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# AIXM / WXXM Conference

## Digital Convergence on the Common Operating Picture

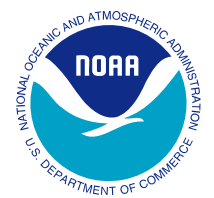
### **The 4-Dimensional Weather Data Cube**

Tom Ryan, FAA  
Mark Miller, NWS  
4 May 2010

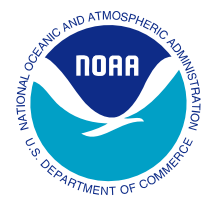


# Presentation Outline

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- Why the 4-D Weather (Wx) Data Cube?
- What is it?
- What Standards?
- What kind of Evaluations?
- Why Convergence?



# Why the 4-D Wx Data Cube?



Joint Planning and  
Development Office

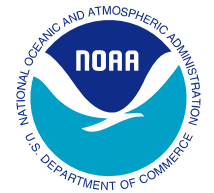
## Concept of Operations for the Next Generation Air Transportation System

Version 2.0  
13 June 2007





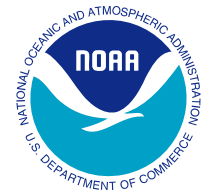
# NextGen Goals



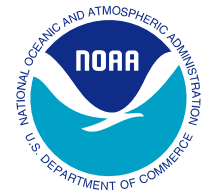
- **Network-Enabled Information Access**
- Performance-Based Services (now Performance-Based Operations and Services)
- *Weather Assimilated into Decision-Making*
- *Layered, Adaptive Security*
- Broad-Area Precision Navigation (now Positioning, Navigation, and Timing [PNT] Services)
- Aircraft Trajectory-Based Operations (TBO)
- Equivalent Visual Operations (EVO) (the characteristics of which are described throughout this concept)
- Super-Density Arrival/Departure Operations



# What is the 4-D Wx Data Cube?

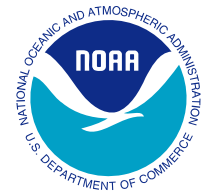


- Data from various publishing systems — but not the publishing systems themselves
- Software that provides capabilities for
  - Locating and retrieving data
  - Subsetting of data
  - Complex retrieval processing
- Service adapters to support legacy systems

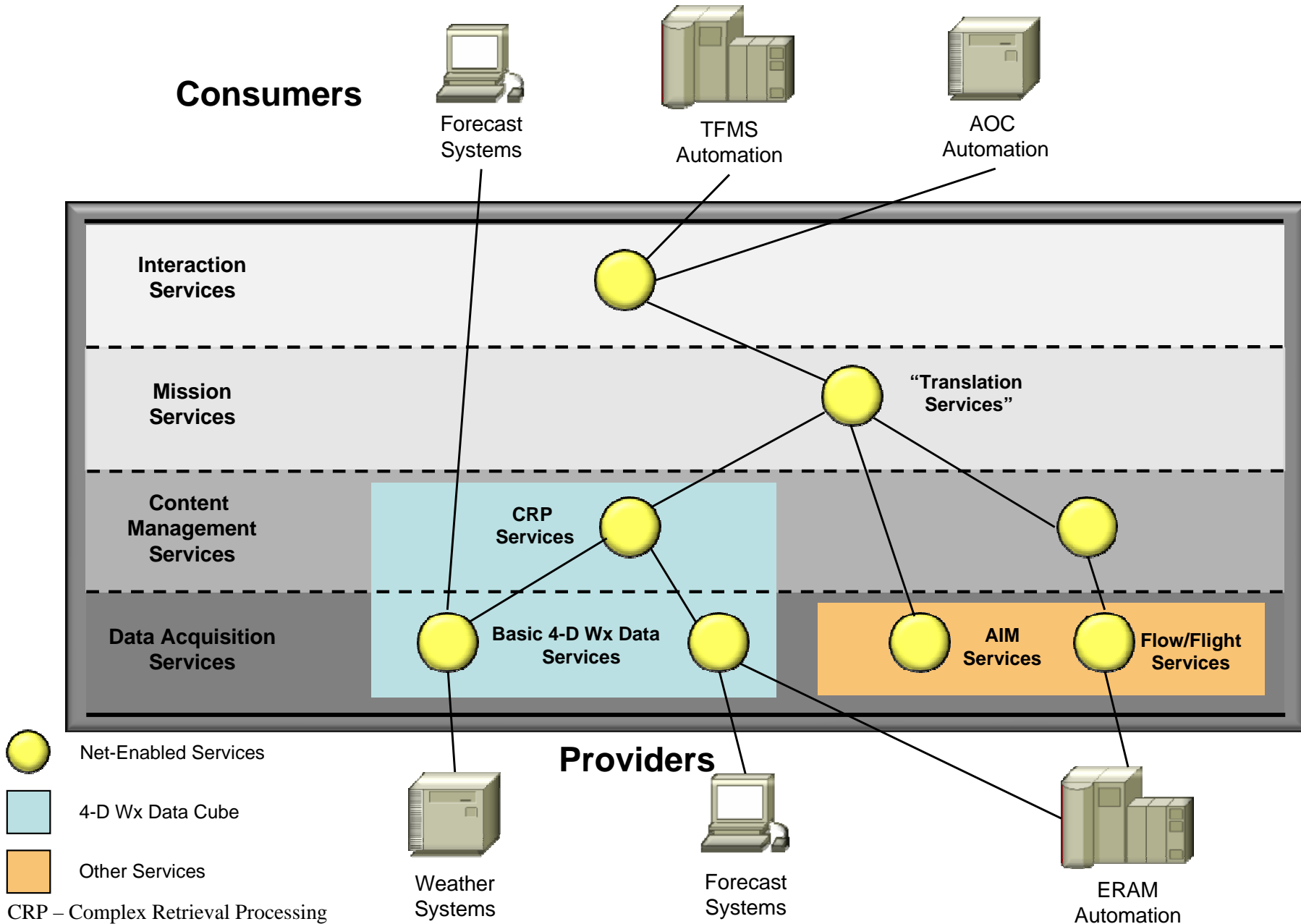


# What Standards?

- Data Access Standards
  - Open Geospatial Consortium (OGC) standards
    - Web Coverage Service (WCS)
    - Web Feature Service (WFS)
    - Web Mapping Service (WMS)
  - Joint METOC Broker Language (JMBL)
- Data Format Standards
  - GML, XML, and NetCDF-4
  - Working with EUROCONTROL to develop a common data model, WXXM
- Registry/Repository Standard
  - ebXML
- Complete list? Google nnew for the NNEW Wiki

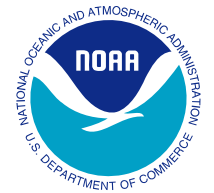


# 4-D Wx Data Cube SOA Context



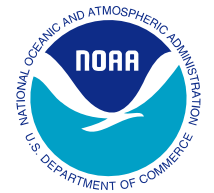


# Capability Evaluations



- Yearly IT evaluations are planned
  - Scope will increase each year as additional capabilities are developed
    - FY09: Multi-agency interoperability/NEO data sharing, initial subset of products defined for IOC
    - FY10: Federation and fault tolerance of registries/repositories, many of the Wx products defined for IOC, additional partners
    - FY11: Emulate a proposed IOC architecture, additional partners, add products, increased security measures
- NextGen Demos
- Participation in OGC Web Services Testbeds





# Why Convergence?

- Collaboration is improved and it is happening
  - Capitalize on others' strengths and existing work
  - Improving the benefit to cost ratio
  - Expanding the horizons of our personal and professional influence
- Building on Successes
  - Services as building blocks rather than systems
  - Quality development in the future can be faster and cheaper
  - NWS using WFS & WCS RIs from FAA (Matt Peroutka & Steve Olson after lunch on Wednesday)
  - Merging AIXM / WXXM (Navin Vembar Thursday morning)
  - OWS-7 (Nadine Alameh Thursday morning)



# 4-D Wx Data Cube Summary



- NextGen requires it
- A network-enabled, virtual, data repository of aviation weather data
- Using Open Standards
- Regular and recurring evaluations
- Collaborate and Converge!