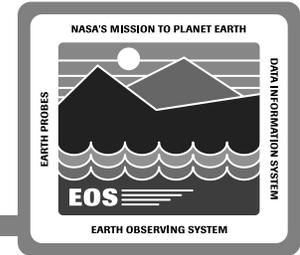


IST Architecture

Jim Creegan

13 December 1994

IST Overview



Key Requirements

IST vs. UserStation

Interfaces

AM-1 Locations

IST Pool

Management Mode

Security

Engineering Data

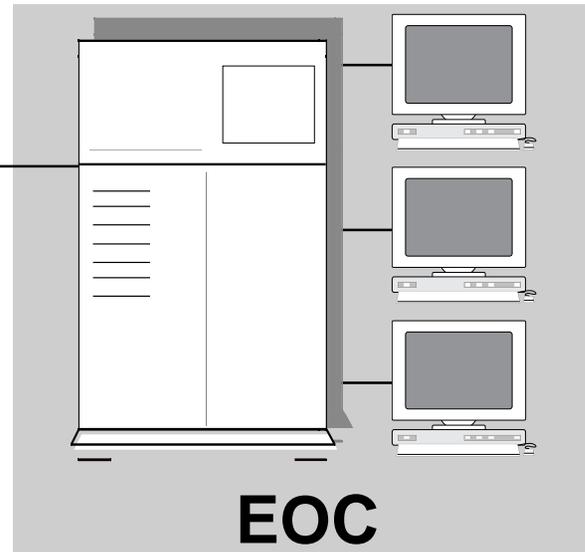
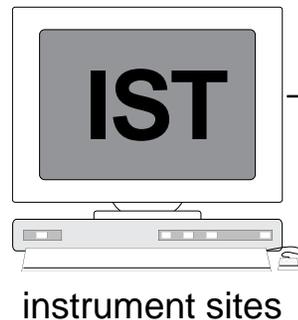
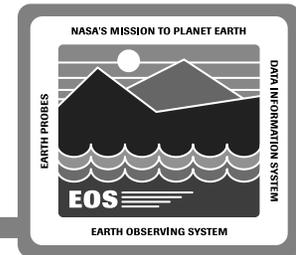
I & T Transition

Specification Need Dates

Preliminary Specifications

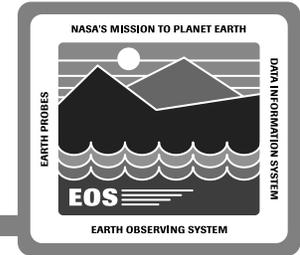
IST Design Benefits

Key Requirements



- **Allow participation in operations by instrument teams at remote sites**
- **Software toolkit that runs on a PI/TL provided workstation**
- **Platform independent (SUN, HP, DEC, SGI, IBM)**
- **One or more per instrument site**
- **Provide the following functionality:**
 - **Planning & scheduling**
 - **Monitor real-time telemetry**
 - **Perform analysis**
 - **Command requests**

IST vs. UserStation



An IST is functionally similar to an EOC UserStation

- **The basic software running on the EOC UserStation runs on the IST**
- **Major exception: command requests vs. real-time commanding**

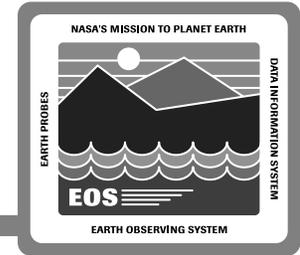
Command requests should be very infrequent

- **Any changes 6 hours or more before target date must be handled through planning & scheduling**

The IST can perform limited functions while disconnected from the EOC

- **Display/manipulation of analysis data once an analysis request has Been serviced**
- **Tools (display builder, document reader, etc.)**

IST Interfaces



SCF to IST

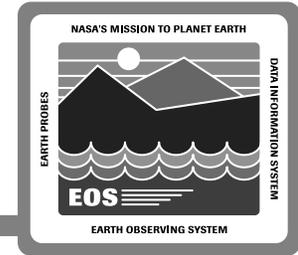
- **Microprocessor Memory Loads**
- **IDB updates**
 - **EMail request to CCB to update the database, or**
 - **A new database file**

IST to SCF

- **Microprocessor Memory Dumps**
- **Reports**
 - **Publisher's Display Format (PDF)**
 - **Encapsulated Postscript (EPS)**
 - **COTS editor format**
- **Carry-Out Data Files**

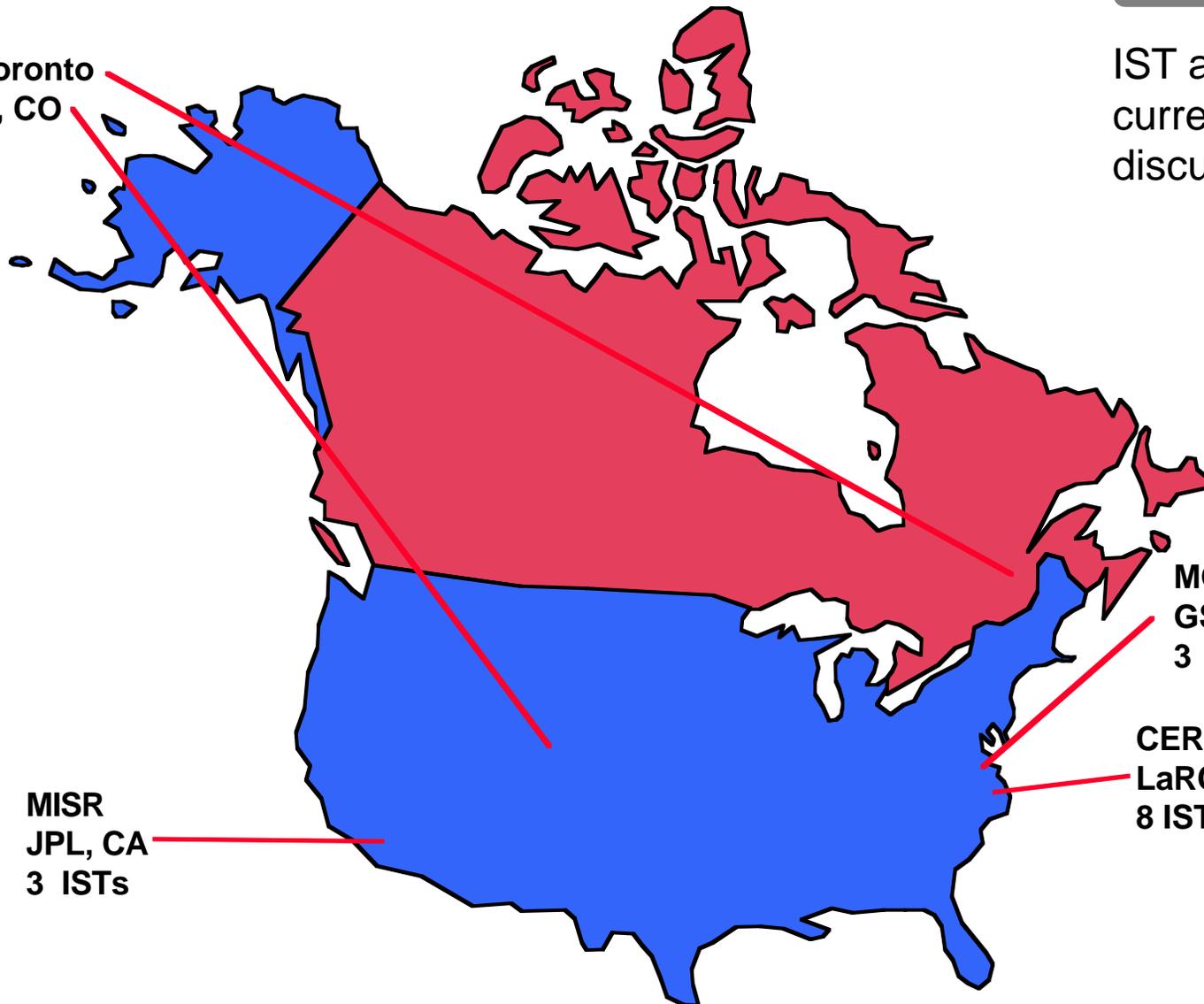
All file interfaces are transferred to/from well defined staging areas (directories)

AM-1 IST Locations



MOPITT
1 IST U of Toronto
1 IST NCAR, CO

IST at MMC
currently under
discussion

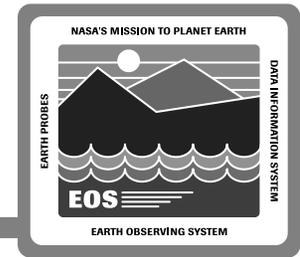


MISR
JPL, CA
3 ISTs

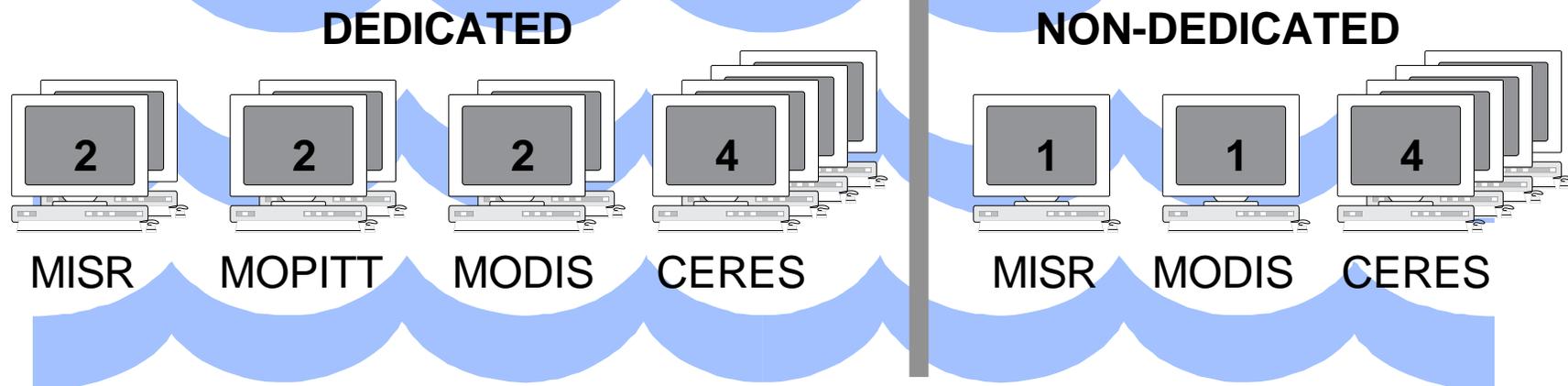
MODIS
GSFC, MD
3 ISTs

CERES
LaRC, VA
8 ISTs

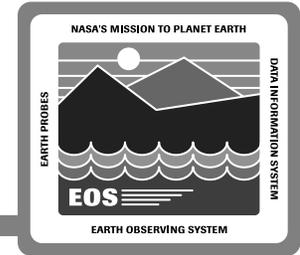
IST Pool



- Each IST places a performance burden upon the EOC
 - Network, history data retrieval for replays and analysis, etc.
- The IST pool allows that burden to be managed
- Pool Management
 - Dedicated (Guaranteed): always available
 - Non-Dedicated (Floating): first-come, first serve

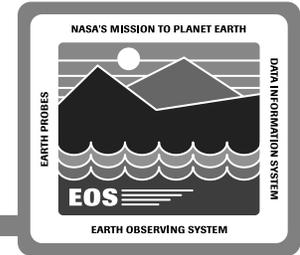


Management Mode



- **Only an IST in management mode may perform the following functions:**
 - **Submit command requests**
 - **Submit database updates**
- **Given the infrequency of controlled functions, management mode will be controlled by authorization**
 - **List of IOT members allowed to run management mode**

IST Security

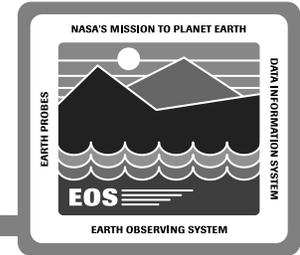


Joint CSMS/FOS IST Security Study identified threats and appropriate security measures

FINDINGS:

- **User Authentication**
 - **CSMS provided services to facilitate user log-in**
- **User Authorization**
 - **Management Mode**
- **Integrity and/or Data Encryption into the EOC**
 - **Protect the data coming from the ISTs to the EOC**
 - **No driving requirements to protect the data from the EOC to the ISTs**
- **Pause Screen**
 - **Password controlled**
 - **Allows a user to leave their IST for a break without logging off**

Engineering Data



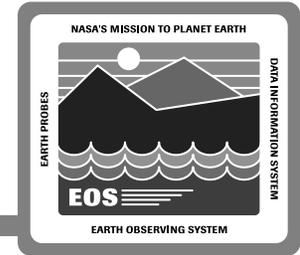
Engineering data from DAACs

- AM-1 project provides the engineering database
- CM control maintained in the EOC (same update procedures as HK Database)
- IOT requests replay or analysis products of engineering data in the Same manner as HK replay or analysis request
- EOC retrieval and servicing of engineering data transparent to IOT

Housekeeping and engineering data from any instrument is available to Any IST

- Access housekeeping data from S/C and all instruments
- One instrument's engineering data available per replay/request

I & T Transition



Results of two design studies. Evaluated CSTOL and 4 other command Languages. Analyzed OASIS/TAE+ display definition files.

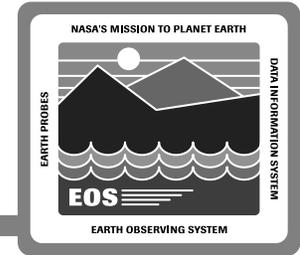
- **OASIS Procedures**

- **We will provide a translator to transition procedures from CSTOL to ECS Command Language (ECL)**
- **95% translation, will flag portions that cannot be translated**
- **FOT/IOT validation & sign off after translation**

- **Displays**

- **We will provide the capability to build similar displays**
- **We cannot provide automatic translation of OASIS/TAE+ displays**
- **FOT will work with AM-1 and instrument I&T teams to build similar displays for the EOC**

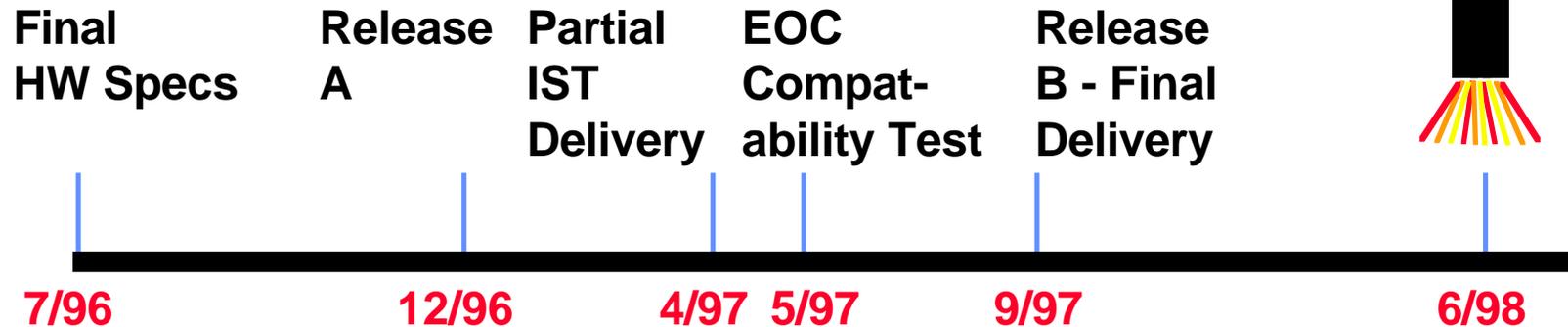
Specification Need Dates



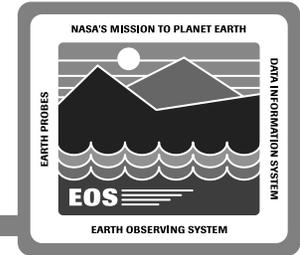
Need Date for Final HW specs

- Final delivery of IST, release B, 9/97
- IST needed to support EOC Compatability Test, 5/97
- Partial delivery, 4/97
- Final hardware specs needed 9 mo prior to partial delivery, 7/96

Note that prototypes will be made available prior to 4/97



Preliminary Specifications



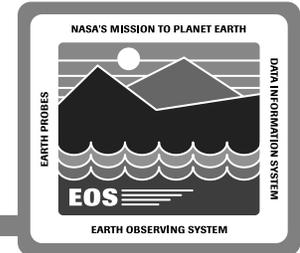
COTS Hardware

- **Unix Workstation (SUN, HP, DEC, SGI, IBM), mid range CPU**
- **Large Color Monitor (1280 x 1024)**
- **64 MB memory**
- **6 GB hard disk**
- **Ethernet card**
- **4mm DAT tape drive**
- **Floppy drive**

COTS Software

- **Motif/X-Windows (latest version)**
- **DCE**
- **MOSAIC (no cost to PI/TL)**
- **ECS provided Kerberos software (no cost to PI/TL)**
- **TCP/IP software**

IST Design Benefits



- **Allows for multiple user access per instrument site**
- **Does not limit the management mode IST capabilities to one physical IST/workstation**
- **Produces a standard IST**
 - **Configurable by the user**
 - **Application software not modifiable by the user**
- **Provides access to engineering data**
- **Keeps the hardware requirements low-cost & industry standard**
- **Protects the EOC from unauthorized access**
- **Protects the EOC functions from performance burden imposed by the IST**