Connecting EFBs over Inmarsat

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eEnablement of Aircraft: Driving a Revolutionary Change

Breakthroughs in communications technologies have driven an unprecedented revolution in how we communicate.

These breakthroughs have reached into the airline industry, resulting in new aircraft communication capabilities that have built momentum to form the foundation of the

“eEnabled” Aircraft
Delivering a *business transformation* and *benefits* through an adaptable infrastructure capable of growing with the future.
Making the eEnabled Aircraft a Reality

Design, implement, and certify a common eEnabled aircraft information system, independent of aircraft type, that includes:

- Ensure that all communications media are seamlessly integrated and fully functional to support communications with the eEnabled aircraft information system:
  - ACARS (VHF/HF)
  - Inmarsat Safety Services
  - Wi-Fi
  - Inmarsat SwiftBroadband
  - 3G/4G

- Leverage and integrate communication infrastructures to allow connectivity with the eEnabled aircraft information system.
eEnabled Benefits

There are many tangible and intangible benefits to an airline’s business case

**Corporate**
Improve the speed, accuracy, deployment, and presentation of information between aircraft and ground infrastructure, informing and aligning decisions and actions for operational efficiency, maintenance effectiveness, and service enhancement outcomes.

**Flight Operations**
eEnabled Goal: Deliver improved fuel use, communications efficiency, and increased payload
- INCREASE accuracy of flight plan fuel
- DECREASE weight of manuals and charts
- DECREASE weight and drag of Satcomms aerial
- DECREASE manual operations for chart delivery and updates

**Engineering**
eEnabled Goal: Deliver a safe, on-time, available aircraft
- INCREASE appropriate preparation and action by ground engineer
- INCREASE rate of first-time fix through better troubleshooting and historical information
- DECREASE time spent retrieving and analysing paper tech log information
- DECREASE time spent in unnecessary or erroneous component removal
- DECREASE manpower and time for QAR removal

**Inflight Services**
eEnabled Goal: Deliver timely access to information for service delivery, enhancement, and recovery
- DECREASE revenue loss from credit card fraud on inflight sales
- DECREASE weight of Inflight Services Ops manuals
- DECREASE printing costs for Services Ops manuals

**IT Services**
eEnabled Goal: Deliver a common platform network across entire fleet, regardless of OEM.
- INCREASE automated content management and delivery
- INCREASE capability to support data-intensive eEnabled applications
- DECREASE administrator time for manual data entry
eEnabled Business Case Drivers

Applications

Communications
Business Case Driver . . .

The Best Return on Investment
Allows “Freedom of Choice”

- Invest in eEnabled solutions that allow a freedom of choice for:
  - ✓ applications
  - ✓ aircraft systems
  - ✓ communications

  Competition is a good thing . . . leverage the market

- Implement common aircraft eEnabled solutions across all aircraft types to deliver significant cost savings across the fleet:
  - ✓ initial investment
  - ✓ training
  - ✓ applications
  - ✓ communications

- Be able to choose the best communication path driven by the application.

  Communications management is core to realizing eEnabled benefits
It’s the application and how it uses information that delivers the benefit.

Applications that eliminate paper and manual processes from the aircraft provide a tremendous benefit and are relatively easy to implement.

Applications that save considerable fuel and man-hours drive the true benefit and solidify an eEnabled business case.

Airlines will leverage newer technologies in the aircraft and on the ground and will seek new enhanced applications to benefit multiple stakeholders within an airline.
A CASE STUDY:

Freedom of Choice. . .
The Best Communications Path
for the eEnabled Aircraft
Choosing the Best Communications Path

Consideration:
The aircraft is becoming a remote IT office

• Broadband communications are a reality for the aircraft:
  ✓ Gatelink Wi-Fi     ✓ Satellite
  ✓ Gatelink 3G/4G     ✓ Other proprietary solutions

• But this is not your typical IP network.
  • Automated, but secure wireless access is required.
  • Just like ACARS, each “pipe” remains a shared single resource that needs a management function.
  • Just like ACARS, each radio has a unique management interface.
Merging Narrowband and Broadband into a Seamless Communication Service for the Airline

- Airline Apps
  - Flight planning
  - Flight following
  - Flight ops support
  - Aircraft performance
  - Airport data
  - Weather data
  - ACARS Message Hosting
  - EFB/IFE Content Management

- Integrated Media
  - ACARS/VDLM2
  - Inmarsat Safety Services
  - Gatelink Wi-Fi and Gatelink 3G/4G
  - Inmarsat SBB
  - USB storage device
  - Others
ARINC eEnabled End-to-End Solution

Enabling Communications (AeroSync)

- Integrated communications manager empowering an airline to use and maximize the potential of:
  - Onboard computing devices (EFBs, IFE, tablets, etc.)
  - Multiple air/ground data networks

- Communicates over multiple networks without developing separate and unique application interfaces:
  - ACARs, inmarsat SBB, Gatelink (Wifi/3G/4G), etc.

- Delivers data to destination over the most appropriate data link based on the airline’s requirements:
  - specialized “least cost” routing algorithms

- Offers optimization features based on airline/aircraft knowledge from the user airline
ARINC eEnabled End-to-End Solution

Enabling Communications (AeroSync)

- Integrated aircraft data manager providing a common client interface for EFB applications to receive various aircraft data parameters for onboard operation:
  - Insulates the applications from the intimate knowledge of the actual aircraft architecture
  - Provides a common aircraft data repository for on-board applications
  - Single point of interface to Aircraft Interface Device function

- AeroSync lets airlines focus more on new applications for their EFBs.
A Generic eEnabled Aircraft Architecture

- Installed EFB
- Crew tablet EFB
- Ethernet Switch
- Cabin Wireless
- Avionics
- Aircraft Data Management
- Aircraft Interface Device
- Communications Management
- SATCOM Antenna

Inmarsat SwiftBroadband Network
ARINC SwiftBroadband Ground Infrastructure
# Managing Communications and Aircraft Data for Applications

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<th>Satellite</th>
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AeroSync allows airlines to focus more on the benefits new applications deliver

Applications have a single communications and aircraft data interface, completely independent of the aircraft configuration. A common solution no matter what airframe, insulating the applications from the details of making the applications deliver benefits.
Case Study Summary

- Communications management is core to realizing eEnabled benefits.

- Broadband communications technologies, such as Inmarsat SwiftBroadband, have been embraced for aviation communications . . . it is reality!
  - Ensuring these and other technologies coexist peacefully with legacy communications is a must.
  - Providing airlines the ability to choose and manage their communications choices is key to delivering the full value of the benefits applications drive.