



Deploying Space-Based ADS-B Through ICAO's CRV

What is space-based Automatic Dependent Surveillance-Broadcast (ADS-B)?

Aireon operates the first ever, space-based air traffic surveillance system for Automatic Dependent Surveillance-Broadcast (ADS-B) equipped aircraft throughout the entire globe. Aireon's space-based ADS-B data meets the strict, real-time Air Traffic Service (ATS) surveillance requirements for separation services and bypasses the limitations of ground-based systems by putting ADS-B receivers on a constellation of Low-Earth Orbit (LEO) satellites, operated by Iridium Communications.

What is the International Civil Aviation Organization's (ICAO) Asia Pacific Common Regional Virtual Private Network (CRV)?

The CRV is a cross-border, dedicated communications network for ICAO Member States, provided by a common network service provider. A good way to think about the CRV is as a secure "cloud" that allows the transfer of digital data without unique point-to-point, leased telecommunications lines. The CRV is used to exchange flight plan information, voice transmissions, and now, Aireon's space-based air traffic surveillance data. There are other ICAO-sponsored communications networks like CRV, including the Pan-European Network Service (PENS) in Europe, the FAA's Telecommunication Infrastructure (FTI) in the U.S. and Canada, Rede Digital da Região SAM (REDDIG) in South America and Mejoras al Enlace de Voz del ATS (MEVA) in the Caribbean.

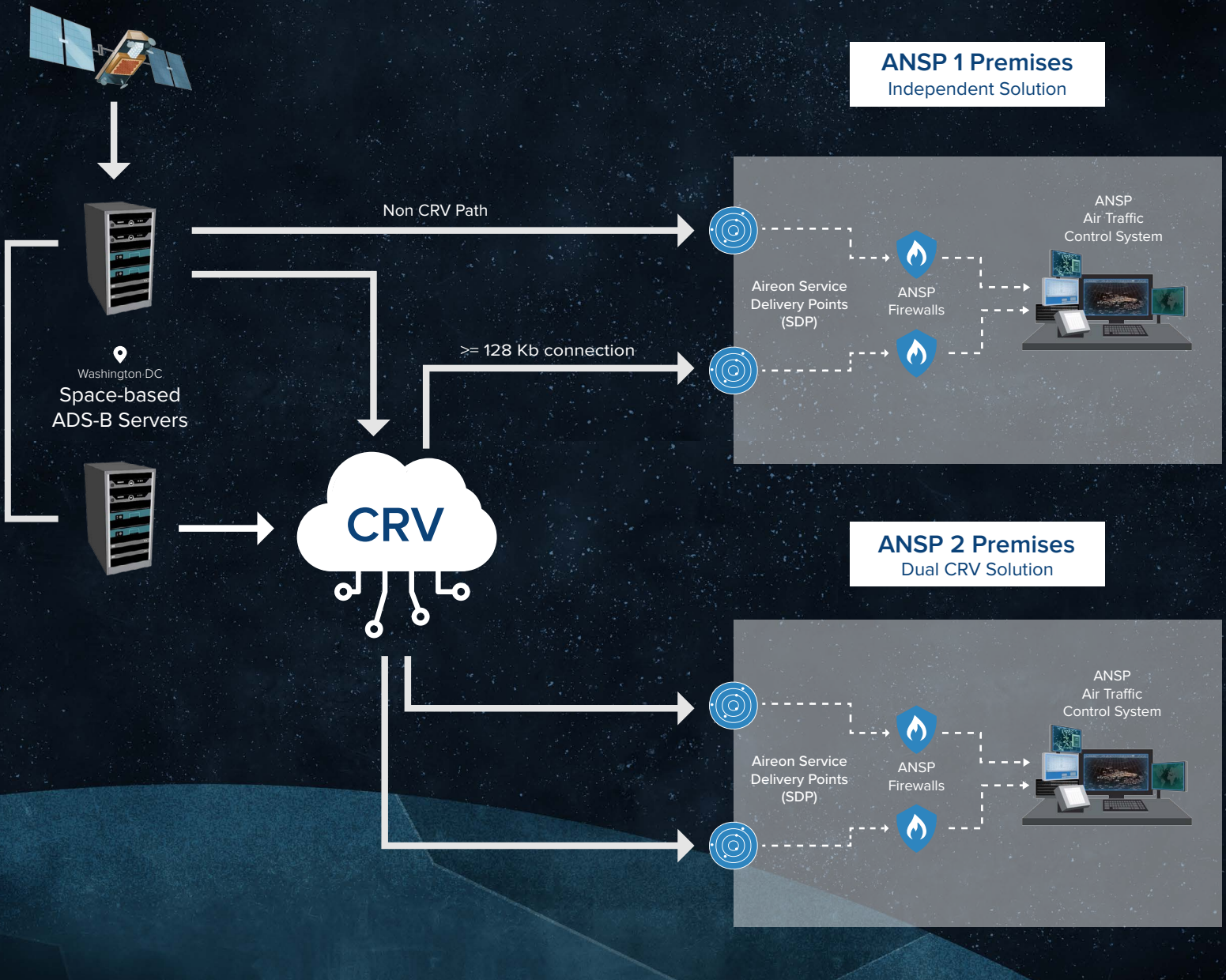
The CRV's main objective is to reduce costs related to the proliferation of point-to-point circuits. It also allows new links and capabilities to be set up without the purchase of additional hardware. A new circuit can be established through easy configuration rather than the purchase of hardware and communication links.

Aireon has now connected to the CRV, allowing for the delivery of surveillance data to Asia Pacific Air Navigation Service Providers (ANSPs) via CRV.

How does the CRV work?

The CRV has been built leveraging a high-speed international IP network, with mission-critical connections running across a diversified infrastructure, supporting multiple aviation-specific applications.

The CRV offers several options to ANSPs the packages have differing price and performance characteristics and the ANSP must choose that most appropriate for the ANSP use. An operational ATS surveillance service will typically use a dual "Package C" which allows a "hot/hot" configuration for seamless service and redundancy. The chart on the following page depicts the flow of Aireon's space-based ADS-B data to multiple customers, through the CRV.



What are the Benefits to using the CRV Instead of Telecommunications Lines?

The Asia Pacific region has many areas where communications challenges exist due to inhospitable terrain and lack of high-quality infrastructure. This brings high costs to deploy redundant and mission-critical point-to-point connectivity.

By connecting space-based ADS-B through the CRV, ANSPs can:

- ▶ Enable cost efficiencies, as compared to multiple point-to-point connections
- ▶ Reduce procurement time and effort, as each ANSP will require only the initial connection to the network
- ▶ Ensure speed, latency and redundancy of data transmissions through service agreement

Is the CRV already being used to Deploy Aireon's Space-Based ADS-B?

NiuSky Pacific Limited (NSPL), formerly PNG Air Services Limited (PNGASL), the sole provider of Air Navigation Services for Papua New Guinea, was the first ANSP to receive air traffic surveillance data through the CRV in April 2021. NSPL contracted Aireon to provide airspace-wide surveillance coverage, for the first time in their history, and solve terrestrial infrastructure constraints. The Aireon system was initially operationally commissioned using dual dedicated data communication links but has transitioned one leg to CRV (delivered via VSAT). By utilizing the CRV, NSPL will decommission local telecommunications lines, reducing costs to the ANSP. NSPL will soon transfer to a dual CRV configuration, allowing for the removal of the remaining leased communications line, resulting in further cost savings.

