High-Speed Aero Connectivity
SITAONAIR

Airline Challenges

The demand for connectivity is growing everywhere, even in the air. Increasingly, airlines are seeking a robust inflight connectivity experience for passengers, crew and operations that meets the growing data demand from connected devices. According to NSR, the passenger connectivity services market is expected to grow to $5.4B by 2025.

When selecting a service provider for onboard internet, most airlines focus on product features, business benefits and cost. The airline industry wants a solution that "just works" without extensive troubleshooting or maintenance—service, software, and hardware that can be easily and quickly installed on the aircraft. Plus, all installations must meet specific aero certifications and standards.

However, providing reliable global satellite connectivity to an aircraft travelling in excess of 1000 kmph at 10km in the air, while dealing with complex per country and region regulatory requirements, is a huge challenge. The airline's satellite platform must be able to actively manage rapidly-changing capacity demand as the plane moves, doppler shift caused by the plane's speed, satellite backhaul latency, traffic routing across continents, and the movement across multiple satellites, beams and bands—all while providing a seamless connectivity experience to end users expecting a land-like Wi-Fi experience.

iDIRECT

SITAONAIR is an inflight connectivity service provider that offers airlines a service portfolio of worldwide nose-to-tail connectivity solutions and services powered by satellite operators. To deliver the inflight high-speed connectivity airlines demand, SITAONAIR was tasked with building inflight mobility networks that provide higher efficiency and performance, flexibility and scalability.

The iDirect Solution

Through its various offerings and mobility portfolio, iDirect brings together satellite operator, inflight connectivity company's providing-Wi-Fi, mobile voice and data, antenna systems, hardware, and software into a single, easy-to-use platform that allows SITAONAIR to deliver the best inflight mobility solution.

Networks and terminals:
Network service and terminals are the foundation on which seamless inflight connectivity is built. When selecting a network service, inflight connectivity service providers must consider the amount of performance and capacity needed per fleet, coverage area for flight routes, and service availability to passengers and its scalability.

In selecting an aero terminal solution, network operators need to consider airline supplemental type certificates, regulatory restrictions, service provider network integration and, in some cases, terminal type approvals. Successful terminal solutions must include technical integration between terminal provider, solution integrator and service provider.

For inflight connectivity offerings, iDirect supports Ku-band 12-18GHZ and Ka-band 26-40GHZ, as they increase performance and resiliency in the operator's network. This is because Ku- and Ka-band offerings create higher forward and return throughput to aero terminals, increased link resiliency for small aero terminals, increased bandwidth, and spectral efficiency due to HTS and frequency re-use. This solution optimizes overall network performance while managing demand, realizing lower business costs and delivering against Service Level Agreements (SLAs).

Quality of Service (QoS) and SLAs:
Integration with a strong QoS is important to guarantee the stringent SLA's and multiple user profiles that come from the different use cases in nose-to-tail connectivity. iDirect provides a scalable, flexible VSAT technology solution built to dynamically allocate shared bandwidth across a fleet to reduce OPEX by optimizing capacity costs and sharing resources across the fleet. The iDirect platform integrates with advanced Quality of Service (QoS) and a robust network management system.

To support bandwidth commitments to mobile remotes, a service provider must manage bandwidth for a group of remotes that travels between spot beams or satellites. With a fleet of aircraft, the beams will not be evenly loaded in all parts of the coverage at all times, in which case the operator also has the flexibility to restrict a service offering to certain geographic areas or usage profiles based on fair access polices and assigned Committed Information Rate/ Maximum Information Rate traffic profiles to better manage congestion and optimize fill rates.

Advanced mobility features:

iDirect's advanced mobility features integrate with service providers and antenna systems for seamless mobility management. The iDirect CX780 modem integrates with the aircraft antenna, service provider systems and satellite network to optimize operations and capacity management. Service providers can take advantage of advanced mobility capabilities that enable fast-moving remotes to automatically cross multiple spot beams within a short period of time, maintaining a constant IP session. These capabilities include integrated Automatic Beam Selection (ABS) technology which features beam switching with no manual intervention across multiple satellite footprints, incorporates regulatory rulesets and available capacity into decisions to enable global connectivity. Waveforms that support spread spectrum and doppler compensation are specifically designed for small aeronautical terminals and fast-reacquisition and blockage mitigation functions enable rapid return to service in the event that the path to the antenna is momentarily blocked by aircraft movement.

The End Result

With iDirect's all-in-one platform, SITAONAIR has successfully activated and deployed its high-speed Internet ONAIR portal over Inmarsat's GX Aviation broadband network. So far, passengers on 14 commercial airlines can access SITAONAIR's portal for connectivity services that mirror what they have at home. Passengers can stream videos, surf the web, message friends, shop and send work emails while they fly. Internet ONAIR also integrates the latest traffic management technology to optimize the use of the satellite connectivity, and allows the airline to control bandwidth usage and prevent passenger access to web content set as inappropriate. This is enabled by the iDirect platform, which consistently delivers the CIR and MIR. SITAONAIR's services can be found on aircraft big and small, long range or single-aisle, and on European, African, Middle Eastern and Asian airlines.

Thanks to the iDirect platform, SITAONAIR has also built a unique monitoring tool that tracks live performance for individual aircraft. This tool uses iDirect-provided NMS statistics to analyze real-time both system performance and **end-to-end experience** by considering terminal state, traffic demand, CIR and MIR statistics,combined with other traffic data. This tool is critical for airlines to better manage their fleets and anticipate potential issues.

"SITAONAIR does not believe pre - allocating satellite bandwidth at the passenger level is the optimal and efficient way to ensure the best passenger experience. We believe that our role goes beyond this and consists in prioritizing satellite bandwidth in real time depending on the passenger profile and needs. We assess passengers' real time experiences, as well as each piece of the connectivity chain, so we can offer the best quality of experience possible. With the iDirect platform, we're able to create land-like connectivity for our airborne passengers while seeing greater network performance and savings in efficiency and cost. It's a win-win for everyone."

- Yann Cabaret, **VP Customer Programs & Cabin Services**