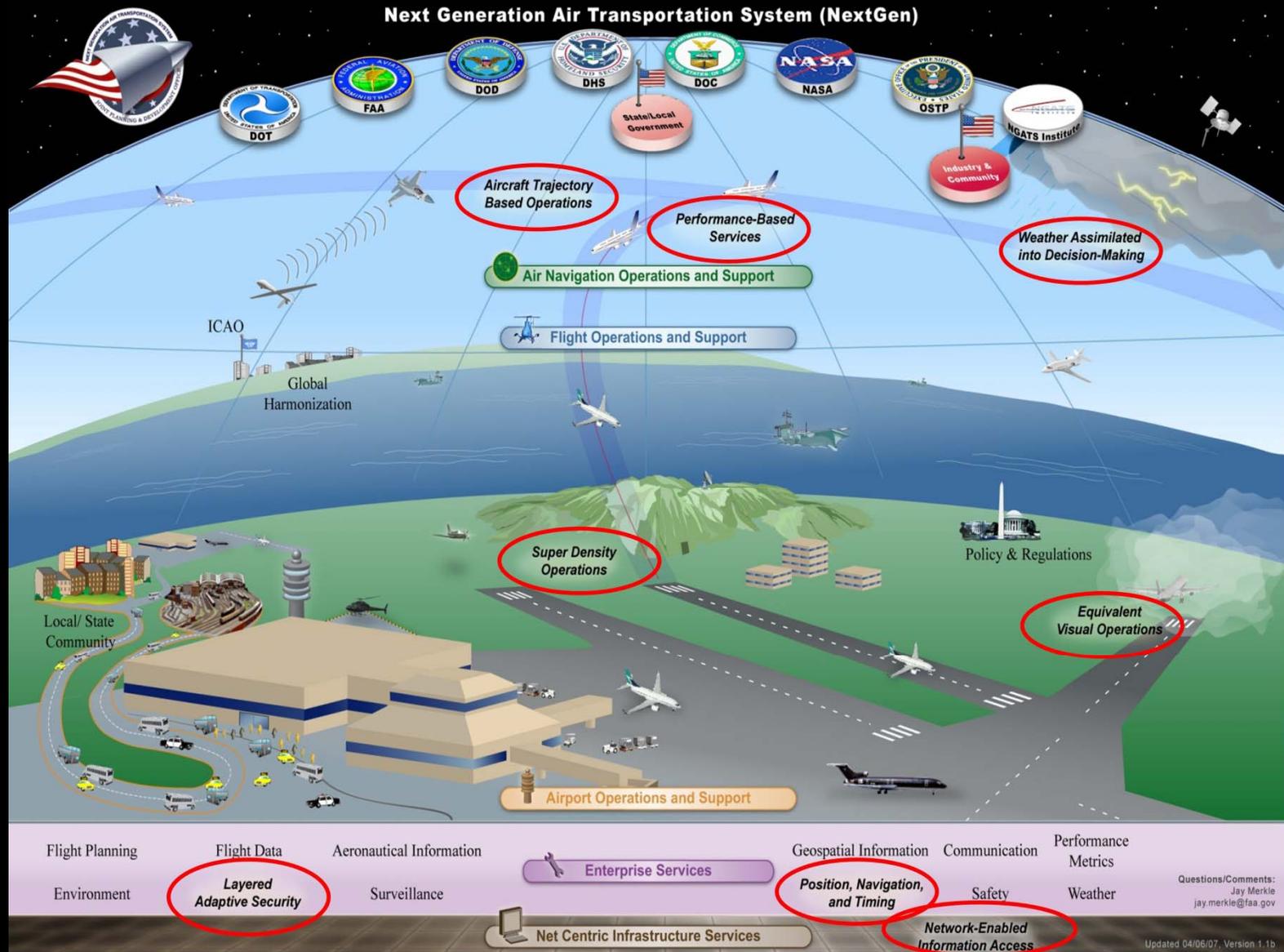


Environmental Data Integration, NOAA, and the Next Generation Air Transportation System (NextGen)

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Overview of NextGen





New standards, all emerging simultaneously

- Aeronautical Information Exchange Model (AIXM)
- Weather Information Exchange Model (WXXM)
- Flight Information Exchange Model (FIXM)

Goals

- Provide weather data to our users and partners using vendor-neutral geospatially-aware techniques
- Foster collaboration among participating organizations (FAA, DHS, NASA, Defense, private industry)
- *Short-term objective:* focus on interagency commitments to Federal Aviation Administration

Key Enabling Technologies

- Registry-Repository (Reg/Rep)
- Web Coverage Service (WCS)
- Web Feature Service (WFS)
- Web Mapping Service (WMS)
- IT Security

Data Encoding Technologies and Standards

- ISO 19115/19139 compliant metadata
- CF-Compliant NetCDF
- GRIB2
- Weather encoding in XML
 - WXXM is the first effort
 - WMO and ICAO collaborating to build on this

Prototyping To Date

- Federated Reg/Rep running
- “Reference Implementations” of WCS, WFS, and WMS running in multiple locations
- Beginnings of a secure, operational interconnection between NWS and FAA
 - Substantial effort required for security, including the application layer
 - Authorization and authentication required

Leverage for All NOAA

- Metadata expertise, including ISO standards
- Experience with load balancing and service reliability
- Experience with securing application layer
- “Place at the table” as encoding standards evolve

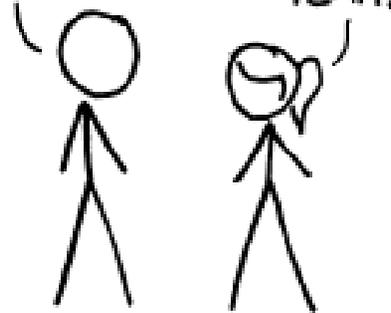
Extension to NWS Services

- Building upon the enterprise services framework for all NWS
 - WMO Information System
 - Satellite Ground Readiness Centralized Distribution Service
 - ...and more to come!

HOW STANDARDS PROLIFERATE: (SEE: A/C CHARGERS, CHARACTER ENCODINGS, INSTANT MESSAGING, ETC.)

SITUATION:
THERE ARE
14 COMPETING
STANDARDS.

14?! RIDICULOUS!
WE NEED TO DEVELOP
ONE UNIVERSAL STANDARD
THAT COVERS EVERYONE'S
USE CASES.



SOON:

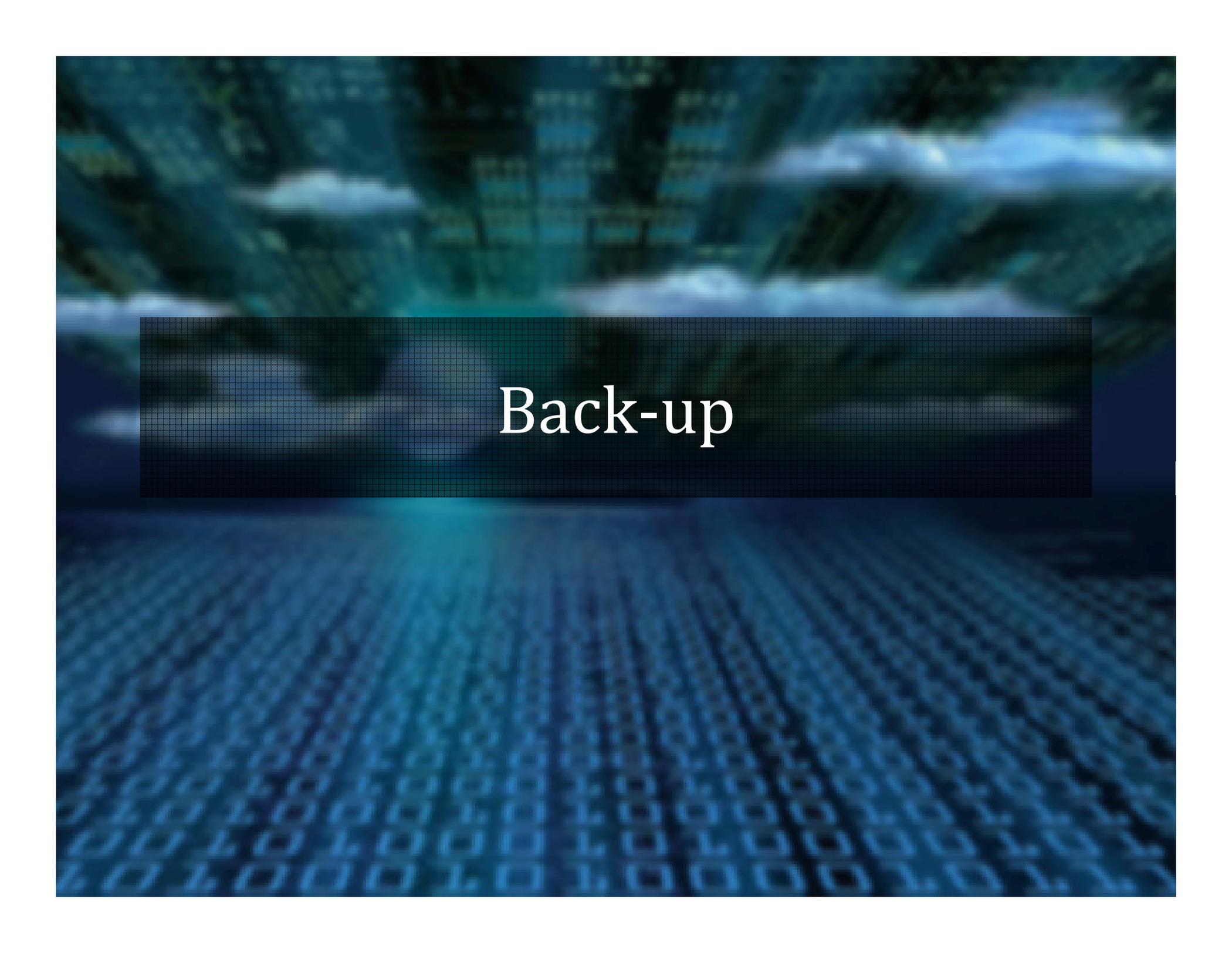
SITUATION:
THERE ARE
15 COMPETING
STANDARDS.

Challenges

- Creating the digital services needed to support a “Weather-Ready Nation”
- Prototyping capabilities and bringing them to operations as standards continue to emerge
- Establishing collaborative boundaries in the weather enterprise



Questions?



Back-up

The Fine Print—Data Format Standards

Standard Name	Responsible Organization	Version	Weather-specific extensions	Comments
NetCDF	Unidata	4.2	No	
NetCDF Climate and Forecast Convention	CF Management Body	1.3	No	
Geography Markup Language (GML)	OGC	3.2.1	No	GML is used as the basis for WXXM.
Weather Information Exchange Model (WXXM)	Eurocontrol, FAA, others	1.1.1	No	
GRIB	WMO	2.0	No	
Extensible Markup Language (XML)	W3C	1.1	No	
XML Schema	W3C	1.0	No	

The Fine Print—Data Service Standards

Standard Name	Responsible Organization	Version	Weather-specific extensions	Comments
Web Coverage Service	OGC	1.1.2	Yes	Extensions: <ul style="list-style-type: none"> • Publish/Subscribe (data availability notifications) • NetCDF 4 and GRIB2 encoding extension • Trajectory-based data retrieval • Forecast time support
Web Feature Service	OGC	2.0	Yes	Extensions: <ul style="list-style-type: none"> • Subscription • EXI support • Trajectory-based data retrieval (if not sufficiently supported by existing filters)
ebXML Registry Services	OASIS	4.0	Yes	Extensions: <ul style="list-style-type: none"> • Spatial queries • Cataloging and discovery of services, datasets and content using ISO 19115, ISO 19119 and ISO 19139 • Support for semantically enhanced search using OWL ontologies
ebXML Registry Info. Mode	OASIS	4.0 (candidate draft 5)	Yes	Extensions <ul style="list-style-type: none"> • OGC csw-ebrim Basic Package 1.0 • Spatial metadata using GML 3.2.1
SOAP	W3C	1.2	No	
Efficient XML Interchange	W3C	1.0	No	
SPARQL	W3C	1.0	No	

The Fine Print—Metadata Standards

Standard Name	Responsible Organization	Version	Weather-specific extensions	Comments
ISO 19107.2003	ISO	2003	No	Geographic Information Spatial Schema
ISO 19108.2002	ISO	2002	No	Geographic Information - Temporal Schema
ISO 19108.2006	ISO	2006	No	Geographic Information – Temporal Schema – Corrigendum 1
ISO 19115.2003	ISO	2003	No	Geographic Information – Metadata
ISO 19115.2006	ISO	2006	No	Geographic Information – Metadata – Corrigendum 1
ISO 19115-2.2009	ISO	2009	No	Geographic Information – Metadata – Part2 – Extensions for Imagery and Gridded Data
ISO 19119.2005	ISO	2005	No	Geographic Information – Services Metadata