System Overview

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Topics

Capacities / PDR Baseline

- **Modifications since SDR**
- **Capacity review**

System Context

- **Release A TRMM/V0 Mission Support**
- **Release A AM1/Landsat 7 Test Support**

Modifications Since SDR

Requirement Changes

- **Science Capacities refined through work of Ad Hoc Working Group on Production (AHWGP)**
- **Landsat -7 archiving requirements added (Previously only distribution with temporary storage)**
- **Oakridge DAAC changed to only ECS-provided information management services (DAAC to provide archive)**
- **Quicklook data requirements removed from FOS**
- **Limited Data Acquisition Requests (DAR's) for use by ASTER instrument**

Architecture/Design Changes

- **Use of CORBA delayed beyond Release B**
- **Integration of V0 client with ECS capabilities for Release A**
- **Identification of distinct SCIENCE and DOCUMENT 'data' servers**
- **Planning deals with dynamic replanning and/or priority updates based on changing conditions**

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Objectives of AHWGP

1. To provide an interface between Science Community, Project, and ECS Contractor to ensure that we have a sound basis for describing data products, operational scenarios, and EOSDIS archival size, computational loading, and network properties, and external interfaces for acquiring non-EOS data.

2. To provide mechanisms for building the infrastructure needed to smooth the passage of documentation and other descriptions from the Science Community into the Project, Hughes, and the DAACs.

Background

- Initial discussions started immediately following SDR
  - initiated by Bruce Barkstrom
  - participation by ITs, ECS modelers, SPSO
- AHWGP proposed to ESDIS on July 27
  - Bruce Barkstrom and Mel Banks as co-chairs
- First AHWGP telecon on August 11

Participants

Core Group

- **Instrument Teams (ITs) -**
  - **CERES (Barkstrom)**
  - **LIS (Goodman)**
  - **ASTER (Geller)**
  - **MISR (Bothwell)**
  - **MODIS (Evans, Masuoka, Fleig)**
  - **MOPITT (Bailey)**
- **Project - Banks, Reber, Schwaller, Lu**
- **ECS - Modelers (Bass, Theobald, Howard), SDPS (Dodge), CSMS (Armstrong), Science (Endal, instrument ASTs)**

Others - Project (Putney, Kempler), ECS (Guzek, MacDonald, Cox, Hardin), ASTER (Pniel)

Processing Scenarios

Current Model is a Major Departure from SDR

- Processes and Physical Files

Ad Hoc Working Group on Production (AHWGP)

- Joint effort by Instrument Team, ESDIS and ECS
- Covers Standard Product inputs, processing, outputs
- TRMM and EOS AM-1 instruments (ECS Release A and B)

Information Provided by Instrument Software Teams

- Designed to support ECS modeling requirements

Static Models Used to Validate Inputs

- Compared to SPSO database to flag changes for validation
- Provided to Instrument Teams to validate timelines

Dynamical Model Used to Identify Disconnects

Processing Estimates

Instrument Team Inputs to AHWGP Expressed as

- **"Theoretical" Floating_Point_Operations per Execution**
- **Execution Frequency**

Based on Operations Counts or Normalized Benchmarks

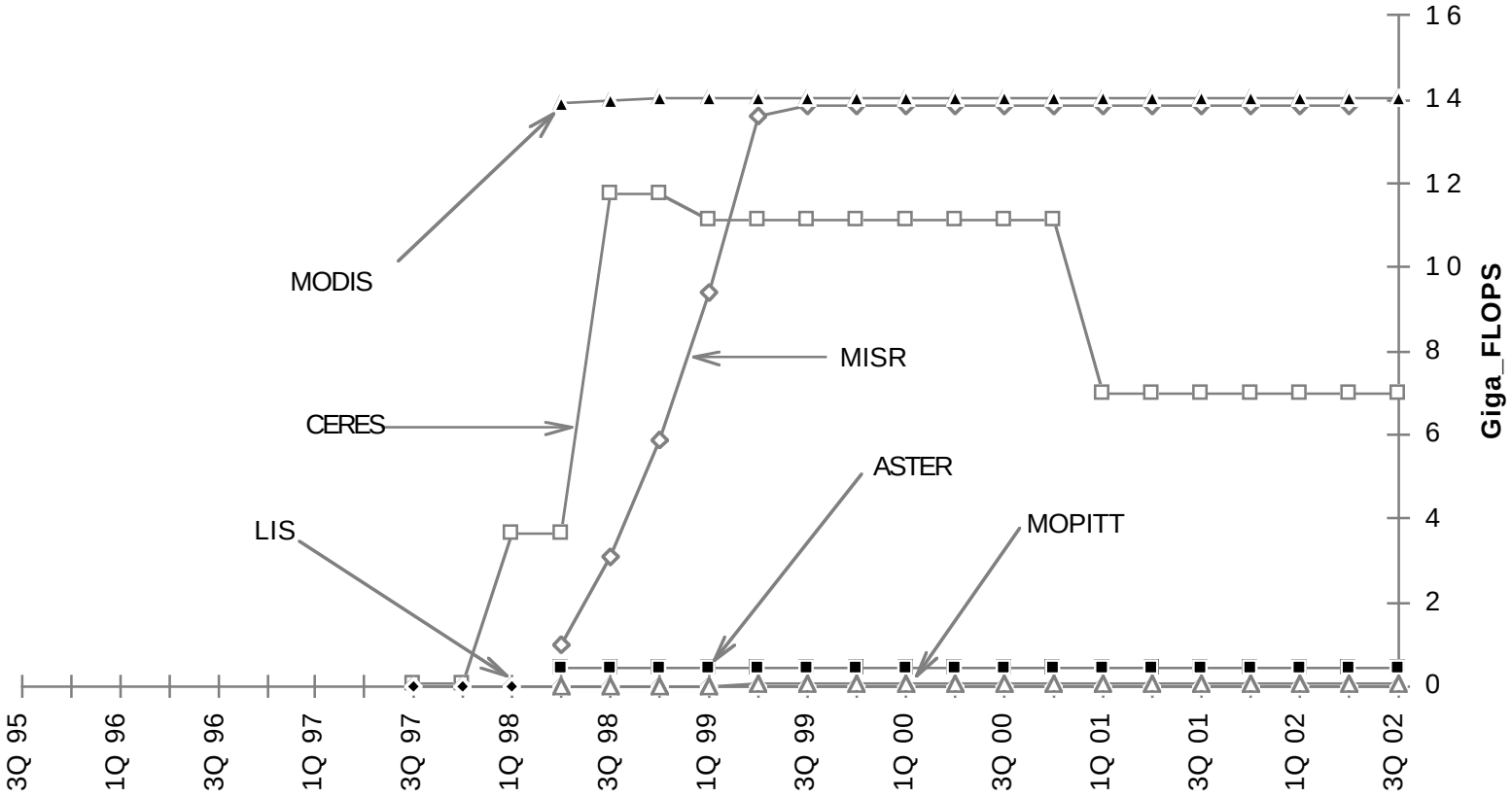
- **Divide by allowed execution time to get "theoretical" FLOPS**
- **Multiply by 4 to get required COTS rating ("peak" FLOPS)**

Technical Baseline Reflects "Theoretical" FLOPS

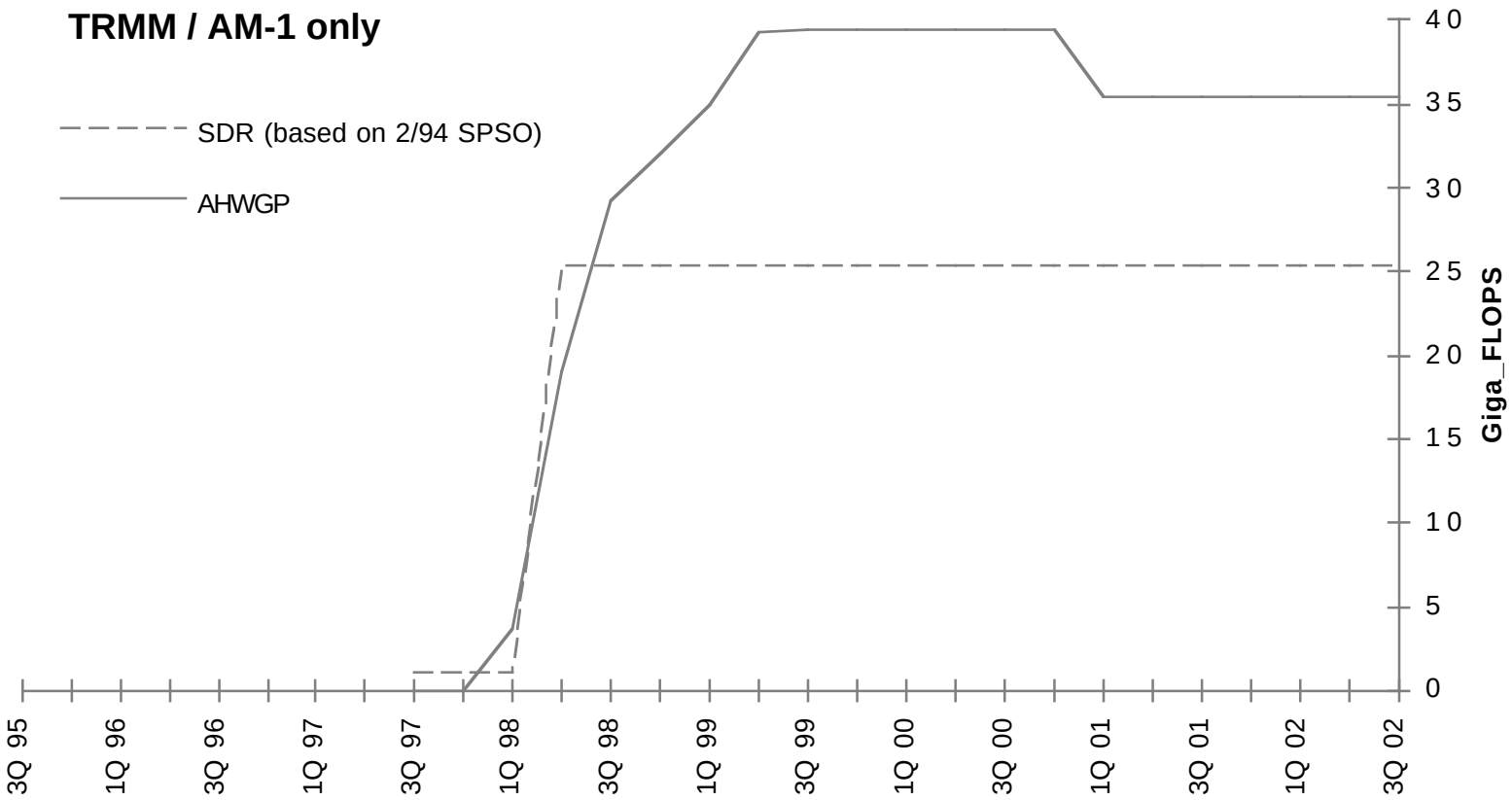
All Graphs in this Presentation Show "Peak" FLOPS

Includes TRMM and AM-1 Instruments Only

Processing by Instrument



Comparison to SDR Baseline



Total Processing Req.

Algorithm Integration & Test Estimate Based on Engineering Judgment

Reprocessing Profile Based on UARS Experience

Total (AI&T + Processing + Reprocessing):

= 0.3 X at L-2 years

= 1.2 X at L-1 year

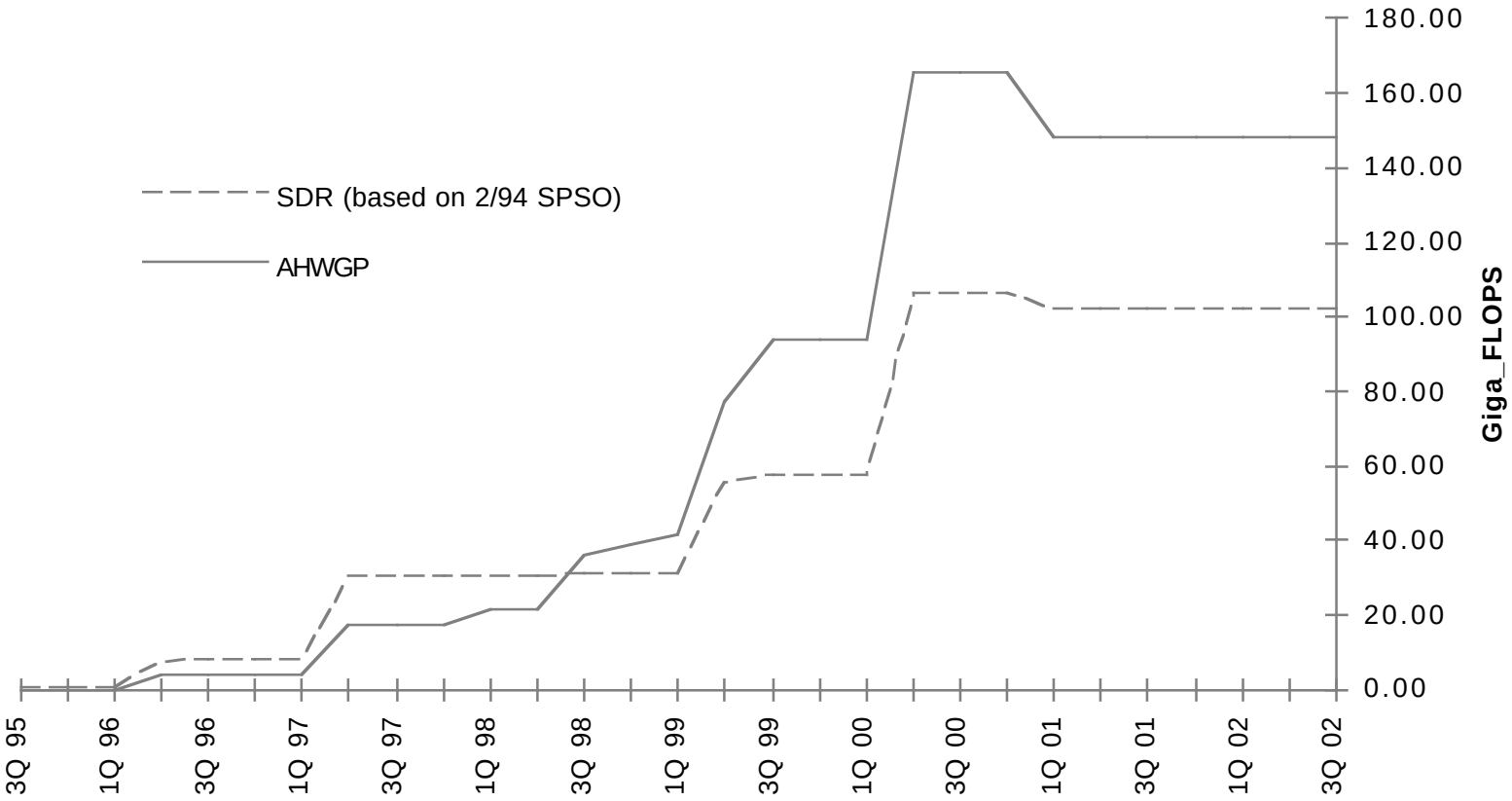
= 2.2 X at L+1 year

= 4.2 X at L+2 years

where X = at-launch processing for pre-launch period

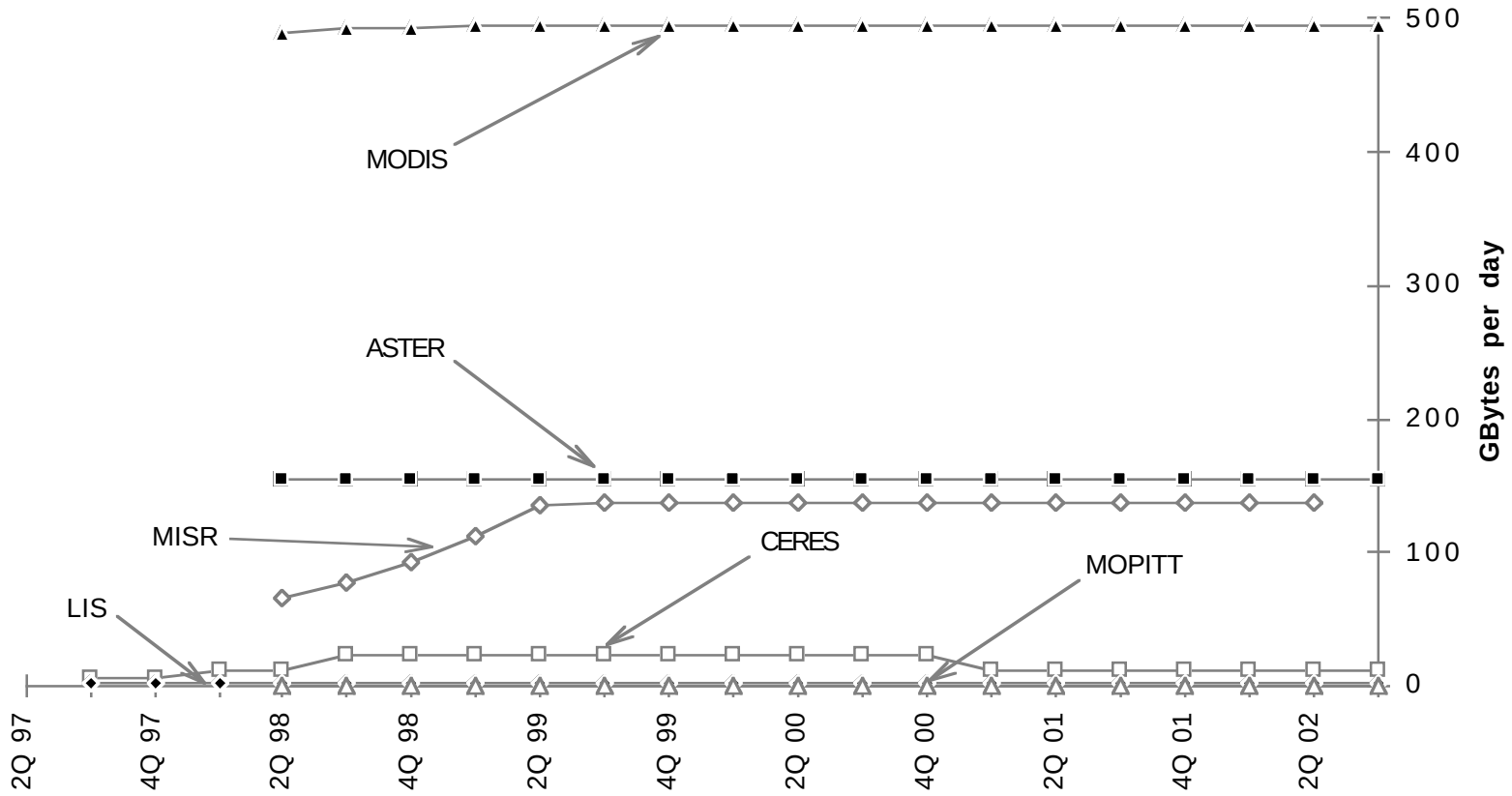
X = quarterly processing for post-launch period

TRMM / AM-1 Total



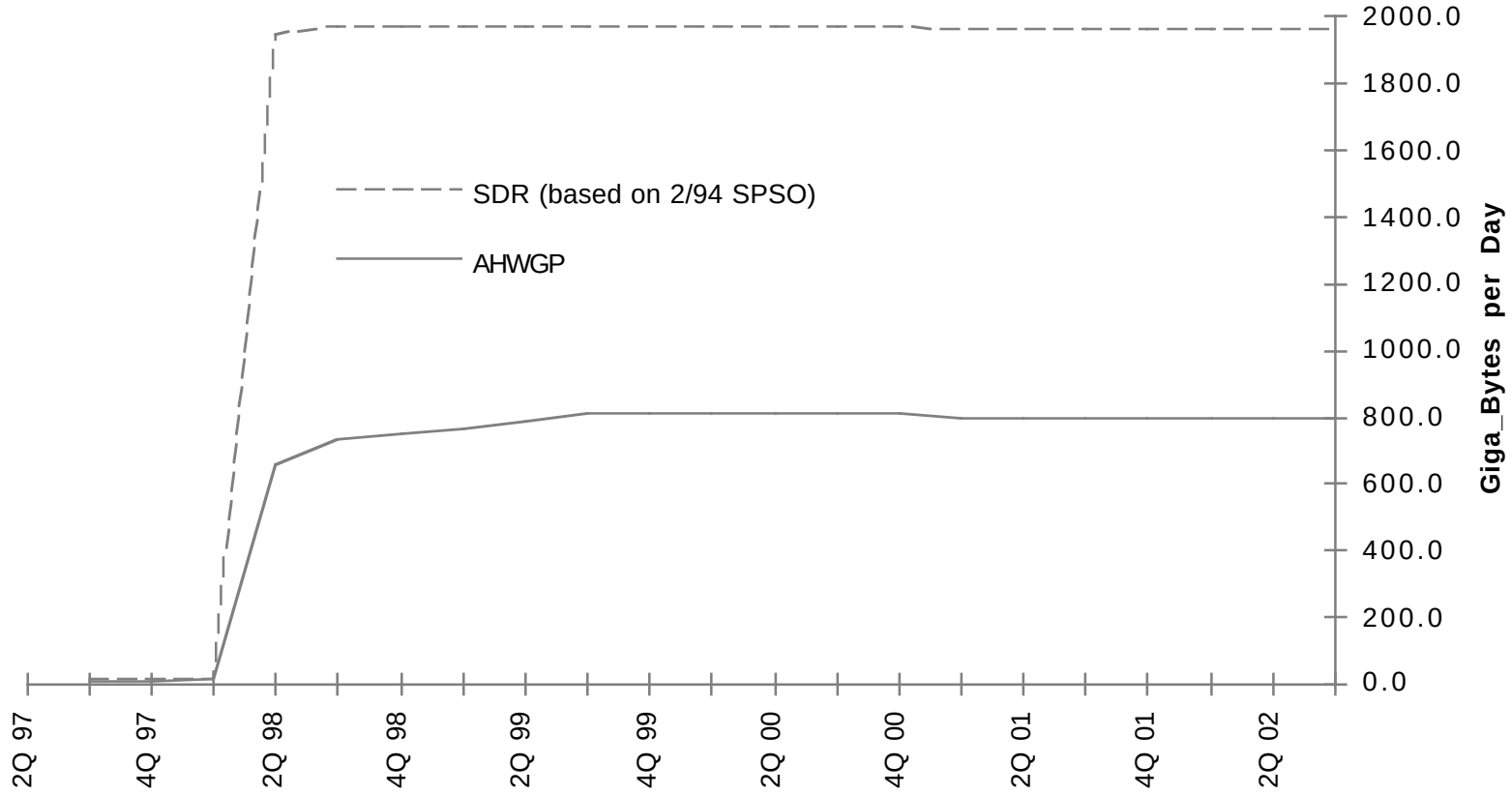
Data Volume by Instrument

Product Levels 1-3



Comparison to SDR Baseline

TRMM / AM-1 only
Product Levels 1-3



Archive Requirements

All Level 1-3 Standard Product Data

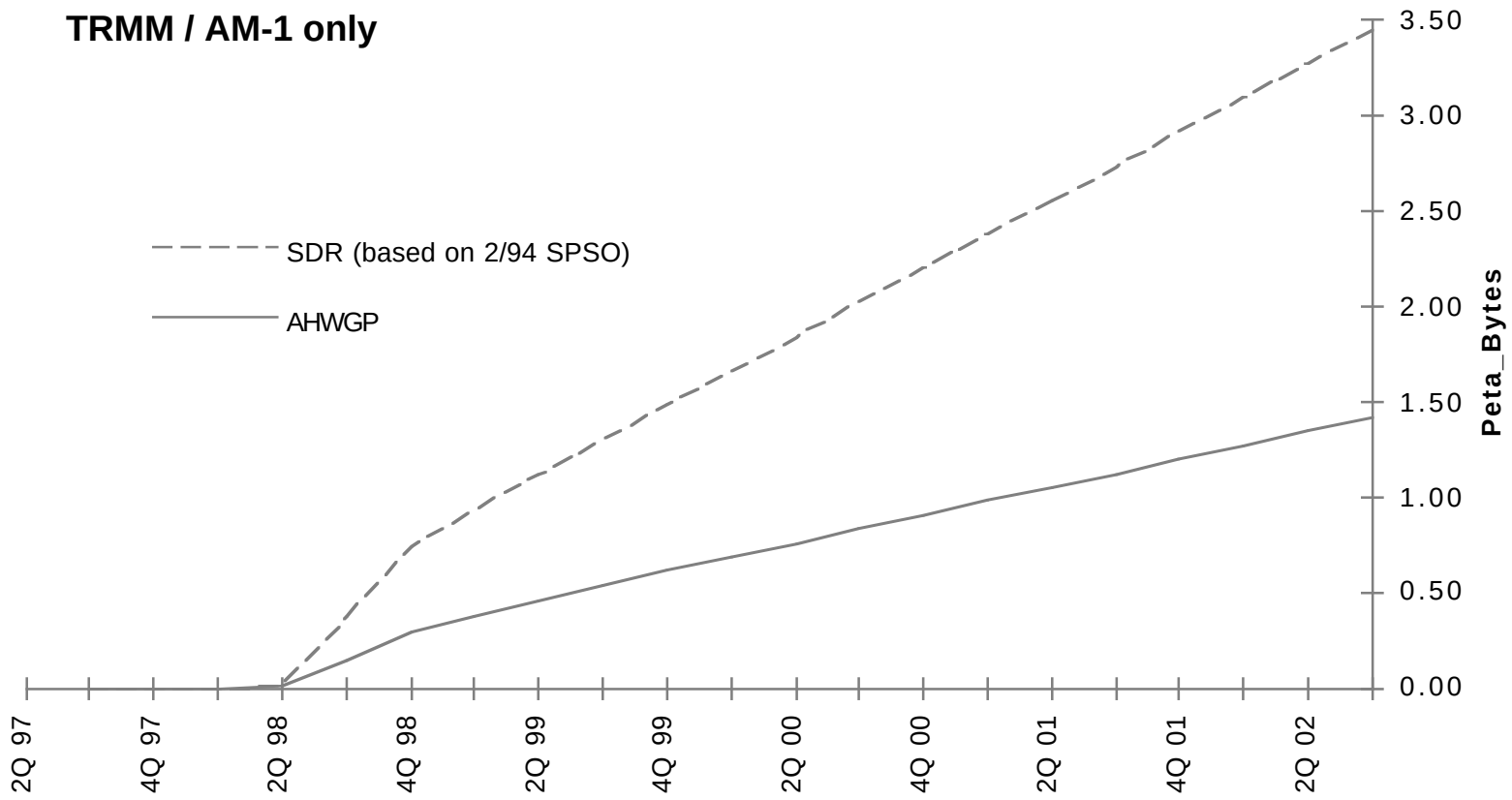
6 Months Spare Capacity to Support Reprocessing

Level 0 Archived if No Level 1A Product (CERES, LIS, MOPITT)

1 Year Rolling Archive for Level 0 (MISR, MODIS)

No Level 0 for ASTER

Product Archives



AHWGP Impact

50% Increase in Estimated Processing Requirement

- **Some New Benchmarking Results**
- **Includes Requested Contingency for ASTER and MISR**
- **Continues Previous Contingency for MODIS**

55% Decrease in Estimated Product Archive Requirement

- **Major Savings in MODIS Ocean Products due to File Reorganization**
  - **will require some processing-on-demand or subscriptions to interim products**
- **Other Instruments Have Also Reduced Data Volumes Based on File Definitions**

Reduction in Data Volumes Affects Archives and Working Storage

Estimate 26% Reduction in Cost of COTS HW/SW for TRMM/AM-1 Standard Product Processing and Storage

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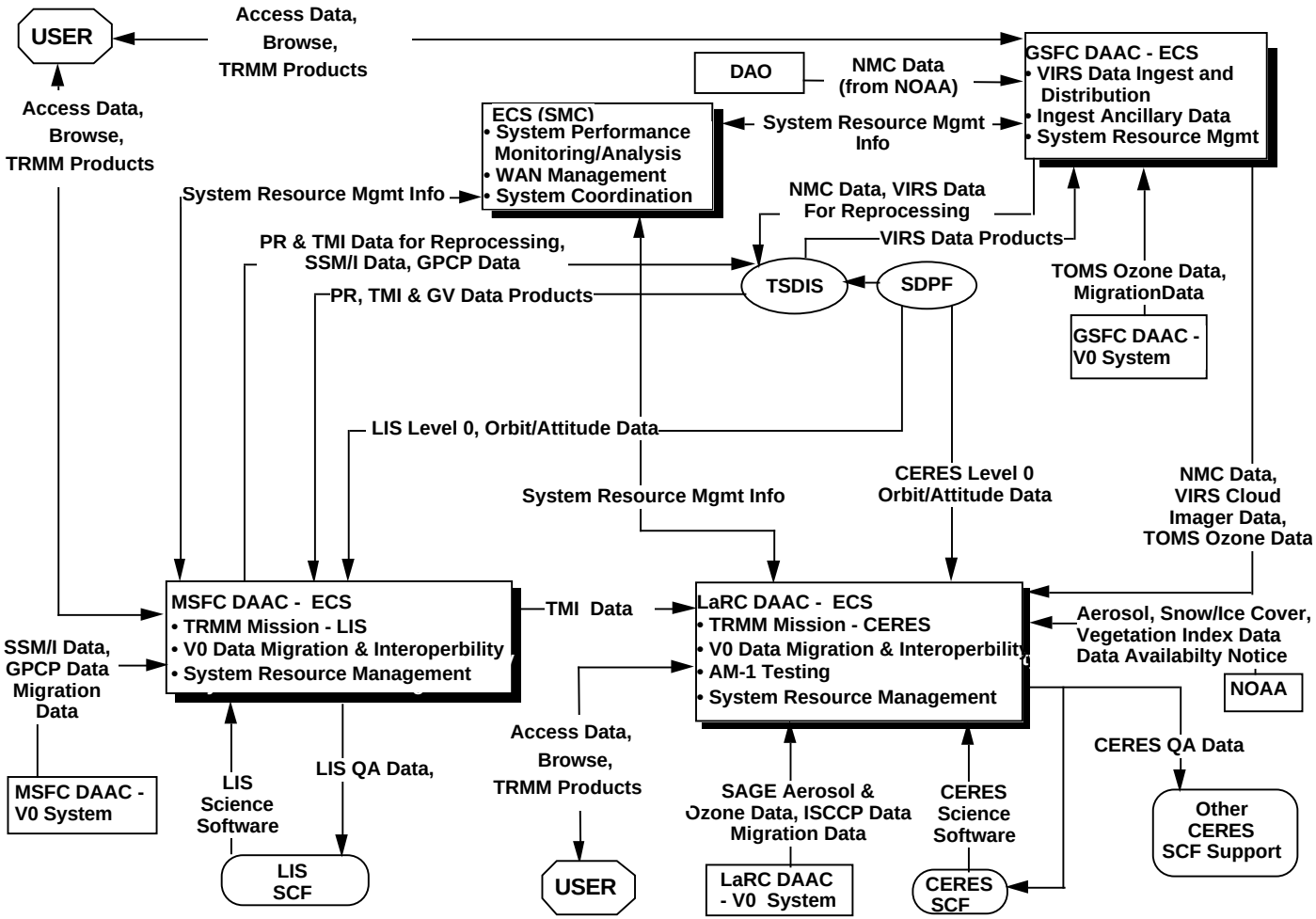
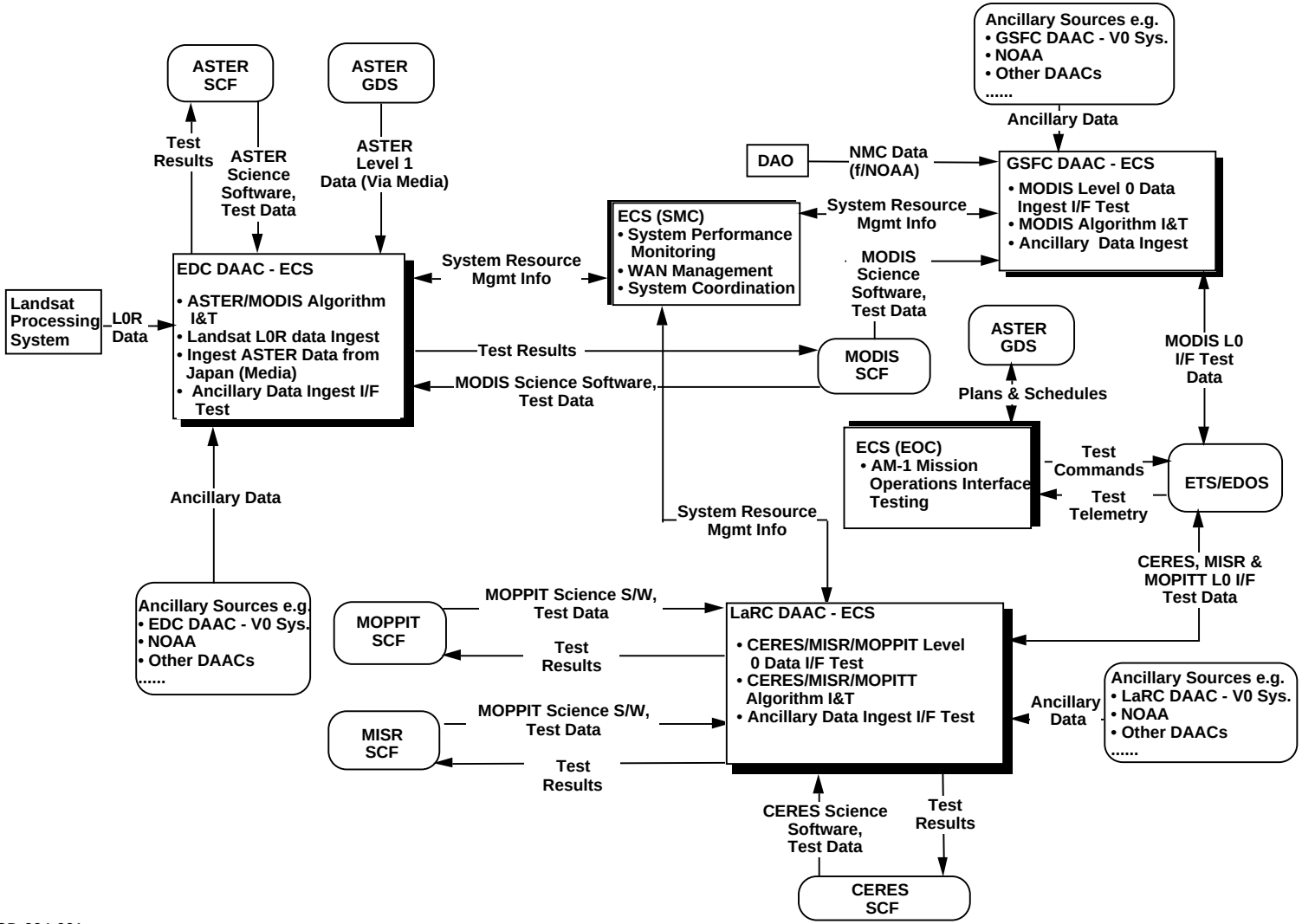
ECS TRMM/V0 Support (Release A)



ECS Functional Capabilities - TRMM/V0 Support (Release A)

- MSFC, LaRC and GSFC support for TRMM Science Operations
- DAAC Information Management and Archive
- TRMM CERES and LIS Science Data Processing Support
- TRMM Data Access and Distribution @ 2X daily volume
- Ancillary Data Ingest to Support TRMM Processing
- Algorithm I & T Support for TRMM Instruments
- Support Version 0 Data Migration

ECS AM-1/Landsat Test Support (Release A)



ECS Functional Capabilities - AM-1/ Landsat Test Support (Release A)

- FOS Core Functionality to perform EOS AM-1 Spacecraft and Instrument Command and Control Testing and Ground Interface Testing (EDOS, ECOM, FDF, NCC ...)
- Algorithm I & T Support to EOS AM-1 Instruments
  - EDC (ASTER/MODIS)
  - GSFC (MODIS)
  - LaRC (CERES/MISR/MOPPIT)
- Landsat-7 Early Interface Test Support at EDC

Release A Capacity Synopsis

Component*	MSFC	LaRC	GSFC	EDC
• Peak GFLOPs	.25 GFLOPs	3.6 GFLOPs	4.2 GFLOPs	.6 GFLOPs
• Processing RAID Capacity	10 GB	30 GB	75 GB	70 GB
• Fielded Media Capacity	4 TB	3 TB	6 TB	N/A
• Distribution RAID Capacity	10 GB	10 GB	10 GB	N/A
• DS Working Storage RAID Capacity	30 GB	50 GB	30 GB	N/A
• Ingest Raid Capacity	65 GB	75 GB	10 GB	10 GB

* Includes only major components