9% ●
DACTA III		DTCEA-LP		95,0%	72,1% ●	87,7% ●
DACTA III		DTCEA-MO		95,9%	80,8% ●	91,6% ●
DACTA III		DTCEA-NT		97,0%	79,0% ●	94,9% ●
DACTA III		DTCEA-PL		94,6%	77,0% ●	91,9% ●
DACTA III		DTCEA-PS		94,4%	68,9% ●	94,4% ●
DACTA III		DTCEA-STA		92,8%	40,0% ●	60,8% ●
DACTA III		DTCEA-SV		90,9%	71,4% ●	90,9% ●
DACTA III		EACEA-BRR		91,1%	91,1% ●	81,1% ●

**Figure 2: MPLS and E1 link availability**

3.3 However, by integrating both links, as well as the satellite network maintained by DECEA, to the ATN-Br, we were able to keep operating ACC-Recife without any reports.

3.4 Another direct benefit is the flexibility that this network provides to Brazilian airspace. It was presented in 2024, during GREPECAS/22, how Brazil took advantage of this flexibility during a disastrous situation.

3.5 In 2024, Rio Grande do Sul was afflicted by a natural disaster that caused several floods in the State, damaging several critical infrastructures, including CNS means and airports. Despite that, air movement continued due to the need for rescue operations and humanitarian actions. However, APP-PA, which is in Porto Alegre, the State capital, was unable to operate. Due to the ATN-Br flexibility, it was possible to redirect the services from Porto Alegre surrounding area to the ACC-Curitiba and establish a remote APP to provide air traffic services to the area.

## 4. Conclusion

4.1 The ATN-Br network is demonstrating itself to be a robust infrastructure, capable of supporting the performance requirements demanded by aeronautical applications. Brazil is proceeding with its implementation in all its territory and evolving the network. It was already possible to replace the E1 technology by MPLS links and new technologies are being studied and tested to be integrated to the network.