



CENTER FOR ADVANCED AVIATION SYSTEM DEVELOPMENT (CAASD)

Distributing Net-Enabled FAA Weather Data

Mark Simons
MITRE/CAASD

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Organization

- **System Wide Information Management (SWIM) Program**
 - Background
 - SWIM Evolution
- **Current Exchange Patterns**
 - Imagery and Encoded Data
 - Machine-to-Human Interfaces
- **Early Implementations**
 - Machine-to-Machine Interfaces
 - Net-Enabled Architectures
 - Core Services
- **Future Plans**
- **Summary**

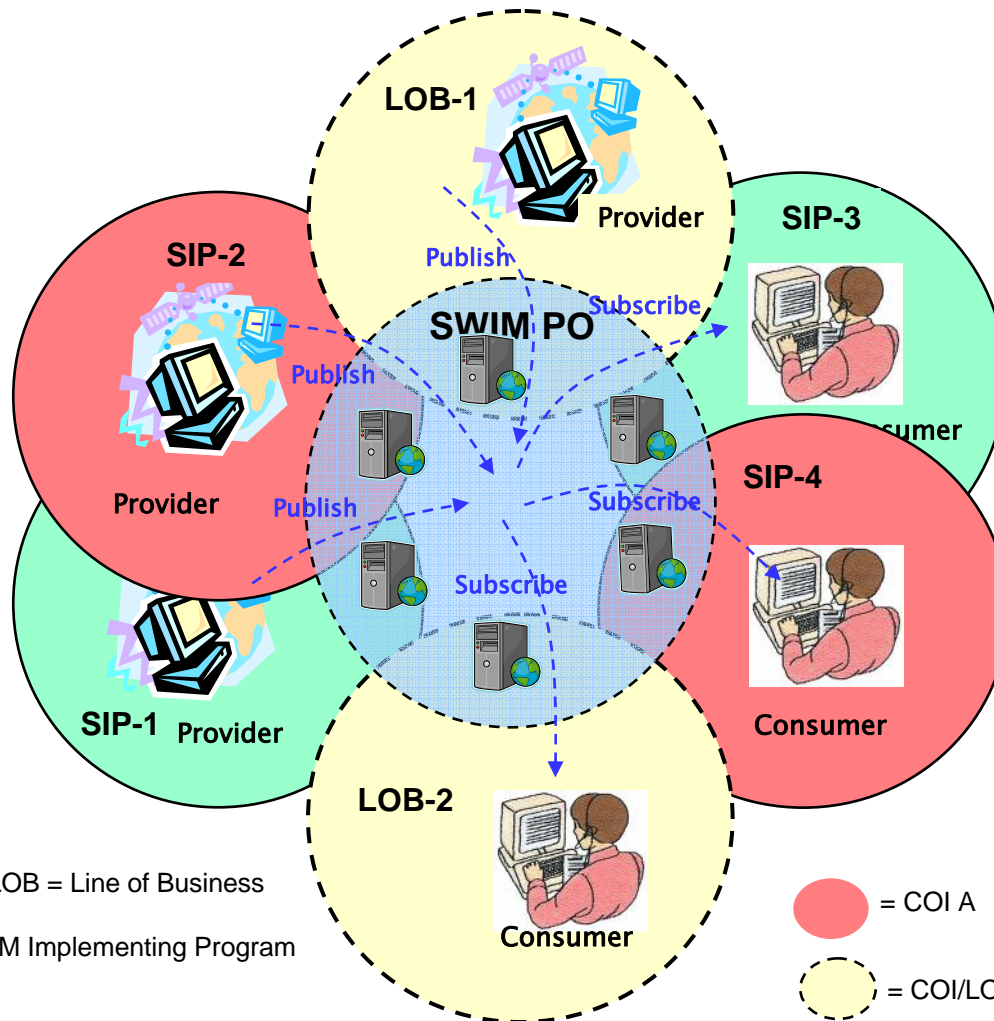


SWIM Background

- **Purpose**
 - Address shortfalls in current FAA information management practices
 - Reduce labor intensive development of customized interfaces through use of net-enabling technologies
- **Schedule**
 - Segment 1: 2009-2013
 - Segment 2: 2011-2015
 - Future Segments 2013+
- **Core Services**
 - Messaging, Interface Management, Service Security, Service Monitoring
- **Communities of Interest (COI)**
 - COI tasked with determining initial services
 - SWIM Implementing Programs (SIPs) develop services
 - Services use publish/subscribe – request/response exchange patterns



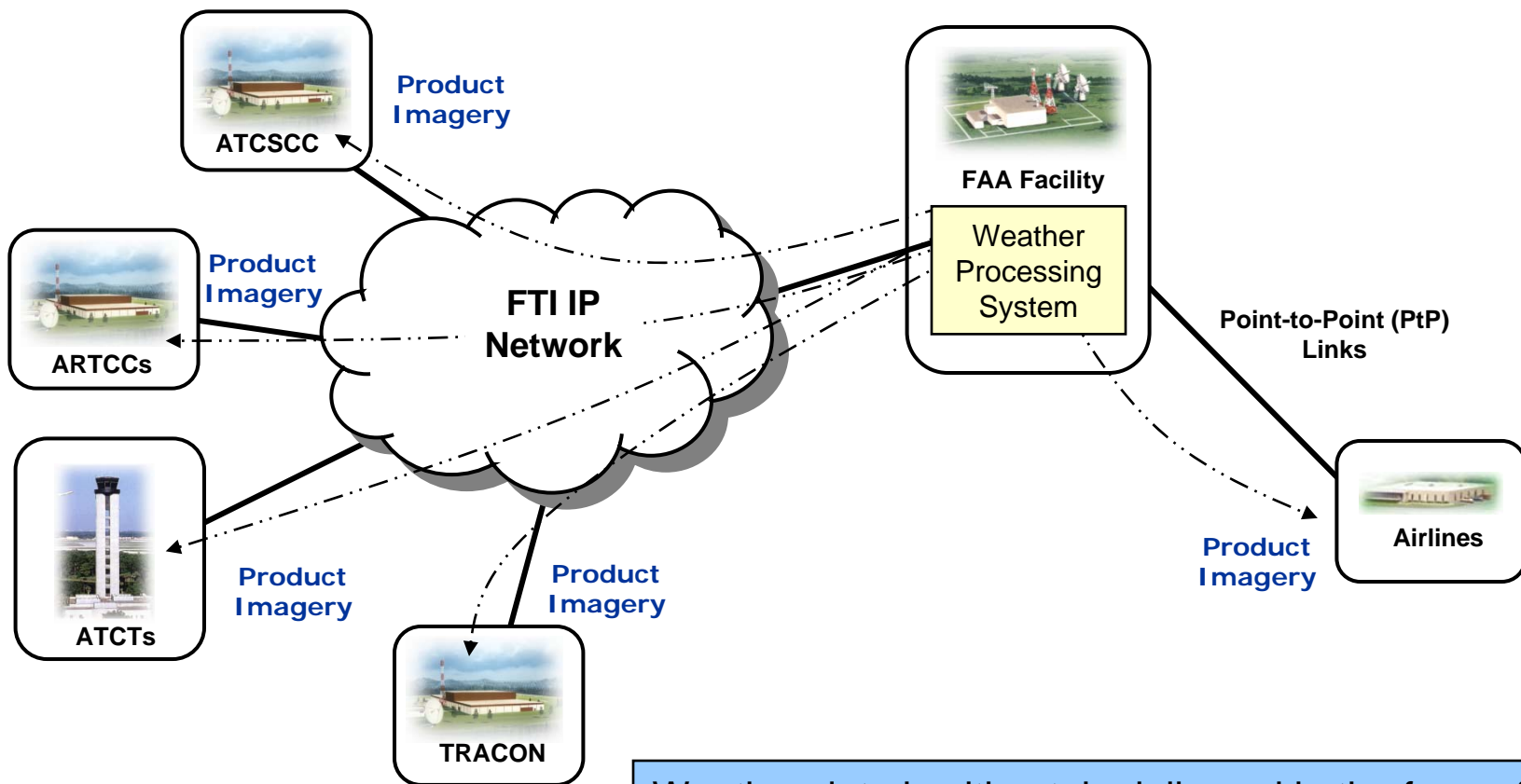
Organic SWIM Evolution



- SWIM provides Core Services and Components
- SIPs develop Net-Enabled service in SWIM Segments
- LOB programs use SWIM standards and Net-Enabling technologies
- Multiple paths towards NextGen



Notional Exchange of FAA Weather Data Today

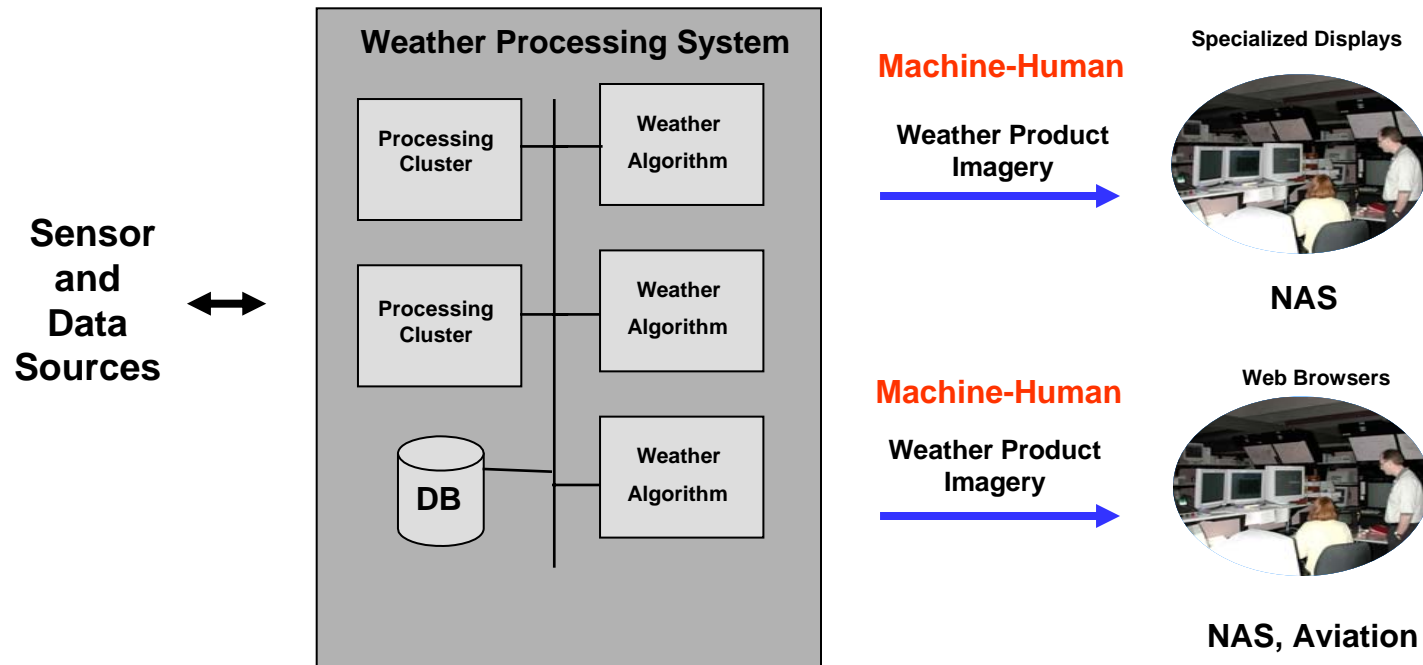


Weather data is ultimately delivered in the form of *product imagery*.

Legend:
----- Existing TCP/IP



Current Machine-to-Human Interfaces



The *underlying binary, scientifically-formatted data* is not readily available for integration within end-system automation algorithms.



Weather COI

- **Identified candidate net-enabled services for SWIM Segment 1**
 - **Considered benefits to FAA and to larger Federal Enterprise**
 - **Focus on delivery of convective weather information**
- **Candidates selected:**
 - **CIWS Information**
 - **ITWS Information**
 - **Text Weather Information**

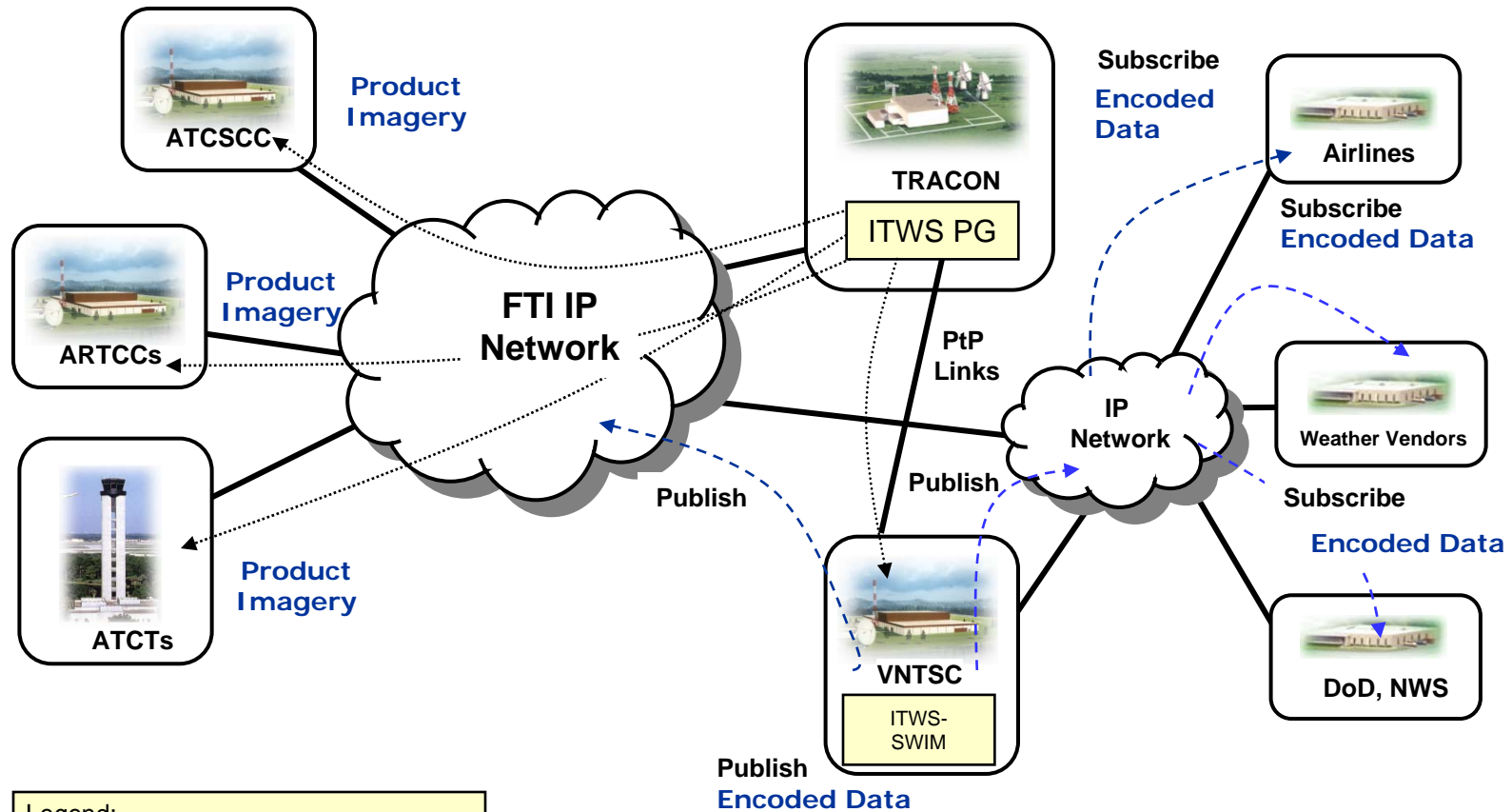


SWIM Segment 1 Weather Data

- **CIWS Information**
 - Thunderstorm Forecast
 - Current and Forecast Echo Tops
 - Growth and Decay Trends
- **ITWS Information**
 - Windshear, Microburst, Gust Front
 - Precipitation, 6-Level, Short-range, Long-Range
 - Ribbon Display
 - Runway Configuration
 - Terminal Winds, Convective Weather Forecast
 - Storm Cell, Motion, Lightning in Storm Cell
- **Text Weather Information**
 - Pilot Reports (PIREPs)
 - Altimetry



Notional Net-Enabled Distribution of ITWS Information



Legend:

VNTC = Volpe National Transportation Center

NWS = National Weather Service

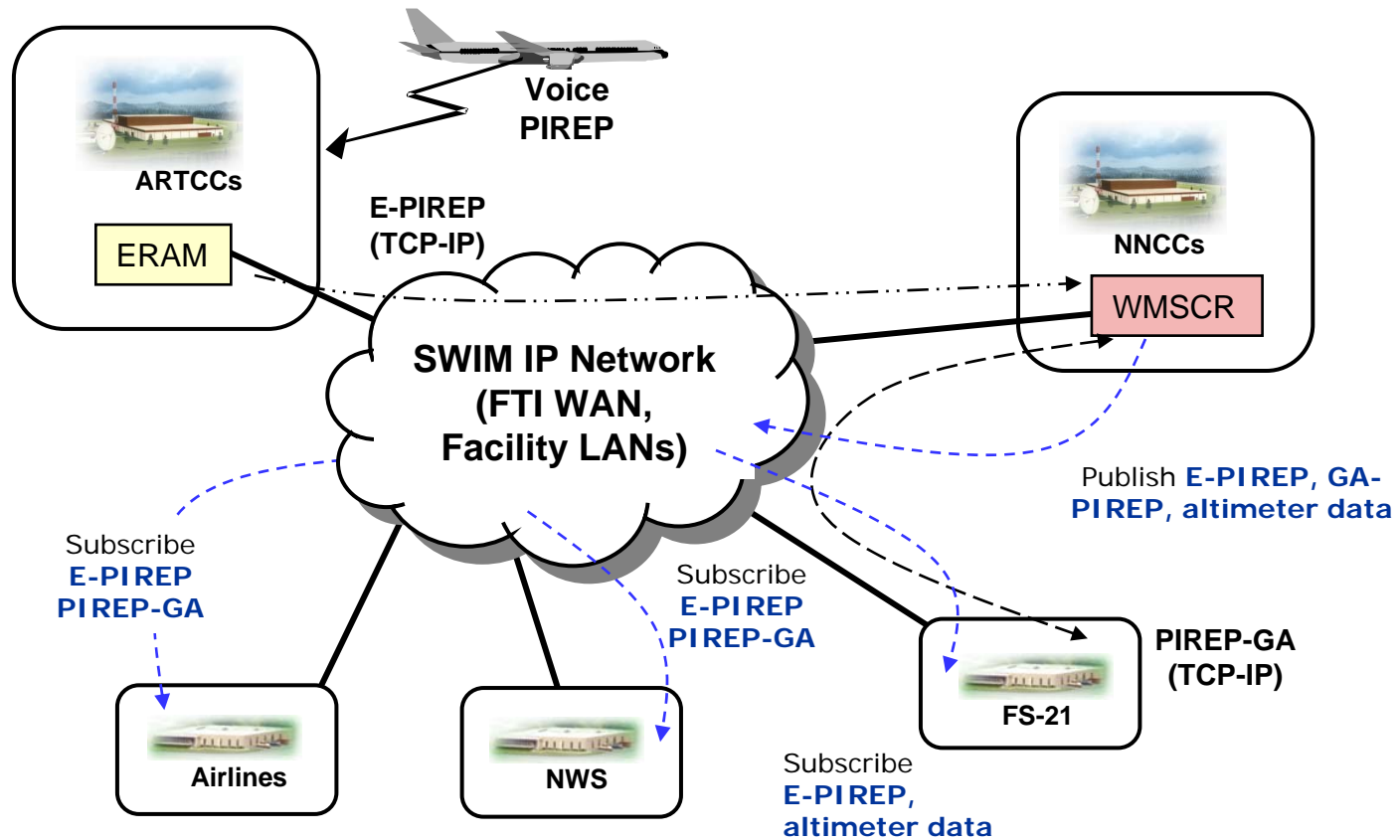
DoD = Department of Defense

..... Existing TCP/IP Communication

- - - - - Proposed SWIM Web Service



Notional Net-Enabled Distribution of PIREP and Altimetry Data

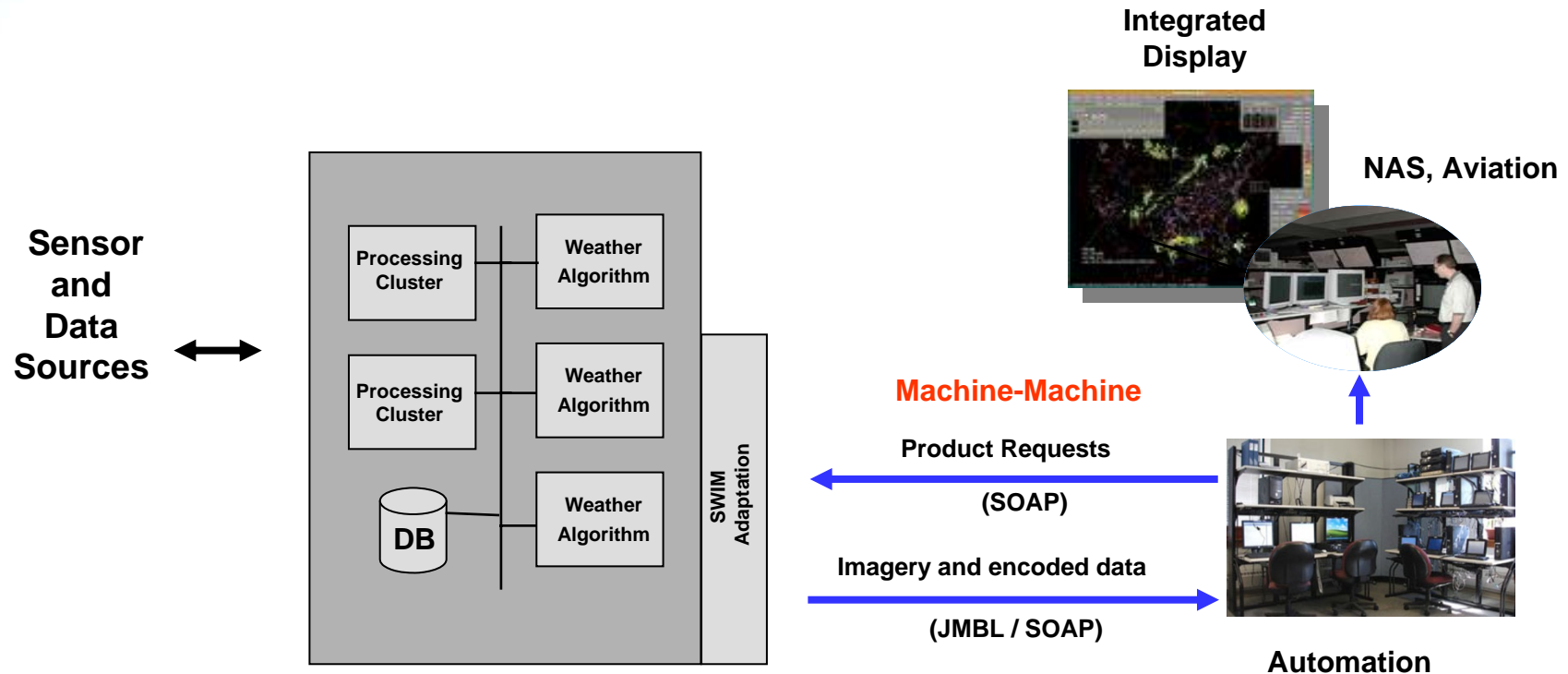


Legend:

NNCCs = NADIN Network Control Centers	--- --	Proposed TCP/IP
FS-21 = Flight Services for 21 st Century	--- --	Existing TCP/IP Communication
PIREP-GA = PIREPs from General Aviation	--- --	Proposed SWIM Web Service
E-PIREP = Electronic PIREP		



Net-Enabled Machine-to-Machine Interfaces



The underlying binary formats are referred to as **encoded data formats** and facilitate exchanges with end user automation systems



Future Plans

- **Focus on providing services for weather sensor data**
 - NEXRAD
 - TDWR
 - Surface Observation
- **Additionally services providing access to Weather Model data will be considered**
 - Rapid Update Cycle (RUC), Eta
 - Weather Research Forecast (WRF)
 - Rapid Refresh WRF (RR-WRF)



Summary

- **SWIM net-enabled services should be deployed during the 2009-2013 timeframe**
- **Services will support terminal, en-route and traffic flow domains**
- **Services are foreseen to evolve incrementally as weather products and systems change and mature towards NextGen**
- **Net-Enabling technologies decrease the development time needed to distribute information and increase interoperability**



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