

## **ARINC Project Initiation/Modification (APIM)**

- 1.0 Name of Proposed Project** **APIM 17-009**  
Supplement 8 to ARINC 628 Part 1 - MultiGigabit Cabin Wireless Access Point (CWAP) to support IEEE 802.11ac Wave 2 and cabin network expansion.
- 1.1 Name of Originator and/or Organization**  
VT Miltope
- 2.0 Subcommittee Assignment and Project Support**
- 2.1 Suggested AEEC Group and Chairman**  
Cabin System Subcommittee (CSS)  
Dale Freeman, Delta Air Lines
- 2.2 Support for the activity (as verified)**  
Airlines: Delta, Lufthansa  
Airframe Manufacturers: Airbus, Boeing  
Suppliers: KID, VT Miltope, LH-Technik, Thales, Panasonic, Rockwell-Collins, ZII  
Others:
- 2.3 Commitment for Drafting and Meeting Participation (as verified)**  
Airlines: Delta, Lufthansa  
Airframe Manufacturers: Airbus, Boeing  
Equipment Suppliers: KID, VT Miltope, LH-Technik, Thales, Panasonic, Rockwell-Collins, ZII  
Others:
- 2.4 Recommended Coordination with other groups**  
FOS, NIS
- 3.0 Project Scope (why and when standard is needed)**  
As cabin networks expand, so does the need for more and more data via wired and wireless networks. The introduction of IEEE 802.11ac Wave 2 CWAPs has finally caught up to the 1-Gigabit Ethernet backbone that feeds them. This project aims to:
- Evaluate, select, and define the Ethernet backbone that will feed the next generation CWAPs. A faster Ethernet backbone throughout the cabin will foster future growth of cabin systems and inflight entertainment.
  - Define MultiGigabit CWAP equipment and interface definitions to support IEEE 802.11ac Wave 2 for a wide variety of cabin installations.
- 3.1 Description**  
The throughput that current IEEE 802.11ac Wave 1 CWAPs can support has already shown that daisy-chaining more than 2 CWAPs together can result in a network bottle neck on the wired Ethernet backbone. Higher quality video streams and other IFE options being considered along with the major increase in

cabin management data will require a much faster backbone. The increased throughput required from the wireless clients to the IFE servers is just the start of the throughput bottle neck as seen in Figure 1 below. Currently, aircraft are wired with 100Mbps (100BaseT) or 1 Gbps (1000BaseT) Ethernet lines.

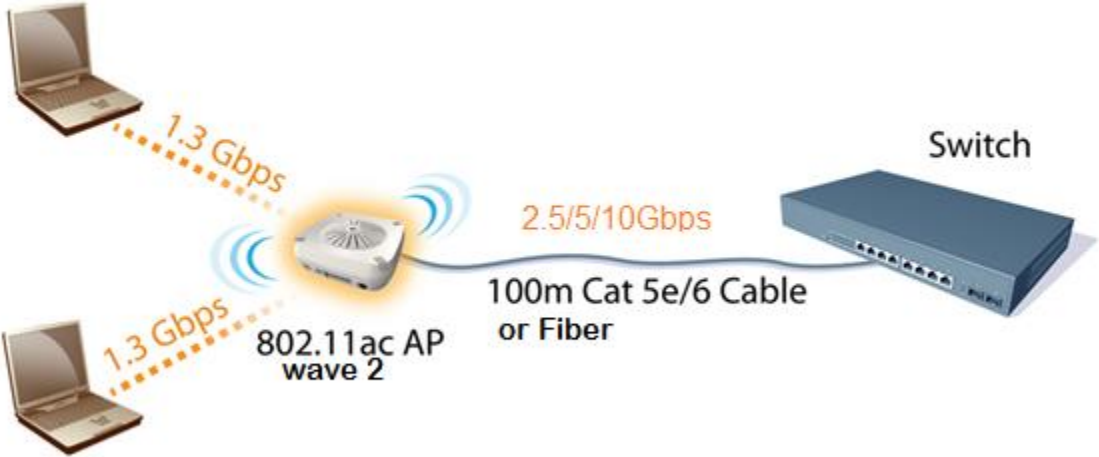


Figure 1

**3.2 Planned usage of the envisioned specification**

New aircraft developments planned to use this specification      yes  no   
     Specify: TBD

Modification/retrofit requirement      yes  no   
     Specify: Airlines are retrofitting wireless networks into their existing fleets to provide passenger and crew connectivity.

Needed for airframe manufacturer or airline project      yes  no   
     Specify: Boeing and Airbus airplane programs providing for connectivity

Mandate/regulatory requirement      yes  no   
     Program and date: No mandate

Is the activity defining/changing an infrastructure standard?      yes  no   
     Specify:

When is the ARINC Standard required? TBD

What is driving this date? TBD

Are 18 months (min) available for standardization work?      yes  no   
     If NO, please specify solution: Not applicable

Are Patent(s) involved?      yes  no   
     If YES please describe, identify patent holder: Not applicable

### 3.3 Issues to be worked

- Selection of the Ethernet backbone to the CWAPs: 2.5 Gbps, 5 Gbps or 10 Gbps.
- Connectors and pin assignments for best performance and safety of the aircraft.
- 10 Gbps fiber optic implementation (coordinate with FOS).
- Compatibility with current wired dual-quadrx cabling in aircraft. Current cabling will not support 10 Gbps Ethernet but might support 2.5 Gbps or 5 Gbps.
- Consideration of MultiGigabit standard IEEE Std 802.3bz-2016, which was just released on 23Sept16 and could lend itself to having switch manufacturers being able to support 100/1G/2.5G/5G/10G speeds. Hardware is not readily available yet in Q1 2017
- Network security considerations (coordinate with NIS)

### 4.0 Benefits

#### 4.1 Basic benefits

Operational enhancements yes  no

For equipment standards:

(a) Is this a hardware characteristic? yes  no

(b) Is this a software characteristic? yes  no

(c) Interchangeable interface definition? yes  no

(d) Interchangeable function definition? yes  no

If not fully interchangeable, please explain: \_\_\_\_\_

Is this a software interface and protocol standard? yes  no

Product offered by more than one supplier yes  no

Identify:

#### 4.2 Specific project benefits (Describe overall project benefits.)

The purpose of the project is to develop and standardize certifiable technical solutions for a high-speed data throughput backbone above 1 Gbps within the cabin.

The project should be done to essentially reduce the required development, logistics, certification and maintenance efforts for CWAP products, to keep pace with the WiFi technology upgrades and to provide Airlines and passengers a reliable and high speed solution for connectivity in the future.

##### 4.2.1 Benefits for Airlines

Airlines will benefit from uninterrupted WiFi service for the crews' increasing work load and from a reliable passenger experience that keeps expecting faster and better services like passengers' experience on the ground.

Choice of suppliers using standardized interfaces and provisions

Lower Capex, lower logistics and maintenance effort by standardized equipment, Asset value kept when aircraft is sold.

High speed backbone throughout the cabin for more flexibility in equipment locations.

**4.2.2 Benefits for Airframe Manufacturers**

Standardized products from a variety of suppliers  
CWAP line-fit offerability (since no restrictions for use in different regions)

**4.2.3 Benefits for Avionics Equipment Suppliers**

Use of reliable and mature COTS platforms from known international suppliers  
Reduced development, logistics and certification effort  
Faster introduction of new WiFi technology  
Standardized equipment for all aircraft manufacturers  
Higher volumes and reduced equipment costs

**5.0 Documents to be Produced and Date of Expected Result**

Supplement 8 to ARINC 628P1, CWAP definition, Update of section 17.0 “CABIN WIRELESS ACCESS POINT (CWAP)”

**5.1 Meetings and Expected Document Completion**

The following table identifies the number of meetings and meeting days for the overall Cabin Systems Subcommittee effort.

<b>Activity</b>	<b>Mtgs</b>	<b>Mtg-Days (Total)</b>	<b>Expected Start Date</b>	<b>Expected Completion Date</b>
Supplement 8 to ARINC 628P1	6	18	May 2017	Jan 2019

Reflects all CSS meetings responsible for several APIMs in work. In addition to the proposed meetings identified above, the CSS will have virtual meetings to develop preliminary pin assignments and connector definitions.

**6.0 Comments**

None.

**6.1 Expiration Date for the APIM**

April 2019

***Completed forms should be submitted to the AEEC Executive Secretary.***