AWIPS Technology Infusion

Darien Davis
NOAA/OAR Forecast Systems Laboratory
Systems Development Division
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BOULDER, COLORADO

"What's a nice lab like you, doing in a place like this?"

Forecast Systems Laboratory

Mission Statement

The mission of the Forecast Systems Laboratory (FSL) is to anticipate the science and technology that will be needed by the nation's operational atmospheric, oceanic, and hydrologic forecasting services in the next five to ten years. After researching and developing new observing and forecasting systems, ***FSL transfers those technologies to operational users*** such as the National Weather Service (NWS), other government agencies (e.g. U.S. Air Force and the FAA), the commercial and general aviation communities, foreign weather forecasting services, and other private interests.

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PROFS/FSL History

- 1980s Risk Reduction Activities for AWIPS 90
- 1990-4 UNIX prototyping AWIPS-like visualization tool
- 1996 Installed data management and WFO D2D tool, Denver WFO
- Adopted as basis of NWS modernization tool

"One NOAA"

- http://www.ppi.noaa.gov
  - NOAA strategic plans and visions
  - Line office strategic plans
- Mission Goals
  - Ecosystems
  - Climate
  - Weather and Water
  - Transportation

Planning/Programming/Budget/Execution

- Three year Process
- Currently
  - FY08 Planning
  - FY07 Programming and Budgeting
  - FY06 Operating plans (execution)

NWS Strategic Plans
"Working together to Save Lives"

- Government Performance and Results Act
  - Corporate performance measures
- Strategic Plan, Appendix A
  - Ex. Lead Time for tornadoes
    - 2003 13 minutes
    - 2010 16 minutes

Office of Oceanic and Atmospheric Research

…Integrated Global Environmental Observation and Data Management System

NOAA will develop an Integrated Global Environmental Observation and Data Management System based on user requirements and an ***integrated architecture***. NOAA Research will promote international cooperation in developing this system and participate in technology research and development for global observations, particularly meteorological, climate and ocean observations.

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Where is AWIPS software technology infusion in this process?

- Weather and Water Goal
  - ❑Science and Technology Infusion Program
    - ❑Capability G:R&D and A (acquisition) for IT
      - ❑ Advancement of Information Systems for Forecast and Warnings
      - ❑Providing Weather Forecast Technology for Worldwide Application
      - ❑AWIPS

Major Software Areas supporting NWS Operations

- NAWIPS
- AWIPS
- WHFS/RFC
- GFE/Digital Services/NDFD

NWS Software "Challenges"

- Upgrades for Observing systems
  - NPOES/phased array radar/high res models
- Upgrades for technology
  - DVB/Linux Replacement/Storage/WAN
- 1996-to-current
  - No resources for major software upgrades

  …until now

NWS Programming Branch

- Charter from Nov/2004 NWS Corporate Board
- Part of NWS Office of Science and Technology
- Members include NCEP/OST/OHD/FSL/MDL
- Looking at 5 years over-the-horizon

Draft Vision Statement

A secure, reliable, sustainable, scalable and extensible enterprise based Information Technology (IT) system that enables **seamless access** to information and services throughout the National Oceanic and Atmospheric Administration (NOAA) operational and research domain to support NOAA business operations.

Major Areas for Upgrade

- Data Architecture
- Information Exchange
- Collaboration
- Visualization Techniques
- Infrastructure

Current Activities at NOAA

- FSL ALPS (Advanced Linux Prototype System)
  - Linux Prototype
  - Advanced visualization Techniques
  - Data “pull” technology
- Programming Branch
- NOAA IT Enterprise team
- “Capability G” team
- CLASS
  - Comprehensive Large Array-data Stewardship System

Information Architecture and Data Services

- Sharing
- Discovery
- Reliability

Sharing…

- Inter application
  - (GFE/WHFS/D2D/NAWIPS)
- Intra NOAA
  - NMFS/NOS/NWS/OAR
- Trusted Public
  - Emergency Managers, DHS, etc

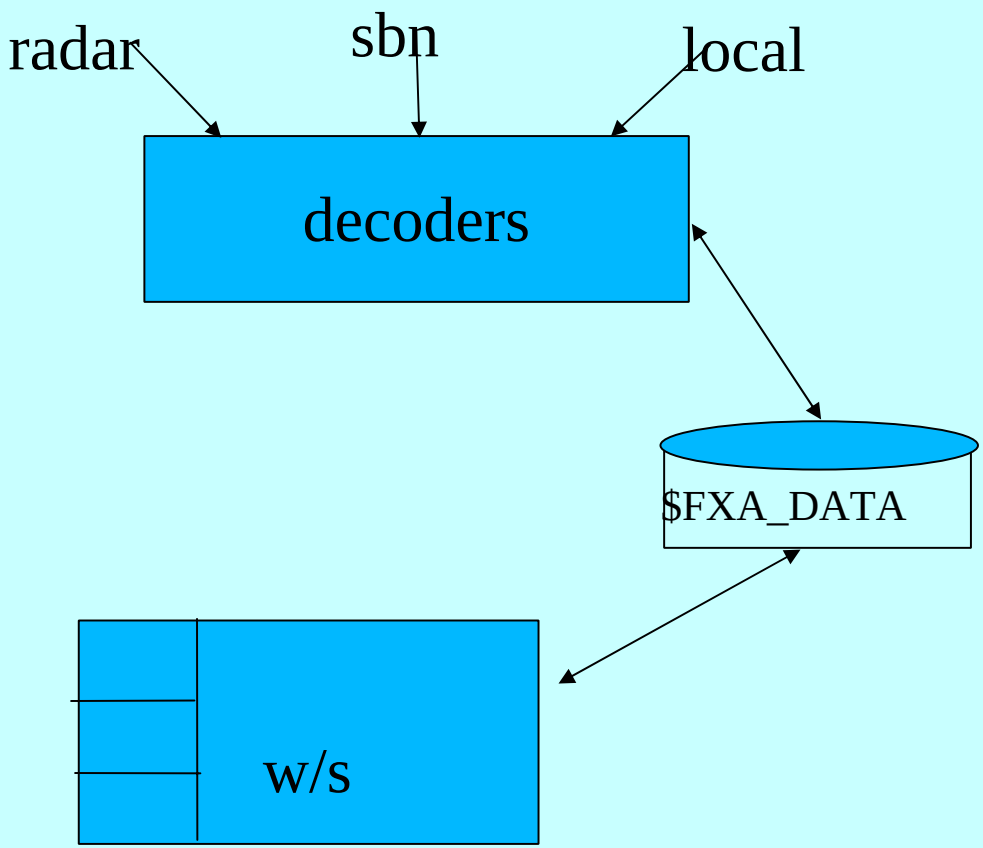
Discovery…

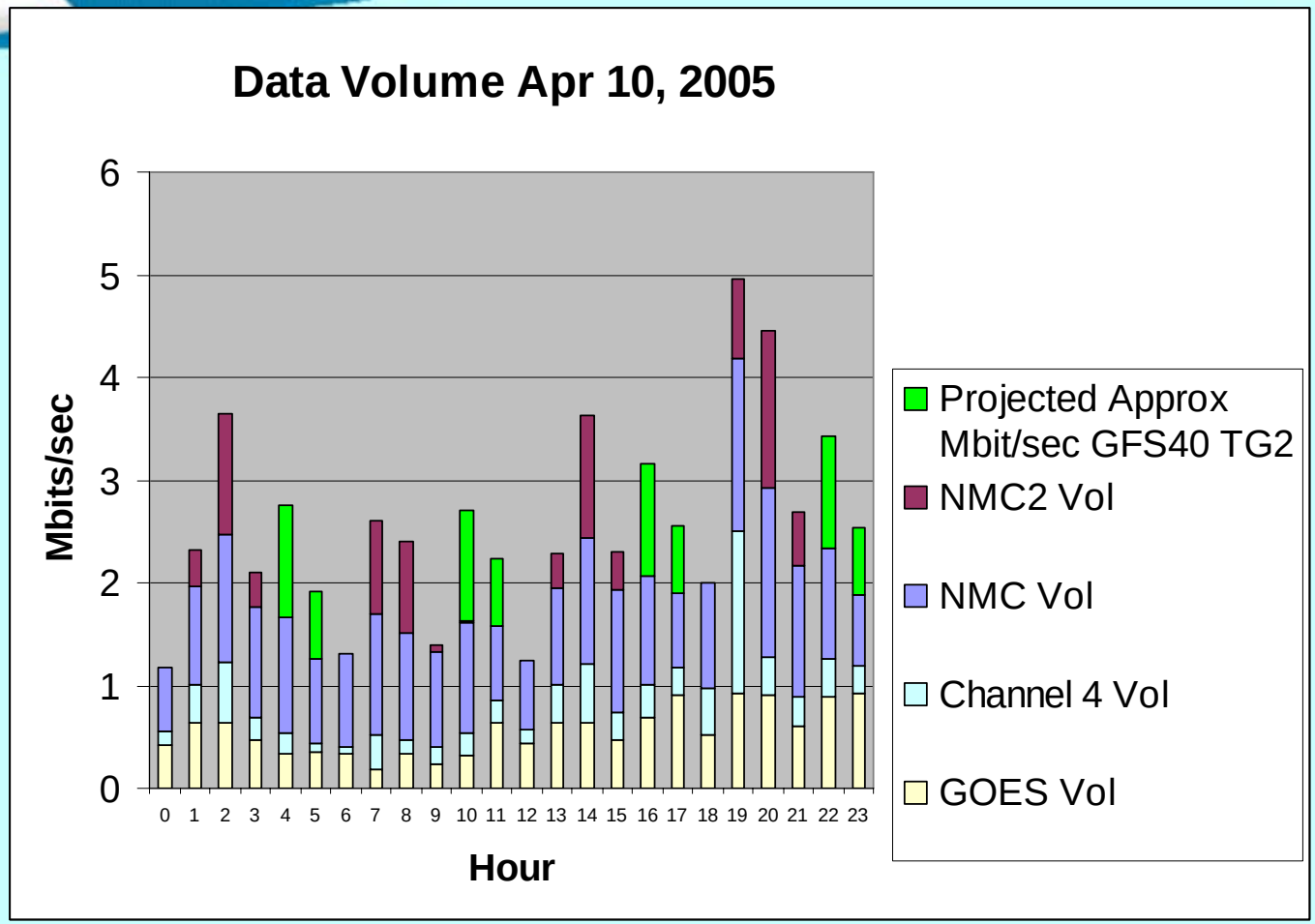
- How do we recognize new data sets without an upgrade?
- >$75,000 per AWIPS minor upgrade
- >18 months from data “inception” to forecaster display

Reliability…

- Service Backup
- Failover
- Redundancy

Current site ingest





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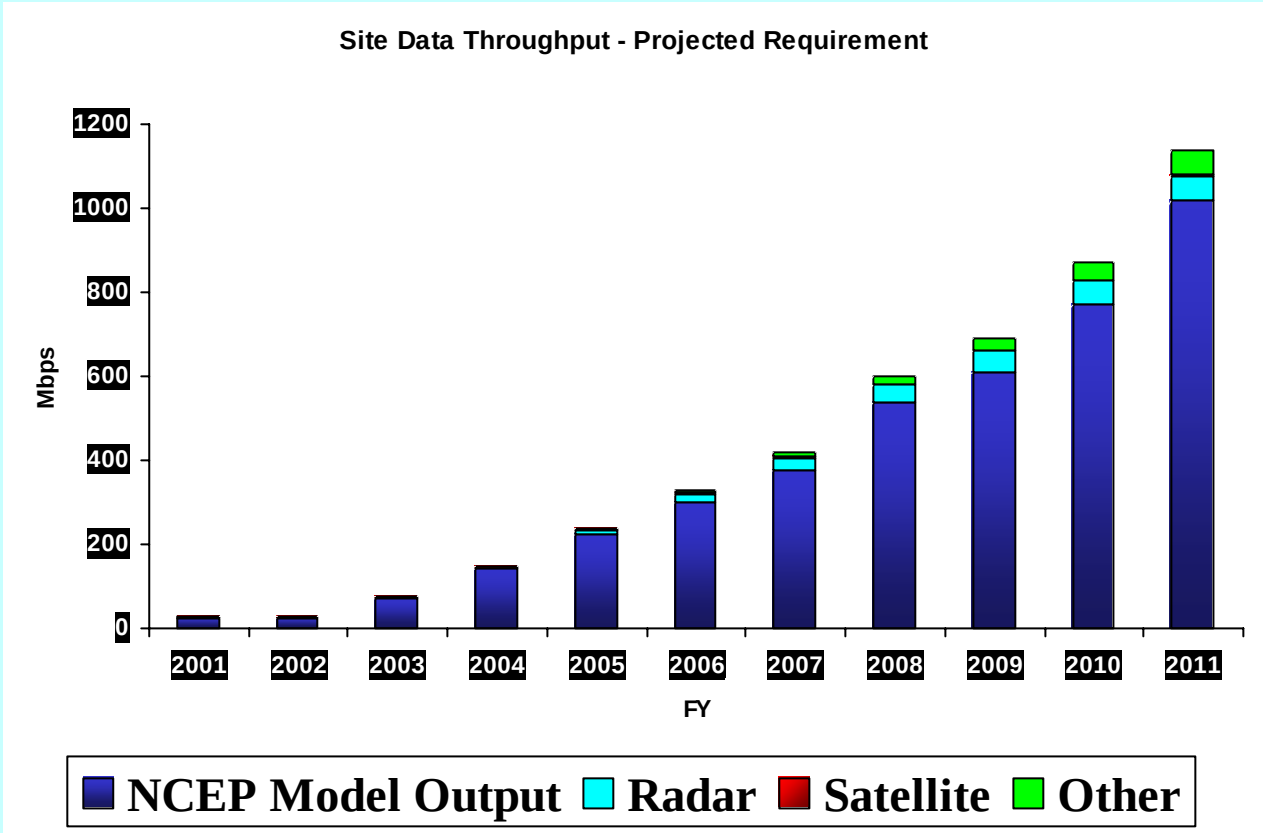

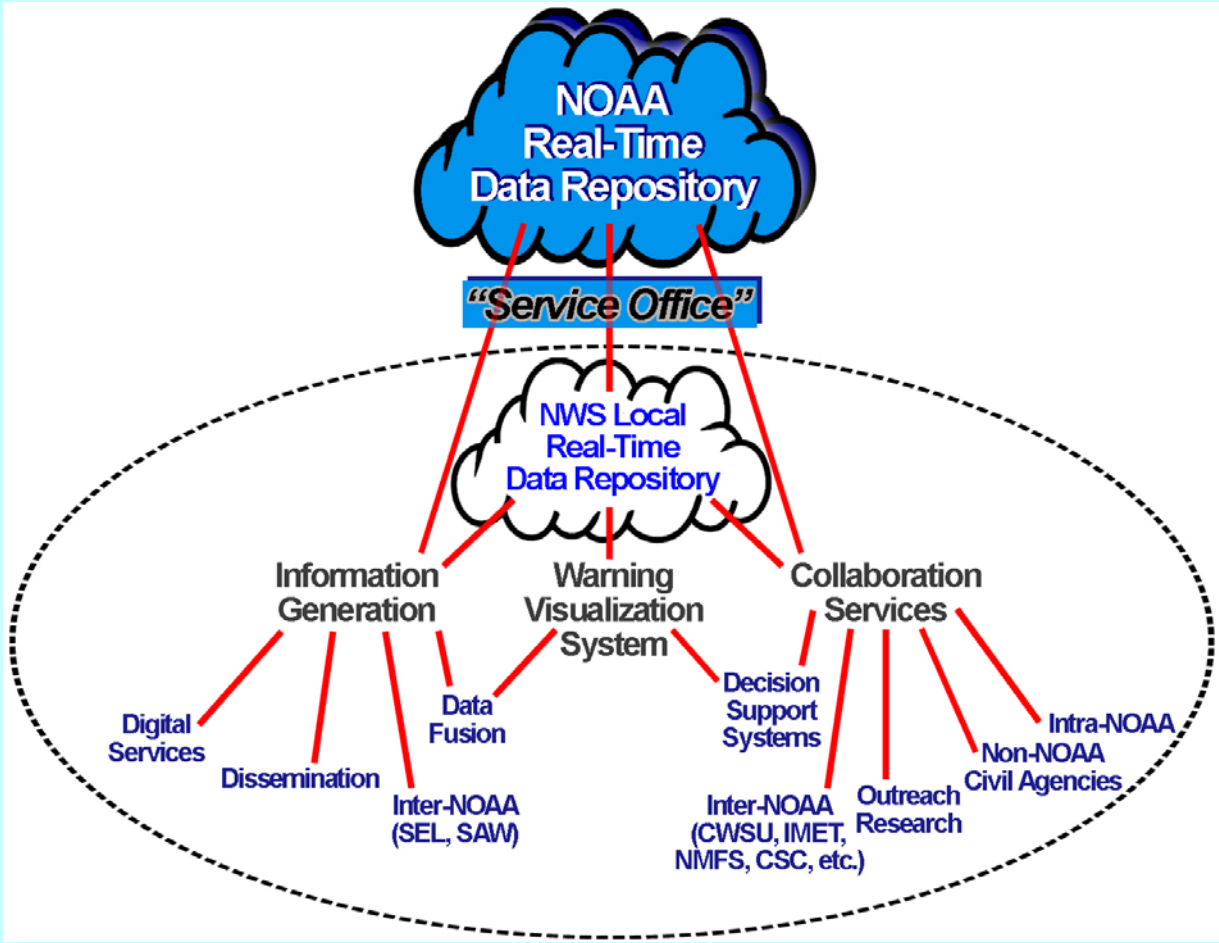

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NOAA Real-Time Data Repository

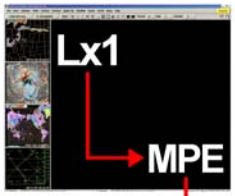
- **Not Primary Source of "Warning-Essential" Information**
  - **> No Input on Time-Based GPRA Goals**
- **Data Information Services**
  - **> Who, What, When, Where, How**
- **Registration Services**
  - **> "Auto-Updating"**
  - **> Security**
- **Data Server, Data Client, Router**

NWS Local Real-Time Data Repository

- Short-Fuse “Data”
- Data Supporting W/W/A, All - Hazards
- Product Generation
- Subset of National Data Set
- Performance-Based Data Retrieval (GPRA)

Case 1– Discover

Phase I in AWIPS D2D



Grid Depict Key

Grid Source Table

Inventory

Local File

XML Client Master Table

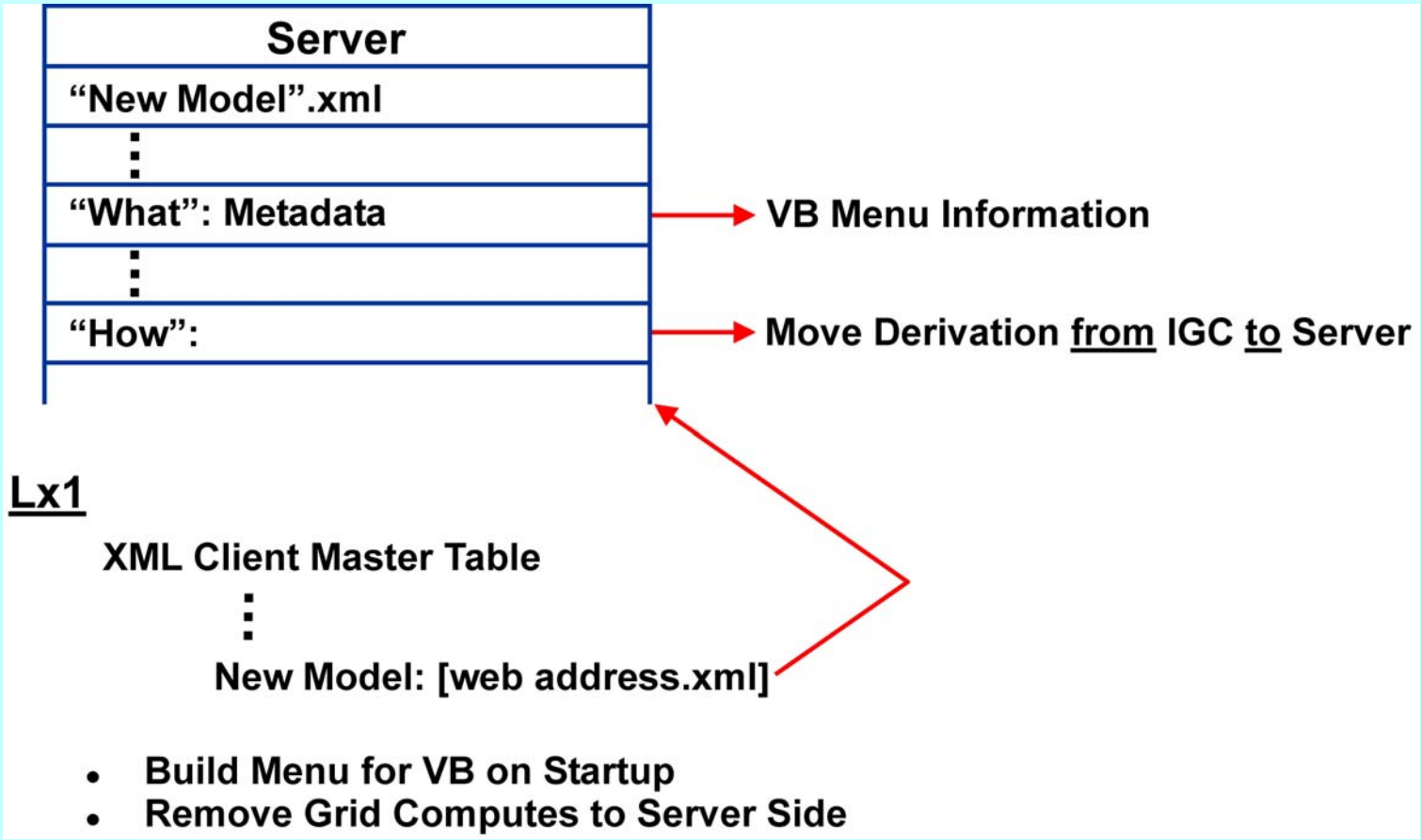
List of Web-Addressable Sites

- GFE: [<web address.xml>]
- MPE: [<web address.xml>]

Server
MPE.xml
Where: (file: or http: address)
Who: (client registration list)
When: (inventory list/update)
What: (metadata information)
How: (clipping, derivation, etc.)

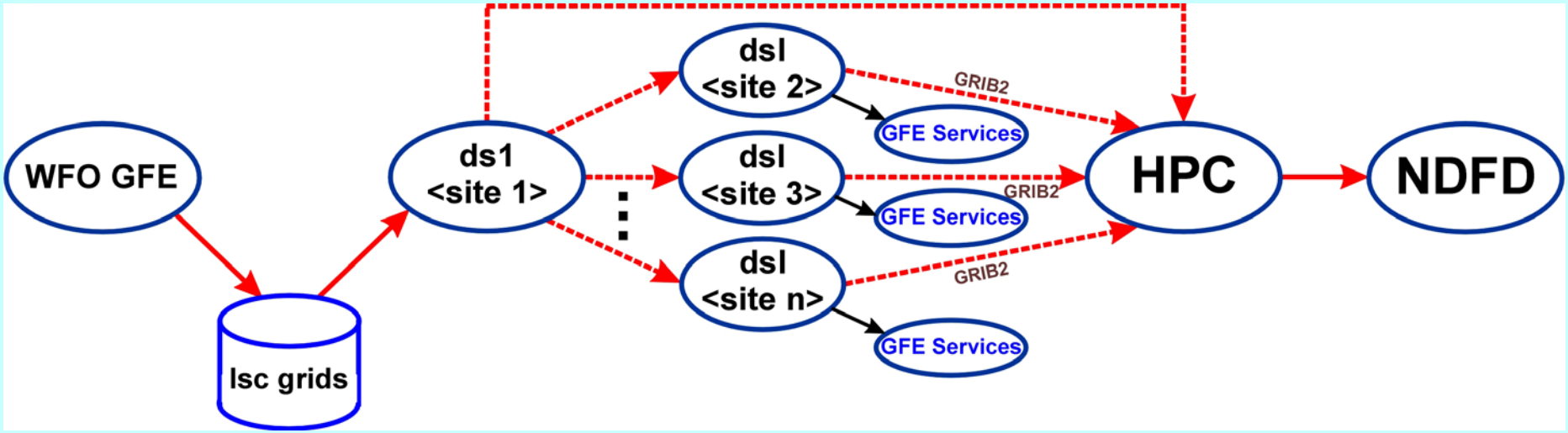
Case 1: Discovery

Phase II



Case 2: Sharing

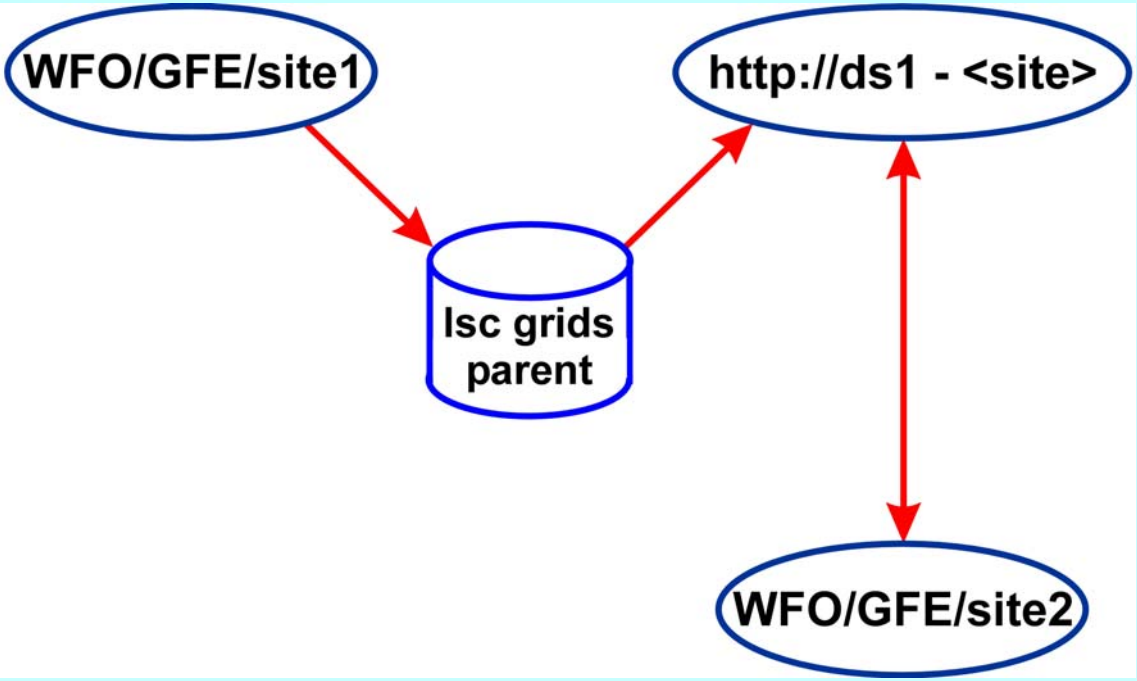
InterSite Coordination



- One – Two Planet Chat board
- Store-and-Forward Grids

Case 2: Sharing

Phase I



- Data
- Intra-Site Metadata

Data Subset Parameters on Demand

Metrics per Site

>Quantity of Grids Created

> Quantity of Grids Accessed

Challenge

>Auto Update

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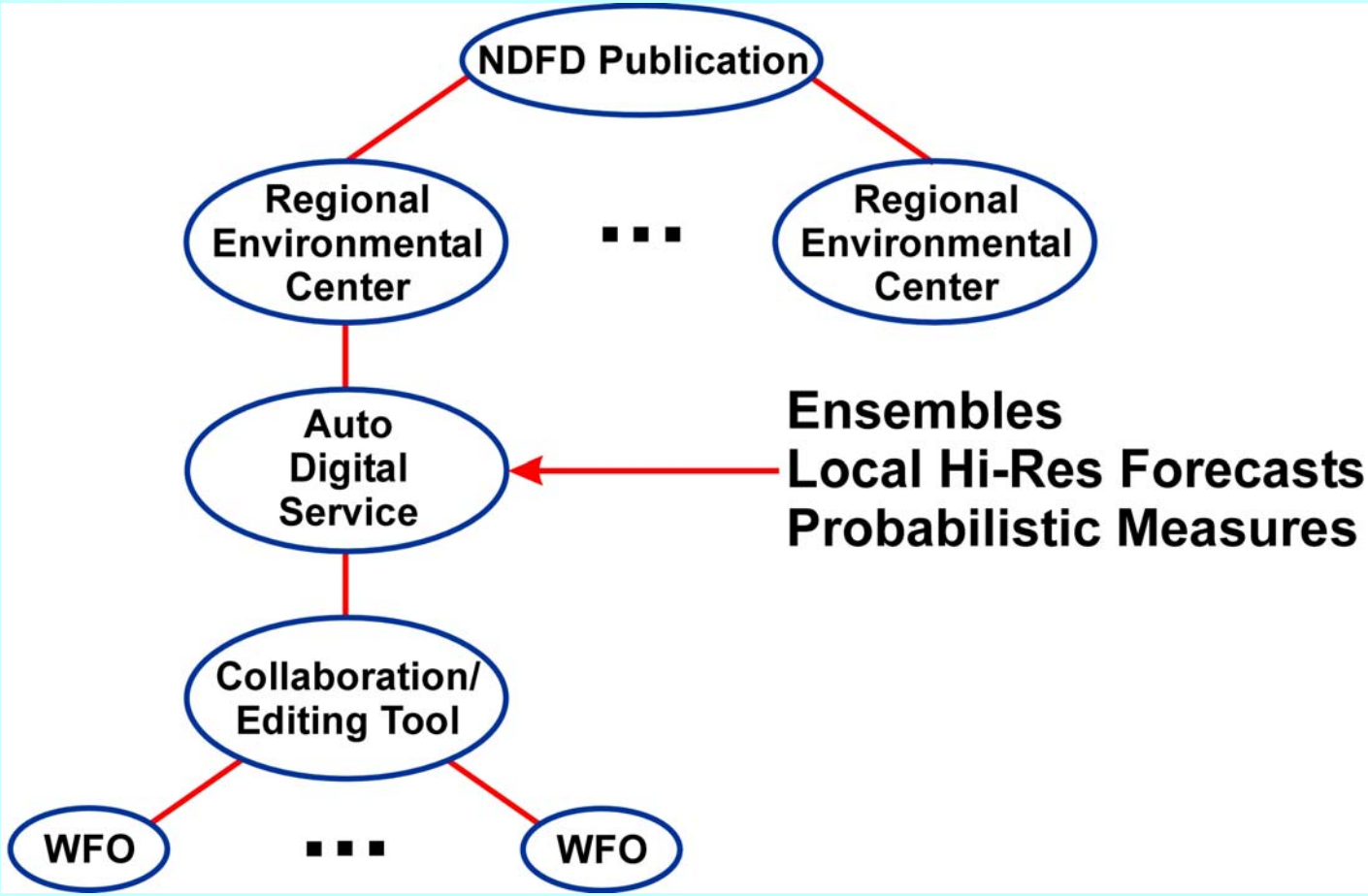
Case 2: Sharing

(if I were queen…)



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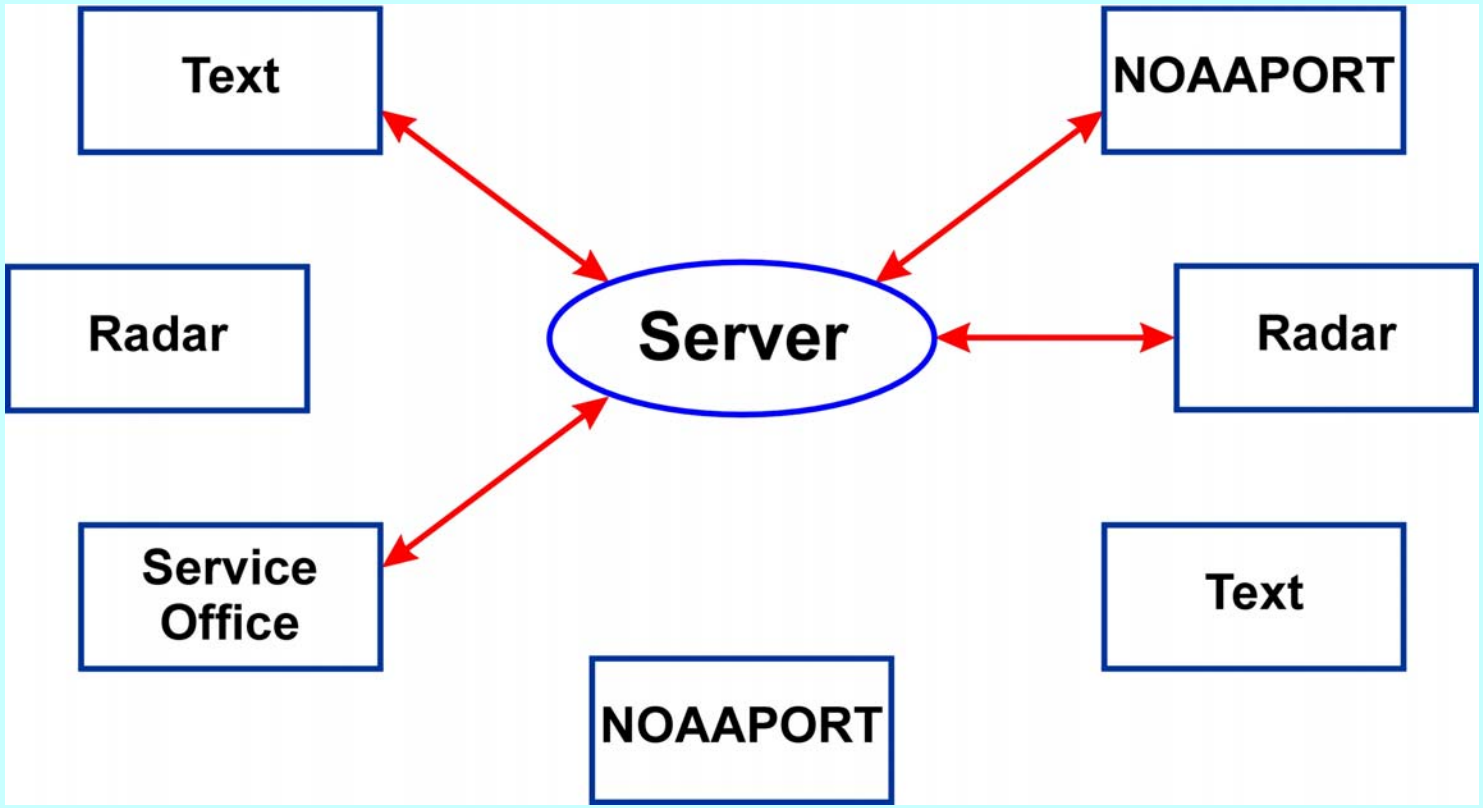
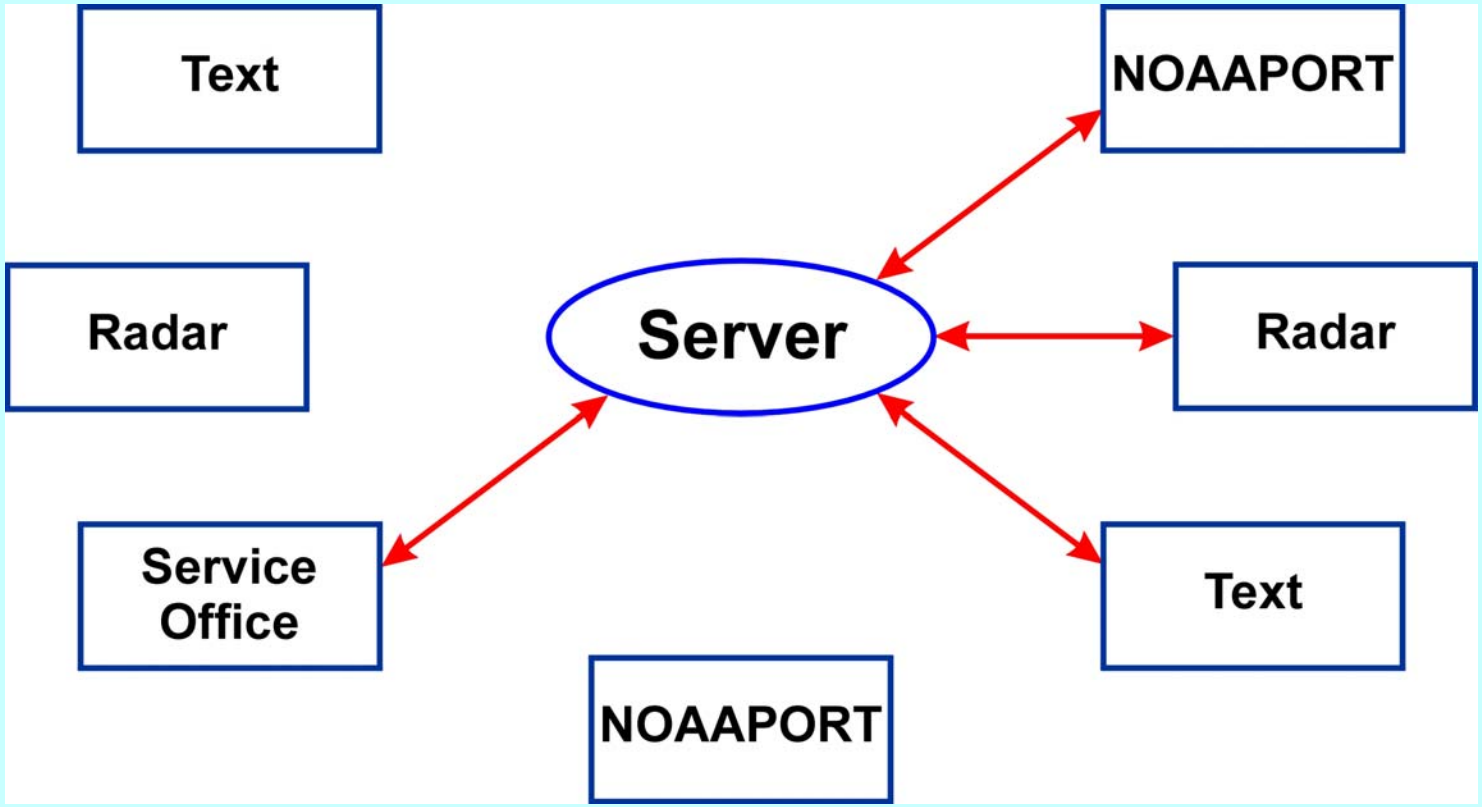
Case 3: Reliability



Case 3: Reliability



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Summary

- New investigations within NOAA
- Research and analysis efforts
- Emphasis on collaboration