Aeronautical Connectivity Application Brief

Commercial airlines are rapidly discovering the advantage of in-flight connectivity. It's absolutely essential to compete for the loyalty of more than one billion people who travel each year. And it's critical to improving operational productivity in an industry constantly facing rising costs.

While the concept of in-flight connectivity took decades to get off the ground, the technology is taking firm hold today. Nearly every major airline has rolled out, or is planning to install, some form of in-flight connectivity service. The question now is how to maximize the technology to create business value. And that varies across a wide variety of applications, from passenger WiFi and entertainment services to new ways for improving airplane operations.

Success requires choosing the right communications platform and developing a comprehensive business case. Those airlines that can best leverage in-flight connectivity will gain a clear business advantage in terms of customer loyalty, crew productivity and company profitability.

Business Benefits

In-flight connectivity improves an airline's business in multiple ways.

♦ **In-Flight Entertainment.** Access to the Internet and premium content can drive revenue and loyalty.

♦ **Cockpit Services.** Intelligence to make better decisions regarding safety and operations.

♦ **Maintenance Services.** Real-time access to mechanical issues enables faster repairs.

♦ **Crew Services.** Real-time information to passengers will improve customer service.

iDIRECT

The Power of Connectivity

Applications for Connectivity

When evaluating the proper communications solution, airlines need to consider their long-term plans for a broad range of applications across their fleet and service territory.

Passenger Connectivity

The growth of smart phones and tablet devices are creating an environment where many passengers want to use their own technology to stay connected for either work or social reasons. This includes streaming video, voice connectivity and online activities, such as email and social media. The challenge for most airlines is whether they should charge passengers for connectivity or use it as a differentiator to promote the experience of choosing their airline. The type of airline, route being travelled and time to destination can impact how an airline looks at their strategy for passenger connectivity.

Cockpit Services

Electronic Flight Bag (EFB) systems provide pilots with a suite of applications designed to provide greater insight into the performance of their flight. EFB systems are either built-in to the aircraft with specific functionality or can be accessed by pilots via connected devices, such as a tablet. When connected, these devices can better provide real-time information, including dynamic charts, weather updates and navigation tools that provide better insight and improve situational awareness for the pilot. These capabilities also enable a pilot to share operational details about the plane with aircraft support personnel and technicians on the ground.

Maintenance Applications

The more time a plane is in the air, the more profitable it is for an airline. With in-flight connectivity, aircraft can leverage sensors that monitor aircraft health through engine management, or critical system functionality, along with measuring other parameters like speed, altitude and fuel consumption. These systems can even alert ground crews of maintenance issues prior to landing. This will help ensure that any repairs or maintenance can be addressed as soon as the plane reaches the gate, enabling for quick turnaround of that aircraft for its next flight.

Crew Solutions

With connectivity onboard, airline crew can take customer service to new heights. They can enhance the experience by knowing the travel history and details of particular passengers or let passengers select meal preferences electronically. They can better check on the status of connecting flights or checked baggage before landing. Connectivity also enables the airline to verify on-board credit card purchases through real-time authorization, which helps eliminate losses due to fraud.

Choosing the Right Technology

Looking beyond traditional aircraft connectivity solutions, there are two primary technologies that are being used to provide broadband connectivity to aircraft: Air-to-Ground (ATG) and VSAT (Very Small Aperture Terminal) satellite connectivity.

Air-to-Ground Solutions

ATG uses the same underlying cellular base station technology that is used in many of the mobile phone networks that are operational today. This has been a popular way for connecting aircraft that are travelling over land or continental-based flights because they are taking advantage of existing cellular technology to connect aircraft.

While ATG offers a current solution to in-flight connectivity, it does have some challenges. ATG is not a global solution as international routes will travel over large expanses of water and areas without coverage. ATG may also be limited by the amount of cellular spectrum available as well as licenses and agreements in each sovereignty. For an airline these issues may be a challenge as they may want to fit their aircraft with a single solution versus having to look at multiple communication technologies to manage.
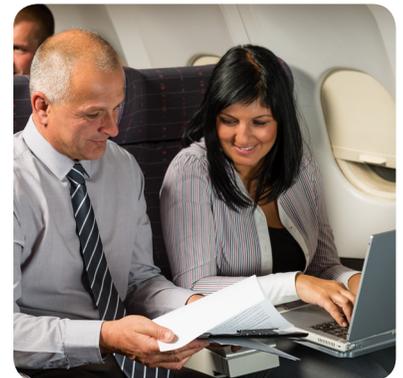
VSAT Platforms

The other primary solution for in-flight connectivity is VSAT, which is rapidly being embraced by airlines. With VSAT, airlines are able to offer higher data rates, with continual coverage for both domestic and international routes. The challenge facing VSAT is higher operational expenses based on the cost of satellite bandwidth. Fortunately, this is being addressed by new High Throughput Satellites (HTS), which are projected to dramatically improve capacity economics in the near future.

As the market for in-flight connectivity matures, VSAT is positioned to become the dominant enabling technology. Euroconsult projects a 400% increase in the number of commercial aircraft connected over the next ten years, while NSR projects that the market for in-flight entertainment and connectivity services over satellite will increase $3.4 billion during that same period.

A Growing In-flight Revenue Opportunity

NSR projects that the market for in-flight entertainment and connectivity services delivered over satellite will increase $3.4 billion over the next ten years.

iDirect: The VSAT standard for the airline industry

The iDirect In-Flight Connectivity Solution

The iDirect Intelligent Platform™ is the leading VSAT system for high throughput, bandwidth-efficient, in-flight connectivity. iDirect has been supplying VSAT technology to integrators in the commercial aviation market since 2007 to enable connectivity for major airlines, as well as military forces and business-jet operators.

The iDirect platform features specialized VSAT router boards designed for integration onboard the aircraft. The iDirect platform is also distinguished by a comprehensive range of advanced mobility technologies, such as:

- **Automatic Beam Switching.** An aircraft can automatically connect to satellite beams as it travels across multiple footprints without the need for manual intervention.

- **Global Network Management System.** Airlines can track each onboard remote with a consistent IP address to monitor its status and ensure a high-quality connection.

- **Group Quality of Service.** Airlines can manage the use of bandwidth across an airline's entire fleet to prioritize service levels based on multiple criteria, including bandwidth profiles for individual aircraft or even specific onboard applications.

- **Direct Sequence Spread Spectrum.** iDirect's spread spectrum waveform mitigates satellite interference common with ultra-small antennas or phased-array antennas, while maintaining a reliable and efficient link.

- **OpenAMIP.** An industry wide, open-source IP based protocol that facilitates the exchange of information between the airborne antenna and the satellite router.

New Horizons for In-flight Connectivity

A commercial aircraft is one of the most complex pieces of machinery in the sky—tasked with carrying the most precious cargo on earth. Connectivity provides a tremendous amount of value for airlines to increase customer satisfaction and improve their operations. And as broadband continues its rise to the skies, iDirect's VSAT platform is well positioned to deliver the speed, reliability and efficiency required for the connected aircraft.

The VSAT Advantage
With VSAT, airlines are able to offer higher data rates and continual coverage for both domestic and international routes. Euroconsult projects a 400% increase in the number of commercial aircraft connected over the next ten years.

iDirect
13861 Sunrise Valley Drive
Suite 300
Herndon, VA 20171
+1 703.648.8000
+1 866.345.0983
www.idirect.net

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