United Airlines Vision for Weather Decision Making

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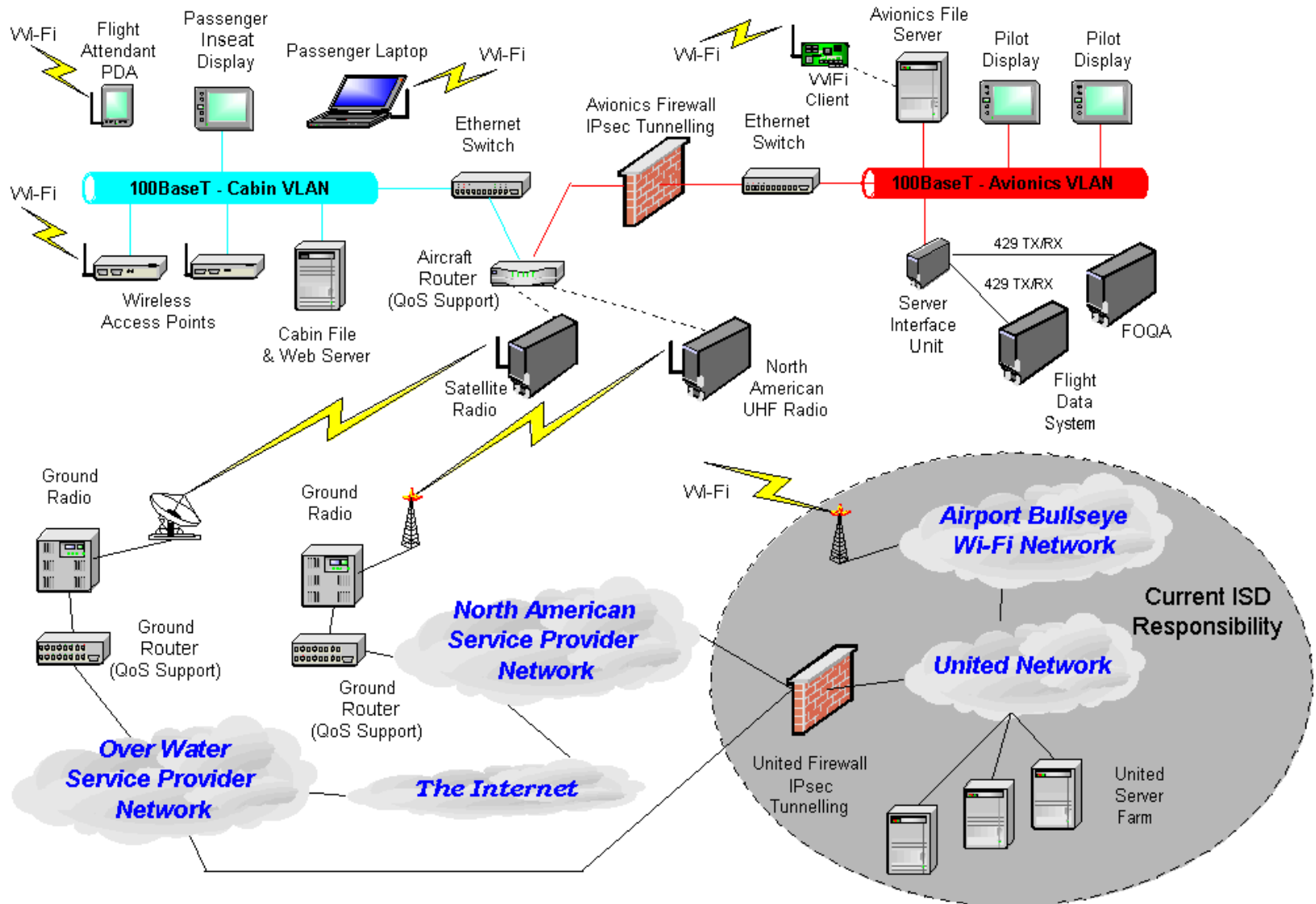
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Overview

- What are the potential WDM datalinks?

- EFB programs

- Flight Deck applications

- R/D Enablement topics

The business case for WDM information

- There needs to be differentiation between WDM capable aircraft and non-WDM capable aircraft
  - If aircraft with WDM information are treated the same as all others, the system will revert to today's standard.
  - Products delivered to the aircraft need to show weather relative to position. Available in GA and Class 2/3 EFBs
    - Strategic Convective – still using X-Band Radar onboard
    - Near-term GTG with information on CIT
    - Convective tops product
  - WDM with TIS-B information (i.e. ATC sector loading)
- Possible Traffic Flow Management (TFM) differentiators:
  - Parallel Airspace Flow Programs (AFPs), one for WDM capable with a higher convective re-route approval rate.
  - ATC Understanding of Multi-center weather reroutes

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There are many ways to send/receive WX data to the aircraft now…

E-Enablement / Connectivity

- United is in the process of installing LiveTV Ka-Band satellite broadband onto DirecTV equipped aircraft
  - 737 Fleet
  - 757-300s
- Panasonic (PAC) Global Ku-band (GCS) broadband system being installed on remainder domestic and international aircraft
  - A319/320
  - 747
  - 777
  - 757-200s

- When activated, crew internet access will be via segregated portal, limited to operational products only
- Customers may access internet using any Wi-Fi enabled portable electronic device (PED)

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Class 1/2 EFBs - Tablets

Software Applications

- Airwatch Mobile Device Manager (MDM)

- AirWatch Secure Content Locker – Document Management & Viewer

- Jeppesen Mobile FD Pro

- WSI PilotBrief Optima

- Non-company applications restricted – App Store disabled

- WiFi and AID Compatible

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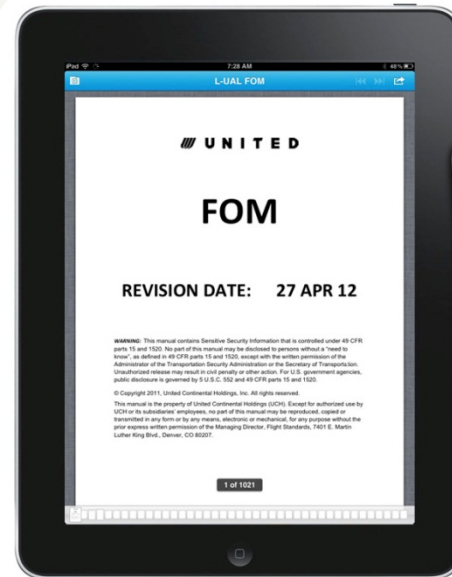
EFBs are here and are great WX routing platforms!

Class 3 EFB on our B747s/787s

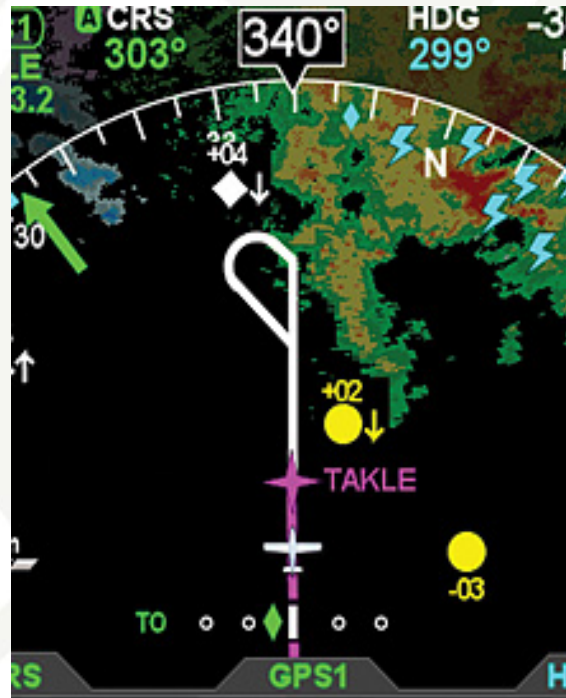Class 2 EFB on 737,756,777, A319/320
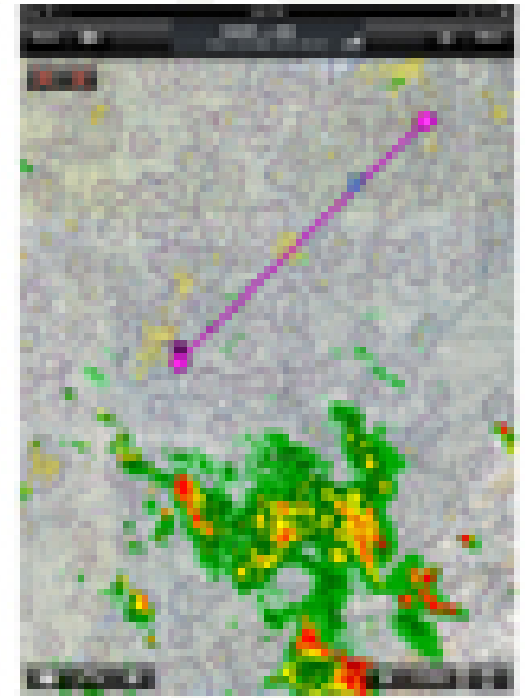

Class 1 EFBs (iPads) for 11,000 pilots

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Real-time weather to aircraft very advanced in General Aviation – Aspen Avionics Display with XM Weather…

Aspen MFD with XM WX

Aspen Display with Stormscope and XM WX

ADS-B Weather on iPad

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# Now that we have a weather "pipe", how can we better use TAMDAR/E-Pirep/AMDAR/Other WX?


Magpie-1

WSI PilotBrief Optima (v2.1)

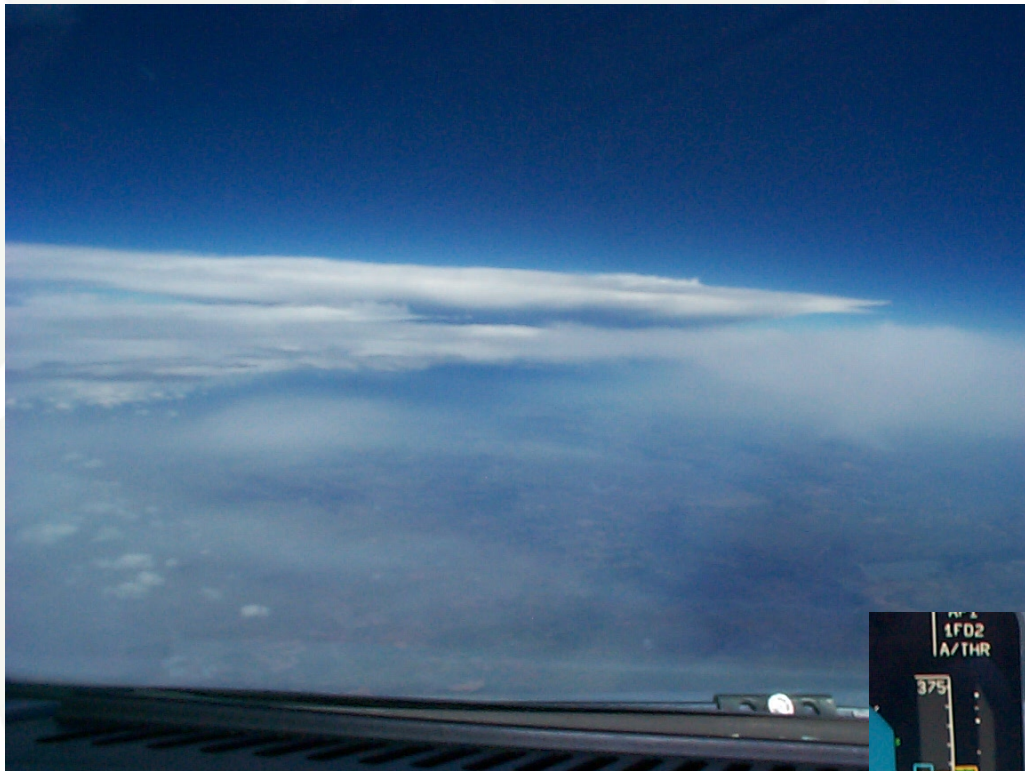## Weather Overlay / Google Maps

- Full weather graphics available with Route overlay

- Textual weather cached for offline viewing

- Forecast feature showing future weather depiction

- Ability to view displays in both landscape and portrait orientations

- Decoded and Encoded weather reports
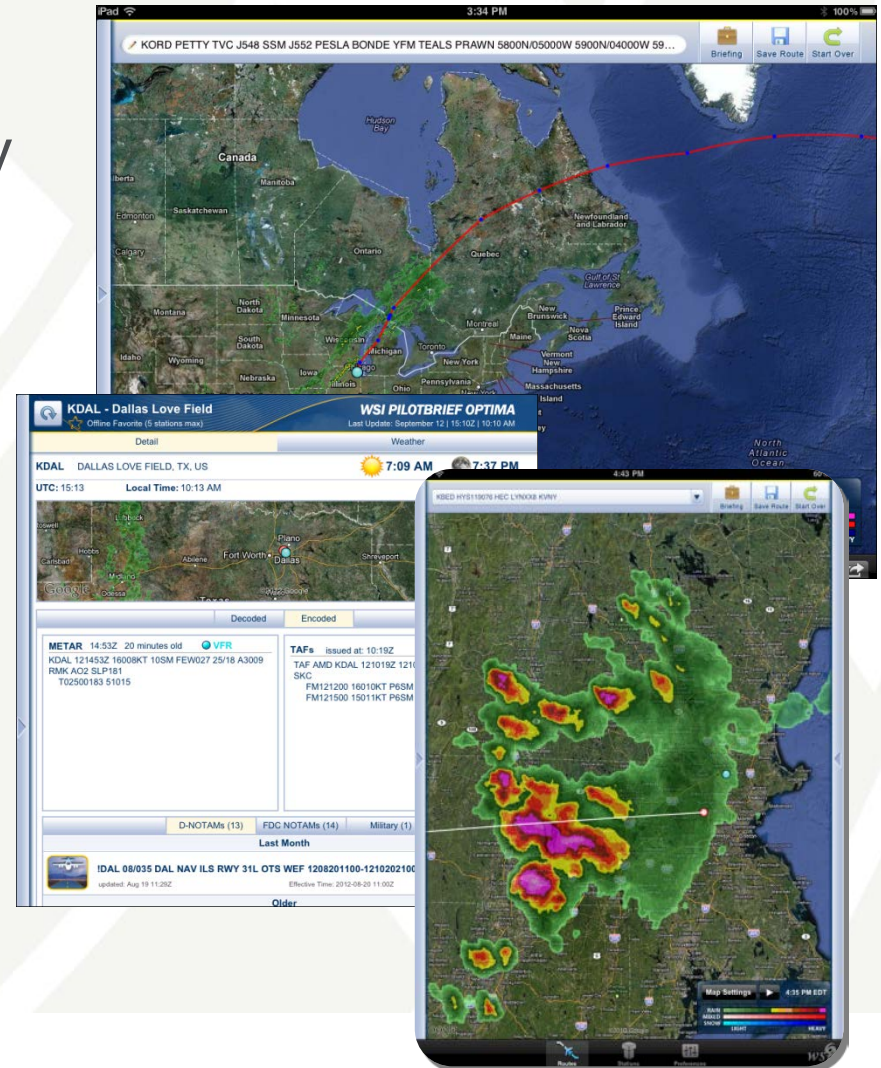
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Making Strategic route decisions with EFB/Weather
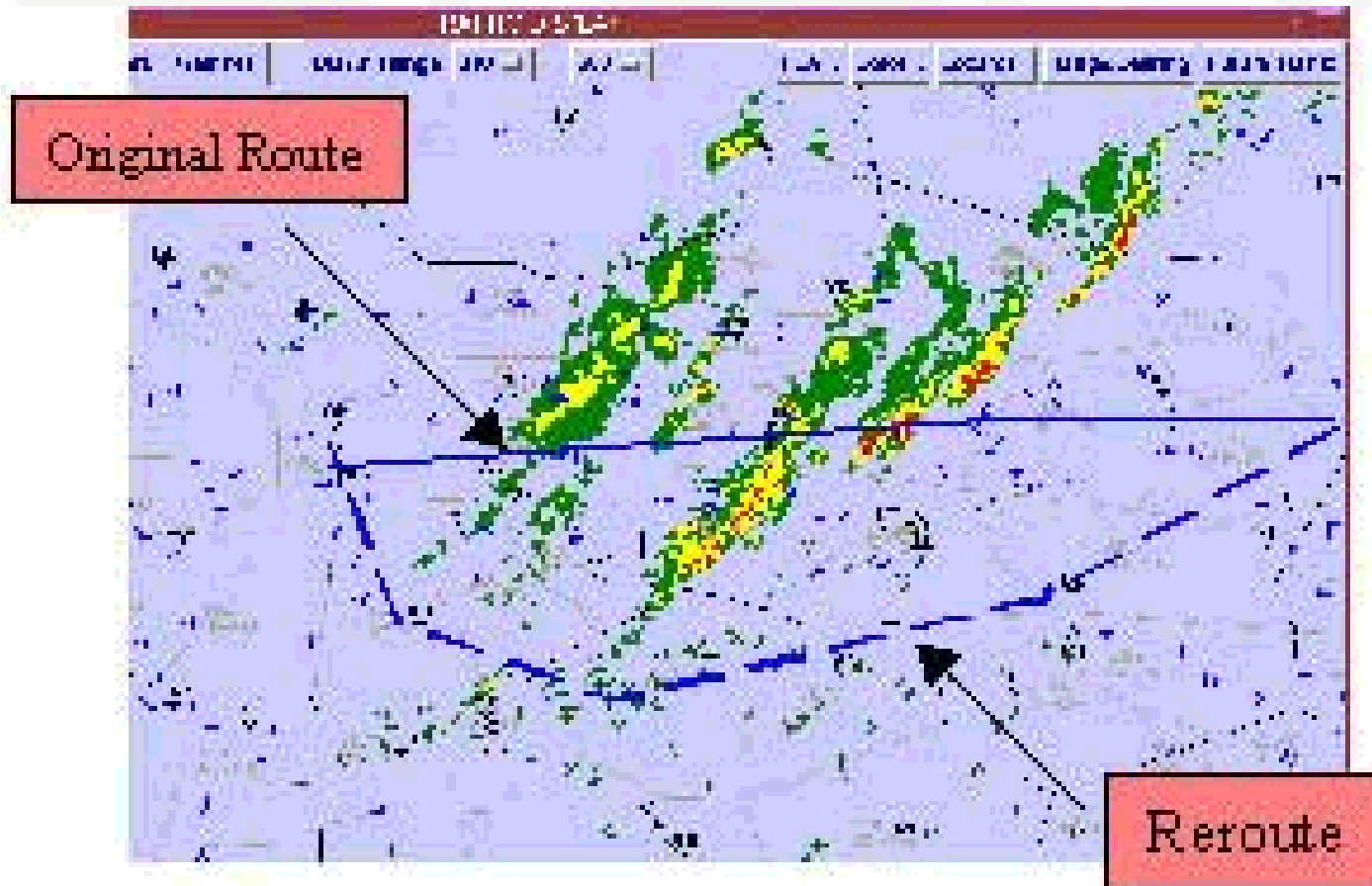
En Route

Oklahoma TRW in/out view

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United Vision for Tablet EFB Weather

- Within 1-2 years all aircraft will have a broadband pipeline to the ground, so live graphical weather will be routine, for now….

- Cached graphical weather for inflight viewing

- Goal is to replace pilots printing a copy of graphical weather during preflight preparation
  - Inflight reference
  - Crew briefings
  - Issues:
    - What products are appropriate to cache?
    - When to use BB weather vs. current systems?
    - How can we make better strategic decisions?

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United Vision for Tablet EFB Weather (cont.)

- What can live graphical weather be used for inflight?
  - Better management of cabin service around areas of turbulence.
  - Better management of the "Fasten Seatbelt" sign
  - Bring the cockpit into the Collaborative Decision Making (CDM) triad with ATC and Dispatch
    - May also require traffic flow management information in addition to weather information
  - Give pilots the tools to advocate for better decisions
    - Better reroutes
    - Better pilot situational awareness during Severe Weather Avoidance Plan (SWAP) operations
    - RTCA Special Committee 206 is working on a standards basis for the FAA to allow for appropriate use of updated graphical weather inflight

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Top 3 priorities for improvement
Research & development needs

1. Integration of Cockpit Weather Technology into the ATM System
2. Datalink Viability –
   1. Desire to utilize COTS systems
   2. What data can go where?
3. Standardized Certification process – POI vs. AFS-400

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Questions?

**Thank you -
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