

NextGen Net-Centric Operations Supporting NextGen Weather

-A Work in Progress-

v1.4.1

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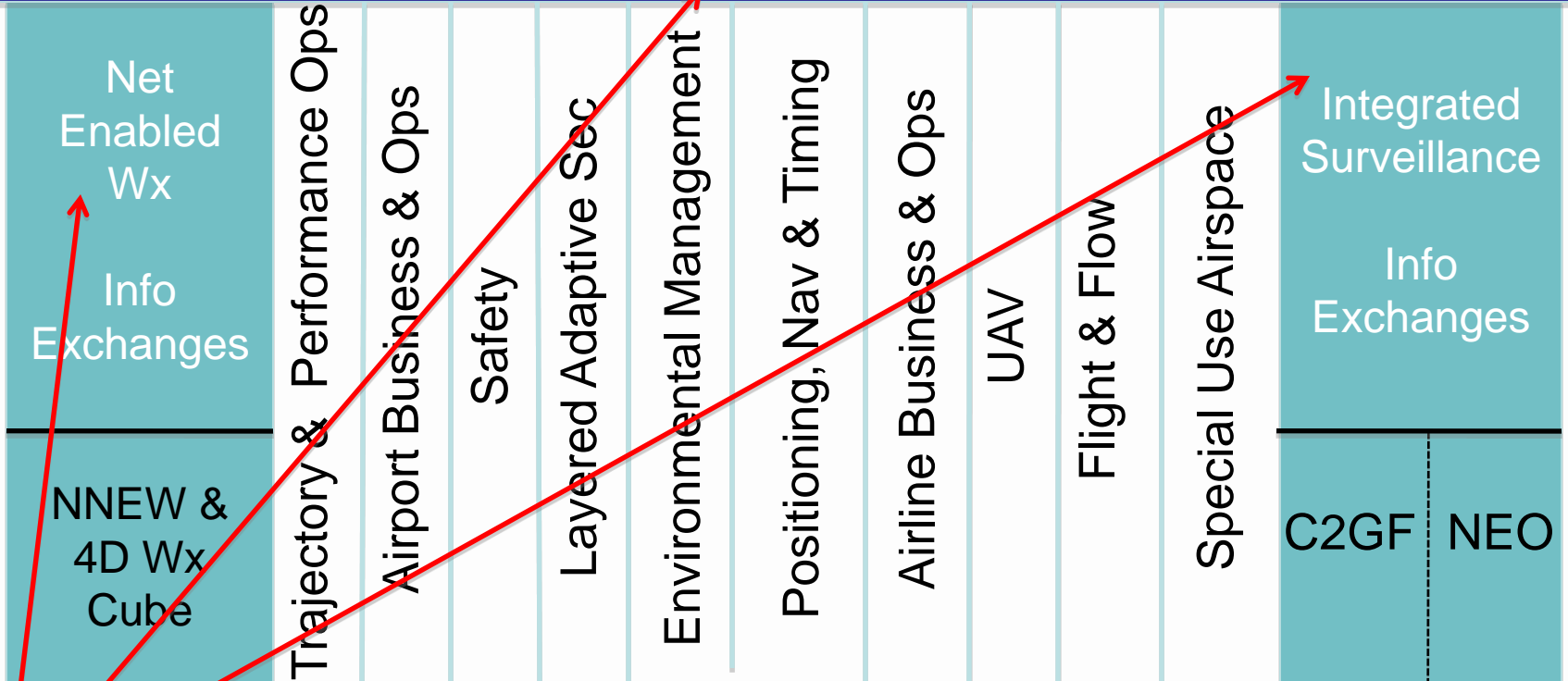
NCOD Support to NextGen Weather

- Support Definition of Information Sharing Services
 - Ensure inter-operability across business areas
- Assist in Resolving Supporting Infrastructure Service Issue
- Coordinate Inter-agency Testing of Resulting Services

User Input



Joint NCO ConOps



Inter-Agency Test & Evaluation Collaboration

Start with capability areas having potential for near-term success



JPDO NCOD Info Sharing Development Strategy

Operators/
Users



Select
Operational
Thread

ID Inter-agency functional appeal

Identify
Processes/
Decisions

*CONOPS
Scenarios, actors*

Describe
Info Exchanges

*Users, service levels, security requirements,
Authoritative sources*

Derive
Infrastructure
Requirements

*Connectivity, speeds, bandwidth,
standards*

*Iterative approach
allows incorporation
of industry advancements*

Perform Inter-
organizational
T&E

*Validate,
Experiment,
Measure value*

*Adoption is an
Option—endorse
Efforts already underway*

Transition to
Operations



NextGen Actors

What decisions do they make?

What info do they need?

- Passengers
- Passenger-related users
- Cockpit Flight Crews
- Cabin Air Crews
- Air Traffic Controllers
- Air Traffic Planners
- Air Marshals
- Ramp Crew (refuel, bags)
- Baggage Handlers
- Airport Security
- Airport Concessionaires
- Airport Ground Transport
- FEMA Planners
- Weather Forecasters
- First Responders
- Shippers
- Freight Forwarders
- AMOC Operators
- AMOC Supervisors
- AMOC Intel Analysts
- TSA screeners
- TSA Intel Analysts
- CBP arrival inspectors
- CBP Intel Analysts
- Airline Management
- Flight Instructors
- Gate Agents
- Ticket Agents
- NORAD Analysts
- USAF/USA/USN Controllers
- Airport Owners
- Airport Ops Managers
- GA Pilots
- Air-taxi operators
- IT System Developers
- IT Infrastructure Ops
- Avionics Developers
- FAA Certification Ops
- Safety Review
- Aircraft Maintenance
- Air Rework Facilities
- Manufacturers
- NTSB Investigators
- Insurance Investigators
- Airline incident analysts
- Union Representatives
- Union Management
- Criminals
- Terrorists
- Drug Dealers
- Smugglers

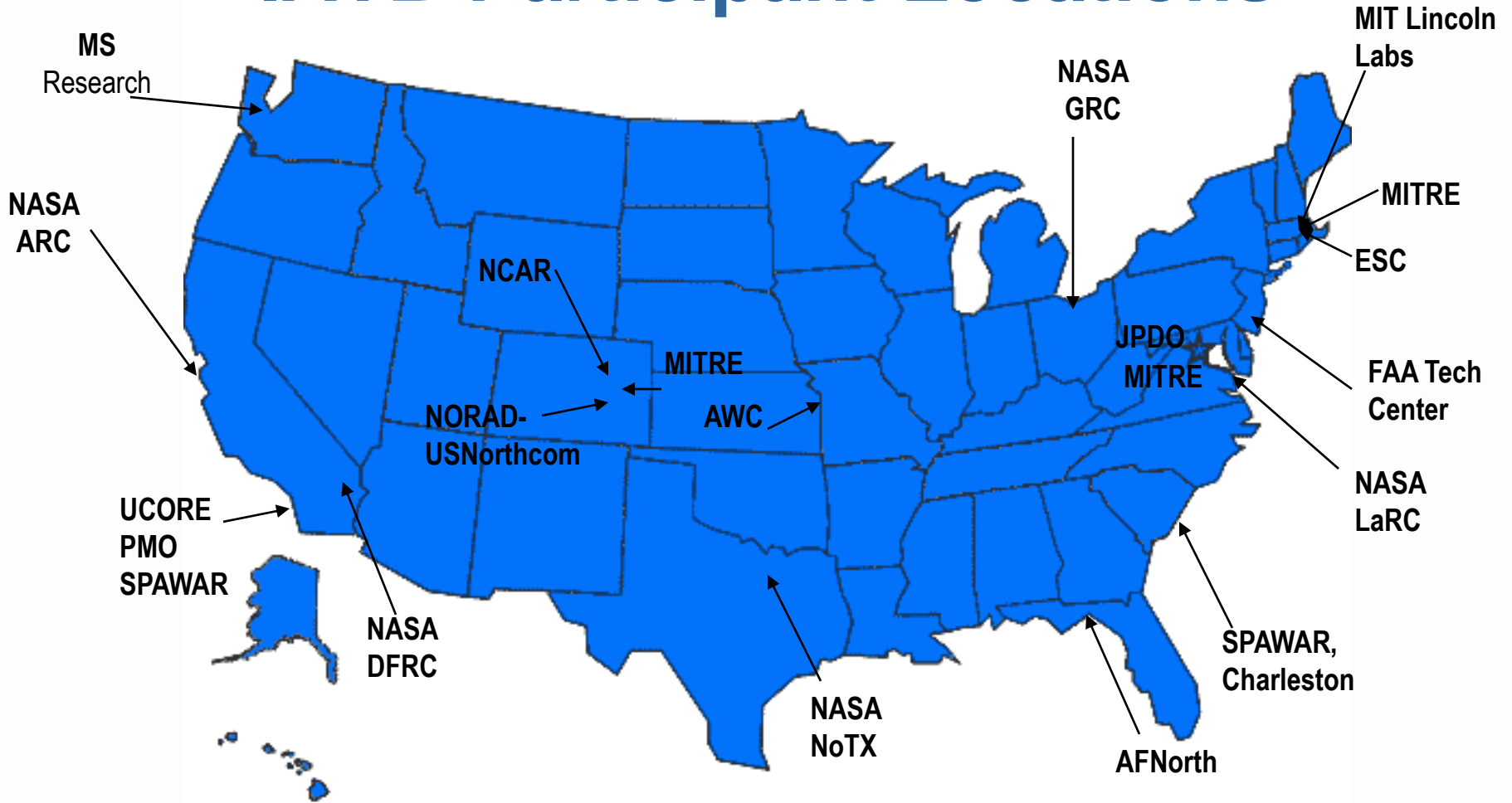
IATB Concept

- IATB is a collaboration among partners who have NextGen information to share or want to find ways to use information related to NextGen
 - Not a physical facility itself
- Light Governance consistent with R&D maturity
 - Follows JPDO and JPDO/NCOD Governance models
 - Applies Internet Engineering Task Force (IETF) philosophy
 - “Community standards and working code”
- Services are NOT operational
 - Limitations are advertised
 - Cannot be permitted to impact operational systems
 - “Best Effort” made to keep them in operation for use by others
- Periodic, well-defined experiments to evaluate value of specific information sharing to stakeholders

IATB Capabilities

- Debug data communications issues which preclude inter-agency information sharing
 - Data comm network connectivity
 - Cybersecurity and Firewalls
 - Standards and Protocols
- Provide pre-production environment for developers of client applications to access information services
- Provide environment for evaluating business value of information sharing through focused experiments
 - similar to JEFX
 - Prepare for Research to Operations Transition within Agency
- Assist cultural change by showing feasibility and value
 - Educate Senior Management

IATB Participant Locations



Currently Adopted Information Services

(Reflects only Programs Adopted by 6/6/10)

Information	Sensitivity	Source	ETA	Issues
Federated Metadata Directory	Public	NASA LaRC ASDC	7/30/10	Tool Selection through ESC. Initially duplication/synch with local directory. Final: federation with local control
Federated Registry	Public	NASA LaRC ASDC	Now	ebXML in JBOSS. Need UDDI version (IBM)
Timing Example	Public	NASA LaRC ASDC	Now	Alion COI Provisioning
Weather (Initial test set)	Public	FAA NNEW	2010 Fall	Alion – Inventory artifacts
Other Aviation Weather	Public	NWS/FAA 4D Wx Cube		Meeting with Mark Miller and Tom Day
Combined Track ID	Various	DoD C2 Gapfiller JCTD	Winter 2010	Initial version
SWIM Segment 2	Public	TBD	TBD	Need Official Coordination with FAA

Currently Adopted Information Services

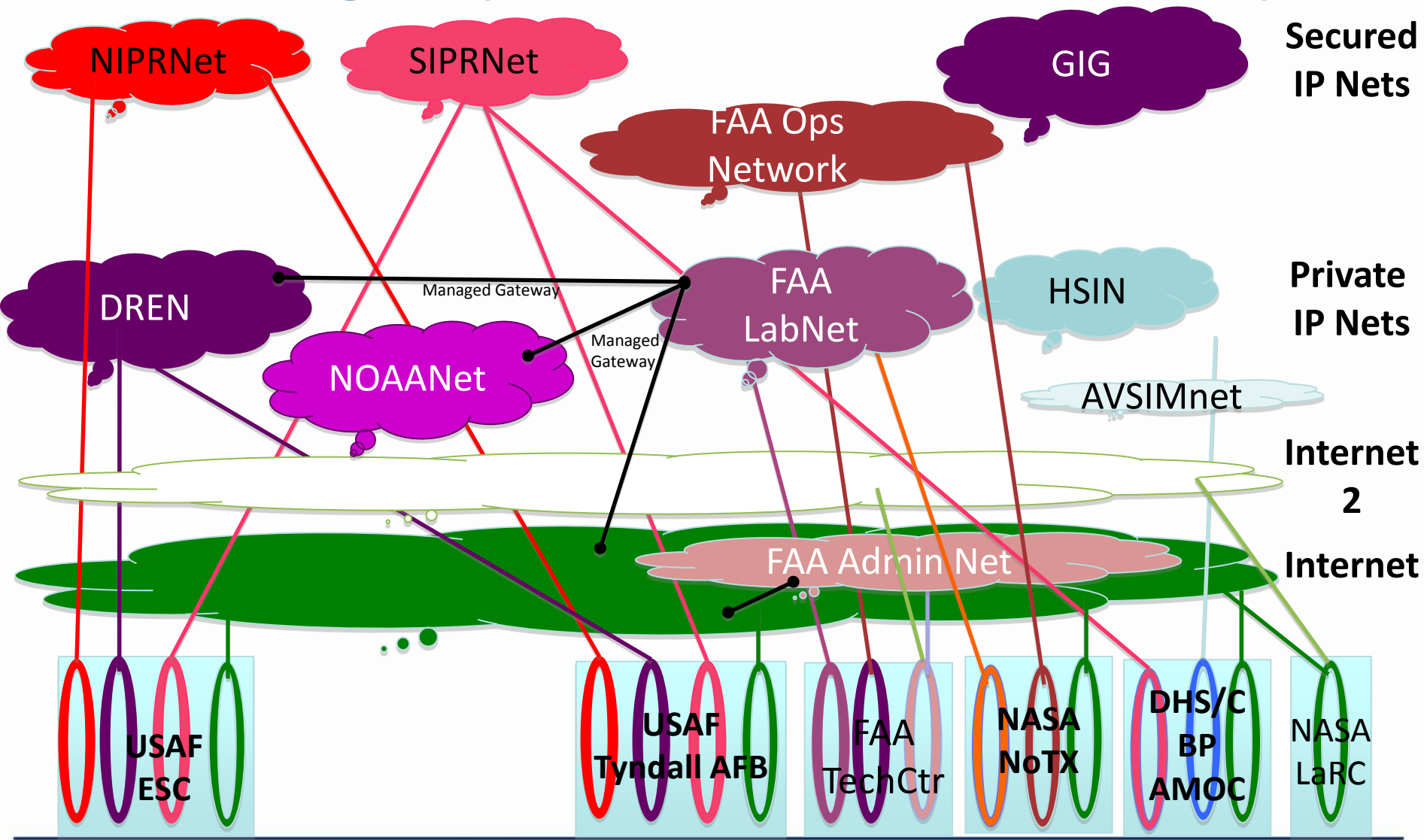
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Information	Sensitivity	Source	ETA	Issues
FAA Flight Plans (even as they change in real-time)	Public	FAA EDX R6	•Fall 2010 •Spring 2011	•Recorded Data •Live Data
Aircraft Registration	Public	FAA EDX R6	•Fall 2010 •Spring 2011	•Recorded Data •Live Data
International Flight Data Objects	Public	FAA EDX R6	•Fall 2010 •Spring 2011	•Recorded Data •Live Data
WARP	Public	FAA EDX R6	•Fall 2010 •Spring 2011	•Recorded Data •Live Data
ITWS	Public	FAA EDX R6	•Fall 2010 •Spring 2011	•Recorded Data •Live Data
CIWS	Public	FAA EDX R6	•Fall 2010 •Spring 2011	•Recorded Data •Live Data
Airport/runway status	Public	FAA EDX R6	•Fall 2010 •Spring 2011	•Recorded Data •Live Data
Surface Surveillance	Public	FAA EDX R6	•Fall 2010 •Spring 2011	•Recorded Data •Live Data
NOTAMS	Public	FAA EDX R6	•Fall 2010 •Spring 2011	•Recorded Data •Live Data
PIREPs	Public	FAA EDX R6	•Fall 2010 •Spring 2011	•Recorded Data •Live Data
LRR/SRR Radar detections and reports	Public	FAA EDX R6	•Fall 2010 •Spring 2011	•Recorded Data •Live Data

6/10/10



Inter-Agency Data Comm Connectivity



IATB Collaborative Tools

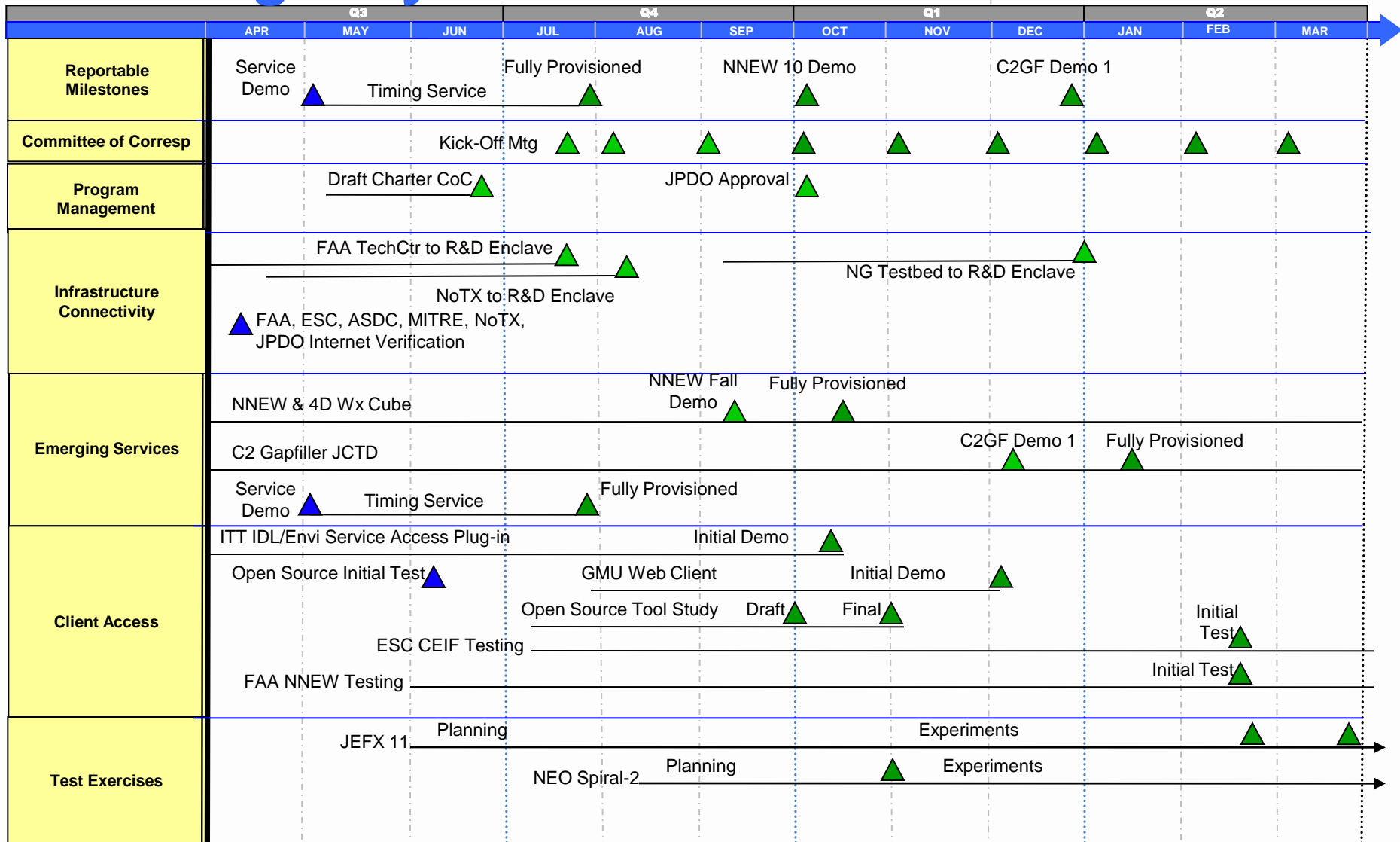
Functionality	Provided by	ETA	Test Bed Impact	Operations Impact	Tool Implemented	Comments
Calendar	NASA LaRC	Summer 2010	Scheduling IATB Events, needs		iCal	Standards based for interchange of events
Registry – Authoritative Data Sources	NASA LaRC	May 2010	Authorization and alignment		JBOSS	Will be further expanded to link ebXML and UDDI
Metadata directory	NASA LaRC	Summer 2010	Discovery, accessible, understandable		AMPS	AMPS from USAF/ESC
File Sharing & Digital Library	NASA LaRC	Summer 2010	Publish requirements, documents			Test plans, test results. Published documents
Shared Test Management Software	Local	Partial	Characterize performance		iTKO Lisa	Each Site. Need licensing and procurement help
WebEx	JPDO	In Place	Real-time		Meeting Place	Test Management Only
Voice Conference	JPDO	In Place	Troubleshooting		JPDO	Testbed collaboration only. Need operational voice conf.
Chat/IRC	JPL	TBD	Troubleshooting		TBD	Private server
Action Tracking	JPDO	TBD	Experiment Mgt		TBD	Private
Video Repository	JPL	TBD	Lessons Learned		TBD	Private
IATB Twitter	JPL	TBD	Experiment Mgt		TBD	Private
IATB Wiki	JPL	TBD	Experiment Mgt		TBD	wikimedia at NASA LaRC
Facebook	JPL	TBD	Expert Coordination		TBD	Private



A Phased Approach

- Phase 0 – 4-6 weeks
 - Prove that a minimal service can be shared from LaRC to ESC and FAA's WJH Technical Center
- Phase 1 - 5-6 months
 - Evaluate the interagency sharing of initial information from the 4D Weather Cube, C2Gapfiller, EDX and other services already exposed
- Phase 2 – 1 year
 - Add key collaboration sites
 - Add Information Sharing Services, as Projects are adopted
- Phase 3
 - Demonstrate candidate C2GF disadvantaged client, if available
 - Implement Sustaining Business Model

Inter-agency Testbed Near-term Schedule



LEGEND: Planned Event Completed Overdue Replan

IATB Governance

- 2-Body Problem
 - Steering Committee – policy and review
 - Committee of Correspondence – technical working group
- Conceptual Origins
 - Modeled after Internet Engineering Task Force
 - Collaboration not direction
 - Community Standards and Working Code
 - An Element under JPDO's NextGen NCO Governance Model
- Responsibilities
 - Service Level Agreements by Providers
 - Appropriate Use Agreement by Consumers
 - Acceptance and application of Standards
 - Clear and consistent statement of information protection for data

Nearterm Technical Issues for IATB

- Exchange Electronic Credentials
 - Initially USAF and NASA
 - Work with FAA
 - Expand to include agencies using PIV-2 cards
 - Expand to include industry using PIV-2 cards
- Verify connectivity between the various consumers and a reference info service
- What is a Fully Provisioned Service
- Interoperability among registry services
- Interoperability of info services between ESBs
 - Web services
 - Java messaging services
- Interoperability between SOAP and REST Services
- Authorization of access to information services
- Monitoring services for outage
- Enforcement of compliance of service delivery SLAs (technical)

Key Issues to be worked out

- Governance and how do we manage IATB in the face of natural inertia from Agencies to remain isolated or limit collaboration
- Data Communications architecture across multiple security domains
- Relationship to data.gov
- Research to Operations Transition Process
- Access Control
 - Federated ID Management across Agencies and Companies
 - Authorization schema
 - Needed to protect proprietary or SBU data before industry can participate
- Outreach and collaboration with additional assets
 - Expand Agency participation
 - Create industry involvement
 - Need to show value

Proposed IATB Follow-on Focus Areas

- Information Exchange
 - Air-to-ground, air-to-air communications testing
 - Data and Information standards
 - Data compression and/or encryption for transmission only
 - Cyber-security in inter-organizational information sharing
- SOA Business Applications
 - Develop common user interfaces across communities of interest
 - Evaluate impact of each test to needs, providing value to NextGen and NAS
 - Identify or develop easy-to-use mashup environment
- Interoperability of SOA Software Tools
 - Catalog & test various tools (ESB, registry server, metadata, etc.)
 - Test Management tools
 - Metadata creation and alignment tools

IATB: What Can I Do With It?

- Register your interest
 - Notify Emily Brandes Emily.CTR.Brandes@faa.gov of your interest
- Join the NextGen Institute to clarify Organizational Conflict of Interest
- Test Your Info Service Client connection to the ASDC Timing Service
 - Service reports clocktime on unix box at NASA Langley Atmospheric Science Data Center
 - Located in DMZ at NASA LaRC and has been verified accessible to outside clients without prior arrangements
 - Service at <http://soa-asdc.larc.nasa.gov/ASDCTimeService/TimeService>
 - WSDL at <http://soa-asdc.larc.nasa.gov/ASDCTimeService/TimeService?WSDL>
 - Examine the service using generic client: <http://www.soapclient.com/soapptest.html>
 - NOTE THAT THIS URL DOES NOT LOAD A Web Browser – it takes a client
- Report success to Ms. Brandes
 - Suggest information services that you would like to see added
- Stay in touch as we add services
 - Look for effective mashups that can be used to demonstrate business value to the partners