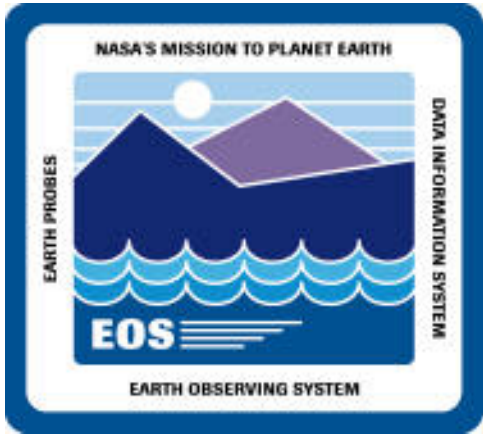

DAAC LAN Architecture

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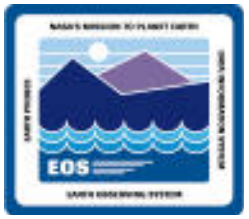
1 November 1995

Overview



Release B DAAC LAN Design Drivers

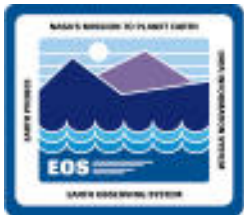
- Separation of push and pull
- High data flow rates at some DAACs

Release B DAAC LAN Architecture

- Separate User and Processing networks
- Additional high-speed HiPPI-based processing network at some DAACs to support large data flows
- Builds upon Release A topology

Presentation uses GSFC DAAC to illustrate design features; DAAC-unique designs will be presented in the Thursday poster sessions (also in section 3.4.1 of DAAC-unique 305 volumes)

Design Drivers



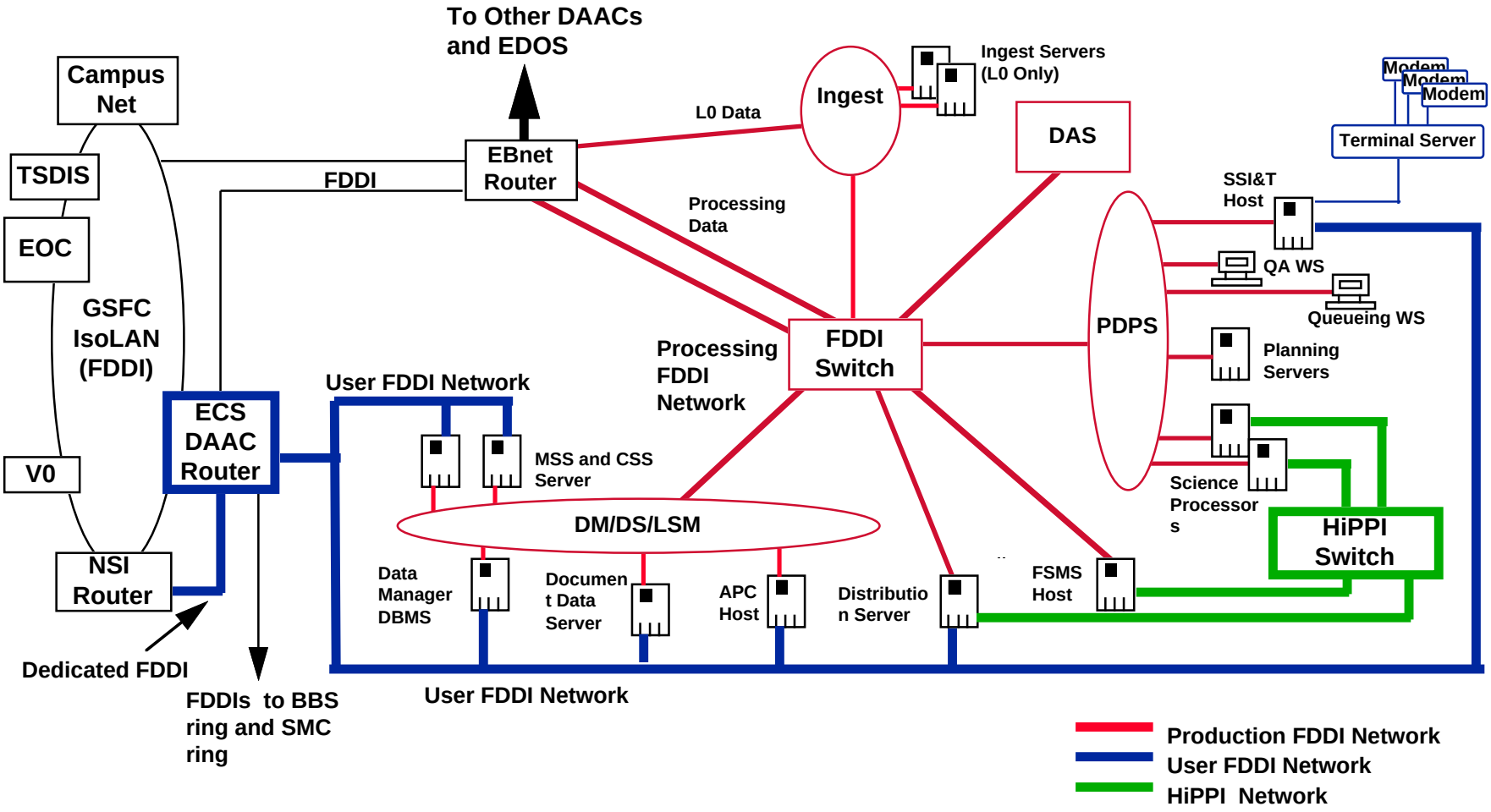
Separation of Push and Pull Flows

- **Do not want user pull to interfere with processing flows**
- **Example: heavy user interest in data relating to oil spill**

Very large data flows at some DAACs (GSFC, LaRC, and EDC)

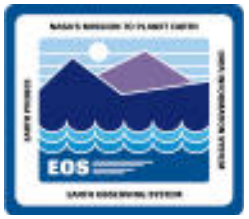
- **Some flows far exceed FDDI capability**
- **These flows between Data Server and Processing subsystems**

Release B DAAC LAN Architecture



GSFC DAAC

Push/Pull Separation: User Network



Separate network handles only user flows

- Builds on Release A network topology
- (Generally) FDDI-based network solely for connectivity to users
- Prevents users from gaining direct access to production-only hosts

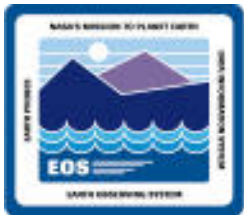
Only hosts requiring user access are connected

- Data Manager and Data Server hosts (for browsing, ordering, etc.)
- LSM hosts (for receipt of management data such as from NSI, receipt of electronic mail, etc.; but no user interaction)
- Planning hosts (for remote access by ITs; details shown in Monday's "Remote SSI&T" presentation)

Dedicated router interface to users

- Router connects to NSI and local campus via exchange LAN
- Provides single controlled access point for all users

Push/Pull Separation: Production Network (FDDI)



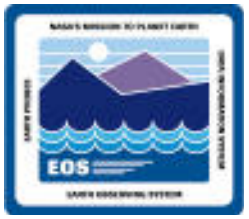
Switched FDDI-based network

- Subsystems/hosts connected to FDDI rings according to data flow requirements
  - Some hosts may require dedicated FDDI segments
- FDDI Switch provides extremely high throughput
  - Allows flexibility to aggregate and segregate FDDI interfaces as required to support data flow requirements

All production data received from EBnet interface

- Multiple FDDI interfaces possible to handle high DAAC-DAAC volumes
- High RMA L0 data provided directly to dedicated Ingest ring
- Non-ECS production data also provided via EBnet
  - e.g., TSDIS at GSFC, LPS at EDC
  - Provides single interface for all production data

High-Speed Production Network (HiPPI)



HiPPI (High-Performance Parallel Interface) Production Network

- 800 Mbps full-duplex switched (not shared) architecture
- Fully standardized and established

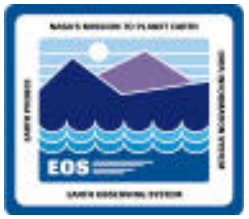
Connects Data Server and Processing hosts at some DAACs

- Creates a dedicated network to handle large data flows
- Network not accessed by other subsystems, other DAACs, or users

Implementation involves running applications over “raw” HiPPI

- Non-IP based
- CSS-to-ISS interface involves accessing lower-lever HiPPI layers directly (HiPPI-FP and HiPPI-PH)
- Both “raw” HiPPI and IP-over-HiPPI will be prototyped
  - IP-over-HiPPI best choice if throughput rates meet requirements

Evolutionary Features



FDDI Switch allows graceful growth path

- **Currently supports up to 16 FDDI interfaces; planned support for 32**
- **Flexibility to combine or separate FDDI rings as need to support data rates**

Separation of User and Processing networks allows each to evolve independently as requirements and loads change

New technologies can be inserted into existing architecture

- **FDDI Switch has ATM interfaces to connect FDDI and ATM**
  - **Allows controlled migration to ATM compared to complete swap-out**
  - **Possible ATM interface to EBnet and NSI**

Current Status

COTS Selections

- User Network router (no RFP required; vendors already on contract)
- HiPPI switch (RFP and vendor selection required)
- Release A FDDI switch selections completed
  - Alantec PowerHub 7000 and DEC GigaSwitch

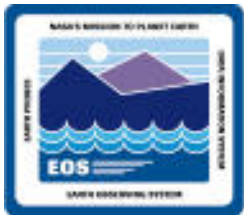
Prototypes

- HiPPI (involves ISS, CSS, Data Server, and Processing)
- Ongoing ATM prototyping (for post-Release B networks)

Next Steps

- HiPPI implementation ("raw" HiPPI versus IP-over-HiPPI)
- Refine site-specific aspects of design
  - Unique interfaces (such as at ORNL and ASF)
  - Site-specific interfaces to EBnet and NSI

Summary



DAAC LAN Architecture

- **Prevents user pull from impacting processing data flows via creation of separate User Network**
  - **Interface to NSI and local campus via exchange LAN**
- **Contains switched FDDI-based Production Network to support DAAC processing and interface to EBnet**
- **Production Network supports very high data flows at some DAACs via high-speed HiPPI network connecting Data Server and Processing subsystems**