

*Comprehensive Large Array-data
Stewardship System
(CLASS)
An Element of NOAA's
Stewardship Enterprise*

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And

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NOAA

Agenda

- NOAA's Stewardship Enterprise
- Project Management
- CLASS System Overview
- Accomplishments to Date
- Current Hardware Architecture
- FY04 Goals
- "Final" Architecture

NOAA's SATELLITE DATA AND INFORMATION STEWARDSHIP

DATA RESCUE

INFORMATION
TECHNOLOGY CLASS

SCIENTIFIC DATA
STEWARDSHIP



Scientific Data Stewardship Generic Guiding Principles


- 1. Careful monitoring of observing system performance for long-term applications**
- 2. Generation of authoritative long-term records through validation of the calibration process, reprocessing, product generation and the blending of *in situ* and satellite measurements**
- 3. Provide state of the environment information for decision makers and place the current state in its historical context**
- 4. Archive and access to fundamental measurements, products and metadata (supported by CLASS)**
- 5. Data archaeology and improved use (supported by CDMP)**

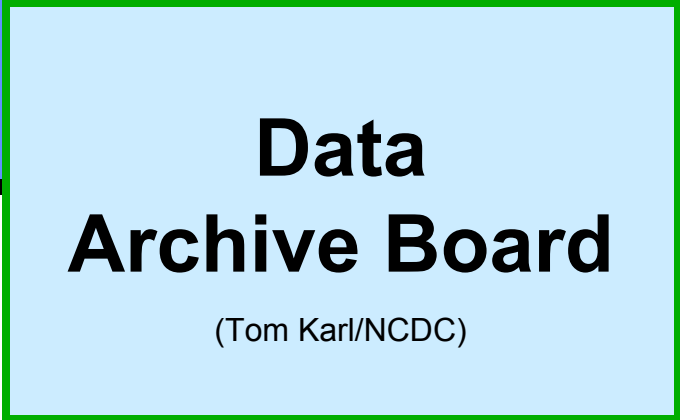
NOAA's Satellite, Data, and Information Stewardship FY03

Data Sets and Observations		Data Rescue Stewardship		Information Technology Stewardship (CLASS)				Scientific Data Stewardship (SDS)				
		Planning	Rescue	Ingest	Store	Access	Migrate	Observing System Performance Monitoring (Near Real-Time)		Climate Data Records (Long-Term Processing)		Assessing State of the Environment (Ongoing)
								Bias Monitoring	Products, Assimilation, Metadata	Data Characterization	Sentinel Blended Products	Information for Decision Makers
Historical	In-Situ Research	Implemented	Implemented	Implemented	Phase 2	Phase 2	Phase 2	Phase 3	Phase 3	Phase 3	Phase 2	Phase 2
	Land	Implemented	Phase 3	Implemented	Implemented	Implemented	Implemented	Implemented	Implemented	Implemented	Phase 2	Implemented
	Ocean	Implemented	Phase 2	Implemented	Implemented	Implemented	Implemented	Implemented	Implemented	Implemented	Phase 2	Implemented
Current	DMSP	Implemented	Implemented	Implemented	Phase 2	Phase 2	Phase 2	Phase 3	Phase 3	Phase 3	Phase 3	Phase 3
	POES	Implemented	Implemented	Implemented	Phase 2	Phase 2	Phase 2	Phase 3	Phase 3	Phase 3	Phase 3	Phase 3
	ASOS	Implemented	Implemented	Implemented	Phase 2	Phase 2	Phase 2	Phase 3	Phase 3	Phase 3	Phase 3	Phase 3
	NEXRAD	Implemented	Implemented	Implemented	Phase 2	Phase 2	Phase 2	Phase 3	Phase 3	Phase 3	Phase 3	Phase 3
	GOES	Implemented	Implemented	Implemented	Phase 2	Phase 2	Phase 2	Phase 3	Phase 3	Phase 3	Phase 3	Phase 3
Future	MODEL OUTPUT	Implemented	Phase 2	Phase 2	Phase 3	Phase 3	Phase 3	Phase 2	Phase 2	Phase 2	Phase 2	Phase 2
	New In-Situ Land & Ocean	Implemented	Phase 3	Phase 3	Phase 3	Phase 3	Phase 3	Phase 3	Phase 3	Phase 3	Phase 3	Phase 3
	NPP	Phase 2	Phase 3	Phase 3	Phase 3	Phase 3	Phase 3	Phase 3	Phase 3	Phase 3	Phase 3	Phase 3
	NPOESS	Phase 2	Phase 3	Phase 3	Phase 3	Phase 3	Phase 3	Phase 3	Phase 3	Phase 3	Phase 3	Phase 3
	EOS	Phase 2	Phase 3	Phase 3	Phase 3	Phase 3	Phase 3	Phase 3	Phase 3	Phase 3	Phase 3	Phase 3

 = Implemented

 = Phase 2 Implementation

 = Phase 3 Implementation

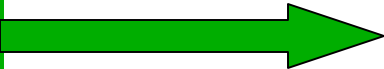
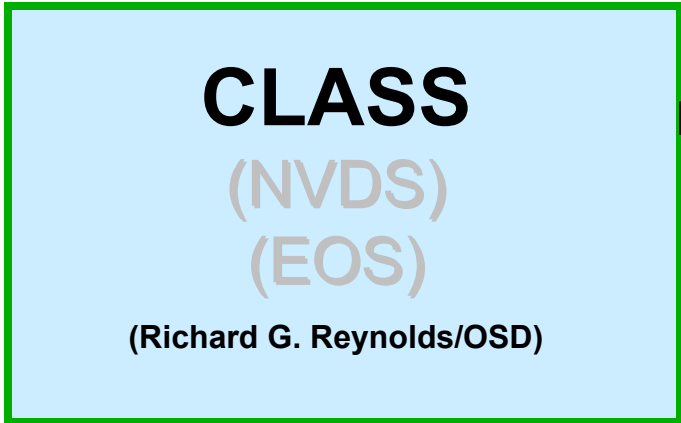


Approved Requirements

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Requirements

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**Information
Exchange**



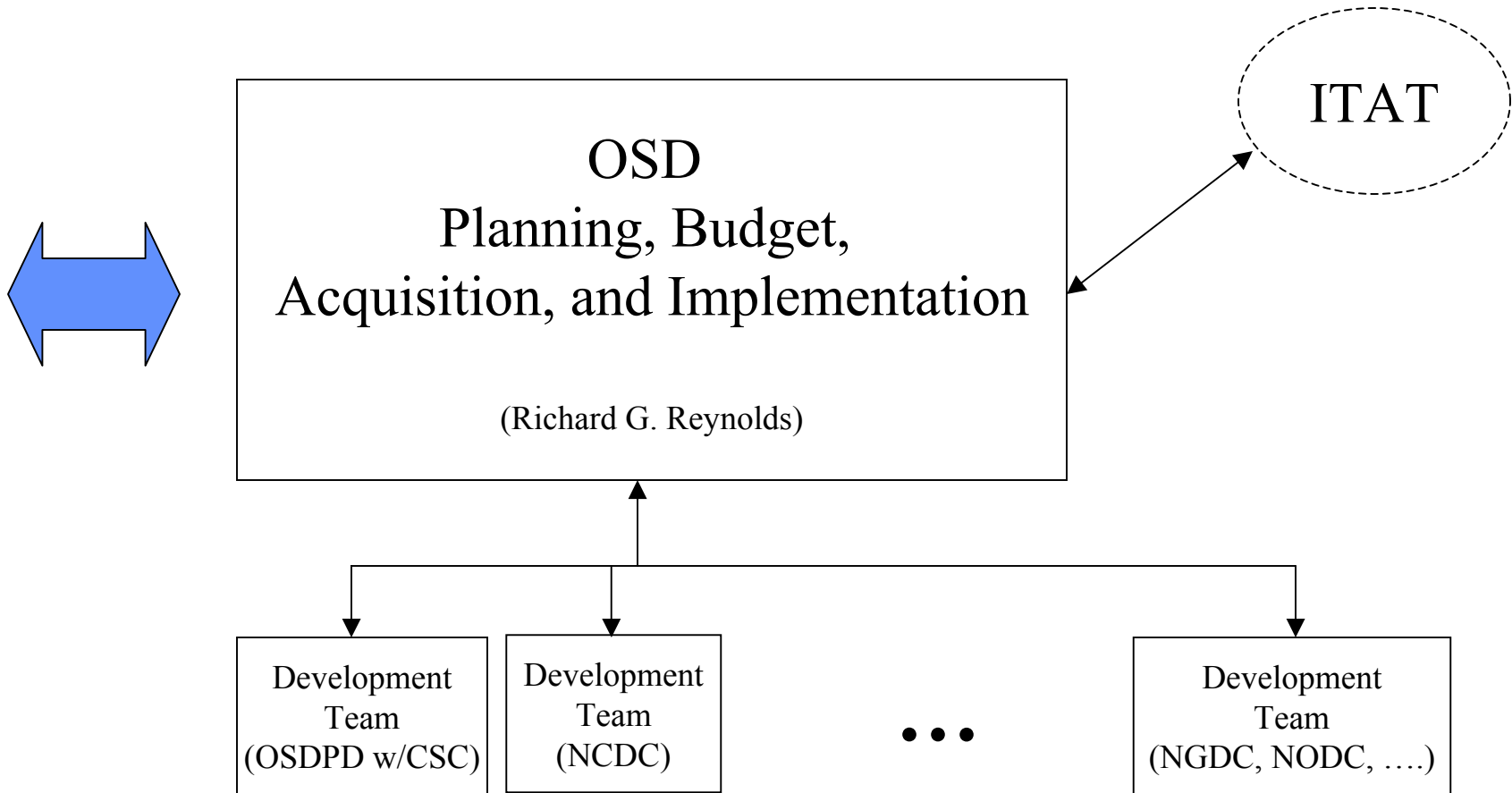
Implementation

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**Knowledge
&
Experience**

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Project Management



Project Management (Continued)

Richard G. Reynolds (OSD)

Charles Bryant (OSD), Chung Wu (OSD)

Suitland Team

Alex Kidd (OSDPD)
Tino Cremidis (CSC)

David Bowman (NCDC)

- Baseline system
- Central software repository
- System Architecture
- System integration
- System testing
- Processes/policies
- Support Suitland operations

West Virginia Team

Scott McCormack (TMC)

- GOES Lead
- Support Asheville operations

Boulder Team

Eric Kihn (NGDC)

- SABR Integration
- DMSP
- Data Mining

• Ted Habermann (NGDC)

- Geospatial databases
- Geotiff images
- Metadata

COAST

Chung Wu (OSD)

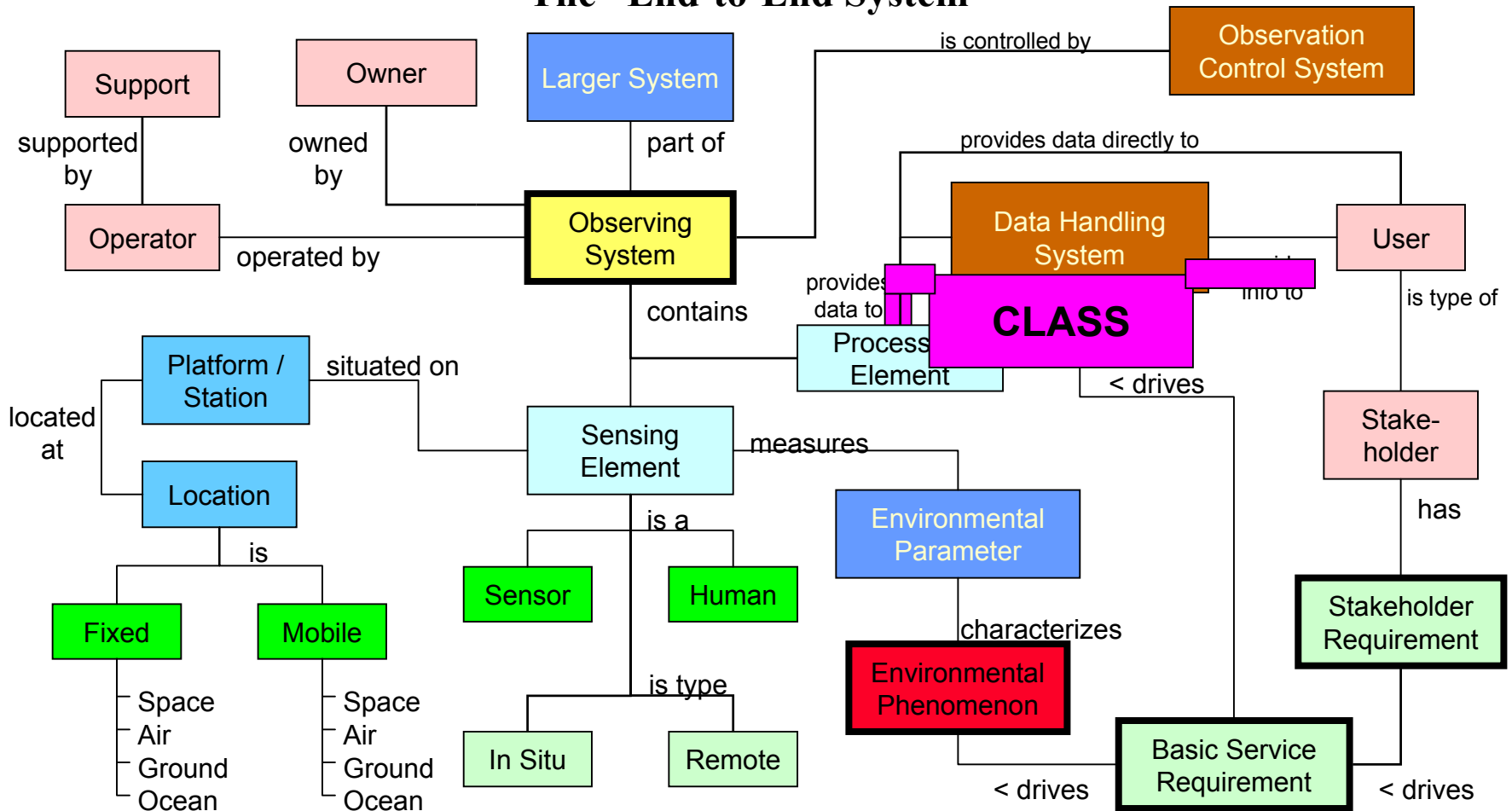
- E-commerce
- Order Management System

CLASS Overview

- CLASS is a web-based data archive and distribution system for NOAA/NESDIS environmental data
- Archive ... ingest, storage, metadata management, and data quality assurance
- Distribution ... access, visualization, and data delivery
- Reprocessing for Scientific Data Stewardship
- CLASS is an extension of an 1995 operational system ... SAA (Satellite Active Archive)
 - Transition to the CLASS architecture began in 2001
- CLASS currently supports POES and DMSP data sets
 - GOES “campaign” is undergoing pre-release testing
- CLASS will support additional campaigns, broader user base, new functionality currently being defined
 - CLASS must concurrently support ongoing operations and new requirements implementation

CLASS Overview (Continued)

NOAA Observing System -- Notional Architecture -- The "End-to-End System"



CLASS Accomplishments through FY03

- Completed overall design of CLASS top-level architecture
- Prepared key system documentation
 - Requirements
 - ICDs
 - CONOPS
 - Management Plans and Procedures
- Established operational, integration and test, and development environments in Suitland
- Completed migration from SAA to CLASS
- Consolidated three web sites in one web-based user interface
- Enhanced ingest system to be independent of file type

CLASS Accomplishments through FY03

(Continued)

- Delivered baseline systems to Suitland and Asheville
- Migrated about 30TB of data from old tape archive system
- Added more than 50 new derived products to the archive
- Suitland CLASS Operational with POES and DMSP data sets
- Completed IJPS/Metop – Archive and Access Segment Preliminary Design Review
- Coordinated with NPP/NPOESS for defining the IDPS to CLASS Interface Control Document (draft)
- Worked with NASA personnel to define requirements to archive EOS/MODIS Level-0 data.

CLASS Accomplishments through FY03

(Continued)

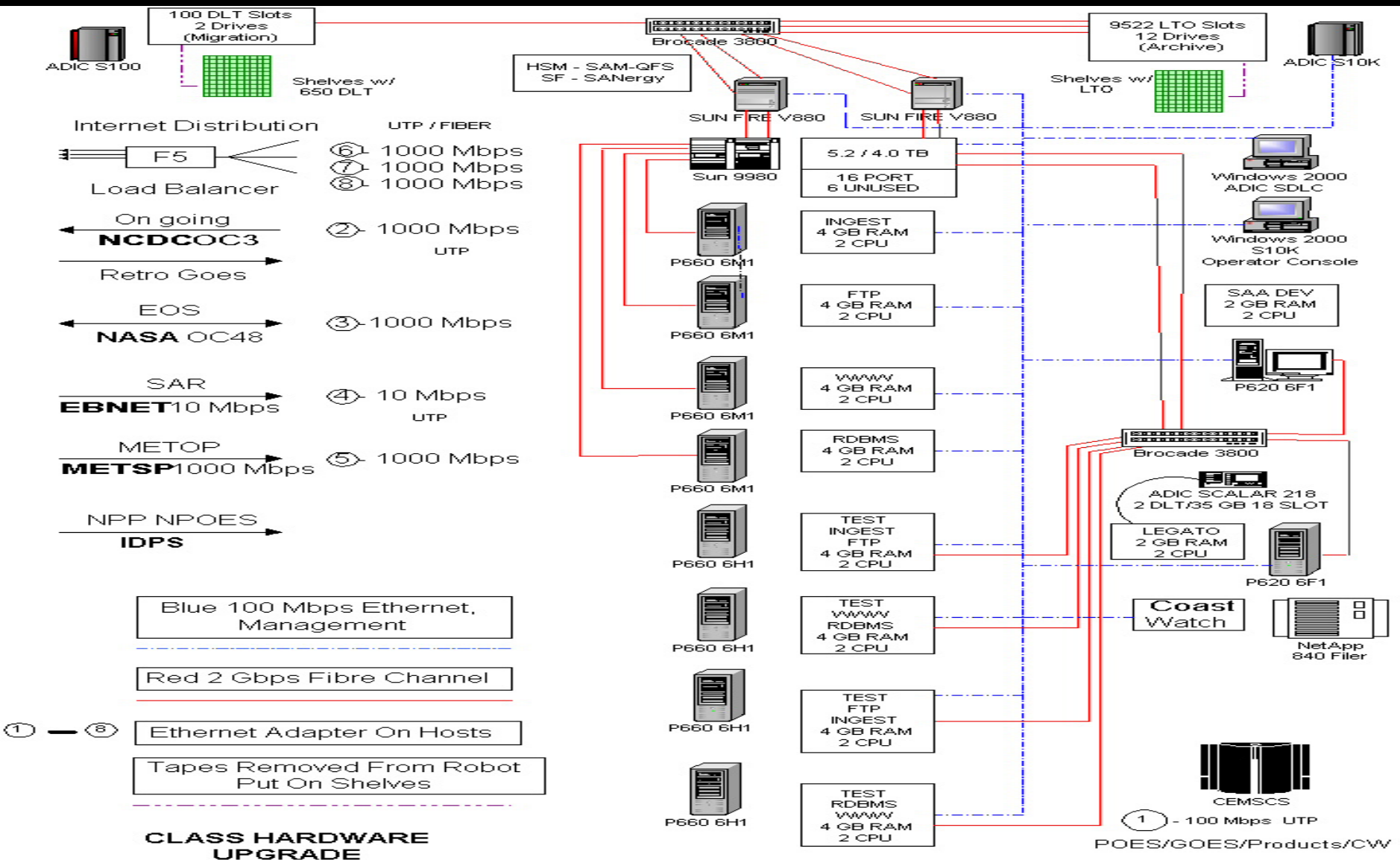
- Established the CLASS Operations Team (COT)
 - Includes OSDPD and NCDC personnel
 - In preparation for Baseline Dual-Site Operations
- Suitland CSC Development Team Certified
 - SEI-CMM Level-3
- Completed documentation of business case for CLASS
- Established a project wide risk management program

- OSDPD-CSC worked with IBM-China for implementation of CLASS for National Satellite Meteorological Center (NSMC)
 - NSMC evaluating CLASS vs enhance portions of their existing system

Current CLASS Hardware Architecture

- CLASS hardware for Suitland and Asheville sites:
 - Operational Servers, 4 at each site
 - IBM P660, 4GB RAM 2CPUs
 - Integration and Test Servers, 2 at each site
 - IBM P660
 - Development Servers, 2 at Suitland
 - IBM P660
 - Storage Area Network (SAN)
 - SUN 9980, 5.2TB
 - Tape Archive System & Hierarchical Storage Manager (HSM)
 - 9522 LTO Tape Slots, 12 Drives, 8PB capacity @ LTO-3

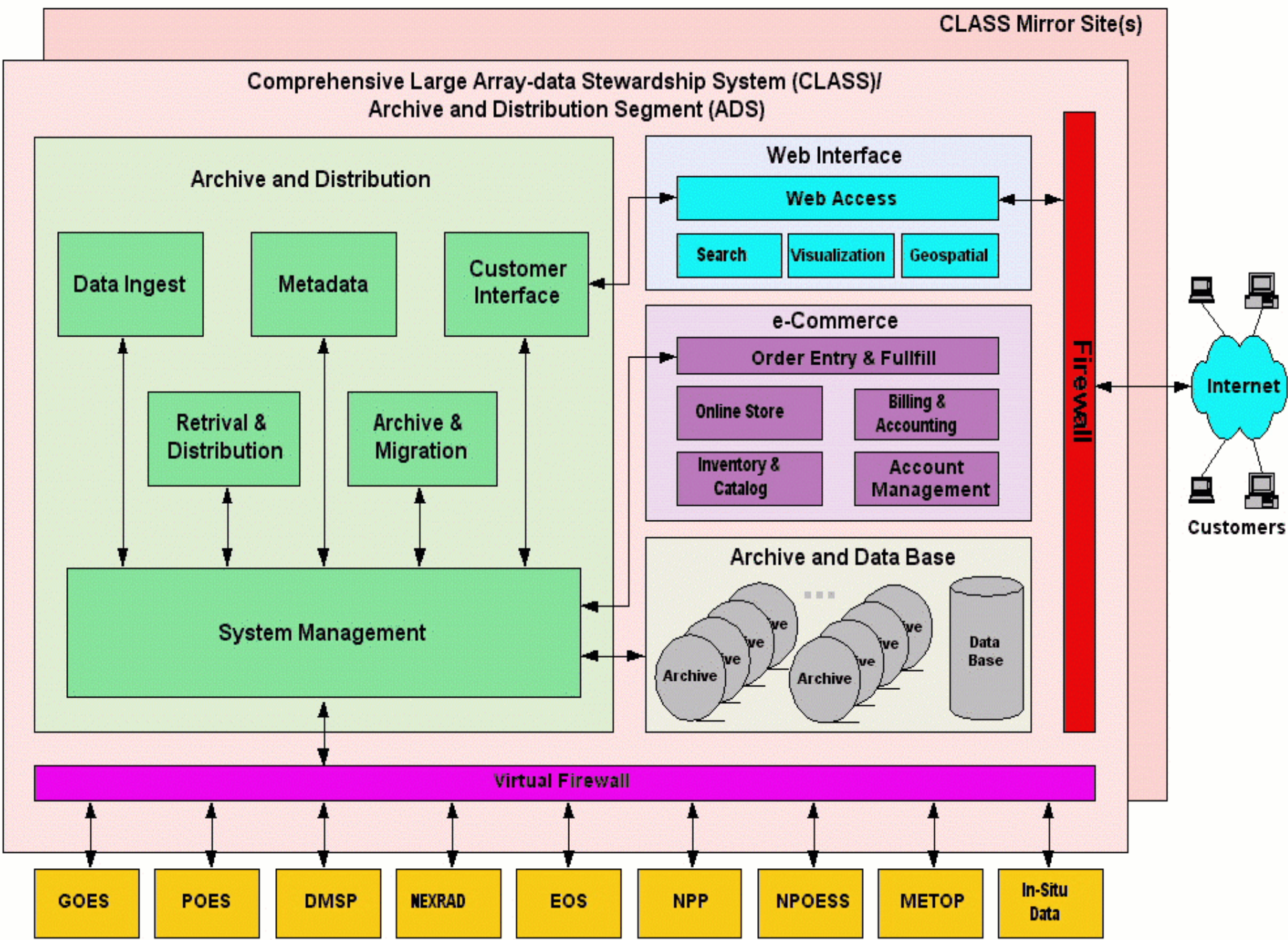
Suitland System Hardware



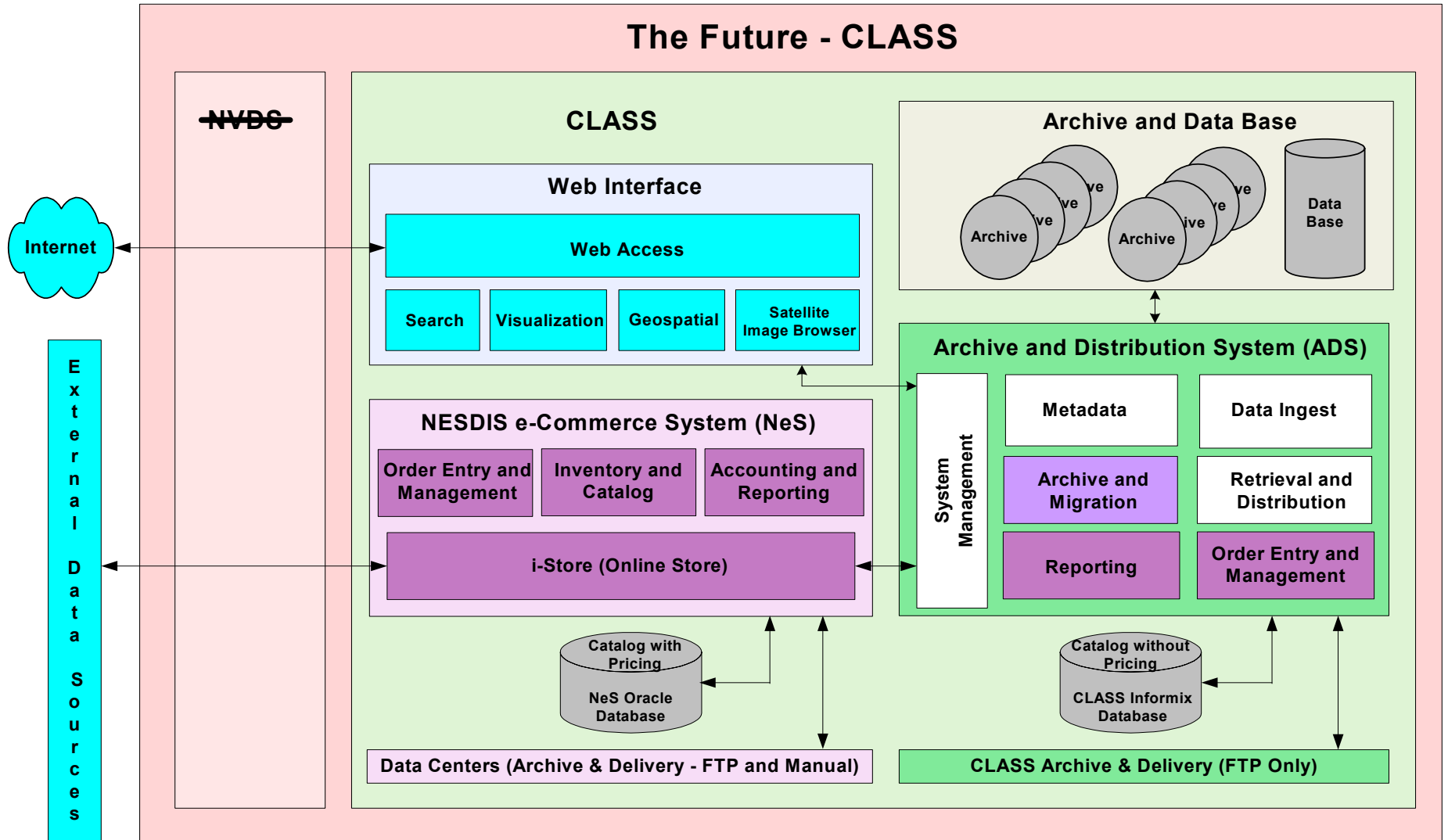
FY04 CLASS Goals

- Prepare a “5-Year” Budget and Program Plan for CLASS
- Focus CLASS resources on CLASS Activities
- Initial test of CLASS enhancements for IJPS ... NOAA-N (October 2003)
- Configure and Test CLASS at NCDC and transition to Operations (December 2003)
- Complete IJPS/Metop Critical Design Review (February 2004)
- Complete testing and transition to operations of CLASS dual site capabilities (March 2004)
- Complete testing and transition to operations of the GOES Campaign (March 2004)
- Configure and Test CLASS for support of IJPS/Metop, and transition to Operations (September 2004)

CLASS/ADS Functional Block Diagram



The Future CLASS



Issues/Risks

- CLASS Funding Inadequate for “Promises” being made

- Reduction in CLASS funding will force cuts in development team, and delay requirements and interface definitions, software enhancements or hardware upgrades

- CLASS Detailed Designs not complete
 - Integrated CLASS-NVDS System
 - Metadata Management
 - Data Discovery
 - E-Commerce
 - NPP/NPOESS
 - EOS
 - GOES-R

NOAA CLIMATE OBSERVATIONS AND MONITORING

