Frequently Asked Questions – Airlines

1) **Why is gatelink important to my airline?**

   Answer: If you have purchased new data centric aircraft such as the Boeing 787 or the Airbus 380, a gatelink solution is critical for achieving operational efficiency. Both aircraft will require download and upload of significant amounts of data. In many cases the volume of data exceeds the capabilities of traditional communications options on-board today's aircraft. As a result, both Boeing and Airbus are equipping these aircraft with Wi-Fi avionics to support wireless broadband communications while at the gate.

   In other cases airlines are investing significant amounts of money in new applications to enhance their operations or to enhance their passenger's experience. These new applications are usually data intensive, leading the airlines to a gatelink type of communications solution.

2) **What types of applications benefit from a gatelink solution?**

   Answer: Virtually any application on-board the aircraft. Some of the key drivers are Electronic Flight Bags (EFBs), Flight Operations Quality Assurance (FOQA) applications, and In-Flight Entertainment (IFE).

3) **Gatelink is just "a simple wireless connection" between the aircraft and the gate, why can't I do it myself?**

   Answer: You can, but gatelink is much more than a "simple wireless" connection. In some cases an airline solution could make sense, but the following issues related to fielding a gatelink network should be evaluated prior to making that decision.

   - To gain the most benefit from a gatelink solution, it must be available at multiple airports. This means:
     - Airport negotiations
     - Contract management with every airport
     - Resolving technical differences
       - SSIDs
       - Security requirements
   - There are multiple elements associated with a gatelink solution. From the network development and management perspective there needs to be considerable focus on the following:
     - Wireless Infrastructure
     - Airport LAN
     - WAN connectivity
     - Capacity planning

- You need to ensure unauthorized users do not gain access to the network. This is accomplished through several complex mechanisms including development of an authentication process that includes:
    - Public Key Infrastructure (PKI)
    - Authentication server
    - Airborne client
- Implementation at each airport will be unique and will include the need to resolve:
    - RF issues
    - WAN bandwidth limitations
    - Performance/Throughput problems
    - Certificate management issues
- Testing the service, hardware and application(s) is multi-faceted and includes:
    - System-level testing
    - Testing interoperability with various vendors
- Ongoing Troubleshooting and Maintenance of a widely dispersed network at multiple airports can be resource intensive and is made more complex by the type and number of elements that will require oversight.
    - Security
    - Equipment
    - Networks
    - Adding, changing, deleting users/devices
    - Increased throughput requirements
- Implementing additional airports

4) **Why does my airline need GateFusion?**

Answer: GateFusion is a complete end-to-end global communications solution that enables an aircraft/device at the gate to wirelessly transfer data to/from an airline's remote ground based applications.

GateFusion includes:

- the financial benefits of a common-use shared infrastructure.
- a consistent, gatelink standards based wireless interface with a global reach at airports around the world.
- high performance Direct IP connectivity between the airport and the airlines ground application(s) via AviNet, ARINC's global Wide Area Network.
- our unique Data Delivery Service (DDS) that eliminates potential bandwidth limitations typically encountered over a long distance WAN connection between an aircraft at the gate and its remote application(s).
- a single point of contact with 24x7 coverage for all service changes, problem resolution, and billing questions.

5) How does a shared infrastructure provide financial benefits to my airline?

Answer: GateFusion spreads the costs of its shared elements (access points, communications circuits, routers and servers) over the entire user group. As a result, individual airlines do not bear the expense of implementing, managing and maintaining their own Wi-Fi on the ramp and having to add additional high capacity circuits between the airports and the airlines' ground application servers. They get the added benefit of our unique Data Delivery Service (DDS) which dramatically increases downloading and uploading performance.

6) Why does my airline need the same wireless interface at every airport?

Answer: The Wi-Fi avionics available for today's aircraft have been built to the AEEC Gatelink standards. As a result, they can only operate within a limited set of parameters. Each airport operates their wireless interfaces and may not implement all characteristics of the AEEC Gatelink standards in the same manner. GateFusion has been designed to account for these differences in the implementation of the standards and provides the same seamless wireless interface between the aircraft and the gate at every airport. Without GateFusion there would be a need to maintain the implemented gatelink configuration of each airport within each aircraft's Wi-Fi avionics, a cumbersome solution that may necessitate modifications to today's Wi-Fi avionics.

7) What is Direct IP connectivity?

Answer: Direct IP connectivity is a real-time end-to-end connection between the aircraft at the gate and its remote ground application(s) in the airline's host data center.

8) Why is GateFusion's Data Delivery Service (DDS) important to my airline?

Answer: GateFusion includes two different data delivery components, Direct IP and our Data Delivery Service (DDS).

Direct IP provides real-time connectivity between the aircraft at the gate and the airline's remote application(s). Direct IP is subject to bandwidth constraints on the WAN, but is an efficient delivery mechanism for many applications.

Our Data Delivery Service (DDS) allows large data files to be pre-staged at the airport on the GateFusion Local Delivery Server (LDS) prior to flight arrival. With DDS real-time data transfers are performed locally at the airport between the aircraft and the LDS rather than between the aircraft and its remote application(s). The LDS also becomes a temporary storage medium for data being downloaded from the aircraft, allowing the aircraft to depart even if the ground application has not yet received/processed all/any

of the data. Ultimately DDS eliminates potential delays associated with bandwidth constraints on the WAN.

DDS also provides a common middleware application and a common interface that allows each ground application to "integrate" as opposed to having to modify and develop an equivalent but unique solution for every ground application.

As an example of DDS in operation we'll use an update of a manual on all Electronic Flight Bags (EFBs). The airline only has to send the updated manual to ARINC's DDS once and DDS then manages:

- distribution of the manual to the appropriate airport(s) LDS prior to aircraft arrival.
- tracking and reporting delivery status of the updated manual to each aircraft.
- partial delivery of the data if an aircraft must leave the gate prior to receiving the full update by forwarding the remaining data to the next GateFusion airport in the aircrafts itinerary.

All of the above activities free up the airlines resources by eliminating the need for real-time connections between every aircraft and the airline's host computer.

9) **Why are GateFusion's primary functions centralized at ARINC's Headquarters?**

Answer: We've achieved many of the financial benefits for our customers by centralizing and sharing key elements such as aircraft authentication servers and our Central Delivery Servers (CDS) at ARINC Headquarters. Our data indicates that although in some cases these components can be a significant distance from our GateFusion airports or from our airline customer's ground application servers, the performance impact is insignificant. Also, as the GateFusion service grows and stabilizes we may evolve to a distributed CDS architecture.

10) **What airports does GateFusion cover?**

Answer: We are installing our first live systems in Orlando, Florida and Manchester, England. We have contracts with several airports and we are in serious discussion with approximately 100 others. Although we're putting our airport relationships in place today, our actual deployment of the service will be driven by our customer's coverage requirements.

11) **What equipment and software needs to be installed on my aircraft to be able to use GateFusion?**

Answer: The Wi-Fi avionics are called Terminal Wireless LAN Units (TWLUs). They provide Wi-Fi access for on-board applications and are usually installed in the cockpit and can share existing external antenna sites on the fuselage through use of multi-purpose antennas.

To take advantage of our Data Delivery Service (DDS) an ARINC on-board software client must also be installed.

12) **Can I use GateFusion to enable other devices for wireless communications on the ramp?**

Answer: GateFusion was designed primarily to support wireless communications between the aircraft at the gate and its ground applications. Our design also allows for any device on the ramp used in support of the aircraft to utilize the GateFusion network.

13) **How does GateFusion ensure that it is actually my aircraft/device that it's communicating with?**

Answer: Through a variety of authentication mechanisms including device authentication using X509 Public Key Infrastructure (PKI) certificates.

14) **Can I use my existing communications links at an airport to transport data between my aircraft and its applications?**

Answer: GateFusion was designed to remove from the airline's airport network the burden of transporting high volume data traffic between the aircraft and its application(s).

It also achieves cost savings for our customers through a shared infrastructure. GateFusion installs communications links to each airport where service is available. Accommodating an airline's communications links simply adds complexity to the architecture without any advantage as it will not reduce the cost of the service.

15) **How do my avionics and applications get qualified for use with GateFusion?**

Answer: ARINC is already qualifying for use with GateFusion the Terminal Wireless LAN Units (TWLUs) produced by today's major manufacturers. When not already qualified, ARINC will work with the airline to test their applications and hardware for use with GateFusion.

16) **How is GateFusion priced?**

Answer: GateFusion has been designed for ease of use and to be easy on your budget. There is a one-time implementation fee per airport. The recurring service fee has two components, a flat monthly tail/device charge and a flat monthly charge per airport gate equivalent. There are no usage based charges.