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EOSDIS Core System Project

Release 6A Segment/Design Specification for the ECS Project

March 2001

Final

Raytheon Company
Upper Marlboro, Maryland

Release 6A Segment/Design Specification for the ECS Project

March 2001

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Preface

This document is a contract deliverable with an approval code 2. As such, it does not require formal Government acceptance. Contractor approved changes to this document are handled in accordance with change control requirements described in the ECS Configuration Management Plan. Changes to this document are made by Document Change Notice (DCN) or by complete revision. The ECS Science Configuration Control Board has reviewed it, and this final version is being delivered for Government review and comment.

Any questions or proposed changes can be addressed to:

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Abstract

The Release 6A Segment/Design Specification is an overview description of the ECS Project. The functionality of the ECS software is described at the Subsystem, Computer Software Configuration Item (CSCI), Computer Software Component (CSC), and Process levels. Architecture and context diagrams illustrate the process interconnections within the ECS CSCIs and the external connections to other CSCIs, subsystems, and specified segment interfaces. Interface event description tables describe the data, messages, notifications, or status information that occurs at each level of functionality within the ECS. A basic description of the Commercial Off The Shelf (COTS) software and hardware used in ECS is included. Also, a more detailed class level of documentation is offered from the output of the on-line documentation tool ABC++.

Detailed design in this document is the level of information derived from requirement sources, and used by the development team to complete the ECS design implementation for a software system at a 6A state of maturity.

Keywords: Release 6A, Overview, SDPS, CSMS, Design, Detailed Design, Subsystem, Architecture, Software, Hardware, Object Oriented, Security, Gateway, System Management, Reports, User Interface, GUI.

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Appendix A. Process

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Appendix B. Software Libraries

Appendix C. JAVA Archives

Abbreviations and Acronyms

1. Introduction

1.1 Purpose and Scope

The purpose of the Segment/Design Specification for the Earth Observing System (EOS) Data and Information System (EOSDIS) Core System (ECS) is to provide an overview of the hardware and software subsystems of the project. This document describes the detailed design of each ECS software subsystem implemented to satisfy the allocated and derived functional and performance requirements. This document also provides basic descriptions of the Commercial Off The Shelf (COTS) hardware and software used in the ECS. This document contains:

- Functional overviews of each Computer Software Configuration Item (CSCI)
- Context diagrams of each CSCI
- Interface event descriptions based on the context diagrams
- Process architecture diagrams
- Interface event description tables based on the process architecture diagrams
- CSCI data stores (databases as they relate to the process architecture diagrams)
- CSCI functions allocated to processes. For data servers, this includes descriptions of the functionality offered to clients via the server interfaces. For Graphical User Interface (GUI) applications, it describes the functionality provided to the GUI users.
- Specific limitations of the capabilities provided
- Summary of object classes listed by CSCI
- Summary of class libraries listed by CSCI
- Abbreviations and Acronyms

Hyper-linked on-line documentation generated by ABC++ is provided to accompany this document. The various subsystems, sub-directories, processes, libraries, and classes can be browsed down to the code level. This documentation can be accessed through the Universal Resource Locator (URL) <http://scooby.hitc.com:8080/ecs/index.html> for those who have access to the ECS internally at the Landover Facility. For anyone not having access to the ECS internally at the Landover facility, the Data Management Office of the ECS Project must be contacted for access.

Under every process or library documented in Appendix A or B, there is a directory string. This string indicates the location of the Makefile and sources for the library.

This same directory string can be used to locate on-line documentation. This is accomplished by replacing the “/ecs/formal” part of the directory string with the URL for the on-line

documentation associated with the page on which the classes are listed along with the names of processes and libraries which share those classes.

1.2 Document Organization

The remainder of this document is organized as follows:

- Section 2: Related Documentation
- Section 3: System Description
- Section 4: Subsystem Descriptions
- Section 5: Limitations of Current Implementation
- Appendix A: Software Processes
- Appendix B: Software Libraries
- Abbreviations and Acronyms

2. Related Documentation

2.1 Parent Documents

The parent documents are the documents from which the scope and content of this Design Specification are derived. These documents are listed below.

194-207-SEI	System Design Specification for the ECS Project
305/DV2 (F)	Segment/Design Specifications for the ECS Project
334-CD-600	6A Science System Release Plan for the ECS Project
212-WP-002	Game Plan for the ECS Project

2.2 Applicable Documents

Documents referenced in this document are listed below.

920-series General documents

920-TDE-001	EDC Hardware Diagram (Design)
920-TDG-001	GSFC Hardware Diagram (Design)
920-TDL-001	LaRC Hardware Diagram (Design)
920-TDN-001	NSIDC Hardware Diagram (Design)
920-TDS-001	SMC Hardware Diagram (Design)
920-TDV-001	VATC Hardware Diagram (Design)
920-TDP-001	PVC Hardware Diagram (Design)
920-TDV-101	VATC-SMC Hardware Diagram (Design)
920-TDE-002	EDC Hdwe/Sfwe Mapping (COTS)
920-TDG-002	GSFC Hdwe/Sfwe Mapping (COTS)
920-TDL-002	LaRC Hdwe/Sfwe Mapping (COTS)
920-TDN-002	NSIDC Hdwe/Sfwe Mapping (COTS)
920-TDS-002	SMC Hdwe/Sfwe Mapping (COTS)
920-TDV-002	VATC Hdwe/Sfwe Mapping (COTS)

920-TDP-002	PVC Hdwe/Sfwe Mapping (COTS)
920-TDE-003	EDC System Infrastructure Assignments (DCE/ DNS/DTS Infra.)
920-TDG-003	GSFC System Infrastructure Assignments (DCE/ DNS/DTS Infra.)
920-TDL-003	LaRC System Infrastructure Assignments (DCE/ DNS/DTS Infra.)
920-TDN-003	NSIDC System Infrastructure Assignments (DCE/ DNS/DTS Infra.)
920-TDV-003	VATC System Infrastructure Assignments (DCE/ DNS/DTS Infra.)
920-TDP-003	PVC System Infrastructure Assignments (DCE/ DNS/DTS Infra.)
920-TDE-004	EDC Floor Plan
920-TDG-004	GSFC Floor Plan
920-TDL-004	LaRC Floor Plan
920-TDN-004	NSIDC Floor Plan
920-TDS-004	SMC Floor Plan
920-TDV-004	VATC Floor Plan
920-TDP-004	PVC Floor Plan
920-TDE-005	EDC Cable Management Plan
920-TDG-005	GSFC Cable Management Plan
920-TDL-005	LaRC Cable Management Plan
920-TDN-005	NSIDC Cable Management Plan
920-TDS-005	SMC Cable Management Plan
920-TDV-005	VATC Cable Management Plan
920-TDP-005	PVC Cable Management Plan
920-TDE-007	EDC Vendor Documentation List
920-TDG-007	GSFC Vendor Documentation List
920-TDL-007	LaRC Vendor Documentation List

920-TDN-007	NSIDC Vendor Documentation List
920-TDE-008	EDC Mount Points
920-TDG-008	GSFC Mount Points
920-TDL-008	LaRC Mount Points
920-TDN-008	NSIDC Mount Points
920-TDV-008	VATC Mount Points
920-TDP-008	PVC Mount Points
920-TDV-108	VATC-SMC Mount Points
920-TDE-009	EDC DAAC Baseline Hardware / Database Mapping
920-TDG-009	GSFC DAAC Baseline Hardware / Database Mapping
920-TDL-009	LaRC DAAC Baseline Hardware / Database Mapping
920-TDN-009	NSIDC DAAC Baseline Hardware / Database Mapping
920-TDS-009	SMC DAAC Baseline Hardware / Database Mapping
920-TDN-009	VATC DAAC Baseline Hardware / Database Mapping
920-TDP-009	PVC DAAC Baseline Hardware / Database Mapping
920-TDV-109	VATC-SMC DAAC Baseline Hardware / Database Mapping
920-TDE-010	EDC DAAC Baseline Database Configuration Listing (Superseded by 910-TDA-021)
920-TDG-010	GSFC DAAC Baseline Database Configuration Listing (Superseded by 910-TDA-021)
920-TDL-010	LaRC DAAC Baseline Database Configuration Listing (Superseded by 910-TDA-021)
920-TDN-010	NSIDC DAAC Baseline Database Configuration Listing (Superseded by 910-TDA-021)
920-TDV-010	VATC DAAC Baseline Database Configuration Listing (Superseded by 910-TDA-021)

920-TDE-012	EDC DAAC SCSI Cable Management Plan
920-TDG-012	GSFC DAAC SCSI Cable Management Plan
920-TDL-012	LaRC DAAC SCSI Cable Management Plan
920-TDN-012	NSIDC DAAC SCSI Cable Management Plan
920-TDP-012	PVC DAAC SCSI Cable Management Plan
920-TDE-013	EDC Custom Code Configuration Parameters (Superseded by 910-TDA-021)
920-TDG-013	GSFC Custom Code Configuration Parameters (Superseded by 910-TDA-021)
920-TDL-013	LaRC Custom Code Configuration Parameters (Superseded by 910-TDA-021)
920-TDN-013	NSIDC Custom Code Configuration Parameters (Superseded by 910-TDA-021)
920-TDV-013	VATC Custom Code Configuration Parameters (Superseded by 910-TDA-021)
920-TDE-014	EDC Operating System (OS) and COTS Hardware Patch Maps
920-TDG-014	GSFC Operating System (OS) and COTS Hardware Patch Maps
920-TDL-014	LaRC Operating System (OS) and COTS Hardware Patch Maps
920-TDN-014	NSIDC Operating System (OS) and COTS Hardware Patch Maps
920-TDS-014	SMC Operating System (OS) and COTS Hardware Patch Maps
920-TDV-014	VATC Operating System (OS) and COTS Hardware Patch Maps
920-TDP-014	PVC Operating System (OS) and COTS Hardware Patch Maps
920-TDE-015	EDC Sun Platform Unix Kernel Configuration Parameters
920-TDG-015	GSFC Sun Platform Unix Kernel Configuration Parameters
920-TDL-015	LaRC Sun Platform Unix Kernel Configuration Parameters
920-TDN-015	NSIDC Sun Platform Unix Kernel Configuration Parameters
920-TDS-015	SMC Sun Platform Unix Kernel Configuration Parameters

920-TDV-015	VATC Sun Platform Unix Kernel Configuration Parameters
920-TDP-015	PVC Sun Platform Unix Kernel Configuration Parameters
920-TDV-115	VATC-SMC Sun Platform Unix Kernel Configuration Parameters
920-TDE-016	EDC SGI Platform Unix Kernel Configuration Parameters
920-TDG-016	GSFC SGI Platform Unix Kernel Configuration Parameters
920-TDL-016	LaRC SGI Platform Unix Kernel Configuration Parameters
920-TDN-016	NSIDC SGI Platform Unix Kernel Configuration Parameters
920-TDV-016	VATC SGI Platform Unix Kernel Configuration Parameters
920-TDP-016	PVC SGI Platform Unix Kernel Configuration Parameters
920-TDV-116	VATC-SMC SGI Platform Unix Kernel Configuration Parameters
920-TDE-017	EDC HP Platform Unix Kernel Configuration Parameters
920-TDG-017	GSFC HP Platform Unix Kernel Configuration Parameters
920-TDL-017	LaRC HP Platform Unix Kernel Configuration Parameters
920-TDN-017	NSIDC HP Platform Unix Kernel Configuration Parameters
920-TDS-017	SMC HP Platform Unix Kernel Configuration Parameters
920-TDV-017	VATC HP Platform Unix Kernel Configuration Parameters
920-TDP-017	PVC HP Platform Unix Kernel Configuration Parameters
920-TDV-117	VATC-SMC HP Platform Unix Kernel Configuration Parameters
920-TDE-018	EDC Host Memory Configuration Parameters
920-TDG-018	GSFC Host Memory Configuration Parameters
920-TDL-018	LaRC Host Memory Configuration Parameters
920-TDN-018	NSIDC Host Memory Configuration Parameters
920-TDS-018	SMC Host Memory Configuration Parameters
920-TDV-018	VATC Host Memory Configuration Parameters
920-TDP-018	PVC Host Memory Configuration Parameters

920-TDV-118	VATC-SMC Host Memory Configuration Parameters
920-TDE-019	EDC Custom Code Baseline Configuration Parameters
920-TDG-019	GSFC Custom Code Baseline Configuration Parameters
920-TDL-019	LaRC Custom Code Baseline Configuration Parameters
920-TDN-019	NSIDC Custom Code Baseline Configuration Parameters
920-TDS-019	SMC Custom Code Baseline Configuration Parameters
920-TDV-019	VATC Custom Code Baseline Configuration Parameters
920-TDP-019	PVC Custom Code Baseline Configuration Parameters

921-series Network Infrastructure documents

921-TDG-001	GSFC Network Overview Diagram (LAN Topology)
921-TDL-001	LaRC Network Overview Diagram (LAN Topology)
921-TDE-002	EDC Hardware / Network Diagram
921-TDG-002	GSFC Hardware / Network Diagram
921-TDL-002	LaRC Hardware / Network Diagram
921-TDN-002	NSIDC Hardware / Network Diagram
921-TDS-002	SMC Hardware / Network Diagram
921-TDV-002	VATC Hardware / Network Diagram
921-TDP-002	PVC Hardware / Network Diagram
921-TDV-102	VATC-SMC Hardware / Network Diagram
921-TDE-003	EDC Host IP (Address) Assignments
921-TDG-003	GSFC Host IP (Address) Assignments
921-TDL-003	LaRC Host IP (Address) Assignments
921-TDN-003	NSIDC Host IP (Address) Assignments
921-TDS-003	SMC Host IP (Address) Assignments

921-TDV-003	VATC Host IP (Address) Assignments
921-TDP-003	PVC Host IP (Address) Assignments
921-TDV-103	VATC-SMC Host IP (Address) Assignments
921-TDE-004	EDC Network IP (Address) Assignments (DAAC Network Hardware)
921-TDG-004	GSFC Network IP (Address) Assignments
921-TDL-004	LaRC Network IP (Address) Assignments
921-TDN-004	NSIDC Network IP (Address) Assignments
921-TDS-004	SMC Network IP (Address) Assignments
921-TDV-004	VATC Network IP (Address) Assignments
921-TDP-004	PVC Network IP (Address) Assignments
921-TDV-104	VATC-SMC IP Address Assignments
921-TDE-005	EDC Dual-Homed Host Static Routes
921-TDG-005	GSFC Dual-Homed Host Static Routes
921-TDL-005	LaRC Dual-Homed Host Static Routes
921-TDN-005	NSIDC Dual-Homed Host Static Routes
921-TDV-005	VATC Dual-Homed Host Static Routes
921-TDP-005	PVC Dual-Homed Host Static Routes
921-TDE-006	EDC Ingest Host Static Routes
921-TDG-006	GSFC Ingest Host Static Routes
921-TDL-006	LaRC Ingest Host Static Routes

922-series Disk Partitions documents

922-TDE-001	EDC APC Server
922-TDG-001	GSFC APC Server
922-TDL-001	LaRC APC Server
922-TDN-001	NSIDC APC Server

922-TDV-001	VATC APC Server
922-TDP-001	PVC APC Server
922-TDE-002	EDC Application Server
922-TDG-002	GSFC Application Server
922-TDL-002	LaRC Application Server
922-TDN-002	NSIDC Application Server
922-TDS-002	SMC Application Server
922-TDV-002	VATC Application Server
922-TDP-002	PVC Application Server
922-TDG-003	GSFC AQA Host
922-TDL-003	LaRC AQA Host
922-TDE-005	EDC CSS Server
922-TDG-005	GSFC CSS Server
922-TDL-005	LaRC CSS Server
922-TDN-005	NSIDC CSS Server
922-TDP-005	PVC CSS Server
922-TDE-006	EDC Distribution Server
922-TDG-006	GSFC Distribution Server
922-TDL-006	LaRC Distribution Server
922-TDN-006	NSIDC Distribution Server
922-TDP-006	PVC Distribution Server
922-TDE-007	EDC FSMS Server
922-TDG-007	GSFC FSMS Server

922-TDL-007	LaRC FSMS Server
922-TDN-007	NSIDC FSMS Server
922-TDV-007	VATC FSMS Server
922-TDP-007	PVC FSMS Server
922-TDE-008	EDC Ingest Server
922-TDG-008	GSFC Ingest Server
922-TDL-008	LaRC Ingest Server
922-TDN-008	NSIDC Ingest Server
922-TDV-008	VATC Ingest Server
922-TDP-008	PVC Ingest Server
922-TDE-009	EDC Interface Server
922-TDG-009	GSFC Interface Server
922-TDL-009	LaRC Interface Server
922-TDN-009	NSIDC Interface Server
922-TDP-009	PVC Interface Server
922-TDE-010	EDC MSS Server
922-TDG-010	GSFC MSS Server
922-TDL-010	LaRC MSS Server
922-TDN-010	NSIDC MSS Server
922-TDS-010	SMC MSS Server
922-TDV-010	VATC MSS Server
922-TDP-010	PVC MSS Server
922-TDE-011	EDC MSS File Server / CM Server
922-TDG-011	GSFC MSS File Server / CM Server

922-TDL-011	LaRC MSS File Server / CM Server
922-TDN-011	NSIDC MSS File Server / CM Server
922-TDS-011	SMC MSS File Server / CM Server
922-TDV-011	VATC MSS File Server / CM Server
922-TDP-011	PVC MSS File Server / CM Server
922-TDE-012	EDC OPS Workstation
922-TDG-012	GSFC OPS Workstation
922-TDL-012	LaRC OPS Workstation
922-TDN-012	NSIDC OPS Workstation
922-TDP-012	PVC OPS Workstation
922-TDE-013	EDC PDPS DBMS Server
922-TDG-013	GSFC PDPS DBMS Server
922-TDL-013	LaRC PDPS DBMS Server
922-TDN-013	NSIDC PDPS DBMS Server
922-TDV-013	VATC PDPS DBMS Server
922-TDP-013	PVC PDPS DBMS Server
922-TDE-014	EDC Queuing Server
922-TDG-014	GSFC Queuing Server
922-TDL-014	LaRC Queuing Server
922-TDN-014	NSIDC Queuing Server
922-TDV-014	VATC Queuing Server
922-TDP-014	PVC Queuing Server
922-TDE-015	EDC Science Processor
922-TDG-015	GSFC Science Processor

922-TDL-015	LaRC Science Processor
922-TDN-015	NSIDC Science Processor
922-TDV-015	VATC Science Processor
922-TDP-015	PVC Science Processor
922-TDE-016	EDC SDSRV Server
922-TDG-016	GSFC SDSRV Server
922-TDL-016	LaRC SDSRV Server
922-TDN-016	NSIDC SDSRV Server
922-TDP-016	PVC SDSRV Server
922-TDE-017	EDC Sybase Staging Server
922-TDG-017	GSFC Sybase Staging Server
922-TDL-017	LaRC Sybase Staging Server
922-TDN-017	NSIDC Sybase Staging Server
922-TDV-017	VATC Sybase Staging Server
922-TDE-018	EDC Working Storage Server
922-TDV-018	VATC Working Storage Server
922-TDP-018	PVC Working Storage Server
922-TDL-020	LaRC Science Processor # 2
922-TDE-021	EDC AIT Workstation/DBMS Server
922-TDG-021	GSFC AIT Workstation/DBMS Server
922-TDL-021	LaRC AIT Workstation/DBMS Server
922-TDN-021	NSIDC AIT Workstation/DBMS Server
922-TDP-021	PVC AIT Workstation/DBMS Server

922-TDE-022	EDC AIT Workstation
922-TDG-022	GSFC AIT Workstation
922-TDL-022	LaRC AIT Workstation
922-TDP-022	PVC AIT Workstation
922-TDE-023	EDC Planning Management Workstation
922-TDG-023	GSFC Planning Management Workstation
922-TDL-023	LaRC Planning Management Workstation
922-TDN-023	NSIDC Planning Management Workstation
922-TDE-024	LUT Sybase Server
922-TDE-025	DEM Science Server
922-TDE-027	EDC Data Spec Workstation
922-TDG-027	GSFC Data Spec Workstation
922-TDL-027	LaRC Data Spec Workstation
922-TDN-027	NSIDC Data Spec Workstation
922-TDP-027	PVC Data Spec Workstation
922-TDE-028	EDC ACSLS Workstation
922-TDG-028	GSFC ACSLS Workstation
922-TDL-028	LaRC ACSLS Workstation
922-TDP-028	PVC ACSLS Workstation
922-TDE-029	EDC Ingest Workstation
922-TDG-029	GSFC Ingest Workstation

922-TDL-029	LaRC Ingest Workstation
922-TDP-029	PVC Ingest Workstation
922-TDE-031	EDC Tape System Backup Server
922-TDG-031	GSFC Tape System Backup Server
922-TDL-031	LaRC Tape System Backup Server
922-TDN-031	NSIDC Tape System Backup Server
922-TDP-031	PVC Tape System Backup Server
922-TDE-032	EDC QA Workstation
922-TDG-032	GSFC QA Workstation
922-TDL-032	LaRC QA Workstation
922-TDN-032	NSIDC QA Workstation
922-TDP-032	PVC QA Workstation
922-TDE-033	EDC Planning Management Workstation
922-TDP-033	PVC Planning Management Workstation
922-TDE-034	EDC AIT Server
922-TDE-035	EDC DISK/RAID Driver
922-TDG-035	GSFC DISK/RAID Driver
922-TDL-035	LaRC DISK/RAID Driver
922-TDN-035	NSIDC DISK/RAID Driver
922-TDP-035	PVC DISK/RAID Driver
922-TDG-036	GSFC FSMS Workstation

922-TDE-037	EDC Xterm Server
922-TDL-037	LaRC Xterm Server
922-TDE-038	EDC Landsat 7 Simulator Disk RAID
922-TDG-039	GSFC MODAPS Server Disk
922-TDP-039	PVC MODAPS Server Disk
922-TDP-040	PVC EDOS/LPS Workstation Disk
922-TDP-041	PVC Push Area Workstation Disk
922-TDE-042	EDC Console Manager Disk
922-TDG-042	GSFC Console Manager Disk
922-TDL-042	LaRC Console Manager Disk
922-TDN-042	NSIDC Console Manager Disk

2.2.1 Other Related Documents and Documentation

205-CD-004	Science User's Guide and Operations Procedures Handbook (Release B.0) for the ECS Project
311-CD-606	Subscription Server Database Design and Schema Specifications for the ECS Project
313-CD-600	6A ECS Internal Interface Control Document for the ECS Project
333-CD-600	Release 6A SDP Toolkit User's Guide for the ECS Project
611-CD-600	Release 6A Mission Operations Procedures for the ECS Project, Section 3.2
625-CD-504	ECS Project Training Material Volume 4: System Administration (System Startup and Shutdown section)
193-801-SD4	PGS Toolkit Requirements Specification for the ECS Project (a.k.a. GSFC 423-06-02)

193-WP-118	Algorithm Integration and Test Issues, White Paper for the ECS Project
194-WP-925	Science Software Integration and Test White Paper for the ECS Project
423-16-01	Data Production Software and Science Computing Facility (SCF) Standards and Guidelines
423-42-06	Interface Control Definition for the EOS Data Gateway (EDG): Messages and Development Data Dictionary V0 and ASTER/ECS Message Passing Protocol Specification
COTS	XRP-II Manual
RFC	793 Transmission Control Protocol
RFC	768 User Datagram Protocol
RFC	791 Internet Protocol
RFC	1597 Address Allocation for Private Internet
	WWW page http://cmdm.east.hitc.com/baseline

2.3 Information Documents Not Referenced

The documents listed below, while not directly applicable, help in the maintenance of the delivered software.

The documents listed below, while not directly applicable, help in the maintenance of the delivered software.

423-41-02	Goddard Space Flight Center, Functional and Performance Requirements Specification for the Earth Observing System Data and Information System Core System
423-41-03	EOSDIS Core System Contract Data Requirements Document
540-022	Goddard Space Flight Center, Earth Observing System Communications System Interface Requirements Document
560-EDOS-0211.0001	Goddard Space Flight Center, Interface Requirements Document between EDOS and the EOS Ground System

2.4 ECS Tool Descriptions

2.4.1 Discover

Discover is an information system for software engineering that transforms a code base into a tangible asset by enabling a software engineer's code comprehension, analysis of impact to code,

and automated support of metrics collection. Discover starts with the creation of an Information Model, a highly associative database. The Information Model stores and tracks every entity, attribute and relationship between software objects. The Discover products do leverage off the Information Model to provide a variety of graphical and narrative development, engineering analysis, and quality assessment tools. The use of Discover on the ECS Program has been customized to take advantage of a selected set of Discover tools. However, the broad spectrum of tools is available for the more experienced user to use. The major activities provided for use by the user are:

1. Basic Navigation and Query – How to navigate in the Discover environment, taking advantage of the query mechanisms provided by the Discover Browser.
2. Results Collection – How to make query results logical groupings (groups) to assist in better understanding and management of system components.
3. Graphical Representations – How to use the graphical views to understand the relationships of code, which include:

Call Trees – Header file or function calling relationships

Outline – Representation of the code Structure

Flowchart – Overview of the program flow which also depicts complexity

Class Inheritance Diagrams – Shows class hierarchy according to a particular class

Entity Relationship Diagram (ERD) – A methodology independent representation of the relationships between C++ classes similar to object diagrams

Graphs – Shows the possible paths between two functions.

4. Impact Analysis – How to use the ECS customized “Modified Entities Report” which is a single push button action to determine what has been changed, the extent of the change, and the quality of the change made by a software engineer.

Detailed instructions for the use of the Discover tool are provided in the Discover User Training Version 5.1 slide presentation.

2.4.2 ABC++

ABC++ is a program that creates on-line and hard copy documentation for C, C++, and Java programs by analyzing the source and header files. It is "piggybacked" onto the C++ and Java compilers, librarian programs, and linker such that in the process of building all of the components of a project, documentation pages are automatically generated.

For C++, an HTML documentation page is generated for each source file, which is compiled. A documentation page is generated for each header file included either directly or indirectly by the compilation. If one or more source files are compiled, which implement a header file previously compiled, a combined module documentation page is generated which indicates the header and all sources that implement it. For Java, a documentation page is generated for each Java module

compiled and for each Java module imported directly or indirectly by an explicitly compiled module.

For each module documented, the classes, functions, variables, constants, templates, and macros are catalogued, forming a reference manual by which the various components may be located easily by Hyperlinks. Comments, extracted from the code are associated with each declaration.

For each library or program built, an HTML documentation page is generated listing all the classes, functions, variables, etc., which are globally accessible. For each program, a list of libraries linked is generated. Along with each of these names, the first sentence of the comments on the various components is also displayed. A description of the program or library is obtained, if available, from a text file called lib_<libraryName> or prg_<programName> located in the directory the program or library is built.

After all modules have been compiled, a set of directories is generated in HTML, locating all modules and their global internal components, and describing each of these items with the first sentence from their descriptions. A description of any given directory is obtained, if available from a file called "index.txt" in that directory.

Hard copy (in RTF, which is compatible with MS-Word) may be extracted as desired from the various documentation pages. For the purposes of this document, this is limited to the indexes of classes and templates in each library plus the list of non-COTS libraries linked for each program.

An HTML representation of every source and header file is also generated such that every user-defined name, every overloaded operator, every "include", and every import is linked to its definition. This makes it possible to browse everywhere in the project. Hyperlinks from the documentation pages to the source/header pages allow one to jump directly into the code in order to understand it if the comments in the code do not explain it well enough.

A complete cross-reference is generated in the process of building these pages. The user can obtain a list of Hyperlinks locating every reference to a particular overload of a name or function anywhere in the entire project.

The on-line ECS documentation can be accessed with Netscape at the following URL (for the time being anyway):

<http://scooby.hitc.com:8080/ecs>

A link to the above page called ABC++ ECS Documentation is also given on the Internal Server Page as:

<http://dmsserver.gsfc.nasa.gov/>

that can be accessed from the ECS Data Handling System (EDHS):

<http://edhs1.gsfc.nasa.gov/>

2.4.3 Rational Rose

The Rational Rose tool provides support for object-oriented analysis and design. In particular, the Rose tool provides support for controlled-iterative or component-based development. The Rose tool is used on the ECS Project to document the object-oriented elements of the design using class diagrams, use-case diagrams, interaction diagrams, component diagrams, and object diagrams. The Unified Modeling Language (UML) is the methodology used on the ECS Project for all design activities (although the Rose tool also supports the Booch '93 Methodology or the Object Modeling Technique (OMT) as well).

The Rose tool can also be used to reverse engineer code developed that lacks supporting documentation to get as-built object diagrams.

Before using the Rational Rose tool, see “Rational Rose 98, Using Rose” for important tool usage and reference information. In addition, the following references can be obtained and used:

- (1) “Unified Method for Object-Oriented Development,” by Grady Booch and Jim Rumbaugh (version 1.1, Rational Software Corporation) for an introduction to the respective method’s notation, semantics, and process for object-oriented analysis and design.
- (2) the second edition of “Object-Oriented Analysis and Design with Applications” by Grady Booch, (Benjamin/Cummings, 1994)
- (3) “Object-Oriented Modeling and Design” by James Rumbaugh, Michael Blaha, William Premerlani, Frederick Eddy and William Lorensen, (Prentice-Hall, 1991)

3. System Description

3.1 Release 6A Objectives

3.1.1 Release 6A Capabilities

The ECS capabilities are developed in increments called formal releases. Release 6A, which is controlled by Configuration Management, provides capabilities to support the Ingest and archive of raw data obtained from the EOS AM Mission spacecraft 1, morning equator crossing spacecraft series (Terra (AM-1)), EOS PM Mission spacecraft 1, afternoon equator crossing spacecraft series (Aqua (PM-1)) and the Land Remote-Sensing Satellite (Landsat 7). Other capabilities provided by Release 6A include processing the data obtained, distributing raw or processed data as requested, quality assurance of processed data, supporting communication networks, and systems monitoring via interfaces with the ECS operations staff.

Release 6A capabilities include:

- support the regeneration and archive of products previously produced and archived
- support ingest, production, storage, and distribution of Terra and Aqua instrument data
- support writing files to CD-ROMs and DLT tape drives for distribution
- provide access to non-science data collections by a limited number of attributes and values
- provide Science Data Server scalability/operability improvements
- support FTP Pull Subscription
- provide machine-to-machine gateway support between SIPS and ECS for data orders
- provide capability for operator deletion of granules
- allow users to request a data processing request associated with a DAR at the time of submittal
- ingest and archival of Terra (AM-1) and other science and engineering data from the EDOS and Landsat 7 Level 0 Reformatted (LOR) data from the Landsat 7 Processing System (LPS)
- ingest of Product Generation Executive (PGE) software from a Science Computing Facility (SCF) either electronically or via media tape
- archival, production, and Quality Assurance (QA) processing of Terra (AM-1) science data products, science software integration and test, and the associated communications network interfaces with the SCF
- operator interfaces for production and resource planning

- directory and inventory search, including a user browse capability via the Version Zero (V0) System user interface
- receiving requests for science data products and distributing science data products via FTP and 8mm tape (**Note:** 8MM can only be obtained via the V0 Gateway and routed to the PDS for Release 6A. 8mm cannot be selected via the ODFRM or the Subscription Server.)
- interfacing with the Advanced Space-borne Thermal Emission and Reflection Radiometer (ASTER) Ground Data System (GDS) for the submission of Data Acquisition Requests (DARs) for data collection by the ASTER instrument aboard the Terra (AM-1) spacecraft
- ingest of ASTER Level 1A/1B data from the ASTER GDS
- managing the startup and shutdown of system network components, user registration and profile administration, database and archive administration, system data and file back-up and restores, system performance tuning and resource usage monitoring, and other routine operator duties
- support of DAR submittals and DAR query status between the ECS Java DAR Tool and the ASTER GDS via the MOJO Gateway
- support the display of browse data as a result of a single user request from the search results screen
- support to submit on-demand requests to the ASTER GDS for the generation of Level 1B products
- support the searching and ordering of ECS data products by the ASTER GDS
- support the searching and ordering of ASTER GDS products by ECS users
- V0 Gateway support for client requests for searches based on full ECS core metadata and product specific attributes, Landsat7 floating scenes, and band subsetting, and Landsat 7 data billing information
- SDP Toolkit support for thread safe concurrent processing by the science software
- user authorization checks to restrict data set access at the granule level based on data quality information
- support for five new production rules required for PM-1
- automated support for on-demand requests for ASTER processing
- operations support to update certain ESDT attributes without requiring the deletion of the data collection
- ESDTs to support MODIS, AIRS, and AMSR on PM-1
- support for data retrieval and distribution of a subset of a Landsat 7 granule as selected by floating scenes and/or individual bands

- delivery of Terra (AM-1) ancillary data files for use at other DAAC sites
- spatial container changes for ASTER L1A/L1B from bounded rectangle to gpolygon
- ingest of FDS (formerly FDD) orbit data via polling without DR
- ingest of SAGE III MOC granules into the Science Data Server via SIPS interface
- ingest of SAGE III SCF granules into the Science Data Server via the SIPS interface
- ingest of DAS HDF EOS data via standard polling with DR
- ingest standard ECS products, including MODAPS and MOPITT SCF via the SIPS interface
- ingest data resident in the SDPS across a mode in the same DAAC or across DAACs
- ingest of ASTER 14 DEM granules into the Science Data Server via the SIPS interface
- ingest of ACRIM L0 and higher level data from the ACRIM SCF via the SIPS interface
- SSI&T support for PM-1 (AIRS and MODIS)
- mapping of data collection to information manager
- editing of ECS core attribute values
- consolidation of trouble tickets using the Remedy Tool
- fault recovery for mode management
- startup and shutdown of an entire mode
- encryption of the subscription server FTP password in the Science Data Server database
- support of production rules to allow multiple L0 granules as input into a single PGE
- support of production rules for most recent granule and optional DPRs
- tracking Landsat 7 order processing via MSS
- deletion of science data from the archive without deleting the corresponding metadata
- Configurable parameters to control the number of granules returned from a single search request
- handling of variations on search areas and product-specific spatial representations
- installation of ESDTs to insert and acquire archived data without the archive storage directory names
- processing of orbit, attitude, and ephemeris data into toolkit native format and HDF
- persistence of asynchronous acquire requests, which do not have callback functions
- storage of event information into the SDSRV database instead of flat files
- monitoring of the usage of memory by the Science Data Server

- provides COTS packages to allow operations to generate customized reports from ECS databases
- production rules for the closest granule, the spatial pad, and orbit processing of run time parameters
- provide a single configuration registry database to replace the numerous ECS application configuration files
- capability to associate the ASTER browse granule for the L1A product with the ASTER L1B and DEM products

ECS Release 6A has been distributed to five site locations including:

1. the System Management Center (SMC), located at the Goddard Space Flight Center (GSFC),
2. the DAAC at GSFC,
3. the DAAC at the Langley Research Center (LaRC),
4. the DAAC at the Earth Resource Observation System (EROS) Data Center (EDC)
5. the DAAC at the National Snow and Ice Center (NSIDC)

The ECS Release 6A communications network includes the National Aeronautics and Space Administration (NASA) Science Internet (NSI) and the EOSDIS Backbone Network (EBnet). These portions of the network are physically located at the SMC and at the DAAC sites. The communications network connects ECS to data providers at the EDOS, the Landsat 7 Processing System (LPS), NOAA Affiliated Data Center (ADC), and the EOSDIS Version 0 system.

The data users for Release 6A are the science user community connected to the four DAACs, the SCFs, and the ASTER GDS.

3.1.2 Release 6A Instrument and DAAC Support

ECS Release 6A supports the following instrument data operations and DAACs.

- Terra (AM-1) Support:

ECS Release 6A supports archiving, processing, and distributing instrument data from a complement of four Terra (AM-1) instruments. These instruments are ASTER, Multi-Imaging SpectroRadiometer (MISR), Moderate-Resolution Imaging SpectroRadiometer (MODIS), and Measurements Of Pollution In The Troposphere (MOPITT).

ECS Release 6A provides a communications network and data/information management support for:

- ASTER instrument data including the receipt of ASTER level 1 data on magnetic tape at EDC from Japan, and the production and distribution of higher level ASTER products by EDC.

- MISR instrument data including the receipt of MISR level 0 data and the LaRC archive, production, and distribution of levels 1, 2 and 3 data and data products.
 - MODIS instrument data including level 0 data: archive, production, and distribution of levels 1A and 1B including distribution of the 1A and 1B data to the MODIS Data Processing System (MODAPS) for higher level processing. The receiving of higher level MODIS products from MODAPS via the SIPS interface is also supported.
 - MOPITT instrument data including the receipt of MOPITT level 0 data, and the LaRC archive, production, and distribution of levels 1, 2 and 3 data. During the initial period after launch, the MOPITT higher level products are generated at the SCF and provided to the ECS via the SIPS interface.
- Landsat 7 Support:
 - ECS Release 6A provides a repository for Landsat 7 L0R (L0 reformatted) data. The ECS communications network includes interfaces with the Landsat 7 system elements, the Mission Management Office (MMO), and the Ground Data Processing System (GDPS). The GDPS is composed of the Landsat 7 Processing System and the Image Assessment System (IAS).
 - The ECS network interfaces are needed to receive product cost information, exchange of registration services, and system management status from the MMO. The ECS receives and stores Landsat 7 level 0R data, metadata, and browse data from the LPS. The ECS also receives calibration data and metadata from the IAS. ECS network interfaces for data search, data order, and data distribution services to Landsat 7 users are also provided in Release 6A.
 - SAGE III Support
 - ECS Release 6A supports receiving SAGE III Level 0 data from the SAGE III MOC, provides the level 0 data to the SAGE III SCF, and receives higher level products from the SCF via the SIPS interface.
 - ACRIM Support
 - ECS Release 6A supports receiving ACRIM L0 data and higher level products from the SCF via the SIPS interface.
 - Aqua (PM-1) Support

ECS Release 6A supports archiving, processing, and distributing instrument data from a complement of five Aqua (PM-1) instruments. These instruments are Atmospheric Infrared Sounder (AIRS), Humidity Sounder for Brazil (HSB), Advanced Microwave Sounding Unit (AMSU), Advanced Microwave Scanning Radiometer - EOS (AMSR-E), and Moderate-Resolution Imaging SpectroRadiometer (MODIS).

ECS Release 6A provides a communications network and data/information management support for:

- AIRS/HSB/AMSU instrument data including the receipt of AIRS/HSB/AMSU level 0 data and the GSFC archive, production, and distribution of levels 1, 2 and 3 data and data products.
- MODIS instrument data including level 0 data: archive, production, and distribution of levels 1A and 1B including distribution of the 1A and 1B data to the MODIS Data Processing System (MODAPS) for higher level processing. The receiving of higher level MODIS products from MODAPS via the SIPS interface is also supported.
- AMSR-E instrument data including the receipt of level 0 data from EDOS, and the NSIDC archive and distribution of levels 1, 2 and 3 data. The Level 1A data is received from the NSIDC V0 DAAC while the level 2 and 3 data is received from the AMSR-E SCF via the SIPS interface.
- ICESAT/GLAS Support
 - ECS Release 6A supports the ingest of ICESAT GLAS level 1, level 2, level 3 and ancillary input data for archive and distribution at the NSIDC DAAC using the standard SIPS interface. The ECS also archives GLAS level 0 data received from EDOS.
- GSFC Data Assimilation Office (DAO) Support
 - ECS Release 6A provides communications network interfaces to support the DAO in the receipt, archive, and distribution of data from NOAA's National Meteorological Center (NMC) and AM-1 instruments. This includes the ingest of NMC Levels 1-3 data sets and the archive, production, and distribution of ECS Level 4 data by GSFC.

3.2 Release 6A Architecture Overview

The ECS Release 6A architecture comprises the logical items listed here. Commercial Off The Shelf (COTS) software and hardware are used, to the extent possible, to implement the ECS functionality of these logical items.

- System
- Segments
- Subsystems
- Computer software configuration items (CSCIs)
- Computer software components (CSCs)
- Processes

ECS Release 6A was built of the following two segments.

- CSMS – Communications and Systems Management Segment
- SDPS – Science Data Processing Segment

Each segment was in turn built of the following subsystems.

- CSMS: CSS - Communications Subsystem
ISS - Internetworking Subsystem
MSS - System Management Subsystem
- SDPS: CLS - Client Subsystem
DMS - Data Management Subsystem
IOS- Interoperability Subsystem
DSS - Data Server Subsystem
PLS - Planning Subsystem
DPS - Data Processing Subsystem
INS - Ingest Subsystem

System: A stand-alone composite of hardware, facilities, material, software, services, and personnel required for operation based upon a defined set of system level requirements and designed as a related set of capabilities and procedures.

Segment: A logical and functional subset of related capabilities, implemented with COTS hardware and COTS and custom developed software to satisfy a defined subset of the system level requirements.

Subsystem: A logical subset of Segment related capabilities, implemented with COTS hardware and COTS and custom developed software to satisfy a defined subset of segment level requirements.

CSCI: A logical subset of Subsystem related capabilities, implemented with COTS and custom developed software to satisfy a defined subset of the subsystem level software requirements.

CSC: A logical subset of CSCI related capabilities, implemented with COTS and custom developed software to satisfy a defined subset of the CSCI level software requirements.

Process: A logical and functional set of software, written in a specific order and in a defined manageable size to manipulate data as part of a product-generating algorithm. A process is a separately compiled executable (i.e., binary image). A process can use infrastructure library calls, system service calls, COTS service calls, and application programming interfaces to manipulate data to generate products.

Figure 3.2-1 is a hierarchical software diagram. The hierarchical software diagram depicts an example of the decomposition levels used in the ECS design and described in this document. The diagram is also a graphical representation of the terms just described.

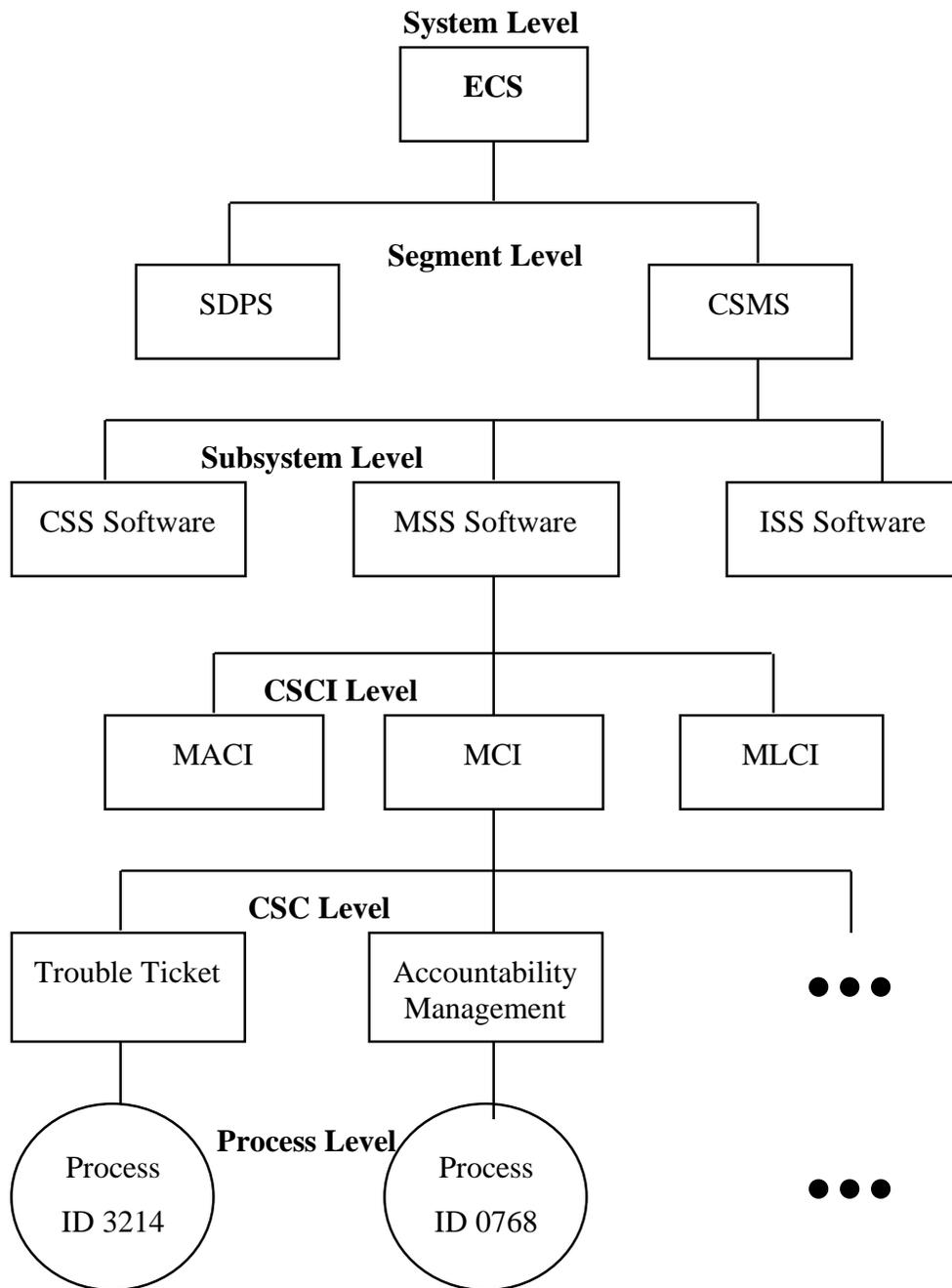


Figure 3.2-1. Example Hierarchical Software Diagram

3.2.1 Release 6A Context Description

ECS Release 6A provides the capability to collect and process satellite science data as depicted in Figure 3.2.1-1.

The Science Data Processing and Communications and Systems Management are the two segments of the ECS Release 6A described in this document. The Science Data Processing Segment (SDPS) provides science data ingest and production, search and access functions, data archive, and system management capabilities. The SDPS receives Terra (AM-1) and PM-1 Level 0 science data from EDOS and LOR Data from the Landsat 7 Processing System. The SDPS exchanges data with the ASTER GDS and other affiliated data centers to obtain science and other data (i.e., engineering and ancillary) required for data production. It also connects with the ASTER GDS to submit ASTER Data Acquisition Requests (DARs) for the collection of science data by the ASTER instrument. Science algorithms, provided by the Science Computing Facilities (SCFs), are used in data production to transform data into higher level products (Level 1 to Level 4 products) for research. The ECS project uses SCF expertise to support the Quality Assurance activities of using the results of the Science Software Integration and Test (SSIT) activities to process data and verify the data production science algorithms prior to actual data production. The Communications and Systems Management Segment (CSMS) provides the communications infrastructure for the ECS and systems management for all of the ECS hardware and software components. The CSMS provides the interconnection between users and service providers within the ECS, transfer of information between subsystems, CSCIs, CSCs, and processes of the ECS.

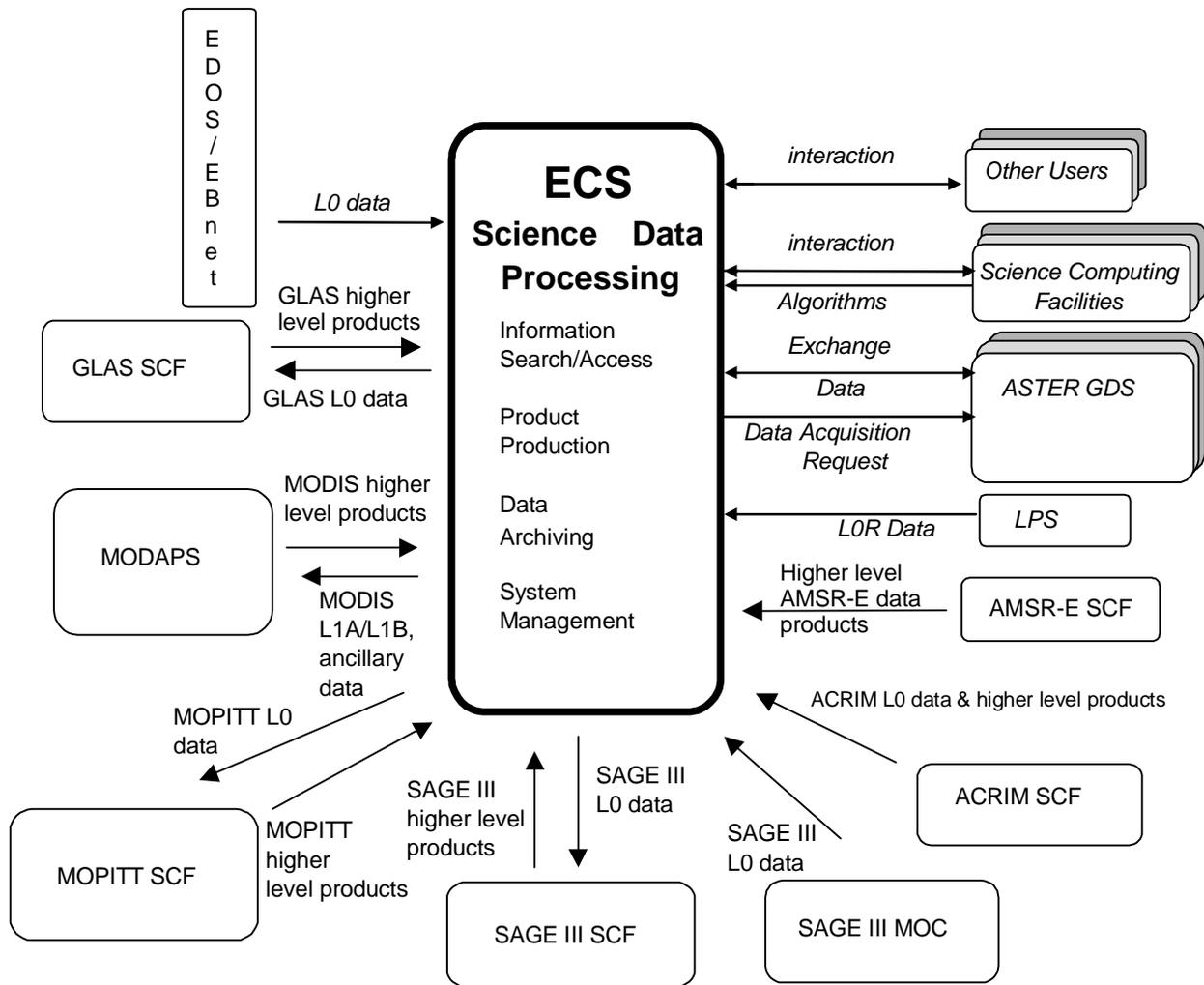


Figure 3.2.1-1. Release 6A Context Diagram

The remaining sections of this document provide an overview of the ECS Release 6A design and as such do not deal specifically with the configuration of components at each EOSDIS site. For more information on the site unique configurations, refer to the 920-series of General documents. Each of the segments consists of subsystems as specified in Section 3.2.

3.2.2 Release 6A Architecture

3.2.2.1 Subsystem Architecture

The ECS SDPS subsystems are depicted in Figure 3.2.2.1-1. A subsystem consists of the Commercial Off The Shelf (COTS) and/or ECS developed software and the COTS hardware needed for its execution. The SDPS subsystems can be grouped into a 'Push' or 'Pull' category

of functionality with the exception of DSS. The information search and data retrieval makes up the ‘Pull’ side of the ECS architecture/design and consists of the CLS, DMS, IOS and also uses the DSS functionality described on the ‘Push’ side of the ECS architecture. Data capture (ingest of data), storage management, planning and data processing of satellite or previously archived data from other sites make up the ‘Push’ side of the ECS architecture/design and consists of the DSS, INS, PLS, and DPS. This document describes the software and hardware components of each subsystem. However, since the hardware configurations differ between the sites, the hardware descriptions in this document are at a generic level. Specific hardware and network configurations for each site are documented in the 921-series Network Infrastructure documents.

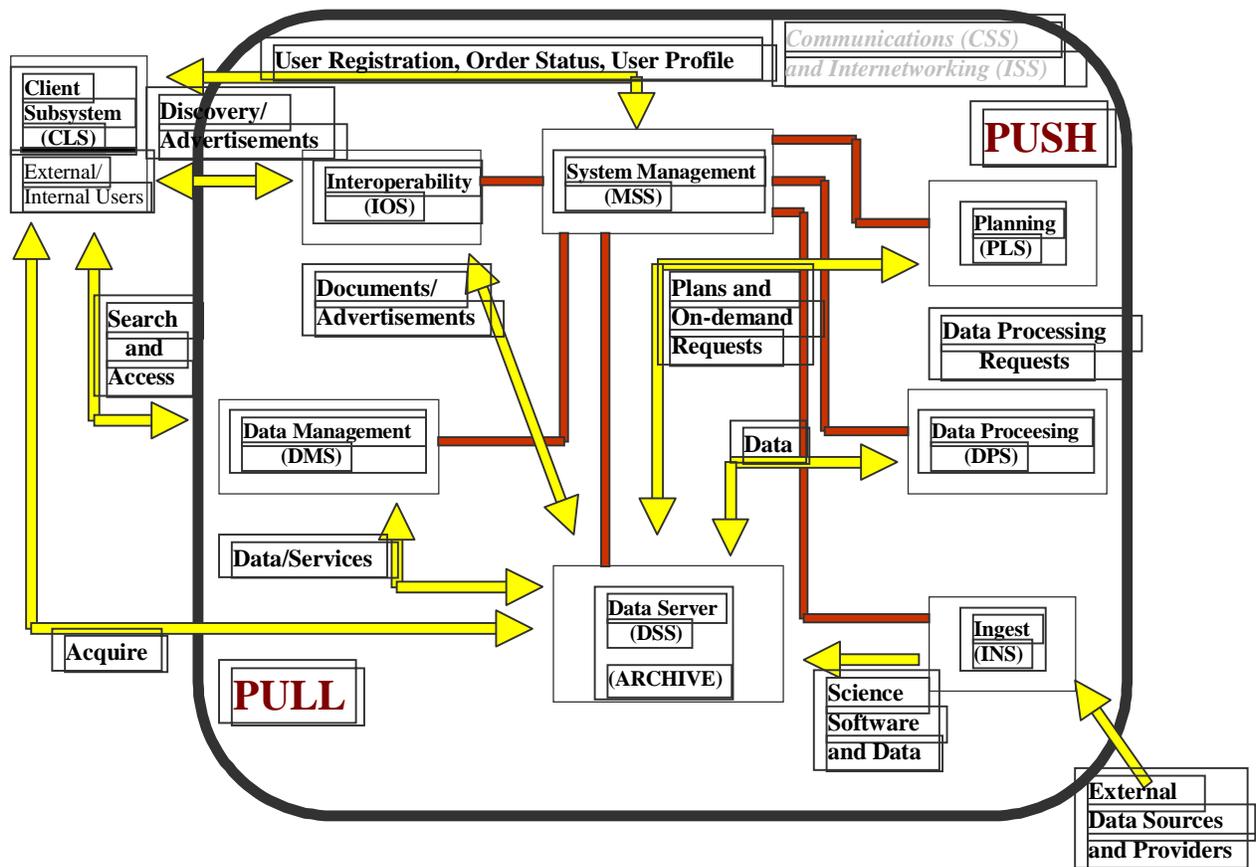


Figure 3.2.2.1-1. Subsystem Architecture Diagram

As shown in the subsystem architecture diagram, SDPS Release 6A subsystems can be grouped into a ‘Push’ or ‘Pull’ category of functionality with the exception of DSS. The DMS and the IOS on the ‘Pull’ side of ECS also use the DSS functionality described on the ‘Push’ side of the ECS architecture. Data capture (ingest of data), storage management, planning and data

processing of satellite or previously archived data from other sites make up the 'Push' side of the ECS architecture/design and consists of:

1. The DSS with the functions needed to
 - archive (insert) science data
 - search for and retrieve archived data
 - manage (create and delete items from) the archives
 - stage (store on physical media temporarily) data resources needed as input to data processing or resulting as output from their processing execution
2. The INS with interfaces to external suppliers (such as EDOS and LPS) to:
 - transfer data into SDPS and temporarily store the data
 - provide staging capabilities for data waiting to be archived
 - provide operator interfaces for managing ingest operations
3. The DPS and PLS with:
 - DPS dispatching and monitoring the execution of the science software, and interfaces to DSS to stage the input data needed and archive the generated data
 - PLS providing long and short term planning of science data processing of the production environment and production resources

Information search and data retrieval makes up the 'Pull' side of the ECS architecture/design and consists of:

1. The CLS, DMS, and IOS with:
 - CLS providing user interfaces for data search and retrieval to science users and operators
 - DMS providing support for data search and retrieval across all ECS sites in conjunction with the DSS at each site. The DMS also provides a gateway as the interface to the Version 0 (V0) Information Management System (IMS) using the V0 IMS protocol
 - IOS managing advertisements of data and services it receives from the DSS or non-ECS users via the operations staff. IOS makes the advertisements available via a World Wide Web (WWW) interface for searching and browsing. Other SDPS subsystems (i.e., CLS, PLS, DPS, DMS, and INS) use IOS to determine the location of data and the services, offered by the DSS, for a particular type of data or distributed data that has been processed

CSMS – The following subsystems are the CSMS subsystems, which interact with and support the SDPS to complete the ECS architecture.

2. The MSS with:
 - hardware and software baseline and configuration management
 - trouble ticketing and nonconformance report (NCR) tracking
 - system start-up and shut-down
 - fault and performance monitoring for networks, platforms, and software applications
 - user account management and user order tracking
3. The CSS with:
 - Distributed Computing Environment (DCE) using Transmission Control Protocol/Internet Protocol (TCP/IP) for the network communications stack.
 - Libraries with common software mechanisms for application error handling, aspects of recovering client/server communications; Universal References to distributed objects and interfaces to e-mail, file transfer and network file copy capabilities.
 - External gateways to translate from the CSMS internal protocols, based on DCE, to protocols acceptable by external systems such as ASTER GDS and Landsat 7 LPS and vice versa.
4. The ISS with:
 - Networking hardware devices (e.g., routers, switches, hubs, cabling, etc.) and their respective embedded software. For more information on site unique configurations, refer to the 920-series of General documents.

3.2.2.2 Multi-Site Architecture

ECS Release 6A is distributed to five sites specified in Section 3.1.1. Each site is identified and its operational capabilities follow. Please note that the reference to MODIS and CERES includes the Terra and Aqua missions in this subsection.

1. EDC DAAC capabilities include:
 - ingest of ASTER Level 1A / 1B and Landsat 7 Level 0R data, with ancillary data needed for production
 - production, archival and distribution of ASTER products
 - archival and distribution of Landsat 7 0R data
 - Receipt of higher level MODIS land products from MODAPS, via the SIPS interface, for archival and distribution
2. GSFC DAAC capabilities include:
 - ingest of MODIS, AIRS, HSB and AMSU Level 0 data and related ancillary data

- production, archival and distribution of the level 1A and 1B including the distribution of the level 1A, 1B and ancillary data to MODAPS for higher level processing
 - Receipt of higher level MODIS atmospheric and ocean products from MODAPS, via the SIPS interface, for archival and distribution
 - production, archival, and distribution of the higher level products for AIRS/HSB/AMSU
3. LaRC DAAC capabilities include:
- ingest of CERES, MISR and MOPITT Level 0 and related ancillary data
 - production, archival, and distribution of the higher level products for MISR
 - data forwarding support for CERES through LaTIS and MOPITT to the SCF
 - receipt of higher level CERES products from LaTIS, via the SIPS interface, for archival and distribution
 - receipt of higher level MOPITT products from the MOPITT SCF, via the SIPS interface, for archival and distribution
 - receipt of SAGE III Level 0 from the SAGE III MOC and the distribution of this data to the SAGE III SCF for processing
 - receipt of higher level SAGE III products from the SCF, via the SIPS interface, for archival and distribution
 - receipt of ACRIM products from the SCF, via the SIPS interface, for archival and distribution
4. NSIDC DAAC capabilities include:
- receipt of higher level MODIS snow and ice products from MODAPS, via the SIPS interface, for archival and distribution
 - Ingest of AMSR-E Level 0 data and related ancillary data
 - Receipt of the AMSR-E higher level products via the SIPS interface, for archival and distribution
 - Ingest of GLAS Level 0 data and related ancillary data
 - Distribution of GLAS Level 0 to the SCF for higher level processing
 - Receipt of the GLAS higher level products from the SCF, via the SIPS interface, for archival and distribution
5. SMC capabilities include:
- overall ECS system performance monitoring, coordinating, and setting system-wide policies and priorities

1. Introduction

1.1 Purpose and Scope

The purpose of the Segment/Design Specification for the Earth Observing System (EOS) Data and Information System (EOSDIS) Core System (ECS) is to provide an overview of the hardware and software subsystems of the project. This document describes the detailed design of each ECS software subsystem implemented to satisfy the allocated and derived functional and performance requirements. This document also provides basic descriptions of the Commercial Off The Shelf (COTS) hardware and software used in the ECS. This document contains:

- Functional overviews of each Computer Software Configuration Item (CSCI)
- Context diagrams of each CSCI
- Interface event descriptions based on the context diagrams
- Process architecture diagrams
- Interface event description tables based on the process architecture diagrams
- CSCI data stores (databases as they relate to the process architecture diagrams)
- CSCI functions allocated to processes. For data servers, this includes descriptions of the functionality offered to clients via the server interfaces. For Graphical User Interface (GUI) applications, it describes the functionality provided to the GUI users.
- Specific limitations of the capabilities provided
- Summary of object classes listed by CSCI
- Summary of class libraries listed by CSCI
- Abbreviations and Acronyms

Hyper-linked on-line documentation generated by ABC++ is provided to accompany this document. The various subsystems, sub-directories, processes, libraries, and classes can be browsed down to the code level. This documentation can be accessed through the Universal Resource Locator (URL) <http://scooby.hitc.com:8080/ecs/index.html> for those who have access to the ECS internally at the Landover Facility. For anyone not having access to the ECS internally at the Landover facility, the Data Management Office of the ECS Project must be contacted for access.

Under every process or library documented in Appendix A or B, there is a directory string. This string indicates the location of the Makefile and sources for the library.

This same directory string can be used to locate on-line documentation. This is accomplished by replacing the “/ecs/formal” part of the directory string with the URL for the on-line

documentation associated with the page on which the classes are listed along with the names of processes and libraries which share those classes.

1.2 Document Organization

The remainder of this document is organized as follows:

- Section 2: Related Documentation
- Section 3: System Description
- Section 4: Subsystem Descriptions
- Section 5: Limitations of Current Implementation
- Appendix A: Software Processes
- Appendix B: Software Libraries
- Abbreviations and Acronyms

2. Related Documentation

2.1 Parent Documents

The parent documents are the documents from which the scope and content of this Design Specification are derived. These documents are listed below.

194-207-SEI	System Design Specification for the ECS Project
305/DV2 (F)	Segment/Design Specifications for the ECS Project
334-CD-600	6A Science System Release Plan for the ECS Project
212-WP-002	Game Plan for the ECS Project

2.2 Applicable Documents

Documents referenced in this document are listed below.

920-series General documents

920-TDE-001	EDC Hardware Diagram (Design)
920-TDG-001	GSFC Hardware Diagram (Design)
920-TDL-001	LaRC Hardware Diagram (Design)
920-TDN-001	NSIDC Hardware Diagram (Design)
920-TDS-001	SMC Hardware Diagram (Design)
920-TDV-001	VATC Hardware Diagram (Design)
920-TDP-001	PVC Hardware Diagram (Design)
920-TDV-101	VATC-SMC Hardware Diagram (Design)
920-TDE-002	EDC Hdwe/Sfwe Mapping (COTS)
920-TDG-002	GSFC Hdwe/Sfwe Mapping (COTS)
920-TDL-002	LaRC Hdwe/Sfwe Mapping (COTS)
920-TDN-002	NSIDC Hdwe/Sfwe Mapping (COTS)
920-TDS-002	SMC Hdwe/Sfwe Mapping (COTS)
920-TDV-002	VATC Hdwe/Sfwe Mapping (COTS)

920-TDP-002	PVC Hdwe/Sfwe Mapping (COTS)
920-TDE-003	EDC System Infrastructure Assignments (DCE/ DNS/DTS Infra.)
920-TDG-003	GSFC System Infrastructure Assignments (DCE/ DNS/DTS Infra.)
920-TDL-003	LaRC System Infrastructure Assignments (DCE/ DNS/DTS Infra.)
920-TDN-003	NSIDC System Infrastructure Assignments (DCE/ DNS/DTS Infra.)
920-TDV-003	VATC System Infrastructure Assignments (DCE/ DNS/DTS Infra.)
920-TDP-003	PVC System Infrastructure Assignments (DCE/ DNS/DTS Infra.)
920-TDE-004	EDC Floor Plan
920-TDG-004	GSFC Floor Plan
920-TDL-004	LaRC Floor Plan
920-TDN-004	NSIDC Floor Plan
920-TDS-004	SMC Floor Plan
920-TDV-004	VATC Floor Plan
920-TDP-004	PVC Floor Plan
920-TDE-005	EDC Cable Management Plan
920-TDG-005	GSFC Cable Management Plan
920-TDL-005	LaRC Cable Management Plan
920-TDN-005	NSIDC Cable Management Plan
920-TDS-005	SMC Cable Management Plan
920-TDV-005	VATC Cable Management Plan
920-TDP-005	PVC Cable Management Plan
920-TDE-007	EDC Vendor Documentation List
920-TDG-007	GSFC Vendor Documentation List
920-TDL-007	LaRC Vendor Documentation List

920-TDN-007	NSIDC Vendor Documentation List
920-TDE-008	EDC Mount Points
920-TDG-008	GSFC Mount Points
920-TDL-008	LaRC Mount Points
920-TDN-008	NSIDC Mount Points
920-TDV-008	VATC Mount Points
920-TDP-008	PVC Mount Points
920-TDV-108	VATC-SMC Mount Points
920-TDE-009	EDC DAAC Baseline Hardware / Database Mapping
920-TDG-009	GSFC DAAC Baseline Hardware / Database Mapping
920-TDL-009	LaRC DAAC Baseline Hardware / Database Mapping
920-TDN-009	NSIDC DAAC Baseline Hardware / Database Mapping
920-TDS-009	SMC DAAC Baseline Hardware / Database Mapping
920-TDN-009	VATC DAAC Baseline Hardware / Database Mapping
920-TDP-009	PVC DAAC Baseline Hardware / Database Mapping
920-TDV-109	VATC-SMC DAAC Baseline Hardware / Database Mapping
920-TDE-010	EDC DAAC Baseline Database Configuration Listing (Superseded by 910-TDA-021)
920-TDG-010	GSFC DAAC Baseline Database Configuration Listing (Superseded by 910-TDA-021)
920-TDL-010	LaRC DAAC Baseline Database Configuration Listing (Superseded by 910-TDA-021)
920-TDN-010	NSIDC DAAC Baseline Database Configuration Listing (Superseded by 910-TDA-021)
920-TDV-010	VATC DAAC Baseline Database Configuration Listing (Superseded by 910-TDA-021)

920-TDE-012	EDC DAAC SCSI Cable Management Plan
920-TDG-012	GSFC DAAC SCSI Cable Management Plan
920-TDL-012	LaRC DAAC SCSI Cable Management Plan
920-TDN-012	NSIDC DAAC SCSI Cable Management Plan
920-TDP-012	PVC DAAC SCSI Cable Management Plan
920-TDE-013	EDC Custom Code Configuration Parameters (Superseded by 910-TDA-021)
920-TDG-013	GSFC Custom Code Configuration Parameters (Superseded by 910-TDA-021)
920-TDL-013	LaRC Custom Code Configuration Parameters (Superseded by 910-TDA-021)
920-TDN-013	NSIDC Custom Code Configuration Parameters (Superseded by 910-TDA-021)
920-TDV-013	VATC Custom Code Configuration Parameters (Superseded by 910-TDA-021)
920-TDE-014	EDC Operating System (OS) and COTS Hardware Patch Maps
920-TDG-014	GSFC Operating System (OS) and COTS Hardware Patch Maps
920-TDL-014	LaRC Operating System (OS) and COTS Hardware Patch Maps
920-TDN-014	NSIDC Operating System (OS) and COTS Hardware Patch Maps
920-TDS-014	SMC Operating System (OS) and COTS Hardware Patch Maps
920-TDV-014	VATC Operating System (OS) and COTS Hardware Patch Maps
920-TDP-014	PVC Operating System (OS) and COTS Hardware Patch Maps
920-TDE-015	EDC Sun Platform Unix Kernel Configuration Parameters
920-TDG-015	GSFC Sun Platform Unix Kernel Configuration Parameters
920-TDL-015	LaRC Sun Platform Unix Kernel Configuration Parameters
920-TDN-015	NSIDC Sun Platform Unix Kernel Configuration Parameters
920-TDS-015	SMC Sun Platform Unix Kernel Configuration Parameters

920-TDV-015	VATC Sun Platform Unix Kernel Configuration Parameters
920-TDP-015	PVC Sun Platform Unix Kernel Configuration Parameters
920-TDV-115	VATC-SMC Sun Platform Unix Kernel Configuration Parameters
920-TDE-016	EDC SGI Platform Unix Kernel Configuration Parameters
920-TDG-016	GSFC SGI Platform Unix Kernel Configuration Parameters
920-TDL-016	LaRC SGI Platform Unix Kernel Configuration Parameters
920-TDN-016	NSIDC SGI Platform Unix Kernel Configuration Parameters
920-TDV-016	VATC SGI Platform Unix Kernel Configuration Parameters
920-TDP-016	PVC SGI Platform Unix Kernel Configuration Parameters
920-TDV-116	VATC-SMC SGI Platform Unix Kernel Configuration Parameters
920-TDE-017	EDC HP Platform Unix Kernel Configuration Parameters
920-TDG-017	GSFC HP Platform Unix Kernel Configuration Parameters
920-TDL-017	LaRC HP Platform Unix Kernel Configuration Parameters
920-TDN-017	NSIDC HP Platform Unix Kernel Configuration Parameters
920-TDS-017	SMC HP Platform Unix Kernel Configuration Parameters
920-TDV-017	VATC HP Platform Unix Kernel Configuration Parameters
920-TDP-017	PVC HP Platform Unix Kernel Configuration Parameters
920-TDV-117	VATC-SMC HP Platform Unix Kernel Configuration Parameters
920-TDE-018	EDC Host Memory Configuration Parameters
920-TDG-018	GSFC Host Memory Configuration Parameters
920-TDL-018	LaRC Host Memory Configuration Parameters
920-TDN-018	NSIDC Host Memory Configuration Parameters
920-TDS-018	SMC Host Memory Configuration Parameters
920-TDV-018	VATC Host Memory Configuration Parameters
920-TDP-018	PVC Host Memory Configuration Parameters

920-TDV-118	VATC-SMC Host Memory Configuration Parameters
920-TDE-019	EDC Custom Code Baseline Configuration Parameters
920-TDG-019	GSFC Custom Code Baseline Configuration Parameters
920-TDL-019	LaRC Custom Code Baseline Configuration Parameters
920-TDN-019	NSIDC Custom Code Baseline Configuration Parameters
920-TDS-019	SMC Custom Code Baseline Configuration Parameters
920-TDV-019	VATC Custom Code Baseline Configuration Parameters
920-TDP-019	PVC Custom Code Baseline Configuration Parameters

921-series Network Infrastructure documents

921-TDG-001	GSFC Network Overview Diagram (LAN Topology)
921-TDL-001	LaRC Network Overview Diagram (LAN Topology)
921-TDE-002	EDC Hardware / Network Diagram
921-TDG-002	GSFC Hardware / Network Diagram
921-TDL-002	LaRC Hardware / Network Diagram
921-TDN-002	NSIDC Hardware / Network Diagram
921-TDS-002	SMC Hardware / Network Diagram
921-TDV-002	VATC Hardware / Network Diagram
921-TDP-002	PVC Hardware / Network Diagram
921-TDV-102	VATC-SMC Hardware / Network Diagram
921-TDE-003	EDC Host IP (Address) Assignments
921-TDG-003	GSFC Host IP (Address) Assignments
921-TDL-003	LaRC Host IP (Address) Assignments
921-TDN-003	NSIDC Host IP (Address) Assignments
921-TDS-003	SMC Host IP (Address) Assignments

921-TDV-003	VATC Host IP (Address) Assignments
921-TDP-003	PVC Host IP (Address) Assignments
921-TDV-103	VATC-SMC Host IP (Address) Assignments
921-TDE-004	EDC Network IP (Address) Assignments (DAAC Network Hardware)
921-TDG-004	GSFC Network IP (Address) Assignments
921-TDL-004	LaRC Network IP (Address) Assignments
921-TDN-004	NSIDC Network IP (Address) Assignments
921-TDS-004	SMC Network IP (Address) Assignments
921-TDV-004	VATC Network IP (Address) Assignments
921-TDP-004	PVC Network IP (Address) Assignments
921-TDV-104	VATC-SMC IP Address Assignments
921-TDE-005	EDC Dual-Homed Host Static Routes
921-TDG-005	GSFC Dual-Homed Host Static Routes
921-TDL-005	LaRC Dual-Homed Host Static Routes
921-TDN-005	NSIDC Dual-Homed Host Static Routes
921-TDV-005	VATC Dual-Homed Host Static Routes
921-TDP-005	PVC Dual-Homed Host Static Routes
921-TDE-006	EDC Ingest Host Static Routes
921-TDG-006	GSFC Ingest Host Static Routes
921-TDL-006	LaRC Ingest Host Static Routes

922-series Disk Partitions documents

922-TDE-001	EDC APC Server
922-TDG-001	GSFC APC Server
922-TDL-001	LaRC APC Server
922-TDN-001	NSIDC APC Server

922-TDV-001	VATC APC Server
922-TDP-001	PVC APC Server
922-TDE-002	EDC Application Server
922-TDG-002	GSFC Application Server
922-TDL-002	LaRC Application Server
922-TDN-002	NSIDC Application Server
922-TDS-002	SMC Application Server
922-TDV-002	VATC Application Server
922-TDP-002	PVC Application Server
922-TDG-003	GSFC AQA Host
922-TDL-003	LaRC AQA Host
922-TDE-005	EDC CSS Server
922-TDG-005	GSFC CSS Server
922-TDL-005	LaRC CSS Server
922-TDN-005	NSIDC CSS Server
922-TDP-005	PVC CSS Server
922-TDE-006	EDC Distribution Server
922-TDG-006	GSFC Distribution Server
922-TDL-006	LaRC Distribution Server
922-TDN-006	NSIDC Distribution Server
922-TDP-006	PVC Distribution Server
922-TDE-007	EDC FSMS Server
922-TDG-007	GSFC FSMS Server

922-TDL-007	LaRC FSMS Server
922-TDN-007	NSIDC FSMS Server
922-TDV-007	VATC FSMS Server
922-TDP-007	PVC FSMS Server
922-TDE-008	EDC Ingest Server
922-TDG-008	GSFC Ingest Server
922-TDL-008	LaRC Ingest Server
922-TDN-008	NSIDC Ingest Server
922-TDV-008	VATC Ingest Server
922-TDP-008	PVC Ingest Server
922-TDE-009	EDC Interface Server
922-TDG-009	GSFC Interface Server
922-TDL-009	LaRC Interface Server
922-TDN-009	NSIDC Interface Server
922-TDP-009	PVC Interface Server
922-TDE-010	EDC MSS Server
922-TDG-010	GSFC MSS Server
922-TDL-010	LaRC MSS Server
922-TDN-010	NSIDC MSS Server
922-TDS-010	SMC MSS Server
922-TDV-010	VATC MSS Server
922-TDP-010	PVC MSS Server
922-TDE-011	EDC MSS File Server / CM Server
922-TDG-011	GSFC MSS File Server / CM Server

922-TDL-011	LaRC MSS File Server / CM Server
922-TDN-011	NSIDC MSS File Server / CM Server
922-TDS-011	SMC MSS File Server / CM Server
922-TDV-011	VATC MSS File Server / CM Server
922-TDP-011	PVC MSS File Server / CM Server
922-TDE-012	EDC OPS Workstation
922-TDG-012	GSFC OPS Workstation
922-TDL-012	LaRC OPS Workstation
922-TDN-012	NSIDC OPS Workstation
922-TDP-012	PVC OPS Workstation
922-TDE-013	EDC PDPS DBMS Server
922-TDG-013	GSFC PDPS DBMS Server
922-TDL-013	LaRC PDPS DBMS Server
922-TDN-013	NSIDC PDPS DBMS Server
922-TDV-013	VATC PDPS DBMS Server
922-TDP-013	PVC PDPS DBMS Server
922-TDE-014	EDC Queuing Server
922-TDG-014	GSFC Queuing Server
922-TDL-014	LaRC Queuing Server
922-TDN-014	NSIDC Queuing Server
922-TDV-014	VATC Queuing Server
922-TDP-014	PVC Queuing Server
922-TDE-015	EDC Science Processor
922-TDG-015	GSFC Science Processor

922-TDL-015	LaRC Science Processor
922-TDN-015	NSIDC Science Processor
922-TDV-015	VATC Science Processor
922-TDP-015	PVC Science Processor
922-TDE-016	EDC SDSRV Server
922-TDG-016	GSFC SDSRV Server
922-TDL-016	LaRC SDSRV Server
922-TDN-016	NSIDC SDSRV Server
922-TDP-016	PVC SDSRV Server
922-TDE-017	EDC Sybase Staging Server
922-TDG-017	GSFC Sybase Staging Server
922-TDL-017	LaRC Sybase Staging Server
922-TDN-017	NSIDC Sybase Staging Server
922-TDV-017	VATC Sybase Staging Server
922-TDE-018	EDC Working Storage Server
922-TDV-018	VATC Working Storage Server
922-TDP-018	PVC Working Storage Server
922-TDL-020	LaRC Science Processor # 2
922-TDE-021	EDC AIT Workstation/DBMS Server
922-TDG-021	GSFC AIT Workstation/DBMS Server
922-TDL-021	LaRC AIT Workstation/DBMS Server
922-TDN-021	NSIDC AIT Workstation/DBMS Server
922-TDP-021	PVC AIT Workstation/DBMS Server

922-TDE-022	EDC AIT Workstation
922-TDG-022	GSFC AIT Workstation
922-TDL-022	LaRC AIT Workstation
922-TDP-022	PVC AIT Workstation
922-TDE-023	EDC Planning Management Workstation
922-TDG-023	GSFC Planning Management Workstation
922-TDL-023	LaRC Planning Management Workstation
922-TDN-023	NSIDC Planning Management Workstation
922-TDE-024	LUT Sybase Server
922-TDE-025	DEM Science Server
922-TDE-027	EDC Data Spec Workstation
922-TDG-027	GSFC Data Spec Workstation
922-TDL-027	LaRC Data Spec Workstation
922-TDN-027	NSIDC Data Spec Workstation
922-TDP-027	PVC Data Spec Workstation
922-TDE-028	EDC ACSLS Workstation
922-TDG-028	GSFC ACSLS Workstation
922-TDL-028	LaRC ACSLS Workstation
922-TDP-028	PVC ACSLS Workstation
922-TDE-029	EDC Ingest Workstation
922-TDG-029	GSFC Ingest Workstation

922-TDL-029	LaRC Ingest Workstation
922-TDP-029	PVC Ingest Workstation
922-TDE-031	EDC Tape System Backup Server
922-TDG-031	GSFC Tape System Backup Server
922-TDL-031	LaRC Tape System Backup Server
922-TDN-031	NSIDC Tape System Backup Server
922-TDP-031	PVC Tape System Backup Server
922-TDE-032	EDC QA Workstation
922-TDG-032	GSFC QA Workstation
922-TDL-032	LaRC QA Workstation
922-TDN-032	NSIDC QA Workstation
922-TDP-032	PVC QA Workstation
922-TDE-033	EDC Planning Management Workstation
922-TDP-033	PVC Planning Management Workstation
922-TDE-034	EDC AIT Server
922-TDE-035	EDC DISK/RAID Driver
922-TDG-035	GSFC DISK/RAID Driver
922-TDL-035	LaRC DISK/RAID Driver
922-TDN-035	NSIDC DISK/RAID Driver
922-TDP-035	PVC DISK/RAID Driver
922-TDG-036	GSFC FSMS Workstation

922-TDE-037	EDC Xterm Server
922-TDL-037	LaRC Xterm Server
922-TDE-038	EDC Landsat 7 Simulator Disk RAID
922-TDG-039	GSFC MODAPS Server Disk
922-TDP-039	PVC MODAPS Server Disk
922-TDP-040	PVC EDOS/LPS Workstation Disk
922-TDP-041	PVC Push Area Workstation Disk
922-TDE-042	EDC Console Manager Disk
922-TDG-042	GSFC Console Manager Disk
922-TDL-042	LaRC Console Manager Disk
922-TDN-042	NSIDC Console Manager Disk

2.2.1 Other Related Documents and Documentation

205-CD-004	Science User's Guide and Operations Procedures Handbook (Release B.0) for the ECS Project
311-CD-606	Subscription Server Database Design and Schema Specifications for the ECS Project
313-CD-600	6A ECS Internal Interface Control Document for the ECS Project
333-CD-600	Release 6A SDP Toolkit User's Guide for the ECS Project
611-CD-600	Release 6A Mission Operations Procedures for the ECS Project, Section 3.2
625-CD-504	ECS Project Training Material Volume 4: System Administration (System Startup and Shutdown section)
193-801-SD4	PGS Toolkit Requirements Specification for the ECS Project (a.k.a. GSFC 423-06-02)

193-WP-118	Algorithm Integration and Test Issues, White Paper for the ECS Project
194-WP-925	Science Software Integration and Test White Paper for the ECS Project
423-16-01	Data Production Software and Science Computing Facility (SCF) Standards and Guidelines
423-42-06	Interface Control Definition for the EOS Data Gateway (EDG): Messages and Development Data Dictionary V0 and ASTER/ECS Message Passing Protocol Specification
COTS	XRP-II Manual
RFC	793 Transmission Control Protocol
RFC	768 User Datagram Protocol
RFC	791 Internet Protocol
RFC	1597 Address Allocation for Private Internet
	WWW page http://cmdm.east.hitc.com/baseline

2.3 Information Documents Not Referenced

The documents listed below, while not directly applicable, help in the maintenance of the delivered software.

The documents listed below, while not directly applicable, help in the maintenance of the delivered software.

423-41-02	Goddard Space Flight Center, Functional and Performance Requirements Specification for the Earth Observing System Data and Information System Core System
423-41-03	EOSDIS Core System Contract Data Requirements Document
540-022	Goddard Space Flight Center, Earth Observing System Communications System Interface Requirements Document
560-EDOS-0211.0001	Goddard Space Flight Center, Interface Requirements Document between EDOS and the EOS Ground System

2.4 ECS Tool Descriptions

2.4.1 Discover

Discover is an information system for software engineering that transforms a code base into a tangible asset by enabling a software engineer's code comprehension, analysis of impact to code,

and automated support of metrics collection. Discover starts with the creation of an Information Model, a highly associative database. The Information Model stores and tracks every entity, attribute and relationship between software objects. The Discover products do leverage off the Information Model to provide a variety of graphical and narrative development, engineering analysis, and quality assessment tools. The use of Discover on the ECS Program has been customized to take advantage of a selected set of Discover tools. However, the broad spectrum of tools is available for the more experienced user to use. The major activities provided for use by the user are:

1. Basic Navigation and Query – How to navigate in the Discover environment, taking advantage of the query mechanisms provided by the Discover Browser.
2. Results Collection – How to make query results logical groupings (groups) to assist in better understanding and management of system components.
3. Graphical Representations – How to use the graphical views to understand the relationships of code, which include:

Call Trees – Header file or function calling relationships

Outline – Representation of the code Structure

Flowchart – Overview of the program flow which also depicts complexity

Class Inheritance Diagrams – Shows class hierarchy according to a particular class

Entity Relationship Diagram (ERD) – A methodology independent representation of the relationships between C++ classes similar to object diagrams

Graphs – Shows the possible paths between two functions.

4. Impact Analysis – How to use the ECS customized “Modified Entities Report” which is a single push button action to determine what has been changed, the extent of the change, and the quality of the change made by a software engineer.

Detailed instructions for the use of the Discover tool are provided in the Discover User Training Version 5.1 slide presentation.

2.4.2 ABC++

ABC++ is a program that creates on-line and hard copy documentation for C, C++, and Java programs by analyzing the source and header files. It is "piggybacked" onto the C++ and Java compilers, librarian programs, and linker such that in the process of building all of the components of a project, documentation pages are automatically generated.

For C++, an HTML documentation page is generated for each source file, which is compiled. A documentation page is generated for each header file included either directly or indirectly by the compilation. If one or more source files are compiled, which implement a header file previously compiled, a combined module documentation page is generated which indicates the header and all sources that implement it. For Java, a documentation page is generated for each Java module

compiled and for each Java module imported directly or indirectly by an explicitly compiled module.

For each module documented, the classes, functions, variables, constants, templates, and macros are catalogued, forming a reference manual by which the various components may be located easily by Hyperlinks. Comments, extracted from the code are associated with each declaration.

For each library or program built, an HTML documentation page is generated listing all the classes, functions, variables, etc., which are globally accessible. For each program, a list of libraries linked is generated. Along with each of these names, the first sentence of the comments on the various components is also displayed. A description of the program or library is obtained, if available, from a text file called lib_<libraryName> or prg_<programName> located in the directory the program or library is built.

After all modules have been compiled, a set of directories is generated in HTML, locating all modules and their global internal components, and describing each of these items with the first sentence from their descriptions. A description of any given directory is obtained, if available from a file called "index.txt" in that directory.

Hard copy (in RTF, which is compatible with MS-Word) may be extracted as desired from the various documentation pages. For the purposes of this document, this is limited to the indexes of classes and templates in each library plus the list of non-COTS libraries linked for each program.

An HTML representation of every source and header file is also generated such that every user-defined name, every overloaded operator, every "include", and every import is linked to its definition. This makes it possible to browse everywhere in the project. Hyperlinks from the documentation pages to the source/header pages allow one to jump directly into the code in order to understand it if the comments in the code do not explain it well enough.

A complete cross-reference is generated in the process of building these pages. The user can obtain a list of Hyperlinks locating every reference to a particular overload of a name or function anywhere in the entire project.

The on-line ECS documentation can be accessed with Netscape at the following URL (for the time being anyway):

<http://scooby.hitc.com:8080/ecs>

A link to the above page called ABC++ ECS Documentation is also given on the Internal Server Page as:

<http://dmsserver.gsfc.nasa.gov/>

that can be accessed from the ECS Data Handling System (EDHS):

<http://edhs1.gsfc.nasa.gov/>

2.4.3 Rational Rose

The Rational Rose tool provides support for object-oriented analysis and design. In particular, the Rose tool provides support for controlled-iterative or component-based development. The Rose tool is used on the ECS Project to document the object-oriented elements of the design using class diagrams, use-case diagrams, interaction diagrams, component diagrams, and object diagrams. The Unified Modeling Language (UML) is the methodology used on the ECS Project for all design activities (although the Rose tool also supports the Booch '93 Methodology or the Object Modeling Technique (OMT) as well).

The Rose tool can also be used to reverse engineer code developed that lacks supporting documentation to get as-built object diagrams.

Before using the Rational Rose tool, see “Rational Rose 98, Using Rose” for important tool usage and reference information. In addition, the following references can be obtained and used:

- (1) “Unified Method for Object-Oriented Development,” by Grady Booch and Jim Rumbaugh (version 1.1, Rational Software Corporation) for an introduction to the respective method’s notation, semantics, and process for object-oriented analysis and design.
- (2) the second edition of “Object-Oriented Analysis and Design with Applications” by Grady Booch, (Benjamin/Cummings, 1994)
- (3) “Object-Oriented Modeling and Design” by James Rumbaugh, Michael Blaha, William Premerlani, Frederick Eddy and William Lorensen, (Prentice-Hall, 1991)

3. System Description

3.1 Release 6A Objectives

3.1.1 Release 6A Capabilities

The ECS capabilities are developed in increments called formal releases. Release 6A, which is controlled by Configuration Management, provides capabilities to support the Ingest and archive of raw data obtained from the EOS AM Mission spacecraft 1, morning equator crossing spacecraft series (Terra (AM-1)), EOS PM Mission spacecraft 1, afternoon equator crossing spacecraft series (Aqua (PM-1)) and the Land Remote-Sensing Satellite (Landsat 7). Other capabilities provided by Release 6A include processing the data obtained, distributing raw or processed data as requested, quality assurance of processed data, supporting communication networks, and systems monitoring via interfaces with the ECS operations staff.

Release 6A capabilities include:

- support the regeneration and archive of products previously produced and archived
- support ingest, production, storage, and distribution of Terra and Aqua instrument data
- support writing files to CD-ROMs and DLT tape drives for distribution
- provide access to non-science data collections by a limited number of attributes and values
- provide Science Data Server scalability/operability improvements
- support FTP Pull Subscription
- provide machine-to-machine gateway support between SIPS and ECS for data orders
- provide capability for operator deletion of granules
- allow users to request a data processing request associated with a DAR at the time of submittal
- ingest and archival of Terra (AM-1) and other science and engineering data from the EDOS and Landsat 7 Level 0 Reformatted (LOR) data from the Landsat 7 Processing System (LPS)
- ingest of Product Generation Executive (PGE) software from a Science Computing Facility (SCF) either electronically or via media tape
- archival, production, and Quality Assurance (QA) processing of Terra (AM-1) science data products, science software integration and test, and the associated communications network interfaces with the SCF
- operator interfaces for production and resource planning

- directory and inventory search, including a user browse capability via the Version Zero (V0) System user interface
- receiving requests for science data products and distributing science data products via FTP and 8mm tape (**Note:** 8MM can only be obtained via the V0 Gateway and routed to the PDS for Release 6A. 8mm cannot be selected via the ODFRM or the Subscription Server.)
- interfacing with the Advanced Space-borne Thermal Emission and Reflection Radiometer (ASTER) Ground Data System (GDS) for the submission of Data Acquisition Requests (DARs) for data collection by the ASTER instrument aboard the Terra (AM-1) spacecraft
- ingest of ASTER Level 1A/1B data from the ASTER GDS
- managing the startup and shutdown of system network components, user registration and profile administration, database and archive administration, system data and file back-up and restores, system performance tuning and resource usage monitoring, and other routine operator duties
- support of DAR submittals and DAR query status between the ECS Java DAR Tool and the ASTER GDS via the MOJO Gateway
- support the display of browse data as a result of a single user request from the search results screen
- support to submit on-demand requests to the ASTER GDS for the generation of Level 1B products
- support the searching and ordering of ECS data products by the ASTER GDS
- support the searching and ordering of ASTER GDS products by ECS users
- V0 Gateway support for client requests for searches based on full ECS core metadata and product specific attributes, Landsat7 floating scenes, and band subsetting, and Landsat 7 data billing information
- SDP Toolkit support for thread safe concurrent processing by the science software
- user authorization checks to restrict data set access at the granule level based on data quality information
- support for five new production rules required for PM-1
- automated support for on-demand requests for ASTER processing
- operations support to update certain ESDT attributes without requiring the deletion of the data collection
- ESDTs to support MODIS, AIRS, and AMSR on PM-1
- support for data retrieval and distribution of a subset of a Landsat 7 granule as selected by floating scenes and/or individual bands

- delivery of Terra (AM-1) ancillary data files for use at other DAAC sites
- spatial container changes for ASTER L1A/L1B from bounded rectangle to gpolygon
- ingest of FDS (formerly FDD) orbit data via polling without DR
- ingest of SAGE III MOC granules into the Science Data Server via SIPS interface
- ingest of SAGE III SCF granules into the Science Data Server via the SIPS interface
- ingest of DAS HDF EOS data via standard polling with DR
- ingest standard ECS products, including MODAPS and MOPITT SCF via the SIPS interface
- ingest data resident in the SDPS across a mode in the same DAAC or across DAACs
- ingest of ASTER 14 DEM granules into the Science Data Server via the SIPS interface
- ingest of ACRIM L0 and higher level data from the ACRIM SCF via the SIPS interface
- SSI&T support for PM-1 (AIRS and MODIS)
- mapping of data collection to information manager
- editing of ECS core attribute values
- consolidation of trouble tickets using the Remedy Tool
- fault recovery for mode management
- startup and shutdown of an entire mode
- encryption of the subscription server FTP password in the Science Data Server database
- support of production rules to allow multiple L0 granules as input into a single PGE
- support of production rules for most recent granule and optional DPRs
- tracking Landsat 7 order processing via MSS
- deletion of science data from the archive without deleting the corresponding metadata
- Configurable parameters to control the number of granules returned from a single search request
- handling of variations on search areas and product-specific spatial representations
- installation of ESDTs to insert and acquire archived data without the archive storage directory names
- processing of orbit, attitude, and ephemeris data into toolkit native format and HDF
- persistence of asynchronous acquire requests, which do not have callback functions
- storage of event information into the SDSRV database instead of flat files
- monitoring of the usage of memory by the Science Data Server

- provides COTS packages to allow operations to generate customized reports from ECS databases
- production rules for the closest granule, the spatial pad, and orbit processing of run time parameters
- provide a single configuration registry database to replace the numerous ECS application configuration files
- capability to associate the ASTER browse granule for the L1A product with the ASTER L1B and DEM products

ECS Release 6A has been distributed to five site locations including:

1. the System Management Center (SMC), located at the Goddard Space Flight Center (GSFC),
2. the DAAC at GSFC,
3. the DAAC at the Langley Research Center (LaRC),
4. the DAAC at the Earth Resource Observation System (EROS) Data Center (EDC)
5. the DAAC at the National Snow and Ice Center (NSIDC)

The ECS Release 6A communications network includes the National Aeronautics and Space Administration (NASA) Science Internet (NSI) and the EOSDIS Backbone Network (EBnet). These portions of the network are physically located at the SMC and at the DAAC sites. The communications network connects ECS to data providers at the EDOS, the Landsat 7 Processing System (LPS), NOAA Affiliated Data Center (ADC), and the EOSDIS Version 0 system.

The data users for Release 6A are the science user community connected to the four DAACs, the SCFs, and the ASTER GDS.

3.1.2 Release 6A Instrument and DAAC Support

ECS Release 6A supports the following instrument data operations and DAACs.

- Terra (AM-1) Support:

ECS Release 6A supports archiving, processing, and distributing instrument data from a complement of four Terra (AM-1) instruments. These instruments are ASTER, Multi-Imaging SpectroRadiometer (MISR), Moderate-Resolution Imaging SpectroRadiometer (MODIS), and Measurements Of Pollution In The Troposphere (MOPITT).

ECS Release 6A provides a communications network and data/information management support for:

- ASTER instrument data including the receipt of ASTER level 1 data on magnetic tape at EDC from Japan, and the production and distribution of higher level ASTER products by EDC.

- MISR instrument data including the receipt of MISR level 0 data and the LaRC archive, production, and distribution of levels 1, 2 and 3 data and data products.
 - MODIS instrument data including level 0 data: archive, production, and distribution of levels 1A and 1B including distribution of the 1A and 1B data to the MODIS Data Processing System (MODAPS) for higher level processing. The receiving of higher level MODIS products from MODAPS via the SIPS interface is also supported.
 - MOPITT instrument data including the receipt of MOPITT level 0 data, and the LaRC archive, production, and distribution of levels 1, 2 and 3 data. During the initial period after launch, the MOPITT higher level products are generated at the SCF and provided to the ECS via the SIPS interface.
- Landsat 7 Support:
 - ECS Release 6A provides a repository for Landsat 7 L0R (L0 reformatted) data. The ECS communications network includes interfaces with the Landsat 7 system elements, the Mission Management Office (MMO), and the Ground Data Processing System (GDPS). The GDPS is composed of the Landsat 7 Processing System and the Image Assessment System (IAS).
 - The ECS network interfaces are needed to receive product cost information, exchange of registration services, and system management status from the MMO. The ECS receives and stores Landsat 7 level 0R data, metadata, and browse data from the LPS. The ECS also receives calibration data and metadata from the IAS. ECS network interfaces for data search, data order, and data distribution services to Landsat 7 users are also provided in Release 6A.
 - SAGE III Support
 - ECS Release 6A supports receiving SAGE III Level 0 data from the SAGE III MOC, provides the level 0 data to the SAGE III SCF, and receives higher level products from the SCF via the SIPS interface.
 - ACRIM Support
 - ECS Release 6A supports receiving ACRIM L0 data and higher level products from the SCF via the SIPS interface.
 - Aqua (PM-1) Support

ECS Release 6A supports archiving, processing, and distributing instrument data from a complement of five Aqua (PM-1) instruments. These instruments are Atmospheric Infrared Sounder (AIRS), Humidity Sounder for Brazil (HSB), Advanced Microwave Sounding Unit (AMSU), Advanced Microwave Scanning Radiometer - EOS (AMSR-E), and Moderate-Resolution Imaging SpectroRadiometer (MODIS).

ECS Release 6A provides a communications network and data/information management support for:

- AIRS/HSB/AMSU instrument data including the receipt of AIRS/HSB/AMSU level 0 data and the GSFC archive, production, and distribution of levels 1, 2 and 3 data and data products.
- MODIS instrument data including level 0 data: archive, production, and distribution of levels 1A and 1B including distribution of the 1A and 1B data to the MODIS Data Processing System (MODAPS) for higher level processing. The receiving of higher level MODIS products from MODAPS via the SIPS interface is also supported.
- AMSR-E instrument data including the receipt of level 0 data from EDOS, and the NSIDC archive and distribution of levels 1, 2 and 3 data. The Level 1A data is received from the NSIDC V0 DAAC while the level 2 and 3 data is received from the AMSR-E SCF via the SIPS interface.
- ICESAT/GLAS Support
 - ECS Release 6A supports the ingest of ICESAT GLAS level 1, level 2, level 3 and ancillary input data for archive and distribution at the NSIDC DAAC using the standard SIPS interface. The ECS also archives GLAS level 0 data received from EDOS.
- GSFC Data Assimilation Office (DAO) Support
 - ECS Release 6A provides communications network interfaces to support the DAO in the receipt, archive, and distribution of data from NOAA's National Meteorological Center (NMC) and AM-1 instruments. This includes the ingest of NMC Levels 1-3 data sets and the archive, production, and distribution of ECS Level 4 data by GSFC.

3.2 Release 6A Architecture Overview

The ECS Release 6A architecture comprises the logical items listed here. Commercial Off The Shelf (COTS) software and hardware are used, to the extent possible, to implement the ECS functionality of these logical items.

- System
- Segments
- Subsystems
- Computer software configuration items (CSCIs)
- Computer software components (CSCs)
- Processes

ECS Release 6A was built of the following two segments.

- CSMS – Communications and Systems Management Segment
- SDPS – Science Data Processing Segment

Each segment was in turn built of the following subsystems.

- CSMS: CSS - Communications Subsystem
ISS - Internetworking Subsystem
MSS - System Management Subsystem
- SDPS: CLS - Client Subsystem
DMS - Data Management Subsystem
IOS- Interoperability Subsystem
DSS - Data Server Subsystem
PLS - Planning Subsystem
DPS - Data Processing Subsystem
INS - Ingest Subsystem

System: A stand-alone composite of hardware, facilities, material, software, services, and personnel required for operation based upon a defined set of system level requirements and designed as a related set of capabilities and procedures.

Segment: A logical and functional subset of related capabilities, implemented with COTS hardware and COTS and custom developed software to satisfy a defined subset of the system level requirements.

Subsystem: A logical subset of Segment related capabilities, implemented with COTS hardware and COTS and custom developed software to satisfy a defined subset of segment level requirements.

CSCI: A logical subset of Subsystem related capabilities, implemented with COTS and custom developed software to satisfy a defined subset of the subsystem level software requirements.

CSC: A logical subset of CSCI related capabilities, implemented with COTS and custom developed software to satisfy a defined subset of the CSCI level software requirements.

Process: A logical and functional set of software, written in a specific order and in a defined manageable size to manipulate data as part of a product-generating algorithm. A process is a separately compiled executable (i.e., binary image). A process can use infrastructure library calls, system service calls, COTS service calls, and application programming interfaces to manipulate data to generate products.

Figure 3.2-1 is a hierarchical software diagram. The hierarchical software diagram depicts an example of the decomposition levels used in the ECS design and described in this document. The diagram is also a graphical representation of the terms just described.

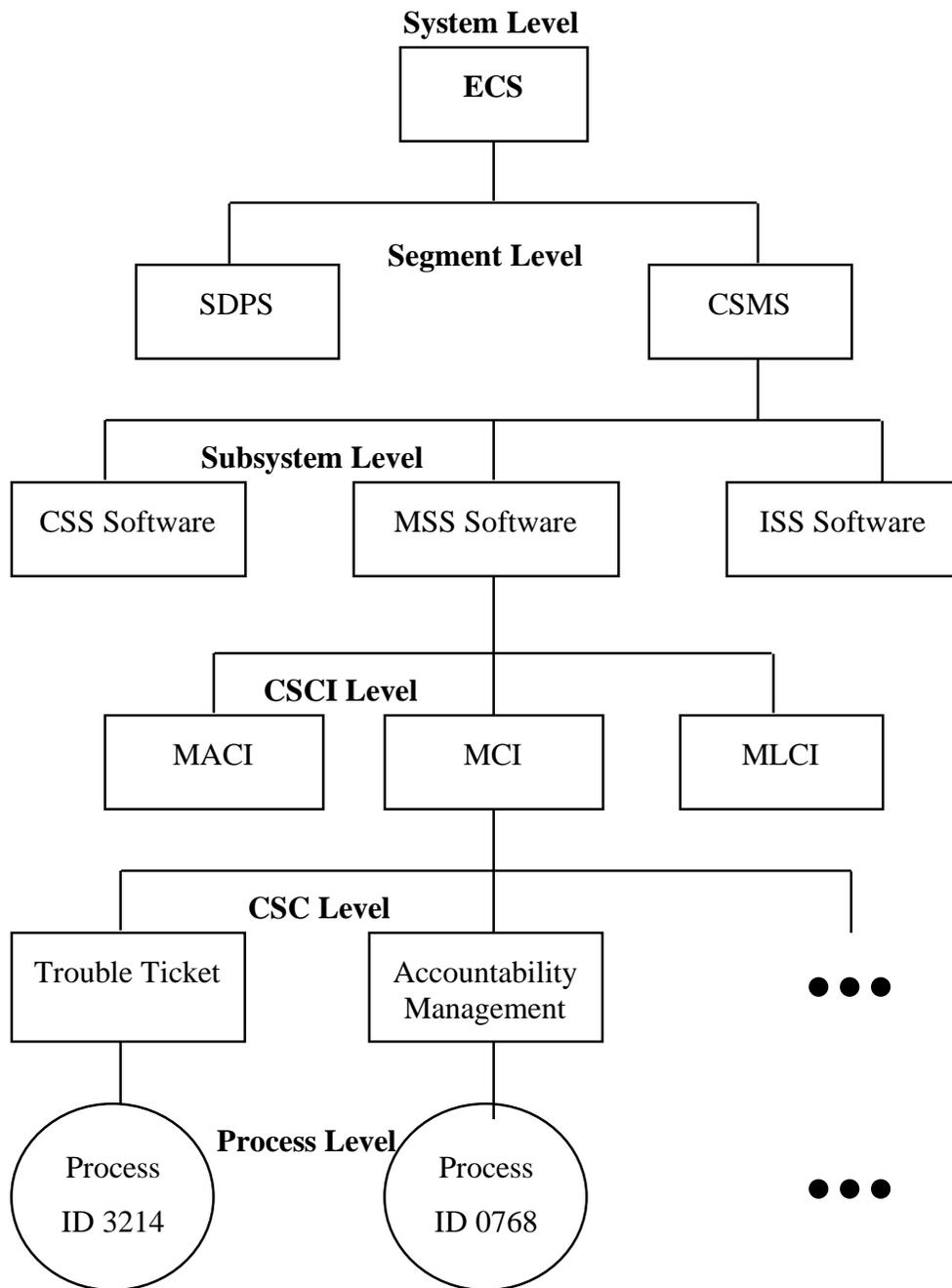


Figure 3.2-1. Example Hierarchical Software Diagram

3.2.1 Release 6A Context Description

ECS Release 6A provides the capability to collect and process satellite science data as depicted in Figure 3.2.1-1.

The Science Data Processing and Communications and Systems Management are the two segments of the ECS Release 6A described in this document. The Science Data Processing Segment (SDPS) provides science data ingest and production, search and access functions, data archive, and system management capabilities. The SDPS receives Terra (AM-1) and PM-1 Level 0 science data from EDOS and LOR Data from the Landsat 7 Processing System. The SDPS exchanges data with the ASTER GDS and other affiliated data centers to obtain science and other data (i.e., engineering and ancillary) required for data production. It also connects with the ASTER GDS to submit ASTER Data Acquisition Requests (DARs) for the collection of science data by the ASTER instrument. Science algorithms, provided by the Science Computing Facilities (SCFs), are used in data production to transform data into higher level products (Level 1 to Level 4 products) for research. The ECS project uses SCF expertise to support the Quality Assurance activities of using the results of the Science Software Integration and Test (SSIT) activities to process data and verify the data production science algorithms prior to actual data production. The Communications and Systems Management Segment (CSMS) provides the communications infrastructure for the ECS and systems management for all of the ECS hardware and software components. The CSMS provides the interconnection between users and service providers within the ECS, transfer of information between subsystems, CSCIs, CSCs, and processes of the ECS.

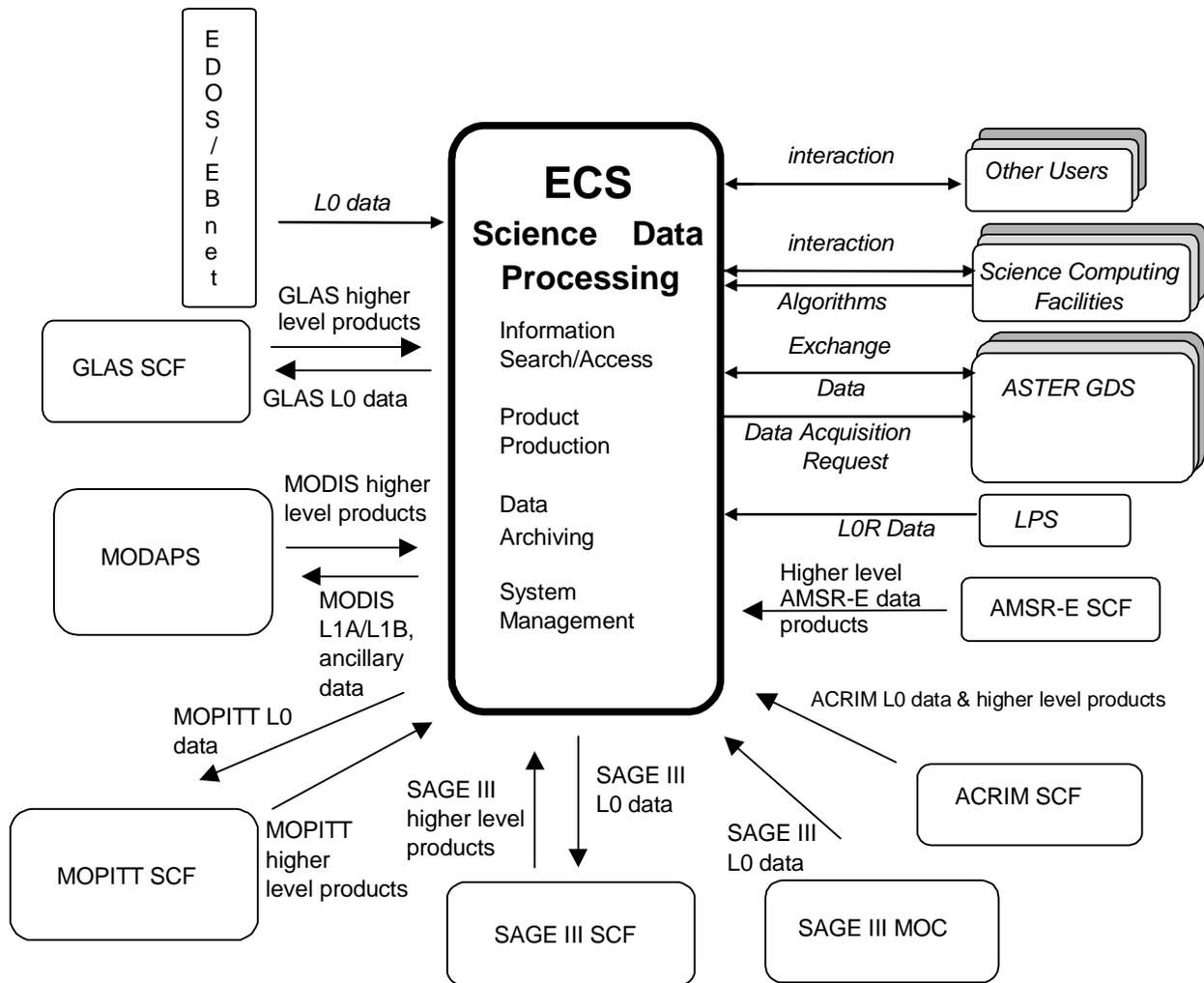


Figure 3.2.1-1. Release 6A Context Diagram

The remaining sections of this document provide an overview of the ECS Release 6A design and as such do not deal specifically with the configuration of components at each EOSDIS site. For more information on the site unique configurations, refer to the 920-series of General documents. Each of the segments consists of subsystems as specified in Section 3.2.

3.2.2 Release 6A Architecture

3.2.2.1 Subsystem Architecture

The ECS SDPS subsystems are depicted in Figure 3.2.2.1-1. A subsystem consists of the Commercial Off The Shelf (COTS) and/or ECS developed software and the COTS hardware needed for its execution. The SDPS subsystems can be grouped into a 'Push' or 'Pull' category

of functionality with the exception of DSS. The information search and data retrieval makes up the ‘Pull’ side of the ECS architecture/design and consists of the CLS, DMS, IOS and also uses the DSS functionality described on the ‘Push’ side of the ECS architecture. Data capture (ingest of data), storage management, planning and data processing of satellite or previously archived data from other sites make up the ‘Push’ side of the ECS architecture/design and consists of the DSS, INS, PLS, and DPS. This document describes the software and hardware components of each subsystem. However, since the hardware configurations differ between the sites, the hardware descriptions in this document are at a generic level. Specific hardware and network configurations for each site are documented in the 921-series Network Infrastructure documents.

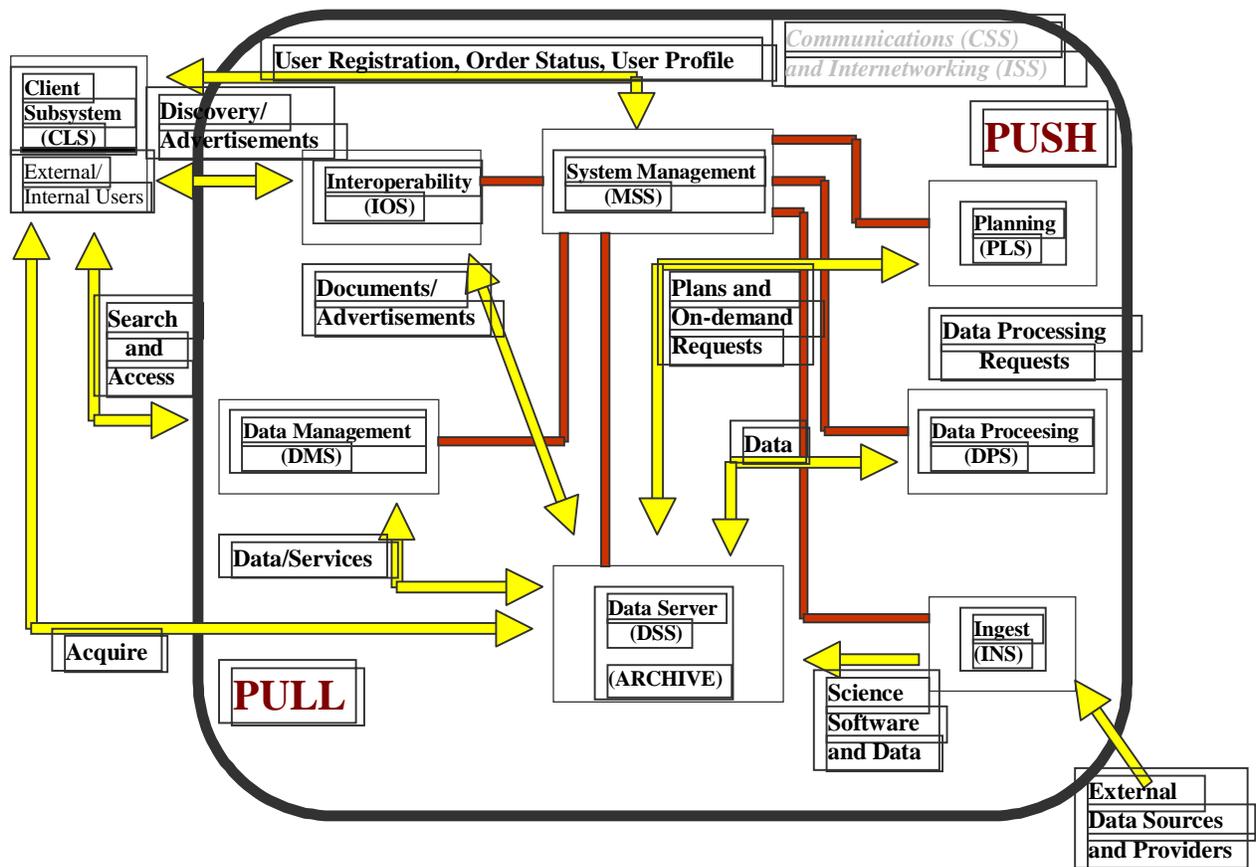


Figure 3.2.2.1-1. Subsystem Architecture Diagram

As shown in the subsystem architecture diagram, SDPS Release 6A subsystems can be grouped into a ‘Push’ or ‘Pull’ category of functionality with the exception of DSS. The DMS and the IOS on the ‘Pull’ side of ECS also use the DSS functionality described on the ‘Push’ side of the ECS architecture. Data capture (ingest of data), storage management, planning and data

processing of satellite or previously archived data from other sites make up the 'Push' side of the ECS architecture/design and consists of:

1. The DSS with the functions needed to
 - archive (insert) science data
 - search for and retrieve archived data
 - manage (create and delete items from) the archives
 - stage (store on physical media temporarily) data resources needed as input to data processing or resulting as output from their processing execution
2. The INS with interfaces to external suppliers (such as EDOS and LPS) to:
 - transfer data into SDPS and temporarily store the data
 - provide staging capabilities for data waiting to be archived
 - provide operator interfaces for managing ingest operations
3. The DPS and PLS with:
 - DPS dispatching and monitoring the execution of the science software, and interfaces to DSS to stage the input data needed and archive the generated data
 - PLS providing long and short term planning of science data processing of the production environment and production resources

Information search and data retrieval makes up the 'Pull' side of the ECS architecture/design and consists of:

1. The CLS, DMS, and IOS with:
 - CLS providing user interfaces for data search and retrieval to science users and operators
 - DMS providing support for data search and retrieval across all ECS sites in conjunction with the DSS at each site. The DMS also provides a gateway as the interface to the Version 0 (V0) Information Management System (IMS) using the V0 IMS protocol
 - IOS managing advertisements of data and services it receives from the DSS or non-ECS users via the operations staff. IOS makes the advertisements available via a World Wide Web (WWW) interface for searching and browsing. Other SDPS subsystems (i.e., CLS, PLS, DPS, DMS, and INS) use IOS to determine the location of data and the services, offered by the DSS, for a particular type of data or distributed data that has been processed

CSMS – The following subsystems are the CSMS subsystems, which interact with and support the SDPS to complete the ECS architecture.

2. The MSS with:
 - hardware and software baseline and configuration management
 - trouble ticketing and nonconformance report (NCR) tracking
 - system start-up and shut-down
 - fault and performance monitoring for networks, platforms, and software applications
 - user account management and user order tracking
3. The CSS with:
 - Distributed Computing Environment (DCE) using Transmission Control Protocol/Internet Protocol (TCP/IP) for the network communications stack.
 - Libraries with common software mechanisms for application error handling, aspects of recovering client/server communications; Universal References to distributed objects and interfaces to e-mail, file transfer and network file copy capabilities.
 - External gateways to translate from the CSMS internal protocols, based on DCE, to protocols acceptable by external systems such as ASTER GDS and Landsat 7 LPS and vice versa.
4. The ISS with:
 - Networking hardware devices (e.g., routers, switches, hubs, cabling, etc.) and their respective embedded software. For more information on site unique configurations, refer to the 920-series of General documents.

3.2.2.2 Multi-Site Architecture

ECS Release 6A is distributed to five sites specified in Section 3.1.1. Each site is identified and its operational capabilities follow. Please note that the reference to MODIS and CERES includes the Terra and Aqua missions in this subsection.

1. EDC DAAC capabilities include:
 - ingest of ASTER Level 1A / 1B and Landsat 7 Level 0R data, with ancillary data needed for production
 - production, archival and distribution of ASTER products
 - archival and distribution of Landsat 7 0R data
 - Receipt of higher level MODIS land products from MODAPS, via the SIPS interface, for archival and distribution
2. GSFC DAAC capabilities include:
 - ingest of MODIS, AIRS, HSB and AMSU Level 0 data and related ancillary data

- production, archival and distribution of the level 1A and 1B including the distribution of the level 1A, 1B and ancillary data to MODAPS for higher level processing
 - Receipt of higher level MODIS atmospheric and ocean products from MODAPS, via the SIPS interface, for archival and distribution
 - production, archival, and distribution of the higher level products for AIRS/HSB/AMSU
3. LaRC DAAC capabilities include:
- ingest of CERES, MISR and MOPITT Level 0 and related ancillary data
 - production, archival, and distribution of the higher level products for MISR
 - data forwarding support for CERES through LaTIS and MOPITT to the SCF
 - receipt of higher level CERES products from LaTIS, via the SIPS interface, for archival and distribution
 - receipt of higher level MOPITT products from the MOPITT SCF, via the SIPS interface, for archival and distribution
 - receipt of SAGE III Level 0 from the SAGE III MOC and the distribution of this data to the SAGE III SCF for processing
 - receipt of higher level SAGE III products from the SCF, via the SIPS interface, for archival and distribution
 - receipt of ACRIM products from the SCF, via the SIPS interface, for archival and distribution
4. NSIDC DAAC capabilities include:
- receipt of higher level MODIS snow and ice products from MODAPS, via the SIPS interface, for archival and distribution
 - Ingest of AMSR-E Level 0 data and related ancillary data
 - Receipt of the AMSR-E higher level products via the SIPS interface, for archival and distribution
 - Ingest of GLAS Level 0 data and related ancillary data
 - Distribution of GLAS Level 0 to the SCF for higher level processing
 - Receipt of the GLAS higher level products from the SCF, via the SIPS interface, for archival and distribution
5. SMC capabilities include:
- overall ECS system performance monitoring, coordinating, and setting system-wide policies and priorities

4. Subsystem Description

Design Description Organization and Approach

This section presents a subsystem-by-subsystem overview description of the “as-built” ECS. The current detailed design information is provided for the Hardware Configuration Items (HWCI), Computer Software Component Items (CSCI), and Computer Software Components (CSC) for each subsystem and is being delivered to the DAACs in drop increments.

The SDPS and CSMS subsystem descriptions include:

- Subsystem functional overviews with a subsystem context diagram and a table of interface event descriptions
- CSCI descriptions with a context diagram and a table with interface event descriptions
- Architecture Diagrams, Process Descriptions, and Process Interface Event Tables. The Architecture Diagrams show the processes of the CSCI/CSC and how these processes connect with other CSCIs and CSCs of the same subsystem and the interfaces with other subsystems and external entities such as Operations, External Data Providers and Users. These Processes and the supporting libraries are listed in Appendices A (Software Process) and B (Software Libraries).
- Data Store descriptions for each CSCI in each SDPS/CSMS subsystem. The Data Stores are identified with the software name and shown in the architecture diagrams either as single data stores or as a group of data stores with a generic name such as “Data Stores” or “database.”
- Hardware descriptions of the subsystem hardware items and the fail-over strategy.

The convention used for Context and Architecture diagrams includes using circular shapes to show the subject subsystems, CSCIs, CSCs, or processes (with name in bold), elliptical shapes to show associated CSCIs, CSCs, or processes within a given subsystem and squares or rectangles to show external subsystems, CSCIs, CSCs, and processes. Data stores are shown using the data store or database name with horizontal lines, one above and one below the name. An interface event is data, a message (which includes a notification or status), command/request or status code passed between subsystems, CSCIs, CSCs, or processes. The convention used to identify events is a straight line between two objects labeled with a phrase beginning with an action-oriented word to best describe the event. The arrow on the event line indicates an origination point and to where the event is directed. The response to this action is not shown in the diagram, in most cases, for simplification. However, the response is described in the description column of the interface event tables. Interface events are identified in the interface event or process interface tables starting with the interface event at the top and middle of the diagram and going clock-wise around the diagram. The external interface subsystem is identified in the interface event description and is in bold to assist with the location of the interface events on the diagram. If there are two items in bold, there are two different interfaces (Subsystems, CSCIs, or CSCs)

requesting the same interface event. These conventions are consistent with other ECS documentation. The convention for naming the ECS processes is *Ec* <subsystem abbreviation> meaningful name. The *Ec* identifies the process as an ECS developed process versus a Commercial Off The Shelf (COTS) product. The *subsystem abbreviations* are listed subsystem-by-subsystem.

- Cl for CLS
- Cs for CSS
- Dm for DMS
- Dp for DPS
- Ds for DSS
- In for INS
- Io for IOS
- Ms for MSS
- Pl for PLS

The *meaningful name* identifies the process and its functionality within the subsystem, CSCI, or CSC. An example is *EcIoAdServer*, which identifies an ECS-developed IOS process called the Advertisement Server. Some names within an architecture diagram do not follow this convention because the names are COTS product names. All COTS product names are kept for simplicity and to adhere to licensing and trademark agreements. The remaining names that do not follow the naming convention are imbedded throughout the system and would require time to replace and cause operational disruptions. These names will be cleaned up during the final maintenance stages of the contract.

4.1 Data Server Subsystem Overview

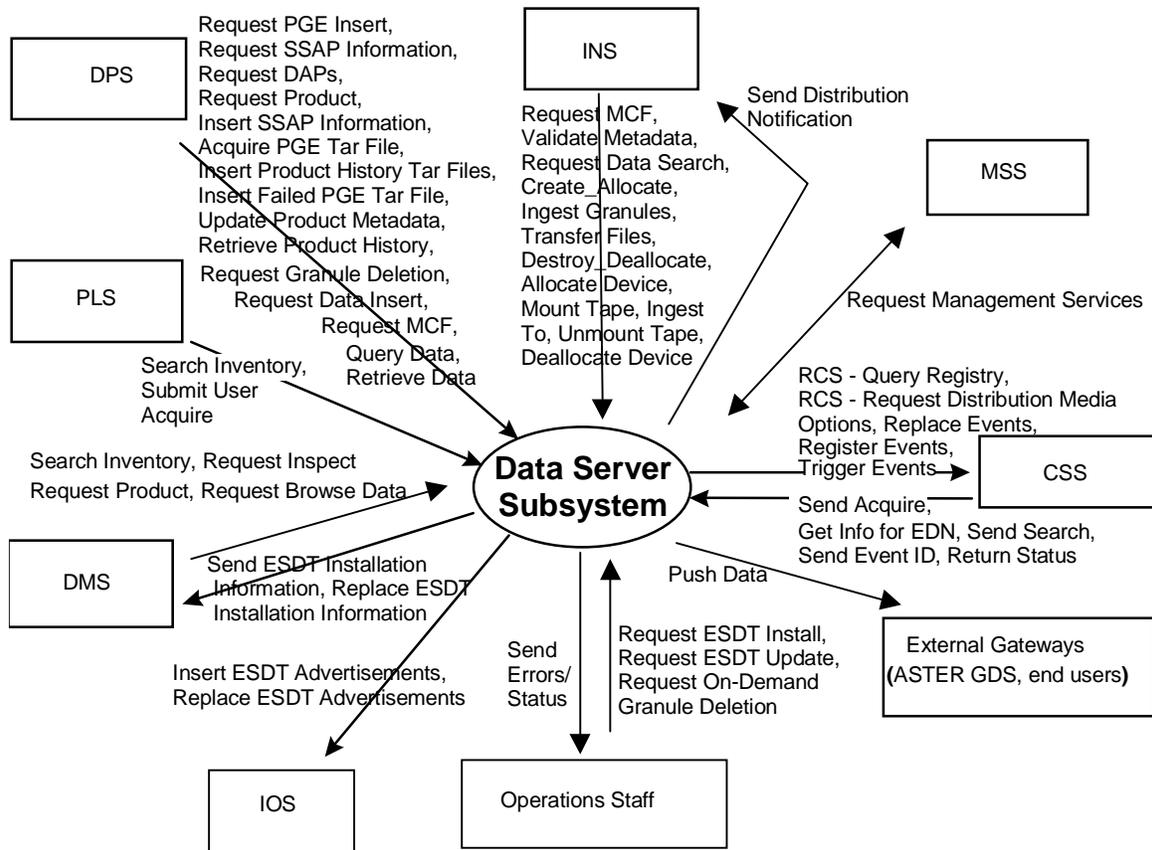
The Data Server Subsystem (DSS) provides capabilities to store, search, retrieve, and distribute earth science and related data. The DSS provides data repositories and management capabilities to safely store data on a permanent basis. The DSS stages data needed for data processing by the Data Processing Subsystem (DPS) or for retrieval by users at external locations. The DSS organizes and stores its data by data types, and provides advanced search capabilities and processing services on those data types in support of earth science data users. The DSS distributes data to users either electronically or on physical media. It also includes administrative capabilities to operate and manage its hardware and software.

DSS functionality includes:

- The DSS provides advertisements, for data types and corresponding data type services, to the Interoperability Subsystem (IOS)
- The DSS stores (archives) the Ingest Subsystem (INS) ingested data and products created via the DPS
- The DSS receives service requests for data and data type services from external service requesters including the Client Subsystem (CLS), the Data Management Subsystem (DMS), the Planning Subsystem (PLS), and the DPS
- The DSS provides (distributes) data in response to service requests, to the request originator, by means of either electronic transfer or physical media. Alternatively, the subsystem can provide references to data as a Universal Reference (UR)

Data Server Subsystem Context

Figure 4.1-1 is the context diagram for the DSS. The diagram shows the events DSS sends to other SDPS or CSMS subsystems and the events sent to DSS.



Note:
RMS = Request Management Services,
RCS = Request Communications Support,
EDN = Expedited Data Set Notification,
ESDT = Earth Science Data Type,
PGE = Product Generation Executive,
SSAP = Science Software Archive Package,
DAPs = Delivered Algorithm Packages,
MCF = Metadata Configuration File
 The Science Data Server GUI is shown in the architecture diagram.

Figure 4.1-1. Data Server Subsystem Context Diagram

Table 4.1-1 provides a description of the interface events shown in the Data Server Subsystem context diagram.

Table 4.1-1. Data Server Subsystem Interface Events (1 of 4)

Event	Interface Event Description
Request MCF	The INS and DPS request the Metadata Configuration File (MCF) from the DSS prior to a data insert request. The DSS provides the MCF information as part of the GetMCF service call.
Validate Metadata	The INS populates the metadata files and sends the files to the DSS for validation.
Request Data Search	The INS sends a search request to the DSS for a granule corresponding to a particular ESDT short name and version, which has a particular local granule id.
Create_Allocate	The INS sends requests to the DSS to allocate areas on the local staging disk to store ingested data.
Ingest Granules	The INS sends insert requests to the DSS for a particular file or files (into the SDPS inventory and archives). Inserted data is accompanied by metadata. The metadata is catalogued in the SDSRV inventory as a granule of a particular ESDT short name and version.
Transfer Files	The INS sends requests to the DSS to transfer (copy) data files to a staging disk.
Destroy_Deallocate	The INS sends requests to the DSS to deallocate a staging disk area (to remove an existing staging disk area from usage).
Allocate Device	The INS sends requests to the DSS to allocate peripheral devices for data ingesting.
Mount Tape	The INS sends requests to the DSS to load tapes to hardware peripherals for reading the tapes.
Ingest To	The INS sends requests to the DSS to copy files from peripheral resources to staging disk areas.
Unmount Tape	The INS sends requests to the DSS to unload and detach tapes from hardware peripherals after reading or writing to the tapes.
Deallocate Device	The INS sends requests to the DSS to deallocate the previously allocated media resource.
Send Distribution Notification	The INS receives a distribution notification, via e-mail, from the DSS when data being distributed is to be ingested.
Request Management Services	<p>The MSS provides a basic management library of services to the subsystems, implemented as client or server applications, using the CSS Process Framework. The basic management library of services includes:</p> <ul style="list-style-type: none"> • System startup and shutdown - Please refer to the release-related, current version of the Mission Operations Procedures for the ECS Project document (611) and the current ECS Project Training Material document (625), identified in Section 2.2.1 of this document. • User Profile Request - The MSS provides requesting subsystems with User Profile parameters such as e-mail address and shipping address upon request by authorized users to support their processing activities.

Table 4.1-1. Data Server Subsystem Interface Events (2 of 4)

Event	Interface Event Description
Request Communications Support	<p>The CSS provides a library of services available to each subsystem. The subsystem services required to perform specific assignments are requested from the CSS. These services include:</p> <ul style="list-style-type: none"> • DCE Support • Name/Address Services • Server Request Framework (SRF) • Universal Reference (UR) • Error/Event Logging • Fault Handling Services • User Authentication Services • Mode Information • (Query Registry) Retrieving the requested configuration attribute-value pairs from the Configuration Registry • Distribution Media Options from the Configuration Registry
Request Distribution Media Options	<p>The DSS requests the Distribution Media Options for an Earth Science Data Type (ESDT) from the CSS Registry Server.</p>
Replace Events	<p>The CSS Subscription Server receives the updated subscription events with updated qualifiers for an Earth Science Data Type (ESDT) from the DSS when an ESDT is updated. This event replaces the original event in the CSS Subscription Server.</p>
Register Events	<p>The CSS Subscription Server receives the subscription events for an Earth Science Data Type (ESDT) from the DSS when an ESDT is installed into the system or when an ESDT is updated by adding additional events.</p>
Trigger Events	<p>The CSS is notified by the DSS (via an event trigger) when a subscription event occurs on an ESDT Service.</p>
Send Acquire	<p>The CSS creates an “acquire” (instruction to obtain data) and sends it to the DSS via a remote procedure call. This is similar to the “Request Product” interface event, except it applies to EDOS expedited data.</p>
Get Info for EDN	<p>The CSS receives and uses the Expedited Data Set Notification (EDN) information, obtained from the DSS by request, to send messages to users at the ASTER GDS.</p>
Send Search	<p>The CSS sends requests to the DSS, on behalf of the SIPS, to get qualified granule URs returned.</p>
Send Event ID	<p>The CSS sends Event Ids to the DSS when ESDTs are installed or when ESDTs are updated by adding additional events.</p>
Return Status	<p>The CSS returns status to the DSS to simply indicate that the request was received, not that the action succeeded.</p>
Push Data	<p>The External Gateways or other external users receive instructions (assembled by the DSS) to send data via the CSS. The DSS requests data to be pushed, via the FTP service and followed by a signal file, to the destination specified in an acquire instruction (by particular ESDTs that function this way).</p>

Table 4.1-1. Data Server Subsystem Interface Events (3 of 4)

Event	Interface Event Description
Request ESDT Install	The Operations Staff sends ESDT installation information to the DSS for adding descriptor, dynamic link library (dll), and version id for a new Earth Science Data Type.
Request ESDT Update	The Operations Staff sends updated ESDT information to the DSS for adding updated descriptor and Dynamic Link Library (DLL) information for an existing ESDT.
Request On-Demand Granule Deletion	The Operations Staff sends requests to the DSS to delete science granules from the archive and inventory or just the archive. The associated PH, QA and Browse granules can also be deleted.
Send Errors/Status	The Operations Staff receives error conditions and status of data distributions from the DSS.
Insert ESDT Advertisements	The Interoperability Subsystem (IOS) receives requests to insert advertisements for data types (ESDTs) from the DSS including both data product and signature service advertisements.
Replace ESDT Advertisements	The IOS receives requests to update advertisements for data types (ESDTs) from the DSS including both data product and signature service advertisements. These updated advertisements replace the previous advertisement associated with this ESDT.
Send ESDT Installation Information	The DMS Data Dictionary receives ESDT installation information from the DSS, whenever a new ESDT is installed. This data consists of Inventory and Collection level metadata.
Replace ESDT Installation Information	The DMS Data Dictionary receives updated ESDT information from the DSS, whenever an ESDT is updated. This data consists of updated Inventory and Collection level metadata.
Search Inventory	The DMS and PLS send Inventory Search Requests to the DSS to search the SDPS Inventory (metadata). In response, Earth Science Data Type (ESDT) Universal References (URs) for the granules are returned from the DSS.
Request Inspect	The DMS sends a request for an inspection of granule metadata to the DSS in support of a price estimate request.
Request Product	The DMS forwards product requests (to the DSS) to acquire data granules for an external user. This includes requests for Landsat 7 raw data archived within the ECS. The DPS sends requests, to the DSS, for particular data granules to be pushed, via the FTP service, onto the DPS science processor as input for data processing or for SSIT work.
Request Browse Data	The DMS submits requests for Browse data to the DSS to acquire reduced resolution products to support a product request.
Submit User Acquire	The PLS submits an acquire command to the DSS on behalf of the user. The user gets a response via the DSS upon data distribution.
Request PGE Insert	The DPS sends requests to the DSS to insert data that defines a PGE and allows it to be scheduled and executed.
Request SSAP Information	The DPS sends requests to the DSS for SSAP information, including names of existing SSAPs and the information associated with a specific SSAP. In response, the DSS sends lists of SSAPs and related information.

Table 4.1-1. Data Server Subsystem Interface Events (4 of 4)

Event	Interface Event Description
Request DAPs	The DPS requests DAPs based on URs from the DSS. The DAPs are placed on a local DPS disk.
Insert SSAP Information	The DPS sends requests to the DSS to insert SSAP information, via the DPS SSAP GUI by the Operations Staff, including SSAP name, SSAP version number, PGE name, PGE version number, and SSAP Acceptance Date.
Acquire PGE Tar File	The DPS acquires a tar file for any PGE not currently local to the science processor from the DSS. The executable is extracted from the tar file and used during PGE execution.
Insert Product History Tar Files	The DPS sends a request to the DSS to insert the PGE Production History Tar File resulting outputs for permanent archive after the PGE has successfully completed executing.
Insert Failed PGE Tar File	After an unsuccessful execution of a PGE, the DPS obtains the Tar file containing the PGE log files, core dump (if any), PCF and other files, and requests the files be inserted into the DSS for permanent archive.
Update Product metadata	The DPS (the Operations Staff) sends requests to update product metadata in the DSS using the QA Monitor GUI.
Retrieve Product History	The DPS (the Operations Staff using the QA Monitor GUI) submits requests to the DSS to transfer the Production History tar file from the Science Data archives to the user's host machine.
Request Granule Deletion	The DPS sends delete requests to the DSS for particular granules (interim data) in the metadata (the SDPS inventory).
Request Data Insert	The DPS sends insert requests to the DSS for a particular file or files (into the SDPS inventory and archives). Inserted data is accompanied by metadata. The metadata is catalogued in the SDSRV inventory as a granule of a particular ESDT short name and version. These files can be processing output, static files received with PGEs, PGE Tape Archive (TAR) files, APs, SSAPs or DAPs, failed PGE tar files, or production history files.
Query Data	The DPS submits requests of this type to the DSS. It searches the archive for granules that match the user-supplied selection criteria: data type and begin/end date. Results are displayed to the user.
Retrieve Data	The DPS sends retrieval requests, to the DSS, for a particular data granuleId. The product is transferred (pushed), via the File Transfer Protocol (FTP) service, onto the DPS science processor and used as input for Product Generation Executive (PGE) processing or for Science Software Integration and Test (SSIT) work.

Data Server Subsystem Structure

The DSS is three CSCIs:

- The Science Data Server (SDSRV) CSCI manages and provides user access to collections of non-document (non hard copy) earth science data, extracts and modifies data by request, accepts browse, search, and retrieval requests from users, and catalogs data insert requests from other SDPS or CSMS CSCIs, CSCs, and processes. The SDSRV CSCI manages earth science data as logical collections of related data, via interfaces independent of data formats and hardware configurations inherent in underlying storage technologies. The SDSRV manages interactive sessions with service

requesters and informs the service requester of the availability of data and services via the IOS.

- The Data Distribution (DDIST) CSCI formats and distributes data to users electronically or via physical media. The formatting process includes the layout of a sequence of files, assembling a packing list and using Tape Archive (TAR) formats for tapes. The DDIST CSCI accepts requests from the SDSRV CSCI. The DDIST CSCI distributes staged data (data prepared for distribution), directs the Storage Management (STMGT) CSCI to transfer data either electronically or by 8mm tape, and provides a Graphical User Interface (GUI) for operations management to view, cancel, suspend/resume and change the priorities of distribution requests. Electronic distribution can be requested via an FTP push or pull. With push, the DDIST CSCI uses network resources managed by the STMGT CSCI to transfer the data to a remote destination specified by the requester. For pull, the data is placed in an area managed by the STMGT CSCI, from which the requester can retrieve the data.
- The Storage Management (STMGT) CSCI stores and manages data, and retrieves data files from the archives for other science data processing software. The STMGT CSCI provides an interface to make implemented changes in new data storage technologies transparent to users and without interfering with ECS systems outside the STMGT CSCI. The STMGT CSCI performs quality assurance processing and files recovery services. The STMGT CSCI also provides management of storage resources and prepares data for distribution.

The Data Server Subsystem hardware consists of the following four Hardware Configuration Items (HWCI):

- Access Control and Management

The Access Control and Management HWCI (ACMHW) is hardware to support the Ingest and Data Server Subsystems' software to directly interact with users. The ACMHW provides a level of security by isolating other hardware items from external software access.

- Working Storage

The Working Storage HWCI (WKSHW) is hardware to provide high-performance storage of large volumes of data on a temporary basis.

- Data Repository

The Data Repository HWCI (DRPHW) is hardware to provide high-capacity storage for long-term storage of data files.

- Distribution and Ingest Peripherals

The Distribution and Ingest Peripherals HWCI (DIPHW) is hardware to provide support to ingest and distribution via physical media.

Detailed information on hardware/software mapping, hardware diagrams, disk partitioning, etc., can be found in 920-TDx-00x, the 921-TDx-00x, and the 922-TDx-00x series of baseline documents.

Use of COTS in the Data Server Subsystem

- RogueWave's Tools.h++

The Tools.h++ class libraries provide libraries of object strings and collections. These libraries must be installed for the DSS processes to run.

- RogueWave's DBTools.h++

The DBTools.h++ C++ class libraries interact with the Sybase database Structured Query Language (SQL) server and buffer the processes from the relational database used. These libraries must be installed for the Server to run.

- Rogue Wave's Net.h++

This is a C++ class library to provide an object-oriented interface to Inter-Process Communication (IPC) and network communication services. The Net.h++ framework enables developed code to be portable to multiple operating systems and network services. These libraries must be installed with the STMGT software to support interaction with other subsystems.

- Integrated Computer Solutions (ICS) Builder Xcessory

The Builder Xcessory GUI builder tool modifies the displays. The Builder Xcessory generates the C++ code to produce the Mtool display at run time. There is no operational part of the Builder Xcessory needed at run-time.

- Sybase SQL Server

The Sybase SQL server provides the capabilities to insert, update and delete database contents. The Sybase SQL Server must be operational to execute search and insert requests for metadata. The terms Sybase Server and Sybase SQL Server are used interchangeably in this section.

- Autometric's Spatial Query Server

The Spatial Query Server (SQS) provides the capability to store and search spatial metadata. SQS has spatial indexing to search on spatial metadata for the SDSRV.

- Sybase Open Client / CT_LIB

The Sybase Open Client provides access between DSS custom code and the Sybase SQL Server DBMS.

- University of Illinois' Hierarchical Data Format (HDF)

HDF provides EOS extended capabilities for sub-setting services with the SDSRV CSCI.

- University of Colorado’s Object Description Language (ODL)

ODL provides a general architecture, independent means of passing metadata files between subsystems.

- DCE Client

DCE Client provides DSS with communications between other subsystems. DCE can reside on one or both sides of the interface. An instance must be installed on the platform where DSS resides. Although the DCE Client is part of CSS, this COTS product must be installed for DSS to run in the SDPS operational and test environment.

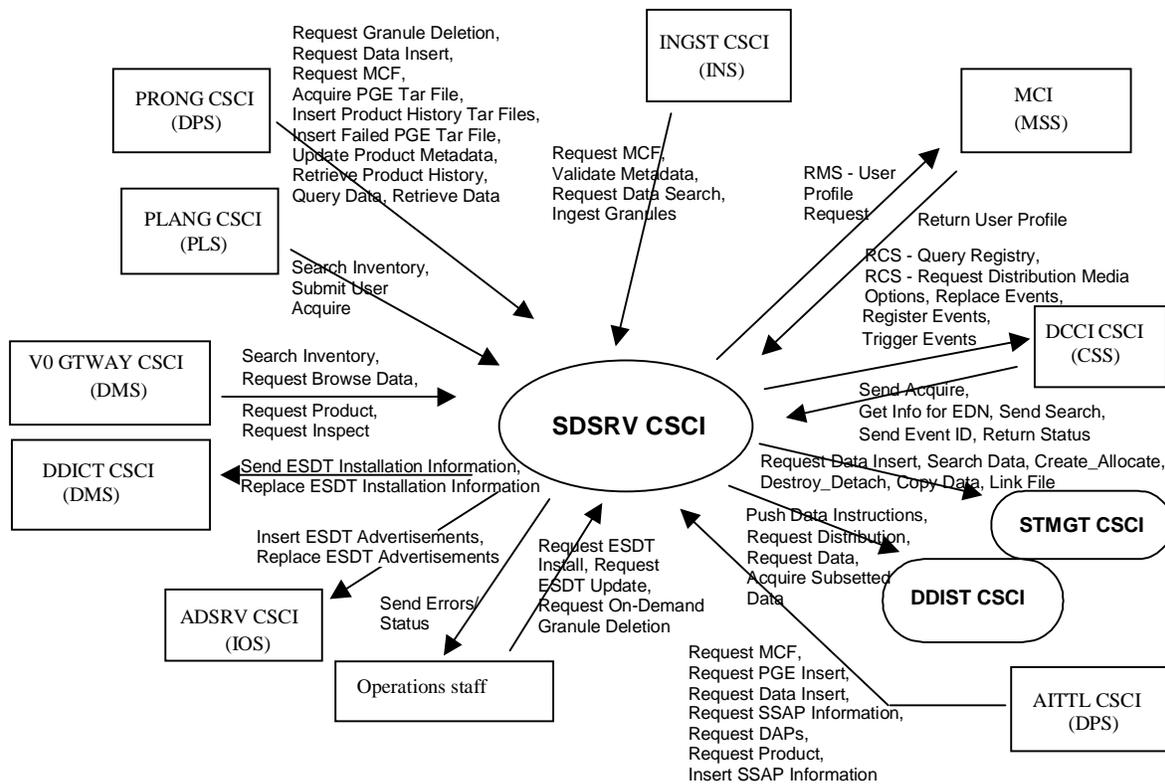
4.1.1 Science Data Server Software Description

4.1.1.1 Science Data Server Functional Overview

The SDSRV CSCI provides the SDPS with a catalog of Earth Science Data holdings, and the Earth Science Data Type services that operate on the data. The SDSRV CSCI provides a catalog of metadata describing the archived data holdings of the SDPS and provides mechanisms to acquire the data from the archive. The SDSRV CSCI also provides data type services on the catalog and a data reduction or sub-setting and reformatting services.

4.1.1.2 Science Data Server Context

Figure 4.1.1.2-1 is the SDSRV CSCI context diagram. The diagram shows the events sent to the SDSRV CSCI and the events the SDSRV CSCI sends to other CSCIs. The events have been grouped by CSCI including the Storage Management and Data Distribution functions of the DSS.



Note:
RMS = Request Management Services,
RCS = Request Communications Support,
EDN = Expedited Data Set Notification,
ESDT = Earth Science Data Type,
PGE = Product Generation Executive,
SSAP = Science Software Archive Package,
DAPs = Delivered Algorithm Packages,
MCF = Metadata Configuration File
 The Science Data Server GUI is shown in the architecture diagram.

Figure 4.1.1.2-1. SDSRV CSCI Context Diagram

Table 4.1.1.2-1 provides descriptions of the interface events shown in the SDSRV CSCI context diagram.

Table 4.1.1.2-1. SDSRV CSCI Interface Events (1 of 5)

Event	Interface Event Description
Request MCF	The INGST , PRONG , and AITTL CSCIs request the Metadata Configuration File (MCF) template, from the SDSRV CSCI, for each input or output data type, respectively, prior to a data insert request. The SDSRV CSCI provides the MCF information as part of the GetMCF service call. Also, the PRONG CSCI can request from the SDSRV CSCI the MCF for a particular ESDT short name prior to a data insert request.
Validate Metadata	The INGST CSCI populates the metadata files and sends a request to the SDSRV CSCI to validate the metadata files.
Request Data Search	The INGST CSCI sends a search request to the SDSRV CSCI for a granule corresponding to a particular ESDT short name and version, which has a particular local granule id.
Ingest Granules	The INGST CSCI sends requests to the SDSRV CSCI to insert a particular file or files into the inventory and archive. Inserted data is accompanied by metadata. The metadata is catalogued in the SDSRV inventory as a granule of a particular ESDT short name and version. For the INGST CSCI , this data can be algorithms, Level 0 (L0) data, standard products, ancillary data, correlative data or calibration data. All data insert requests are sent to the STMGT CSCI from the SDSRV CSCI.
Request Management Services	The MCI provides a basic management library of services to the CSCIs, implemented as client or server applications, using the DCCI CSCI Process Framework. The basic management library of services includes: <ul style="list-style-type: none"> • System startup and shutdown - Please refer to the release-related, current version of the Mission Operations Procedures for the ECS Project document (611) and the current ECS Project Training Material document (625), identified in Section 2.2.1 of this document. • Request User Profile - The MCI provides requesting CSCIs with User Profile parameters such as e-mail address and shipping address upon request by authorized users to support their processing activities.
Return User Profile	The MCI sends the user profile to the DSS for inventory searches, to request product orders, and to request subscriptions.
Request Communications Support (RCS)	The DCCI CSCI provides a library of services available to each SDPS and CSMS CSCI/CSC. The CSCI services required to perform specific assignments are requested from the DCCI CSCI. These services include: <ul style="list-style-type: none"> • DCE Support • Name/Address Services • Server Request Framework (SRF) • Universal Reference (UR) • Error/Event Logging • Fault Handling Services • User Authentication Services • Mode Information • (Query Registry) Retrieving the requested configuration attribute-value pairs from the Configuration Registry • Distribution Media Options from the Configuration Registry

Table 4.1.1.2-1. SDSRV CSCI Interface Events (2 of 5)

Event	Interface Event Description
Replace Events	The DCCI CSCI (Subscription Server) receives updated subscription events with modified qualifiers for an Earth Science Data Type (ESDT) from the SDSRV CSCI, when an ESDT is updated. This event replaces the original event in the DCCI CSCI.
Register Events	The DCCI CSCI (Subscription Server) receives the subscription events for an Earth Science Data Type from the SDSRV CSCI, when an ESDT is installed into the system or when an ESDT is updated by adding additional events.
Trigger Events	The DCCI CSCI receives notification from the SDSRV CSCI (via an event trigger) when a subscription event occurs on an Earth Science Data Type Service.
Request Distribution Media Options	The SDSRV CSCI requests Distribution Media Options from the DCCI CSCI when it first accesses an Earth Science Data Type.
Send Acquire	The DCCI CSCI creates an "acquire" (instruction to obtain data) and sends it to the SDSRV CSCI. This is similar to the "Request Product" interface event, except it applies to EDOS expedited data.
Get Info for EDN	The DCCI CSCI receives the Expedited Data Set Notification (EDN) information from the SDSRV CSCI, by request, and uses the EDN information to send messages to users at the ASTER GDS.
Send Search	The DCCI CSCI sends requests to the SDSRV CSCI, on behalf of the SIPS, to get qualified granule URs returned.
Send Event ID	The DCCI CSCI sends Event Ids to the SDSRV CSCI when ESDTs are installed or when ESDTs are updated by adding additional events.
Return Status	The DCCI CSCI returns status to the SDSRV CSCI to simply indicate that the request was received, not that the action succeeded
Request Data Insert	The STMGT CSCI receives data insert requests from the SDSRV CSCI to store data in the archive. The AITTL and PRONG CSCIs send requests to the SDSRV CSCI to insert a particular file or files into the inventory and archive. Inserted data is accompanied by metadata. The metadata is catalogued in the SDSRV inventory as a granule of a particular ESDT short name and version. These files can be processing output, static files received with PGEs, PGE Tape Archive (TAR) files, Algorithm Packages (APs), Science Software Archive Packages (SSAPs) or Delivered Algorithm Packages (DAPs), failed PGE tar files, or production history files.
Search Data	The STMGT CSCI receives search requests from the SDSRV CSCI for granules corresponding to a particular ESDT short name and version, which has a particular local granule id.
Create_Allocate	The STMGT CSCI receives requests from the SDSRV CSCI to allocate areas on the local staging disk to store "ingested" data or output files from routine data processing or SSIT work.
Destroy_Detach	The STMGT CSCI receives requests from the SDSRV CSCI to detach from a staging disk area (lose access to an existing staging disk area owned by another process).
Copy Data	The STMGT CSCI receives requests from the SDSRV and DDIST CSCIs to copy data within staging disks and between staging disks.

Table 4.1.1.2-1. SDSRV CSCI Interface Events (3 of 5)

Event	Interface Event Description
Link File	The STMGT CSCI receives SDSRV and DDIST CSCIs send requests to the STMGT CSCI to link files from read-only cache to a staging disk specified in the request.
Push Data Instructions	The DDIST CSCI receives instructions from the SDSRV CSCI (assembles instructions) to send data. The DDIST CSCI sends a request to the STMGT CSCI to push the data, via the FTP service, followed by a signal file (to the destination specified in an acquire instruction by particular ESDTs that function this way).
Request Distribution	The DDIST CSCI receives distribution requests from the SDSRV CSCI for various categories of data. The distribution services on those data are essentially identical for all data categories.
Request Data	The DDIST CSCI receives data retrieval requests from the SDSRV CSCI. (The PRONG CSCI sends data retrieval requests to the SDSRV CSCI). The DDIST CSCI puts the request in a queue with the appropriate priority. When the request is taken from the queue, the STMGT CSCI is passed the data retrieval request from the DDIST CSCI for a particular data granule to be pushed onto the DPS science processor, via the FTP service. The data granule is to be used as input for PGE processing or for SSIT work.
Acquire Subsetted Data	The DDIST CSCI receives requests from the SDSRV CSCI to retrieve subsetted data files for distribution.
Request PGE Insert	The AITTL CSCI sends requests to the SDSRV CSCI to insert data that defines a PGE and allows it to be scheduled and executed.
Request SSAP Information	The AITTL CSCI sends requests to the SDSRV CSCI for SSAP information, including names of existing SSAPs and the information associated with a specific SSAP. In response, the SDSRV CSCI sends lists of SSAPs and related information.
Request DAPs	The AITTL CSCI requests DAPs based on URs from the SDSRV CSCI. The DAPs are placed on a local AITTL disk.
Request Product	The AITTL CSCI sends requests to the SDSRV CSCI to push data granules, via the FTP service, onto the DPS science processor as input for data processing or SSIT work. The VO GTWAY CSCI sends requests to the SDSRV CSCI for a product order from an external user to be distributed by the DDIST CSCI upon receipt of the data from the STMGT CSCI. This product order request includes requests for Landsat 7 products archived within the ECS.
Insert SSAP Information	The AITTL CSCI sends requests (the Operations Staff via the SSAP GUI) to the SDSRV CSCI to insert SSAP information, including SSAP name, SSAP version number, PGE name, PGE version number, and SSAP Acceptance Date.
Request ESDT Install	The Operations Staff sends ESDT installation information to the SDSRV CSCI for adding the descriptor, dynamic link library (dll), and version id for a new Earth Science Data Type.
Request ESDT Update	The Operations Staff sends updated ESDT information to the SDSRV CSCI for adding updated descriptor and dynamic link library (dll) information for an existing ESDT.

Table 4.1.1.2-1. SDSRV CSCI Interface Events (4 of 5)

Event	Interface Event Description
Request On-Demand Granule Deletion	The Operations Staff sends requests to the SDSRV CSCI to delete science granules from the archive and inventory or just the archive. The associated PH, QA and Browse granules can also be deleted.
Send Errors/Status	The Operations Staff receives error conditions and status of data distribution from the SDSRV CSCI (for acquires that are synchronous) or the DDIST CSCI (if the acquire is asynchronous and the DDIST CSCI gets the request).
Insert ESDT Advertisements	The ADSRV CSCI receives requests to insert advertisements for data types (ESDTs) from the SDSRV CSCI including both data product and signature service advertisements.
Replace ESDT Advertisements	The ADSRV CSCI receives requests to insert updated advertisements for data types (ESDTs) from the SDSRV CSCI including both data product and signature service advertisements. This information replaces the original information.
Send ESDT Installation Information	The DDICT CSCI receives sends ESDT installation information from the SDSRV CSCI, whenever a new ESDT is installed. This data consists of Inventory and Collection level metadata.
Replace ESDT Installation Information	The DDICT CSCI receives updated ESDT information from the SDSRV CSCI, whenever an ESDT is updated. This data consists of Inventory and Collection level metadata. The updated information replaces the ESDT information in the DDICT CSCI.
Search Inventory	The V0 GTWAY and PLANG CSCIs send requests to the SDSRV CSCI to search the SDPS Inventory (archives). In response, the ESDT Universal References (URs) for the granules are returned from the SDSRV CSCI.
Request Browse Data	The V0 GTWAY CSCI submits requests for browse data to the SDSRV CSCI to acquire reduced resolution products to support a product request.
Request Inspect	The V0 GTWAY CSCI sends a request for an inspection of granule metadata to the SDSRV CSCI in support of a price estimate request.
Submit User Acquire	The PLANG CSCI submits an acquire command to the SDSRV CSCI on behalf of the user. The user gets a response via the DDIST CSCI upon data distribution.
Request Granule Deletion	The PRONG CSCI sends delete requests to the SDSRV CSCI for particular granules (interim data) in the SDSRV metadata.
Acquire PGE Tar File	The PRONG CSCI acquires a tar file for any PGE not currently local to the science processor from the SDSRV CSCI. The executable is extracted from the tar file and used during PGE execution.
Insert Product History Tar Files	The PRONG CSCI sends a request to the SDSRV CSCI to insert the PGE Production History Tar File resulting outputs for permanent archive after the PGE has successfully completed executing.
Insert Failed PGE Tar File	After an unsuccessful execution of a PGE, the PRONG CSCI obtains the Tar file containing the PGE log files, core dump (if any), PCF and other files, and requests the files be inserted into the SDSRV CSCI for permanent archive.
Update Product Metadata	The PRONG CSCI sends requests (the Operations Staff using the QA Monitor GUI) to update product metadata in the SDSRV CSCI.

Table 4.1.1.2-1. SDSRV CSCI Interface Events (5 of 5)

Event	Interface Event Description
Retrieve Product History	The PRONG CSCI submits requests (the Operations Staff using the QA Monitor GUI) to the SDSRV CSCI to transfer the Production History tar file from the Science Data archives to the user's host machine.
Query Data	The PRONG CSCI submits requests of this type to the SDSRV CSCI. It searches the archive for granules that match the user-supplied selection criteria: data type and begin/end date. Results are displayed to the user.
Retrieve Data	The PRONG CSCI sends retrieval requests, to the SDSRV CSCI, for a particular data granuleId. The product is transferred (pushed), via the FTP service, onto the DPS science processor and used as input for PGE processing or for SSIT work.

4.1.1.3 Science Data Server Architecture

Figures 4.1.1.3-1, 4.1.1.3-2 and 4.1.1.3.3 are the SDSRV CSCI architecture diagrams. The diagrams show the events sent to the SDSRV CSCI processes and the events the SDSRV CSCI processes send to other processes.

The Science Data Server (SDSRV) CSCI is six processes: four SDPS custom developed processes and two COTS processes. The four SDPS custom developed processes are the Science Data Server (EcDsScienceDataServer), the Hierarchical Data Format (HDF) EOS Server (EcDsHdfEosServer) [Note: multiple HDF Server processes can be defined.], and the Science Data Server GUI (EcDsSdSrvGui), and the Granule Deletion Administration Tool (EcDsGranuleDelete). The COTS processes are the Sybase SQL Server and the Spatial Query Server (SQS). The SDSRV CSCI uses the Sybase SQL Server Database Management System (DBMS) for SDPS Inventory and Configuration data storage. The server holds Earth Science Data Type configuration information and the data catalog for all the archived products found at a DAAC.

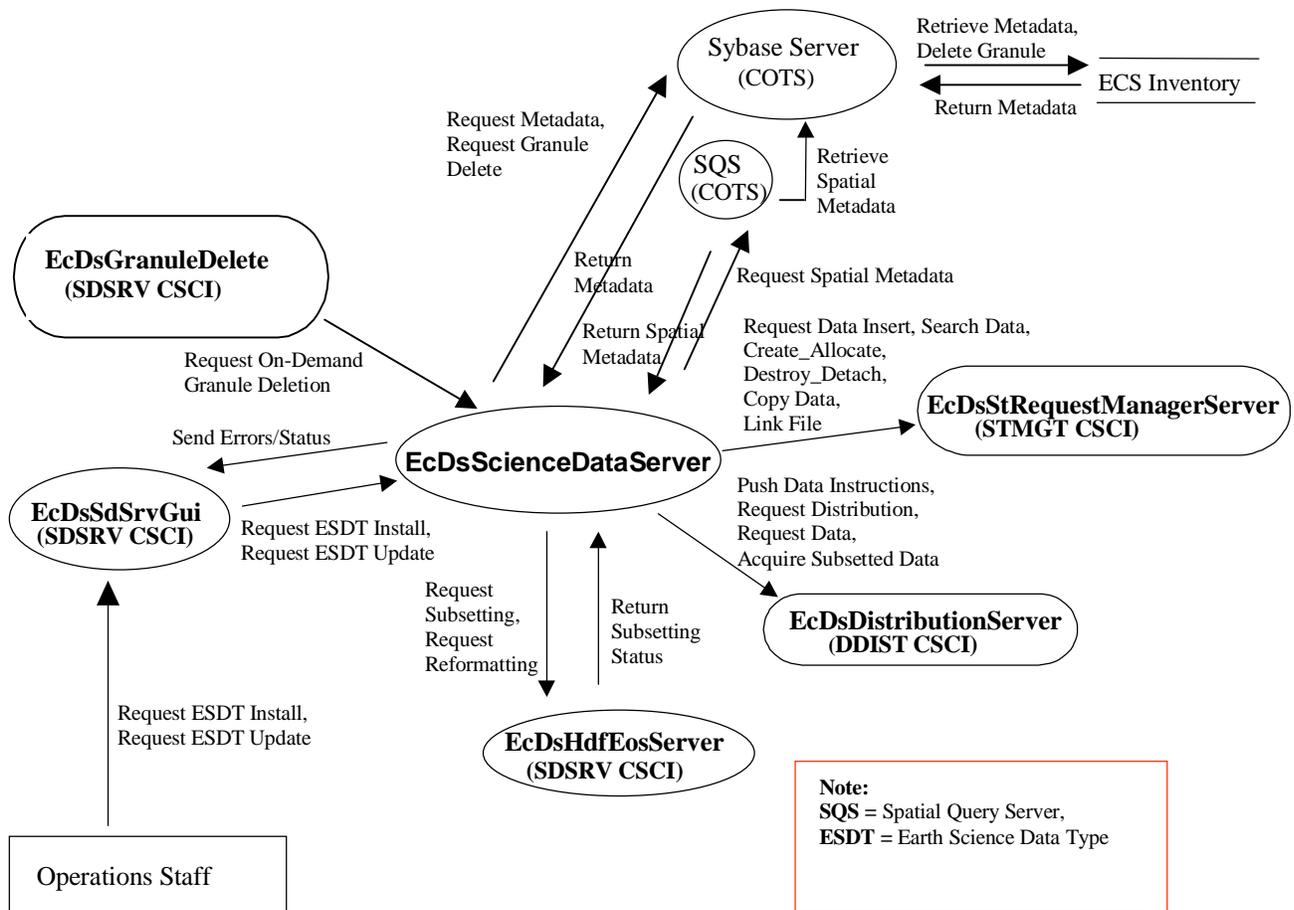


Figure 4.1.1.3-1. SDSRV CSCI Architecture Diagram

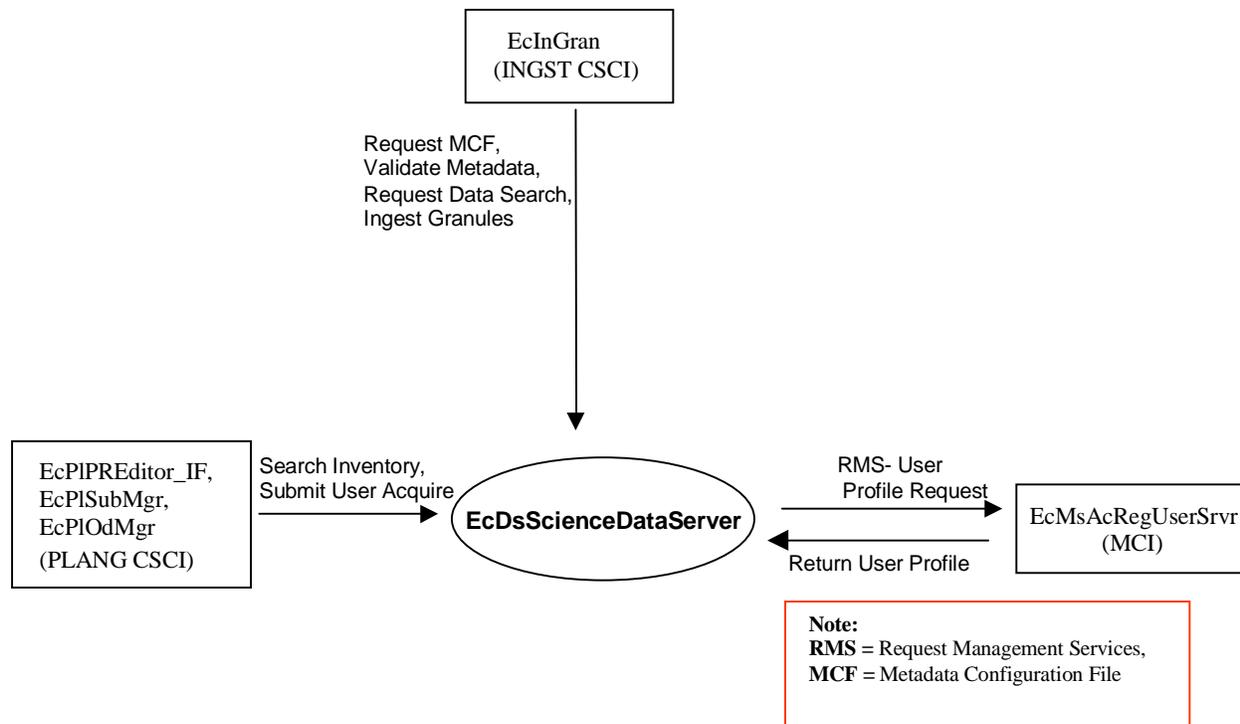


Figure 4.1.1.3-2. SDSRV CSCI Architecture Diagram (cont.)

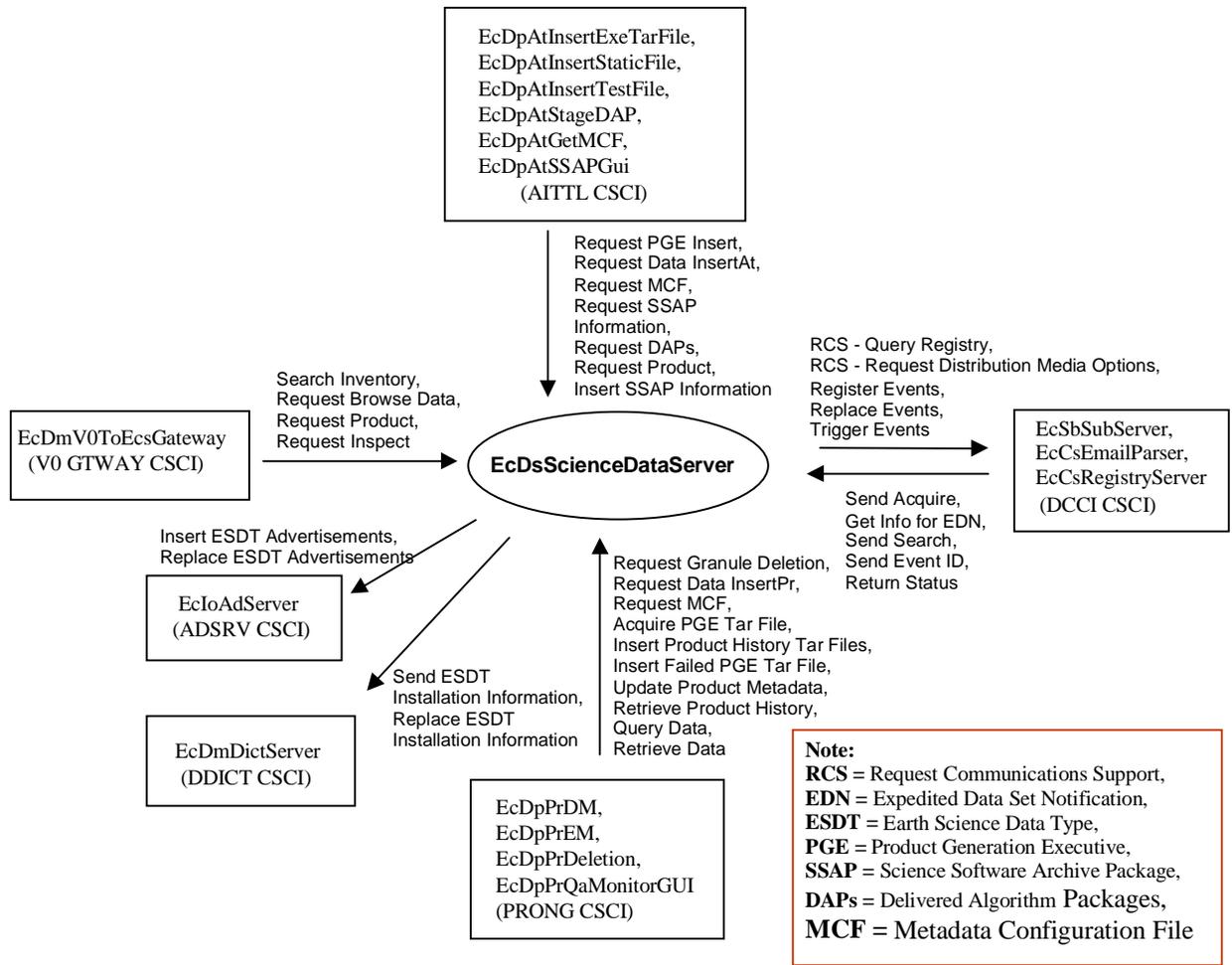


Figure 4.1.1.3-3. SDSRV CSCI Architecture Diagram (cont.)

4.1.1.4 Science Data Server Process Descriptions

Table 4.1.1.4-1 provides descriptions of the processes shown in the SDSRV CSCI architecture diagrams.

Table 4.1.1.4-1. SDSRV CSCI Processes (1 of 2)

Process	Type	COTS / Developed	Functionality
EcDsScienceDataServer	Server	Developed	<p>The EcDsScienceDataServer server manages collections of earth science and related data, and service requests for the storage, search, retrieval, and manipulation of data within those collections. The science data server performs the following functions:</p> <ul style="list-style-type: none"> • manages earth science data as logical collections of related data, using interfaces independent of any data formats and hardware configurations provided by underlying storage technologies, • manages interactive sessions with users, • manages the processing of service requests from the DMS (VO Gateway), providing a variety of services on earth science and related data, • issues requests to the STMGT and DDIST CSCIs to perform storage and distribution services in support of processing service requests, • provides advertisements to the IOS to announce the availability of data and services to users, • issues commands to the EcloAdServer to replace advertisement information including the metadata and services • manages the processing of service requests from the INS and DPS to "insert" data for long-term storage and access, • manages the processing of service requests from the DPS to provide data to be used as input for data processing, • provides subscription events and event triggers to the CSS subscription server • issues commands to the CSS EcSbSubServer to replace subscription events • provides sub-setting requests to the EcDsHdfEosServer for scene sub-setting • provides sub-setting requests to the EcDsHdfEosServer for compound sub-setting • provides reformatting request to the EcDsHdfEosServer for conversion from HDFEOS to HDF <p>The EcDsScienceDataServer supports:</p> <ul style="list-style-type: none"> • Single requests, one at a time • Multiple concurrent requests • Asynchronous request processing • Request processing buffered from Remote Procedure Call (RPC) threads • Multiple threads within a single user session

Table 4.1.1.4-1. SDSRV CSCI Processes (2 of 2)

Process	Type	COTS / Developed	Functionality
EcDsHdfEosServer	Server	Developed	The EcDsHdfEosServer provides science data sub-setting capabilities for earth science data configured with a sub-setting service. EcDsHdfEosServer supports: <ul style="list-style-type: none"> • Single requests, one at a time • Asynchronous request processing • Request processing buffered from RPC threads • Sub-setting requests of spatial (floating scene or fixed scene)/band/temporal sub-setting • Reformatting requests from HDFEOS to HDF
EcDsSdSrvGui	GUI	Developed	The EcDsSdSrvGui provides an operator interface for : <ul style="list-style-type: none"> • receiving descriptor files and dynamic link libraries (dll) for configuring ESDTs into the EcDsScienceDataServer • monitoring active EcDsScienceDataServer requests • updating ESDT information in the EcDsScienceDataServer The EcDsSdSrvGui supports: <ul style="list-style-type: none"> • Single requests, one at a time
EcDsGranuleDelete	Command Line Utility	Developed	The EcDsGranuleDelete provides a command line operator interface for: <ul style="list-style-type: none"> • deleting granules in the EcDsScienceDataServer and the EcDsStArchiveServer • deleting granules in the EcDsScienceDataServer
Sybase	Server	COTS	Provides the management of spatial data types of an earth science catalog of metadata for the SDPS. Includes capabilities for searching and storing the catalog.
Spatial Query Server (SQS)	Server	COTS	Provides the capability to manage spatial data types of earth science catalog metadata for the SDPS (including specialized spatial searches).

4.1.1.5 Science Data Server Process Interface Descriptions

Table 4.1.1.5-1 provides descriptions of the interface events shown in the SDSRV CSCI architecture diagram for Figure 4.1.1.3-1.

Table 4.1.1.5-1. SDSRV CSCI Process Interface Events (1 of 6)

Event	Event Frequency	Interface	Initiated By	Event Description
Request Metadata	One per request to store, search, delete, update, Earth Science Metadata	<i>Process:</i> Sybase Server (COTS)	<i>Processes:</i> EcDsScienceDataServer <i>Library:</i> DsDb <i>Class:</i> DsDbInterface via the Sybase Open Server, SQS, and Sybase Open Client COTS	The Sybase Server receives requests from the EcDsScienceDataServer to store, search, delete, or update Earth Science Metadata. The results are sent back to the EcDsScienceDataServer. The M&O Staff must manually change a configured parameter in order for the EcDsScienceDataServer to communicate directly with the Sybase Server.
Request Granule Delete	One granule per request	<i>Process:</i> Sybase Server (COTS)	<i>Process:</i> EcDsScienceDataServer <i>Library:</i> DsDb <i>Class:</i> DsDbInterface	The Sybase Server receives requests to delete granules from the EcDsScienceDataServer.
Retrieve Metadata	One to many per metadata request	Data Tables within the ECS Inventory	<i>Process:</i> Sybase Server <i>Libraries (Sybase):</i> Libtcl.so Libtli.so Libsybdb.so <i>Class:</i> Sybase Open Client /ct_lib	The Sybase Server retrieves metadata from the ECS Inventory database and returns the metadata to the SQS or the EcDsScienceDataServer.
Delete Granule	One per request	Data Tables within the ECS Inventory	<i>Process:</i> EcDsScienceDataServer <i>Library:</i> DsDb <i>Class:</i> DsDbInterface	The Sybase Server requests granules to be deleted from the ECS Inventory data tables.
Return Metadata	One to many per metadata request	<i>Process:</i> Sybase Server (COTS)	Data Tables within the ECS Inventory	The ECS Inventory data tables provide the metadata or spatial metadata to the Sybase Server.

Table 4.1.1.5-1. SDSRV CSCI Process Interface Events (2 of 6)

Event	Event Frequency	Interface	Initiated By	Event Description
Retrieve Spatial Metadata	One per request	<i>Process:</i> Spatial Query Server (SQS) [COTS]	<i>Processes:</i> EcDsScienceDataServer <i>Library:</i> DsDb <i>Class:</i> DsDbInterface via the Sybase Open Server, SQS, and Sybase Open Client COTS	The SQS sends requests to the Sybase Server to store, search, delete, or update Earth Science Metadata. The results are sent back to the SQS. The default configuration is for the EcDsScienceDataServer to communicate via the SQS to the ECS inventory.
Request Spatial Metadata	One per request to store, search, delete, or update spatial Earth Science Metadata.	<i>Process:</i> SQS (COTS)	<i>Process:</i> EcDsScienceDataServer <i>Libraries:</i> DpPrDsslF, DsDb <i>Class:</i> DsDbInterface	The SQS receives requests from the EcDsScienceDataServer to store, search, delete, or update spatial Earth Science Metadata in the ECS inventory database.
Return Spatial Metadata	Per request	<i>Process:</i> EcDsScienceDataServer <i>Libraries:</i> DpPrDsslF, DsDb <i>Class:</i> DsDbInterface	<i>Process:</i> SQS (COTS)	Metadata results are sent back to the EcDsScienceDataServer via the SQS. The results include the status of the Sybase Server and SQS Server commands. The SQS handles the translation of spatial metadata data types (understood by the EcDsScienceDataServer and SQS) to relational data types (understood by SQS and the Sybase Server) and vice versa.
Return Metadata	Per request	<i>Process:</i> Sybase Server (COTS)	<i>Process:</i> EcDsScienceDataServer <i>Libraries:</i> DpPrDsslF, DsDb <i>Class:</i> DsDbInterface	Metadata results are sent back to the EcDsScienceDataServer via the SQS. The results include the status of the Sybase Server commands.

Table 4.1.1.5-1. SDSRV CSCI Process Interface Events (3 of 6)

Event	Event Frequency	Interface	Initiated By	Event Description
Request Data Insert	One per data insert request from EcDpPrDM or EcInGran	<i>Process:</i> EcDsStRequestManagerServer <i>Library:</i> DsStRmClient <i>Class:</i> DsStRequestManager	<i>Process:</i> EcDsScienceDataServer <i>Library:</i> DsCI <i>Classes:</i> DsCIRequest, DsCICommand, DsGeESDT	The EcDsStRequestManager Server receives data insert requests from the EcDsScienceDataServer for data to be stored in the SDPS inventory.
Search Data	One granule per search request	<i>Process:</i> EcDsStRequestManagerServer <i>Library:</i> DsStRmClient <i>Class:</i> DsStRequestManager	<i>Process:</i> EcDsScienceDataServer <i>Library:</i> DsCI <i>Class:</i> DsCIQuery	The EcDsStRequestManager Server receives search requests from the EcDsScienceDataServer for a granule corresponding to a particular ESDT short name and version, which has a particular local granule id.
Create_Allocate	One allocation per request	<i>Process:</i> EcDsStRequestManagerServer <i>Library:</i> DsStRmClient <i>Class:</i> DsStRequestManager	<i>Process:</i> EcDsScienceDataServer <i>Library:</i> DsGe <i>Class:</i> DsGeESDT	The EcDsStRequestManager Server receives requests from the EcDsScienceDataServer to allocate areas on the local staging disk to store data for distribution.
Destroy_Detach	One detach per request	<i>Process:</i> EcDsStRequestManagerServer <i>Library:</i> DsStRmClient <i>Class:</i> DsStRequestManager	<i>Process:</i> EcDsScienceDataServer <i>Library:</i> DsGe <i>Class:</i> DsGeESDT	The EcDsStRequestManager Server receives requests from the EcDsScienceDataServer to detach from (lose access) to an existing staging disk area owned by another process.
Copy Data	One file copy per request	<i>Process:</i> EcDsStRequestManagerServer <i>Library:</i> DsStRmClient <i>Class:</i> DsStRequestManager	<i>Process:</i> EcDsScienceDataServer <i>Library:</i> DsGe <i>Class:</i> DsGeESDT	The EcDsStRequestManager Server receives requests from the EcDsScienceDataServer to copy data within staging disks and between staging disks.

Table 4.1.1.5-1. SDSRV CSCI Process Interface Events (4 of 6)

Event	Event Frequency	Interface	Initiated By	Event Description
Link File	One link per file in a request	<i>Process:</i> EcDsStRequestManagerServer <i>Library:</i> DsStRmClient <i>Class:</i> DsStRequestManager	<i>Process:</i> EcDsScienceDataServer <i>Library:</i> DsGe <i>Class:</i> DsGeESDT	The EcDsStRequestManager Server receives requests from the EcDsScienceDataServer to link files from the read-only cache to a staging disk and from one staging disk to another.
Push Data Instructions	One per distribution request	<i>Process:</i> EcDsDistributionServer <i>Libraries:</i> DsDdB, DsDdC, DsDdl <i>Classes:</i> DsDdRequestMgrC, DsDdGranuleC	<i>Process:</i> EcDsScienceDataServer <i>Library:</i> DsSr <i>Class:</i> DsSrWorkingCollection	The EcDsDistributionServer receives instructions from the EcDsScienceDataServer to send data to external systems or users.
Request Distribution	One per distribution request	<i>Process:</i> EcDsDistributionServer <i>Library:</i> DsDdC <i>Class:</i> DsDdRequestMgrC	<i>Process:</i> EcDsScienceDataServer <i>Library:</i> DsSr <i>Class:</i> DsSrWorkingCollection	The EcDsDistributionServer receives distribution requests from the EcDsScienceDataServer for various categories of data. The distribution services are essentially identical for all data categories.
Request Data	One granule per retrieval request	<i>Process:</i> EcDsDistributionServer <i>Class:</i> DsDdGranuleS	<i>Process:</i> EcDsScienceDataServer <i>Class:</i> DsDbInterface	The EcDsDistributionServer receives requests from the EcDsScienceDataServer for a particular data granule(s) to be provided.
Acquire Subsetted Data	One file per request	<i>Process:</i> EcDsDistributionServer <i>Class:</i> DsDdGranuleS	<i>Process:</i> EcDsScienceDataServer <i>Class:</i> DsDbInterface	The EcDsDistributionServer receives requests from the EcDsScienceDataServer to retrieve subsetted data files for distribution.

Table 4.1.1.5-1. SDSRV CSCI Process Interface Events (5 of 6)

Event	Event Frequency	Interface	Initiated By	Event Description
Return Subsetting status	One per sub-setting request	<i>Process:</i> EcDsScienceDataServer <i>Library:</i> DsCsSh <i>Classes:</i> DsCsConformant DsCsNonConformant	<i>Process:</i> EcDsHdfEosServer <i>Classes:</i> DsESDTLsL70R DsESDTLsL70RWRS	The EcDsHdfEosServer sends the status of sub-setting requests to the EcDsScienceDataServer.
Request Subsetting	One per request to reduce resolution	<i>Process:</i> EcDsHdfEosServer <i>Library:</i> DsCsSh <i>Classes:</i> DsCsConformant DsCsNonConformant	<i>Process:</i> EcDsScienceDataServer <i>Classes:</i> DsESDTLsL70R DsESDTLsL70RWRS	The EcDsHdfEosServer receives requests from the EcDsScienceDataServer to reduce the resolution of an archived earth science data product using configured services for spatial (floating scene or fixed scene) / band/temporal reduction.
Request Reformatting	One per request to reformat the data	<i>Process:</i> EcDsHdfEosServer <i>Libraries:</i> DsDc, DsCsSh <i>Class:</i> DsCsNonConformantImp	<i>Process:</i> EcDsScienceDataServer <i>Classes:</i> DsESDTLsL70R DsESDTLsL70RWRS	The EcDsHdfEosServer receives requests from the EcDsScienceDataServer to convert HDFEOS format to HDF format.
Request ESDT Install	One per new ESDT installation	<i>Process:</i> EcDsScienceDataServer <i>Library:</i> DsAd <i>Class:</i> DsAdDataTypeCollector	Operations Staff <i>Process:</i> EcDsSdSrvGui <i>Class:</i> DsGuSdDataType	The Operations Staff sends ESDT installation information for adding the descriptor, dynamic link library (dll), and version ID for a new ESDT to the EcDsScienceDataServer, via the EcDsSdSrvGui.

Table 4.1.1.5-1. SDSRV CSCI Process Interface Events (6 of 6)

Event	Event Frequency	Interface	Initiated By	Event Description
Request ESDT Update	One per new ESDT update	<i>Process:</i> EcDsScienceDataServer <i>Library:</i> DsAd <i>Class:</i> DsAdDataTypeCollector	Operations Staff <i>Process:</i> EcDsSdSrvGui <i>Class:</i> DsGuSdDataType	The Operations Staff sends updated ESDT information, via the EcDsSdSrvGui, to the EcDsScienceDataServer, for adding updated descriptor and dynamic link library (dll) information for an existing ESDT.
Request On-Demand Granule Deletion	Per Operations Staff request	<i>Process:</i> EcDsScienceDataServer <i>Library:</i> DsCI <i>Classes:</i> DsCIRequest, DsCICommand, DsCIESDTReferenceCollector	Operations Staff <i>Process:</i> EcDsGranuleDelete <i>Class:</i> DsUtGranuleDelete	The Operations Staff sends requests, via the EcDsGranuleDelete tool, to the EcDsScienceDataServer to delete science granules from the archive and inventory or just the archive. The associated PH, QA and Browse granules can also be deleted. A physical delete or a Delete From Archive can be performed
Send Errors/Status	Once per distribution request completion	Operations Staff <i>Process:</i> EcDsSdSrvGui <i>Class:</i> DsGuErrorDialog	<i>Process:</i> EcDsScienceDataServer <i>Library:</i> EcUt <i>Class:</i> EcLgErrorMsg	The Operations Staff receives, via the EcDsSdSrvGui , error conditions and status of ESDT installs and updates from the EcDsScienceDataServer (for acquires that are synchronous).

Table 4.1.1.5-2 provides descriptions of the interface events shown in the SDSRV CSCI architecture diagram for Figure 4.1.1.3-2

Table 4.1.1.5-2. SDSRV CSCI Process Interface Events (1 of 4)

Event	Event Frequency	Interface	Initiated By	Event Description
Request MCF	One per set of external data received by ECS	<i>Process:</i> EcDsScienceDataServer <i>Library:</i> DsCI <i>Class:</i> DsCIDescriptor	<i>Process:</i> EclnGran <i>Library:</i> InPreprocess <i>Class:</i> InDataPreprocessTask	The EclnGran process requests the Metadata Configuration File (MCF) from the EcDsScienceDataServer, prior to a data insert request. The EcDsScienceDataServer provides the MCF information as part of the GetMCF service call.
Validate metadata	One per data insert request.	<i>Process:</i> EcDsScienceDataServer <i>Library:</i> DsCI <i>Class:</i> DsCIDescriptor	<i>Process:</i> EclnGran <i>Library:</i> InPreprocess <i>Class:</i> InDataPreprocessTask	The EclnGran process populates the metadata files and sends requests to the EcDsScienceDataServer to validate the metadata files.
Request Data Search	One per input pointer in metadata or per granule pointer in linkage file	<i>Process:</i> EcDsScienceDataServer <i>Library:</i> DsCI <i>Class:</i> DsCIQuery	<i>Process:</i> EclnGran <i>Library:</i> InPreprocess <i>Class:</i> InDataPreProcessTask	The EclnGran process sends a search request to the EcDsScienceDataServer for a granule corresponding to particular ESDT short name and version, which has a particular local granule id.
Ingest Granules	One per data insert request from EclnGran	<i>Process:</i> EcDsScienceDataServer <i>Library:</i> DsCI <i>Classes:</i> DsCIRequest, DsCICommand, DsGeESDT	<i>Process:</i> EclnGran <i>Library:</i> InPreprocess <i>Class:</i> InDataServerInsertionTask	The EclnGran process sends requests to the EcDsScienceDataServer to insert a particular file or files into the archive. Inserted data is accompanied by metadata. The metadata is catalogued in the SDSRV inventory as a granule of a particular ESDT short name and version. This data can be algorithms, Level 0 (L0) data, standard products, ancillary data, correlative data or calibration data.

Table 4.1.1.5-2. SDSRV CSCI Process Interface Events (2 of 4)

Event	Event Frequency	Interface	Initiated By	Event Description
Search Inventory	One per query	<i>Process:</i> EcDsScienceDataServer <i>Library:</i> DsCI <i>Class:</i> DsCIQuery	<i>Processes:</i> EcPIPREditor_IF, EcPISubMgr, EcPIOdMgr <i>Library:</i> DpPrDssIF <i>Class:</i> DpPrDSSInterface	The EcPIPREditor_IF , EcPISubMgr and EcPIOdMgr processes create two types of queries. One type only has the ESDT short name and data start and stop times and the other type also includes spatial coordinates. The EcPIPREditor_IF process queries when the predicted data is available. The EcPIPREditor_IF process creates an ESDT Reference from an UR after receiving an ESDT Reference from a query. The EcDsScienceDataServer returns ESDT References for granules to satisfy the query. The EcPISubMgr process creates an ESDT Reference from an UR after receiving a subscription notification or receiving an ESDT reference from a query. The EcPISubMgr process queries when predicted data is not available. The EcPIOdMgr process creates an ESDT Reference from an UR after receiving a subscription notification or receiving an ESDT reference from a query. The EcPIOdMgr process queries when predicted data is not available. The EcDsScienceDataServer returns metadata information about the granule being inspected.

Table 4.1.1.5-2. SDSRV CSCI Process Interface Events (4 of 4)

Event	Event Frequency	Interface	Initiated By	Event Description
Return User Profile	One per request	<i>Process:</i> EcDsScienceDataServer <i>Library:</i> DsSr <i>Class:</i> DsSrManagedServer	<i>Process:</i> EcMsAcRegUserSrvr <i>Library:</i> MsAcClnt <i>Class:</i> MsAcUserProfile RWPortal	The EcMsAcRegUserSrvr returns the user profile to the EcDsScienceDataServer.

Table 4.1.1.5-3 provides descriptions of the interface events shown in the SDSRV CSCI architecture diagram for Figure 4.1.1.3-3.

Table 4.1.1.5-3. SDSRV CSCI Process Interface Events (1 of 10)

Event	Event Frequency	Interface	Initiated By	Event Description
Request PGE Insert	One per insert request	<i>Process:</i> EcDsScienceDataServer <i>Library:</i> DsCI <i>Classes:</i> DsCIRequest, DsCICommand	<i>Processes:</i> EcDpAtInsertExeTarFile, EcDpAtInsertStaticFile, EcDpAtInsertTestFile <i>Library:</i> PICore2 <i>Classes:</i> DpAtDsrv, PIResourceRequirement	The EcDpAtInsertExeTarFile , EcDpAtInsertStaticFile , and EcDpAtInsertTestFile send PGE insert requests to the EcDsScienceDataServer for data that defines a PGE and allows it to be scheduled and executed.

Table 4.1.1.5-3. SDSRV CSCI Process Interface Events (2 of 10)

Event	Event Frequency	Interface	Initiated By	Event Description
Request Data InsertAt	One per data insert request	<p><i>Process:</i> EcDsScienceDataServer</p> <p><i>Library:</i> DsCI</p> <p><i>Classes:</i> DsCIRequest, DsCICommand, DsGeESDT</p>	<p><i>Processes:</i> EcDpAtInsertExeTarFile, EcDpAtInsertStaticFile, EcDpAtInsertTestFile</p> <p><i>Library:</i> DpAtDsrv</p> <p><i>Class:</i> DpAtDsrv</p>	<p>The EcDpAtInsertExeTarFile, EcDpAtInsertStaticFile, and EcDpAtInsertTestFile, processes send requests to the EcDsScienceDataServer to insert a particular file or files into the archive. Inserted data is accompanied by metadata. The metadata is catalogued in the SDSRV inventory as a granule of a particular ESDT short name and version. For the EcDpAtInsertExeTarFile, EcDpAtInsertStaticFile, and EcDpAtInsertTestFile processes these files can be processing output, static files received with PGEs, PGE Tape Archive (TAR) files, Algorithm Packages (APs), Science Software Archive Packages (SSAPs), or Delivered Algorithm Packages (DAPs), failed PGE tar files, or production history files.</p>
Request MCF	One per set of external data received by the ECS	<p><i>Process:</i> EcDsScienceDataServer</p> <p><i>Library:</i> DsCI</p> <p><i>Class:</i> DsCIDescriptor</p>	<p><i>Processes:</i> EcDpPrEM, EcDpPrDM, EcDpAtGetMCF</p> <p><i>Library:</i> DpPrDsslF</p> <p><i>Class:</i> DpPrDSSInterface</p>	<p>The EcDpAtGetMCF, EcDpPrDM, and EcDpPrEM processes request the Metadata Configuration File (MCF) from the EcDsScienceDataServer, prior to a data insert request. The EcDsScienceDataServer provides the MCF information as part of the GetMCF service call.</p>

Table 4.1.1.5-3. SDSRV CSCI Process Interface Events (3 of 10)

Event	Event Frequency	Interface	Initiated By	Event Description
Request SSAP Information	One per SSAP information request	<i>Process:</i> EcDsScienceDataServer <i>Library:</i> DsCi <i>Classes:</i> DsCIESDTReferenceCollector, DsCiRequest, DsCiCommand	<i>Process:</i> EcDpAtSSAPGui <i>Libraries:</i> DpAtSSAP, DpAtDsrv <i>Classes:</i> DpAtSSAPManager, DpAtDsrv	The EcDpAtSSAPGui sends requests to the EcDsScienceDataServer for information about SSAPs, including names of existing SSAPs and the components associated with a specific SSAP.
Request DAPs	One per DAPs request	<i>Process:</i> EcDsScienceDataServer <i>Library:</i> DsCi <i>Classes:</i> DsCIESDTReferenceCollector, DsCiRequest, DsCiCommand	<i>Process:</i> EcDpAtAcquireDAP <i>Library:</i> DpAtDsrv <i>Class:</i> DpAtDsrv	The EcDpAtStageDAP requests DAPs from the SDSRV Archives based on the UR. In response, the DAPs are returned and stored on the local AITTL disk.
Request Product	One per product order request	<i>Process:</i> EcDsScienceDataServer <i>Library:</i> DsCi <i>Classes:</i> DsCiRequest, DsCiCommand	<i>Process:</i> EcDpAtStageDAP <i>Library:</i> DpAtSrv <i>Class:</i> DpAtSrv	The EcDpAtStageDAP sends requests to the EcDsScienceDataServer for particular data granules to be pushed, via the FTP service, onto the DPS science processor as input for data processing or for SSIT work.
Insert SSAP Information	One per SSAP	<i>Process:</i> EcDsScienceDataServer <i>Library:</i> DsCi <i>Classes:</i> DsCiRequest, DsCiCommand	Operations Staff <i>Process:</i> EcDpAtSSAPGui <i>Library:</i> DpAtDsrv <i>Classes:</i> DpAtSSAPManager, DpAtDsrv	The Operations Staff uses the EcDpAtSSAPGui to send requests to the EcDsScienceDataServer to insert new SSAP information or update some existing SSAP information.

Table 4.1.1.5-3. SDSRV CSCI Process Interface Events (4 of 10)

Event	Event Frequency	Interface	Initiated By	Event Description
Request Communications Support	One service per request	<p>Process: DCE Security Server</p> <p>Libraries: EcSelogin, EcSeLogincontext</p> <p>Classes: EcSelogin, EcSeLogincontext</p> <p>Library: EcPf</p> <p>Classes: EcPfManagedServer, EcPfclient</p> <p>Library(Common): EcUr</p> <p>Class: EcUrServerUR</p> <p>Library: Event</p> <p>Class: EcLgErrorMsg</p> <p>Process: EcSbSubServer</p> <p>Library: EcSbCl</p> <p>Classes: EcClEvent, EcClTriggerEventCb, EcClRegisterEventCb</p> <p>Process: EcCsEmailParser</p> <p>Class: EcCsEmailParser</p> <p>Process: EcCsRegistryServer</p> <p>Library: EcCsRegistryClient</p> <p>Class: EcRgRegistryServer_C</p>	<p>Process: EcDsScienceDataServer</p> <p>Libraries: DsDe, DsBt</p> <p>Classes: DsDeEventCustomizer, DsBtSbSbrvNotifier</p>	<p>The DCCI CSCI provides a library of services available to each SDPS and CSMS CSCI. The CSCI services required to perform specific assignments are requested from the DCCI CSCI. These services include:</p> <ul style="list-style-type: none"> • DCE Support • Name/Address Services • Server Request Framework (SRF) • Universal Reference (UR) • Error/Event Logging • Fault Handling Services • User Authentication Services • Mode Information • (Query Registry) Retrieving the requested configuration attribute-value pairs from the Configuration Registry • Distribution Media Options from the Configuration Registry

Table 4.1.1.5-3. SDSRV CSCI Process Interface Events (5 of 10)

Event	Event Frequency	Interface	Initiated By	Event Description
Register Events	One per ESDT installation	<i>Process:</i> EcSbSubServer <i>Library:</i> EcSbSrSh <i>Class:</i> EcSbEvent	<i>Process:</i> EcDsScienceDataServer <i>Library:</i> DsDe <i>Class:</i> DsDeEventCustomizer	The EcDsScienceDataServer sends the subscription events for an Earth Science Data Type to the EcSbSubServer when an ESDT is installed into the system or when an ESDT is updated by adding additional subscription events.
Replace Events	One per ESDT update	<i>Process:</i> EcSbSubServer <i>Library:</i> EcSbSrSh <i>Class:</i> EcCIEvent	<i>Process:</i> EcDsScienceDataServer <i>Library:</i> DsDe <i>Class:</i> DsDeEventCustomizer	The EcDsScienceDataServer sends the updated subscription events for an Earth Science Data Type (ESDT) to the EcSbSubServer when an ESDT is updated in the system. This replaces the previous information.
Trigger Events	One per subscription event	<i>Process:</i> EcSbSubServer <i>Library:</i> EcSbCI <i>Class:</i> EcCIEvent	<i>Process:</i> EcDsScienceDataServer <i>Library:</i> DsBt <i>Class:</i> DsBtSbsrvNotifier	The EcDsScienceDataServer notifies the EcSbSubServer (via an event trigger) when a subscription event occurs on an Earth Science Data Type Service.
Request Distribution Media Options	One per ESDT load	<i>Process:</i> EcCsRegistryServer <i>Library:</i> EcCsRegistryClient <i>Class:</i> EcRgRegistryServerC	<i>Process:</i> EcDsScienceDataServer <i>Library:</i> DsDe1 <i>Class:</i> DsDeServiceCustomizer	The EcDsScienceDataServer requests media options from the Registry Server when it accesses an ESDT for the first time.
Send Acquire	One per acquire	<i>Process:</i> EcDsScienceDataServer <i>Library:</i> DsCI <i>Classes:</i> DsCIRequest DsCICommand DsCIESDTReferenceCollector	<i>Process:</i> EcCsEmailParser <i>Class:</i> EcCsEmailParser <i>Process:</i> EcSbSubServer <i>Library:</i> EcSbSr <i>Class:</i> EcSbSubscription	An “acquire” (instruction to obtain data) is created by the EcCsEmailParser or the EcSbSubServer and sent to the EcDsScienceDataServer. This is similar to the “Request Product” interface event, except it applies to EDOS expedited data.

Table 4.1.1.5-3. SDSRV CSCI Process Interface Events (6 of 10)

Event	Event Frequency	Interface	Initiated By	Event Description
Get Info for EDN	One per request	<i>Process:</i> EcDsScienceDataServer <i>Library:</i> DsCI <i>Class:</i> DsCIESDTReference	<i>Process:</i> EcCsEmailParser <i>Class:</i> EcCsEmailParser	The EcCsEmailParser sends requests to the EcDsScienceDataServer for the Expedited Data Set Notification (EDN) information and sends messages to users at the ASTER GDS.
Send Search	Per client request	<i>Processes:</i> EcDsScienceDataServer <i>Library:</i> DsCI <i>Class:</i> DsCIESDTReferenceCollector	<i>Process:</i> EcCsMtMGateway <i>Library:</i> DsXSsStaticClientLibs	The EcCsMtMGateway sends inventory search requests, constructed from the qualifying metadata information in the SIPS request, to the EcDsScienceDataServer via a remote procedure call.
Send Event ID	One per event	<i>Process:</i> EcDsScienceDataServer <i>Library:</i> DsDe <i>Class:</i> DsDeEventCustomizer	<i>Process:</i> EcSbSubServer <i>Library:</i> EcSbSrSh <i>Class:</i> EcSbEvent	The EcSbSubServer sends Event IDs to the EcDsScienceDataServer when ESDTs are installed or when ESDTs are updated by adding additional events.
Return Status	One per request	<i>Process:</i> EcDsScienceDataServer <i>Library:</i> DsBt <i>Class:</i> DsBtSbsrvNotifier	<i>Process:</i> EcSbSubServer <i>Library:</i> EcUt	Status returned by the EcSbSubServer to the EcDsScienceDataServer to simply indicate that the request was received, not that the action succeeded.
Request Granule Deletion	One per granule delete request	<i>Process:</i> EcDsScienceDataServer <i>Library:</i> DsCI <i>Classes:</i> DsCIRequest DsCICommand DsCIESDTReferenceCollector	<i>Process:</i> EcDpPrDeletion <i>Library:</i> DpPrDsslF <i>Class:</i> DpPrDSSInterface	The EcDpPrDeletion sends delete requests to the EcDsScienceDataServer for particular granules (interim data) in the SDSRV archives.

Table 4.1.1.5-3. SDSRV CSCI Process Interface Events (7 of 10)

Event	Event Frequency	Interface	Initiated By	Event Description
Request Data InsertPr	One per data insert request	<i>Process:</i> EcDsScienceDataServer <i>Library:</i> DsCI <i>Classes:</i> DsCIRequest, DsCICommand, DsGeESDT	<i>Processes:</i> EcDpPrDM, EcDpPrEM, EcDpPrQaMonitorGUI <i>Libraries:</i> DpPrDssIF, DpPrQaMonitor <i>Classes:</i> DpPrDSSInterface, DpPrQAGranuleQaFlags	The EcDpPrDM , EcDpPrEM , and EcDpPrQaMonitorGUI processes send requests to the EcDsScienceDataServer to insert a particular file or files into the archive. Inserted data is accompanied by metadata. The metadata is catalogued in the SDSRV inventory as a granule of a particular ESDT short name and version. For the EcDpPrEM and EcDpPrDM processes, these files can be granules or PGE tar files. For the EcDpPrQaMonitorGUI, these files are metadata updates.
Acquire PGE Tar File	One per request	<i>Process:</i> EcDsScienceDataServer <i>Library:</i> DsCI <i>Classes:</i> DsCIRequest, DsCICommand	<i>Process:</i> EcDpPrEM <i>Library:</i> DpPrDssIF <i>Class:</i> DpPrDSSInterface	The EcDpPrEM process acquires a tar file for any PGE not currently local to the science processor from the EcDsScienceDataServer. The executable is extracted from the tar file and used during PGE execution.
Insert Product History Tar Files	One per successful PGE execution	<i>Process:</i> EcDsScienceDataServer <i>Library:</i> DsCI <i>Classes:</i> DsCIRequest, DsCICommand	<i>Process:</i> EcDpPrDM <i>Library:</i> DpPrDssIF <i>Class:</i> DpPrDSSInterface	After the PGE has successfully completed executing and archiving the resulting outputs, the EcDpPrDM requests the PGE Production History Tar file be inserted into the EcDsScienceDataServer for permanent archive.
Insert Failed PGE Tar File	One per unsuccessful PGE execution	<i>Process:</i> EcDsScienceDataServer <i>Library:</i> DsCI <i>Classes:</i> DsCIRequest, DsCICommand	<i>Process:</i> EcDpPrEM <i>Library:</i> DpPrDssIF <i>Class:</i> DpPrDSSInterface	After an unsuccessful execution of a PGE, the EcDpPrEM obtains the Tar file containing the PGE log files, core dump (if any), PCF and other files, and requests the files be inserted into the EcDsScienceDataServer for permanent archive.

Table 4.1.1.5-3. SDSRV CSCI Process Interface Events (8 of 10)

Event	Event Frequency	Interface	Initiated By	Event Description
Update Product Metadata	One per metadata product update	<i>Process:</i> EcDsScienceDataServer <i>Library:</i> DsCI <i>Classes:</i> DsCICommand, DsCIRequest, DsCIESDTReferenceCollector	<i>Process:</i> EcDpPrQaMonitorGUI <i>Library:</i> DpPrQaMonitor <i>Class:</i> DpPrQAGranuleQaFlags	The EcDpPrQaMonitorGUI provides the operator with capabilities to update product metadata in the EcDsScienceDataServer.
Retrieve Product History	One per request	<i>Process:</i> EcDsScienceDataServer <i>Library:</i> DsCI <i>Class:</i> DsCIAcquireCommand	<i>Process:</i> EcDpPrQaMonitorGUI <i>Library:</i> DpPrQaMonitor <i>Class:</i> DpPrQaMonitor	The EcDpPrQaMonitorGUI submits requests of this type to the EcDsScienceDataServer. It transfers the Production History tar file from the Science Data archive to the user's host machine.
Query Data	One per query	<i>Process:</i> EcDsScienceDataServer <i>Library:</i> DsCI <i>Class:</i> DsCIESDTReferenceCollector	Operations Staff <i>Process:</i> EcDpPrQaMonitorGUI <i>Library:</i> DpPrQaMonitor <i>Class:</i> DpPrQaDataGranule	The Operations Staff uses the EcDpPrQaMonitorGUI to submit requests of this type to the EcDsScienceDataServer. It searches the archive for granules that match the user-supplied selection criteria: data type and begin/end date. Results are displayed to the user.
Retrieve Data	One per request	<i>Process:</i> EcDsScienceDataServer <i>Library:</i> DsCI <i>Classes:</i> DsCIQuery, DsCIAcquireCommand	Operations Staff <i>Process:</i> EcDpPrQaMonitorGUI <i>Library:</i> DpPrQaMonitor <i>Class:</i> DpPrQaMonitor	The Operations Staff uses the EcDpPrQaMonitorGUI to send retrieval requests, to the EcDsScienceDataServer, for a particular data granuleId. The product is transferred (pushed), via the FTP service, onto the DPS science processor and used as input for PGE processing or for SSIT work.

Table 4.1.1.5-3. SDSRV CSCI Process Interface Events (9 of 10)

Event	Event Frequency	Interface	Initiated By	Event Description
Send ESDT Installation Information	One per new ESDT installation	<i>Process:</i> EcDmDictServer <i>Library:</i> EcDmDdClient <i>Class:</i> DmDdCISchemaRequest	<i>Process:</i> EcDsScienceDataServer <i>Library:</i> DsDe <i>Class:</i> DsDeDataDictController	The EcDsScienceDataServer sends ESDT installation information, to the EcDmDictServer , whenever a new ESDT is installed. This data consists of Inventory and Collection level metadata.
Replace ESDT Installation Information	One per ESDT update	<i>Process:</i> EcDmDictServer <i>Library:</i> EcDmDdClient <i>Class:</i> DmDdCISchemaRequest	<i>Process:</i> EcDsScienceDataServer <i>Library:</i> DsDe <i>Class:</i> DsDeDataDictController	The EcDsScienceDataServer sends updated ESDT information to the EcDmDictServer whenever an ESDT is updated. This data consists of updated Inventory and Collection level metadata.
Insert ESDT Advertisements	One per advertisement insert request	<i>Process:</i> EcloAdServer <i>Libraries:</i> IoAdCore IoAdSubs <i>Classes:</i> IoAdApprovedAdv IoAdGroup IoAdProvider IoAdProduct	<i>Process:</i> EcDsScienceDataServer <i>Library:</i> DsDe <i>Class:</i> DsDelIOSController	The EcloAdServer receives requests to insert advertisements for data types (ESDTs) from the EcDsScienceDataServer including both data product and signature service advertisements.
Replace ESDT Advertisements	One per advertisement update request	<i>Process:</i> EcloAdServer <i>Libraries:</i> IoAdCore, IoAdSubs <i>Classes:</i> IoAdApprovedAdv, IoAdGroup, IoAdProvider, IoAdProduct	<i>Process:</i> EcDsScienceDataServer <i>Library:</i> DsDe <i>Class:</i> DsDelIOSController	The EcloAdServer receives requests to update advertisements for data types (ESDTs) from the EcDsScienceDataServer including both data product and signature service advertisements.

Table 4.1.1.5-3. SDSRV CSCI Process Interface Events (10 of 10)

Event	Event Frequency	Interface	Initiated By	Event Description
Search Inventory	One per service request	<i>Process:</i> EcDsScienceDataServer <i>Library:</i> DsCI <i>Classes:</i> DsCIQuery, DsCIESDTRReferenceCollector	<i>Process:</i> EcDmV0ToEcsGateway <i>Library:</i> RequestProcessing <i>Class:</i> DmGwInvSearchRequest	The EcDmV0ToEcsGateway sends requests to the EcDsScienceDataServer to search the SDPS Inventory (archives). In response, ESDT Universal References (URs) for the granules are returned from the EcDsScienceDataServer.
Request Browse Data	One per browse request	<i>Process:</i> EcDsScienceDataServer <i>Library:</i> DsCI <i>Classes:</i> DsCIESDTRReferenceCollector, DsCIRequest, DsCICommand	<i>Process:</i> EcDmV0ToEcsGateway <i>Library:</i> RequestProcessing <i>Class:</i> DmGwBrowseRequest	The EcDmV0ToEcsGateway submits requests for browse data to the EcDsScienceDataServer to acquire reduced resolution products to support a product request.
Request Product	One per product order request	<i>Process:</i> EcDsScienceDataServer <i>Library:</i> DsCI <i>Classes:</i> DsCIRequest, DsCICommand	<i>Process:</i> EcDmV0ToEcsGateway <i>Library:</i> RequestProcessing <i>Class:</i> DmGwAcquireRequest	The EcDmV0ToEcsGateway forwards product requests to the EcDsScienceDataServer from an external user to be distributed by the EcDsDistributionServer upon receipt of the data from the EcDsStStagingDiskServer.
Request Inspect	One per price estimate request	<i>Process:</i> EcDsScienceDataServer <i>Library:</i> DsCI <i>Classes:</i> DsCIESDTRReferenceCollector, DsCIRequest	<i>Process:</i> EcDmV0ToEcsGateway <i>Library:</i> RequestProcessing <i>Class:</i> DmGwPriceEstRequest	The EcDmV0ToEcsGateway sends a request for an inspection of granule metadata to the EcDsScienceDataServer in support of a price estimate request.

4.1.1.6 Science Data Server Data Stores

Table 4.1.1.6-1 provides a description of the data stores for the SDSRV CSCI, and the conceptual model of the data store. The physical model for the SDSRV data stores can be found in the Science Data Server Database Design and Schema Specifications for the ECS Project (CDRL 311).

Table 4.1.1.6-1. SDSRV CSCI Data Stores

Data Store	Type	Description
ECS Inventory	Database	<p>The ECS Inventory (archives) contains the metadata describing the earth science data for the Earth Science Data Types at a specific DAAC. The metadata describes:</p> <ul style="list-style-type: none"> • Collection level information • Browse data • Science data (as granules) • Quality Assessments • Algorithm Packages • Delivered Algorithm Packages • Production History <p>The ECS catalog also contains systems data for the dynamic configuration of the EcDsScienceDataServer.</p> <p>The ECS catalog also contains implementation of the “ECS Data Model” for Attribute Validity checking.</p> <p>The ECS catalog also contains system data for ESDT Configuration.</p>

4.1.2 Data Distribution Software Description

4.1.2.1 Data Distribution Functional Overview

The Data Distribution (DDIST) CSCI monitors and controls processing for distribution requests. Data Distribution processing consists of directing the STMGT CSCI to place data for distribution in working storage and creating packing lists, and directing the STMGT CSCI to copy data on to hard media or push data as required via the FTP, and sending notifications for pulls completed via the FTP. Data handled electronically is either pushed via the FTP to a user-specified location or placed in a directory to be pulled. If data is to be pulled, once the data is ready, the DDIST CSCI sends an electronic message to the user providing the required information for the user to pull the data. If data is to be distributed via hard media, a complete packing list is generated as well as an inventory list for each hard media generated. The DDIST CSCI has a GUI interface with the administration/operations staff (Admin. /Ops). The GUI provides error conditions and status to operations staff and enables the operations staff to set parameters and control operations including suspending, canceling, and resuming requests, changing the priorities of requests, changing the media type, performing multiple selects, and setting threshold sizes. The DDIST CSCI provides limited automatic error response by suspending requests when most errors are encountered. The hard media types supported are 8mm tape, D3 tape, CD-ROM and Digital Linear Tape (DLT).

The DDIST CSCI determines the number of hard media for an order, places the files on the hard media, generates packing lists, and hard media inventory lists. The DDIST CSCI directs the STMGT CSCI to pack one hard media for a given request at a time.

The DDIST CSCI has an interface with the following:

- STMGT CSCI
- SDSRV CSCI
- Administrator/Operations staff (through GUI or command line)
- MSS (MCI)

The Administrator/Operations staff and the SDSRV CSCI control the DDIST CSCI activities. The DDIST CSCI receives direction to perform its functions from calls to the STMGT CSCI.

4.1.2.2 Data Distribution Context

Figure 4.1.2.2-1 is the DDIST CSCI context diagram. The diagram shows the events sent to the DDIST CSCI and the events the DDIST CSCI sends to other CSCIs and Users. Table 4.1.2.2-1 provides descriptions of the events (by service name) shown in the DDIST CSCI context diagram.

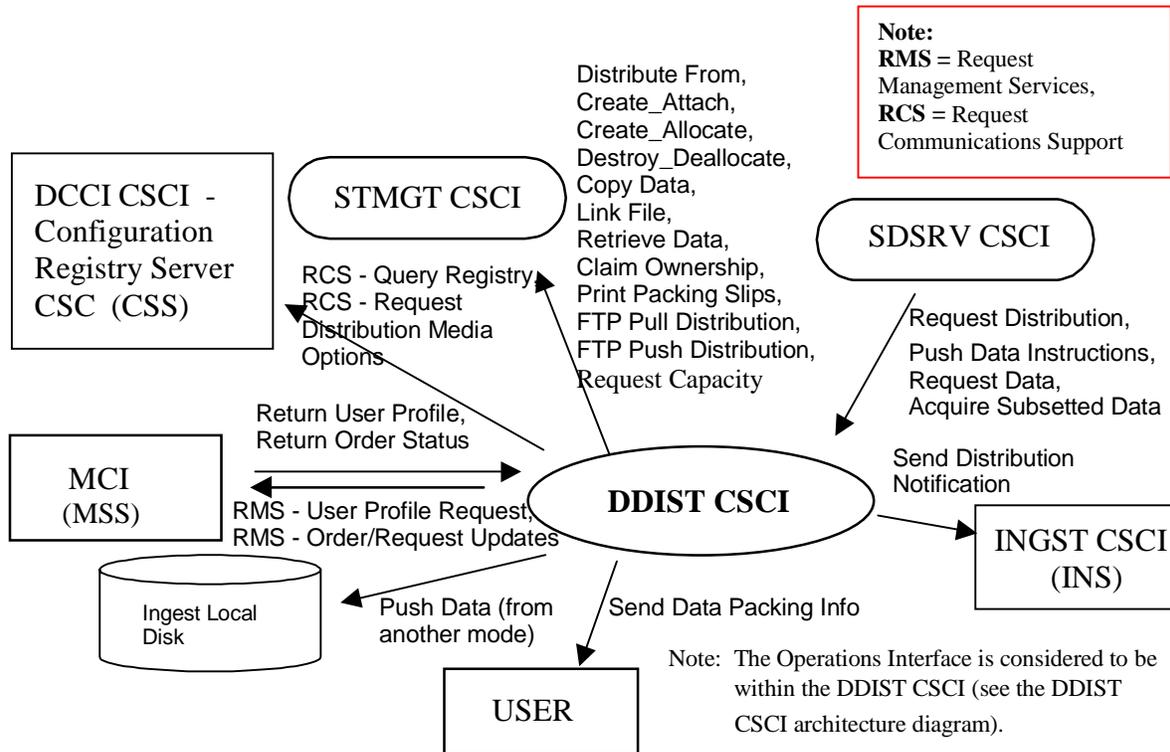


Figure 4.1.2.2-1. DDIST CSCI Context Diagram

Table 4.1.2.2-1. DDIST CSCI Interface Events (1 of 3)

Event	Interface Event Description
Distribute From	The DDIST CSCI sends requests to the STMGT CSCI to copy files from staging disks to an allocated peripheral resource.
Create_Attach	The DDIST CSCI sends requests to the STMGT CSCI to attach (gain access to an existing staging disk area allocated by another process) to a staging disk area.
Create_Allocate	The DDIST CSCI sends requests to the STMGT CSCI to allocate areas on the local staging disk to store data for distribution.
Destroy_Deallocate	The DDIST CSCI sends requests to the STMGT CSCI to deallocate (lose access to) an existing staging disk area.
Copy Data	The DDIST CSCI sends requests to the STMGT CSCI to copy data within staging disks and between staging disks.
Link File	The DDIST CSCI sends requests to the STMGT CSCI to link files from read-only cache to a staging disk specified in the request.
Retrieve Data	The DDIST CSCI sends requests to the STMGT CSCI to retrieve data from the SDPS archives to be staged for distribution.

Table 4.1.2.2-1. DDIST CSCI Interface Events (2 of 3)

Event	Interface Event Description
Claim Ownership	The DDIST CSCI sends requests to the STMGT CSCI to claim ownership of (take responsibility for deallocating) an existing staging disk area.
Print Packing Slips	The DDIST CSCI requests to print a file on a given staging disk. The DDIST CSCI also sends requests to print out a packing list file associated with a distribution request, which has been successfully completed, to the STMGT CSCI .
FTP Pull Distribution	The DDIST CSCI sends requests to the STMGT CSCI to move a file to the Pull area.
FTP Push Distribution	The DDIST CSCI sends requests to the STMGT CSCI to distribute a file directly to a user or to a predetermined local disk area for the user.
Request Capacity	The DDIST CSCI sends requests to the STMGT CSCI to get the effective maximum capacity of a media type. This information is used to determine the number of media needed to satisfy a given request.
Request Distribution	A request sent from the SDSRV CSCI to the DDIST CSCI for science data or a product to be sent to a specified user.
Push Data Instructions	The SDSRV CSCI assembles instructions to send data and sends the instructions to the DDIST CSCI. The DDIST CSCI sends a request to the STMGT CSCI to push the data, via the FTP service, followed by a signal file, to the destination specified in an acquire instruction.
Request Data	The DDIST CSCI stores the request received from the SDSRV CSCI in a queue with the appropriate priority. When the request is taken from the queue, the STMGT CSCI is passed the data retrieval request from the DDIST CSCI for a particular data granule to be pushed onto the DPS science processor, via the FTP service. The data granule is to be used as input for PGE processing or for SSIT work.
Acquire Subsetted Data	The SDSRV CSCI sends requests to the DDIST CSCI to retrieve subsetted data files for distribution.
Send Distribution Notification	The DDIST CSCI sends a distribution notification, via e-mail, to the INGST CSCI when data being distributed is to be ingested.
Send Data Packing Info	Notification sent to the user via E-mail about a data product to be or has been distributed. Data handled electronically is either pushed, via the FTP service, to a user-specified location or placed in a directory to be pulled via the FTP service by the user.
Push Data (from another mode)	The DDIST CSCI pushes data, via the FTP service, to the Ingest local disk when it is distributing data to be ingested.

Table 4.1.2.2-1. DDIST CSCI Interface Events (3 of 3)

Event	Interface Event Description
Request Management Services	<p>The MCI provides a basic management library of services to the CSCIs, implemented as client or server applications, using the CSS Process Framework. The basic management library of services includes:</p> <ul style="list-style-type: none"> • System startup and shutdown - Please refer to the release-related, current version of the Mission Operations Procedures for the ECS Project document (611) and the current ECS Project Training Material document (625), identified in Section 2.2.1 of this document. <p>The MCI also interfaces with other CSCIs or CSCs to perform the following:</p> <ul style="list-style-type: none"> • User Profile Request – The MCI provides requesting CSCIs or CSCs with access to user profile information such as e-mail address and shipping address to support their processing activities. • Order/Request Updates - The DDIST CSCI interfaces with the Accountability Management Service Order/Request Tracking to create/update the EcAcRequest (user product order request) such as media id, quantity and type.
Return User Profile	The DDIST CSCI receives user profile information from the MCI to authenticate a user.
Return Order Status	The DDIST CSCI receives order status (i.e., Order ID, Request ID) information from the MCI .
Request Communications Support	<p>The DCCI CSCI provides a library of services available to each SDPS and CSMS CSCI. The CSCI services required to perform specific assignments are requested from the DCCI CSCI. These services include:</p> <ul style="list-style-type: none"> • DCE Support • Name/Address Services • Server Request Framework (SRF) • Error/Event Logging • Fault Handling Services • Mode Information • (Query Registry) Retrieving the requested configuration attribute-value pairs from the Configuration Registry • Distribution Media Options from the Configuration Registry

4.1.2.3 Data Distribution Architecture

The DDIST CSCI is two SDPS developed processes with the addition of the Sybase Server COTS hardware and software process package as a data repository identified as:

- EcDsDistributionServer - Data Distribution
- EcDsDdistGui - Data Distribution GUI
- Sybase Server - Data Repository (storage area)

Figure 4.1.2.3-1 is the DDIST CSCI architecture diagram. The diagram shows the events sent to the DDIST CSCI processes and the events the DDIST CSCI processes send to other processes and the Operations staff.

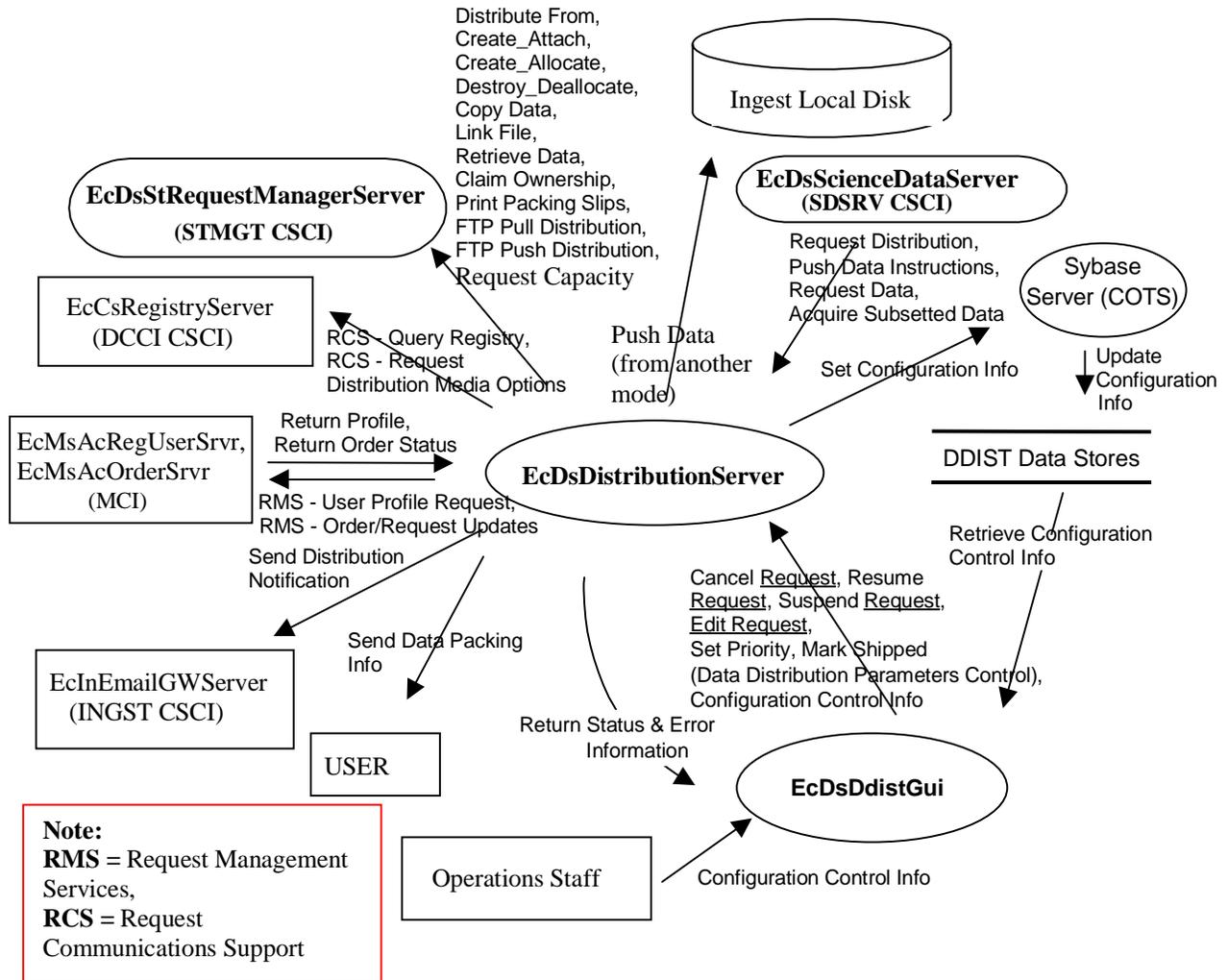


Figure 4.1.2.3-1. DDIST CSCI Architecture Diagram

4.1.2.4 Data Distribution Process Descriptions

Table 4.1.2.4-1 provides descriptions of the processes shown in the DDIST CSCI architecture diagram.

Table 4.1.2.4-1. DDIST CSCI Processes

Process	Type	COTS/ Developed	Functionality
EcDsDistributionServer	Server	Developed	This process provides the control and coordination for data distribution through request processing.
EcDsDdistGui	GUI	Developed	This process enables operations to initiate, track, and manipulate distribution requests by using input GUI controls and database information.
Sybase	Server	COTS	The process contains the request list and has a set of stored procedures, which updates the request configuration, provides the request configuration to GUI operations and checkpoints the state of the CSCI for fault recovery purposes.

4.1.2.5 Data Distribution Process Interface Descriptions

Table 4.1.2.5-1 provides descriptions of the interface events shown in the DDIST CSCI architecture diagram.

Table 4.1.2.5-1. DDIST CSCI Process Interface Events (1 of 9)

Event	Event Frequency	Interface	Initiated By	Event Description
Distribute From	One data copy from staging disk per request	<i>Process:</i> EcDsStRequestManagerServer <i>Library:</i> DsStRmClient <i>Class:</i> DsStRequestManager	<i>Process:</i> EcDsDistributionServer <i>Class:</i> DsDdMedia	The EcDsDistributionServer sends requests to the EcDsStRequestManager Server to copy files from staging disks to an allocated peripheral resource.
Create_Attach	One attach per request	<i>Process:</i> EcDsStRequestManagerServer <i>Library:</i> DsStRmClient <i>Class:</i> DsStRequestManager	<i>Process:</i> EcDsDistributionServer <i>Classes:</i> DsDdMedia, DsDsStaging	The EcDsDistributionServer sends requests to the EcDsStRequestManager Server to attach (gain access to an existing staging disk area allocated by another process) to a staging disk area.

Table 4.1.2.5-1. DDIST CSCI Process Interface Events (2 of 9)

Event	Event Frequency	Interface	Initiated By	Event Description
Create_Allocate	One allocation per request	<i>Process:</i> EcDsStRequestManagerServer <i>Library:</i> DsStRmClient <i>Class:</i> DsStRequestManager	<i>Process:</i> EcDsDistributionServer <i>Class:</i> DsDdMedia	The EcDsDistributionServer send requests to the EcDsStRequestManager Server to allocate areas on the local staging disk to store data for distribution.
Destroy_Deallocate	One deallocation per request	<i>Process:</i> EcDsStRequestManagerServer <i>Library:</i> DsStRmClient <i>Class:</i> DsStRequestManager	<i>Process:</i> EcDsDistributionServer <i>Class:</i> DsDdMedia	The EcDsDistributionServer sends requests to the EcDsStRequestManager Server to deallocate (lose access to) an existing staging disk area.
Copy Data	One per data copy operation	<i>Process:</i> EcDsStRequestManagerServer <i>Library:</i> DsStRmClient <i>Class:</i> DsStRequestManager	<i>Process:</i> EcDsDistributionServer <i>Library:</i> DsDdS <i>Class:</i> DsDdGranuleS	The EcDsDistributionServer sends requests to the EcDsStRequestManager Server to copy data within staging disks and between staging disks.
Link File	One link per file in a request	<i>Process:</i> EcDsStRequestManagerServer <i>Library:</i> DsStRmClient <i>Class:</i> DsStRequestManager	<i>Process:</i> EcDsDistributionServer <i>Library:</i> DsDdS <i>Class:</i> DsDdGranuleS	The EcDsDistributionServer sends requests to the EcDsStRequestManager Server to link files from the read-only cache to a staging disk and from one staging disk to another.
Retrieve Data	One granule per retrieval request	<i>Process:</i> EcDsStRequestManagerServer <i>Library:</i> DsStRmClient <i>Class:</i> DsStRequestManager	<i>Process:</i> EcDsDistributionServer <i>Class:</i> DsDdGranuleS	The EcDsDistributionServer sends requests to the EcDsStRequestManager Server to retrieve data from the SDPS archives and to compress the retrieved data.

Table 4.1.2.5-1. DDIST CSCI Process Interface Events (3 of 9)

Event	Event Frequency	Interface	Initiated By	Event Description
Claim Ownership	One per staging disk area	<i>Process:</i> EcDsStRequestManagerServer <i>Library:</i> DsStRmClient <i>Class:</i> DsStRequestManager	<i>Process:</i> EcDsDistributionServer <i>Class:</i> DsDdMedia	The EcDsDistributionServer sends requests to the EcDsStRequestManager Server to claim ownership of (take responsibility for deallocating) an existing staging disk area.
Print packing slips	As many needed per distribution request	<i>Process:</i> EcDsStRequestManagerServer <i>Library:</i> DsStRmClient <i>Class:</i> DsStRequestManager	<i>Process:</i> EcDsDistributionServer <i>Class:</i> DsDsReadytoShipQueue	The EcDsDistributionServer sends requests to the EcDsStRequestManager Server to print a file on a given staging disk. The EcDsDistributionServer requests the EcDsStRequestManager Server to print out a packing list file associated with a distribution request, which has been completed successfully.
FTP Pull Distribution	One order per pull request	<i>Process:</i> EcDsStRequestManagerServer <i>Library:</i> DsStRmClient <i>Class:</i> DsStRequestManager	<i>Process:</i> EcDsDistributionServer <i>Class:</i> DsDdGranuleS	The EcDsDistributionServer sends requests to the EcDsStRequestManager Server to move a file to the Pull area.
FTP Push Distribution	One order per push request	<i>Process:</i> EcDsStRequestManagerServer <i>Library:</i> DsStRmClient <i>Class:</i> DsStRequestManager	<i>Process:</i> EcDsDistributionServer <i>Class:</i> DsDdGranuleS	The EcDsDistributionServer sends requests to the EcDsStRequestManager Server to distribute a file directly to a user via a local disk area accessible by the user.

Table 4.1.2.5-1. DDIST CSCI Process Interface Events (4 of 9)

Event	Event Frequency	Interface	Initiated By	Event Description
Request Capacity	One calculation per request	<i>Process:</i> EcDsStRequestManagerServer <i>Library:</i> DsStRmClient <i>Class:</i> DsStRequestManager	<i>Process:</i> EcDsDistributionServer <i>Class:</i> DsDdMedia	The EcDsDistributionServer determines the effective maximum capacity of a media type to send to the EcDsStRequestManager Server . This is used to determine the number of media needed to satisfy a given request.
Push Data (from another mode)	One distribution per request	Ingest Local Disk	<i>Process:</i> EcDsDistributionServer <i>Class:</i> DsDdGranuleS	The EcDsDistributionServer pushes data, via the FTP Service, to the Ingest Local Disk when it is distributing data to be ingested.
Request Distribution	One per request for science data or product order	<i>Process:</i> EcDsDistributionServer <i>Library:</i> DsDdSSH <i>Classes:</i> DsDdScheduler, DsDdRequestMgrReal, DsDdDCERequestMgrConcrete	<i>Process:</i> EcDsScienceDataServer <i>Class:</i> DsDdRequestMgrReal	The EcDsScienceDataServer sends requests to the EcDsDistributionServer for science data or a product to be sent to a specified user.
Push Data Instructions	One per distribution request	<i>Process:</i> EcDsDistributionServer <i>Libraries:</i> DsDdB, DsDdC, DsDdl <i>Classes:</i> DsDdRequestMgrC, DsDdGranuleC	<i>Process:</i> EcDsScienceDataServer <i>Library:</i> DsSr <i>Class:</i> DsSrWorkingCollection	The EcDsScienceDataServer assembles instructions to send data to the EcDsDistributionServer. The EcDsDistributionServer sends a request to the EcDsStStagingDiskServer to push the data, via the FTP service, followed by a signal file to the destination specified in an acquire instruction by particular ESDTs that function this way.

Table 4.1.2.5-1. DDIST CSCI Process Interface Events (5 of 9)

Event	Event Frequency	Interface	Initiated By	Event Description
Request Data	One granule per retrieval request	<i>Process:</i> EcDsDistributionServer <i>Class:</i> DsDdGranuleS	<i>Process:</i> EcDsScienceDataServer <i>Class:</i> DsDbInterface	The EcDsScienceDataServer sends requests to the EcDsDistributionServer for a particular data granule(s) to be provided.
Acquire Subsetted Data	One file per request	<i>Process:</i> EcDsDistributionServer <i>Class:</i> DsDdGranuleS	<i>Process:</i> EcDsScienceDataServer <i>Class:</i> DsDbInterface	The EcDsScienceDataServer sends requests to the EcDsDistributionServer to retrieve subsetted data files for distribution.
Set Configuration Info	One per scheduling request	Sybase Server (COTS)	<i>Process:</i> EcDsDistributionServer <i>Libraries:</i> DsDdSSh, DsDdC <i>Classes:</i> DsDdRequestMgrBaseC, DsDdConfiguration, DsDdDistRequestS	Current configuration information entered by the Operations staff via the EcDsDdistGui is sent to the Sybase Server database via the EcDsDistributionServer. The Operations staff can access the configuration information from the database for expedient data distribution or product order distribution scheduling.
Update Configuration Info	One set per request	DDIST Data Stores	<i>Process:</i> Sybase Server (COTS)	The Sybase Server updates the configuration data in the data stores as requested.
Retrieve Configuration Control Info	Upon Operations Staff request	DDIST Data Stores	<i>Process:</i> EcDsDdistGui <i>Classes:</i> DsDdConfiguration, DsDdPfConfigFile	The Operations Staff retrieve configuration control information from the database for viewing or update via the EcDsDdistGui .
Cancel Request	One per priority cancel request	<i>Process:</i> EcDsDistributionServer <i>Library:</i> DsDdC <i>Class:</i> DsDdRequestMgrBaseC	Operations Staff <i>Process:</i> EcDsDdistGui <i>Class:</i> DsGuiDistRequest	The Operations Staff uses the EcDsDdistGui to send a command to the EcDsDistributionServer to cancel the priority of a request.

Table 4.1.2.5-1. DDIST CSCI Process Interface Events (6 of 9)

Event	Event Frequency	Interface	Initiated By	Event Description
Resume Request	One per resume request	<i>Process:</i> EcDsDistributionServer <i>Libraries:</i> DsDdB, DsDdC, DsDdl <i>Class:</i> DsDdRequestMgrC	Operations Staff <i>Process:</i> EcDsDdistGui <i>Class:</i> DsGuiDistRequest	The Operations Staff uses the EcDsDdistGui to send a command to the EcDsDistributionServer to resume requests when resume requests are suspended with errors.
Suspend Request	One per suspend request	<i>Process:</i> EcDsDistributionServer <i>Libraries:</i> DsDdB, DsDdC, DsDdl <i>Class:</i> DsDdRequestMgrC	Operations staff <i>Process:</i> EcDsDdistGui <i>Class:</i> DsGuiDistRequest	The Operations staff uses the EcDsDdistGui to send a command to the EcDsDistributionServer to suspend a request(s).
Edit Request	Per operator request on any given suspended request	<i>Process:</i> EcDsDistributionServer <i>Library:</i> DsDdSSH <i>Classes:</i> DsDdScheduler, DsDdRequestMgrReal, DsDdDCERequestMgrConcrete	Operations Staff <i>Process:</i> EcDsDdistGui <i>Class:</i> DsGuiDistRequest	The Operations Staff uses the EcDsDdistGui to send requests to the EcDsDistributionServer to edit a suspended request to the selected media type and compression type.
Set Priority	One per priority change	<i>Process:</i> EcDsDistributionServer <i>Library:</i> DsDdS <i>Classes:</i> DsDdMedia, DsDdRequestListS, DsDdRequestMgrReal, DsDdDistRequestS	Operations staff <i>Process:</i> EcDsDdistGui <i>Class:</i> DsGuiDistRequest	The Operations staff uses the EcDsDdistGui to send a command to the EcDsDistributionServer to change the priority of a distribution request.
Mark Shipped	One per hard media request	<i>Process:</i> EcDsDistributionServer <i>Libraries:</i> DsDdB, DsDdC, DsDdl <i>Class:</i> DsDdRequestMgrC, DsDdMedia	<i>Process:</i> EcDsDdistGui <i>Class:</i> DsGuiDistRequest	The Operations staff uses the EcDsDdistGui to send a command to the EcDsDistributionServer to mark the hard media request for shipment.

Table 4.1.2.5-1. DDIST CSCI Process Interface Events (7 of 9)

Event	Event Frequency	Interface	Initiated By	Event Description
Configuration Control Info	One per configuration sent	<i>Process:</i> EcDsDistributionServer <i>Library:</i> DsDdSSH <i>Classes:</i> DsDdDistListS, DsDdDistFileS, DsDdDistRequestS	Operations staff <i>Process:</i> EcDsDdistGui <i>Classes:</i> DsDdConfiguration DsDdPfConfigFile	The Operations staff enters configuration control information (queues, thresholds, suspend and resume status) via the EcDsDdistGui or command line to send to the EcDsDistributionServer and eventually be stored in the DDIST data stores.
Return Status & Error Information	One per Distribution Request	<i>Process:</i> EcDsDdistGui <i>Class:</i> DsGuErrorDialog	<i>Process:</i> EcDsDistributionServer <i>Classes:</i> DsDdMedia, DsDdBaseQueue	The EcDsDistributionServer sends Distribution Request status and error information to the Operations staff via the EcDsDdistGui , if the acquire is asynchronous and the EcDsDistributionServer gets the request.
Send Data Packing Info	One per distributed data location	User	<i>Process:</i> EcDsDistributionServer <i>Library:</i> DsDdSSH <i>Class:</i> DsDdMedia	The EcDsDistributionServer sends notifications to the user via e-mail with the location of data to be distributed or has been distributed.
Send Distribution Notification	One per distribution	<i>Process:</i> EcInEmailGWServer <i>Classes:</i> InEmailGWServer, InEmailParser	<i>Process:</i> EcDsDistributionServer <i>Library:</i> DsDdSSH <i>Classes:</i> DsDdMedia, DsDdMediaDist	The EcDsDistributionServer sends distribution notifications, via e-mail, to the EcInEmailGWServer .

Table 4.1.2.5-1. DDIST CSCI Process Interface Events (9 of 9)

Event	Event Frequency	Interface	Initiated By	Event Description
Return Order Status	One per order request	<i>Process:</i> EcDsDistributionServer <i>Library:</i> DsDdSSh <i>Classes:</i> DsDdMedia, DsDdRequestMgrServer	<i>Process:</i> EcMsAcOrderSrvr <i>Library:</i> MsAcCInt <i>Class:</i> EcAcOrderCMgr	The EcMsAcOrderSrvr provides order status information (i.e., Order ID, Request ID) for products requested by the EcDsDistributionServer.
Request Communications Support	One service per request	<i>Process:</i> DCE Security Server <i>Libraries:</i> EcSelogin, EcSeLogincontext <i>Classes:</i> EcSelogin, EcSeLogincontext <i>Library:</i> EcPf <i>Classes:</i> EcPfManagedServer, EcPfclient <i>Library (Common):</i> EcUr <i>Class:</i> EcUrServerUR <i>Library:</i> Event <i>Class:</i> EcLgErrormsg <i>Process:</i> EcCsRegistryServer <i>Library:</i> EcCsRegistryClient <i>Class:</i> EcRgRegistryServer_C	<i>Processes:</i> EcDsDistributionServer <i>Classes:</i> DsDdRequestMgrServer , DsDdlog	The DCCI CSCI provides a library of services available to each SDPS and CSMS CSCI. The CSCI services required to perform specific assignments are requested from the DCCI CSCI. These services include: <ul style="list-style-type: none"> • DCE Support • Name/Address Services • Server Request Framework (SRF) • Error/Event Logging • Fault Handling Services • Mode Information • (Query Registry) Retrieving the requested configuration attribute-value pairs from the Configuration Registry • Distribution Media Options from the Configuration Registry

4.1.2.6 Data Distribution Data Stores

Table 4.1.2.6-1 provides descriptions of the individual DDIST CSCI data stores entitled collectively “DDIST Data Stores” in the DDIST CSCI architecture diagram. More details on these database tables can be found in the Data Distribution Database Design and Schema Specifications for the ECS Project.

Table 4.1.2.6-1. DDIST CSCI Data Stores

Data Store	Type	Description
DsDdFile	Sybase	This data store holds the distribution files maintained/processed by the EcDsDistributionServer. Table Abbreviation "F" is used as the standard naming convention for stored procedures.
DsDdGranule	Sybase	This data store holds the distribution granules maintained/processed by the EcDsDistributionServer. Table Abbreviation "G" is used as the standard naming convention for stored procedures.
DsDdParameterList	Sybase	This data store holds the GIParameter list for each request maintained/processed by the EcDsDistributionServer. The EcDsScienceDataServer provides data from external metadata (i.e., via the MCF). Request information is initiated here first. Table abbreviation "PL" is used as the standard naming convention for stored procedures.
DsDdRequest	Sybase	This data store holds the distribution requests maintained/processed by the EcDsDistributionServer. Table abbreviation "R" is used as the standard naming convention for stored procedures.
DsDdServerGeneric	Sybase	This data store holds generic configuration settings for the EcDsDistributionServer.
DsDdParameterListVersion	Sybase	This data store holds all versions of the GL Parameter list for each request currently being maintained and processed by the EcDsDistributionServer. Each time a request is edited, a new row is added to this table.
DsDdRequestVersion	Sybase	This data store holds all versions of the distribution requests currently being maintained and processed by the EcDsDistributionServer. Each time a request is edited, a new row is added to the data store.
DsDdStaging	Sybase	This data store holds the persistent, non-derivable state components of the Staging object for the EcDsDistributionServer.
DsDdTransferResults	Sybase	This data store holds the transfer results for the EcDsDistributionServer.
DsDdPriorityThread	Sybase	This data store holds the threshold for the number of threads, which can be active for each request.

4.1.3 Storage Management Software Description

4.1.3.1 Storage Management Functional Overview

The Storage Management (STMGT) CSCI stores/archives, manages, and retrieves non-document earth science data and provides a user friendly graphical user interface (GUI) for operations. The STMGT CSCI manages all physical storage resources for all the DSS CSCIs and processes including: tape robotic archive, RAID disk cache, on-line storage, and peripheral

devices used for ingesting data from and distributing data to hard media such as various hard media sizes or drive types.

The STMGT CSCI manages both long-term, high capacity archival of data (data repository) and short term/temporary storage (working storage/cache management). The STMGT CSCI controls associated file access services to the archive, handles short-term data storage needs for the INGST CSCI, the DDIST CSCI, the SDSRV CSCI, and the PRONG CSCI. The STMGT CSCI also provides access to hard media peripheral devices for both the INGST CSCI and the DDIST CSCI.

During data ingest, the STMGT CSCI provides interfaces to enable ingest and obtain access to disk space, FTP services, and shared resource peripheral devices. The STMGT CSCI copies files into the archive for permanent storage. During data distribution, the SDSRV CSCI and the DDIST CSCI copy files from the archive and allocates magnetic disk space for staging the files. The DDIST CSCI also allocates the peripheral devices shared with the INGST CSCI for copying of files to hard media, or to copy files for electronic distribution. The STMGT CSCI maintains a user pull area to allow for electronic pull distribution.

The STMGT CSCI provides retrieval and storage methods to the DDIST CSCI and the SDSRV CSCI to support storing and providing data for their client CSCIs. The PRONG CSCI is a client CSCI in both storage and retrieval requests by retrieving lower level data via FTP Push Acquire through the SDSRV and DDIST CSCIs and by storing data via insert request to the SDSRV CSCI. In addition to the product files created by the PRONG CSCI, the following types of files are stored for the PRONG CSCI: intermediate product files (interim files), production history files, metadata files, and lower level data files such as raw science data. The STMGT CSCI stores files as a result of insert requests to the SDSRV CSCI by the INGST CSCI and the PRONG CSCI. The STMGT CSCI retrieves files from the archive to satisfy sub-setting requests submitted to the SDSRV CSCI and by acquire requests submitted to the SDSRV CSCI and routed through the DDIST CSCI.

The STMGT GUI provides a simple and consistent interface to set various system parameters, identify errors, analyze the underlying problem(s), and develop corrective measures. The persistence of the data is maintained in a database through a STMGT GUI interface. The GUI provides a method to manage system resources such as servers, cache thresholds, on-line storage availability, and peripherals. The GUI also provides the operator with the capability to track the status of files, hard media, and drives for an enhanced level of quality control.

4.1.3.2 Storage Management Context

Figure 4.1.3.2-1 is the STMGT CSCI context diagram. The diagram shows the events sent to other CSCIs and events received from other CSCIs. The STMGT CSCI has a direct interface with the INGST CSCI. **Note:** any items italicized and inside of < > are items which show consistency across the diagrams. These items do not have descriptions in the table associated with the diagram, but are shown in a previous diagram and described in a previous table.

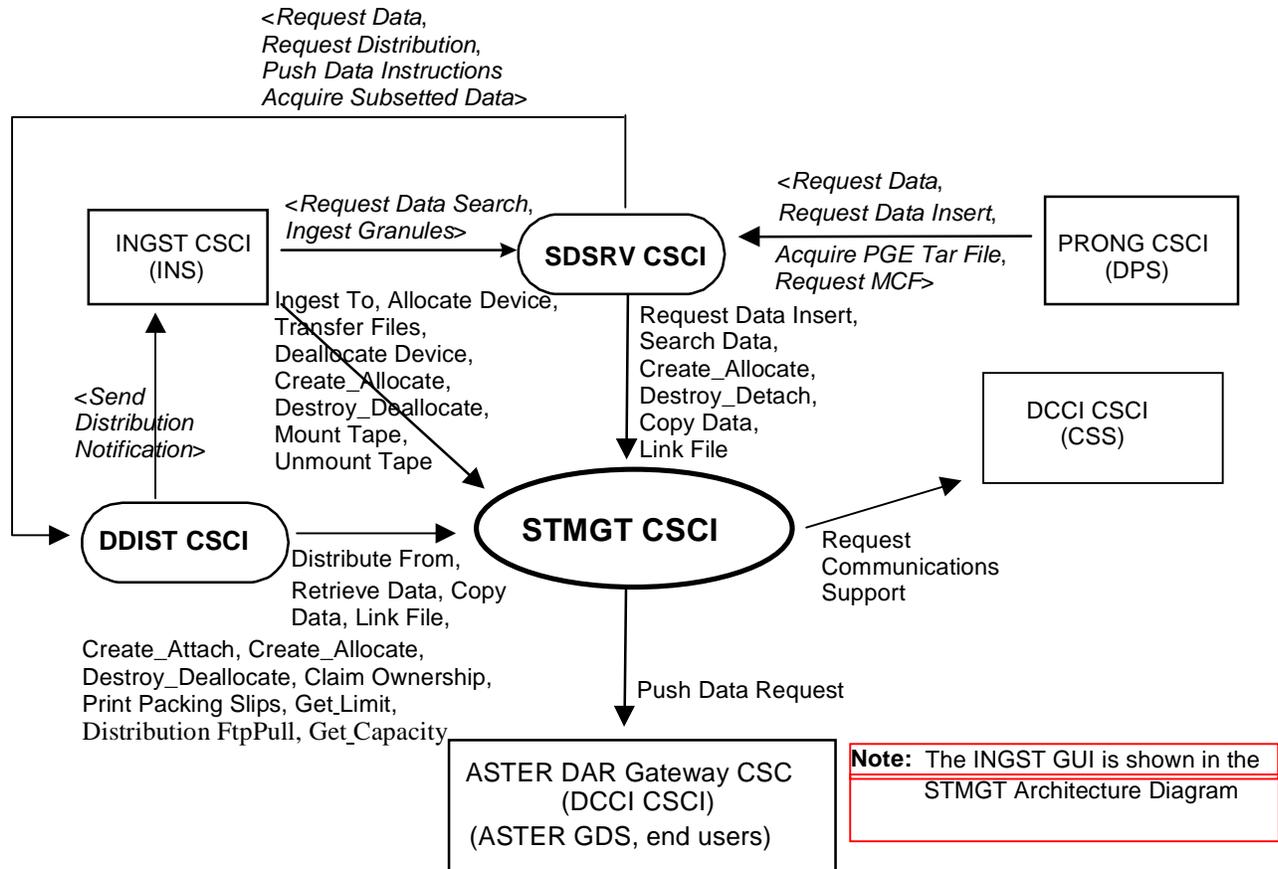


Figure 4.1.3.2-1. STMGT CSCI Context Diagram

Table 4.1.3.2-1 provides descriptions of the interface events shown in the STMGT CSCI context diagram.

Table 4.1.3.2-1. STMGT CSCI Interface Events (1 of 3)

Event	Interface Event Description
Request Management Services	System startup and shutdown - Please refer to the release-related, current version of the Mission Operations Procedures for the ECS Project document (611) and the current ECS Project Training Material document (625), identified in Section 2.2.1 of this document.
Request Data	The PRONG CSCI sends data retrieval requests to the SDSRV CSCI. The SDSRV CSCI sends the data retrieval request to the DDIST CSCI. The DDIST CSCI puts the request in a queue with the appropriate priority. When the request is taken from the queue, the STMGT CSCI is passed the data retrieval request from the DDIST CSCI for a particular data granule to be pushed onto the DPS science processor, via the FTP service. The data granule is to be used as input for PGE processing or for SSIT work.
Request Data Insert	The PRONG CSCI sends data insert requests to the SDSRV CSCI. The SDSRV CSCI sends the data insert request to the STMGT CSCI. The STMGT CSCI receives the data insert request for a particular file or files to be inserted into the archive, and their metadata be catalogued into the SDSRV inventory, as a granule of a particular ESDT short name and version. These files can be processing output, static files received with PGEs, PGE Tape Archive (TAR) files, APs, SSAPs or DAPs, failed PGE tar files, or production history files.
Acquire PGE Tar File	The PRONG CSCI sends requests to the SDSRV CSCI to acquire a tar file for any PGE not currently local to the science processor. The executable is extracted from the tar file and used during PGE execution in the PRONG CSCI.
Request MCF	The PRONG CSCI requests the MCF from the SDSRV CSCI for a particular ESDT short name prior to a data insert request.
Search Data	The STMGT CSCI receives search requests from the SDSRV CSCI for granules corresponding to a particular ESDT short name and version, which has a particular local granule id.
Create_Allocate	The STMGT CSCI receives requests from the DDIST CSCI and INGST CSCI to allocate areas on the local staging disk to store data for distribution. The SDSRV CSCI sends requests to the STMGT CSCI to allocate areas on the local staging disk to store ingested data or output files from routine data processing or SSIT work.
Destroy_Detach	The SDSRV CSCI sends requests to the STMGT CSCI to detach from a staging disk area (lose access to an existing staging disk area owned by another process).
Copy Data	The SDSRV and DDIST CSCIs send requests to the STMGT CSCI to copy data within staging disks and between staging disks.
Link File	The DDIST CSCI sends requests to the STMGT CSCI to link files from read-only cache to a staging disk specified in the request.

Table 4.1.3.2-1. STMGT CSCI Interface Events (2 of 3)

Event	Interface Event Description
Request Communications Support	<p>The DCCI CSCI provides a library of services available to each SDPS and CSMS CSCI. The CSCI services required to perform specific assignments are requested from the DCCI CSCI. These services include:</p> <ul style="list-style-type: none"> • DCE Support • Name/Address Services • Server Request Framework (SRF) • Error/Event Logging • Fault Handling Services • Mode Information • (Query Registry) Retrieving the requested configuration attribute-value pairs from the Configuration Registry • Distribution Media Options from the Configuration Registry
Push Data	<p>The STMGT CSCI pushes data (i.e., EDS), via the FTP service and an FTP Daemon, to the ASTER DAR Gateway for data distribution per user request. A signal file is also sent to indicate the completion of the file transfer by particular ESDTs that function this way.</p>
Distribute From	<p>The DDIST CSCI sends requests to the STMGT CSCI to copy files from staging disks to an allocated peripheral resource.</p>
Retrieve Data	<p>The SDSRV CSCI sends requests to the STMGT CSCI to retrieve data or products from the archival storage.</p>
Create_Attach	<p>The STMGT CSCI receives requests from the DDIST CSCI to attach (gain access to an existing staging disk area allocated by another process) to a staging disk area.</p>
Create_Allocate	<p>The STMGT CSCI receives requests from the DDIST CSCI and INGST to allocate areas on the local staging disk to store data for distribution.</p>
Destroy_Deallocate	<p>The STMGT CSCI receives requests from the DDIST CSCI and INGST CSCI to deallocate (lose access to) an existing staging disk area.</p>
Claim Ownership	<p>The STMGT CSCI receives requests from the DDIST CSCI to claim ownership of (take responsibility for deallocating) an existing staging disk area.</p>
Print Packing Slips	<p>The DDIST CSCI sends requests to the STMGT CSCI to print the packing list associated with distribution requests.</p>
FTP Pull Distribution	<p>The STMGT CSCI receives requests from the DDIST CSCI to move a file to the Pull area.</p>
FTP Push Distribution	<p>The STMGT CSCI receives requests from the DDIST CSCI to distribute a file directly to the user via a predetermined local disk area accessible by the user.</p>
Request Capacity	<p>The DDIST CSCI sends requests to the STMGT CSCI to get the effective maximum capacity of a media type. This information is used to determine the number of media needed to satisfy a given request.</p>
Send Distribution Notification	<p>The DDIST CSCI sends a distribution notification, via e-mail, to the INGST CSCI when data being distributed is to be ingested.</p>

Table 4.1.3.2-1. STMGT CSCI Interface Events (3 of 3)

Event	Interface Event Description
Request Distribution	The SDSRV CSCI sends distribution requests to the DDIST CSCI for various categories of data. The distribution services on those data are essentially identical for all data categories. In response, data packaging information is sent back to the user via e-mail.
Push Data Instructions	The SDSRV CSCI assembles instructions to send data to users, sends the instructions to the DDIST CSCI and the DDIST CSCI sends a request to the STMGT CSCI FTP Distribution server to push the data followed by a signal file to the destination specified in an acquire instruction.
Acquire Subsetted Data	The SDSRV CSCI sends requests to the DDIST CSCI to retrieve subsetted data files for distribution.
Request Data Search	The INGST CSCI sends a search request to the SDSRV CSCI for a granule corresponding to a particular ESDT short name and version, which has a particular local granule id.
Ingest Granules	The INGST CSCI sends requests to the SDSRV CSCI to insert a particular file or files into the SDSRV inventory and archive. Inserted data is accompanied by metadata. The metadata is catalogued in the SDSRV inventory as a granule of a particular ESDT short name and version.
Ingest To	The INGST CSCI sends requests to the STMGT CSCI to copy files from peripheral resources to staging disk areas.
Allocate Device	The INGST CSCI sends requests to the STMGT CSCI to allocate peripheral devices for data ingesting.
Transfer Files	The INGST CSCI sends requests to the STMGT CSCI to transfer (copy) data files to a staging disk.
Deallocate Device	The INGST CSCI sends requests to the STMGT CSCI to deallocate previously allocated peripheral resources.
Mount Tape	The INGST CSCI process sends requests to the STMGT CSCI to load tapes to hardware peripherals for reading the tapes.
Unmount Tape	The INGST CSCI process sends requests to the STMGT CSCI to unload and detach tapes from hardware peripherals after reading or writing to the tapes.

4.1.3.3 Storage Management Architecture

The STMGT CSCI architecture diagram consists of three diagrams to better display the functionality of the STMGT CSCI. Figure 4.1.3.3-1 is the STMGT CSCI INGEST architecture diagram. Figure 4.1.3.3-2 is the STMGT CSCI DISTRIBUTION STAGING architecture diagram. Figure 4.1.3.3-3 is the STMGT CSCI DISTRIBUTION TRANSFER architecture diagram. The diagrams show the events sent to the STMGT CSCI processes and the events the STMGT CSCI processes sends to other processes or gateways for remote systems such as the ASTER GDS. **Note:** any items italicized and inside of < > are items which show consistency across the diagrams. These items do not have descriptions in the table associated with the diagram, but are shown in a previous diagram and described in a previous table.

Table 4.1.3.5-1 provides descriptions of the interface events shown in the STMGT CSCI INGEST architecture diagram. Table 4.1.3.5-2 provides descriptions of the interface events

shown in the STMGT CSCI DISTRIBUTION STAGING architecture diagram. Table 4.1.3.5-3 provides descriptions of the interface events shown in the STMGT CSCI DISTRIBUTION TRANSFER architecture diagram.

The STMGT CSCI is composed of the following processes:

- EcDsStArchiveServer (used for archiving data)
- EcDsStCacheManagerServer and EcDsStStagingDiskServer (used for staging data)
- EcDsSt8MMServer, EcDsStD3Server, EcDsStDLTServer and EcDsStCDROMServer, EcDsStFtpServer, (used for hard media resource management)
- EcDsStFtpServer and EcDsStPullMonitorServer (used for electronic data transfer)
- EcDsStRequestManager (used to route requests from clients to servers)

The STMGT GUI software (EcDsStmgGui) is an interface with the database to set parameter configurations and to monitor and manage the servers.

The Archival Management and Storage System (AMASS) is an automated library management system. See the AMASS R Overview by EMASS, version 4.9.1, dated August 1998, document number 600705 for more information about the AMASS management and storage system.

Note: All interface events from a client to the STMGT CSCI pass through the Request Manager process. For external processes sending interface events to the Request Manager, the sequence is external process to the Request Manager to the Sybase check-pointing tables to the STMGT process. For internal processes within the STMGT CSCI, the sequence is STMGT process to the Sybase tables to the receiving STMGT process. The example diagram below illustrates the flow of requests in an FTP Pull distribution from the DDIST CSCI to the STMGT CSCI.

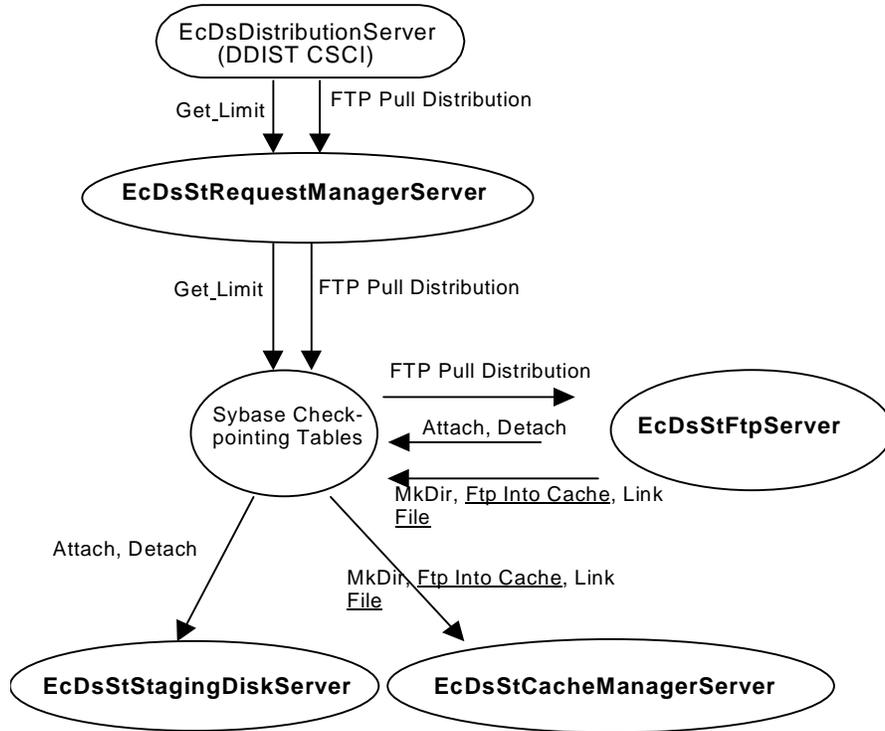


Figure 4.1.3.3-0. Sample FTP Pull Distribution Request

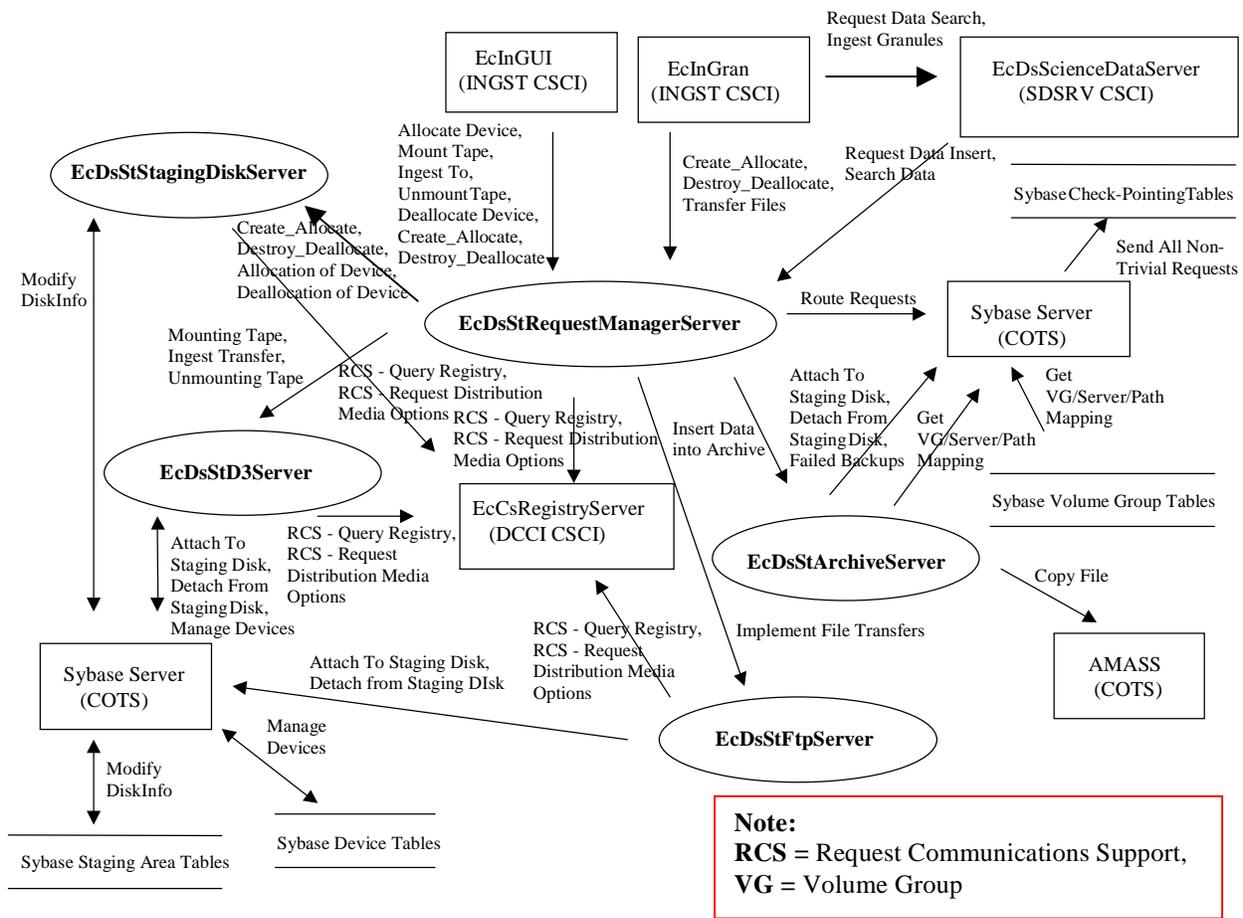


Figure 4.1.3.3-1. STMG CSCI INGEST Architecture Diagram

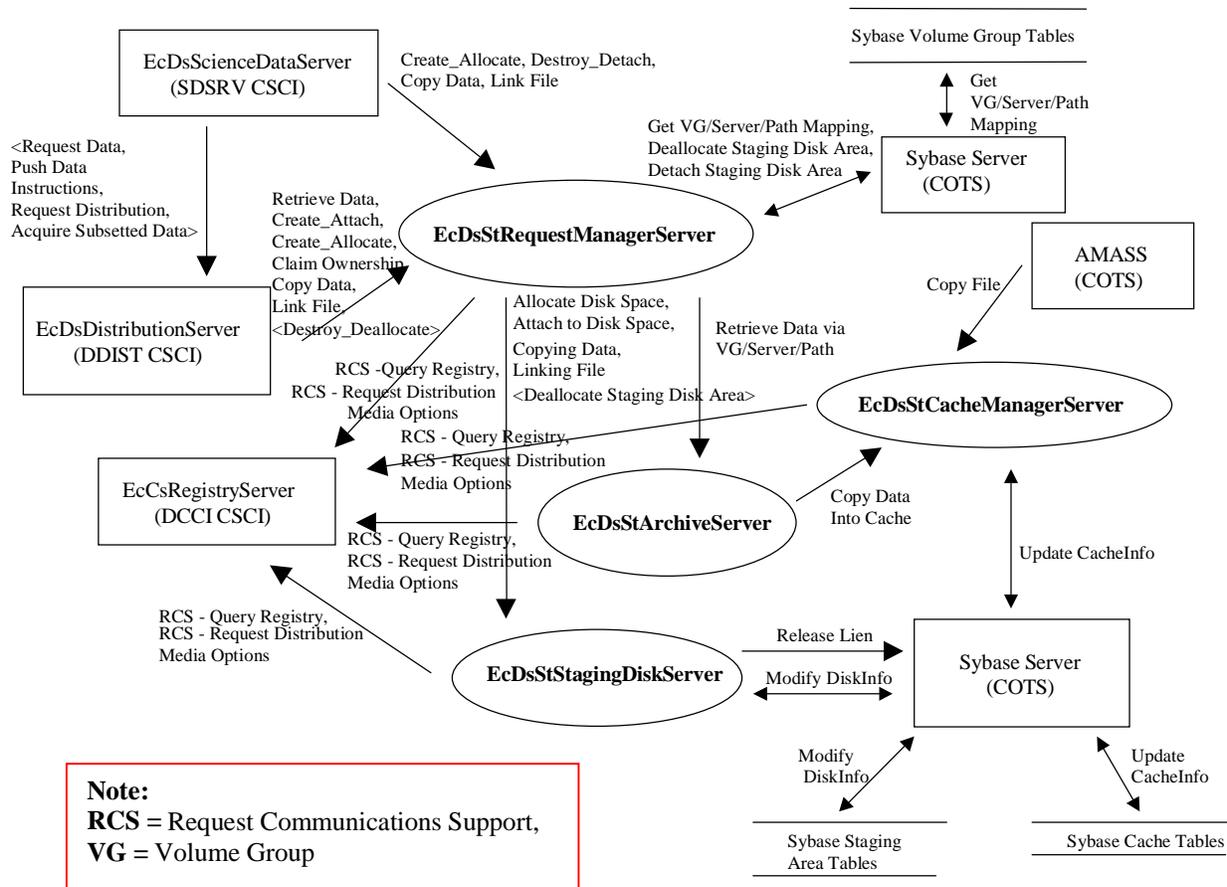


Figure 4.1.3.3-2. STMG CSCI DISTRIBUTION STAGING Architecture Diagram

Note:
RCS = Request Communications Support

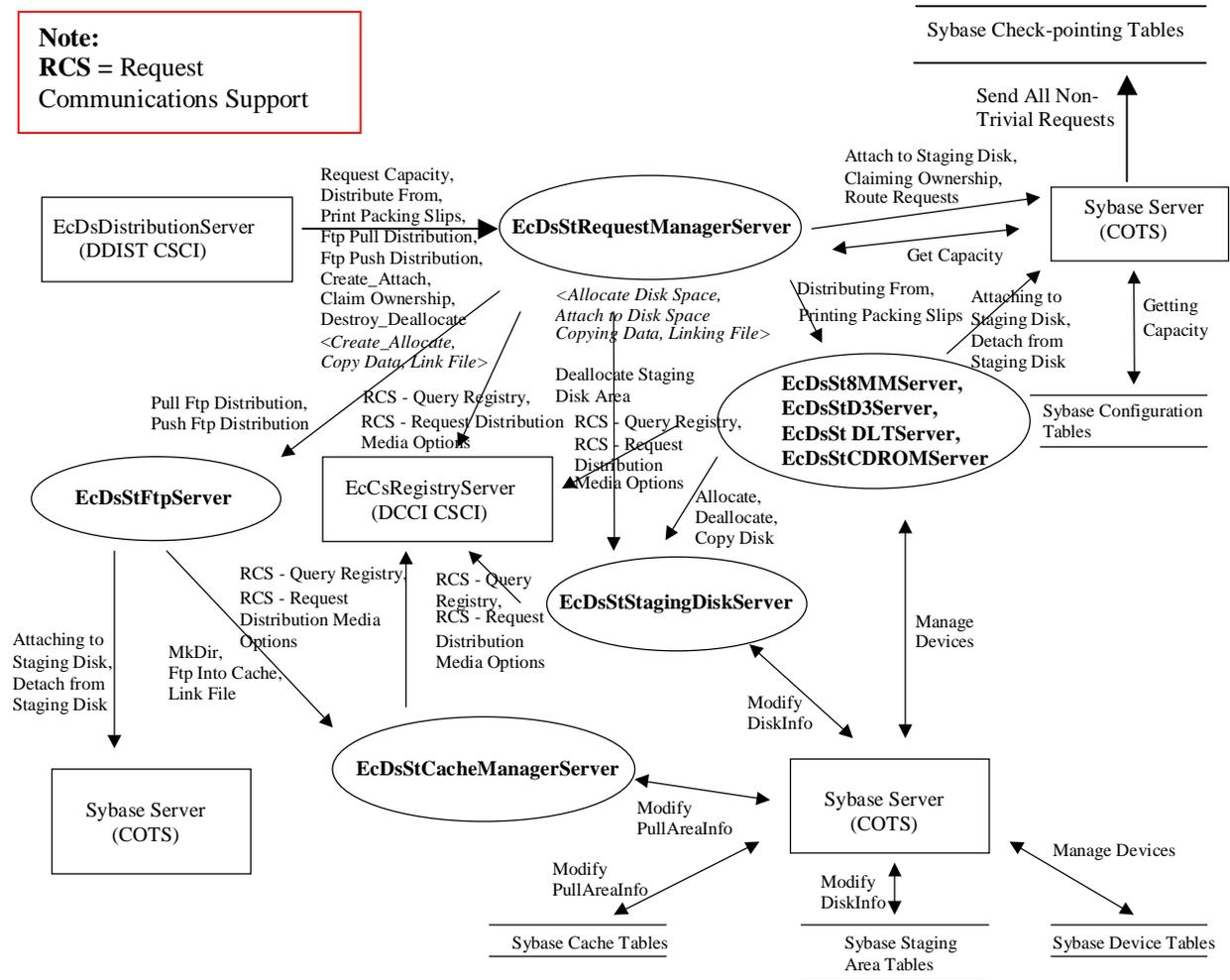


Figure 4.1.3.3-3. STMGT CSCI DISTRIBUTION TRANSFER Architecture Diagram

4.1.3.4 Storage Management Process Descriptions

Table 4.1.3.4-1 provides descriptions of the processes shown in the STMGT CSCI INGEST, DISTRIBUTION STAGING, and DISTRIBUTION TRANSFER architecture diagrams, respectively.

Table 4.1.3.4-1. STMGT CSCI Processes (1 of 2)

Process	Type	COTS/ Developed	Functionality
EcDsStArchiveServer	Server	Developed	An Archive Server provides access to stored data. There can be multiple archive servers running at a given site, each with its own type of data or storage media. For requests retrieving files from the Archive, the staging disk is located on the same host as the Archive. For data being inserted, based on network architecture, files are moved to a staging disk located on a node with the appropriate network access. Within STMGT, ESDTs are allocated to Archive instances.
EcDsStCacheManagerServer	Server	Developed	The Cache Manager Server manages the group of data files retrieved from the archive and placed into a cache area on a staging disk. A list of these data files is maintained so subsequent data retrieval requests are fulfilled immediately without requiring an additional archive access. The Cache Manager Server also deletes files, which are no longer used to prevent the cache area from becoming too full. The STMGT CSCI supports multiple cache managers.
EcDsStStagingDiskServer	Server	Developed	The Staging Disk Server manages shared disk space. The Staging Disk Server enables disk space allocations and file reservations between staging directories and from non-staging to staging directories. The STMGT software supports multiple instances of the Staging Disk Server.
EcDsStPullMonitorServer	Server	Developed	The Pull Monitor Server manages the files in the user pull area. As files are retrieved (i.e., electronically pulled) from the user pull area by respective ECS users or as the files become stale (their time-out periods have expired), the Pull Monitor Server deletes them. Several algorithms are available for monitoring and maintaining the data levels at a specified capacity. Note: This is just a symbolic link to the Cache Manager Server binary executable image.
(Media Server) EcDsSt8MMServer, EcDsStD3Server, EcDsStDLTServer, EcDsStCDROMServer	Servers	Developed	The Media Server schedules access to shared peripheral devices. Queues are maintained for requests based on priority and request receipt time. Each type of media pool has its own Media Server. Individual Media Servers identified are 8-mm tape, D3Tape, Digital Linear Tape (DLT) and Compact Disk, Read Only Memory (CD-ROM). Media Servers also enable printing of packing lists for media distributions. The STMGT software supports multiple instances of each type of Media Server.
EcDsStFtpServer	Server	Developed	The FTP Server manages the electronic transfer of files to and from staging disks. The STMGT software supports multiple instances of the FTP Server.

Table 4.1.3.4-1. STMGT CSCI Processes (2 of 2)

Process	Type	COTS/ Developed	Functionality
EcDsStRequestManagerServer	Server	Developed	The Request Manager routes requests to the appropriate server for servicing. Priority queuing is enforced for all requests, regardless of type and the status of all requests is centrally maintained in the database. The Request Manager provides the primary point of detection and recovery for unexpected client or server termination.
AMASS	Server	COTS	Provides a Unix File System interface to the robotics to control the media where data is written and read.
Sybase	Server	COTS	The Sybase Server interacts with other STMGT CSCI servers to copy files to be stored in the ECS archives via AMASS, to store schedules for media distribution processing, to create and delete staging disk storage areas, and to allow Operations staff to insert or update data distribution information.

4.1.3.5 Storage Management Process Interface Descriptions

Table 4.1.3.5-1 provides descriptions of the interface events shown in the STMGT CSCI INGEST architecture diagram.

Table 4.1.3.5-1. STMGT CSCI INGEST Process Interface Events (1 of 8)

Event	Event Frequency	Interface	Initiated By	Event Description
Create_Allocate	One allocation per request	<i>Process:</i> EcDsStRequestManagerServer <i>Library:</i> DsStRmClient <i>Class:</i> DsStRequestManager	<i>Process:</i> EclnGUI <i>Library:</i> InResource <i>Class:</i> InResourceIF <i>Process:</i> EclnGran <i>Library:</i> InResource <i>Class:</i> InResourceIF	The EclnGUI and EclnGran processes send requests to the EcDsStRequestManagerServer to allocate (create space) areas on the local staging disk to store ingested data.

Table 4.1.3.5-1. STMGT CSCI INGEST Process Interface Events (2 of 8)

Event	Event Frequency	Interface	Initiated By	Event Description
Destroy_ Deallocate	One deallocation per request	<i>Process:</i> EcDsStRequestManagerServer <i>Library:</i> DsStRmClient <i>Class:</i> DsStRequestManager	<i>Process:</i> EcInGran <i>Library:</i> InResource <i>Class:</i> InResourceIF	The EcInGran process sends requests to the EcDsStRequestManagerServer to deallocate (lose access to) an existing staging disk area.
Transfer Files	One per Science Data file activity	<i>Process:</i> EcDsStRequestManagerServer <i>Library:</i> DsStRmClient <i>Class:</i> DsStRequestManager	<i>Process:</i> EcInGran <i>Library:</i> InResource <i>Class:</i> InResourceIFProcess	The EcInGran sends a request to the EcDsStRequestManagerServer to transfer (copy) data files to a staging disk.
Implement File Transfers	One per Science Data file activity	<i>Process:</i> EcDsStFtpServer <i>Library:</i> DsStTmServer <i>Class:</i> DsStReceptionist	<i>Process:</i> EcDsStRequestManagerServer <i>Library:</i> DsStTmClient <i>Class:</i> DsStPatron	The EcDsStRequestManagerServer forwards the transfer (or staging) request to the EcDsStFtpServer for processing.
Request Data Search	One per input pointer in metadata or per granule pointer in linkage file	<i>Process:</i> EcDsScienceDataServer <i>Library:</i> DsCI <i>Class:</i> DsCIQuery	<i>Process:</i> EcInGran <i>Library:</i> InPreprocess <i>Class:</i> InDataPreProcessTask	The EcInGran process sends a search request to the EcDsScienceDataServer for a granule corresponding to particular ESDT short name and version, which has a particular local granule id.
Ingest Granules	One per ingest request	<i>Process:</i> EcDsScienceDataServer <i>Library:</i> DsCI <i>Classes:</i> DsCIRequest, DsCICommand, DsGeESDT	<i>Process:</i> EcInGran <i>Library:</i> InPreprocess <i>Class:</i> InDataServerInsertionTask	The EcInGran sends requests to the EcDsScienceDataServer to add new granules to the SDSRV granule inventory after ingesting.

Table 4.1.3.5-1. STMGT CSCI INGEST Process Interface Events (3 of 8)

Event	Event Frequency	Interface	Initiated By	Event Description
Request Data Insert	One granule insertion per request	<i>Process:</i> EcDsStRequestManager Server <i>Library:</i> DsStRmClient <i>Class:</i> DsStRequestManager	<i>Process:</i> EcDsScienceDataServer <i>Class:</i> DsGeESDT	The EclnGran process sends requests to the EcDsScienceDataServer to insert a particular file or files into the archive. Inserted data is accompanied by metadata. The metadata is catalogued in the SDSRV inventory as a granule of a particular ESDT short name and version. The EcDsScienceDataServer sends requests to the EcDsStRequestManagerServer to insert data into the SDPS archives, including metadata.
Search Data	One granule per search request	<i>Process:</i> EcDsStRequestManager Server <i>Library:</i> DsStRmClient <i>Class:</i> DsStRequestManager	<i>Process:</i> EcDsScienceDataServer <i>Library:</i> DsCl <i>Class:</i> DsClQuery	The EcDsScienceDataServer sends a search request to the EcDsStRequestManagerServer for a granule corresponding to particular ESDT short name and version, which has a particular local granule id.
Route Requests	Random from external clients	Sybase Server (COTS) Database Tables: DsStGenericRequest, DsStArchiveRequest, DsStFtpRequest, DsStMediaRequest, DsStStagingDiskRequest	<i>Process:</i> EcDsStRequestManager Server <i>Library:</i> DsStTmClient <i>Class:</i> DsStCommonDBIF	All requests submitted by external clients are executed within the Sybase Server database. Requests that can be fulfilled solely by the database ("trivial requests") are satisfied and the results returned to the client with no additional communications with STMGT servers.
Send All Non-Trivial Requests	Per submitted client requests	Sybase Server (COTS) Database Tables: DsStArchiveRequest, DsStFtpRequest, DsStMediaRequest,	Sybase Server (COTS)	Non-Trivial requests are persisted to the Sybase Server check-pointing tables and routed to the appropriate STMGT server for processing.

Table 4.1.3.5-1. STMGT CSCI INGEST Process Interface Events (4 of 8)

Event	Event Frequency	Interface	Initiated By	Event Description
Insert Data Into Archive	Per insert request	<i>Process:</i> EcDsStArchiveServer <i>Library:</i> DsStTmServer <i>Class:</i> DsStReceptionist	<i>Process:</i> EcDsStRequestManagerServer <i>Library:</i> DsStTmClient <i>Class:</i> DsStPatron	The EcDsStRequestManagerServer sends requests to the EcDsStArchiveServer to insert data into the archive.
Request Communications Support	One service per request	<i>Process:</i> DCE Security Server <i>Libraries:</i> EcSelogin, EcSeLogincontext <i>Classes:</i> EcSelogin, EcSeLogincontext <i>Library:</i> EcPf <i>Classes:</i> EcPfManagedServer, EcPfclient <i>Library (Common):</i> EcUr <i>Class:</i> EcUrServerUR <i>Library:</i> Event <i>Class:</i> EcLgErrormsg <i>Process:</i> EcCsRegistryServer <i>Library:</i> EcCsRegistryClient <i>Class:</i> EcRgRegistryServer_C	<i>Processes:</i> EcDsStRequestManagerServer, EcDsStArchiveServer, EcDsStStagingDiskServer, EcDsStD3Server, EcDsStFtpServer	The DCCI CSCI provides a library of services available to each SDPS and CSMS CSCI. The CSCI services required to perform specific assignments are requested from the DCCI CSCI. These services include: <ul style="list-style-type: none"> • DCE Support • Name/Address Services • Server Request Framework (SRF) • Error/Event Logging • Fault Handling Services • Mode Information • (Query Registry) Retrieving the requested configuration attribute-value pairs from the Configuration Registry • Distribution Media Options from the Configuration Registry

Table 4.1.3.5-1. STMGT CSCI INGEST Process Interface Events (5 of 8)

Event	Event Frequency	Interface	Initiated By	Event Description
Attach To Staging Disk	One per request	Sybase Server (COTS)	<p>Process: EcDsStArchiveServer <i>Library:</i> DsStCmnDb <i>Class:</i> DsStCommonDBIF</p> <p>Process: EcDsStFtpServer <i>Library:</i> DsStCmnDb <i>Class:</i> DsStCommonDBIF</p> <p>Process: EcDsStD3Server <i>Library:</i> DsStCmnDb <i>Class:</i> DsStCommonDBIF</p>	The EcDsStArchiveServer , EcDsStFtpServer , and EcDsStD3Server send requests to the Sybase Server to attach (i.e., gain access) to an existing staging disk area.
Detach From Staging Disk	One per request	Sybase Server (COTS)	<p>Process: EcDsStArchiveServer <i>Library:</i> DsStCmnDb <i>Class:</i> DsStCommonDBIF</p> <p>Process: EcDsStFtpServer <i>Library:</i> DsStCmnDb <i>Class:</i> DsStCommonDBIF</p> <p>Process: EcDsStD3Server <i>Library:</i> DsStCmnDb <i>Class:</i> DsStCommonDBIF</p>	The EcDsStArchiveServer , EcDsStFtpServer , and EcDsStD3Server send requests to the Sybase Server to detach (i.e., lose access) to an existing staging disk area.

Table 4.1.3.5-1. STMGT CSCI INGEST Process Interface Events (6 of 8)

Event	Event Frequency	Interface	Initiated By	Event Description
Get VG/Server /Path Mapping	One per volume group	Sybase Server (COTS) [Database Tables: DsStVolumeGroup, DsStOffsite]	<i>Process:</i> EcDsStArchiveServer <i>Library:</i> DsStCmnDb <i>Class:</i> DsStCommonDBIF	The EcDsStArchiveServer obtains the physical Unix path used to store data for the specified ESDT from the Sybase Server.
Copy File	One file insert per request	AMASS (COTS)	<i>Process:</i> EcDsStArchiveServer <i>Library:</i> DsStCmnFileIO <i>Classes:</i> DsStCopyService	The EcDsStArchiveServer inserts data into the archives sending a request for a Unix file copy into the AMASS cache by buffered read/write software.
Manage Devices	One per media	Sybase Server (COTS) Database Tables: DsStDevice, DsStSlot, DsStStacker]	<i>Process:</i> EcDsStD3Server <i>Library:</i> DsStCmnDb <i>Class:</i> DsStCommonDBIF	The EcDsStD3Server uses database tables obtained via the Sybase Server to determine if a drive is available to handle the request. The Sybase Server updates its device, slot, and stacker tables (data stores).
Modify DiskInfo	One per ingest	Sybase Server (COTS) [Database Table: DsStStagingDisk, DsStStagingDiskLien, DsStStagingDiskFile]	<i>Process:</i> EcDsStStagingDiskServer <i>Library:</i> DsStSdServer <i>Class:</i> DsStStagingDiskService Thread	The EcDsStStagingDiskServer submits a request to the Sybase Server to update the availability of space on the local disk. The Sybase Server updates its staging area tables (data stores).
Allocate Device	One allocation per request	<i>Process:</i> EcDsStRequestManagerServer <i>Library:</i> DsStRmClient <i>Class:</i> DsStRequestManager	<i>Process:</i> EcInGUI <i>Library:</i> InResource <i>Class:</i> InResourceIF	The EcInGUI sends requests to the EcDsStRequestManagerServer to allocate peripheral devices for data ingesting.
Allocation Of Device	One allocation per request	<i>Process:</i> EcDsStStagingDiskServer <i>Library:</i> DsStTmServer <i>Class:</i> DsStReceptionist	<i>Process:</i> EcDsStRequestManagerServer <i>Library:</i> DsStTmClient <i>Class:</i> DsStPatron	The EcDsStRequestManagerServer forwards the request to the EcDsStStagingDiskServer for processing.

Table 4.1.3.5-1. STMGT CSCI INGEST Process Interface Events (7 of 8)

Event	Event Frequency	Interface	Initiated By	Event Description
Mount Tape	One per physical tape	<i>Process:</i> EcDsStRequestManagerServer <i>Library:</i> DsStRmClient <i>Class:</i> DsStRequestManager	<i>Process:</i> EcInGUI <i>Library:</i> InResource <i>Class:</i> InResourceIF	The EcInGUI process sends requests to the EcDsStRequestManagerServer to load tapes to hardware peripherals for reading the tapes.
Mounting Tape	One per physical tape	<i>Process:</i> EcDsStD3Server <i>Library:</i> DsStTmServer <i>Class:</i> DsStReceptionist	<i>Process:</i> EcDsStRequestManagerServer <i>Library:</i> DsStTmClient <i>Class:</i> DsStPatron	The EcDsStRequestManagerServer forwards the request to the EcDsStD3Server for processing.
Ingest To	One data copy from peripheral device(s) per request	<i>Process:</i> EcDsStRequestManagerServer <i>Library:</i> DsStRmClient <i>Class:</i> DsStRequestManager	<i>Process:</i> EcInGUI <i>Library:</i> InResource <i>Class:</i> InResourceIF	The EcInGUI process sends requests to the EcDsStRequestManagerServer to copy files from peripheral resources to staging disk areas.
Ingest Transfer	One data copy from peripheral device(s) per request	<i>Process:</i> EcDsStD3Server <i>Library:</i> DsStTmServer <i>Class:</i> DsStReceptionist	<i>Process:</i> EcDsStRequestManagerServer <i>Library:</i> DsStTmClient <i>Class:</i> DsStPatron	The EcDsStRequestManagerServer forwards the request to the EcDsStD3Server for processing.
Unmount Tape	One per physical tape	<i>Process:</i> EcDsStRequestManagerServer <i>Library:</i> DsStRmClient <i>Class:</i> DsStRequestManager	<i>Process:</i> EcInGUI <i>Library:</i> InResource <i>Class:</i> InResourceIF	The EcInGUI process sends requests to the EcDsStRequestManagerServer to unload and detach tapes from hardware peripherals after reading or writing to the tapes.
Unmounting Tape	One per physical tape	<i>Process:</i> EcDsStD3Server <i>Library:</i> DsStTmServer <i>Class:</i> DsStReceptionist	<i>Process:</i> EcDsStRequestManagerServer <i>Library:</i> DsStTmClient <i>Class:</i> DsStPatron	The EcDsStRequestManagerServer forwards the request to the EcDsStD3Server for processing.

Table 4.1.3.5-1. STMGT CSCI INGEST Process Interface Events (8 of 8)

Event	Event Frequency	Interface	Initiated By	Event Description
Deallocate Device	One deallocation per request	<i>Process:</i> EcDsStRequestManagerServer <i>Library:</i> DsStRmClient <i>Class:</i> DsStRequestManager	<i>Process:</i> EcInGUI <i>Library:</i> InResource <i>Class:</i> InResourceIF	The EcInGUI sends requests to the EcDsStRequestManagerServer to deallocate the previously allocated media resource.
Deallocating of Device	One deallocation per request	<i>Process:</i> EcDsStStagingDiskServer <i>Library:</i> DsStSdServer <i>Class:</i> DsStStagingDiskServiceThread	<i>Process:</i> EcDsStRequestManagerServer <i>Library:</i> DsStTmClient <i>Class:</i> DsStPatron	The EcDsStRequestManagerServer forwards the request to the EcDsStStagingDiskServer for processing.

Table 4.1.3.5-2 provides descriptions of the interface events shown in the STMGT CSCI DISTRIBUTION STAGING architecture diagram.

Table 4.1.3.5-2. STMGT CSCI DISTRIBUTION STAGING Process Interface Events (1 of 6)

Event	Event Frequency	Interface	Initiated By	Event Description
Get VG/Server/Path Mapping	One per volume group	Sybase Server (COTS) [Database Tables: DsStVolumeGroup, DsStOffsite]	<i>Process:</i> EcDsStRequestManagerServer <i>Library:</i> DsStCmnDb <i>Class:</i> DsStDBIFTransaction	The EcDsStRequestManagerServer obtains the physical Unix path used to store data for the specified ESDT from the Sybase Server .
Deallocate Staging Disk Space	One per attach request	Sybase Server (COTS)	<i>Process:</i> EcDsStRequestManagerServer <i>Library:</i> DsStCmnDb <i>Class:</i> DsStDBIFTransaction	The EcDsStRequestManagerServer sends a request to the Sybase Server to deallocate an existing staging disk area.

**Table 4.1.3.5-2. STMG T CSCI DISTRIBUTION STAGING Process Interface Events
(2 of 6)**

Event	Event Frequency	Interface	Initiated By	Event Description
Detach Staging Disk Area	One detach per request	<i>Process:</i> EcDsStStagingDiskServer <i>Library:</i> DsStTmServer <i>Class:</i> DsStReceptionist	<i>Process:</i> EcDsStRequestManagerServer <i>Library:</i> DsStTmClient <i>Class:</i> DsStPatron	The EcDsStRequestManagerServer forwards the requests to the EcDsStStagingDiskServer for processing.
Copy file	One file copy per request	AMASS (COTS)	<i>Process:</i> EcDsStCacheManagerServer <i>Library:</i> DsStCmnFileIO <i>Classes:</i> DsStCopyService	The EcDsStCacheManagerServer sends requests for a Unix file copy from the AMASS cache to the read-only cache by buffered read/write software.
Retrieve Data via VG/Server/Path	One per request	<i>Process:</i> EcDsStArchiveServer <i>Library:</i> DsStTmServer <i>Class:</i> DsStReceptionist	<i>Process:</i> EcDsStRequestManagerServer <i>Library:</i> DsStTmClient <i>Class:</i> DsStPatron	The EcDsStRequestManagerServer forwards the requests to retrieve archived data from the archive to the EcDsStArchiveServer .
Copy Data Into Cache	One for each file per request	<i>Process:</i> EcDsStCacheManagerServer <i>Library:</i> DsStTmServer <i>Class:</i> DsStReceptionist	<i>Process:</i> EcDsStArchiveServer DsStTmClient <i>Class:</i> DsStCacheManagerAsyncIF	The EcDsStArchiveServer sends requests to the EcDsStCacheManagerServer to move data from the archives to the read-only cache.
Update CacheInfo	One file copy per request	Sybase Server (COTS) [Database Tables: DsStCache, DsStCacheDirectory, DsStCacheFile, DsStDeleteLogCacheFile, DsStFile Location]	<i>Process:</i> EcDsStCacheManagerServer <i>Library:</i> DsStCmnDb <i>Class:</i> DsStDBIFTransaction	The EcDsStCacheManagerServer submits requests to the Sybase Server to update the availability of space in the read-only cache upon receiving requests to move data from the EcDsStArchiveServer.

**Table 4.1.3.5-2. STMGT CSCI DISTRIBUTION STAGING Process Interface Events
(3 of 6)**

Event	Event Frequency	Interface	Initiated By	Event Description
Modify DiskInfo	Two per request (one each for allocation and deallocation)	Sybase Server (COTS) [Database Table: DsStStagingDisk, DsStStagingDiskLien, DsStStagingDiskFile]	<i>Process:</i> EcDsStStagingDiskServer <i>Library:</i> DsStCmnDb <i>Class:</i> DsStDBIFTransaction	The EcDsStStagingDiskServer submits a request to the Sybase Server to update the availability of space on the local disk. The Sybase Server updates its staging area tables (data stores).
Release Lien	One per file copied	Sybase Server (COTS) [Database Table: DsStStagingDisk, DsStStagingDiskLien, DsStStagingDiskFile]	<i>Process:</i> EcDsStStagingDiskServer <i>Library:</i> DsStCmnDb <i>Class:</i> DsStDBIFTransaction	The EcDsStStagingDiskServer sends requests to the Sybase Server to decrease the access count to a given file. This is done after a file has been copied or a link to a file in the cache has been removed.
Request Communications Support	One service per request	Process: DCE Security Server Libraries: EcSelogin, EcSeLogincontext Classes: EcSelogin, EcSeLogincontext Library: EcPf Classes: EcPfManagedServer, EcPfclient Library (Common): EcUr Class: EcUrServerUR Library: Event Class: EcLgErrormsg Process: EcCsRegistryServer Library: EcCsRegistryClient Class: EcRgRegistryServer_C	Processes: EcDsStRequestManagerServer , EcDsStArchiveServer, EcDsStCacheManagerServer, EcDsStStagingDiskServer	The DCCI CSCI provides a library of services available to each SDPS and CSMS CSCI. The CSCI services required to perform specific assignments are requested from the DCCI CSCI. These services include: <ul style="list-style-type: none"> • DCE Support • Name/Address Services • Server Request Framework (SRF) • Error/Event Logging • Fault Handling Services • Mode Information • Retrieving the requested configuration attribute-value pairs from the Configuration Registry • Distribution Media Options from the Configuration Registry

**Table 4.1.3.5-2. STMG T CSCI DISTRIBUTION STAGING Process Interface Events
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Event	Event Frequency	Interface	Initiated By	Event Description
Retrieve Data	One granule per retrieval request	<i>Process:</i> EcDsStRequestManagerServer <i>Library:</i> DsStRmClient <i>Class:</i> DsStRequestManager	<i>Process:</i> EcDsDistributionServer <i>Class:</i> DsDdGranuleS	The EcDsDistributionServer sends requests to the EcDsStRequestManagerServer to retrieve data from the SDPS archives to be staged for distribution. The EcDsStRequestManagerServer forwards the requests to the EcDsStArchiveServer .
Create_Attach	One attach per request	<i>Process:</i> EcDsStRequestManagerServer <i>Library:</i> DsStRmClient <i>Class:</i> DsStRequestManager	<i>Process:</i> EcDsDistributionServer <i>Class:</i> DsDdMedia	The EcDsDistributionServer sends requests to the EcDsStRequestManagerServer to attach (gain access) to an existing staging disk area allocated by another process.
Create_Allocate	One allocation per request	<i>Process:</i> EcDsStRequestManagerServer <i>Library:</i> DsStRmClient <i>Class:</i> DsStRequestManager	<i>Process:</i> EcDsScienceDataServer <i>Library:</i> DsGe <i>Class:</i> DsGeESDT <i>Process:</i> EcDsDistributionServer <i>Class:</i> DsDdMedia	The EcDsScienceDataServer and EcDsDistributionServer send requests to the EcDsStRequestManagerServer to allocate areas on the local staging disk to store data for distribution.
Claim Ownership	One per attach request	<i>Process:</i> EcDsStRequestManagerServer <i>Library:</i> DsStRmClient <i>Class:</i> DsStRequestManager	<i>Process:</i> EcDsDistributionServer <i>Class:</i> DsDdMedia	The EcDsDistributionServer sends requests to the EcDsStRequestManagerServer to claim ownership of (take responsibility for deallocating) an existing staging disk area.

**Table 4.1.3.5-2. STMGT CSCI DISTRIBUTION STAGING Process Interface Events
(5 of 6)**

Event	Event Frequency	Interface	Initiated By	Event Description
Copy Data	One file copy per request	<i>Process:</i> EcDsStRequestManagerServer <i>Library:</i> DsStRmClient <i>Class:</i> DsStRequestManager	<i>Process:</i> EcDsScienceDataServer <i>Library:</i> DsGe <i>Class:</i> DsGeESDT <i>Process:</i> EcDsDistributionServer <i>Class:</i> DsDdGranuleS	The EcDsScienceDataServer and EcDsDistributionServer send requests to the EcDsStRequestManagerServer to copy data within staging disks and between staging disks.
Link File	One link per file in a request	<i>Process:</i> EcDsStRequestManagerServer <i>Library:</i> DsStRmClient <i>Class:</i> DsStRequestManager	<i>Process:</i> EcDsScienceDataServer <i>Library:</i> DsGe <i>Class:</i> DsGeESDT <i>Process:</i> EcDsDistributionServer <i>Class:</i> DsDdGranule	The EcDsScienceDataServer and EcDsDistributionServer send requests to the EcDsStRequestManagerServer to link files from the read-only cache to a staging disk and from one staging disk to another.
Destroy_Detach	One detach per request	<i>Process:</i> EcDsStRequestManagerServer <i>Library:</i> DsStRmClient <i>Class:</i> DsStRequestManager	<i>Process:</i> EcDsScienceDataServer <i>Library:</i> DsGe <i>Class:</i> DsGeESDT	The EcDsScienceDataServer sends requests to the EcDsStRequestManagerServer to detach (lose access) to an existing staging disk area owned by another process.

**Table 4.1.3.5-2. STMGT CSCI DISTRIBUTION STAGING Process Interface Events
(6 of 6)**

Event	Event Frequency	Interface	Initiated By	Event Description
Allocate Disk Space	One allocation per request	<i>Process:</i> EcDsStStagingDiskServer <i>Library:</i> DsStTmServer <i>Class:</i> DsStReceptionist	<i>Process:</i> EcDsStRequestManagerServer <i>Library:</i> DsStTmClient <i>Class:</i> DsStPatron	The EcDsStRequestManagerServer forwards the requests to the EcDsStStagingDiskServer .
Attach to Disk Space	One attach per request	<i>Process:</i> EcDsStStagingDiskServer <i>Library:</i> DsStTmServer <i>Class:</i> DsStReceptionist	<i>Process:</i> EcDsStRequestManagerServer <i>Library:</i> DsStTmClient <i>Class:</i> DsStPatron	The EcDsStRequestManagerServer forwards the requests to the EcDsStStagingDiskServer for processing.
Copying Data	One file copy per request	<i>Process:</i> EcDsStStagingDiskServer <i>Library:</i> DsStTmServer <i>Class:</i> DsStReceptionist	<i>Process:</i> EcDsStRequestManagerServer <i>Library:</i> DsStTmClient <i>Class:</i> DsStPatron	The EcDsStRequestManagerServer forwards the requests to the EcDsStStagingDiskServer for processing.
Linking File	One link per file in a request	<i>Process:</i> EcDsStStagingDiskServer <i>Library:</i> DsStTmServer <i>Class:</i> DsStReceptionist	<i>Process:</i> EcDsStRequestManagerServer <i>Library:</i> DsStTmClient <i>Class:</i> DsStPatron	The EcDsStRequestManagerServer forwards the requests to the EcDsStStagingDiskServer for processing.

Table 4.1.3.5-3 provides descriptions of the interface events shown in the STMGT CSCI DISTRIBUTION TRANSFER architecture diagram.

Table 4.1.3.5-3. STMGT CSCI DISTRIBUTION TRANSFER Process Interface Events (1 of 9)

Event	Event Frequency	Interface	Initiated By	Event Description
Request Capacity	Per user request	<i>Process:</i> EcDsStRequestManagerServer <i>Library:</i> DsStRmClient <i>Class:</i> DsStRequestManager	<i>Process:</i> EcDsDistributionServer <i>Class:</i> DsDdGranuleS	The EcDsDistributionServer sends requests to the EcDsStRequestManagerServer to get the effective maximum capacity of a media type. This information is used to determine the number of media needed to satisfy a given request.
Distribute From	One data copy from staging disk per request	<i>Process:</i> EcDsStRequestManagerServer <i>Library:</i> DsStRmClient <i>Class:</i> DsStRequestManager	<i>Process:</i> EcDsDistributionServer <i>Class:</i> DsDdGranuleS	The EcDsDistributionServer sends requests to the EcDsStRequestManagerServer to copy files from staging disks to an allocated peripheral resource.
Print Packing Slips	One per distribution request	<i>Process:</i> EcDsStRequestManagerServer <i>Library:</i> DsStRmClient <i>Class:</i> DsStRequestManager	<i>Process:</i> EcDsDistributionServer <i>Class:</i> DsDdReadyToShipQueue	The EcDsDistributionServer sends requests to the EcDsStRequestManagerServer to print a file on a given staging disk. The EcDsDistributionServer only prints out the packing list file associated with a distribution request when the request has been completed successfully.
Ftp Pull Distribution	One file per pull request	<i>Process:</i> EcDsStRequestManagerServer <i>Library:</i> DsStRmClient <i>Class:</i> DsStRequestManager	<i>Process:</i> EcDsDistributionServer <i>Class:</i> DsDdFtpPullMedia	The EcDsDistributionServer sends requests to the EcDsStRequestManagerServer to move a file to the Pull area.

**Table 4.1.3.5-3. STMGT CSCI DISTRIBUTION TRANSFER Process Interface
Events (2 of 9)**

Event	Event Frequency	Interface	Initiated By	Event Description
Ftp Push Distribution	One per push request	<i>Process:</i> EcDsStRequestManagerServer <i>Library:</i> DsStRmClient <i>Class:</i> DsStRequestManager	<i>Process:</i> EcDsDistributionServer <i>Class:</i> DsDdFtpPushMedia	The EcDsDistributionServer sends requests to the EcDsStRequestManagerServer to distribute a file directly to a user.
Create_Attach	One attach per request	<i>Process:</i> EcDsStRequestManagerServer <i>Library:</i> DsStRmClient <i>Class:</i> DsStRequestManager Sybase Server (COTS)	<i>Process:</i> EcDsDistributionServer <i>Classes:</i> DsDdMedia, DsDsStaging	The EcDsDistributionServer sends requests to the EcDsStRequestManagerServer to attach (i.e., gain access) to an existing staging disk area allocated by another process. The EcDsStRequestManagerServer sends requests to the Sybase Server to attach to staging disk areas.
Claim Ownership	One per attach request	<i>Process:</i> EcDsStRequestManagerServer <i>Library:</i> DsStRmClient <i>Class:</i> DsStRequestManager	<i>Process:</i> EcDsDistributionServer <i>Class:</i> DsDdMedia	The EcDsDistributionServer sends requests to the EcDsStRequestManagerServer to claim ownership of (i.e., take responsibility for deallocating) an existing staging disk area.
Destroy_Deallocate	One deallocation per request	<i>Process:</i> EcDsStRequestManagerServer <i>Library:</i> DsStRmClient <i>Class:</i> DsStRequestManager <i>Process:</i> EcDsStStagingDiskServer <i>Library:</i> DsStTmServer <i>Class:</i> DsStBaseReal	<i>Process:</i> EcDsDistributionServer <i>Class:</i> DsDdMedia	The EcDsDistributionServer sends requests to the EcDsStRequestManagerServer to deallocate (i.e., lose access to) an existing staging disk area. The EcDsStRequestManagerServer sends requests to the EcDsStStagingDiskServer to deallocate (i.e., lose access to) an existing staging disk area.

Table 4.1.3.5-3. STMGT CSCI DISTRIBUTION TRANSFER Process Interface Events (3 of 9)

Event	Event Frequency	Interface	Initiated By	Event Description
Send All Non-Trivial Requests	Per submitted client requests	Sybase Server (COTS) Database Tables: DsStGenericRequest, DsStArchiveRequest, DsStFtpRequest, DsStMediaRequest	Sybase Server (COTS)	Non-Trivial requests are persisted to the Sybase Server check-pointing tables and routed to the appropriate STMGT server for processing.
Attach to Staging Disk	One per request	Sybase Server (COTS)	<i>Process:</i> EcDsStRequestManagerServer <i>Library:</i> DsStCmnDb <i>Class:</i> DsStDBIFTransaction	The EcDsStRequestManagerServer sends requests to the Sybase Server to attach (i.e., gain access) to an existing staging disk area.
Claiming Ownership	One per attach request	Sybase Server (COTS)	<i>Process:</i> EcDsStRequestManagerServer <i>Library:</i> DsStCmnDb <i>Class:</i> DsStDBIFTransaction	The EcDsStRequestManagerServer sends requests to the Sybase Server to claim ownership of (i.e., take responsibility for deallocating) an existing staging disk area.
Route Requests	Per external client requests	Sybase Server (COTS) Database Tables: DsStGenericRequest, DsStArchiveRequest, DsStFtpRequest, DsStMediaRequest, DsStStagingDiskRequest	<i>Process:</i> EcDsStRequestManagerServer <i>Library:</i> DsStCmnDb <i>Class:</i> DsStDBIFTransaction	All requests submitted by external clients are executed within the Sybase Server database. Requests that can be fulfilled solely by the database ("trivial requests") are satisfied and the results returned to the client with no additional communications with STMGT servers.
Get Capacity	One calculation per request	Sybase Server (COTS)	<i>Process:</i> EcDsStRequestManagerServer <i>Library:</i> DsStCmnDb <i>Class:</i> DsStDBIFTransaction	The EcDsStRequestManagerServer sends requests to the Sybase Server to determine the effective maximum capacity of a hard media type for the EcDsSt8mmServer, EcDsStD3Server, EcDsStDLTServer and EcDsStCDROMServer. This is used to determine the number of media needed to satisfy a given request.

Table 4.1.3.5-3. STMG CSCI DISTRIBUTION TRANSFER Process Interface Events (4 of 9)

Event	Event Frequency	Interface	Initiated By	Event Description
Distributing From	One data copy from staging disk per request	<i>Processes:</i> EcDsSt8MMServer, EcDsStD3Server, EcDsStDLTServer, EcDsStCDROMServer <i>Library:</i> DsStTmServer <i>Class:</i> DsStReceptionist	<i>Process:</i> EcDsStRequestManagerServer <i>Library:</i> DsStTmClient <i>Class:</i> DsStPatron	The EcDsStRequestManagerServer forwards the requests to the EcDsSt8mmServer , EcDsStD3Server , EcDsStDLTServer or EcDsStCDROMServer for processing.
Printing Packing Slips	One per distribution request	<i>Processes:</i> EcDsSt8MMServer, EcDsStD3Server, EcDsStDLTServer, EcDsStCDROMServer <i>Library:</i> DsStTmServer <i>Class:</i> DsStReceptionist	<i>Process:</i> EcDsStRequestManagerServer <i>Library:</i> DsStTmClient <i>Class:</i> DsStPatron	The EcDsStRequestManagerServer forwards the requests to the EcDsSt8mmServer , EcDsStD3Server , EcDsStDLTServer or EcDsStCDROMServer for processing.
Attaching to Staging Disk	One per attach request	Sybase Server (COTS)	<i>Processes:</i> EcDsSt8MMServer, EcDsStD3Server, EcDsStDLTServer, EcDsStCDROMServer, EcDsStFtpServer <i>Library:</i> DsStCmnDb <i>Class:</i> DsStDBIFTransaction	The EcDsSt8MMServer , EcDsStD3Server , EcDsStDLTServer , EcDsStCDROMServer and EcDsStFtpServer send requests to the Sybase Server to attach (i.e., gain access) to an existing staging disk area.
Detach From Staging Disk	One per request	Sybase Server (COTS)	<i>Processes:</i> EcDsSt8MMServer, EcDsStD3Server, EcDsStDLTServer, EcDsStCDROMServer <i>Library:</i> DsStCmnDb <i>Class:</i> DsStDBIFTransaction	The EcDsSt8MMServer , EcDsStD3Server , EcDsStDLTServer and EcDsStCDROMServer send requests to the Sybase Server to detach (i.e., lose access to) from an existing staging disk area.
Getting Capacity	One calculation per request	Sybase Server (COTS) Database Tables: DsStMediaServer	Sybase Server (COTS)	The Sybase Server obtains the capacity for a particular media type from the Sybase configuration tables.

Table 4.1.3.5-3. STMGT CSCI DISTRIBUTION TRANSFER Process Interface Events (5 of 9)

Event	Event Frequency	Interface	Initiated By	Event Description
Allocate	One allocation per request	<i>Process:</i> EcDsStStagingDiskServer <i>Library:</i> DsStTmServer <i>Class:</i> DsStReceptionist	<i>Processes:</i> EcDsSt8MMServer, EcDsStD3Server, EcDsStDLTServer, EcDsStCDROMServer <i>Library:</i> DsStTmClient <i>Class:</i> DsStPatron	The EcDsSt8MMServer, EcDsStD3Server, EcDsStDLTServer and EcDsStCDROMServer send requests to the EcDsStStagingDiskServer to allocate space on an existing staging disk for data distribution.
Deallocate	One deallocation per request	<i>Process:</i> EcDsStStagingDiskServer <i>Library:</i> DsStTmServer <i>Class:</i> DsStReceptionist	<i>Processes:</i> EcDsSt8MMServer, EcDsStD3Server, EcDsStDLTServer, EcDsStCDROMServer <i>Library:</i> DsStTmClient <i>Class:</i> DsStPatron	The EcDsSt8MMServer, EcDsStD3Server, EcDsStDLTServer and EcDsStCDROMServer send requests to the EcDsStStagingDiskServer to deallocate space on an existing staging disk.
Copy Disk		<i>Process:</i> EcDsStStagingDiskServer <i>Library:</i> DsStTmServer <i>Class:</i> DsStReceptionist	<i>Processes:</i> EcDsSt8MMServer, EcDsStD3Server, EcDsStDLTServer, EcDsStCDROMServer <i>Library:</i> DsStTmClient <i>Class:</i> DsStPatron	The EcDsSt8MMServer, EcDsStD3Server, EcDsStDLTServer and EcDsStCDROMServer send requests to the EcDsStStagingDiskServer to copy data into a staging disk area or between staging disk areas.
Manage Devices	One per media	Sybase Server (COTS) [Database Tables: DsStDevice, DsStSlot, DsStStacker]	<i>Processes:</i> EcDsSt8MMServer, EcDsStD3Server, EcDsStDLTServer, EcDsStCDROMServer <i>Library:</i> DsStCmnDb <i>Class:</i> DsStDBIFTransaction	The EcDsSt8MMServer, EcDsStD3Server, EcDsStDLTServer and EcDsStCDROMServer use database tables obtained via the Sybase Server to determine if a drive is available to handle the request. The Sybase Server updates its device, slot, and stacker tables (data stores).

Table 4.1.3.5-3. STMGT CSCI DISTRIBUTION TRANSFER Process Interface Events (6 of 9)

Event	Event Frequency	Interface	Initiated By	Event Description
Modify DiskInfo	One per distribution request	Sybase Server (COTS) [Database Table: DsStStagingDisk, DsStStagingDiskLien, DsStStagingDiskFile]	<i>Process:</i> EcDsStStagingDiskServer <i>Library:</i> DsStCmnDb <i>Class:</i> DsStDBIFTransaction	The EcDsStStagingDiskServer submits a request to the Sybase Server to update the availability of space on the local disk. The Sybase Server updates its staging area tables (data stores).
Modify PullAreaInfo	One per file to insert	Sybase Server (COTS) [Database Tables: DsStCache, DsStManagedCacheDir, DsStCacheFile, DsStDeleteLogCacheFile, DsStFileLink]	<i>Process:</i> EcDsStPullMonitorServer <i>Library:</i> DsStCmnDb <i>Class:</i> DsStDBIFTransaction	The EcDsStPullMonitorServer submits requests to the Sybase Server to update the availability of space in the Pull cache upon receiving requests to create new user directories and insert files from the EcDsStFtpServer.

Table 4.1.3.5-3. STMGT CSCI DISTRIBUTION TRANSFER Process Interface Events (7 of 9)

Event	Event Frequency	Interface	Initiated By	Event Description
Request Communications Support	One service per request	<p>Process: DCE Security Server</p> <p>Libraries: EcSeLogin, EcSeLogincontext</p> <p>Classes: EcSeLogin, EcSeLogincontext</p> <p>Library: EcPf</p> <p>Classes: EcPfManagedServer, EcPfclient</p> <p>Library (Common): EcUr</p> <p>Class: EcUrServerUR</p> <p>Library: Event</p> <p>Class: EcLgErrormsg</p> <p>Process: EcCsRegistryServer</p> <p>Library: EcCsRegistryClient</p> <p>Class: EcRgRegistryServer_C</p>	<p>Processes: EcDsStRequestManagerServer, EcDsStCacheManagerServer, EcDsStStagingDiskServer, EcDsSt8MMServer, EcDsStD3Server, EcDsStDLTServer, EcDsStCDROMServer, EcDsStFtpServer</p>	<p>The DCCI CSCI provides a library of services available to each SDPS and CSMS CSCI. The CSCI services required to perform specific assignments are requested from the DCCI CSCI. These services include:</p> <ul style="list-style-type: none"> • DCE Support • Name/Address Services • Server Request Framework (SRF) • Error/Event Logging • Fault Handling Services • Mode Information • (Query Registry) Retrieving the requested configuration attribute-value pairs from the Configuration Registry • Distribution Media Options from the Configuration Registry
MkDir	One per directory creation	<p>Process: EcDsStPullMonitorServer</p> <p>Library: DsStTmServer</p> <p>Class: DsStReceptionist</p>	<p>Process: EcDsStFtpServer</p> <p>Library: DsStTmClient</p> <p>Class: DsStPatron</p>	<p>The EcDsStFtpServer sends requests to the EcDsStPullMonitorServer to create directories in the user pull area to which files are linked and from which the external requester can pull files. The EcDsStPullMonitorServer is not a process but a binary link file.</p>

Table 4.1.3.5-3. STMGT CSCI DISTRIBUTION TRANSFER Process Interface Events (8 of 9)

Event	Event Frequency	Interface	Initiated By	Event Description
Ftp Into Cache	One file per insert request into the Pull cache	<i>Process:</i> EcDsStPullMonitorServer <i>Library:</i> DsStTmServer <i>Class:</i> DsStReceptionist	<i>Process:</i> EcDsStFtpServer <i>Library:</i> DsStTmClient <i>Class:</i> DsStPatron	The EcDsStFtpServer sends requests to the EcDsStPullMonitorServer to insert files into the Pull cache. In response, the EcDsStPullMonitorServer returns status to indicate whether the file needs to be transferred to the cache or is already resident.
Link File	One link per file in a request	<i>Process:</i> EcDsStPullMonitorServer <i>Library:</i> DsStTmServer <i>Class:</i> DsStReceptionist	<i>Process:</i> EcDsStFtpServer <i>Library:</i> DsStTmClient <i>Class:</i> DsStPatron	The EcDsStFtpServer sends requests to the EcDsStPullMonitorServer to link files from the Pull cache to the user pull area.
Pull FTP Distribution	One file per pull request	<i>Process:</i> EcDsStFtpServer <i>Library:</i> DsStTmServer <i>Class:</i> DsStReceptionist	<i>Process:</i> EcDsStRequestManagerServer <i>Library:</i> DsStTmClient <i>Class:</i> DsStPatron	The EcDsStRequestManagerServer forwards the requests to the EcDsStFtpServer for processing.
Push FTP Distribution	One per push request	<i>Process:</i> EcDsStFtpServer <i>Library:</i> DsStTmServer <i>Class:</i> DsStReceptionist	<i>Process:</i> EcDsStRequestManagerServer <i>Library:</i> DsStTmClient <i>Class:</i> DsStPatron	The EcDsStRequestManagerServer forwards the requests to the EcDsStFtpServer for processing.

Table 4.1.3.5-3. STMGT CSCI DISTRIBUTION TRANSFER Process Interface Events (9 of 9)

Event	Event Frequency	Interface	Initiated By	Event Description
Request Management Services	At system startup or shutdown and for restarts	Processes: EcDsStRequestManagerServer, EcDsStArchiveServer, EcDsStStagingDiskServer, EcDsStCacheManagerServer, EcDsStFtpServer, EcDsSt8MMServer, EcDsStD3Server, EcDsStDLTServer, EcDsStCDROMServer	DAAC unique startup scripts	System startup and shutdown - Please refer to the release-related, current version of the Mission Operations Procedures for the ECS Project document (611) and the current ECS Project Training Material document (625), identified in Section 2.2.1 of this document.

4.1.3.6 Storage Management Data Stores

Table 4.1.3.6-1 provides descriptions of the individual data stores (entitled collectively “Database”) in the STMGT CSCI architecture diagram. More detailed information on these database tables can be found in the CDRL 311 document on Storage Management.

Table 4.1.3.6-1. STMGT CSCI Data Stores (1 of 5)

Data Store	Type	Description
Sybase Device Tables		
DsStDevice	Sybase	The data store (database table) to contain an entry for each peripheral device the STMGT CSCI uses to service requests to ingest or distribute data. Since this data store is a look-up for entries in the Request entity, this data is initialized prior to software installation.
DsStSlot	Sybase	This data store contains an entry for each peripheral stacker device’s slots the EcDsStArchiveServer and EcDsDistributionServer use to service ingest or data distribution requests, respectively. Since this data store is a look-up entity for entries in the Request entity, this data is initialized prior to software installation.
DsStStacker	Sybase	This data store contains an entry for each peripheral stacker the STMGT CSCI uses to service ingest or data distribution requests. Since this data store is a look-up entity for entries in the Request entity, this data is initialized prior to software installation.
DsStRequestMedia	Sybase	This data store contains the mappings from requests to the hard media needed for the requests.
DsStMediaSet	Sybase	This data store contains the associations of related media into groups that may be loaded or unloaded en masse.

Table 4.1.3.6-1. STMGT CSCI Data Stores (2 of 5)

Data Store	Type	Description
DsStDeviceMedia	Sybase	This data store contains the types of hard media available for distribution requests.
Sybase Cache Tables		
DsStCache	Sybase	This data store identifies every instance of a read-only cache or Pull Area. The current design supports multiple read-only caches, but only one Pull Area.
DsStCacheFile	Sybase	This data store contains an entry for each file in a STMGT cache (read-only cache or pull area). An entry is inserted into the entity for each file retrieved from the Archival Management And Storage System (AMASS).
DsStDeleteLogCache File	Sybase	This data store contains a historic record of each file the STMGT CSCI deletes from its caches (or the DsStCacheFile table). This entity maintains a history of file usage and cache usage for reporting and analysis purposes. An entry is inserted into the entity via a delete trigger in the DsStCacheFile table.
DsStNotification	Sybase	This data store contains configuration information for Pull Area monitoring purposes.
DsStFileLien	Sybase	This data store contains the names of files that have been staged in read-only cache in preparation for being copied or linked to a staging disk. Liens are removed upon copy and converted to links upon link. Liens expire and are automatically removed if not exercised within 24 hours.
DsStFileLink	Sybase	This data store contains the user Pull Area directory
DsStManagedCache Dir	Sybase	This data store contains an entry for each user directory in the Pull Area. An entry is inserted into the data store every time a new directory is added to the Pull Area.
DsStPending Reservations	Sybase	This data store contains a queue for attempts to reserve space, which cannot be met at the time. The queue is serviced on a First-In/First Out (FIFO) priority order.
Sybase Staging Area Table		
DsStStagingDisk	Sybase	This data store saves information (e.g., staging disk size, owner, disk number, and priority request id) about requests for staging disk services.
DsStStagingDiskLien	Sybase	This data store contains a list of the clients currently attached to staging disks. Staging disks are not removed until all liens are released or expired.
DsStStagingDiskFile	Sybase	This data store contains the file names copied to the staging disk areas. This data store is used to track links between staging disks.

Table 4.1.3.6-1. STMGT CSCI Data Stores (3 of 5)

Data Store	Type	Description
Sybase Volume Group Tables		
DsStBackup	Sybase	Stores a reference to every file currently being backed-up related to Archive Backup and Restore functionality.
DsStBackupHistory	Sybase	Stores a history of every file successfully backed-up related to Archive Backup and Restore functionality.
DsStVolumeGroup	Sybase	This data store contains 'volume group' information (the section of the ECS Archive being accessed) from configuration files such as the path currently pointed to and a history of paths used to store data of a given ESDT and version.
Sybase Configuration Tables (All Servers Use these Tables)		
DsStConfigParameter	Sybase	This data store contains an entry for information to configure and initialize each server instance supported by Storage Management. The data consists of information currently accessed through configuration files (*.CFG) plus information as it pertains to the status and node of operation for each server. An entry is inserted for each parameter that a server uses. Two types of parameters can be defined within the constructs of the DsStConfigParameter table, startup and run-time. Startup parameters require the associated server be restarted in order for the parameters to be used. Run-time parameters can be changed without restarting the server (i.e., the server periodically queries the configuration table for new values).
DsStServerType	Sybase	This data store contains all types of servers administered and configured by Storage Management and their associated descriptions. 8 types of standard servers are currently pre-populated with the database construction due to no user interface currently existing to administer (e.g., Archive, Cache Manager, 8MM Tape, Staging Disk, D3...)
DsStServiceThreadConfig	Sybase	This data store contains the allocation of service threads by priority for each server. For servers, which use multiple thread pools, the priority allocation of each thread pool is stored.
DsStStagingDiskServer	Sybase	This data store contains configuration parameters specific to instances of the Staging Disk Server.
DsStFtpServer	Sybase	This data store contains configuration parameters specific to instances of the FTP Server.
DsStArchiveServer	Sybase	This data store contains configuration parameters specific to instances of the Archive Server.
DsStMediaServer	Sybase	This data store contains configuration parameters specific to instances of the D3, DLT, 8MM, and CDROM Servers.

Table 4.1.3.6-1. STMGT CSCI Data Stores (4 of 5)

Data Store	Type	Description
DsStCDROMServer	Sybase	This data store contains configuration parameters specific to instances of the CDROM Server above and beyond those found in the DsStMediaServer data store.
EcDbDatabaseVersions	Sybase	Contains version information about the installed database. Data includes the date of installation, the version number of the database installed, and the latest version number available for the loaded database.
DsStPreconfiguredDevice	Sybase	This data store contains a list of devices known to the deployed version of the ECS software. This is provided as a convenience to the operator in order to facilitate installation and configuration of new hardware.
DsStPreconfiguredStacker	Sybase	This data store contains a list of stackers known to the deployed version of the ECS software. This is provided as a convenience to the operator in order to facilitate installation and configuration of new hardware.
Sybase Operator Logging Tables		
DsStErrorAttribute	Sybase	This data store is required for the DsStErrorDetails class. This data store provides a mapping between character mnemonics and numeric error codes. It defines the attributes for each error, and provides adequate characterization for appropriate retry/recovery procedures from the error attributes.
DsStErrorText	Sybase	This data store provides text descriptions and suggested recovery actions for each error code, and presents errors in a meaningful manner.
DsStEventLog	Sybase	This data store contains a history of events and COTS errors encountered by the STMGT CSCI. The STMGT CSCI inserts a new ERROR_LOG entry each time an event occurs or an error is encountered. The Operations staff has the capability to purge this entity periodically based on a date/time value.
Sybase Check-pointing Tables (All Servers use these Tables)		
DsStArchiveRequest	Sybase	Stores all requests for archive services until they are completed.
DsStFile	Sybase	Contains an entry for each file STGMT is currently processing related to a DsStArchiveRequest entry.
DsStFtpRequest	Sybase	Stores information (e.g., pull directory name and parameter list for FTP request) about FTP specific requests.
DsStGenericRequest	Sybase	Stores common information to all STMGT requests (e.g., checkpoint state, request status, and type of operation, and owner name) regardless of type.
DsStCacheManagerRequest	Sybase	Contains information (e.g., unique file name, and original file name and file size for Cache Manager specific requests.
DsStMediaRequest	Sybase	Contains information specific to requests processed by the D3, DLT, 8MM, and CDROM servers.

Table 4.1.3.6-1. STMGT CSCI Data Stores (5 of 5)

Data Store	Type	Description
DsStMediaServerContacted	Sybase	Tracks which instances of media servers have attempted to service a media request.
DsStCancelledRequest	Sybase	Stores a list of requests, which have been cancelled, with the reason for cancellation.
DsStDependentRequest	Sybase	Tracks dependencies between requests, i.e., where a higher-level request is waiting for a lower-level request to complete.
DsStArchiveFileRequest	Sybase	Contains information specific to Archive Server requests, which operate on a single file, e.g., ArStoreFile and ArRetrieveFile.
DsStPrintRequest	Sybase	Contains information specific to print requests to be serviced by a media server.
DsStStagingDiskRequest	Sybase	Contains information specific to Staging Disk Server requests.

4.1.4 Data Server Subsystem Hardware

4.1.4.1 Access Control and Management Hardware CI Description

The Access Control and Management HWCI (ACMHW), provides access to the Data Server subsystem for subsystem and direct “push/pull” user access, provides tools and capabilities for system administration, and supports the infrastructure of the Data Server. This HWCI controls logical data server access, maintains sessions, provides sub-setting support, directs service requests to other appropriate Data Server Subsystem configuration items, and supports the control and data flow for electronic distributions. The Access Control and Management hardware is logically divided into the Administration Stations (AS) and the Access/Process Coordinators (APCs). The number, type, and configuration of ASs and APCs depend on site requirements and the number of data servers supported. Table 4.1.4.1-1 provides descriptions of the ACMHW.

Table 4.1.4.1-1. Access Control and Management HWCI Descriptions

Server Name	Class/Type	Description
Administration Stations	OPS Workstation	SUN workstations
Access/Process Coordination	APC Data Server	Two SGI Servers with Multi-processor Capabilities and a SUN Server

Administration Stations (AS) hosts provide access to the Administration Services for one or more data servers. These services provide Data Server Administrators with the capability to modify and monitor the configuration of the data server. The data server configuration includes resource availability, number and location of items, data server schema, advertised services, data types and archiving strategy. In addition, this set of services includes the capability to perform Archive maintenance functions. The ASs are mid-sized workstations executing GUI packages to accommodate the imposed I/O and processing requirements.

The Access/Process Coordinators (APCs) are the interface to the data server services. The APCs support session establishment, management, and control, and are used to access the data server services. Sessions management (from a user perspective) provides a variety of data server resources including results sets, cached compute-on-demand data objects, search contexts, etc. These resources impose a computational load and an I/O load on the APC processors. A greater I/O load is imposed by the APCs functioning as a data throughput mechanism for electronic data distribution in Release 5A and for data manipulation via sub-setting in Release 5A. APC platforms also support ingest, storage, and distribution of the Browse data. The Browse data hardware accommodates the different DAAC sizes. At the smaller DAACs, Browse data resides on a RAID disk, at larger sites, like GSFC, Browse data is stored in the EMASS Automated Media Library (AML) robotic libraries handling optical media for HP optical drives. Each APC consists of four platforms configured in pairs as follows: each pair is an SGI host acting as a server and running a Science Data Server database and a SUN host running the ECS Science Data Server custom code. One pair is primary, while the other is the standby. The APCs provide the computer resources, search engines, and tools to operate on data retrieved from repositories. Algorithms operating on site data can execute on an APC or a computer in the Data Processing Subsystem.

The APC SGI server host accommodates electronic ingest of Browse data and data from sources external to the DAAC, including electronic distribution, and manages the requests to the Data Server. APC storage supports functions such as sub-setting, storing user session context, keeping track of user session interactions that can be suspended or resumed, and the Browse collection.

Two identical AS workstations supply AS fail-over/recovery capability via redundant operation. Either workstation can be used independently as an operator workstation and in the event of a failure of one, the other can assume the full role. The two APC servers in a standby configuration share a common disk pool. This disk pool is configured as an outboard stack of RAID disk drives dual-ported to the two servers. One of the servers is configured as primary, the other as a standby secondary. The active server maintains the current system configuration files on disk. In some cases, both servers are active with separate primary responsibilities and shared secondary responsibilities. The servers can accommodate degraded mode fail-over capability in the event of a failure. When a failure on a primary APC is detected, the operator initiates a fail-over procedure. During a fail-over, the backup APC server reads the system status files from the shared disk and begins operating as primary.

Three types of network failures can affect the DSS. 1) If the FDDI cable between a host and the FDDI concentrator were damaged, a new cable would be required. No other configuration would be required. 2) If an individual port on the FDDI concentrator fails, the attached host must be moved to another port, and should be replaced quickly. Note the above failures result in a service interruption only for the workstations. Since all servers/processors are attached to two concentrators, they can communicate as normal in the event of a cable or concentrator fault, and the applications are unaffected by the event. 3) If the PowerHub 8000 fails, service interruption would occur for both the workstations and servers/processors until the faulty module is replaced.

4.1.4.2 Data Repositories Hardware CI Description

Data Repositories (DRs) HWCI (DRPHW) are hardware to store and maintain data permanently. Different technologies are used to instantiate DRs depending on the volume and type of data to be stored, the access patterns of the data, and additional unique requirements imposed on the repository (i.e., data maintenance requirements, backup and restore functions, media management and control, etc.).

DRs are classified as “permanent”, meaning the services to monitor and maintain data integrity for large data holdings are supported by this repository's storage technology. A copy of all data at a site not considered temporary is eventually maintained in a site permanent DR.

The File and Storage Management System (FSMS) host platform is an SGI machine. In DRPHW CIs there are at least two such hosts to serve as a primary and a backup. At the sites with more than two FSMS hosts, one of the hosts serves as a backup to all other hosts and the WKSHW host if any (See Section 4.1.4.3 for the WKSHW Description).

The Data Server's servers and workstations are directly connected to the DAAC FDDI network and HIPPI fabric. The Data Server processors/servers contain dual-attached station (DAS) cards, dual-homed to separate FDDI concentrators. This provides redundancy so full connectivity exists to the servers even in the event of a concentrator failure. The workstations contain single-attached station (SAS) cards and each are connected to a single concentrator, and they are also split across concentrators so they are not all connected to the same unit. The FDDI concentrators are in turn connected to the FDDI switch.

Table 4.1.4.2-1 provides descriptions for the Data Repository HWCI.

Table 4.1.4.2-1. Data Repository HWCI Descriptions

Class/Type	Description
Archive Robotics	STK Powderhorn
Magnetic Tape Drives	STK Redwood
SMP Server Workstation (FSMS Host)	SGI Server with Multi-processor Capabilities.

4.1.4.3 Working Storage Hardware CI Description

Working Storage HWCI (WKSHW) of the Data Server supplies storage for temporary file and buffer storage within the Data Server architecture. This pool contains the interim processing data. WKSHW provides the staging capacity for data acquires and inserts of the interim data.

EDC is the only site that requires interim product data. All interim product data used by the Data Processing Subsystem are staged in the WKSHW for a maximum period of 90 days (most interim products are far more short-lived). Disk storage is supplied for the interim products. Also at EDC, where interim product data accumulation is very significant, archival robotics and tapes are used for this storage as a second tier of WKSHW. A separate AMASS instance supports the functioning of the robotic WKSHW. Table 4.1.4.3-1 provides descriptions for the Working Storage HWCI.

Table 4.1.4.3-1. Working Storage HWCI Descriptions

Item Name	Class/Type	Comments
Working Storage Primary Tier	RAID (host attached)	EDC only
Working Storage Secondary Tier	Tape Robotics	EDC only

Using a RAID for storage implementation provides fault tolerance of the WKSHW. The RAID provides degraded mode of operations for a single disk failure. Second tier storage RMA is equivalent to the rest of the robotic library storage in the archive repository (See Section 4.1.4.2 for the Data Repository Hardware Description). The WKSHW host is backed up by a standby in the DRPHW configuration.

4.1.4.4 Distribution and Ingest Peripheral Management Hardware CI Description

The hardware of the Distribution and Ingest Peripheral Management (DIPHW) supports the media distribution methods for data dissemination from the system and hard media ingest of data into the system. Hard media distribution and ingest is used in an assortment of data recording peripherals. Robotic control is used where applicable to minimize operator involvement.

Data distributed from the data server is buffered for a full day shift (8 hours at most sites). The buffering of the data is provided by the Distribution Storage Management hardware in the data server.

The distribution and ingest peripheral hardware supply the hard media for inter-site, user data distribution scheduling and management. This HWCI contains media drives, jukeboxes/stackers, server hosts, and disk storage for network distribution.

Staging disks in the Distribution and Ingest configuration items of the DSS serve as a buffer to the data pull process. The buffered data pull optimizes performance of the data retrieval for distribution or data processing/archiving after ingest.

The Distribution and Ingest Management hardware includes SUN server controlled recording devices for both hard media data distribution and hard media data ingest.

Equipment complement: RAID (host attached), 8-mm tape drives and stackers, 3480/3490 drives, CD Recordable, printers, optical scanner, FAX, two SUN servers in a load sharing configuration.

4.2 Ingest Subsystem Overview

The Ingest Subsystem (INS) ingests data into Science Data Processing Segment (SDPS) repositories in accordance with approved ICDs. Data is accepted from a variety of external data providers in a variety of formats predefined within SDPS regarding the expected metadata and metadata characteristics. The INS supports a variety of Ingest requests and preprocesses the data for archiving into the SDPS. The preprocessing depends on the attributes of the ingested data such as data type, data format, and the level to which the ingested data has been processed from raw instrument data.

The data types are formally referred to as Earth Science Data Types (ESDTs). An ESDT is a defined data set associated with a given mission/instrument or identified grouping and is registered in an SDPS ESDT Baseline List. The ESDT is identified with a short name, a long name, a collection description, and information on file type, metadata, formats, and services provided such as sub-setting by a given attribute. An example of an ESDT is AST_L1A; the short name for the ASTER reconstructed Level 1A data set, unprocessed instrument digital counts with radiometric (LR) and geometric (LG) coefficients attached. ESDTs can also be ancillary data, algorithms, correlative and calibration data.

The INS software processes execute in a specific pattern based on the ESDT being ingested. The processes include an automated ingest process, a polling ingest process, a media ingest process, and a cross mode ingest process. Ingest processes provide for the receipt of external data, which is archived within the ECS SDPS archival system. Specific ingest process procedures are established to support each unique INS interface and allow the processing interface parameters to be modified as interface and mission requirements evolve. For a given incoming data set corresponding to an ESDT, the INS performs data preprocessing, metadata extraction, and directs the DSS SDSRV CSCI to perform metadata validation.

Data is staged (prepared for transfer) to one of two areas depending on the data level, ESDT, and other data set specific characteristics:

- Level 0 (L0) data received from external data providers and other selected data (EDOS ancillary data) is staged to the INS working storage area. Metadata is extracted and the format is validated in the working storage area. The L0 data is transferred to an archive data repository in the DSS for long-term storage.
- Non-L0 data (such as non-EDOS ancillary data and L1A - L4 data from external facilities) is staged directly to the working storage area in the DSS. Extraction of metadata is performed on the data by the INS software residing in the INS processor hardware. The DSS (SDSRV CSCI) is called by the INS software residing in the INS processor hardware to perform metadata validation. The non-L0 data is transferred to a DSS archive data repository for long-term storage.

Ingest Subsystem Context

Figure 4.2-1 is the INS context diagram. The diagram shows the events sent to the INS from other SDPS or CSMS subsystems and the events the INS sends to other SDPS or CSMS subsystems, the Operations staff, and external providers. Table 4.2-1 provides descriptions of the interface events shown in the Ingest Subsystem context diagram.

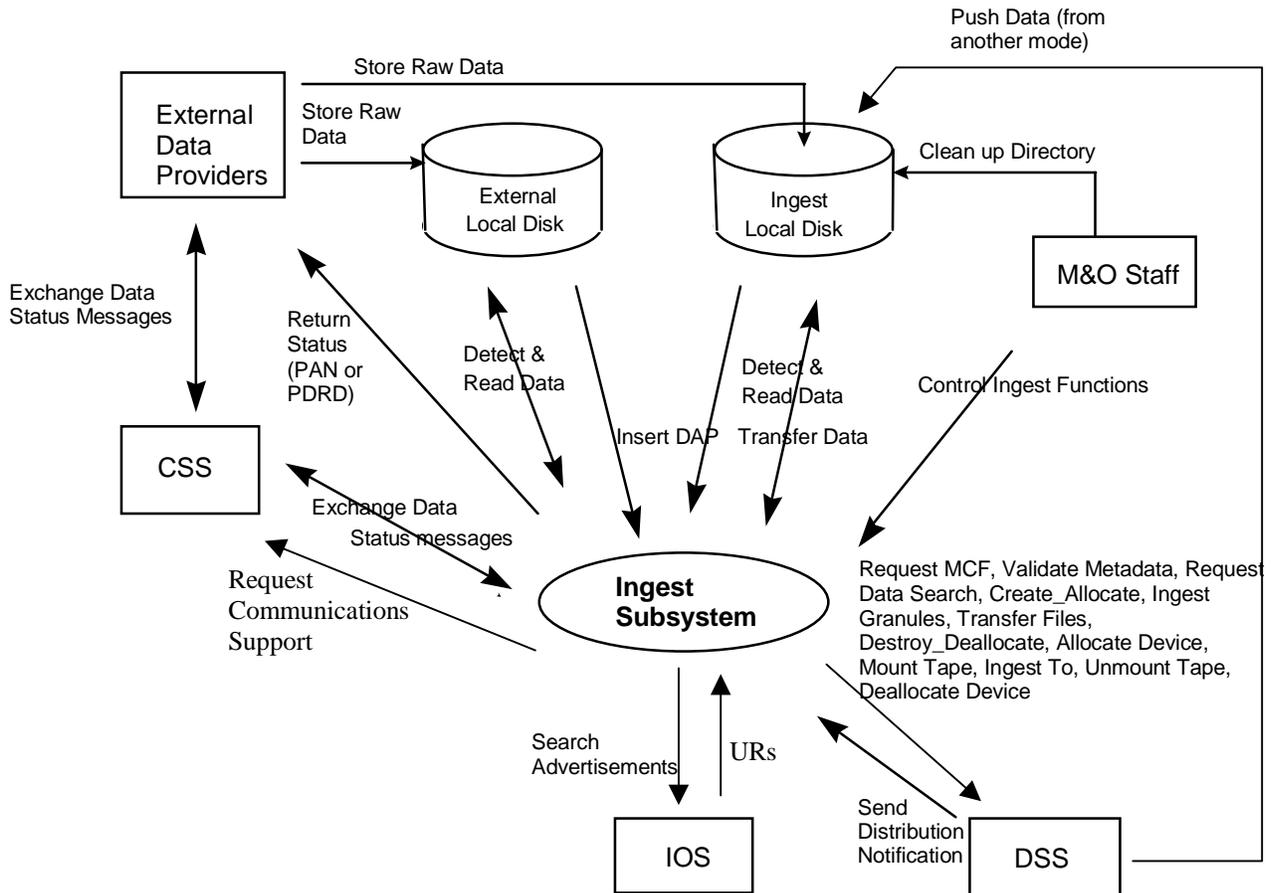


Figure 4.2-1. Ingest Subsystem Context Diagram

Table 4.2-1. Ingest Subsystem Interface Events (1 of 2)

Event	Interface Event Description
Push Data (from another mode)	The DSS pushes data, via the FTP service, to the Ingest local disk when it is distributing data to be ingested.
Clean up Directory	The Operations staff sends clean up instructions to the Ingest Local Disk for data clean up. Currently, delete and remove Unix commands are executed from the Unix command line to clean up the Ingest local disk.
Control Ingest Functions	The Operations staff controls the Ingest function by monitoring requests, canceling requests and granules, resuming suspended requests and granules, changing database parameters, viewing history, and performing manual media ingest via a GUI.
Detect & Read Data	The INS polls for data files, Delivery Record files, or distribution notification files in an agreed upon location (External to ECS or Ingest internal Local Disk).
Transfer Data	The INS retrieves data from the Ingest local disk and stores distribution notification files and PDRs for cross mode ingest on the Ingest local disk.
Insert DAP	Delivered Algorithm Packages (DAPs) are located on a Local Disk (external or internal to a DAAC) and are inserted into the SDPS via the automated polling ingest interface.
Request MCF	The INS requests the Metadata Configuration File (MCF) template, from the DSS , for a particular ESDT short name prior to a data insert request.
Validate Metadata	The DSS validates the metadata files that the INS has populated.
Request Data Search	The INS requests a search, by the DSS , for the granule corresponding to a particular ESDT short name and version, which has a particular local granule id.
Create_Allocate	The INS sends requests to the DSS to allocate areas on the local staging disk to store ingested data.
Ingest Granules	The INS sends requests to the DSS to insert a particular file or files into the SDSRV inventory and archive. Inserted data is accompanied by metadata. The metadata is catalogued in the SDSRV inventory as a granule of a particular ESDT short name and version.
Transfer Files	The INS sends requests to the DSS to transfer (copy) data files to a staging disk.
Destroy_Deallocate	The INS sends requests to the DSS to deallocate a staging disk area (to remove an existing staging disk area from usage). Deallocation of staging disks deletes transferred copies of the data after it (the original data) has been archived.
Allocate Device	The INS sends requests to the DSS to allocate peripheral devices for data ingesting.
Mount Tape	The INS sends requests to the DSS to load tapes to hardware peripherals for reading the tapes.
Ingest To	The INS sends requests to the DSS to copy files from peripheral resources to staging disk areas.
Unmount Tape	The INS sends requests to the DSS to unload and detach tapes from hardware peripherals after reading or writing to the tapes.
Deallocate Device	The INS sends requests to the DSS to deallocate the previously allocated media resource.

Table 4.2-1. Ingest Subsystem Interface Events (2 of 2)

Event	Interface Event Description
Send Distribution Notification	The DSS sends a distribution notification, via e-mail, to the INS when data being distributed is to be ingested.
URs	The Interoperability Subsystem (IOS) returns Universal References (URs) for CSMS managed objects (hosts, servers, routers, other devices) to the INS.
Search Advertisements	The IOS receives requests to search for advertisements. The INS uses the advertisement information to locate the relevant data servers to interact with.
Request Management Services	System startup and shutdown - Please refer to the release-related, current version of the Mission Operations Procedures for the ECS Project document (611) and the current ECS Project Training Material document (625), identified in Section 2.2.1 of this document.
Request Communications Support	The CSS provides a library of services available to each SDPS and CSMS CSCI. The CSCI services required to perform specific assignments are requested from the CSS. These services include: <ul style="list-style-type: none"> • DCE Support • File Transfer Services • Network & Distributed File Services • Bulk Data Transfer Services • Name/Address Services • Server Request Framework (SRF) • Universal Reference (UR) • Error/Event Logging • Fault Handling Services • Mode Information • Retrieving the requested configuration attribute-value pairs from the Configuration Registry • Distribution Media Options from the Configuration Registry
Exchange Data Status Messages	Data status messages are sent to and from the CSS Gateways via Remote Procedure Calls (RPCs). The CSS receives a Data Availability Notice (DAN) from the External Data Providers via the CSS Gateways . Afterwards, additional data status messages are exchanged between the CSS Gateways and the INS. For Landsat 7 data exchanges, a Data Delivery Notice (DDN) is sent from the INS to the Landsat 7 Gateway Server and a Data Availability Acknowledgement (DAA) is sent to the Landsat 7 Gateway Server from the INS. A Data Delivery Acknowledgement (DDA) is returned from the LPS through the CSS to the INS.
Return Status (PAN or PDRD)	The INS returns the status of a request received from an External Data Provider by transmitting a Production Acceptance Notification (PAN) or a Product Delivery Record Discrepancy (PDRD) to the External Data Provider directly.
Store Raw Data	The raw data (L0) provided from the External Data Provider to the ECS. Some external providers put this data on an external local disk for ECS to pull while others push the data onto a local INS internal disk.

Ingest Subsystem Structure

The INS is one CSCI and one HWCI. Ingest backup hardware runs in the Test Mode as long as there are no failures. The configuration items are:

- Ingest (INGST) CSCI provides the software capability to acquire data by various methods and transfers the data into the SDPS. These methods include an Automated transfer from the network, Polling with or without Delivery Record for data placed at predetermined locations, a Media transfer method which includes reading tapes and a cross mode ingest method. The INGST CSCI also stores and manages request information, and provides for data preprocessing and insertion into the appropriate SDPS storage location.
- Ingest Client HWCI (ICLHW) supports INGST in bringing data into the SDPS from an external interface. This HWCI also includes an Ingest Workstation for execution of the Ingest GUI.

Use of COTS in the Ingest Subsystem

- Rogue Wave's Tools.h++

The Tools.h++ class libraries provide basic functions and objects. These libraries must be installed with the INS software for any of the INS processes to run.

- Rogue Wave's DBTools.h++

The DBTools.h++ class libraries interact with the Sybase SQL database server. These libraries must be installed with the INS software to interact with Sybase. The INS uses an interface software process control file (PCF) to obtain access to the Sybase Server.

- Rogue Wave's Net.h++

This is a C++ class library to provide an object-oriented interface to Inter-Process Communication (IPC) and network communication services. The Net.h++ framework enables developed code to be portable to multiple operating systems and network services. These libraries must be installed with the INS software to support the interface to other subsystems.

- Integrated Computer Solutions' (ICS) Builder Xcessory (built on X/Motif)

The Builder Xcessory GUI builder tool modifies the displays of Ingest GUIs. The tool also generates the C++ code to produce Ingest GUIs at run time. There is no operational part of the Builder Xcessory needed at run-time.

- Sybase (xaClient, SQL Server)

This set of Sybase products provides a relational database to store INS related information and must be installed on the platform where INS software resides.

- Tivoli Client

This product provides the interface to monitor the INS software for system administration purposes. Although Tivoli Client is part of MSS, this COTS product must be installed on the platform where the INS resides for Ingest status to be available at the system level.

- **DCE Client**

This product provides the communications between INS and other subsystems. DCE can reside on one or both sides of the interface and must be installed on the platform where the INS resides. Although the DCE Client is part of the CSS, this COTS product must be installed on the platform where the INS software resides for INS to run in the ECS operational and test environments.

- **HP OpenView Client**

This product provides system administration capabilities to control INS software applications (startup and shutdown). The HP OpenView Client must be installed on the platform where the INS software resides. Although HP OpenView Client is part of the MSS, this COTS product must be installed on the platform where the INS resides for INS to run.

- **UNIX Network Services**

DNS, NFS, E-mail, FTP, TCP/IP and the other Unix services provided are obtained from the CSS and are described in section 4.8 of this document.

4.2.1 INGST Computer Software Configuration Item Description

4.2.1.1 INGST Functional Overview

The INGST CSCI supports a variety of interfaces to external systems. The application-level protocol set up for data transfer is potentially different for each of the external interfaces. As a result, a separate ingest software application is required to facilitate data transfer for each interface. To minimize the software development effort and make it easier to accommodate interfaces to new external systems, data ingest from external systems is categorized, based on common characteristics and ingest processes.

1) Automated Network Ingest Interface

Automated Network Ingest occurs when a Data Availability Notice (DAN) is supplied to the SDPS. The SDPS receives the DAN and schedules automated network data transfer from the source. The DAN describes the location of the available data. External data providers are responsible for developing application software to interact with CSMS automated network ingest software.

2) Automated Polling Ingest Interface

- **Polling with Delivery Record** -- The SDPS periodically checks an agreed-upon network location for a Delivery Record file. The Delivery Record file contains information identical to that in a DAN. The Delivery Record describes the location of the available data. The data location could be on a working storage device within SDPS, where an external data provider has previously transferred the data.

- Polling without Delivery Record -- The SDPS periodically checks an agreed-upon network location for available data. All data in the location make up a collection of ingest data of one specific ESDT, with one file per data granule.

3) Manual Media Ingest Interface (via a GUI)

Manual data transfer mechanisms -- data can be transferred from physical media. Physical Media Ingest enables authorized institutions or science users to provide data on hard media and provides a backup procedure for facilities to submit data to the SDPS when automated network data transfer is temporarily unavailable. The hard media must contain information identical to the Delivery Records described above, in a standard file format, or the data provider must separately provide Delivery Records to a specified SDPS location in the standard file format. Hard media data transfer involves data transfer from one of several ingest peripheral types found at a DAAC.

4) Cross Mode Ingest Interface

The INGST CSCI receives a distribution notice, via e-mail, of data files transferred, via the FTP service. The distribution notification is used to create a Delivery Record File (describes the location of the available data). The Delivery Record file is put in an agreed-upon network location. The polling with Delivery Record process checks the location for the Delivery Record files.

The INGST CSCI includes the processes for ingesting data as described and provides a process for managing requests, and for inserting granule data into the SDPS.

4.2.1.2 INGST Context

Figure 4.2.1.2-1 is the INGST CSCI context diagram. The diagram shows the events sent to the INGST CSCI and the events the INGST CSCI sends to other CSCIs. Table 4.2.1.2-1 provides descriptions of the interface events shown in the INGST CSCI context diagram.

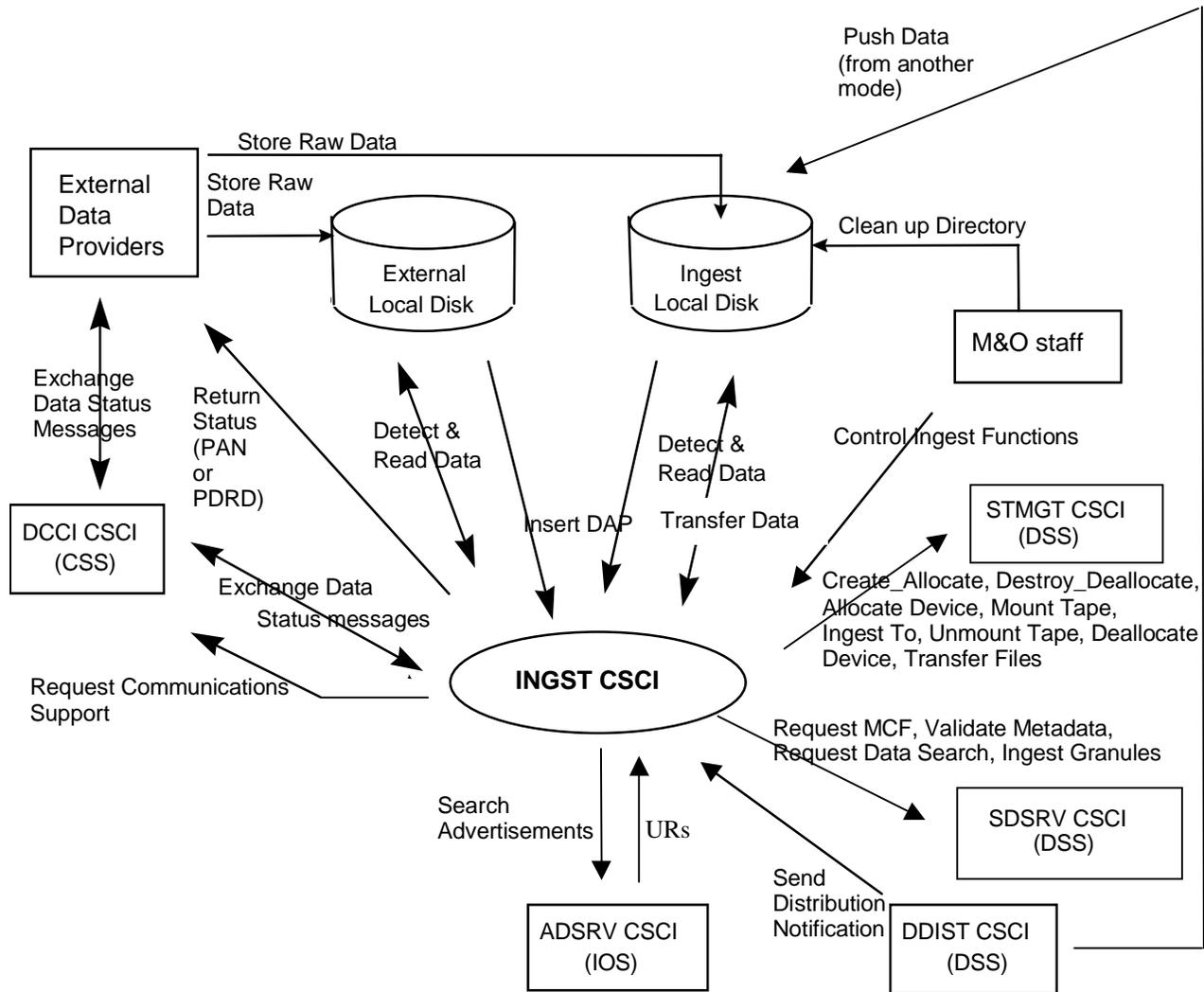


Figure 4.2.1.2-1. INGST CSCI Context Diagram

Table 4.2.1.2-1. INGST CSCI Interface Events (1 of 3)

Event	Interface Event Description
Push Data (from another mode)	The DDIST CSCI pushes data, via the FTP service, to the Ingest local disk when it is distributing data to be ingested.
Clean up Directory	The M&O staff sends clean up instructions to the Ingest local disk for data clean up. Currently, delete and remove Unix commands are executed from the Unix command line to clean up the Ingest local disk.

Table 4.2.1.2-1. INGST CSCI Interface Events (2 of 3)

Event	Interface Event Description
Control Ingest Functions	The M&O staff control the Ingest function by monitoring requests, canceling requests and granules, resuming suspended requests and granules, changing database parameters, viewing history, and performing manual media ingest via a GUI.
Detect & Read Data	The INGST CSCI polls for data files, Delivery Record files, or distribution notification files in an agreed upon location (External to ECS or Ingest internal local disk).
Transfer Data	The INGST CSCI retrieves data from the Ingest local disk and stores distribution notification files and PDRs for cross mode ingest on the Ingest local disk.
Insert DAP	Delivered Algorithm Packages (DAPs) are located on a local disk (external or internal to a DAAC) and are inserted into the SDPS via the automated polling Ingest interface.
Create_Allocate	The INGST CSCI sends requests to the STMGT CSCI to allocate areas on the local staging disk to store ingested data.
Destroy_Deallocate	The INGST CSCI sends requests to the STMGT CSCI to deallocate a staging disk area (to remove an existing staging disk area from usage). Deallocation of staging disks deletes transferred copies of the data after it (the original data) has been archived.
Allocate Device	The INGST CSCI sends requests to the STMGT CSCI to allocate peripheral devices for data ingesting.
Mount Tape	The INGST CSCI sends requests to the STMGT CSCI to load tapes to hardware peripherals for reading the tapes.
Ingest To	The INGST CSCI sends requests to the STMGT CSCI to copy files from peripheral resources to staging disk areas.
Unmount Tape	The INGST CSCI sends requests to the STMGT CSCI to unload and detach tapes from hardware peripherals after reading or writing to the tapes.
Deallocate Device	The INGST CSCI sends requests to the STMGT CSCI to deallocate the previously allocated media resource.
Transfer Files	The INGST CSCI sends requests to the STMGT CSCI to transfer (copy) data files into the STMGT CSCI staging disks.
Request MCF	The INGST CSCI requests the Metadata Configuration File (MCF) template, from the SDSRV CSCI , for a particular ESDT short name prior to a data insert request.
Validate Metadata	The INGST CSCI populates the metadata files and sends them to the SDSRV CSCI for validation.
Request Data Search	The INGST CSCI requests a search, by the SDSRV CSCI , for the granule corresponding to a particular ESDT short name and version, which has a particular local granule id.
Ingest Granules	The INGST CSCI sends requests to the SDSRV CSCI to insert a particular file or files into the archive. Inserted data is accompanied by metadata. The metadata is catalogued in the SDSRV inventory as a granule of a particular ESDT short name and version.

Table 4.2.1.2-1. INGST CSCI Interface Events (3 of 3)

Event	Interface Event Description
Send Distribution Notification	The INGST CSCI receives distribution notification, via e-mail, from the DDIST CSCI when data being distributed is to be ingested.
URs	The ADSRV CSCI returns Universal References (URs) for CSMS managed objects (hosts, servers, routers, other devices) to the INGST CSCI.
Search Advertisements	The ADSRV CSCI receives requests to search for advertisements. The INGST CSCI uses the advertisement information to locate the relevant data servers to interact with.
Request Management Services	System startup and shutdown - Please refer to the release-related, current version of the Mission Operations Procedures for the ECS Project document (611) and the current ECS Project Training Material document (625), identified in Section 2.2.1 of this document.
Request Communications Support	The DCCI CSCI provides a library of services available to each SDPS and CSMS CSCI. The CSCI services required to perform specific assignments are requested from the DCCI CSCI. These services include: <ul style="list-style-type: none"> • DCE Support • File Transfer Services • Network & Distributed File Services • Bulk Data Transfer Services • Name/Address Services • Server Request Framework (SRF) • Universal Reference (UR) • Error/Event Logging • Fault Handling Services • Mode Information • (Query Registry) Retrieving the requested configuration attribute-value pairs from the Configuration Registry
Exchange Data Status Messages	Data status messages are sent to and received from the DCCI CSCI via Remote Procedure Calls (RPCs). A Data Availability Notice (DAN) is sent from the Landsat 7 Processing System (LPS) to the DCCI CSCI and then from the DCCI CSCI to the INGST CSCI. Afterwards, additional data status messages are exchanged between the INGST CSCI, the DCCI CSCI and the External Data Providers. For Landsat 7 data exchanges, a Data Availability Acknowledgment (DAA) and a Data Delivery Notice (DDN) is sent from the INGST CSCI to the DCCI CSCI and from the DCCI CSCI to the LPS. A Data Delivery Acknowledgement (DDA) is returned from the LPS through the DCCI CSCI to the INGST CSCI.
Return Status (PAN or PDRD)	The INGST CSCI returns the status of a request received from an External Data Provider by transmitting a Product Acceptance Notification (PAN) or a Product Delivery Record Discrepancy (PDRD) to the External Data Provider directly.
Store Raw Data	The raw data (L0) is provided from the External Data Provider to the SDPS. Some External Data Providers put this data on an external local disk for SDPS to pull while others push the data onto a local INGST CSCI internal disk.

4.2.1.3 INGST Architecture

The Automated Network Ingest Interface (EcInAuto) sets up ingest sessions with External Data Providers, like Landsat 7 LPS, via the CSMS Gateways. External Data Providers submit Data Availability Notices (DANs) to request a data ingest session. The Polling Ingest Interface (EcInPolling) polls accessible file system locations to detect data to be ingested. This process submits an equivalent DAN or the information for INGST to create a DAN. The Media Ingest Interface (EcInGUI) enables authorized science users or institutions to submit a DAN and the data to be ingested via physical media. The Cross-Mode Ingest Interface (EcInEmailGWServer) receives distribution notifications, via e-mail, and stores them as files in a location, which is polled. This process detects the notification files and creates Delivery Record files, which are put in a polling directory and detected by the Polling Ingest Interface.

The Automated Network Interface, the Polling Ingest Interface, and the Media Ingest all submit ingest requests (containing DANs) to the Ingest Request Manager (EcInReqMgr) and the EcInReqMgr submits data granule requests to the Ingest Granule Server (EcInGran). The EcInGran manages subsequent request processing. The EcInGran invokes a Data Transfer task to transfer data from external locations. The EcInGran also invokes a data preprocessing task to preprocess ingested data (e.g., process metadata and validate metadata parameters) and invokes the Data Server Insertion Task to insert data into the Data Server.

Figure 4.2.1.3-1 is the INGST CSCI architecture diagram. The diagram shows the events sent to the INGST CSCI processes and the events the INGST CSCI processes send to other processes.

Note: System startup and shutdown - Please refer to the release-related, current version of the Mission Operations Procedures for the ECS Project document (611) and the current ECS Project Training Material document (625), identified in Section 2.2.1 of this document.

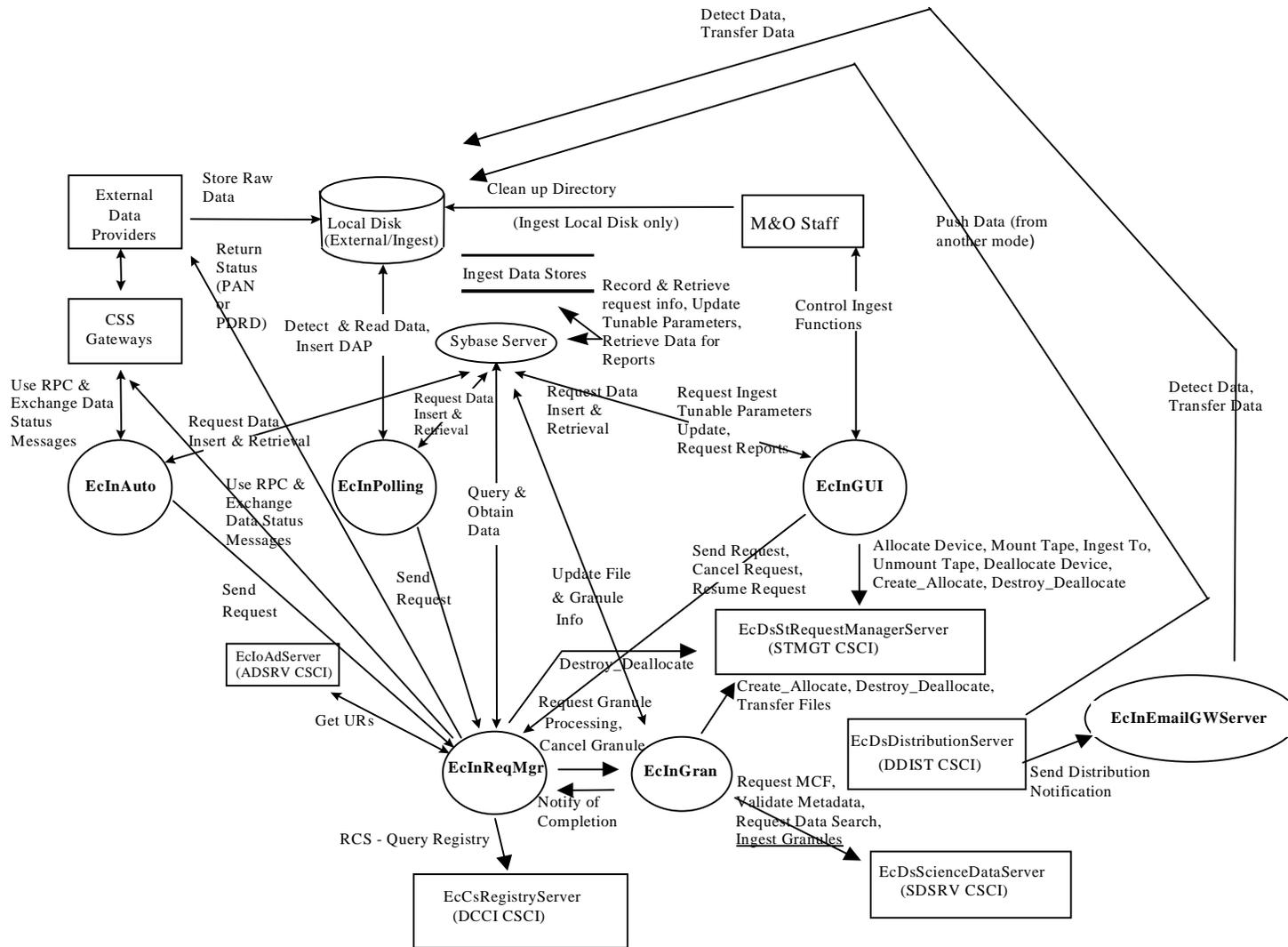


Figure 4.2.1.3-1. INGST CSCI Architecture Diagram INGST Process Descriptions

Table 4.2.1.4-1 provides the descriptions of the processes shown in the INGST CSCI architecture diagram.

Table 4.2.1.4-1. INGST CSCI Processes (1 of 2)

Process	Type	Source	Functionality
EclnAuto	Server	Developed	<p>Provides fundamental capabilities for data ingest into the SDPS, upon receipt of a DAN. This process can be tailored for a specific interface. RPCs are used to request ingest services to schedule data transfer from the source. EclnAuto also</p> <ul style="list-style-type: none"> • manages single requests at a time • invokes an RPC to the EclnReqMgr to begin request processing • checks DAN information • sends and receives data status messages
EclnPolling	Client	Developed	<ul style="list-style-type: none"> • Creates the appropriate polling request • detects new files of interest at tunable periods of time in either external or local disk locations (by checking an agreed upon network location for available data) • creates a unique identifier for the request • submits requests • reports the status of the ongoing requests
EclnGUI	GUI	Developed	<p>Provides Maintenance and Operations (M&O) personnel the capability, via GUI Interface,</p> <ul style="list-style-type: none"> • to perform physical media ingest (to ingest data from hard media) • to monitor the ingest history log, to monitor the status of ongoing ingest requests, to cancel ingest requests and granules, and to resume suspended ingest requests and granules • to modify ingest configuration parameters
EclnReqMgr	Server	Developed	<ul style="list-style-type: none"> • Manages the ingest request traffic and the processing of the ingest requests, and • provides the capability to process multiple ingest requests concurrently by placing the request in a queue • In the event of a failure, the EclnReqMgr process restores on-going requests from the Ingest database
EclnEmailGWServer	Server	Developed	<ul style="list-style-type: none"> • Receives e-mail distribution notification messages • Stores e-mail messages into files • Detects new files of interest at a regular time interval, which can be configured, on a local disk • Creates a polling request and puts it on a local disk location

Table 4.2.1.4-1. INGST CSCI Processes (2 of 2)

Process	Type	Source	Functionality
EclnGran	Server	Developed	<p>Provides services to perform the required data preprocessing and the subsequent data insertion into the appropriate Data Server. The preprocessing of data consists of:</p> <ul style="list-style-type: none"> • converting the data (if needed) • extracting the metadata into the standard SDPS metadata format (if needed) • performing required metadata existence and parameter range checks • updating the metadata with ingest specific metadata (e.g., start and stop date/time for ingest) <p>EclnGran coordinates the ingest granule processing including:</p> <ul style="list-style-type: none"> • performing data preprocessing • sending an insertion request to the appropriate Data Server • updating the granule state • transferring data files into Ingest • building file lists • grouping files with a valid ESDT
Sybase	Server	COTS	<p>Stores and provides access to the INS internal data. In particular, the database stores the Ingest operations databases -- Ingest History Logs and the Ingest request checkpoint state, and template information. See Section 4.2.1.6 INGST Data Stores.</p>

4.2.1.4 INGST Process Interface Descriptions

Table 4.2.1.5-1 provides descriptions of the interface events shown in the INGST CSCI architecture diagram.

Table 4.2.1.5-1. INGST CSCI Process Interface Events (1 of 11)

Event	Event Frequency	Interface	Initiated By	Event Description
Clean up Directory (Ingest local disk only)	One per Unix command to delete or remove	Directories on Ingest Local Disk	M&O Staff-/Unix command	The M&O Staff send clean up instructions to the Ingest Local Disk for data clean up. The Unix commands for delete and remove are executed from the Unix command line to clean up the Ingest Local Disk.
Detect Data	One per poll from EclnEmailGWServer	Directory on local disk	<p><i>Process:</i> EclnEmailGWServer</p> <p><i>Class:</i> InEmailGWServer</p>	The EclnEmailGWServer polls for notification files in an agreed upon location (on the Ingest Local Disk).

Table 4.2.1.5-1. INGST CSCI Process Interface Events (2 of 11)

Event	Event Frequency	Interface	Initiated By	Event Description
Transfer Data	Upon detection	Ingest Local Disk	<i>Process:</i> EclnEmailGWServer <i>Class:</i> InEmailGWServer	The EclnEmailGWServer sends distribution notification files and Delivery Record files to an agreed upon location (on the Ingest local disk).
Push Data (from another mode)	One per distribution	Ingest Local Disk	<i>Process:</i> EcDsDistributionServer <i>Class:</i> DsDdGranuleS	The EcDsDistributionServer pushes data, via the FTP Service, to the Ingest Local Disk when it is distributing data to be ingested.
Control Ingest Functions	One per Ingest Operation	<i>Process:</i> EclnGUI <i>Library:</i> InGuiUt <i>Classes:</i> InRequestControllerRPUtil, InMediaIngestRPUtil, InHistoryLogRPUtil, InOperatorToolsRPUtil	M&O staff	The M&O staff control the Ingest function by monitoring requests, cancelling ingest requests and granules, resuming suspended ingest requests and granules, changing database parameters, viewing history, and performing manual media ingest via a GUI.
Record & Retrieve Request Info	One per request	Ingest Data Stores (database)	Sybase Server (COTS)	Requests from the EclnGUI , EclnPolling , and EclnAuto processes are recorded into the Ingest database for reference and are a source for restarts and re-initializations of outstanding requests.
Update Tunable Parameters	One per update of stored parameters	Sybase Server (COTS)	<i>Process:</i> EclnGUI <i>Library:</i> InGuiUt <i>Class:</i> InOperatorToolsRPUtil	The EclnGUI sends requests to the Sybase Server to update the stored parameters in the Ingest database affecting the functions of the EclnAuto, EclnPolling, EclnReqMgr, and EclnGran processes.

Table 4.2.1.5-1. INGST CSCI Process Interface Events (3 of 11)

Event	Event Frequency	Interface	Initiated By	Event Description
Retrieve Data for Reports	One per data request	Sybase Server (COTS)	<i>Process:</i> EclnGUI <i>Library:</i> InGuiUt <i>Class:</i> InHistoryLogRPUtil	The EclnGUI obtains data from the Ingest database via the Sybase Server to generate reports.
Request Data Insert & Retrieval	One per request	Sybase Server (COTS)	Operations Staff <i>Processes:</i> EclnGUI, EclnPolling, EclnAuto <i>Library:</i> InDBaccUt <i>Classes:</i> InRequestProcessData, InRequestProcessHeader, InExternalDataProviderInfo, InNextAvailableID, InSystemParameters, InCurrentDataTypeMap, InDataTypeTemplate, InEDPAddressMap, InESDTMap, InFileTypeTemplate, InMediaType, InRequestSummaryData, InRequestSummaryHeader, InValDataGranuleState, InValRequestState	Requests from the EclnGUI, EclnPolling, and EclnAuto processes are recorded into the Ingest database, via the Sybase Server , for reference and are a source for restarts and re-initializations of outstanding requests.

Table 4.2.1.5-1. INGST CSCI Process Interface Events (4 of 11)

Event	Event Frequency	Interface	Initiated By	Event Description
Request Ingest Tunable Parameters Update	One per update of stored parameters	Sybase Server (COTS)	<i>Process:</i> EclnGUI <i>Library:</i> InGuiUt <i>Class:</i> InOperatorToolsRPUtil	The EclnGUI sends requests to the Sybase Server to update the stored parameters affecting the functions of the EclnAuto, EclnPolling, EclnReqMgr, and EclnGran processes.
Request Reports	One per data request	Sybase Server (COTS)	<i>Process:</i> EclnGUI <i>Library:</i> InGuiUt <i>Class:</i> InHistoryLogRPUtil	The EclnGUI obtains data from the Ingest database to generate reports via the Sybase Server .
Allocate Device	One allocation per request	<i>Process:</i> EcDsStRequestManagerServer <i>Library:</i> DsStRmClient <i>Class:</i> DsStRequestManager	<i>Process:</i> EclnGUI <i>Library:</i> InResource <i>Class:</i> InResourceIF	The EclnGUI sends requests to the EcDsStRequestManagerServer to allocate peripheral devices for data ingesting.
Mount Tape	One per physical tape	<i>Process:</i> EcDsStRequestManagerServer <i>Library:</i> DsStRmClient <i>Class:</i> DsStRequestManager	<i>Process:</i> EclnGUI <i>Library:</i> InResource <i>Class:</i> InResourceIF	The EclnGUI process sends requests to the EcDsStRequestManagerServer to load tapes to hardware peripherals for reading the tapes.
Ingest To	One data copy from peripheral device(s) per request	<i>Process:</i> EcDsStRequestManagerServer <i>Library:</i> DsStRmClient <i>Class:</i> DsStRequestManager	<i>Process:</i> EclnGUI <i>Library:</i> InResource <i>Class:</i> InResourceIF	The EclnGUI sends requests to the EcDsStRequestManagerServer to copy files from peripheral resources to staging disk areas.

Table 4.2.1.5-1. INGST CSCI Process Interface Events (5 of 11)

Event	Event Frequency	Interface	Initiated By	Event Description
Unmount Tape	One per physical tape	<i>Process:</i> EcDsStRequestManager Server <i>Library:</i> DsStRmClient <i>Class:</i> DsStRequestManager	<i>Process:</i> EcInGUI <i>Library:</i> InResource <i>Class:</i> InResourceIF	The EcInGUI process sends requests to the EcDsStRequestManager Server to unload and detach tapes from hardware peripherals after reading or writing to the tapes.
Deallocate Device	One deallocation per request	<i>Process:</i> EcDsStRequestManager Server <i>Library:</i> DsStRmClient <i>Class:</i> DsStRequestManager	<i>Process:</i> EcInGUI <i>Library:</i> InResource <i>Class:</i> InResourceIF	The EcInGUI sends requests to the EcDsStRequestManager Server to deallocate the previously allocated media resource.
Create_Allocate	One allocation per request	<i>Process:</i> EcDsStRequestManager Server <i>Library:</i> DsStRmClient <i>Class:</i> DsStRequestManager	<i>Process:</i> EcInGUI <i>Library:</i> InResource <i>Class:</i> InResourceIF <i>Process:</i> EcInGran <i>Library:</i> InGranResource <i>Class:</i> InGranResourceIF	The EcInGUI and EcInGran processes send requests to the EcDsStRequestManager Server to allocate areas on the local staging disk to store ingested data.

Table 4.2.1.5-1. INGST CSCI Process Interface Events (6 of 11)

Event	Event Frequency	Interface	Initiated By	Event Description
Destroy_Deallocate	One deallocation per request	<i>Process:</i> EcDsStRequestManager Server <i>Library:</i> DsStRmClient <i>Class:</i> DsStRequestManager	<i>Process:</i> EcInGran <i>Library:</i> InGranResource <i>Class:</i> InGranResourceIF <i>Process:</i> EcInGUI <i>Library:</i> InResource <i>Class:</i> InResourceIF <i>Process:</i> EcInReqMgr <i>Library:</i> InResource <i>Class:</i> InResourceIF	The EcInGran, EcInGUI, and EcInReqMgr processes send requests to the EcDsStRequestManager Server to deallocate a staging disk area (to remove an existing staging disk area from usage).
Send Request	One per request to Request Manager	<i>Process:</i> EcInReqMgr <i>Class:</i> InRequestManager	<i>Processes:</i> EcInAuto, EcInPolling, EcInGUI <i>Library:</i> InGuiUt <i>Classes:</i> InAutoNtwkIngestMgr, InPollingIngestSession, InMedialIngestRPUti	Processing requests from one of the three ingest processes (EcInAuto , EcInPolling , and EcInGUI) are sent to the EcInReqMgr.
Cancel Request	One per Ingest Request/Granule	<i>Process:</i> EcInReqMgr <i>Class:</i> InRequestManager	<i>Process:</i> EcInGUI <i>Library:</i> InGuiUt <i>Class:</i> InRequestController RPUti	The EcInGUI is the interface to the EcInReqMgr process to cancel a request or one of its granules.

Table 4.2.1.5-1. INGST CSCI Process Interface Events (7 of 11)

Event	Event Frequency	Interface	Initiated By	Event Description
Resume Request	One per suspended Ingest Request/Granule	<i>Process:</i> EclnReqMgr <i>Class:</i> InRequestManager	<i>Process:</i> EclnGUI <i>Library:</i> InGuiUt <i>Class:</i> InRequestControllerRPUtil	The EclnGUI is the interface to the EclnReqMgr process to resume a suspended request or one of its granules.
Update File & Granule Info	One per file or granule update	Sybase Server (COTS)	<i>Process:</i> EclnGran <i>Library:</i> InDBaccUt <i>Classes:</i> InRequestProcessData, InRequestFileInfo	The EclnGran process sends requests to the Sybase Server to update file and granule information obtained from the Ingest database.
Request Granule Processing	One per granule processing request	<i>Process:</i> EclnGran <i>Class:</i> InGranuleAsync_S	<i>Process:</i> EclnReqMgr <i>Class:</i> InRequest	The EclnReqMgr sends processing requests to the EclnGran process for granule processing.
Cancel Granule	One per Granule	<i>Process:</i> EclnGran <i>Class:</i> InGranuleAsync_C	<i>Process:</i> EclnReqMgr <i>Class:</i> InRequest	The EclnReqMgr sends a cancel message to the EclnGran process.
Notify of Completion	One per granule completion	<i>Process:</i> EclnReqMgr <i>Library:</i> InGranuleC <i>Class:</i> InGranuleAsync_C	<i>Process:</i> EclnGran <i>Class:</i> InGranuleAsync_S	The EclnGran process sends a completion notification to the EclnReqMgr when a granule for a request is completed.
Transfer Files	One per Science Data file activity	<i>Process:</i> EcDsStRequestManagerServer <i>Library:</i> DsStRmClient <i>Class:</i> DsStRequestManager	<i>Process:</i> EclnGran <i>Library:</i> InGranResource <i>Class:</i> InGranResourceL F	The EclnGran sends requests to the EcDsStRequestManagerServer to transfer (copy) data files to a staging disk

Table 4.2.1.5-1. INGST CSCI Process Interface Events (8 of 11)

Event	Event Frequency	Interface	Initiated By	Event Description
Request MCF	One per access of MCF	<i>Process:</i> EcDsScienceDataServer <i>Library:</i> DsCI <i>Class:</i> DsCIDescriptor	<i>Process:</i> EcInGran <i>Library:</i> InPreprocess <i>Class:</i> InDataPreprocessTask	The EcInGran process requests the MCF template from the EcDsScienceDataServer .
Validate Metadata	One per metadata validation	<i>Process:</i> EcDsScienceDataServer <i>Library:</i> DsCI <i>Class:</i> DsCIDescriptor	<i>Process:</i> EcInGran <i>Library:</i> InPreprocess <i>Class:</i> InDataPreprocessTask	The EcInGran process requests the EcDsScienceDataServer to perform a validation of the metadata files.
Request Data Search	One per granule pointer in linkage file	<i>Process:</i> EcDsScienceDataServer <i>Library:</i> DsCI <i>Classes:</i> DsCIESDTReferenceCollector, DsCIQuery	<i>Process:</i> EcInGran <i>Library:</i> InPreprocess <i>Class:</i> InDataPreprocessTask	The EcInGran process sends a search request to the EcDsScienceDataServer for a granule corresponding to a particular ESDT short name and version, which has a particular local granule id.
Ingest Granules	One per insert into the archive	<i>Process:</i> EcDsScienceDataServer <i>Library:</i> DsCI <i>Class:</i> DsCIRequest	<i>Process:</i> EcInGran <i>Library:</i> InPreprocess <i>Class:</i> InDataServerInsertionTask	The EcInGran process requests a file or files to be inserted into the SDSRV (EcDsScienceDataServer) inventory and archives, and the associated metadata is catalogued in the SDSRV inventory (archives), as a granule of a particular ESDT short name and version.

Table 4.2.1.5-1. INGST CSCI Process Interface Events (9 of 11)

Event	Event Frequency	Interface	Initiated By	Event Description
Send Distribution Notification	One per distribution request	<i>Process:</i> EcInEmailGWServer <i>Classes:</i> InEmailGWServer, InEmailParser	<i>Process:</i> EcDsDistributionServer <i>Library:</i> DsDdSSh <i>Classes:</i> DsDdMedia, DsDdMediadist	The EcInEmailGWServer receives distribution notifications via e-mail from the EcDsDistributionServer .
Request Communications Support	One service per request	<i>Process:</i> DCE Security Server <i>Libraries:</i> EcSelogin, EcSelogincontext <i>Classes:</i> EcSelogin, EcSelogincontext <i>Library:</i> EcPf <i>Classes:</i> EcPfManagedServer, EcPfclient <i>Library (Common):</i> EcUr <i>Class:</i> EcUrServerUR <i>Library:</i> Event <i>Class:</i> EcLgErrormsg <i>Process:</i> EcCsRegistryServer <i>Library:</i> EcCsRegistryClient <i>Class:</i> EcRgRegistryServer_C	<i>Processes:</i> EcInReqMgr, EcInGran, EcInAuto, EcInPolling, EcInGUI, EcInEmailGWServer	The DCCI CSCI provides a library of services available to each SDPS and CSMS process. The process services required to perform specific assignments are requested from the DCCI CSCI. These services include: <ul style="list-style-type: none"> • DCE Support • File Transfer Services • Network & Distributed File Services • Bulk Data Transfer Services • Name/Address Services • Server Request Framework (SRF) • Universal Reference (UR) • Error/Event Logging • Fault Handling Services • Mode Information • (Query Registry) Retrieving the requested configuration attribute-value pairs from the Configuration Registry

Table 4.2.1.5-1. INGST CSCI Process Interface Events (10 of 11)

Event	Event Frequency	Interface	Initiated By	Event Description
Get URs (Search Advertisements)	One per advertisement	<i>Process:</i> EcloAdServer <i>Library:</i> IoAdSearch <i>Class:</i> IoAdApprovedAdvSearchCommand	<i>Process:</i> EclnReqMgr <i>Library:</i> InUpdateUR <i>Class:</i> InUpdateUR	The EclnReqMgr receives Universal References from the EcloAdServer as a result of an advertisement request. Ingest uses the Advertisement Information to locate the relevant Data Server to contact for data requests.
Query & Obtain Data	One per query of Ingest Database	Sybase Server (COTS)	<i>Process:</i> EclnReqMgr <i>Library:</i> InDBaccUt <i>Classes:</i> InDataTypeTemplate, InRequestFileInfo, InRequestProcessData, InRequestProcessHeader, InCurrentDataTypeeMap, InEDPAddressMap, InESDTMap, InExternalDataProviderInfo, InGranuleServerInfo, InSystemParameters	The EclnReqMgr sends requests to the Sybase Server for ingest processing information from the Ingest database.
Return Status (PAN or PDRD)	One per request	External Data Provider	<i>Process:</i> EclnReqMgr <i>Class:</i> InRequest	The EclnReqMgr returns status of a request to the External Data Providers via a Product Acceptance Notification (PAN) or a Product Delivery Record Discrepancy (PDRD).

Table 4.2.1.5-1. INGST CSCI Process Interface Events (11 of 11)

Event	Event Frequency	Interface	Initiated By	Event Description
Detect and Read Data	One per poll from EclnPolling	Various ID directories on various Ingest Local Disks	<i>Process:</i> EclnPolling <i>Class:</i> InPollingIngestSession	The EclnPolling polls for data files or Delivery Record files in an agreed location (on the Ingest Local Disk).
Insert DAP	One per request	Ingest Local disk	<i>Process:</i> EclnPolling <i>Class:</i> InPollingIngestSession	Delivered Algorithm Packages (DAPs) are stored on the Local Disk for insertion into the SDPS with the Ingest Polling process.
Use RPC & Exchange Data Status Messages	One per RPC from CSS	<i>Process:</i> EclnAuto <i>Class:</i> InAutoIngestIF_1_0_Mgr	<i>Process:</i> EcCsLandsat7Gateway <i>Library:</i> EcCsIDLLIB <i>Classes:</i> CsGwLEG, CsGwELG	The EcCsLandsat7Gateway initiates a session with Auto Ingest by invoking a Remote Procedure Call (RPC). The EclnAuto receives DAN messages from the EcCsLandsat7Gateway. The EclnAuto sends DAA messages to the EcCsLandsat7Gateway. When requests are completed, the EclnReqMgr sends DDN messages to the EcCsLandsat7Gateway. DDA messages are sent back to the EclnReqMgr to acknowledge the DDN messages have been delivered.
Store Raw Data	One per data delivery	Ingest Local disk	External Data Providers	The External Data Providers send raw data to the ECS Ingest local disk via the FTP service.

4.2.1.5 INGST Data Stores

The INGST CSCI uses the COTS product Sybase to store related INGST information on a physical medium. The stored information is divided into four functional areas:

1. Checkpoint and reactivate ingest processing
2. Summary or historical information for collecting and reporting metrics
3. Ingest configuration (e.g., thresholds) and template information

4. Validation tables for the INS GUI and software

Table 4.2.1.6-1 provides descriptions of the individual data stores used by the INGST CSCI. The architecture diagram shows a single data store entitled “Ingest Data Stores” for simplification.

Table 4.2.1.6-1. INGST CSCI Data Stores (1 of 2)

Data Store	Type	Description
InRequestProcessHeader	Sybase	Provides checkpoint storage of ingest request processing information associated with a given ingest request. Upon request process completion, copies of these records are stored in InRequestSummaryHeader data store and the request processing ingest information is deleted.
InRequestProcessData	Sybase	Provides checkpoint storage of data granule processing information associated with a given ingest request. Upon request process completion, copies of these records are stored in the InRequestSummaryData data store and the granule processing data information is deleted.
InRequestFileInfo	Sybase	Provides checkpoint storage of file information associated with a data granule within a given ingest request.
InRequestSummaryHeader	Sybase	Provides long-term storage of summary request-level statistics associated with a given ingest request. Summary records are copied upon ingest request processing completion and the processing records are deleted from the system.
InRequestSummaryData	Sybase	Provides long-term storage of summary data type statistics associated with a given data granule in a given ingest request. Summary records are copied upon ingest request processing completion and the processing records are deleted from the system.
InSourceMCF	Sybase	Initially, pre-populated with the valid metadata types for each file type. It “points” to the metadata and indicates “how” to handle the data in a standard object description language (ODL) format.
InSystemParameters	Sybase	Stores current system thresholds that limit ingest request traffic and data volume.
InExternalDataProviderInfo	Sybase	Stores thresholds on ingest request traffic and data volume for External Data Providers.
InValGranuleServerUR	Sybase	Provides the name of each configured Granule Server.
InGranuleServerInfo	Sybase	Stores thresholds on granule traffic and data volume for each Granule Server.
InDataTypeTemplate	Sybase	Initially, pre-populated with current, valid Earth Science Data Types (ESDTs) that the INS is capable of ingesting.
InESDTMap	Sybase	Stores the information for special mappings of the ESDT and the Client data type.
InFileTypeTemplate	Sybase	Initially, pre-populated with all valid file types that make up an ESDT.
InMediaType	Sybase	Stores the valid values of the media types available that can be ingested.
InNextAvailableID	Sybase	Stores the next available RequestID to be given.
InValDataGranuleState	Sybase	Stores all the valid values for a data granule state.
InValIngestType	Sybase	Stores all the valid values for an ingest type.

Table 4.2.1.6-1. INGST CSCI Data Stores (2 of 2)

Data Store	Type	Description
InValNotifyType	Sybase	Stores all the valid values for a notify type.
InValParameterClass	Sybase	Initially, pre-populated with all the valid values for a parameter class.
InValRequestState	Sybase	Stores all the valid values for a request state.
InEDPAddressMap	Sybase	Initially, pre-populated with the IP address for an External Data Provider.
InCurrentDataTypeMap	Sybase	Initially pre-populated with current valid Earth Science Data Types (ESDTs) Ingest is capable of ingesting and the current Ingest version id for each one.

4.2.2 Ingest Subsystem Hardware

4.2.2.1 Ingest Client Hardware CI Description

The Ingest Client HWCI (ICLHW) Server accommodates the required ingest volumes, including I/O, and processing capabilities to support internal data transfers associated with metadata validation and extraction, and to transfer data to the Data Server or Data Processing Subsystem. The disks are sized to accommodate the functionality and provide contingency space for the transfer of more than one day's worth of data within a 24-hour period.

The Ingest Server is a 64-bit SGI machine. Dual processors are installed on the Ingest Server (See 920-TDx-001 series of base-line documents).

The Ingest Server is configured with at least 256 MB of memory with one-way interleaving to support the processors.

The SGI architecture provides configuration for I/O subsystems that attach to the backplane. These I/O subsystem items are referred to as IO cards. Each IO card provides serial and parallel connections, two fast-wide differential SCSI-2 channels, and space for two HIO controller cards. An HIO controller card offers a HIPPI card, a FDDI card, and a card supporting three SCSI-2 channels.

The number of IO cards specified for each Ingest Server is determined by allocating HIO slots to the FDDI and HIPPI interfaces, and counting the number of SCSI-2 interfaces required. The number of internal and external SCSI-2 devices supported by the system determines the number of SCSI-2 interfaces required. The first SCSI-2 channel is delegated to internal devices like CD-ROMs, floppy disk drives, and tape drives. Internal disks ranging in aggregate size from four GB to eight GB are allocated to the second SCSI-2 channel. External disk arrays are allocated to subsequent SCSI-2 channels and the number of channels is based on the required throughput of the external file systems (See 920-TDx-001 and 922-TDx-009 series of base-line documents).

The internal disks on an Ingest Server are used to provide swap space for the operating system and to provide file space for the operating system and applications (See 920-TDx-001 and 922-TDx-009 series of base-line documents).

The external disk arrays are SCSI-2 based RAID units from SGI. The implementation of these ingest buffer arrays are RAID Level 3 and RAID Level 1 for the database and logs (See 922-TDx-009 series of base-line documents). The SGI RAID units use one redundant disk for each four data disks in the RAID Level 3 configuration, and these are built into groups of five disks, with up to four groups (20 disks) per RAID enclosure.

Each enclosure contains two controllers that can access one or more groups of disks in the enclosure. Both controllers can access a group of disks within an enclosure, however, only one controller can access the group at a time. This dual attachment enables the striping of disk volumes across controllers for high throughput and for implementing fail-over of controllers.

A FDDI subnetwork is implemented at each site. Each server of ICLHW is dual-attached to the SDPS FDDI subnetwork (See 920-TDx-001, 921-TDx-002, 921-TDx-003, and 921-TDx-004 series of base-line documents).

A central HIPPI switch HIPPI network is used to implement the ICLHW and Data Repositories with switched 800 Mbps interface ports connected directly to the ICLHW and Data Repository hosts (See 920-TDx-001, 920-TDx-002, 921-TDx-003, AND 921-TDx-004 series of base-line documents).

4.2.2.2 Ingest Workstation Description

The Ingest Workstation is provided to execute the Ingest GUI. This workstation enables the operator to remotely monitor the Ingest Servers and the Ingest processes, from media ingest to remote ingest.

The Ingest Workstation is a 64-bit SGI machine. For information on the processor used on the Ingest Workstation see the 920-TDx-001 series of base-line documents.

The Ingest Workstation is equipped with at least 128 MB of memory (See 920-TDx-001 series of base-line documents).

The Ingest Workstation is equipped with four EISA slots, with a transfer rate of at least 33 MB/second. A FDDI interface card and a graphics subsystem each use an EISA slot. Additionally, the Ingest Workstation is equipped with two fast SCSI-2 connections.

The Ingest Workstation internal disks, providing an aggregate space of eight GB, provide swap space and file system space for the operating system and applications (See 920-TDx-001 series of base-line documents). There are no external disk arrays.

A FDDI subnetwork is implemented at each site. The Ingest Workstation uses a single-attached FDDI interface to connect to the SDPS FDDI subnetwork.

4.3 Client Subsystem Overview

The Client Subsystem (CLS) is a set of CSCIs and processes that provide ECS end-user services.

These services include allowing users to:

- Submit ASTER on-demand orders
- Submit ASTER Data Acquisition Requests (DARs)
- Create, retrieve and update ECS user profiles
- View HDF formatted files

In addition, the workstations operating within an ECS CLS contains infrastructure support software as part of the CSS and platform support software.

Client Subsystem Context

Figure 4.3-1 is the Client Subsystem context diagram. The diagram shows the events sent to the CLS and the events the CLS sends to other SDPS or CSMS subsystems.

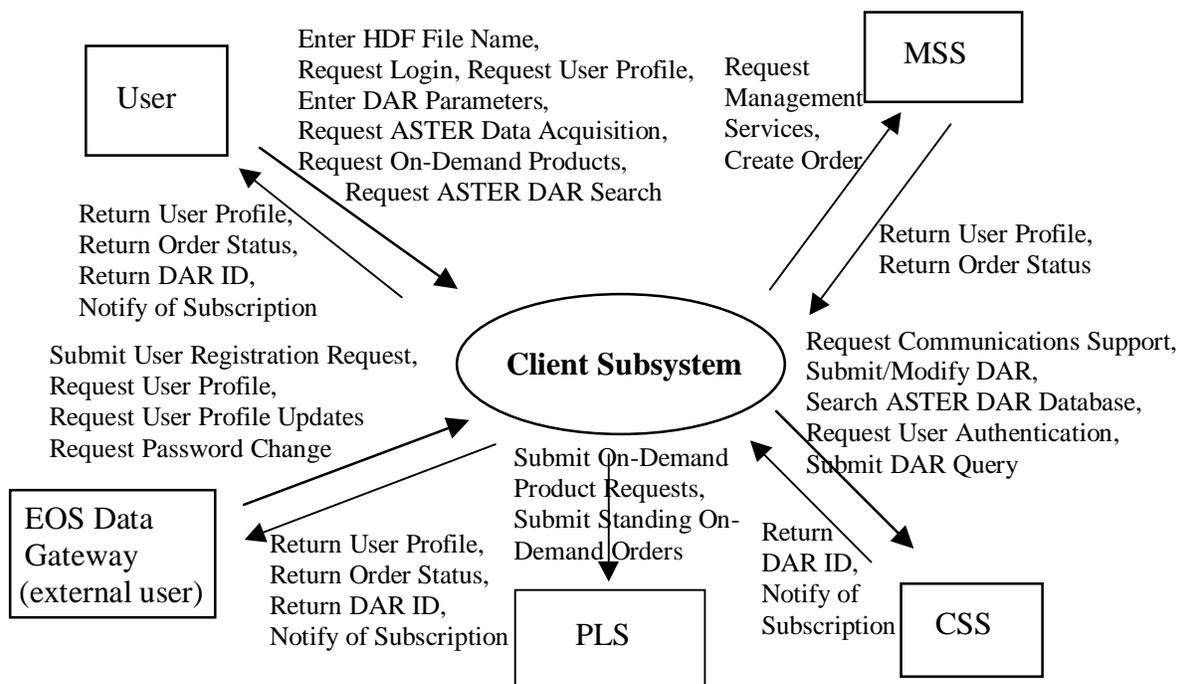


Figure 4.3-1. Client Subsystem Context Diagram

The search and retrieval of data are performed by the EOS Data Gateway, the Version 0 Client (Web version). The EOS Data Gateway is treated as an external entity since the design and design documentation is controlled under another contract. Documentation on the V0 Web Client (EOS Data Gateway) design can be accessed through the Universal Resource Locator <http://harp.gsfc.nasa.gov/~imswww/pub/manuals/imsdesign.html>. Table 4.3-1 provides descriptions of the interface events shown in the Client Subsystem context diagram.

Table 4.3-1. Client Subsystem Interface Events (1 of 3)

Event	Interface Event Description
Enter HDF File Name	This is a file name for a Hierarchical Data Format (HDF) file. The user opens the file to see the data in the file.
Request Login	A user name and password for authenticating the user are provided for access to the ECS. The user name and password is turned into a User Authentication Request to the CSS (via a request for communications support).
Enter DAR Parameters	The user enters parameters (as specified in the Interface Control Document (ICD)) required for submittal or modification of Data Acquisition Requests (DARs) in accordance with the ASTER GDS Interface Requirements Document (IRD). Upon completion of the selection or modification of DAR parameters, the user may submit a DAR. In addition, the user may specify DAR parameters for a search of the DAR database.
Request ASTER Data Acquisition	A user submits a request (to the CLS) to have ASTER data taken (a data acquisition request or DAR) using the parameters entered into the Java DAR Tool. DAR parameters are required for submittal of DARs as specified in the ASTER GDS IRD/ICD. As the result of a successfully submitted DAR, the user receives a DAR ID. This is a string of characters used to track a DAR. The user receives notification every time data resulting from this DAR is received by the ECS.
Request On-Demand Products	The user selects the On-demand Product (ASTER L1B, ASTER DEM, ASTER higher Level) and a processing parameter(s) to provide to the PLS.
Request ASTER DAR Search	A user submits a request (to the CLS) to search the ASTER DAR database by DAR parameters or a specific DAR ID to determine if a scene of interest (to the user) has been acquired by the ASTER instrument.

Table 4.3-1. Client Subsystem Interface Events (2 of 3)

Event	Interface Event Description
Request Management Services	<p>The MSS provides a basic management library of services to the subsystems, implemented as client or server applications, using the CSS Process Framework. The basic management library of services includes:</p> <ul style="list-style-type: none"> • System startup and shutdown - Please refer to the release-related, current version of the Mission Operations Procedures for the ECS Project document (611) and the current ECS Project Training Material document (625), identified in Section 2.2.1 of this document. • User Profile Request - The MSS provides requesting subsystems with User Profile parameters such as e-mail address and shipping address upon request by authorized users to support their processing activities. • Order/Request Tracking - The CLS uses CGI scripts to interface with the MSS Order/Request Tracking service to create a user product order and submit the order to the PLS. • User Profile Updates – The MSS receives user profile parameter updates from a user and makes the updates in the user profile database. • Password Change Request - The CLS sends requests on behalf of ECS users to the MSS to change users' authenticators in the MSS database.
Create Order	<p>The ODFRM, via the Netscape Enterprise Server, uses CGI scripts to interface with the MSS Order Tracking Server to create and track a user data product order.</p>
Return User Profile	<p>The user profile is returned from the MSS to the CLS to be returned to the external user via the EOS Data Gateway.</p>
Return Order Status	<p>The CLS receives an order id and status for the requested ECS product from the MSS and returns the order id and status to the user (to track the order).</p>
Request Communications Support	<p>The CSS provides a library of services available to each SDPS and CSMS subsystem. The subsystem services required to perform specific assignments are requested from the CSS. These services include:</p> <ul style="list-style-type: none"> • DCE Support • Name/Address Services • Server Request Framework (SRF) • Universal Reference (UR) • Error/Event logging • Mode Information • Retrieving the requested configuration attribute-value pairs from the Configuration Registry • Distribution Media Options from the Configuration Registry
Submit/Modify DAR	<p>The user submits a DAR after selecting or modifying DAR parameters to the CSS. As the result of a DAR submission, the user receives a DAR ID. This is a string of characters used to track a DAR. The user receives notification every time data resulting from this DAR is received by the system.</p>
Search ASTER DAR Database	<p>The CLS submits a request to the CSS to search the ASTER GDS DAR database for DARs and their respective status (i.e., acquired scenes). Search qualifications may be in the form of DAR parameters or DAR Ids. To get a status of the search, users may view the Search Status via the Java DAR Tool.</p>

Table 4.3-1. Client Subsystem Interface Events (3 of 3)

Event	Interface Event Description
Request User Authentication	A request to authenticate the user given a user name and password is sent to the CSS . The CSS uses the DCE services to authenticate the user. In response, a user authentication response is sent back as to whether the user name and password are valid.
Submit DAR Query	The CLS sends the parameters required for querying DARs to the CSS as one of the following three queries: queryxARContents, queryxARScenes, or queryxARSummary. The results of the query are returned to the CLS.
Return DAR ID	As the result of a successfully submitted DAR, the user receives a DAR ID from the CSS via the CLS. This is a string of characters used to track a DAR.
Notify of Subscription	The user receives notification every time data resulting from a successfully submitted DAR is received by the ECS from the CSS via the CLS.
Submit On-Demand Product Requests	The CLS submits the on-demand request to the PLS . As a result, the user receives an Order ID. The user receives a notification when the request is processed.
Submit Standing On-Demand Orders	The CLS sends standing on-demand orders to the PLS .
Submit User Registration Request	Users submit a request to be a registered user of the ECS. Registered users can be given special privileges not awarded to guests, such as the capability to order data on a media at a cost. The user request is sent through the EOS Data Gateway (EDG) , which creates both an EDG and an ECS User Profile. The user enters his or her addresses (user, shipping, billing and e-mail) and other important information. This profile information is used to establish an EDG profile and is forwarded through the CLS to the MSS. The MSS creates the ECS profile.
Request User Profile	A User Profile Request is a search for a User Profile from the user via the workbench or EDG . In response, the CLS receives the user profile, which contains information about a user that must be maintained. This includes, but is not limited to, mailing, billing, and shipping addresses, phone number, electronic mail address, project account number and project organization.
Request User Profile Updates	The user can update their User Profile information through the EOS Data Gateway . This includes their addresses (user, shipping, billing, and e-mail) and other important information. This updated profile information (profile2.odl) is forwarded through the CLS to the MSS. The EOS Data Gateway uses the profile2.odl file rather than a live interface with the CLS as its source of user information.
Request Password Change	The user can request a change of his/her EDG User Profile passwords through the EOS Data Gateway . The user enters his current and new passwords. This information is used to change the EDG password and the passwords (old and new) are forwarded through the CLS to the MSS. The MSS changes the ECS password.

Client Subsystem Structure

The Client Subsystem is three CSCIs:

- The Workbench (WKBCH) CSCI includes the set of ECS applications and libraries that provide access to the ECS data and services. There are two tools: the EOSView and the

Java DAR Tool (JDT). The EOSView is a X/Motif application resident on a science user's workstation. The Java DAR Tool is a java-based web application that can be accessed through a web browser.

- The ODFRM CSCI consists of HTML pages and CGI programs. The user creates an On-demand processing request and sends the request to the PLS. The PLS processes the request and sends a notification to the user.
- The Desktop (DESKT) CSCI provides the User Profile Gateway server to communicate with the MSS User Registration Server for creating new user accounts, obtaining user profile information to authenticate users or update user information.

The CLS contains no HWCIs. The DMS hardware (Interface Servers) provides the processing and storage for the WKBCH software. In addition, the User Profile Gateway Server is used to create, retrieve and update user profiles for ECS users via the EOS Data Gateway. The CLS is required to support the following hosts: SGI IRIX 5.3, HP UX 9.05, SUN Solaris, and IBM RS/6000 AIX 3.2.5. Currently, the ECS only supports Personal Computers running windows 95 and higher versions of windows and SUN Solaris running with Netscape versions of 3.01 and higher versions.

The Interface Servers are SUN Ultra 3000 Server class machines. Detailed specifications can be found in the site specific hardware design diagram, 920-TDx-001. Because of their common configuration, these servers can be used interchangeably. The Workbench software executed on these hosts enables user access to the ECS data and services. The Interface Servers also provide storage for user session data and the Java DAR Tool (JDT) map data. User session data is considered critical and thus stored in a Redundant Array of Inexpensive Disks (RAID) for high availability.

Detailed mappings can be found in the site-specific hardware/software mapping in baseline document number 920-TDx-002.

A SUN SPARC Storage Array Model 114, is dual ported between both hosts and provides storage for the user session data as described. A detailed configuration is specified per disk partition, and can be found in baseline document number 922-TDx-009.

Custom code and client applications are loaded on the internal disks of all hosts to prevent dependencies on specific hosts or peripherals. Real time or transaction oriented data (i.e., user session data) is stored in the RAID. The Interface Servers are both "hot" and share the resident RAID device. In the event of a host failure, the operational server assumes total ownership of the RAID and its processes. While in this state, the operational server is recognized to be running in degraded mode until recovery is completed.

Use of COTS in the Client Subsystem

- Netscape Navigator

The Netscape Navigator Web browser accesses the CLS inside a DAAC. The users can use the Web browsers they already have at their facilities.

- Netscape Enterprise Server

The Netscape Enterprise Server is used to serve the Web pages for the Java DAR Tool and the ODFRM.

- XVT Software, Inc.'s XVT

The XVT is used as a widget set and development tool for the EOSView application of the WKBCH CSCI. There is no operational unit of XVT used at run-time.

- Interactive Data Language (IDL)

IDL is used by EOSView to provide the visualization features for users.

- DCE Client

DCE Client provides CLS with communications between other subsystems. DCE can reside on one or both sides of the interface. An instance must be installed on the platform where CLS resides. Although the DCE Client is part of CSS, this COTS product must be installed for CLS to run in the SDPS operational and test environment. The Java DAR Tool does not require the use of DCE.

4.3.1 Workbench Computer Software Configuration Item Description

4.3.1.1 Workbench Functional Overview

The Workbench (WKBCH) CSCI is a set of application programs, which implement the core functionality of the CLS science user interface. The V0 Client performs the data search and retrieval. The EOS Data Gateway is treated as an external entity since the design and design documentation is controlled under another contract. The WKBCH CSCI provides users the capability to submit data acquisition requests for the ASTER instrument data, and to see data products in HDF format.

The Java DAR Tool handles user requests to acquire ASTER data from the satellite. The user specifies when and where the data is to be taken. The DAR is submitted to the ASTER GDS in Japan for review. The acceptance of the DAR by Japan is not immediate (though the acknowledgment of receipt is) and the Java DAR Tool can not determine the DAR status immediately. In addition to the submission and modification of acquisition requests, the Java DAR Tool allows users to search the ASTER DAR database (via MOJO and the DAR Comm. Gateway) in order to examine the status of DARs (i.e., the number and quality of acquired scenes). DARs can be searched on a parameter basis or by their DAR Ids. The Java DAR Tool is a java-based web tool that runs on Sun workstations and PCs.

EOSView is an HDF-EOS viewer that enables users to visualize data they receive from the ECS. EOSView can take any HDF-EOS data file and perform basic visualization functions on it. EOSView is not meant to provide sophisticated data analysis functions like those found in COTS products such as IDL. EOSView is a GUI application used on UNIX platforms using X/Windows and Motif.

4.3.1.2 Workbench Context

Figure 4.3.1.2-1 is the WKBCH CSCI context diagram. The diagram shows the events sent by WKBCH to other SDPS and CSMS subsystems and events sent to WKBCH from the other SDPS and CSMS subsystems.

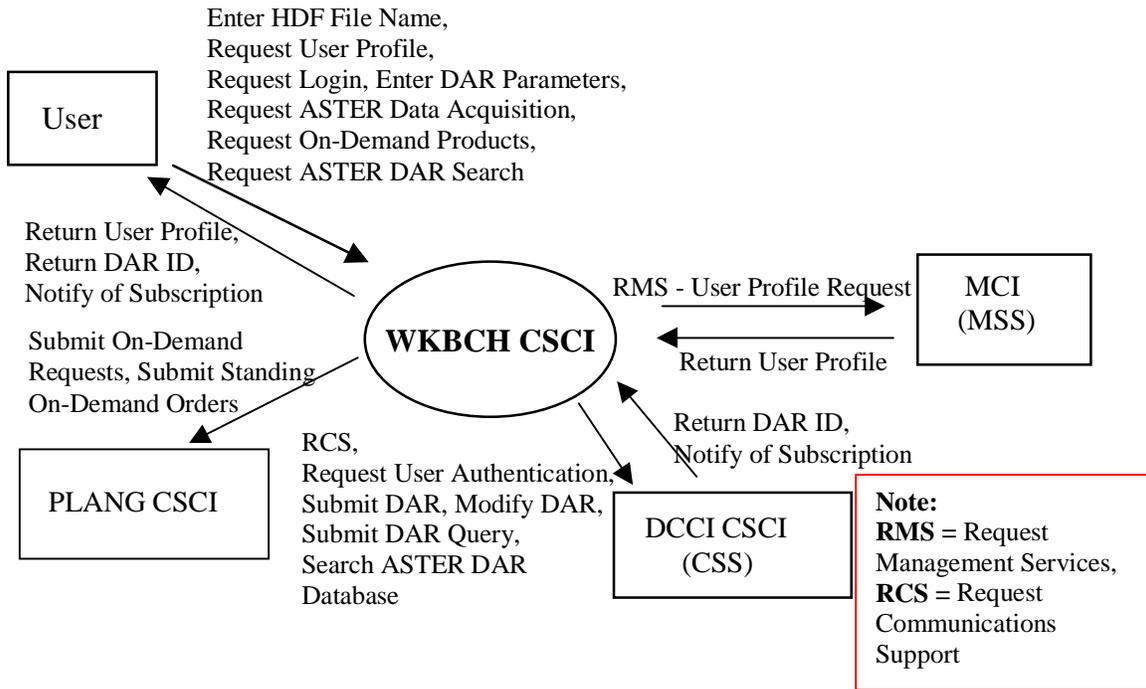


Figure 4.3.1.2-1. WKBCH CSCI Context Diagram

Table 4.3.1.2-1 provides descriptions of the interface events shown in the WKBCH CSCI Context Diagram.

Table 4.3.1.2-1. WKBCH CSCI Interface Events (1 of 3)

Event	Interface Event Description
Enter HDF File Name	This is the name of an HDF file to be opened in EOSView. A file name passed to EOSView enables EOSView to present the file contents to the user . This file can be obtained through any means (i.e., from a search, browse, acquire, or from a friend). The EOSView enables the user to manipulate an HDF file into multiple types of displays. Images, metadata, and actual data values can be viewed. Multiple images can be animated.

Table 4.3.1.2-1. WKBCH CSCI Interface Events (2 of 3)

Event	Interface Event Description
Request User Profile	A User Profile Request is a search for a User Profile from the user . There are two methods used, one is by an encrypted user name and password and the other is by user identification (ID). In response, the WKBCH CSCI receives the user profile, which contains information about a user that must be maintained. This includes mailing, billing, and shipping addresses, phone number, electronic mail address, etc.
Request Login	Enter the user name and password that identifies the user to the ECS. The WKBCH CSCI receives the user name and password and requests a user profile from the MCI to authenticate the user .
Enter DAR Parameters	The user enters parameters (as specified in the Interface Control Document (ICD)) required for submittal or modification of Data Acquisition Requests (DARs) in accordance with the ASTER GDS Interface Requirements Document (IRD). Upon completion of the selection or modification of DAR parameters, the user may submit a DAR. In addition, the user may specify DAR parameters for a search of the DAR database.
Request ASTER Data acquisition	A user submits a request (to the CLS) to have ASTER data taken (a data acquisition request or DAR) using the parameters entered into the Java DAR Tool. DAR parameters are required for submittal of DARs as specified in the ASTER GDS IRD/ICD. As the result of a successfully submitted DAR, the user receives a DAR ID. This is a string of characters used to track a DAR. The user receives notification every time data resulting from this DAR is received by the ECS.
Request On-Demand Products	The user selects the On-demand Product (ASTER L1B, ASTER DEM, ASTER higher Level) and a processing parameter(s) to provide to the PLS.
Request ASTER DAR Search	A user submits a request (to the CLS) to search the ASTER DAR database by DAR parameters or a specific DAR ID to determine if a scene of interest (to the user) has been acquired by the ASTER instrument.
Request Management Services	<p>The MCI provides a basic management library of services to the subsystems, implemented as client or server applications, using the DCCI CSCI Process Framework. The basic management library of services includes:</p> <ul style="list-style-type: none"> • System startup and shutdown - Please refer to the release-related, current version of the Mission Operations Procedures for the ECS Project document (611) and the current ECS Project Training Material document (625), identified in Section 2.2.1 of this document. • User Profile Request - The MSS provides requesting subsystems with User Profile information such as e-mail address and shipping address upon request by authorized users to support their processing activities.
Return User Profile	The user profile is returned from the MCI to the WKBCH CSCI to be returned to the ECS user or used for a DAR submittal.
Return DAR ID	As the result of a successfully submitted DAR, the DCCI CSCI sends a DAR ID to the WKBCH CSCI. The user receives a DAR ID from the WKBCH CSCI. This is a string of characters used to track a DAR.
Notify of Subscription	The DCCI CSCI sends notification to the WKBCH CSCI when the data for a subscription arrives in the ECS. The user receives notification every time data resulting from a successfully submitted DAR is received by the ECS from the DCCI CSCI via the WKBCH CSCI.

Table 4.3.1.2-1. WKBCH CSCI Interface Events (3 of 3)

Event	Interface Event Description
Request Communications Support	<p>The DCCI CSCI provides a library of services available to each SDPS and CSMS CSCI. The CSCI services required to perform specific assignments are requested from the DCCI CSCI. These services include:</p> <ul style="list-style-type: none"> • DCE Support • Network & Distributed File Services • Name/Address Services • Password Services • Server Request Framework (SRF) • Universal Reference (UR) • Error/Event Logging • Fault Handling Services • User Authentication Services • Mode Information • (Query Registry) Retrieving the requested configuration attribute-value pairs from the Configuration Registry
Request User Authentication	<p>A request to authenticate the user given a user name and password is sent to the DCCI CSCI. The DCCI CSCI uses the DCE services to authenticate the user. In response, a user authentication response is sent back as to whether the user name and password are valid.</p>
Submit DAR	<p>The WKBCH CSCI submits a request to the DCCS CSCI to have ASTER data taken (a data acquisition request or DAR) using the parameters entered into the Java DAR Tool. DAR parameters are required for submittal of DARs as specified in the ASTER GDS IRD/ICD. As the result of a successfully submitted DAR, the user receives a DAR ID. This is a string of characters used to track a DAR. The user receives notification every time data resulting from this DAR is received by the ECS.</p>
Modify DAR	<p>The WKBCH CSCI sends the modified DAR parameters to the DCCI CSCI to submit a DAR to the ASTER GDS.</p>
Submit DAR Query	<p>The WKBCH CSCI sends the parameters required for querying DARs to the DCCI CSCI as one of the following three queries: queryxARContents, queryxARScenes, or queryxARSummary. The results of the query are returned to the WKBCH CSCI.</p>
Search ASTER DAR database	<p>A user submits a request to the DCCI CSCI to search the ASTER GDS DAR database for DARs and their respective status (i.e., acquired scenes). Search qualifications may be in the form of DAR parameters or DAR Ids. To get a status of the search, users may view the Search Status via the Java DAR Tool.</p>
Submit On-Demand Requests	<p>The WKBCH CSCI submits the on-demand request to the PLANG CSCI. As a result, the user receives an Order ID. The user receives a notification when the request is processed.</p>
Submit Standing On-Demand Orders	<p>The WKBCH CSCI sends standing on-demand orders to the PLANG CSCI.</p>

4.3.1.3 Workbench Architecture

EOSView and the DAR Tool run on the user's workstation. Since these tools have no interfaces to each other and have distinct operations, their uses are described separately. Figure 4.3.1.3-1 is the EOSView architecture diagram. The diagram shows the events sent to the EOSView tool.

Since EOSView is a stand-alone application, it has no interfaces and gets initialized from the command line of a Unix platform. EOSView allows the user to provide a HDF file name to view HDF formatted files.

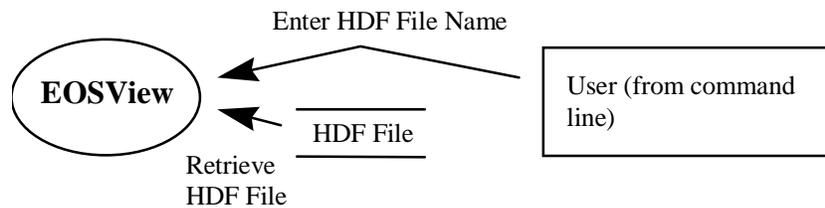


Figure 4.3.1.3-1. EOSView Architecture Diagram

Figure 4.3.1.3-2 is the Java DAR Tool architecture diagram. The diagram shows the events sent to the JDT process and the events the JDT process sends to other CSCIs, CSCs, or processes.

The Java DAR Tool is initiated from the web browser as an applet and can be initiated from the command line as a Java application. The Java DAR Tool uses the CSS MOJO Gateway as the gateway to all ECS services. JDT submits DARs to the CSS MOJO Gateway, which in turn submits them to the DAR Communications Gateway CSC. DAR requests can be a DAR submission or a modification to an existing DAR. After the DAR is successfully submitted, the Java DAR Tool submits a subscription on behalf of the user to get notification when the data associated with the DAR is ingested into the ECS. The Java DAR Tool retrieves the service advertisement from the Advertising Service to determine the parameters to send to the Subscription Server.

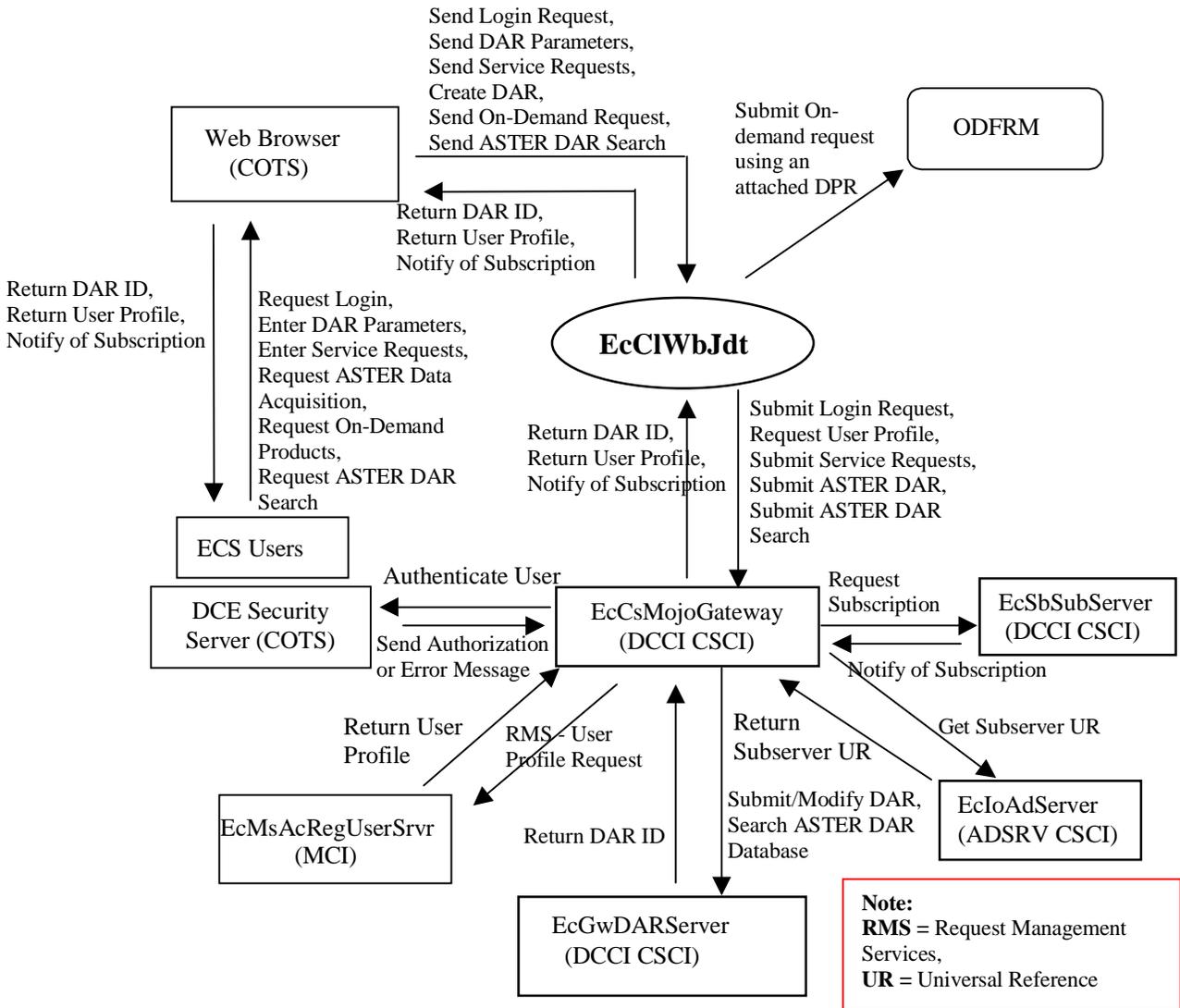


Figure 4.3.1.3-2. Java DAR Tool Architecture Diagram

4.3.1.4 Workbench Process Descriptions

Table 4.3.1.4-1 provides descriptions of the processes shown in the EOSView and DAR Tool Architecture Diagrams.

Table 4.3.1.4-1. WKBCH CSCI Processes

Process	Type	COTS/ Developed	Functionality
EOSView	GUI	Developed	This is the end user tool that provides data visualization functions for the ECS data. It is used by general users of the system and personnel within the DAAC and SCF for Quality Assurance (QA) checks of products.
EcCIWbjdt	GUI	Developed	This is a Java GUI that enables users to submit DARs to the ASTER GDS through the CSS DAR Communications Gateway (via CSS MOJO Gateway). When the DAR is submitted, a DAR Identifier is returned to the user. A subscription is submitted on behalf of the user, asking for notification whenever a data granule with the specified DAR ID is inserted into the SDPS archives. The Java DAR Tool also has the capability to modify DARs in accordance with the ASTER ICD. In addition, the Java DAR Tool allows the user to search for and retrieve DARs and their status (i.e., the scenes acquired).
EcCIDtUserProfile Gateway	Server	Developed	The User Profile Gateway is a retrieval engine for users via the EOS Data Gateway. This enables users to be independent of DCE. The server listens for calls on a socket from the EOS Data Gateway. Server Supports: <ul style="list-style-type: none"> Multiple concurrent requests.

4.3.1.5 Workbench Process Interface Descriptions

Table 4.3.1.5-1 provides descriptions of the process interface events shown in the EOSView, Java DAR Tool, and the URT Architecture Diagrams.

Table 4.3.1.5-1. WKBCH CSCI (EOSView) Process Interface Events (1 of 9)

Event	Event Frequency	Interface	Initiated By	Event Description
Enter HDF File Name	One per user identified file	Read from command line	User <i>Process:</i> EOSView (COTS)	The user types a file name on the EOSView user interface to tell the GUI which file to open.
Retrieve HDF File	One file per request	File name provided by the user as read from the script file that captured it while active.	<i>Process:</i> EOSView (COTS)	The EOSView process retrieves the HDF File from a data store based on the file name provided by the user.

Table 4.3.1.5-1. WKBCH CSCI (Java DAR Tool) Process Interface Events (2 of 9)

Event	Event Frequency	Interface	Initiated By	Event Description
Submit On-demand request using an attached DPR	One per request	<i>Process:</i> ODFRM	<i>Process:</i> EcCIWbJdt <i>Libraries:</i> EcCIWbJestCl.jar, jh.jar, EcCIWbJestSv.jar, jaf.jar, javamail.jar <i>Classes:</i> (many: See Appendix C)	The EcCIWbJdt submits a request to the ODFRM for an on-demand request using an attached DPR.
Submit Login Request	One per User	<i>Process:</i> EcCsMojoGateway <i>Class:</i> EcCsDCELoginProxy	<i>Process:</i> EcCIWbJdt <i>Class:</i> Login	The EcCIWbJdt sends the user name and password to the EcCsMojoGateway for user authentication and use of ECS data and services.
Request User Profile	One per request	<i>Process:</i> EcCsMojoGateway <i>Class:</i> EcMjRetrieveProfileProxy	<i>Process:</i> EcCIWbJdt <i>Class:</i> JDTApplet	The EcCIWbJdt sends user profile requests to the EcCsMojoGateway to get user profile information for DAR submit authorization based upon the user id information provided by the user.
Submit Service Requests	Per user request	Process: EcCsMojoGateway <i>Library:</i> EcCsMojoGateway <i>Classes:</i> EcMjDarSubmitDarProxy, EcMjDarModifyDarProxy, EcCsRetrieveProfileProxy, EcMjDarQueryxARScenesProxy, EcMjECSAdsrvProxy, EcMjECSSbsrvProxy	<i>Process:</i> EcCIWbJdt <i>Class:</i> JDTApplet	The EcCIWbJdt accepts the requests of the user and submits the requests to the EcCsMojoGateway , which in turn sends the requests to the EcSbSubServer, the EcGwDARServer, the EcMsAcRegUserSrvr, or the EcloAdServer.

Table 4.3.1.5-1. WKBCH CSCI (Java DAR Tool) Process Interface Events (3 of 9)

Event	Event Frequency	Interface	Initiated By	Event Description
Submit ASTER DAR	One per request	<i>Process:</i> EcCsMojoGateway <i>Classes:</i> EcMjDarSubmitDarProxy, EcMjDarModifyDarProxy	<i>Process:</i> EcCIWbJdt <i>Class:</i> JDTApplet	A user submits a request to the EcCsMojoGateway to have ASTER data taken (a data acquisition request or DAR) using the parameters entered into the Java DAR Tool. DAR parameters are required for submittal of DARs as specified in the ASTER GDS IRD/ICD.
Submit ASTER DAR Search	One per set of DAR parameters or DAR ID	<i>Process:</i> EcCsMojoGateway <i>Class:</i> EcMjDarQueryxARScenesProxy	<i>Process:</i> EcCIWbJdt <i>Class:</i> JDTApplet	The EcCIWbJdt process sends, to the EcCsMojoGateway , the request to search the ASTER DAR database by DAR parameters or a specific DAR ID for a scene of interest (to the user) from the ASTER instrument.
Return DAR ID	One per set of DAR parameters	<i>Process:</i> EcCsMojoGateway <i>Library:</i> EcCsMojoGateway <i>Class:</i> EcMjDarQueryxARScenesProxy <i>Process:</i> EcCIWbJdt <i>Class:</i> JDTApplet <i>Process:</i> Web Browser (COTS) User	<i>Process:</i> EcGwDARServer <i>Library:</i> EcGwDAR <i>Class:</i> EcGwDARQueryxARScenesRequest_C	As the result of a successfully submitted DAR, the user receives a DAR ID from the EcCsMojoGateway . This is a string of characters used to track a DAR. The user receives notification every time data resulting from this DAR is received by the ECS.
Return User Profile	One per request	<i>Process:</i> EcCsMojoGateway <i>Class:</i> EcCsRetrieveProfileProxy	<i>Process:</i> EcMsAcRegUserSrvr <i>Library:</i> MsAcClnt <i>Class:</i> MsAcUserProfile RWPortal	The EcMsAcRegUserSrvr returns the user profile to the EcCsMojoGateway.

Table 4.3.1.5-1. WKBCH CSCI (Java DAR Tool) Process Interface Events (4 of 9)

Event	Event Frequency	Interface	Initiated By	Event Description
Notify of Subscription	One per subscription submitted	<i>Process:</i> EcCsMojoGateway <i>Class:</i> EcMjECSSbsrvProxy	<i>Process:</i> EcSbSubServer <i>Library:</i> EcSbSr <i>Classes:</i> EcSbSubscription, EcSbNotification	The EcSbSubServer sends E-mail to the ECS User, Operations Staff (via EcSbGui), or inter-process notification (via the message-passing framework) to the EcCsMojoGateway .
Request Subscription	One per notification request	<i>Process:</i> EcSbSubServer <i>Library:</i> EcSbCl <i>Class:</i> EcClSubscription	<i>Process:</i> EcCsMojoGateway <i>Class:</i> EcMjECSSbsrvProxy	The EcCsMojoGateway passes a subscription request to the EcSbSubServer . This is a request for notification upon a specific event occurring in the system. An example would be subscribing to the insert of a particular granule type. A valid subscription request results in the return of a subscription identifier. The subscription Identifier is not returned to the user.
Get Subserver UR	One per advertising search	<i>Process:</i> EcIoAdServer <i>Library:</i> IoAdSearch <i>Class:</i> EcIoAdSearch	<i>Process:</i> EcCsMojoGateway <i>Library:</i> EcCsMojoGateway <i>Class:</i> EcMjECSSbsrvProxy	The EcCsMojoGateway sends a search request to the EcIoAdServer to find the signature service advertisement for the subscription event related to the ASTER data. This provides the EcCIWbJdt with the parameters needed to be filled in before sending the subscription request to the EcSbSubServer.
Return Subserver UR	One per request	<i>Process:</i> EcCsMojoGateway <i>Library:</i> EcCsMojoGateway <i>Class:</i> EcMjECSSbsrvProxy	<i>Process:</i> EcIoAdServer <i>Library:</i> IoAdSearch <i>Class:</i> EcIoAdSearch	The EcIoAdServer returns the UR of the server(s) where the collection level data resides to the EcCsMojoGateway.

Table 4.3.1.5-1. WK BCH CSCI (Java DAR Tool) Process Interface Events (5 of 9)

Event	Event Frequency	Interface	Initiated By	Event Description
Submit/Modify DAR	One per request to DAR	<i>Process:</i> EcGwDARServer <i>Library:</i> EcGwDAR <i>Classes:</i> EcGwDARSubmitDarRequest_C, EcGwDARModifyDarRequest_C	<i>Process:</i> EcCsMojoGateway <i>Library:</i> EcCsMojoGateway <i>Classes:</i> EcMjDarSubmitDarProxy, EcMjDarModifyDarProxy	The EcCsMojoGateway submits the DAR Submit request (and all other DAR related requests) after selecting or modifying DAR parameters to the EcGwDARServer . The EcGwDARServer interfaces directly with the ASTER GDS, and, in the event of a DAR Submit Request, returns a DAR ID to the EcCsMojoGateway. The EcCsMojoGateway, in turn, returns the DAR ID to the EcCIWbJdt. The EcCsMojoGateway handles all ECS service requests from the EcCIWbJdt via proxies.
Search ASTER DAR Database	One per set of DAR parameters or DAR ID	<i>Process:</i> EcGwDARServer <i>Library:</i> EcGwDAR <i>Class:</i> EcGwDARQueryxARScenesRequest_C	<i>Process:</i> EcCsMojoGateway <i>Library:</i> EcCsMojoGateway <i>Class:</i> EcMjDarQueryxARScenesProxy	The EcCsMojoGateway submits a request to the EcGwDARServer to search the ASTER GDS DAR database for DARs and their respective status (i.e., acquired scenes). Search qualifications may be in the form of DAR parameters or DAR IDs. To get a status of the search, users may view the Search Status via the Java DAR Tool.

Table 4.3.1.5-1. WKBCH CSCI (Java DAR Tool) Process Interface Events (6 of 9)

Event	Event Frequency	Interface	Initiated By	Event Description
Request Management Services (RMS)	One per service request	N/A	N/A	The EcMsAcRegUserSrvr provides a basic management library of services to the processes, implemented as client or server applications, using the DCCI CSCI Process Framework. The basic management library of services includes:
RMS (cont.)	One per notice received	<i>Process:</i> EcMsAcRegUserSrvr <i>Library:</i> MsAcCInt <i>Class:</i> MsAcUserProfile RWPortal	<i>Process:</i> EcCsMojoGateway <i>Class:</i> EcCsRetrieveProfileProxy	<ul style="list-style-type: none"> • User Profile Request – The EcMsAcRegUserSrvr provides requesting processes with User Profile parameters such as e-mail and shipping addresses to support their processing activities.
Authenticate User	Once per session	<i>Process:</i> DCE Security Server (COTS) <i>Library:</i> EcSelogincontext.a <i>Class:</i> EcSelogincontext	<i>Process:</i> EcCsMojoGateway <i>Class:</i> EcCsDCELoginProxy	The EcCsMojoGateway sends the user name and password to the DCE Security Server to authenticate the user. In response, the EcCsMojoGateway receives an authentication status.
Send Authorization or Error Message	One per authentication request	<i>Process:</i> EcCsMojoGateway <i>Class:</i> EcCsDCELoginProxy	<i>Process:</i> DCE Security Server (COTS) <i>Library:</i> EcSelogincontext.a <i>Class:</i> EcSelogincontext	The DCE Security Server returns an authorization for the user to gain access to the ECS or an error message for an unauthorized user to the EcCsMojoGateway.

Table 4.3.1.5-1. WKBCH CSCI (Java DAR Tool) Process Interface Events (7 of 9)

Event	Event Frequency	Interface	Initiated By	Event Description
Request Login	Once per session	<i>Process:</i> Web Browser (COTS)	User	A user name and password for authenticating the user. The EcCIWbJdt receives the user name and password from the user via a web browser and requests a user profile from the EcCsMojoGateway to authenticate the user. The user name and password are turned into Authenticate User request to the DCE Security Server (COTS).
Enter DAR Parameters	One set per acquisition	<i>Process:</i> Web Browser (COTS)	User	A user enters parameters (as specified in the Interface Control Document (ICD)) required for submittal or modification of Data Acquisition Requests (DARs) in accordance with the ASTER GDS Interface Requirements Document (IRD). Upon completion of the selection or modification of DAR parameters, the user may submit a DAR. In addition, the user may specify DAR parameters for a search of the DAR database.

Table 4.3.1.5-1. WK BCH CSCI (Java DAR Tool) Process Interface Events (8 of 9)

Event	Event Frequency	Interface	Initiated By	Event Description
Enter Service Requests	Per user request	<p>Process: Web Browser (COTS)</p> <p>Process: EcCIWbJdt</p> <p>Class: JDTApplet</p>	User	<p>A user enters service requests via the web browser. The EcCIWbJdt accepts the requests of the user and submits the requests to the EcCsMojoGateway, which in turn sends the requests to the EcSbSubServer, the EcGwDARServer, the EcMsAcRegUserSrvr, or the EcIoAdServer.</p>
Request On-Demand Products	Per user request	<p>Process: Web Browser (COTS)</p>	User	<p>A user selects the On-demand Product (ASTER L1B, ASTER DEM, and ASTER higher level) and a processing parameter(s).</p>
Request ASTER Data Acquisition	Per user request	<p>Process: Web Browser (COTS)</p>	User	<p>A user submits a request via a Web Browser to have ASTER data taken (a data acquisition request or DAR) using the parameters entered into the Java DAR Tool. DAR parameters are required for submittal of DARs as specified in the ASTER GDS IRD/ICD.</p>

Table 4.3.1.5-1. WKBCH CSCI (Java DAR Tool) Process Interface Events (9 of 9)

Event	Event Frequency	Interface	Initiated By	Event Description
Request ASTER DAR Search	Per user request	<i>Process:</i> Web Browser (COTS)	User	A user submits a request via a Web Browser to search the ASTER DAR database by DAR parameters or a specific DAR ID to determine if the ASTER instrument has acquired a scene of interest (to the user).
Send Login Request	One per User	<i>Process:</i> EcCIWbJdt <i>Class:</i> LoginDialog	<i>Process:</i> Web Browser (COTS)	The Web Browser sends the user id information (name and password) to the EcCIWbJdt process to obtain user authorization to submit data and service requests.
Send DAR Parameters	One set per data acquisition	<i>Process:</i> EcCIWbJdt <i>Class:</i> JDTApplet	<i>Process:</i> Web Browser (COTS)	The Web Browser sends the ASTER DAR parameters to the EcCIWbJdt to get the request processed.
Send Service Requests	Per user request	<i>Process:</i> EcCIWbJdt <i>Class:</i> JDTApplet	<i>Process:</i> Web Browser (COTS)	The Web Browser sends the user service requests to the EcCIWbJdt.
Create DAR	One acquisition at a time	<i>Process:</i> EcCIWbJdt <i>Class:</i> JDTApplet	<i>Process:</i> Web Browser (COTS)	The Web Browser sends the data acquisition request to the EcCIWbJdt.
Send On-Demand Request	One request at a time	<i>Process:</i> EcCIWbJdt <i>Class:</i> JDTApplet	<i>Process:</i> Web Browser (COTS)	The Web Browser sends the ASTER On-Demand requests to the EcCIWbJdt to get the request processed.
Send ASTER DAR Search	Per user request	<i>Process:</i> EcCIWbJdt <i>Class:</i> JDTApplet	<i>Process:</i> Web Browser (COTS)	A user submits a request via a Web Browser to search the ASTER DAR database by DAR parameters or a specific DAR ID to determine if the ASTER instrument has acquired a scene of interest (to the user).

4.3.1.6 Workbench Data Stores

Table 4.3.1.6-1 provides descriptions of the WKBCH CSCI data storage areas shown on the EOSView and Java DAR Tool Architecture Diagrams. To simplify the table, the list of data stores is limited to the areas shown.

Table 4.3.1.6-1. WKBCH CSCI Data Stores

Data Store	Type	Functionality
HDF File	File	A listing of the HDF files accessible by EOSView.
Session Data	File	The Java DAR Tool maintains user session data, which includes submitted and in process DARs, search criteria and search results.

4.3.2 ODFRM Software Description

4.3.2.1 ODFRM Functional Overview

The ODFRM is a combination of HTML web pages and CGI programs called from the HTML web pages to communicate with the PLS. The web pages provide an interface to allow users to:

- Create Aster On-demand Product Requests: ASTER L1B, ASTER DEM and ASTER higher level Products (AST_04, AST_05, AST_06V, AST_06T, AST_06S, AST_07S, AST_07V, AST_09T, AST_09V, AST_09S, AST08) using the web interface.

4.3.2.2 ODFRM Context

Figure 4.3.2.2-1 is the ODFRM CSCI context diagram. The diagram shows the events sent to the ODFRM CSCI and the events the ODFRM CSCI sends to other CSCIs. Table 4.3.2.2-1 provides descriptions of the interface events shown in the ODFRM CSCI context diagram.

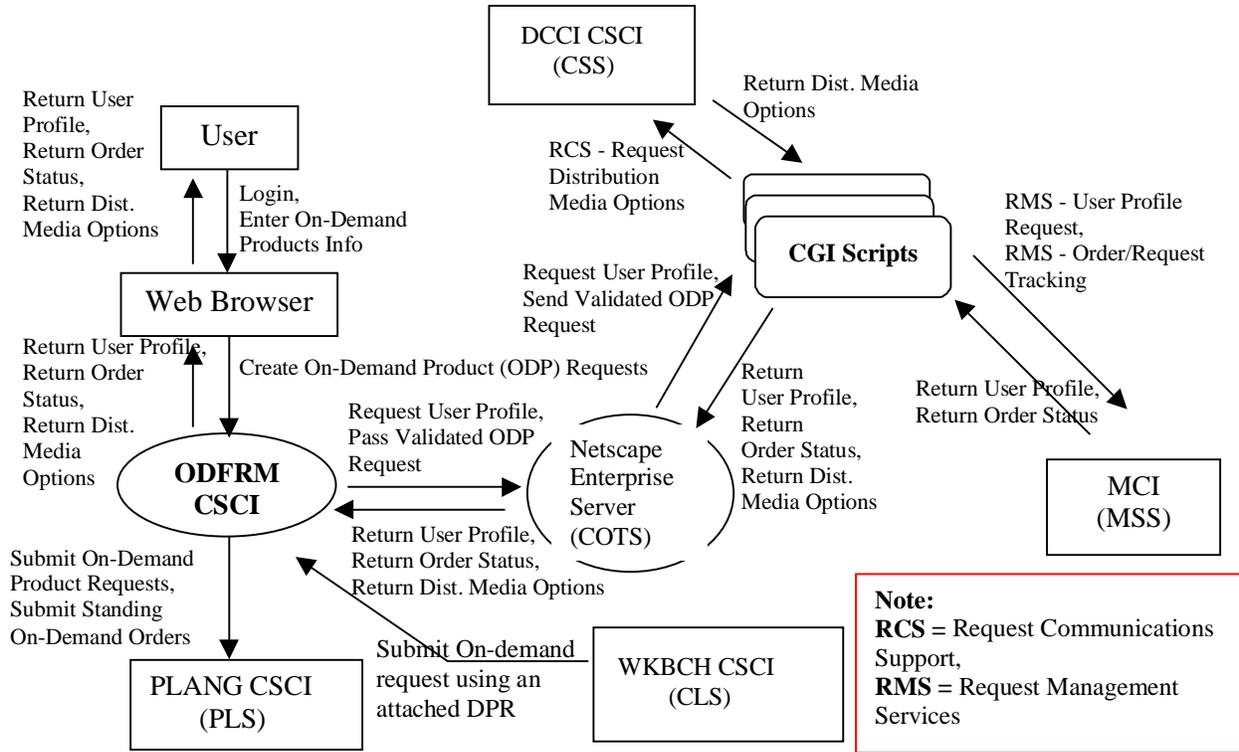


Figure 4.3.2.2-1. ODFRM CSCI Context Diagram

Table 4.3.2.2-1. ODFRM CSCI Interface Events (1 of 2)

Event	Interface Event Description
Login	The user logs into the ECS via a Web Browser.
Enter On-Demand Product Info	The user fills in the user information on the Login screen and presses the submit button.
Create On-demand Product (ODP) Requests	The Web Browser creates an On-Demand Processing Request from information supplied by the user and sends the request to the ODFRM CSCI.
Request User Profile	The ODFRM CSCI gets User Profile Information by submitting a request to the MSS Sybase SQL Server via the Netscape Enterprise Server using a CGI script.
Pass Validated ODP Request	The Netscape Enterprise Server spawns the process EcClOdRequest with the User Login information.
Send Validated ODP Request	The Netscape Enterprise Server sends a request to CGI script to access the MSS database. The EcClOdRequest process accesses the MSS database via CGI scripts and sends the user back the Authentication.

Table 4.3.2.2-1. ODFRM CSCI Interface Events (2 of 2)

Event	Interface Event Description
Request Communications Support	<p>The DCCI CSCI provides a library of services available to each SDPS and CSMS CSCI. The CSCI services required to perform specific assignments are requested from the DCCI CSCI. These services include:</p> <ul style="list-style-type: none"> • DCE Support • Name/Address Services • Server Request Framework (SRF) • Universal Reference (UR) • Error/Event logging • Mode Information • Retrieving the requested configuration attribute-value pairs from the Configuration Registry • Distribution Media Options from the Configuration Registry
Return Dist. Media Options	<p>The options available for distributing the data to be ordered are provided to the CGI script by the DCCI CSCI for return to the user via the Netscape Server, the ODFRM CSCI, and the user's web browser to the user.</p>
Request Management Services	<p>The MCI provides a basic management library of services to the subsystems, implemented as client or server applications, using the DCCI CSCI Process Framework. The basic management library of services includes:</p> <ul style="list-style-type: none"> • User Profile Request - The MSS provides requesting subsystems with User Profile parameters such as e-mail address and shipping address upon request by authorized users to support their processing activities. • Order/Request Tracking - The CLS uses CGI scripts to interface with the MSS Order/Request Tracking service to create a user product order and submit the order to the PLANG CSCI.
Return User Profile	<p>The MCI returns the user profile to the ODFRM CSCI via the CGI script and the Netscape Enterprise Server.</p>
Return Order Status	<p>The ODFRM CSCI receives an order id and status for the requested ECS product from the MCI and returns the order id and status to the user (to track the order) via the CGI script and the Netscape Enterprise Server.</p>
Submit On-demand request using an attached DPR	<p>The ODFRM CSCI receives an on-demand request using an attached DPR from the WKBCH CSCI.</p>
Submit On-Demand Product Requests	<p>The ODFRM CSCI sends the request to the PLANG CSCI to be scheduled for processing.</p>
Submit Standing On-Demand Orders	<p>The ODFRM CSCI sends standing on-demand orders to the PLANG CSCI.</p>

4.3.2.3 ODFRM Architecture

Figure 4.3.2.3-1 is the ODFRM CSCI architecture diagram. The diagram shows the events sent to the ODFRM CSCI processes and the events the ODFRM CSCI processes send to other processes.

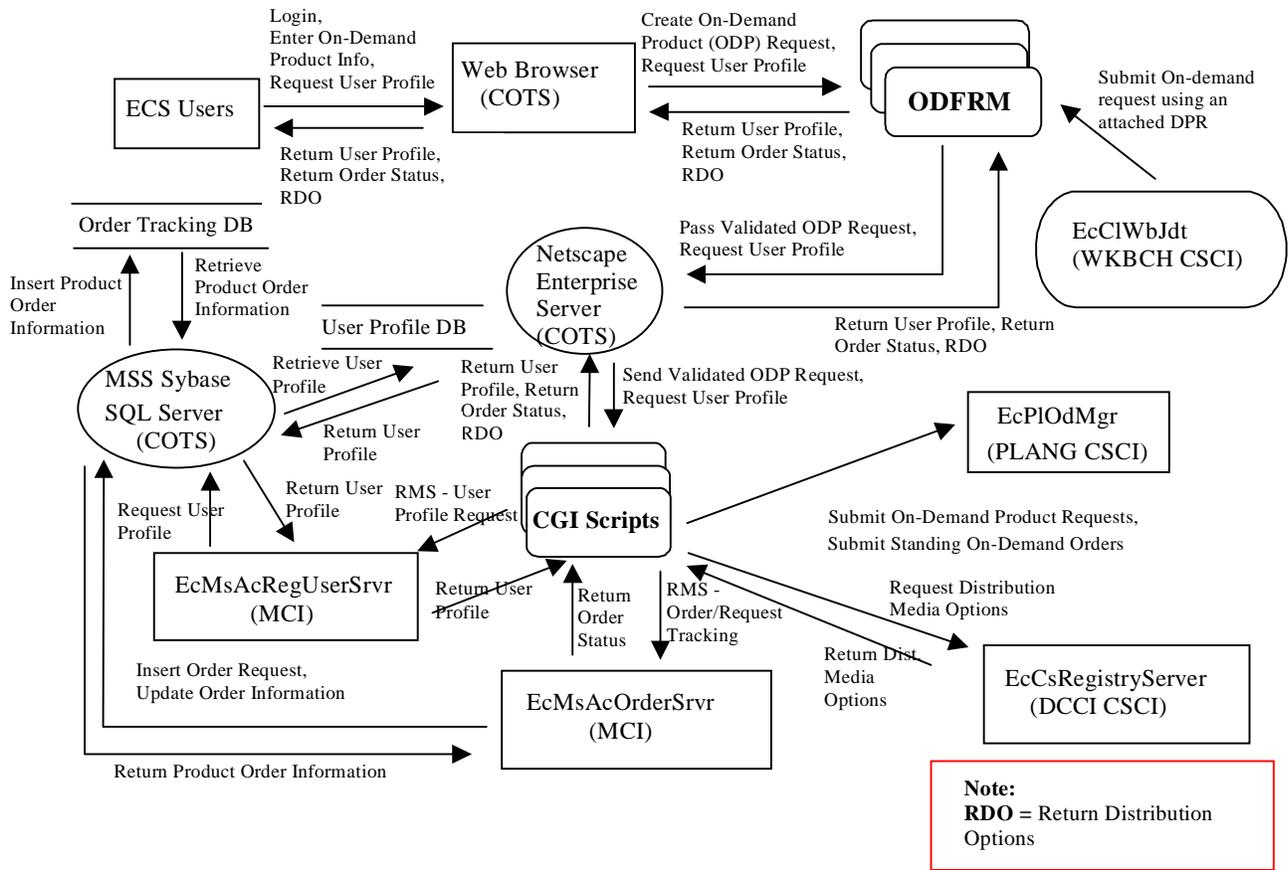


Figure 4.3.2.3-1. ODFRM Architecture Diagram

4.3.2.4 ODFRM Process Description

Table 4.3.2.4-1 provides descriptions of the processes shown in the ODFRM architecture diagram.

Table 4.3.2.4-1. ODFRM Processes

Process	Type	COTS/ Developed	Functionality
ODFRM	HTML	Developed	The ODFRM user interface uses generic HTML that is accessible via common web browsers (no JAVA involved). This is the CSC that uses the HTML Framework to build the actual HTML files that are viewed by the users using a Web browser. Using this ODFRM, 1) A user can login to the system to create Aster On-demand Product requests 2) Once the user logs into the system, he can create an On-demand product request and submit it for processing.
Netscape Enterprise Server	Server	COTS	The Netscape Enterprise Server runs at the DAACs and receives and interprets the Hypertext Transport Protocol (HTTP) from the ODFRM web pages. Refer to the Netscape Server administration documentation for further information.
CGI	CGI	Developed	The ODFRM HTML interface communicates with the MSS Database to create On-demand product requests, accessing User Profile Information through the use of CGI programs. After pressing the Submit button on the ODFRM, the CGI program EcCIodRequest is spawned from the Netscape Enterprise Server. EcCIodRequest CGI Program: This program receives an On-demand product request from the ODFRM (web client) and creates an order with the MSS and sends the request to the PLS for processing.
Sybase Server	Server	COTS	The Sybase Server acts as a SQL server for the MSS CSC (MCI). Refer to the Sybase documentation for details.

4.3.2.5 ODFRM Interface Descriptions

Table 4.3.2.5-1 provides descriptions of the interface events shown in the ODFRM architecture diagram.

Table 4.3.2.5-1. ODFRM Process Interface Events (1 of 5)

Event	Event Frequency	Interface	Initiated By	Event Description
Login	One per session	Process: Web Interface (COTS)	User	The user logs into the ECS via a Web Browser.
Enter On-Demand Product Info	One per user request	Process: Web Interface (COTS)	User	The user fills in the User Information on the Login screen and presses the submit button.

Table 4.3.2.5-1. ODFRM Process Interface Events (2 of 5)

Event	Event Frequency	Interface	Initiated By	Event Description
Request User Profile	One profile per request	<i>Process:</i> Web Interface (COTS) <i>Process:</i> EcMsAcRegUserSrvr <i>Libraries:</i> MsAcCInt, MsAcComm	User CGI Interface, Process: EcCIodRequest <i>Library:</i> CIodCommon <i>Class:</i> CIodProductRequest	The user sends a request to obtain a user profile via the Web Browser, Netscape Server and CGI script to the EcMsAcRegUserSrvr. The EcCIodRequest automatically sends a request to the EcMsAcRegUserSrvr to get the user's profile.
Return User Profile	One per user request	User	MSS Sybase SQL Server (COTS)	The MSS Sybase Server returns the user profile to the EcMsAcRegUserSrvr. The EcMsAcRegUserSrvr returns the user profile to the CGI script. The CGI script returns the user profile to the Netscape Server. The Netscape server returns the user profile to the ODFRM. The ODFRM returns the user profile to the web browser . The web browser shows the user profile to the user.
Return Order Status	One per user request	User	MSS Sybase SQL Server (COTS)	The MSS Sybase Server returns the order id and status to the EcMsAcOrderSrvr. The EcMsAcOrderSrvr returns the order id and status to the CGI script. The CGI script returns the order id and status to the Netscape Server. The Netscape server returns the order id and status to the ODFRM. The ODFRM returns the order id and status to the web browser . The web browser shows the order id and status to the user.
Return Dist. Media Options	One per user request	User	<i>Process:</i> EcCsRegistryServer <i>Library:</i> EcCsRegistryClient <i>Class:</i> EcRgRegistryServer_C	The options available for distributing the data to be ordered are provided to the CGI script by the EcCsRegistryServer for return to the user via the Netscape Server, the ODFRM CSCI, and the user's web browser .

Table 4.3.2.5-1. ODFRM Process Interface Events (3 of 5)

Event	Event Frequency	Interface	Initiated By	Event Description
Create On-Demand Product (ODP) Request	One per user request	ODFRM <i>Process:</i> EcCIodRequest <i>Library:</i> CIodCommon <i>Class:</i> CIodProductRequest	Process: Web Browser (COTS)	The ODFRM receives the On-Demand product information from the user's web browser and validates the information.
Submit On-demand request using an attached DPR	One per user request	ODFRM <i>Process:</i> EcCIodRequest <i>Library:</i> CIodCommon <i>Class:</i> CIodProductRequest	<i>Process:</i> EcCIWbJdt (Java) <i>Libraries:</i> EcCIWbJestCl.jar, jh.jar, EcCIWbJestSv.jar, jaf.jar, javamail.jar <i>Classes:</i> (many: See Appendix C)	The EcCIWbJdt submits a request to the ODFRM for an on-demand request using an attached DPR.
Pass Validated ODP Request	One per user request	<i>Process:</i> Netscape Server (COTS)	ODFRM <i>Process:</i> EcCIodRequest <i>Library:</i> CIodCommon <i>Class:</i> CIodProductRequest	The Netscape Enterprise Server spawns the process EcCIodRequest with the User Login information passed from the ODFRM process.
Send Validated ODP Request	One per user request	CGI Interface, <i>Process:</i> EcCIodRequest <i>Library:</i> CIodCommon <i>Class:</i> CIodProductRequest	Netscape Server (COTS)	The EcCIodRequest process accesses the MSS database using CGI scripts and sends the user back the Authentication.
Submit On-demand product requests	One per user	<i>Process:</i> EcPIodMgr <i>Library:</i> PICore2Class: PIodMsgProxy	CGI Interface, <i>Process:</i> EcCIodRequest <i>Library:</i> CIodCommon <i>Class:</i> CIodProductRequest	The EcCIodRequest process causes an order to be created in the MSS database and sends the request to the EcPIodMgr to be scheduled for processing and sends the user back the OrderId.

Table 4.3.2.5-1. ODFRM Process Interface Events (4 of 5)

Event	Event Frequency	Interface	Initiated By	Event Description
Submit Standing On-Demand Orders	One per user	<i>Process:</i> EcPIOdMgr <i>Library:</i> PICore2 <i>Class:</i> PIOdMsgProxy	CGI Interface, <i>Process:</i> EcCIODRequest <i>Library:</i> CIODCommon <i>Class:</i> CIODProductRequest	The ODFRM sends validated ODP requests to the Netscape Server and a CGI script sends standing on-demand orders to the EcPIOdMgr .
Request Management Services (RMS)	One per service request	N/A	N/A	The EcMsAcRegUserSrvr and EcMsAcOrderSrvr provide a basic management library of services to the processes, implemented as client or server applications, using the DCCI CSCI Process Framework. The basic management library of services includes:
RMS (cont.)	One per notice received	<i>Process:</i> EcMsAcRegUserSrvr <i>Library:</i> MsAcClnt <i>Class:</i> MsAcUserProfile RWPportal	CGI Interface, CGI scripts	<ul style="list-style-type: none"> • User Profile Request – The EcMsAcRegUserSrvr provides requesting processes with User Profile parameters such as e-mail and shipping addresses to support their processing activities.
RMS (cont.)	One per order request	<i>Process:</i> EcMsAcOrderSrvr <i>Library:</i> MsAcClnt <i>Class:</i> EcAcOrderCMgr	CGI Interface, CGI scripts	<ul style="list-style-type: none"> • Order/Request Tracking - The CLS uses a Server and CGI scripts to interface with the MSS Order/Request Tracking service (using the EcMsAcOrderSrvr) to create a user product order and submit the order to the PLS.
Insert Order Request	One per insert order request	Sybase Server (COTS)	<i>Process:</i> EcMsAcOrderSrvr <i>Libraries:</i> MsAcClnt, MsAcComm	The EcMsAcOrderSrvr submits a request to the MSS Sybase Server to insert a product order request into the Order tracking database (DB).

Table 4.3.2.5-1. ODFRM Process Interface Events (5 of 5)

Event	Event Frequency	Interface	Initiated By	Event Description
Update Order Information	One per update of order information	Sybase Server (COTS)	Process: EcMsAcOrderSrvr <i>Libraries:</i> MsAcClnt, MsAcComm	The EcMsAcOrderSrvr submits a request to the MSS Sybase Server to update order information in the Order tracking database (DB).
Return Product Order Information	One per user request	Process: EcMsAcOrderSrvr <i>Libraries:</i> MsAcClnt, MsAcComm	Sybase Server (COTS)	The Sybase Server returns the requested order information to the EcMsAcOrderSrvr.
Insert Product Order Information	One per order request	<i>Data Store:</i> Order Tracking DB	<i>Process:</i> Sybase Server (COTS)	The MSS Sybase Server inserts product order information in the Order Tracking DB.
Retrieve Product Order Information	One per order request	<i>Data Store:</i> Order Tracking DB	<i>Process:</i> Sybase Server (COTS)	The MSS Sybase Server retrieves product order information from the Order Tracking DB.
Retrieve User Profile	One per user request	<i>Process:</i> Sybase Server (COTS)	<i>Process:</i> EcMsAcRegUserSrvr <i>Libraries:</i> MsAcClnt, MsAcComm	The EcMsAcRegUserSrvr forwards the request to the MSS Sybase server, which retrieves the requested profile information.
Return User Profile	One per user request	<i>Process:</i> EcMsAcRegUserSrvr <i>Libraries:</i> MsAcClnt, MsAcComm	<i>Process:</i> Sybase Server (COTS)	The MSS Sybase Server returns the user profile information to the EcMsAcRegUserSrvr. The EcMsAcRegUserSrvr returns the user profile information to the CGI scripts .

4.3.2.6 ODFRM Data Stores

Table 4.3.2.6-1 provides descriptions of the data stores shown in the ODFRM architecture diagram.

Table 4.3.2.6-1. ODFRM Data Stores

Data Store	Type	Functionality
User Profile DB	Database	The User Profile DB contains requests for user registration and also profile information including mailing addresses, e-mail address, and project affiliations of approved registered users.
Order Tracking DB	Database	The Order Tracking DB contains product orders and user requests with the associated current processing status.

4.3.3 Desktop Software Description

4.3.3.1 Desktop Functional Overview

The DESKT CSCI provides the User Profile Gateway server to communicate with the MSS User Registration Server for obtaining user profile information to authenticate users or update user information.

4.3.3.2 Desktop Context

Figure 4.3.3.2-1 is the DESKT CSCI context diagram. The diagram shows the events sent to the DESKT CSCI and events the DESKT CSCI sends to other CSCIs. Table 4.3.3.2-1 provides descriptions of the interface events shown in the DESKT CSCI context diagram.

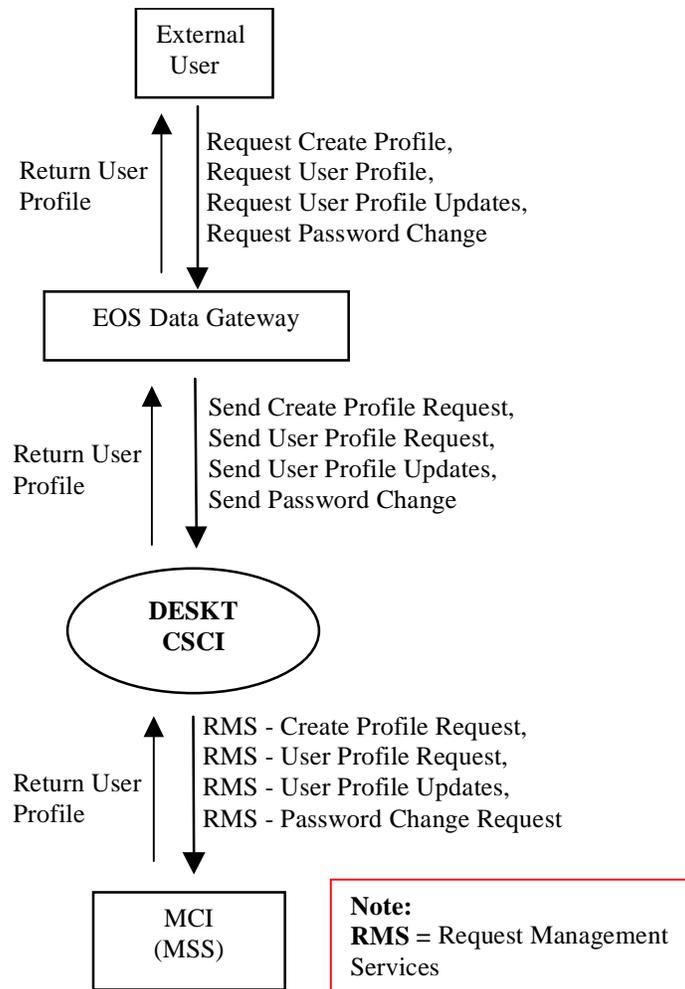


Figure 4.3.3.2-1. DESKT CSCI Context Diagram

Table 4.3.3.2-1. DESKT CSCI Interface Events

Event	Interface Event Description
Request Create Profile	A user submits a request to be a registered user of the ECS to the EOS Data Gateway (to forward to the MCI) to create a user profile. The user profile includes, but is not limited to, mailing, billing and shipping contact information.
Request User Profile	The user sends a request to the EOS Data Gateway (to the MCI) for retrieval of a User Profile. The user profile is the important information about a user that must be maintained. This includes, but is not limited to, mailing, billing, and shipping addresses, phone number, and electronic mail address.
Request User Profile Updates	Users can update their User Profile information through the EOS Data Gateway (EDG). This includes their addresses (user, shipping, billing, and e-mail) and other information. This file gets forwarded to the DESKT CSCI and the DESKT CSCI forwards the file to the MCI.
Request Password Change	The user can request a change or reset of his/her EDG/ECS User Profile passwords through the EOS DATA Gateway. The user enters his userid, current and new passwords. The userid and passwords are converted to authenticators. This information is used to change the EDG password and the authenticators (old and new) are forwarded through the CLS to the MSS. The MSS changes the ECS authenticator. The authenticator is an encrypted version of the userid and password. It is encrypted so it can be passed over a socket without threat of being stolen.
Send Create Profile Request	The EOS Data Gateway sends a request to the DESKT CSCI to register the user in the ECS.
Send User Profile Request	The EOS Data Gateway sends the user profile request to the DESKT CSCI for processing.
Send User Profile Updates	The EOS Data Gateway sends the user profile updates to the DESKT CSCI for processing.
Send Password Change	The EOS Data Gateway sends a request to the DESKT CSCI to change or reset the user's password in the ECS for user access.
Request Management Services	<p>The MCI provides a basic management library of services to the CSCIs, implemented as client or server applications, using the DCCI CSCI Process Framework. The basic management library of services includes:</p> <ul style="list-style-type: none"> • Create Profile Request - The MCI receives user information for becoming a registered user of the ECS from the DESKT CSCI. The MCI sends a response to the user when the request is received. • User Profile Request - The MCI provides requesting CSCIs with User Profile parameters such as e-mail address and shipping address upon request by authorized users to support their processing activities. • User Profile Updates – The MCI receives user profile parameter updates from a user and makes the updates in the user profile database. • Password Change Request - The DESKT CSCI sends requests on behalf of ECS users to the MCI to change or reset users' authenticators in the MSS database.
Return User Profile	The MSS Sybase Server returns the user profile to the DESKT CSCI, via the MCI , to forward back to the user via the EOS Data Gateway.

4.3.3.3 Desktop Architecture

Figure 4.3.3.3-1 is the DESKT CSCI architecture diagram. The diagram shows the events sent to the DESKT CSCI processes and the events the DESKT CSCI processes send to other processes.

The DESKT CSCI consists of one process. This process is the User Profile Gateway, a server that listens for calls on a socket. This process resides inside the DAAC on the INTHW-1 server.

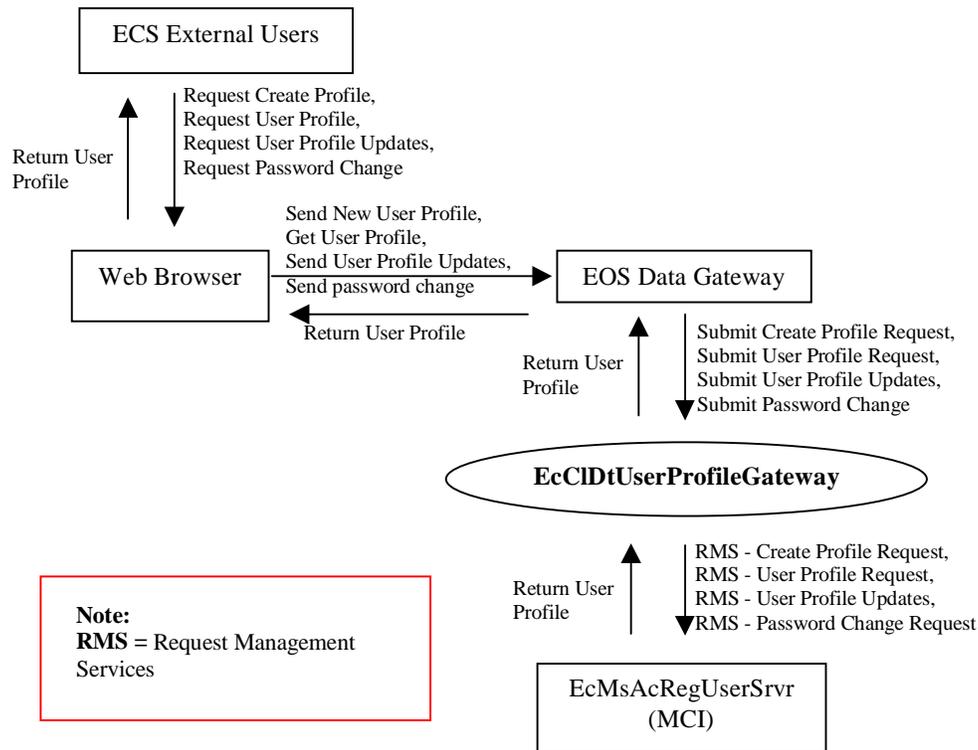


Figure 4.3.3.3-1. DESKT CSCI Architecture Diagram

4.3.3.4 Desktop Process Description

Table 4.3.3.4-1 provides descriptions of the processes shown in the DESKT CSCI architecture diagram.

Table 4.3.3.4-1. DESKT CSCI Processes

Process	Type	COTS/ Developed	Functionality
EcCIDtUserProfileGateway	Server	Developed	<p>The User Profile Gateway is a retrieval and update engine for the user profile information. The server listens for calls on a socket.</p> <p>Interfaces:</p> <ul style="list-style-type: none"> User Profile Request: Request for a user profile given the user's authenticator Profile Update Request: Request to update the user's profile with new information. <p>Server Supports:</p> <ul style="list-style-type: none"> Multiple concurrent requests.

4.3.3.5 Desktop Process Interface Descriptions

Table 4.3.3.5-1 provides descriptions of the interface events shown in the DESKT CSCI architecture diagram.

Table 4.3.3.5-1. DESKT CSCI Process Interface Events (1 of 3)

Event	Event Frequency	Interface	Initiated By	Event Description
Request Create Profile	Once per User	<i>Process:</i> Web Browser (COTS)	User	This is a request by a user to register (establish an account) in the ECS.
Request User Profile	One per User Login	<i>Process:</i> Web Browser (COTS)	User	The user sends a request to the EcMsAcRegUserSrvr using the ECS Authenticator from the EcCIDtUserProfileGateway or the user's ID.
Request User Profile Updates	One per User Profile update	<i>Process:</i> Web Browser (COTS)	User	Users can update their profiles via the Web Browser through the EOS Data Gateway.
Request Password Change	One per password change	<i>Process:</i> Web Browser (COTS)	User	Users can update or reset their passwords via the Web Browser through the EOS Data Gateway.
Send New User Profile	Once per User	<i>Process:</i> EOS Data Gateway	<i>Process:</i> Web Browser (COTS)	The Web Browser sends the User Registration request to the EOS Data Gateway for submittal to the ECS.
Get User Profile	One per User Profile	<i>Process:</i> EOS Data Gateway	<i>Process:</i> Web Browser (COTS)	The Web Browser sends the request to obtain a profile to the EOS Data Gateway .
Send User Profile Updates	One set of parameters per request	<i>Process:</i> EOS Data Gateway	<i>Process:</i> Web Browser (COTS)	The Web Browser sends a request to update profile information to the EOS Data Gateway . This interface to the EcCIDtUserProfileGateway requests an update to the user's profile.
Send Password Change	Once per password change	<i>Process:</i> EOS Data Gateway	<i>Process:</i> Web Browser (COTS)	The Web Browser sends a password change or reset request to the EOS Data Gateway to be processed within the ECS.
Submit Create Profile Request	Once per User	<i>Process:</i> EcCIDtUserProfileGateway <i>Class:</i> CIDtUserProfileServer	<i>Process:</i> EOS Data Gateway	The EOS Data Gateway submits the request to register a user to the EcCIDtUserProfileGateway and ultimately processed by the EcMsAcRegUserSrvr within the MSS.

Table 4.3.3.5-1. DESKT CSCI Process Interface Events (2 of 3)

Event	Event Frequency	Interface	Initiated By	Event Description
Submit User Profile Request	One per user request	<i>Process:</i> EcCIDtUserProfileGateway <i>Class:</i> CIDtUserProfileServer	<i>Process:</i> EOS Data Gateway	The EOS Data Gateway submits the request to obtain a profile to the EcCIDtUserProfileGateway and ultimately processed by the EcMsAcRegUserSrvr.
Submit User Profile Updates	One set of parameters per request	<i>Process:</i> EcCIDtUserProfileGateway <i>Class:</i> CIDtUserProfileServer	<i>Process:</i> EOS Data Gateway	The EOS Data Gateway submits the request to update a profile to the EcCIDtUserProfileGateway and ultimately processed by the EcMsAcRegUserSrvr.
Submit Password Change	Once per password change	<i>Process:</i> EcCIDtUserProfileGateway <i>Class:</i> CIDtUserProfileServer	<i>Process:</i> EOS Data Gateway	The EOS Data Gateway submits the request to change or reset a password to the EcCIDtUserProfileGateway, which is ultimately processed by the EcMsAcRegUserSrvr.
Request Management Services (RMS)	One per service request	N/A	N/A	The EcMsAcRegUserSrvr provides a basic management library of services to the processes, implemented as client or server applications, using the DCCI CSCI Process Framework. The basic management library of services includes:
RMS (cont.)	One per user request	<i>Process:</i> EcMsAcRegUserSrvr <i>Library:</i> MsAcCInt <i>Class:</i> MsAcUserProfileRWPportal	<i>Process:</i> EcCIDtUserProfileGateway <i>Class:</i> CIDtUserProfileServer	<ul style="list-style-type: none"> • User Profile Request – The EcMsAcRegUserSrvr provides requesting processes with User Profile parameters such as e-mail and shipping addresses to support their processing activities.

Table 4.3.3.5-1. DESKT CSCI Process Interface Events (3 of 3)

Event	Event Frequency	Interface	Initiated By	Event Description
RMS (cont.)	One set of parameters per user request	<i>Process:</i> EcMsAcRegUserSrvr <i>Library:</i> MsAcCInt <i>Class:</i> MsAcUserProfileRWPportal	<i>Process:</i> EcCIDtUserProfileGateway <i>Class:</i> CIDtUserProfileServer	<ul style="list-style-type: none"> • User Profile Updates – The EcMsAcRegUserSrvr provides requesting processes with access to User Profile parameters such as e-mail and shipping addresses to support the update of the parameters.
RMS (cont.)	One set of parameters per user request	<i>Process:</i> EcMsAcRegUserSrvr <i>Library:</i> MsAcCInt <i>Class:</i> MsAcUserProfileRWPportal	<i>Process:</i> EcCIDtUserProfileGateway <i>Class:</i> CIDtUserProfileServer	<ul style="list-style-type: none"> • Password Change Request - The EcCIDtUserProfileGateway sends requests on behalf of ECS users to the EcMsAcRegUserSrvr to change or reset a user's password in the MSS database. The password is represented as an authenticator in the MSS database.
Return User Profile	One per user request	<i>Process:</i> EcCIDtUserProfileGateway <i>Class:</i> CIDtUserProfileServer	<i>Process:</i> EcMsAcRegUserSrvr <i>Library:</i> MsAcCInt <i>Class:</i> MsAcUserProfileRWPportal	The EcMsAcRegUserSrvr returns the user profile to the EcCIDtUserProfileGateway . The EcCIDtUserProfileGateway forwards the user profile to the EOS Data Gateway for return to the user via the Web Browser.

4.3.3.6 Desktop Data Stores

There are no data stores used by the DESKT CSCI.

4.4 Data Management Subsystem Overview

The Data Management Subsystem (DMS) provides bi-directional catalog interoperability between the Version 0 (V0) Information Management System (IMS) and the ECS and also bi-directional catalog interoperability between the Advanced Spaceborne Thermal Emission and Reflection Radiometer (ASTER) Ground Data System (GDS) and the ECS. The DMS provides this service by supplying gateway processes. There is a dedicated gateway process for each external catalog interoperability direction.

The DMS provides protocol translation via the dedicated gateways. The DMS provides content translation via a data dictionary of data collection information. This data dictionary contains collection level metadata in addition to attribute and keyword mappings between the ECS and the external catalog systems.

The ECS interface to V0-IMS is marshaled by the V0 EOS Data Gateway (V0 Web Client) Documentation for the V0 Web Client can be found at the following Universal Resource Locator

–
<http://harp.gsfc.nasa.gov/~imswww/pub/manuals/imsdesign.html>.

Data Management Subsystem Context

Figures 4.4-1 and 4.4-2 are the Data Management Subsystem context diagrams. The diagrams show the events sent to the Data Management Subsystem and the events the Data Management Subsystem sends to other SDPS and CSMS subsystems. Tables 4.4-1 and 4.4-2 provide descriptions of the interface events shown in the Data Management Subsystem context diagrams.

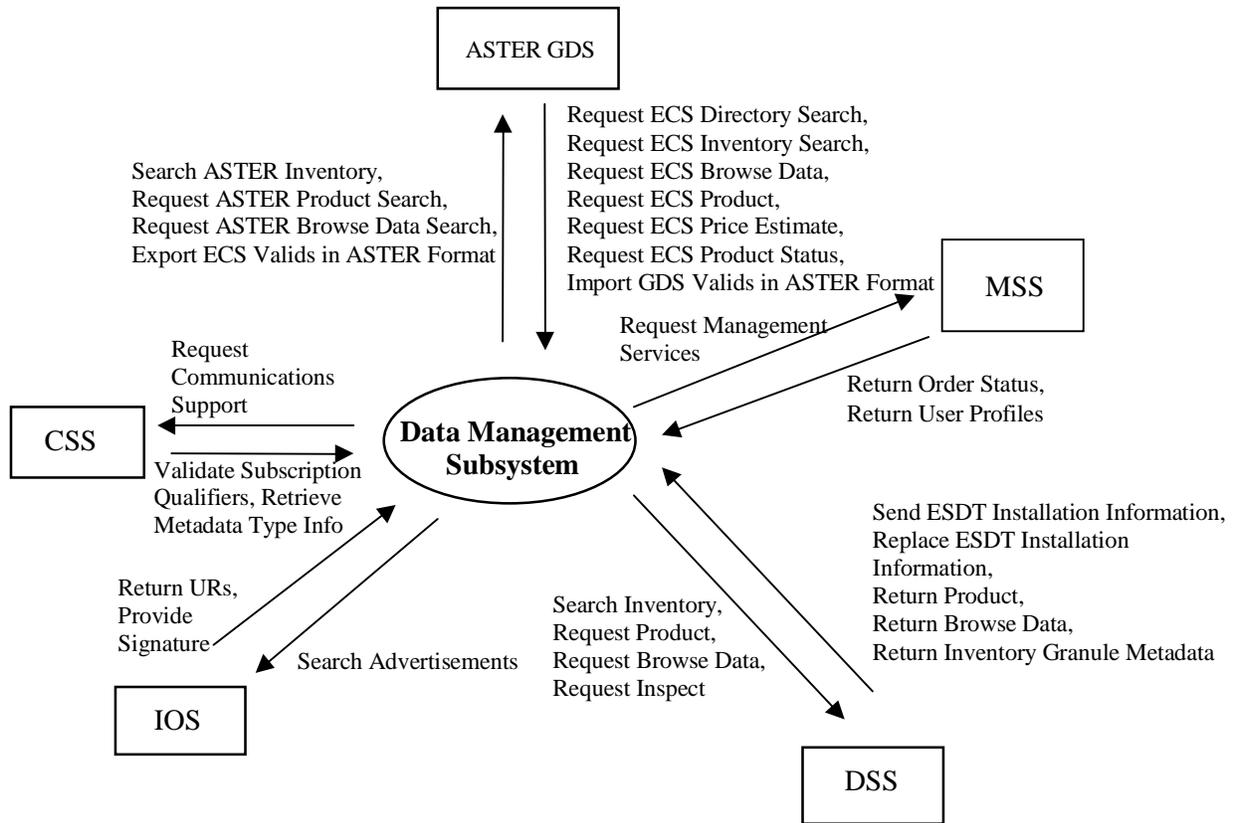


Figure 4.4-1. Data Management Subsystem Context Diagram

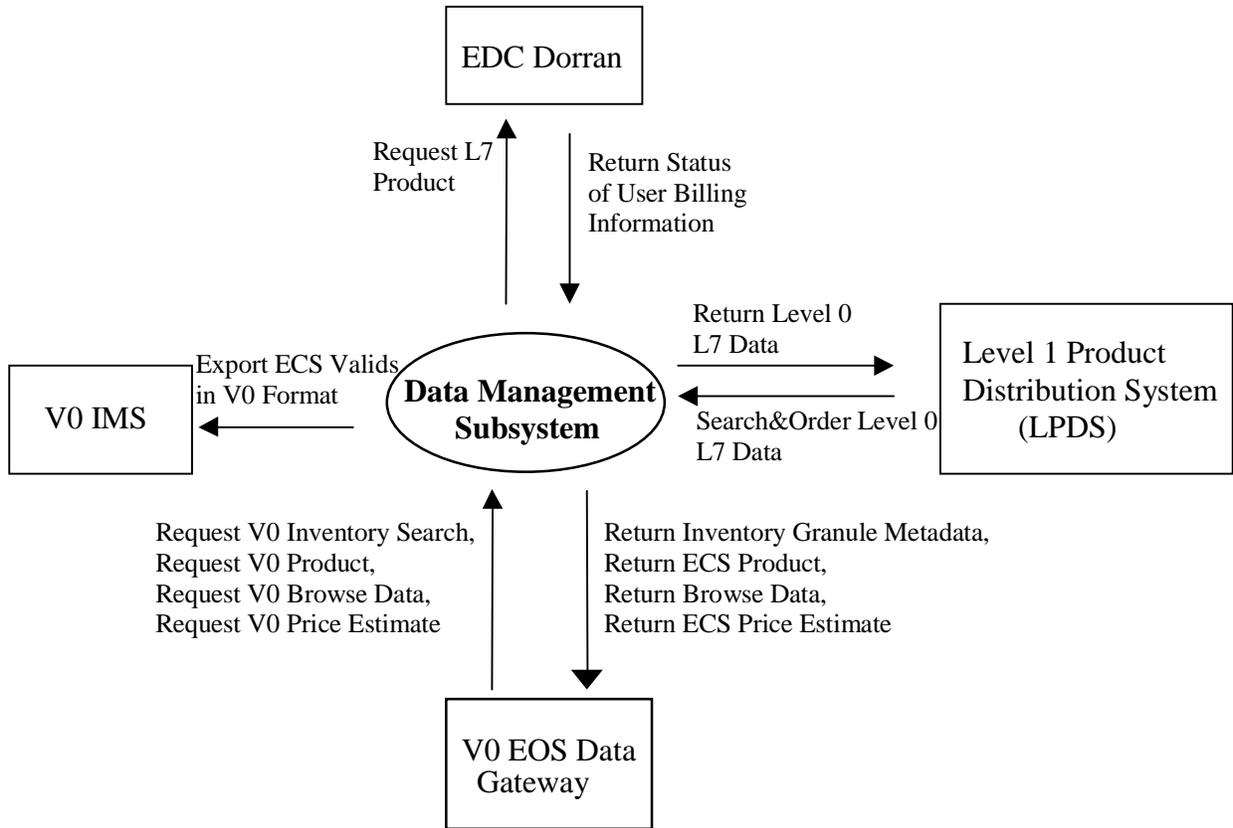


Figure 4.4-2. Data Management Subsystem Context Diagram

Table 4.4-1. Data Management Subsystem Interface Events (1 of 2)

Event	Interface Event Description
Request ECS Directory Search	The DMS receives directory search requests from the ASTER GDS for the discovery of collection level information.
Request ECS Inventory Search	The DMS receives inventory search requests from a user at the ASTER GDS .
Request ECS Browse Data	The DMS receives browse requests provided by users from the ASTER GDS .
Request ECS Product	The DMS receives product requests provided by users from the ASTER GDS . This includes requests for Landsat 7 products archived within the ECS. The ASTER GDS can only receive Landsat 7 fixed scenes because they do not have the means to handle floating scenes.
Request ECS Price Estimate	The DMS receives price estimate requests provided by users from the EOS Data Gateway within the V0 IMS or the ASTER GDS and submits the requests to the DSS.
Request ECS Product Status	The DMS receives product status requests from the ASTER GDS and returns the status of ASTER GDS initiated orders back to the ASTER GDS .
Import GDS Valid in ASTER Format	The DMS receives the valids (in ASTER format) from the ASTER GDS .
Request Management Services	<p>The MSS provides a basic management library of services to the subsystems, implemented as client or server applications, using the CSS Process Framework. The basic management library of services include:</p> <ul style="list-style-type: none"> • System startup and shutdown - Please refer to the release-related, current version of the Mission Operations Procedures for the ECS Project document (611) and the current ECS Project Training Material document (625), identified in Section 2.2.1 of this document. <p>The MSS also interfaces with other subsystems to perform the following:</p> <ul style="list-style-type: none"> • Order/Request Tracking - The DMS interfaces with the MSS Order/Request Tracking service to create a user product order. • User Profile Request - The MSS provides requesting subsystems with User Profile parameters such as e-mail address and shipping address to support their processing activities.
Return Order Status	The MSS provides order ids and order status information for products requested by users.
Return User Profiles	The MSS returns user profile information requested by users or ECS processes.
Send ESDT Installation Information	The DSS inserts new collection level information into the DMS Data Dictionary database as new Earth Science Data Types (ESDTs) are added to the SDPS.
Replace ESDT Installation Information	The DSS sends updated ESDT information to the DMS Data Dictionary whenever an ESDT is updated. This data consists of updated Inventory and Collection level metadata.
Return Product	The DMS receives products (including Landsat 7 data archived within the ECS) from the DSS based upon a product request. The ASTER GDS can only receive Landsat 7 fixed scenes because they do not have the means to handle floating scenes.

Table 4.4-1. Data Management Subsystem Interface Events (2 of 2)

Event	Interface Event Description
Return Browse Data	The DMS receives browse data associated with a particular granule from the DSS .
Return Inventory Granule Metadata	The DMS receives the granule metadata identifying the scene within the granule based on an inventory search request from the DSS .
Search Inventory	The DMS submits inventory search requests to the Science Data Server within the DSS .
Request Product	The DMS submits the product requests to the DSS to acquire data granules.
Request Browse Data	The DMS submits the browse requests to the DSS to obtain browse data to determine the type of product to order.
Request Inspect	The DMS sends a request for an inspection of granule metadata to the DSS in support of a price estimate request.
Search Advertisements	The DMS verifies an ESDT's acquire signature before a product request is serviced by querying the Interoperability Subsystem (IOS) for the signature.
Return URs	The IOS returns to the DMS the URs for the servers from which to retrieve the data.
Provide Signature	The IOS returns to the DMS the signature for the acquire request to obtain the data from the DSS.
Validate Subscription Qualifiers	The DMS data dictionary is queried by the CSS for type and range information to validate qualifiers.
Request Communications Support	<p>The CSS provides a library of services available to each SDPS and CSMS subsystems. The subsystem services required to perform specific assignments are requested from the CSS. These services include:</p> <ul style="list-style-type: none"> • DCE Support • Name/Address Services • Password Services • Server Request Framework (SRF) • Universal Reference (UR) • Error/Event Logging • Fault Handling Services • User Authentication Services • Mode Information • (Query Registry) Retrieving the requested configuration attribute-value pairs from the Configuration Registry • Distribution Media Options from the Configuration Registry
Search ASTER Inventory	The DMS submits inventory search requests to the ASTER GDS on behalf of an ECS user.
Request ASTER Product Search	The DMS submits product requests to the ASTER GDS on behalf of an ECS user.
Request ASTER Browse Data Search	The DMS submits browse data requests to the ASTER GDS on behalf of an ECS user.
Export ECS Valid in ASTER Format	The DMS sends the valids with the ECS core and PSA Attributes to the ASTER GDS .

Table 4.4-2. Data Management Subsystem Interface Events

Event	Interface Event Description
Request L7 Product	The DMS submits the Landsat 7 product requests provided by users to the EDC Dorran Billing and Accounting System and to the DSS. The EDC Dorran Billing and Accounting System approves and tracks Landsat 7 orders. The DSS retrieves Landsat 7 products from the archives.
Return Status of User Billing Information	The Dorran Billing and Accounting System returns the status of the user billing information to the DMS to allow or deny the user access to ECS data and services.
Return Level 0 L7 Data	The DMS sends Level 0 data to the Level 1 Product Distribution System (LPDS) upon request. The LPDS creates level 1 products from the Landsat level 0 data ordered through the V0 Gateway upon user request and sends the Level 1 data to the user.
Search&Order Level 0 L7 Data	The LPDS sends requests for L7 Level 0 data from the ECS to produce and distribute Landsat 7 Level 1 products upon user request.
Return Inventory Granule Metadata	The DMS returns the inventory granule metadata identifying the scene within the granule based on an inventory search request to the user via the V0 EOS Data Gateway .
Return ECS Product	The DMS returns ECS data (including Landsat 7 data archived within the ECS) to the user via the V0 EOS Data Gateway based upon a product request. The ASTER GDS can only receive Landsat 7 fixed scenes because they do not have the means to handle floating scenes.
Return Browse Data	The DMS returns Browse data associated with a particular granule to the user via the V0 EOS Data Gateway .
Return ECS Price Estimate	The DMS returns a price estimate for a price estimate request to the user via the V0 EOS Data Gateway .
Request V0 Inventory Search	The DMS receives inventory search requests from the V0 EOS Data Gateway on behalf of an external ECS user.
Request V0 Product	The DMS receives product requests from the V0 EOS Data Gateway on behalf of an external ECS user.
Request V0 Browse Data	The DMS receives browse data requests from the V0 EOS Data Gateway on behalf of an external ECS user
Request V0 Price Estimate	The user sends a price estimate request for an ECS product to the DMS via the V0 EOS Data Gateway .
Export ECS Valid in V0 Format	The DMS sends the valids with the ECS core and PSA Attributes to the V0 IMS .

Data Management Subsystem Structure

The DMS is three CSCIs and two Hardware Configuration Items (HWCI):

- The Data Dictionary (DDICT) is a software configuration item. DDICT manages the definitions of data collections including the metadata, data domains (valid values), and data location. The Data Dictionary information is stored persistently in a Relational Database Management System (DBMS).

- The Version 0 Gateway (V0 GTWAY) is a software configuration item. The V0 GTWAY CSCI provides access to data and services between the SDSRV CSCI and the V0 IMS. V0 GTWAY services include inventory searches, requests for browse data, product requests, and price estimate requests.
- The ASTER Gateway (ASGTW) is a software configuration item. The ASGTW provides access to data and services between the ECS Science Data Server and the ASTER GDS. Services include inventory searches, requests for browse data, product requests, and price estimate requests.
- The DMS hardware comprises one hardware configuration item Data Management Hardware (DMGHW) CI and one hardware configuration item it shares with the Interoperability Subsystem (IOS), Interoperability Hardware (INTHW) CI. DMGHW and INTHW provide the servers and workstations needed for all data management functions. The DMGHW and INTHW provide processing and storage for the DDICT and V0 GTWAY CSCIs. The DMS hardware also supports the processing requirements of the IOS. The IOS consists of a single hardware configuration item (INTHW) and is described in Section 4.5.2.1.

Use of COTS in the Data Management Subsystem

- RogueWave's Tools.h++

The Tools.h++ class libraries are used by the DMS to provide basic functions and objects such as strings and collections. The Tools libraries must be installed with the DMS software for any of the DMS processes to run.

- RogueWave's DBTools.h++

The DBTools.h++ C++ class libraries are used to interact with the Sybase database Structured Query Language (SQL) server. The use of DBTools buffers the DMS processes from the relational database used. The DBTools libraries must be installed with the DMS for the Data Dictionary Server, Information Managers, and ECS to V0 and V0 to ECS Gateways to run and allow client applications to perform queries of DDICT.

- The ICS Builder Xcessory GUI

The Builder Xcessory GUI builder tool modifies the displays of the Data Dictionary Maintenance Tool (Mtool). The builder tool also generates the C++ code to produce the Mtool displays at run time. There is no operational component of Builder Xcessory needed at run-time.

- Sybase Server

Sybase's SQL server provides access for the Data Dictionary to insert, update, and delete Data Dictionary database information. The Sybase SQL Server must be running during operations for the Data Dictionary Server to execute, search, and update requests on the Data Dictionary database.

- DCE Client

DCE Client provides DMS with communications between other subsystems. DCE can reside on one or both sides of the interface. An instance must be installed on the platform where DMS resides. Although the DCE Client is part of CSS, this COTS software item must be installed for DMS to run in the SDPS operational and test environment.

4.4.1 Data Dictionary Software Description

4.4.1.1 Data Dictionary Functional Overview

The Data Dictionary (DDICT) CSCI provides access to the Data Dictionary database containing information about science data collections, data attributes, data operations, and the domain(s) of the attributes. The DDICT CSCI describes the data objects accessible through Data Servers and the Gateways. The DDICT CSCI provides information support for users to retrieve definitions of the available items and provides infrastructure support to the other CSCIs within the DMS.

The Information contained within the Data Dictionary database includes all collections known within the SDPS. Clients (other SDPS or CSMS CSCIs, CSCs, or processes) of the Data Dictionary obtain data collection information by sending queries to the Data Dictionary. Mappings between the SDPS and the V0 IMS attributes and keywords and the SDPS and ASTER GDS attributes and keywords are also maintained within the Data Dictionary. These mappings are used to translate requests between the V0 IMS and the ECS and the ASTER GDS and the ECS.

The location of a data collection within a data server at a particular site is also stored within the data dictionary. This information allows users to perform queries through user software such as the V0 EOS Data Gateway from any geographical location to forward inventory search, browse, and acquire requests to the appropriate Data Server or Gateway located at the site where the data is physically stored.

4.4.1.2 Data Dictionary Context

Figure 4.4.1.2-1 is the DDICT CSCI context diagram. The diagram shows the events sent to other CSCIs or CSCs and the events the DDICT CSCI receives from other CSCIs and CSCs. Table 4.4.1.2-1 provides descriptions of the interface events shown in the DDICT CSCI context diagram.

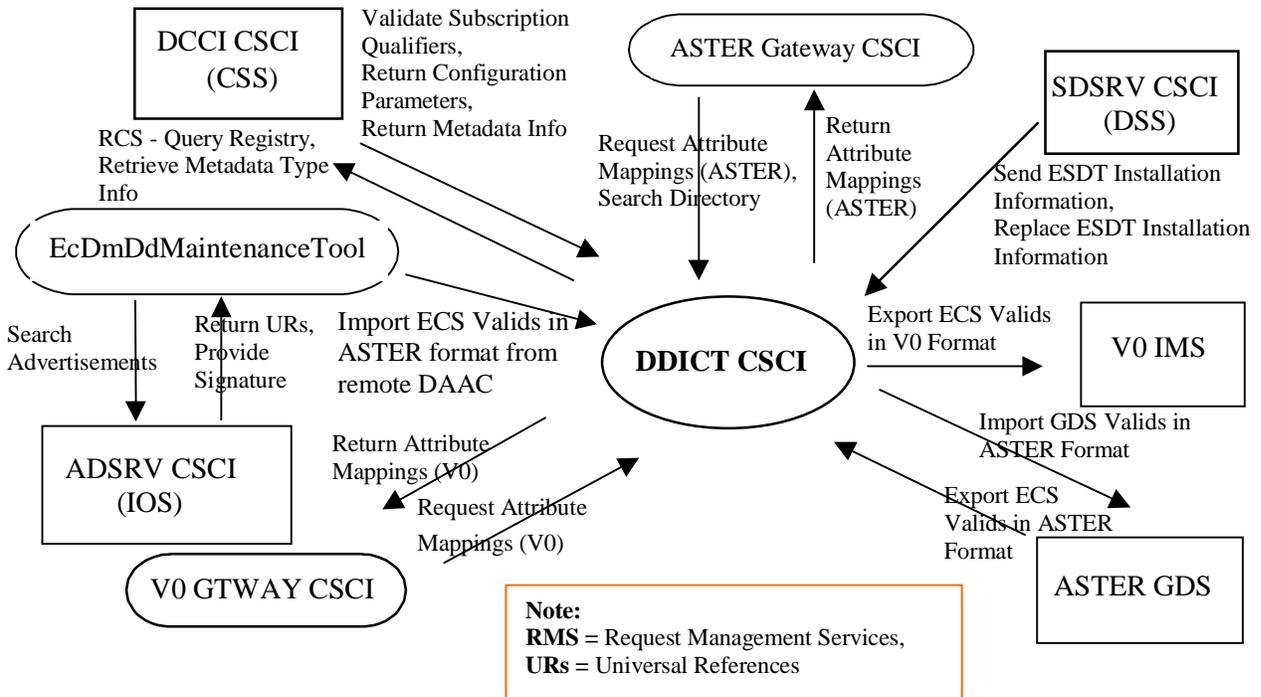


Figure 4.4.1.2-1. Data Dictionary CSCI Context Diagram

Table 4.4.1.2-1. Data Dictionary CSCI Interface Events (1 of 3)

Event	Interface Event Description
Request Management Services	System startup and shutdown - Please refer to the release-related, current version of the Mission Operations Procedures for the ECS Project document (611) and the current ECS Project Training Material document (625), identified in Section 2.2.1 of this document.
Request Attribute Mappings (ASTER)	A user, via the ASTER Gateway (ASTGW) CSCI , requests data collection attribute and keyword mappings (via the ASTGW CSCI) from the DDICT CSCI to translate requests from the ASTER GDS to the ECS and back again.
Search Directory	The DDICT CSCI receives directory search requests from the ASTGW CSCI .
Return Attribute Mappings (ASTER)	The DDICT CSCI returns the data collection attribute and keyword mappings requested by the user via the ASTGW CSCI .
Send ESDT Installation Information	The SDSRV CSCI inserts new collection level information into the DMS Data Dictionary database via the DDICT CSCI, as new Earth Science Data Types (ESDTs) are added to the SDPS.

Table 4.4.1.2-1. Data Dictionary CSCI Interface Events (2 of 3)

Event	Interface Event Description
Replace ESDT Installation Information	The SDSRV CSCI sends updated ESDT information to the DDICT CSCI whenever an ESDT is updated. This data consists of Inventory and Collection level metadata. The updated information replaces the ESDT information in the DDICT CSCI.
Export ECS Valid in V0 Format	The DDICT CSCI sends the valids with the ECS core and PSA Attributes to the V0 IMS .
Import GDS Valid in ASTER format	The DDICT CSCI receives the valids (in ASTER format) from the ASTER GDS .
Export ECS Valid in ASTER format	The DDICT CSCI sends the valids with the ECS core and PSA Attributes to the ASTER GDS .
Request Attribute Mappings (V0)	A user, via the EOS Data Gateway within the V0 IMS, requests data collection attribute and keyword mappings (via the V0 GTWAY CSCI) from the DDICT CSCI to translate requests from the V0 IMS to the ECS and back again.
Return Attribute Mappings (V0)	The DDICT CSCI returns the data collection attribute and keyword mappings requested by the user via the V0 GTWAY CSCI .
Search Advertisements	The DDICT CSCI (EcDmDdMaintenanceTool) sends requests to search for subscription event and signature service advertisements to the ADSRV CSCI . The DDICT CSCI enters subscriptions with the DCCI CSCI Subscription Server or obtains the proper signatures for acquiring data granules from the SDSRV CSCI (for the insert and update of metadata within the SDSRV archives).
Return URs	The DDICT CSCI (EcDmDdMaintenanceTool) receives the Universal References for the servers, which have the collection level data, from the ADSRV CSCI .
Provide Signature	The DDICT CSCI (EcDmDdMaintenanceTool) receives the Signatures for the granules, which have the collection level data, from the ADSRV CSCI .
Import ECS Valid in ASTER format from remote DAAC	The DDICT CSCI receives the valids (in ASTER format) from a remote DAAC using the EcDmDdMaintenanceTool .
Request Communications Support	<p>The DCCI CSCI provides a library of services available to each SDPS and CSMS CSCI. The CSCI services required to perform specific assignments are requested from the DCCI CSCI. These services include:</p> <ul style="list-style-type: none"> • DCE Support • Name/Address Services • Password Services • Server Request Framework (SRF) • Universal Reference (UR) • Error/Event Logging • Fault Handling Services • User Authentication Services • Mode Information • (Query Registry) Retrieving the requested configuration attribute-value pairs from the Configuration Registry • Distribution Media Options from the Configuration Registry

Table 4.4.1.2-1. Data Dictionary CSCI Interface Events (3 of 3)

Event	Interface Event Description
Retrieve Metadata Type Info	The DCCI CSCI retrieves metadata type information from the DDICT CSCI pertaining to search or search & order requests from the SIPS
Validate Subscription Qualifiers	The DDICT CSCI is queried by the DCCI CSCI for type and range information to validate qualifiers.
Return Configuration Parameters	The DDICT CSCI receives the configuration parameters and associated values from the Registry Server within the DCCI CSCI .
Return Metadata Info	The DCCI CSCI receives metadata information from the DDICT CSCI .

4.4.1.3 Data Dictionary Architecture

Figure 4.4.1.3-1 is the DDICT CSCI architecture diagram. The diagram shows the events sent to the DDICT CSCI processes and the events the DDICT CSCI processes send to other processes.

The DDICT CSCI is two SDPS processes, the Data Dictionary Server (EcDmDictService) and the Data Dictionary Maintenance Tool (EcDmMaintenanceTool) and a COTS process (the Sybase Server). The Data Dictionary Server, Maintenance Tool, and Sybase Server processes reside inside a DAAC and run on the DMGHW. The Data Dictionary uses one data store per DAAC, the EcDmDictService Database, as shown in Figure 4.4.1.3-1.

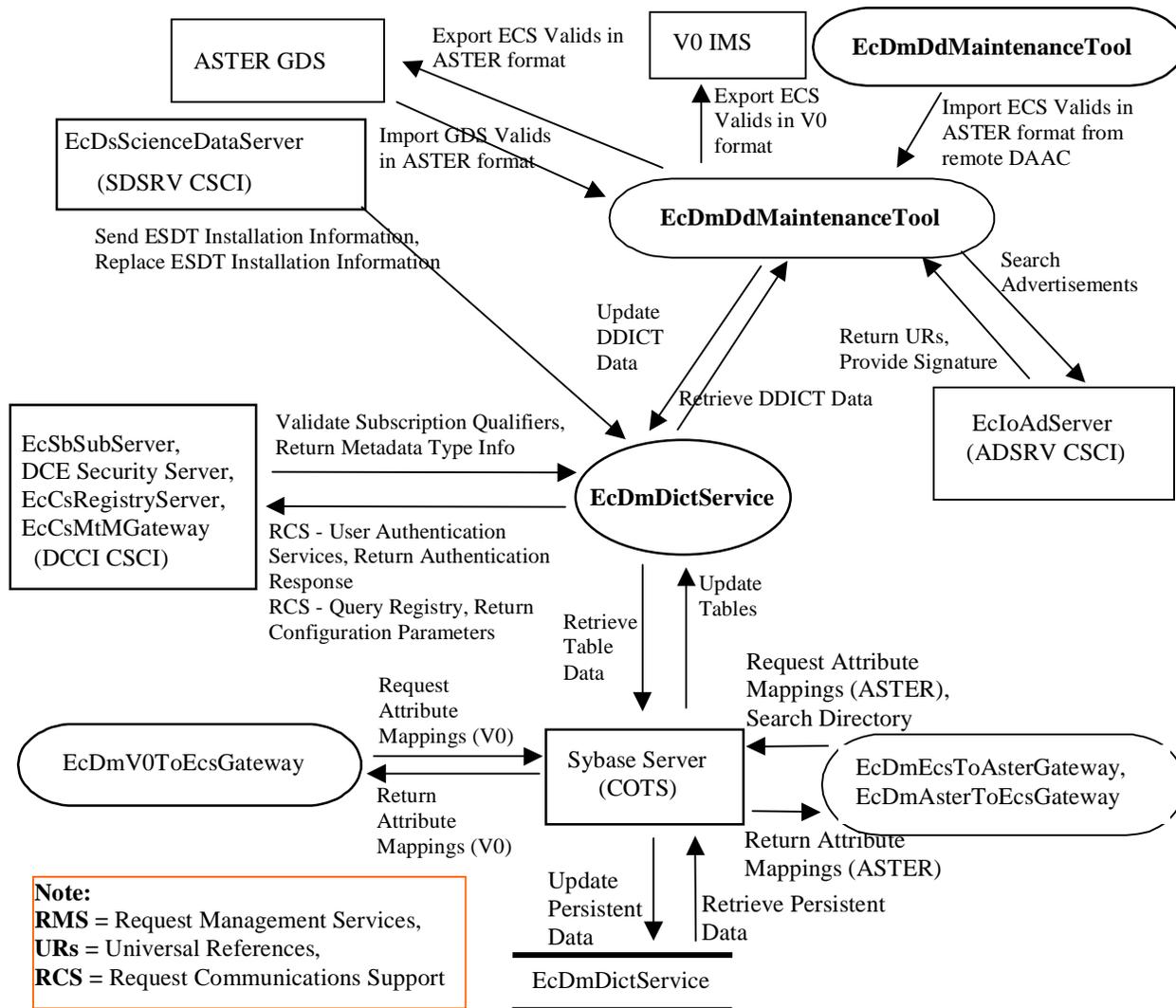


Figure 4.4.1.3-1. Data Dictionary CSCI Architecture Diagram

4.4.1.4 Data Dictionary Process Descriptions

Table 4.4.1.4-1 provides descriptions of the processes shown in the Data Dictionary CSCI architecture diagram.

Table 4.4.1.4-1. Data Dictionary CSCI Processes

Process	Type	COTS/ Developed	Functionality
EcDmDictService	Server	Developed	<p>The Data Dictionary Service is the primary server interface to collection and collection related information for the DMS and other subsystems. It allows DDICT client processes the capability to perform data searches, insertions, updates, or deletions to the collection information held in the DDICT database.</p> <p>The Data Dictionary offers two basic interfaces DDICT Data Search: The Data Dictionary Server allows a user to specify search requests on the Data Dictionary database using a GIParameter List.</p> <p>DDICT Data Insert and Delete: Provides a client process with the capability to insert and delete data within the Data Dictionary database.</p> <p>The Data Dictionary Service supports: Single requests at a time Synchronous request processing Asynchronous request processing</p>
EcDmDdMaintenanceTool	GUI	Developed	<p>Provides a graphical user interface (GUI) to insert, update, or delete schema information held in the DDICT database, allowing DAAC operations staff to maintain the data stored in the Data Dictionary database. The Data Dictionary Maintenance Tool also provides the following capabilities:</p> <p>Import and Export of Valid: The tool allows DAAC operations staff to import and export data collection attribute valids to and from the GDS, ECS, and V0 IMS for catalog interoperability.</p> <p>Data Collection Attribute and Keyword Mapping: Allows DAAC operations staff to map data collection attributes and keyword valids from ECS to V0 IMS and between the ASTER GDS and ECS. The V0 GTWAY CSCI processes (EcDmEcsToV0Gateway and EcDmV0ToEcsGateway) that translate requests from ECS to V0 IMS and the ASTGW CSCI processes (EcDmEcsToAsterGateway and EcDmAsterToEcsGateway) that translate requests between ECS and the ASTER GDS use this information.</p>
Sybase Server	Server	COTS	<p>The Sybase Server acts as a SQL server for the Data Dictionary, and is only run at the DAACs by DAAC operations staff. Refer to Sybase documentation for details.</p>

4.4.1.5 Data Dictionary Process Interface Descriptions

Table 4.4.1.5-1 provides descriptions of the interface events shown in the Data Dictionary CSCI architecture diagram.

Table 4.4.1.5-1. Data Dictionary CSCI Process Interface Events (1 of 7)

Event	Event Frequency	Interface	Initiated By	Event Description
Request Management Services	At system startup or shutdown and for restarts	<i>Process:</i> EcDmDictService	DAAC unique startup scripts	System startup and shutdown - Please refer to the release-related, current version of the Mission Operations Procedures for the ECS Project document (611) and the current ECS Project Training Material document (625), identified in Section 2.2.1 of this document.
Export ECS Valid in V0 Format	Based on V0 valids processing cycle ~ once per week	V0 IMS Host	DAAC Operations Staff <i>Process:</i> EcDmDdMaintenanceTool <i>Classes:</i> DmLmDbiUtils, DmDdMtMainWindow	The DAAC Operations Staff pushes the valids file, using the FTP service, manually to its destination location agreed upon earlier on a V0 IMS Host.
Import ECS Valid in ASTER Format from remote DAAC	Based on ASTER GDS valids processing cycle ~ once per week	ECS Host - EDC	DAAC Operations Staff <i>Process:</i> EcDmDdMaintenanceTool <i>Classes:</i> DmLmDbiUtils, DmDdMtMainWindow	The DAAC Operations Staff at EDC receives a valids file from another DAAC in ASTER format via the FTP service at the EcDmDdMaintenanceTool .
Search Advertisements	One per request to search advertisements	<i>Process:</i> EcIoAdServer <i>Library:</i> IoAdSearch <i>Class:</i> IoAdApprovedAdvSearchcommand CUSTOM libraries: IoAdSearch, IoAdCore, IoAdSubs	DMS Process: EcDmDdMaintenanceTool <i>DMS Library:</i> DmLmReqProc <i>DMS Classes:</i> DmLmProductPlan, DmDdMtDatasetGroup	The EcIoAdServer receives requests to search and retrieve advertisements from the EcDmDdMaintenanceTool .

Table 4.4.1.5-1. Data Dictionary CSCI Process Interface Events (2 of 7)

Event	Event Frequency	Interface	Initiated By	Event Description
Return URs	Per search request	<i>Process:</i> EcDmDdMaintenanceTool <i>Library:</i> DmLmReqProc <i>Classes:</i> DmLmProductPlan, DmDdMtDatasetGroup	<i>Process:</i> EcloAdServer <i>Library:</i> IoAdSearch <i>Class:</i> IoAdApprovedAdvSearchcommand <i>CUSTOM libraries:</i> IoAdSearch, IoAdCore, IoAdSubs	The EcloAdServer returns the URs of the servers where the collection level data reside to the EcDmDdMaintenanceTool .
Provide Signature	One per granule	<i>Process:</i> EcDmDdMaintenanceTool <i>Library:</i> DmLmReqProc <i>Classes:</i> DmLmProductPlan, DmDdMtDatasetGroup	<i>Process:</i> EcloAdServer <i>Library:</i> IoAdSearch <i>Class:</i> IoAdApprovedAdvSearchcommand <i>CUSTOM libraries:</i> IoAdSearch, IoAdCore, IoAdSubs	The EcloAdServer provides the signature of the granules to be acquired (from the EcDsScienceDataServer) to the EcDmDdMaintenanceTool .
Retrieve DDICT data	One per Maintenance Tool search	<i>Process:</i> EcDmDdMaintenanceTool <i>Classes:</i> DmDdMtDBExtract, DmDdMtMainWindow	<i>Process:</i> EcDmDictService <i>Library:</i> EcDmDdClient <i>Class:</i> DmDdCIRequest	The EcDmDictService returns data collection information including collection lists, and collection attributes and keyword valids to the EcDmDdMaintenanceTool .
Update DDICT data	One per table information update	<i>Process:</i> EcDmDictService <i>Library:</i> EcDmDdClient <i>Class:</i> DmDdCISchemaRequest	Operations Staff <i>Process:</i> EcDmDdMaintenanceTool <i>Classes:</i> DmLmDbiUtils, DmDdMtMainWindow	The Operations Staff, using the EcDmDdMaintenanceTool , updates table information within the DDICT database (via the EcDmDictService) including mapping collection attributes to keywords and mapping collections to information managers and adding, modifying, and deleting SDPS Core Attributes.

Table 4.4.1.5-1. Data Dictionary CSCI Process Interface Events (3 of 7)

Event	Event Frequency	Interface	Initiated By	Event Description
Request Communications Support	Request service(s) as required	<p>Process: DCE Security Server</p> <p>Libraries: EcSelogin, EcSeLogincontext</p> <p>Classes: EcSelogin, EcSeLogincontext</p> <p>Library: EcPf</p> <p>Classes: EcPfManagedServer, EcPfclient</p> <p>Library (Common): EcUr</p> <p>Class: EcUrServerUR</p> <p>Process: EcSbSubServer</p> <p>Library: EcSbSr</p> <p>Class: EcSbSubscription</p> <p>Library: Event</p> <p>Class: EcLgErrorMsg</p> <p>Process: EcCsRegistryServer</p> <p>Library: EcCsRegistryClient</p> <p>Class: EcRgRegistryServer_C</p>	<p>Process: EcDmDictService</p> <p>Libraries: EcDmDdClient, DmDdReqProc, DmDdServer</p> <p>Classes: DmDdCISchemaRequest, DmDdCIRequest, DmDdMapper, DmDdProcMsg, DmDdSearchRequest</p>	<p>The DCCI CSCI provides a library of services available to each SDPS and CSMS process. The process services required to perform specific assignments are requested from the DCCI CSCI CSCs. These services include:</p> <ul style="list-style-type: none"> • DCE Support • Name/Address Services • Password Services • Server Request Framework (SRF) • Universal Reference (UR) • Error/Event Logging • Fault Handling Services • User Authentication Services • Mode Information (Query Registry) • Retrieving the requested configuration attribute-value pairs from the Configuration Registry • Distribution Media Options from the Configuration Registry

Table 4.4.1.5-1. Data Dictionary CSCI Process Interface Events (4 of 7)

Event	Event Frequency	Interface	Initiated By	Event Description
Return Metadata Info	Per search or order request	<i>Process:</i> EcCsMtMGateway <i>Class:</i> EcCsMtMAttributeDict	<i>Processes:</i> EcCsMtMGateway EcDmDictService <i>Library:</i> DmXDdDefinedStaticClientLibs <i>Class:</i> DmDdCIRequestServer	The EcCsMtMGateway receives metadata information from the EcDmDictService .
Validate Subscription Qualifiers	One set per request	<i>Process:</i> EcDmDictService <i>Library:</i> EcDmDdClient <i>Class:</i> DmDdCIRequest	<i>Process:</i> EcSbSubServer <i>Library:</i> EcSbSr <i>Class:</i> EcSbSubscription	The EcDmDictService is queried by the EcSbSubServer for type and range information to validate qualifiers.
Return Authentication Response	One per request	<i>Process:</i> EcDmDictService <i>Libraries:</i> EcDmDdClient, DmDdReqProc, DmDdServer <i>Classes:</i> DmDdCISchemaRequest, DmDdCIRequest, DmDdMapper, DmDdProcMsg, DmDdSearchRequest	<i>Process:</i> DCE Security Server <i>Libraries:</i> EcSelogin, EcSeLogincontext <i>Classes:</i> EcSelogin, EcSeLogincontext <i>Library:</i> EcPf <i>Classes:</i> EcPfManagedServer, EcPfclient <i>Library (Common):</i> EcUr <i>Class:</i> EcUrServerUR <i>Library:</i> Event <i>Class:</i> EcLgErrormsg	The EcDmEcsToAsterGateway receives an authentication or error message for a user for access to ECS data and services from the DCE Security Server .
Return Configuration Parameters	One set per request	<i>Process:</i> EcDmDictService	<i>Process:</i> EcCsRegistryServer <i>Library:</i> EcCsRegistryClient <i>Class:</i> EcRgRegistryServer_C	The EcCsRegistryServer returns the attribute-value pairs (configuration parameters) to the EcDmDictService upon request.

Table 4.4.1.5-1. Data Dictionary CSCI Process Interface Events (5 of 7)

Event	Event Frequency	Interface	Initiated By	Event Description
Retrieve metadata type info	One or more client request	<i>Processes:</i> EcCsMtMGateway EcDmDictService <i>Library:</i> DmXDdDefinedStaticClientLibs <i>Class:</i> DmDdCIRquestServer	<i>Process:</i> EcCsMtMGateway <i>Class:</i> EcCsMtMAttributeDict	The EcCsMtMGateway retrieves metadata type information from the EcDmDictService based upon the qualifying metadata contained in the requests sent by the SIPS via a remote procedure call.
Update Tables	One per database update	<i>Process:</i> Sybase Server (COTS SW) RWDBTools.h++ classes	<i>Process:</i> EcDmDictService <i>Library:</i> DmDdReqProc <i>Classes:</i> DmDdMapper, DmDdProcMsg	The EcDmDictService updates data within the Data Dictionary database by inserting and deleting collections and collection metadata, attributes and keywords, and attribute and keyword mappings via the Sybase Server .
Retrieve Table Data	One per retrieve from the database	<i>Process:</i> Sybase Server (COTS SW) RWDBTools.h++ classes	<i>Process:</i> EcDmDictService <i>Library:</i> DmDdServer <i>Class:</i> DmDdSearchRequest	The EcDmDictService retrieves data within the Data Dictionary database such as collections and collection metadata, attributes and keywords, and attribute and keyword mappings via the Sybase Server .
Retrieve Persistent Data	One per set number of queries	<i>Process:</i> Sybase server (COTS SW)	<i>Process:</i> Sybase Server (COTS)	The Sybase Server retrieves data persistently stored on disk(s) based on search queries from the Data Dictionary Server.
Update Persistent Data	One per set number of queries	<i>Process:</i> Sybase server (COTS SW)	<i>Process:</i> Sybase Server (COTS)	The Sybase Server updates data persistently stored on disk(s) based on queries from the Data Dictionary Server.

Table 4.4.1.5-1. Data Dictionary CSCI Process Interface Events (6 of 7)

Event	Event Frequency	Interface	Initiated By	Event Description
Request Attribute Mappings (V0)	One per request from V0 Gateway	<i>Process:</i> EcDmDictService <i>COTS SW</i> <i>Library:</i> RWDBTools.h++ <i>Library:</i> DmLmDbi <i>Class:</i> DmLmIntQuery	<i>Process:</i> EcDmV0ToEcsGateway <i>Library:</i> Persistent <i>Class:</i> DmGwAttributeMap	The EcDmV0ToEcsGateway requests data collection attribute and keyword mappings from the Data Dictionary database via the EcDmDictService to translate requests from the V0 IMS to the SDPS and back again.
Return Attribute Mappings (V0)	One per request	<i>Process:</i> EcDmV0ToEcsGateway <i>Library:</i> Persistent <i>Class:</i> DmGwAttributeMap	<i>Process:</i> EcDmDictService <i>COTS SW</i> <i>Library:</i> RWDBTools.h++ <i>Library:</i> DmLmDbi <i>Class:</i> DmLmIntQuery	The EcDmDictService returns the data collection attribute and keyword mappings requested by the user via the EcDmV0ToEcsGateway .
Request Attribute Mappings (ASTER)	One per request from ASTER Gateway	<i>Process:</i> EcDmDictService <i>COTS SW</i> <i>Library:</i> RWDBTools.h++ <i>Library:</i> DmLmDbi <i>Class:</i> DmLmIntQuery	<i>Processes:</i> EcDmEcsToAsterGateway, EcDmAsterToEcsGateway <i>Library:</i> DmAsGwCommon <i>Class:</i> DmAsGwTranslate	The EcDmEcsToAsterGateway and EcDmAsterToEcsGateway request data collection attribute and keyword mappings from the Data Dictionary database via the EcDmDictService to translate requests from the ASTER GDS to the SDPS and back again.
Return Attribute Mappings (ASTER)	One per request	<i>Processes:</i> EcDmEcsToAsterGateway, EcDmAsterToEcsGateway <i>Library:</i> DmAsGwCommon <i>Class:</i> DmAsGwTranslate	<i>Process:</i> EcDmDictService <i>COTS SW</i> <i>Library:</i> RWDBTools.h++ <i>Library:</i> DmLmDbi <i>Class:</i> DmLmIntQuery	The EcDmDictService returns the data collection attribute and keyword mappings requested by the user via the EcDmEcsToAsterGateway or EcDmAsterToEcsGateway .

Table 4.4.1.5-1. Data Dictionary CSCI Process Interface Events (7 of 7)

Event	Event Frequency	Interface	Initiated By	Event Description
Send ESDT Installation Information	One per new ESDT added to ECS	<i>Process:</i> EcDmDictService <i>Library:</i> EcDmDdClient <i>Class:</i> DmDdCISchemaRequest	<i>Process:</i> EcDsScienceDataServer <i>Library:</i> DsDe1 <i>Class:</i> DsDeDataDictController	The EcDsScienceDataServer inserts new collection information into the DMS Data Dictionary database when new Earth Science Data Types (ESDTs) are added to the SDPS.
Replace ESDT Installation Information	One per ESDT update	<i>Process:</i> EcDmDictService <i>Library:</i> EcDmDdClient <i>Class:</i> DmDdCISchemaRequest	<i>Process:</i> EcDsScienceDataServer <i>Class:</i> DsDeDataDictController	The EcDsScienceDataServer sends updated ESDT information to the EcDmDictService whenever an ESDT is updated. This data consists of updated Inventory and Collection level metadata.
Import GDS Valids in ASTER Format	Based on ASTER valids processing cycle ~ once per week	ECS Host - EDC	DAAC Operations Staff <i>Process:</i> EcDmDdMaintenanceTool <i>Classes:</i> DmLmDbiUtils, DmDdMtMainWindow	The DAAC Operations Staff at the EDC receives a valids file from the ASTER GDS format via e-mail (included as text, not as an attachment) via the EcDmDdMaintenanceTool.
Export ECS Valids in ASTER Format	Based on ASTER valids processing cycle ~ once per week	ASTER GDS Host	DAAC Operations Staff <i>Process:</i> EcDmDdMaintenanceTool <i>Classes:</i> DmLmDbiUtils, DmDdMtMainWindow	The DAAC Operations Staff sends the valids file to the ASTER GDS format via e-mail (included as text, not as an attachment) via the EcDmDdMaintenanceTool.

4.4.1.6 Data Dictionary CSCI Data Stores

Table 4.4.1.6-1 provides descriptions of the data stores shown in the Data Dictionary CSCI architecture diagram.

Table 4.4.1.6-1. Data Dictionary CSCI Data Stores

Data Store	Type	Functionality
EcDmDictService	Database	<p>The Data Dictionary database, EcDmDictService is a Sybase relational database that persistently stores the collection and collection related information on a physical disk medium.</p> <p>Data stores in the Data Dictionary database include:</p> <ul style="list-style-type: none"> • Collection Types: A list of all the data types within the ECS. • Collection Metadata: Various types of collection metadata including instrument, platform, sensor, topic, keyword, temporal and spatial data. • Collection Attributes and Keywords: Attributes and keywords associated with collections originating within and outside the ECS. • Collection Attribute and Keyword Mappings: Associations between the V0 IMS attributes and valid keywords and the ECS attributes and keywords are maintained. • Collection to Information Manager Mappings: Associations between the information manager and the ECS collections stored within them are maintained.

4.4.2 V0 Gateway Software Description

4.4.2.1 V0 Gateway Functional Overview

The Version 0 Gateway (V0 GTWAY) CSCI provides interoperability with the V0 Information Management System for inventory searches, browse requests, product orders, and price estimate requests.

The V0 GTWAY CSCI is one process, the V0 to ECS Gateway server. Queries are passed between the V0 IMS and the V0 Gateway processes using the Object Description Language (ODL) format. The structure of the V0 ODL messages is documented in “Interface Control Definition for the EOS Data Gateway (EDG) Messages and Development Data Dictionary” (423-42-06).

Since the V0 IMS uses different attributes to describe data collections within its data archive, the V0 GTWAY CSCI translates those attributes as defined in the SDPS. To perform the translation, the V0 Gateway uses the data collection attribute and valid keyword mapping information contained within the Data Dictionary database to translate the V0 attributes into equivalent SDPS attributes.

4.4.2.2 V0 Gateway Context

Figures 4.4.2.2-1 and 4.4.2.2-2 are the V0 GTWAY CSCI context diagrams. The diagrams show the events sent to the V0 GTWAY CSCI and the events the V0 GTWAY CSCI sends to other CSCIs. Tables 4.4.2.2-1 and 4.4.2.2-2 provide descriptions of the interface events shown in the V0 GTWAY CSCI context diagrams.

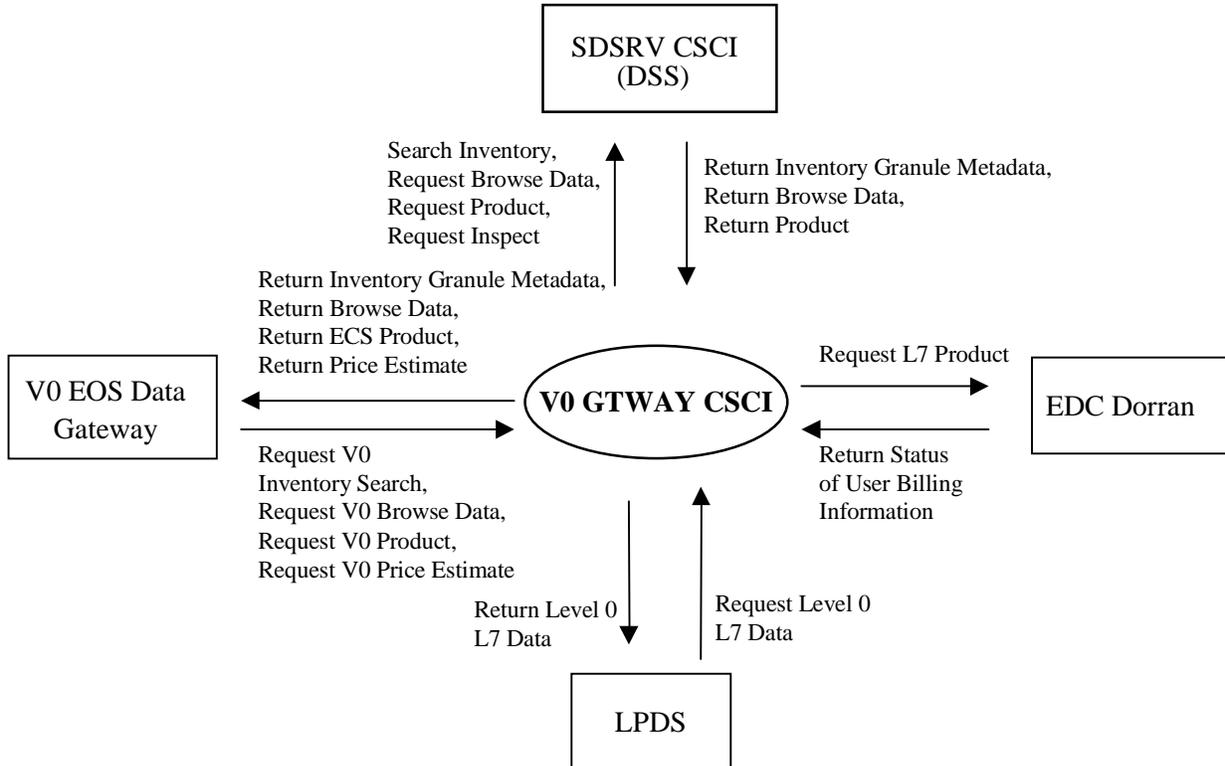


Figure 4.4.2.2-1. V0 GTWAY CSCI Context Diagram

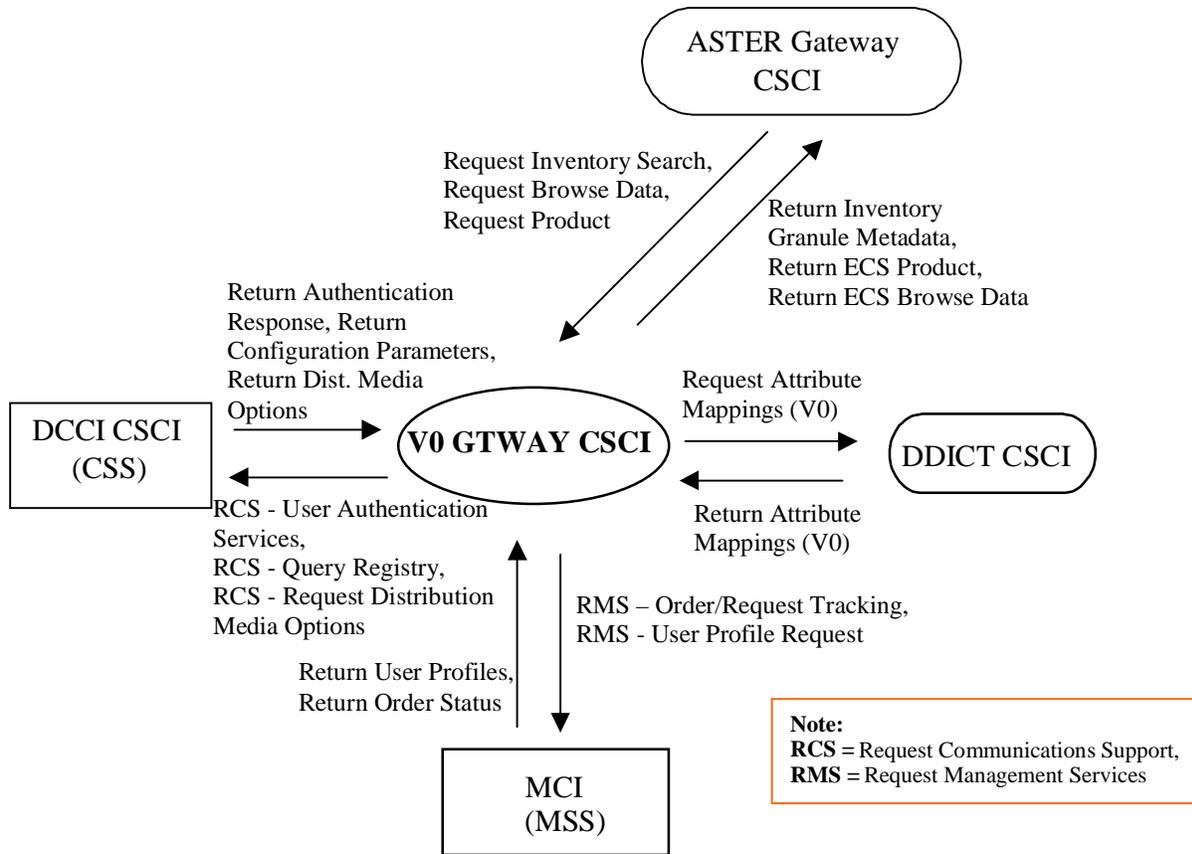


Figure 4.4.2.2-2. V0 GTWAY CSCI Context Diagram

Table 4.4.2.2-1. V0 GTWAY CSCI Interface Events (1 of 2)

Event	Interface Event Description
Search Inventory	The V0 GTWAY CSCI submits inventory search requests to the SDSRV CSCI within the DSS on behalf of a user.
Request Browse Data	The V0 GTWAY CSCI receives browse requests from the V0 IMS via the EOS Data Gateway and submits the browse requests to the SDSRV CSCI within the DSS on behalf of a user.
Request Product	The V0 GTWAY CSCI submits product requests to the SDSRV CSCI within the DSS on behalf of a user.
Request Inspect	The V0 GTWAY CSCI sends a request for an inspection of granule metadata to the SDSRV CSCI in support of a price estimate request.
Return Inventory Granule Metadata	The V0 GTWAY CSCI receives the inventory granule metadata identifying the scene within the granule based on an inventory search request from the SDSRV CSCI .

Table 4.4.2.2-1. V0 GTWAY CSCI Interface Events (2 of 2)

Event	Interface Event Description
Return Browse Data	The V0 GTWAY CSCI receives browse data associated with a particular granule from the SDSRV CSCI .
Return Product	The V0 GTWAY CSCI receives granules (including Landsat 7 data archived within the ECS) from the SDSRV CSCI based upon a product request.
Request L7 Product	The V0 GTWAY CSCI receives Landsat 7 product requests from the ASTGW CSCI or V0 EOS Data Gateway. The V0 GTWAY CSCI sends requests for Landsat 7 products to the V0 IMS for billing and accounting via the EDC Dorrان (Billing and Accounting System) .
Return Status of User Billing Information	The EDC Dorrان (Billing and Accounting System) returns the status of the user billing information to the V0 GTWAY CSCI to allow or deny the user access to ECS data and services.
Request Level 0 L7 Data	The V0 GTWAY CSCI receives requests for Landsat 7 Level 0 data from the Level 1 Product Distribution System (LPDS) . The LPDS creates level 1 products from the Landsat level 0 products ordered through the V0 GTWAY CSCI upon request.
Return Level 0 L7 Data	The V0 GTWAY CSCI returns Landsat 7 level 0 data to the LPDS for generation of a higher level product to be distributed by the LPDS to a user.
Request V0 Inventory Search	The V0 GTWAY CSCI receives inventory search requests from the V0 EOS Data Gateway on behalf of an external ECS user.
Request V0 Browse Data	The V0 GTWAY CSCI receives browse data requests from the V0 EOS Data Gateway on behalf of an external ECS user.
Request V0 Product	The V0 GTWAY CSCI receives product requests from the V0 EOS Data Gateway on behalf of an external ECS user.
Request V0 Price Estimate	The V0 GTWAY CSCI receives price estimate requests from the V0 EOS Data Gateway on behalf of an external ECS user.
Return ECS Product	The V0 GTWAY CSCI returns granules (including Landsat 7 data archived within the ECS) to the V0 EOS Data Gateway .
Return Price Estimate	The V0 GTWAY CSCI returns a price estimate for a price estimate request to the user via the V0 EOS Data Gateway .

Table 4.4.2.2-2. V0 GTWAY CSCI Interface Events (1 of 3)

Event	Interface Event Description
Request Inventory Search	The V0 GTWAY CSCI receives ECS inventory search requests from the ASTGW CSCI on behalf of an ASTER GDS or external ECS user.
Request Browse Data	The V0 GTWAY CSCI receives requests for ECS browse data requests from the ASTGW CSCI on behalf of an ASTER GDS or external ECS user.
Request Product	The V0 GTWAY CSCI receives ECS product requests from the ASTGW CSCI on behalf of an ASTER GDS or external ECS user.
Return Inventory Granule Metadata	The V0 GTWAY CSCI returns the inventory granule metadata identifying the scene within the granule based on an inventory search request from the ASTGW CSCI .
Return ECS Product	The V0 GTWAY CSCI returns granules (including Landsat 7 data archived within the ECS) to the ASTGW CSCI .

Table 4.4.2.2-2. V0 GTWAY CSCI Interface Events (2 of 3)

Event	Interface Event Description
Return Browse Data	The ASTGW CSCI receives browse data associated with a particular granule from the V0 GTWAY CSCI.
Request Attribute Mappings (V0)	The V0 GTWAY CSCI sends requests for data collection attribute and keyword mappings on behalf of a user to the Data Dictionary (DDICT CSCI) database via the Sybase Server to translate requests from the V0 IMS to the ECS protocol and back again.
Return Attribute Mappings (V0)	The DDICT CSCI returns the data collection attribute and keyword mappings to the V0 GTWAY CSCI on behalf of a user.
Request Management Services	<p>The MCI provides a basic management library of services to the CSCIs, implemented as client or server applications, using the DCCI CSCI Process Framework. The basic management library of services includes:</p> <ul style="list-style-type: none"> • System startup and shutdown - Please refer to the release-related, current version of the Mission Operations Procedures for the ECS Project document (611) and the current ECS Project Training Material document (625), identified in Section 2.2.1 of this document. <p>The MCI also interfaces with other CSCIs to perform the following:</p> <ul style="list-style-type: none"> • Order/Request Tracking - The V0 GTWAY CSCI interfaces with the MCI Order/Request Tracking service (EcMsAcOrderSrvr) to create a user product order. • User Profile Request - The MCI provides requesting CSCIs with User Profile parameters such as e-mail address and shipping address to support their processing activities.
Return User Profiles	The V0 GTWAY CSCI receives user profile information from the MCI to authenticate a user.
Return Order Status	The V0 GTWAY CSCI receives order ids and order status information for products requested by users from the MCI .
Request Communications Support	<p>The DCCI CSCI provides a library of services available to each SDPS and CSMS CSCI. The CSCI services required to perform specific assignments are requested from the DCCI CSCI. These services include:</p> <ul style="list-style-type: none"> • DCE Support • File Transfer Services • Network & Distributed File Services • Bulk Data Transfer Services • Name/Address Services • Password Services • Server Request Framework (SRF) • Universal Reference (UR) • Error/Event Logging • Fault Handling Services • User Authentication Services • Mode Information • (Query Registry) Retrieving the requested configuration attribute-value pairs from the Configuration Registry • Distribution Media Options from the Configuration Registry

Table 4.4.2.2- V0 GTWAY CSCI Interface Events (3 of 3)

Event	Interface Event Description
Return Authentication Response	The V0 GTWAY CSCI receives an authentication or error message for a user for access to ECS data and services from the DCCI CSCI .
Return Configuration Parameters	The V0 Gateway CSCI receives the configuration parameters and associated values from the Registry Server from the DCCI CSCI .
Return Dist. Media Options	The V0 GTWAY CSCI receives the requested distribution media options from the DCCI CSCI .

4.4.2.3 V0 Gateway Architecture

Figures 4.4.2.3-1 and 4.4.2.3-2 are the V0 GTWAY CSCI architecture diagrams. The diagrams show the events sent to the V0 GTWAY CSCI processes and the events the V0 GTWAY CSCI processes send to other processes.

The V0 GTWAY CSCI is one process, the EcDmV0ToEcsGateway, as shown in the V0 GTWAY CSCI architecture diagrams.

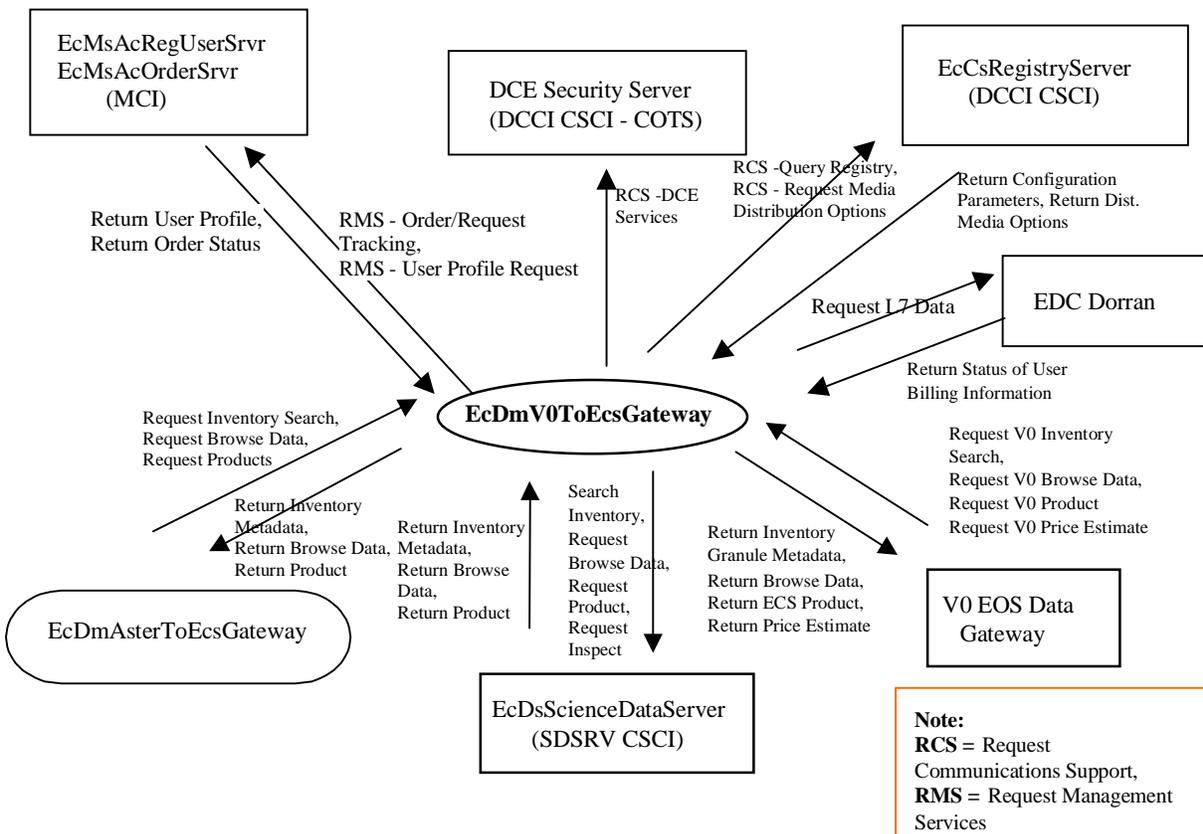


Figure 4.4.2.3-1. V0 GTWAY CSCI Architecture Diagram

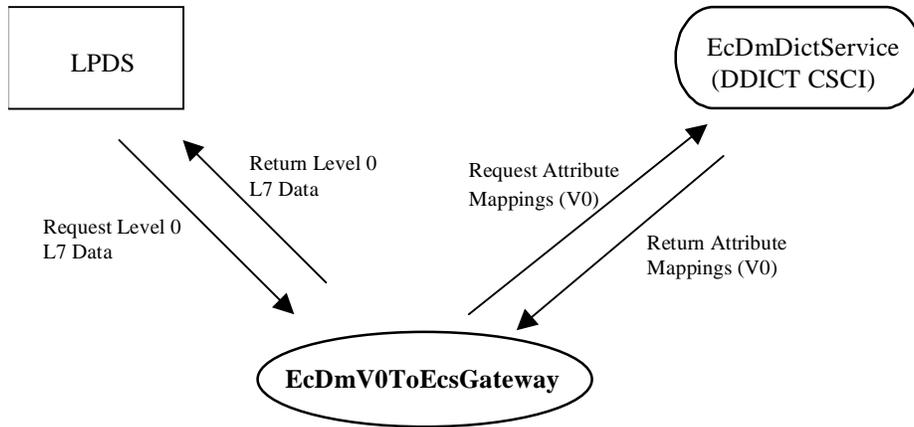


Figure 4.4.2.3-2. V0 GTWAY CSCI Architecture Diagram

4.4.2.4 V0 Gateway Process Descriptions

Table 4.4.2.4-1 provides descriptions of the processes shown in the V0 GTWAY CSCI architecture diagrams.

Table 4.4.2.4-1. V0 GTWAY CSCI Processes

Process	Type	COTS/ Developed	Functionality
EcDmV0ToEcsGateway	Server	Developed	<p>The V0 to ECS Gateway server allows users of the V0 IMS to query on data and services defined within the SDPS.</p> <p>Major Interfaces:</p> <ul style="list-style-type: none"> • Inventory Search: Allows a user to perform searches for data granules within the SDPS archive • Browse: Allows users to browse data granules previously found during a search • Product request: Provides the capability for users to submit data acquire requests for obtaining data granules from the SDPS archive • Price Estimate requests: Allows users to request a price estimate for a given set of granules with spatial and/or band sub-setting constraints • Inspect Requests: Requests DSS to inspect granule metadata in support of a price estimate request. <p>Server Supports:</p> <ul style="list-style-type: none"> • Synchronous request processing • Asynchronous request processing • Multiple concurrent requests

4.4.2.5 V0 Gateway Process Interface Descriptions

Tables 4.4.2.5-1 and 4.4.2.5-2 provide descriptions of the interface events shown in the V0 GTWAY CSCI architecture diagrams.

Table 4.4.2.5-1. V0 GTWAY CSCI Process Interface Events (1 of 7)

Event	Event Frequency	Interface	Initiated By	Event Description
Request Communications Support	Per process request	<p>Process: DCE Security Server</p> <p>Libraries: EcSelogin, EcSeLogincontext</p> <p>Classes: EcSelogin, EcSeLogincontext</p> <p>Library: EcPf</p> <p>Classes: EcPfManagedServer, EcPfclient</p> <p>Library (Common): EcUr</p> <p>Class: EcUrServerUR</p> <p>Library: Event</p> <p>Class: EcLgErrormsg</p> <p>Process: EcCsRegistryServer</p> <p>Library: EcCsRegistryClient</p> <p>Class: EcRgRegistryServer_C</p>	Process: EcDmV0ToEcsGateway	<p>The DCCI CSCI provides a library of services available to each SDPS and CSMS process. The process services required to perform specific assignments are requested from the DCCI CSCI. These services include:</p> <ul style="list-style-type: none"> • DCE Support • File Transfer Services • Network & Distributed File Services • Bulk Data Transfer Services • Name/Address Services • Password Services • Server Request Framework (SRF) • Universal Reference (UR) • Error/Event Logging • Fault Handling Services • User Authentication Services • Mode Information • (Query Registry) Retrieving the requested configuration attribute-value pairs from the Configuration Registry • Distribution Media Options from the Configuration Registry

Table 4.4.2.5-1. V0 GTWAY CSCI Process Interface Events (2 of 7)

Event	Event Frequency	Interface	Initiated By	Event Description
Return Configuration Parameters	One set per request	<i>Process:</i> EcDmV0ToEcsGateway	<i>Process:</i> EcCsRegistryServer <i>Library:</i> EcCsRegistryClient <i>Class:</i> EcRgRegistryServer_C	The EcCsRegistryServer returns the attribute-value pairs (configuration parameters) to the EcDmV0ToEcsGateway upon request.
Return Dist. Media Options	One set per request	<i>Process:</i> EcCsRegistryServer <i>Library:</i> EcCsRegistryClient <i>Class:</i> EcRgRegistryServer_C	<i>Process:</i> EcDmV0ToEcsGateway	The EcCsRegistryServer returns the requested distribution media options to the EcDmV0ToEcsGateway.
Request L7 Data	One order per request	<i>Process:</i> EDC Dorrان (Billing and Accounting System)	<i>Process:</i> EcDmV0ToEcsGateway <i>Library:</i> RequestProcessing <i>Class:</i> DmGwAcquireRequest	The EcDmV0ToECSGateway sends billing requests to the EDC Dorrان (Billing and Accounting System) .
Return Status of User Billing Information	A status returned per request	<i>Process:</i> EcDmV0ToEcsGateway <i>Library:</i> RequestProcessing <i>Class:</i> DmGwAcquireRequest	<i>Process:</i> EDC Dorrان (Billing and Accounting System)	In the case of Landsat 7 data sets, the EDC Dorrان (Billing and Accounting System) returns the status of the user billing information to the EcDmV0ToEcsGateway to allow or deny the user access to ECS data and services.
Request V0 Inventory Search	One per inventory search request	<i>Process:</i> EcDmV0ToEcsGateway <i>Library:</i> RequestProcessing <i>Class:</i> DmGwInvSearchRequest	<i>Process:</i> V0 EOS Data Gateway	The EcDmV0ToEcsGateway receives inventory search requests from the V0 EOS Data Gateway on behalf of an external ECS user.

Table 4.4.2.5-1. V0 GTWAY CSCI Process Interface Events (3 of 7)

Event	Event Frequency	Interface	Initiated By	Event Description
Request V0 Browse Data	One per browse request	<i>Process:</i> EcDmV0ToEcsGateway <i>Library:</i> RequestProcessing <i>Class:</i> DmGwBrowseRequest	<i>Process:</i> V0 EOS Data Gateway	The EcDmV0ToEcsGateway receives browse data requests from the V0 EOS Data Gateway on behalf of an external ECS user.
Request V0 Product	One per product request	<i>Process:</i> EcDmV0ToEcsGateway <i>Library:</i> RequestProcessing <i>Class:</i> DmGwAcquireRequest	<i>Process:</i> V0 EOS Data Gateway	The EcDmV0ToEcsGateway receives product requests from the V0 EOS Data Gateway on behalf of an external ECS user.
Request V0 Price Estimate	One per product	<i>Process:</i> EcDmV0ToEcsGateway <i>Library:</i> RequestProcessing <i>Class:</i> DmGwPriceEstRequest	<i>Process:</i> V0 EOS Data Gateway	The EcDmV0ToEcsGateway receives price estimate requests from the V0 EOS Data Gateway on behalf of an external ECS user.
Return Inventory Granule Metadata	One per requested granule	Process: V0 EOS Data Gateway Process: EcDmAsterToEcsGateway <i>Library:</i> DmAsGwAsterReqProc <i>Classes:</i> DmAsGwAsterInvRequestor, DmAsGwAsterBroRequestor, DmAsGwAsterProRequestor	<i>Process:</i> EcDmV0ToEcsGateway <i>Library:</i> RequestProcessing <i>Class:</i> DmGwInvSearchRequest	The EcDmV0ToEcsGateway forwards the inventory granule metadata identifying the scene within the granule based on an inventory search request from the V0 EOS Data Gateway or the EcDmAsterToEcsGateway .

Table 4.4.2.5-1. V0 GTWAY CSCI Process Interface Events (4 of 7)

Event	Event Frequency	Interface	Initiated By	Event Description
Return Browse Data	One per request	<p>Process: V0 EOS Data Gateway</p> <p>Process: EcDmAsterToEcsGateway</p> <p>Library: DmAsGwAsterReqProc</p> <p>Classes: DmAsGwAsterInvRequestor, DmAsGwAsterBroRequestor, DmAsGwAsterProRequestor</p>	<p>Process: EcDmV0ToEcsGateway</p> <p>Library: RequestProcessing</p> <p>Class: DmGwV0BrowseRequest</p>	The EcDmV0ToEcsGateway receives browse data associated with a particular granule from the V0 EOS Data Gateway or the EcDmAsterToEcsGateway .
Return ECS Product	One per product request	<p>Process: V0 EOS Data Gateway</p>	<p>Process: EcDmV0ToEcsGateway</p> <p>Library: RequestProcessing</p> <p>Class: DmGwProductRequest</p>	The EcDmV0ToEcsGateway receives products based upon V0 user product requests from the EcDsScienceDataServer via the V0 EOS Data Gateway .
Return Price Estimate	One estimate per order	<p>Process: V0 EOS Data Gateway</p>	<p>Process: EcDmV0ToEcsGateway</p> <p>Library: RequestProcessing</p> <p>Class: DmGwPriceEstRequest</p>	The EcDmV0ToEcsGateway calculates the price estimate and sends the estimate to the user via the V0 EOS Data Gateway .
Search Inventory	One per inventory search request	<p>Process: EcDsScienceDataServer</p> <p>Library: DsCI</p> <p>Classes: DsCIESDTReferenceCollector, DsCIRequest</p>	<p>Process: EcDmV0ToEcsGateway</p> <p>Library: RequestProcessing</p> <p>Class: DmGwInvSearchRequest</p>	The EcDmV0ToEcsGateway submits inventory search requests to the EcDsScienceDataServer on behalf of a user.

Table 4.4.2.5-1. V0 GTWAY CSCI Process Interface Events (5 of 7)

Event	Event Frequency	Interface	Initiated By	Event Description
Request Browse Data	One per browse request	<i>Process:</i> EcDsScienceDataServer <i>Library:</i> DsCI <i>Classes:</i> DsCIESDTRReferenceCollector, DsCIRequest	<i>Process:</i> EcDmV0ToEcsGateway <i>Library:</i> RequestProcessing <i>Class:</i> DmGwBrowseRequest	The EcDmV0ToEcsGateway submits requests for browse data to the EcDsScienceDataServer on behalf of a user.
Request Product	One per product request	<i>Process:</i> EcDsScienceDataServer <i>Library:</i> DsCI <i>Classes:</i> DsCIESDTRReferenceCollector, DsCIRequest	<i>Process:</i> EcDmV0ToEcsGateway <i>Library:</i> RequestProcessing <i>Class:</i> DmGwAcquireRequest	The EcDmV0ToEcsGateway submits product requests to the EcDsScienceDataServer on behalf of a user.
Request Inspect	One per price estimate request	<i>Process:</i> EcDsScienceDataServer <i>Library:</i> DsCI <i>Classes:</i> DsCIESDTRReferenceCollector, DsCIRequest	<i>Process:</i> EcDmV0ToEcsGateway <i>Library:</i> RequestProcessing <i>Class:</i> DmGwPriceEstRequest	The EcDmV0ToEcsGateway sends a request for an inspection of granule metadata to the EcDsScienceDataServer in support of a price estimate request.
Return Product	One per product request	<i>Process:</i> EcDmV0ToEcsGateway <i>Library:</i> RequestProcessing <i>Class:</i> DmGwAcquireRequest	<i>Process:</i> EcDsScienceDataServer <i>Library:</i> DsCI <i>Classes:</i> DsCIESDTRReferenceCollector, DsCIRequest	The EcDsScienceDataServer returns products based upon a product request from a user.

Table 4.4.2.5-1. V0 GTWAY CSCI Process Interface Events (6 of 7)

Event	Event Frequency	Interface	Initiated By	Event Description
Request Inventory Search	One item per request	<i>Process:</i> EcDmV0ToEcsGateway <i>Library:</i> RequestProcessing <i>Class:</i> DmGwInvSearchRequest	<i>Process:</i> EcDmAsterToEcsGateway <i>Library:</i> DmAsGwAsterReqProc <i>Class:</i> DmAsGwAsterInvRequestor	The EcDmV0ToEcsGateway receives inventory search requests from the EcDmAsterToEcsGateway .
Request Browse Data	One product per request	<i>Process:</i> EcDmV0ToEcsGateway <i>Library:</i> EcsReqProc <i>Class:</i> DmAsGwEcsBrowseRequest	<i>Process:</i> EcDmAsterToEcsGateway <i>Library:</i> DmAsGwAsterReqProc <i>Class:</i> DmAsGwAsterBroRequestor	The EcDmV0ToEcsGateway receives browse data requests from the EcDmAsterToEcsGateway .
Request Products	One product per request	<i>Process:</i> EcDmV0ToEcsGateway <i>Library:</i> EcsReqProc <i>Class:</i> DmAsGwEcsProRequest	<i>Process:</i> EcDmAsterToEcsGateway <i>Library:</i> DmAsGwAsterReqProc <i>Class:</i> DmAsGwAsterProRequestor	The EcDmV0ToEcsGateway receives product requests from the EcDmAsterToEcsGateway .
Return User Profile	One per profile request	<i>Process:</i> EcDmV0ToEcsGateway <i>Class:</i> DmGwRequestReceiver	<i>Process:</i> EcMsAcRegUserSrvr <i>Library:</i> MsAcCInt <i>Class:</i> EcAcProfileMgr	The EcMsAcRegUserSrvr returns a user profile based upon a profile request from a user.
Request Management Services (RMS)	At system startup or shutdown and for restarts	<i>Process:</i> EcDmV0ToEcsGateway	DAAC unique startup scripts	<ul style="list-style-type: none"> • System startup and shutdown - Please refer to the release-related, current version of the Mission Operations Procedures for the ECS Project document (611) and the current ECS Project Training Material document (625), identified in Section 2.2.1 of this document.

Table 4.4.2.5-1. V0 GTWAY CSCI Process Interface Events (7 of 7)

Event	Event Frequency	Interface	Initiated By	Event Description
RMS (Cont.)	One per product order	<i>Process:</i> EcMsAcOrderSrvr <i>Library:</i> MsAcClnt <i>Class:</i> EcAcOrderCMgr	<i>Process:</i> EcDmV0ToEcsGateway <i>Class:</i> DmGwRequestReceiver	<ul style="list-style-type: none"> • DMS Order/Request Tracking Update – The V0 GTWAY interfaces with the Order/Request tracking service, EcMsAcOrderSrvr, to create a user product order.
RMS (Cont.)	One per profile request	<i>Process:</i> EcMsAcRegUserSrvr <i>Library:</i> MsAcClnt <i>Class:</i> EcAcProfileMgr	<i>Process:</i> EcDmV0ToEcsGateway <i>Class:</i> DmGwRequestReceiver	<ul style="list-style-type: none"> • User Profile Request - The EcMsAcRegUserSrvr provides requesting processes with User Profile information such as e-mail address and shipping address to support their processing activities.

Table 4.4.2.5-2. V0 GTWAY CSCI Process Interface Events

Event	Event Frequency	Interface	Initiated By	Event Description
Request Attribute Mappings (V0)	One set per request	<i>Process:</i> EcDmDictService <i>COTS SW</i> <i>Library:</i> RWDBTools.h++ <i>Library:</i> DmLmDbi <i>Class:</i> DmLmIntQuery	<i>Process:</i> EcDmV0ToEcsGateway <i>Library:</i> Persistent <i>Class:</i> DmGwAttributeMap	The EcDmV0ToEcsGateway sends requests to the EcDmDictService for data collection and keyword mappings to translate requests from the V0 IMS to the SDPS and back again.
Return Attribute Mappings (V0)	One set per request	<i>Process:</i> EcDmV0ToEcsGateway <i>Library:</i> Persistent <i>Class:</i> DmGwAttributeMap	<i>Process:</i> EcDmDictService <i>COTS SW</i> <i>Library:</i> RWDBTools.h++ <i>Library:</i> DmLmDbi <i>Class:</i> DmLmIntQuery	The EcDmV0ToEcsGateway receives data collection and keyword mappings to translate requests from the V0 IMS to the SDPS and back again from the EcDmDictService .
Request Level 0 L7 data	Per user request	LPDS	<i>Process:</i> EcDmV0ToEcsGateway <i>Library:</i> RequestProcessing <i>Class:</i> DmGwAcquireRequest	The EcDmV0ToEcsGateway receives requests for Landsat 7 Level 0 data from the Level 1 Product Distribution System (LPDS) . The LPDS creates level 1 products from the Landsat level 0 data ordered through the EcDmV0ToEcsGateway upon request.
Return Level 0 L7 Data	One per user request	<i>Process:</i> EcDmV0ToEcsGateway <i>Library:</i> RequestProcessing <i>Class:</i> DmGwAcquireRequest	LPDS	The EcDmV0ToEcsGateway returns Landsat 7 level 0 data to the LPDS for generation of higher level products to be distributed by the LPDS to a user.

4.4.2.6 V0 Gateway Data Stores

Table 4.4.3.6-1 provides descriptions of the data stores shown in the V0 GTWAY CSCI architecture diagram. The V0 to ECS and ECS to V0 Gateway processes access the Data Dictionary data store.

Table 4.4.3.6-1. V0 GTWAY CSCI Data Store

Data Store	Type	Functionality
EcDmDictService	Database	<p>The Data Dictionary database, EcDmDictService, is a Sybase relational database that persistently stores the collection and collection related information on a physical disk medium. The DDICT database is replicated wholly to each DAAC.</p> <p>The data stores in the Data Dictionary database used by the V0 GTWAY CSCI are:</p> <ul style="list-style-type: none"> • Collection Types: A list of all the data types within the SDPS • Collection Attributes and Keywords: Attributes and keywords associated with collections originating within and outside the SDPS are used by the V0 GTWAY CSCI to translate requests between the V0 IMS and the SDPS and between the ASTER GDS and the SDPS.

4.4.3 ASTER Gateway Software Description

4.4.3.1 ASTER Gateway Functional Overview

The ASTER Gateway (ASTGW) provides access to data and services accessible at local and remote sites. It decomposes requests and dispatches the component parts to other components (i.e., Information Manager or Gateways) of the local site or to other components via the ASTGW to a remote site.

The ASTGW makes itself accessible to the remote information by exporting schema information to the Data Dictionary Server (EcDmDictService) and making services available through the Data Dictionary Service (DDICT) portion of the Data Management Subsystem (DMS).

4.4.3.2 ASTER Gateway Context

Figures 4.4.3.2-1 and 4.4.3.2-2 are the ASTGW context diagrams. The diagrams show the events sent to other CSCIs or CSCs and the events the ASTGW receives from other CSCIs and CSCs. Tables 4.4.3.2-1 and 4.4.3.2-2 provide descriptions of the interface events shown in the ASTGW context diagrams.

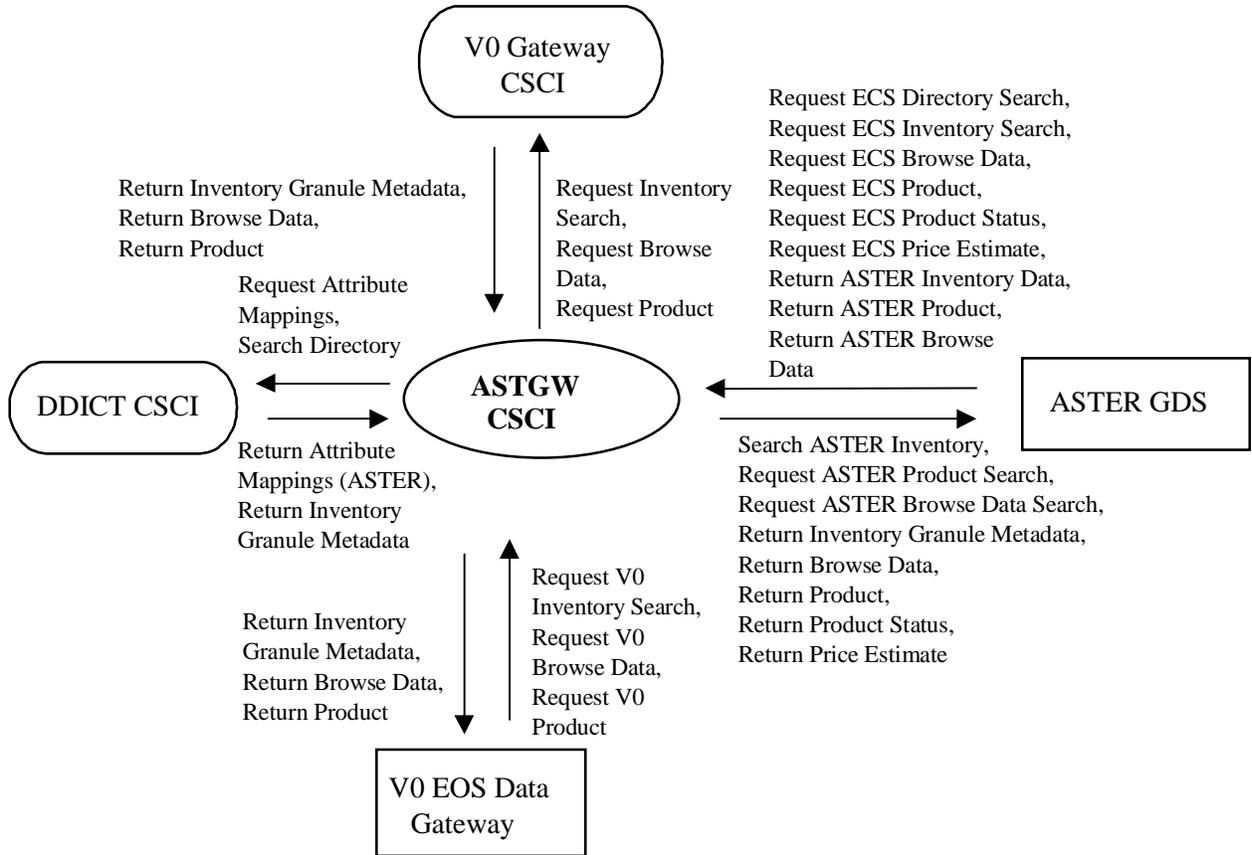


Figure 4.4.3.2-1. ASTER Gateway (ASTGW) CSCI Context Diagram

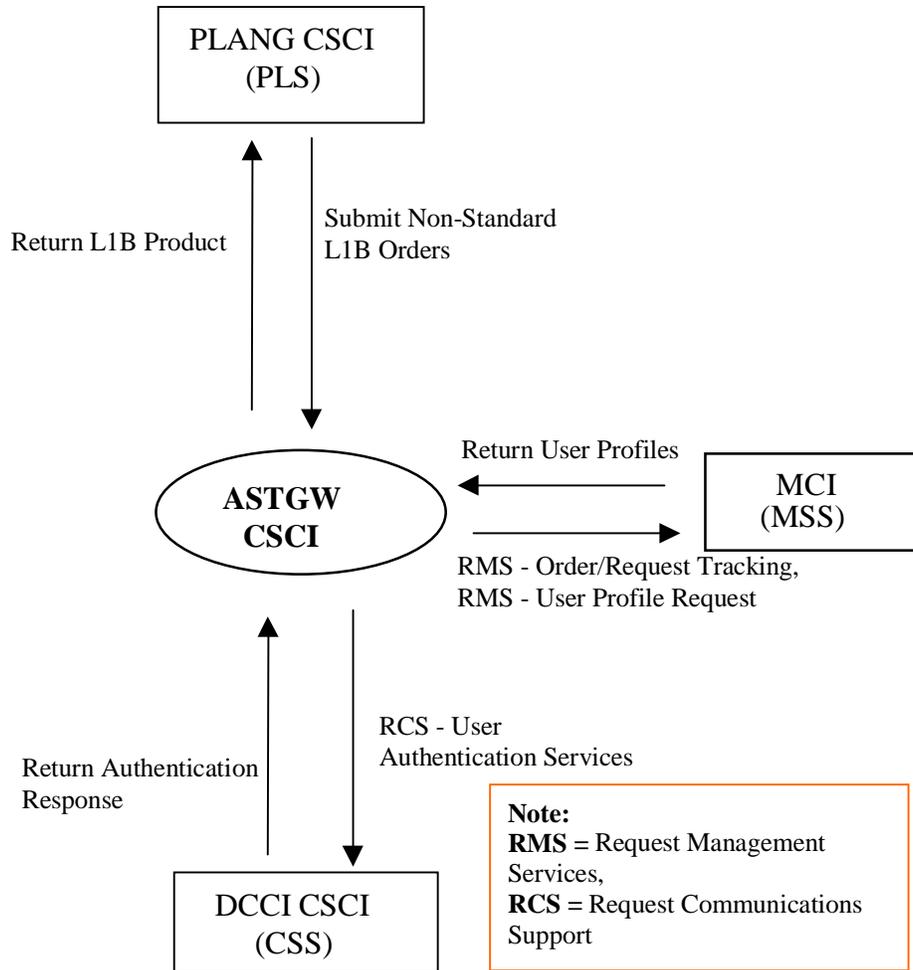


Figure 4.4.3.2-2. ASTER Gateway (ASTGW) CSCI Context Diagram

Table 4.4.3.2-1. ASTER Gateway (ASTGW) CSCI Interface Events (1 of 3)

Event	Interface Event Description
Request Inventory Search	The ASTGW CSCI submits inventory search requests to the V0 GTWAY CSCI on behalf of a GDS user or an external ECS user.
Request Browse Data	The ASTGW CSCI submits browse data requests to the V0 GTWAY CSCI on behalf of an ASTER GDS or external ECS user.
Request Product	The ASTGW CSCI submits product requests to the V0 GTWAY CSCI on behalf of an ASTER GDS or an external ECS user.
Request ECS Directory Search	The ASTGW CSCI receives directory search requests from the ASTER GDS on behalf of a GDS user.
Request ECS Inventory Search	The ASTGW CSCI receives inventory search requests from the ASTER GDS on behalf of a GDS user.

Table 4.4.3.2-1. ASTER Gateway (ASTGW) CSCI Interface Events (2 of 3)

Event	Interface Event Description
Request ECS Browse Data	The ASTGW CSCI receives browse data requests from the ASTER GDS on behalf of a GDS user.
Request ECS Product	The ASTGW CSCI receives product requests from the ASTER GDS on behalf of a GDS user.
Request ECS Product Status	The ASTGW CSCI receives product status requests from the ASTER GDS on behalf of a GDS user.
Request ECS Price Estimate	The ASTGW CSCI receives price estimate requests from the ASTER GDS on behalf of a GDS user.
Return ASTER Inventory Data	The ASTGW CSCI receives inventory data metadata from the ASTER GDS .
Return ASTER Product	The ASTGW CSCI receives ASTER higher level products from the ASTER GDS .
Return ASTER Browse Data	The ASTGW CSCI receives browse data from the ASTER GDS .
Search ASTER Inventory	The ASTGW CSCI submits inventory search requests to the ASTER GDS on behalf of an ECS user.
Request ASTER Product Search	The ASTGW CSCI submits product search requests to the ASTER GDS on behalf of an ECS user.
Request ASTER Browse Data Search	The ASTGW CSCI submits browse data search requests to the ASTER GDS on behalf of an ECS user.
Return Inventory Granule Metadata	The ASTGW CSCI returns the inventory granule metadata identifying the scene within the granule based on an inventory search request to the user via the ASTER GDS, V0 EOS Data Gateway, or V0 Gateway CSCI .
Return Browse Data	The ASTGW CSCI returns Browse data associated with a particular granule to the user via the ASTER GDS, V0 EOS Data Gateway, or V0 Gateway CSCI .
Return Product	The ASTGW CSCI returns ECS data (including Landsat 7 data archived within the ECS) to the user via the ASTER GDS, V0 EOS Data Gateway, or V0 Gateway CSCI based upon a product request. The ASTER GDS can only receive Landsat 7 fixed scenes because they do not have the means to handle floating scenes.
Return Product Status	The ASTGW CSCI returns ECS data status (including Landsat 7 data archived within the ECS) to the user via the ASTER GDS based upon a product status request.
Return Price Estimate	The ASTGW CSCI returns a price estimate for a price estimate request to the user via the ASTER GDS .
Request V0 Inventory Search	The ASTGW CSCI receives inventory search requests from the V0 EOS Data Gateway on behalf of an external ECS user.
Request V0 Browse Data	The ASTGW CSCI receives browse data requests from the V0 EOS Data Gateway on behalf of an external ECS user
Request V0 Product	The ASTGW CSCI receives product requests from the V0 EOS Data Gateway on behalf of an external ECS user.

Table 4.4.3.2-1. ASTER Gateway (ASTGW) CSCI Interface Events (3 of 3)

Event	Interface Event Description
Return Attribute Mappings (ASTER)	The ASTGW CSCI receives attribute mappings and keywords from the DDICT CSCI to translate V0 to ECS and ECS to V0 protocols.
Request Attribute Mappings	The ASTGW CSCI requests data collection attribute and keyword mappings on behalf of a user from the DDICT CSCI Data Dictionary database via the Sybase Server to translate requests from the ASTER GDS or V0 IMS to the ECS protocol and back again.
Search Directory	The ASTGW CSCI sends directory search requests to the DDICT CSCI .

Table 4.4.3.2-2. ASTER Gateway (ASTGW) CSCI Interface Events (1 of 2)

Event	Interface Event Description
Submit Non-Standard L1B Orders	The PLANG CSCI submits requests through the ASTGW CSCI for the production of non-standard L1B on-demand products.
Request Management Services	<p>The MCI provides a basic management library of services to the CSCIs, implemented as client or server applications, using the DCCI CSCI Process Framework. The basic management library of services includes:</p> <ul style="list-style-type: none"> • System startup and shutdown - Please refer to the release-related, current version of the Mission Operations Procedures for the ECS Project document (611) and the current ECS Project Training Material document (625), identified in Section 2.2.1 of this document. <p>The MCI also interfaces with other CSCIs to perform the following:</p> <ul style="list-style-type: none"> • Order/Request Tracking - The ASTGW CSCI interfaces with the MCI Order/Request Tracking service (EcMsAcOrderSvr) to create a user product order. • User Profile Request - The MCI provides requesting CSCIs with User Profile parameters such as e-mail address and shipping address to support their processing activities.

Table 4.4.3.2-2. ASTER Gateway (ASTGW) CSCI Interface Events (2 of 2)

Event	Interface Event Description
Request Communications Support	<p>The DCCI CSCI provides a library of services available to each SDPS and CSMS CSCI. The CSCI services required to perform specific assignments are requested from the DCCI CSCI. These services include:</p> <ul style="list-style-type: none"> • DCE Support • File Transfer Services • Network & Distributed File Services • Bulk Data Transfer Services • Name/Address Services • Password Services • Server Request Framework (SRF) • Universal Reference (UR) • Error/Event Logging • Fault Handling Services • User Authentication Services • Mode Information • (Query Registry) Retrieving the requested configuration attribute-value pairs from the Configuration Registry • Distribution Media Options from the Configuration Registry
Return Authentication Response	The ASTGW CSCI receives an authentication or error message for a user for access to ECS data and services from the DCCI CSCI .
Return L1B Product	The ASTGW CSCI returns the ASTER L1B product to the PLANG CSCI .

4.4.3.3 ASTER Gateway Architecture

Figures 4.4.3.3-1, 4.4.3.3-2, 4.4.3.3-3 and 4.4.3.3-4 are the ASTGW CSCI architecture diagrams. The diagrams show the events sent to the ASTGW CSCI processes and the events the ASTGW CSCI processes send to other processes.

The ASTGW CSCI is two processes, the EcDmEcsToAsterGateway and the EcDmAsterToEcsGateway, as shown in the ASTGW CSCI architecture diagrams.

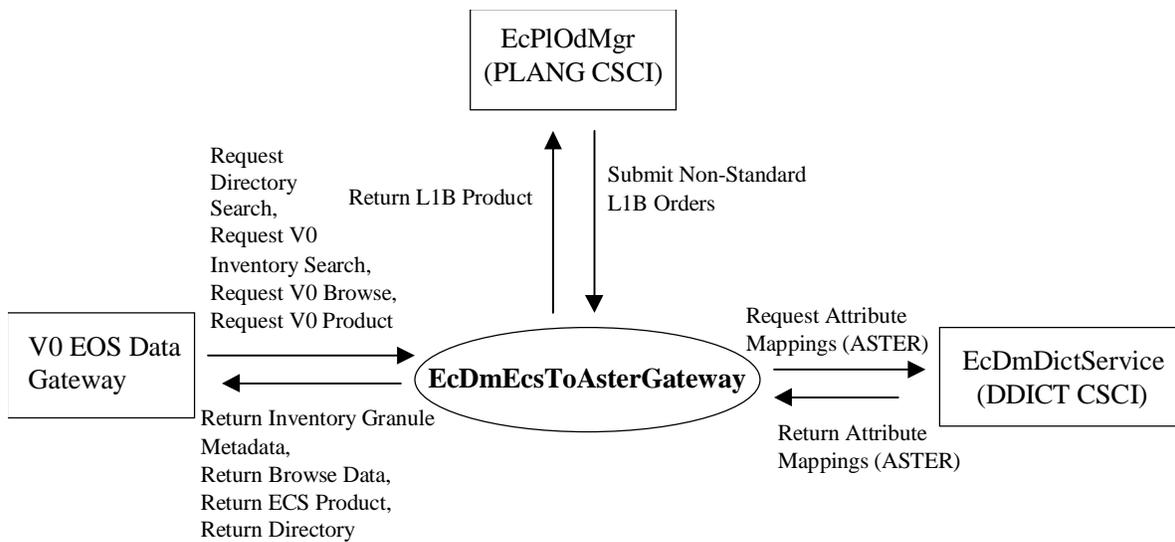


Figure 4.4.3.3-1. ASTER Gateway (ASTGW) CSCI Architecture Diagram

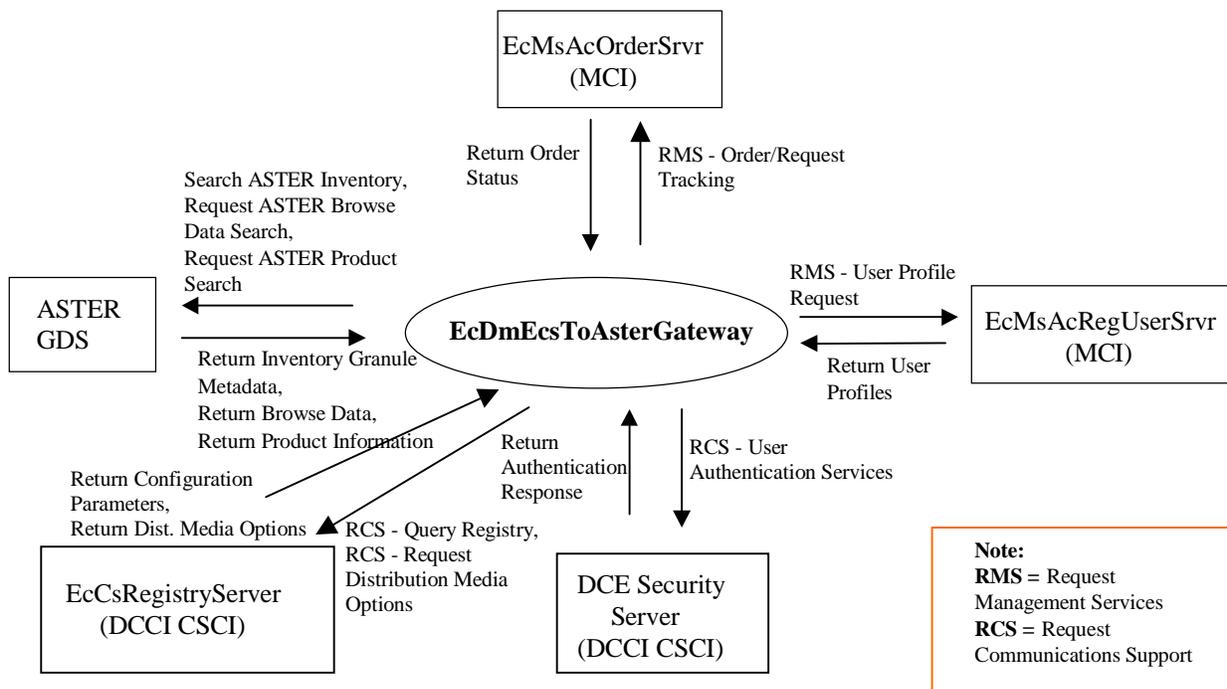


Figure 4.4.3.3-2. ASTER Gateway (ASTGW) CSCI Architecture Diagram

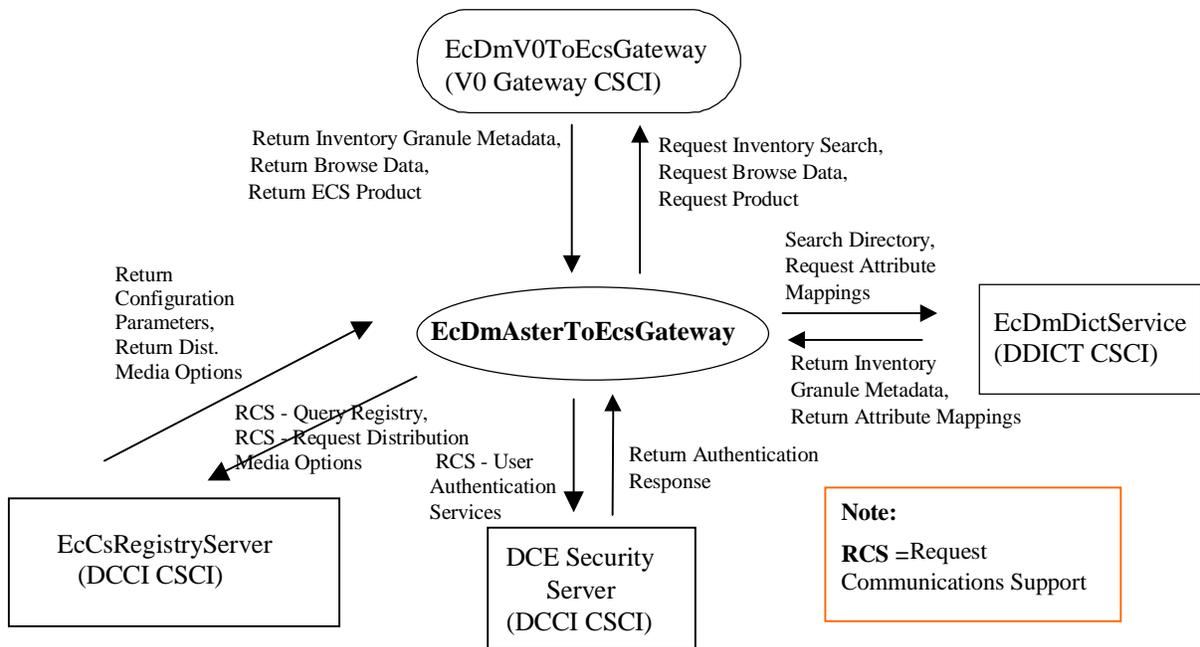


Figure 4.4.3.3-3. ASTER Gateway (ASTGW) CSCI Architecture Diagram

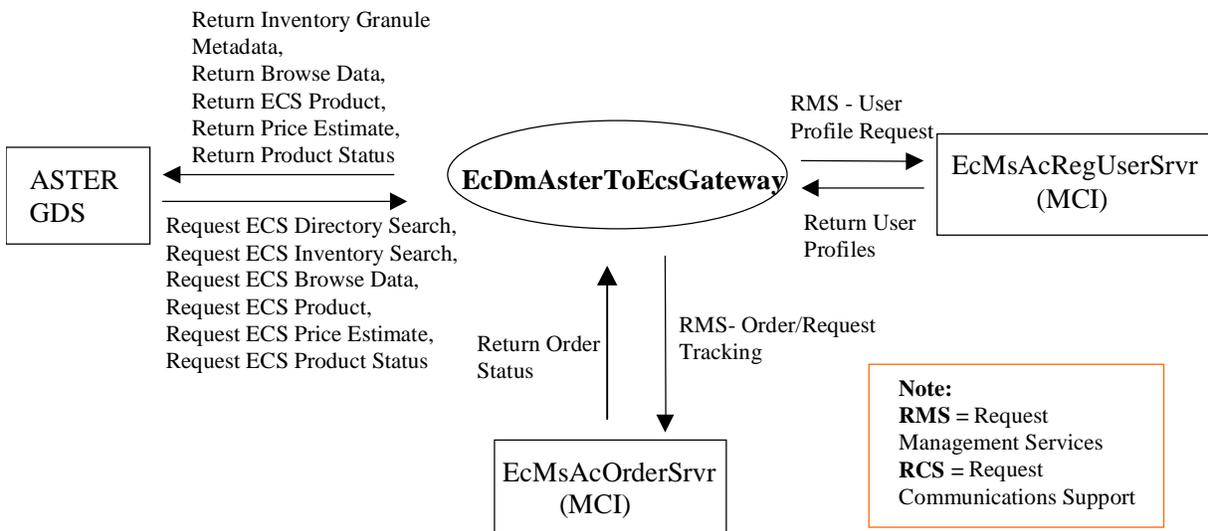


Figure 4.4.3.3-4. ASTER Gateway (ASTGW) CSCI Architecture Diagram

4.4.3.4 ASTER Gateway Process Description

Table 4.4.3.4-1 provides the descriptions of the processes shown in the ASTGW CSCI architecture diagram.

Table 4.4.3.4-1. ASTER Gateway (ASTGW) CSCI Processes

Process	Type	COTS/ Developed	Functionality
EcDmAsterToEcsGateway	Server	Developed	<p>The server receives requests for science data from ASTER GDS in ODL format. Each request is processed as follows:</p> <p>Directory Search - sent to the EcDmDictService server.</p> <p>Inventory Search – sent to the appropriate EcDmV0ToEcsGateway.</p> <p>Browse data - sent to the appropriate EcDmV0ToEcsGateway.</p> <p>Product – requests for data resident at the local DAAC are sent to the appropriate EcDmV0ToEcsGateway. Requests for data resident at other DAACs are translated into EOS Data Gateway ODL and sent to the V0 Gateway.</p> <p>Price Estimate – computed from configuration files.</p> <p>Status – sent to the EcMsAcOrderSrvr.</p> <p>The results are translated back into ODL format and returned to the ASTER GDS.</p>
EcDmEcsToAsterGateway	Server	Developed	<p>The server receives search, browse, and acquire science data requests (from the V0 EOS Data Gateway in ODL and from the EcPIOdMgr (PLANG CSCI) in ECS format), translates them into ASTER GDS ODL format and sends them to the ASTER GDS. The results received from the ASTER GDS are translated back into the requestor's format and sent to the requestor.</p>

4.4.3.5 ASTER Gateway Process Interface Descriptions

Tables 4.4.3.5-1, 4.4.3.5-2, 4.4.3.5-3, and 4.4.3.5-4 provide the descriptions of the interface events shown in the ASTGW CSCI architecture diagrams, respectively.

Table 4.4.3.5-1. ASTER Gateway (ASTGW) CSCI Process Interface Events (1 of 3)

Event	Event Frequency	Interface	Initiated By	Event Description
Submit Non-Standard L1B Orders	Per user product request	<i>Process:</i> EcDmEcsToAsterGateway <i>Library:</i> DmAsGwEcsReqProc <i>Classes:</i> DmGwEcsAsterRequestReceiver, DmGwEcsProductRequest	<i>Process:</i> EcPIOdMgr <i>Library:</i> PICore2 <i>Class:</i> PINonStandardOrder	The EcPIOdMgr submits requests through the EcDmEcsToAsterGateway for the production of non-standard L1B on-demand products.
Request Attribute Mappings (ASTER)	One per data request to DDICT	<i>Process:</i> EcDmDictService COTS SW <i>Library:</i> RWDBTools.h++ <i>Library:</i> DmLmDbi <i>Class:</i> DmLmIntQuery	<i>Process:</i> EcDmEcsToAsterGateway <i>Library:</i> DmAsGwCommon <i>Class:</i> DmAsGwTranslate	The EcDmEcsToAsterGateway requests data collection attribute and valid keyword mappings, on behalf of a user, from the EcDmDictService to translate requests from the GDS to the ECS and back again.
Return Attribute Mappings (ASTER)	One per request	<i>Process:</i> EcDmEcsToAsterGateway <i>Library:</i> DmAsGwCommon <i>Class:</i> DmAsGwTranslate	<i>Process:</i> EcDmDictService COTS SW <i>Library:</i> RWDBTools.h++ <i>Library:</i> DmLmDbi <i>Class:</i> DmLmIntQuery	The EcDmDictService returns the data collection attribute and valid keyword mappings to translate requests from the GDS to the ECS and back again.
Return Inventory Granule Metadata	One per inventory search	V0 EOS Data Gateway	<i>Process:</i> EcDmEcsToAsterGateway <i>Library:</i> RequestProcessing <i>Class:</i> DmGwInvSearchRequest	The EcDmEcsToAsterGateway returns the inventory granule metadata identifying the scene within the granule based on an inventory search request to the user via the V0 EOS Data Gateway .

Table 4.4.3.5-1. ASTER Gateway (ASTGW) CSCI Process Interface Events (2 of 3)

Event	Event Frequency	Interface	Initiated By	Event Description
Return Browse Data	One per browse data request	V0 EOS Data Gateway	<i>Process:</i> EcDmEcsToAsterGateway <i>Library:</i> DmAsGwAsterReqProc <i>Class:</i> DmAsGwAsterBroRequest or	The EcDmEcsToAsterGateway returns Browse data associated with a particular granule to the user via the V0 EOS Data Gateway .
Return ECS Product	One per data request	V0 EOS Data Gateway	<i>Process:</i> EcDmEcsToAsterGateway <i>Library:</i> EcsReqProc <i>Class:</i> DmAsGwEcsProRequest	The EcDmEcsToAsterGateway returns ECS data (including Landsat 7 data archived within the ECS) to the user via the V0 EOS Data Gateway based upon a product request. The ASTER GDS can only receive Landsat 7 fixed scenes because they do not have the means to handle floating scenes.
Return Directory	One per directory request	V0 EOS Data Gateway	<i>Process:</i> EcDmEcsToAsterGateway <i>Library:</i> RequestProcessing <i>Class:</i> DmGwDirectoryRequest	The EcDmEcsToAsterGateway returns collection level metadata to the V0 EOS Data Gateway .
Request Directory Search	One per directory request	<i>Process:</i> EcDmEcsToAsterGateway <i>Library:</i> RequestProcessing <i>Class:</i> DmGwDirectoryRequest	V0 EOS Data Gateway	The V0 EOS Data Gateway sends requests to the EcDmEcsToAsterGateway to search the ASTER directories for collection level metadata.
Request V0 Inventory Search	One per inventory request	<i>Process:</i> EcDmEcsToAsterGateway <i>Library:</i> RequestProcessing <i>Class:</i> DmGwInvSearchRequest	V0 EOS Data Gateway	The V0 EOS Data Gateway sends inventory search requests to the EcDmEcsToAsterGateway for ASTER data on behalf of an external ECS user.

Table 4.4.3.5-1. ASTER Gateway (ASTGW) CSCI Process Interface Events (3 of 3)

Event	Event Frequency	Interface	Initiated By	Event Description
Request V0 Browse Data	One per browse request	<i>Process:</i> EcDmEcsToAsterGateway <i>Library:</i> DmAsGwAsterReqProc <i>Class:</i> DmAsGwAsterBroker	V0 EOS Data Gateway	The V0 EOS Data Gateway sends browse data requests to the EcDmEcsToAsterGateway for ASTER data on behalf of an external ECS user.
Request V0 Product	One per product request	<i>Process:</i> EcDmEcsToAsterGateway <i>Library:</i> EcsReqProc <i>Class:</i> DmAsGwEcsProductRequest	V0 EOS Data Gateway	The V0 EOS Data Gateway sends product requests to the EcDmEcsToAsterGateway for ASTER data on behalf of an external ECS user.
Return L1B Product	Per user product request	<i>Process:</i> EcPIOdMgr <i>Library:</i> PICore2 <i>Class:</i> PINonStandardOrder	<i>Process:</i> EcDmEcsToAsterGateway <i>Library:</i> DmAsGwEcsReqProc <i>Classes:</i> DmGwEcsAsterRequestReceiver, DmGwEcsProductRequest	The EcPIOdMgr submits requests through the EcDmEcsToAsterGateway for the production of non-standard L1B on-demand products.

Table 4.4.3.5-2. ASTER Gateway (ASTGW) CSCI Process Interface Events (1 of 5)

Event	Event Frequency	Interface	Initiated By	Event Description
Request Management Services (RMS)	One per service request	N/A	N/A	The EcMsAcRegUserSvr and EcMsAcOrderSvr provide a basic management library of services to the processes, implemented as client or server applications, using the DCCI CSCI Process Framework. The basic management library of services includes:
RMS (cont.)	One per product order	<i>Process:</i> EcMsAcOrderSvr <i>Library:</i> MsAcClnt <i>Class:</i> EcAcOrderCMgr	<i>Process:</i> EcDmEcsToAsterGateway <i>Class:</i> DmGwRequestReceiver	<ul style="list-style-type: none"> • Order/Request Tracking – The V0 GTWAY interfaces with the Order/Request tracking service, EcMsAcOrderSvr, to create a user product order.
RMS (cont.)	One per request	<i>Process:</i> EcMsAcRegUserSvr <i>Libraries:</i> MsAcClnt MsAcComm <i>Class:</i> MsAcUserProfile	<i>Process:</i> EcDmEcsToAsterGateway <i>Class:</i> DmGwRequestReceiver	<ul style="list-style-type: none"> • User Profile Request – The EcMsAcRegUserSvr provides requesting processes with User Profile parameters such as e-mail and shipping addresses to support their processing activities.
Return User Profiles	One per request	<i>Process:</i> EcDmEcsToAsterGateway <i>Class:</i> DmGwRequestReceiver	<i>Process:</i> EcMsAcRegUserSvr <i>Libraries:</i> MsAcClnt, MsAcComm <i>Class:</i> MsAcUserProfile	The EcMsAcRegUserSvr returns user profile information requested by users or ECS processes.

Table 4.4.3.5-2. ASTER Gateway (ASTGW) CSCI Process Interface Events (2 of 5)

Event	Event Frequency	Interface	Initiated By	Event Description
Request Communications Support	Request service(s) as required	<p>Process: DCE Security Server</p> <p>Libraries: EcSelogin, EcSeLogincontext</p> <p>Classes: EcSelogin, EcSeLogincontext</p> <p>Library: EcPf</p> <p>Classes: EcPfManagedServer, EcPfclient</p> <p>Library (Common): EcUr</p> <p>Class: EcUrServerUR</p> <p>Library: Event</p> <p>Class: EcLgErrorMsg</p> <p>Process: EcCsRegistryServer</p> <p>Library: EcCsRegistryClient</p> <p>Class: EcRgRegistryServer_C</p>	<p>Process: EcDmEcsToAsterGateway</p> <p>Libraries: EcDmDdClient, DmDdReqProc, DmDdServer</p> <p>Classes: DmDdCISchemaRequest, DmDdCIRequest, DmDdMapper, DmDdProcMsg, DmDdSearchRequest</p>	<p>The DCCI CSCI provides a library of services available to each SDPS and CSMS CSCI. The CSCI services required to perform specific assignments are requested from the DCCI CSCI. These services include:</p> <ul style="list-style-type: none"> • DCE Support • File Transfer Services • Network & Distributed File Services • Bulk Data Transfer Services • Name/Address Services • Password Services • Server Request Framework (SRF) • Universal Reference (UR) • Error/Event Logging • Fault Handling Services • User Authentication Services • Mode Information • (Query Registry) Retrieving the requested configuration attribute-value pairs from the Configuration Registry • Distribution Media Options from the Configuration Registry

Table 4.4.3.5-2. ASTER Gateway (ASTGW) CSCI Process Interface Events (3 of 5)

Event	Event Frequency	Interface	Initiated By	Event Description
Return Authentication Response	One per request	<p><i>Process:</i> EcDmEcsToAsterGateway</p> <p><i>Libraries:</i> EcDmDdClient, DmDdReqProc, DmDdServer</p> <p><i>Classes:</i> DmDdCISchemaRequest, DmDdCIRequest, DmDdMapper, DmDdProcMsg, DmDdSearchRequest</p>	<p>Process: DCE Security Server</p> <p><i>Libraries:</i> EcSelogin, EcSeLogincontext</p> <p><i>Classes:</i> EcSelogin, EcSeLogincontext</p> <p>Library: EcPf</p> <p><i>Classes:</i> EcPfManagedServer, EcPfclient</p> <p>Library (Common): EcUr</p> <p><i>Class:</i> EcUrServerUR</p> <p>Library: Event</p> <p><i>Class:</i> EcLgErrormsg</p>	The EcDmEcsToAsterGateway receives an authentication or error message for a user for access to ECS data and services from the DCE Security Server .
Return Configuration Parameters	One set per request	<p><i>Process:</i> EcDmEcsToAsterGateway</p>	<p><i>Process:</i> EcCsRegistryServer</p> <p><i>Library:</i> EcCsRegistryClient</p> <p><i>Class:</i> EcRgRegistryServer_C</p>	The EcCsRegistryServer returns the attribute-value pairs (configuration parameters) to the EcDmEcsToAsterGateway upon request.
Return Dist. Media Options	One set per request	<p><i>Process:</i> EcCsRegistryServer</p> <p><i>Library:</i> EcCsRegistryClient</p> <p><i>Class:</i> EcRgRegistryServer_C</p>	<p><i>Process:</i> EcDmEcsToAsterGateway</p>	The EcCsRegistryServer returns the requested distribution media options to the EcDmEcsToAsterGateway.

Table 4.4.3.5-2. ASTER Gateway (ASTGW) CSCI Process Interface Events (4 of 5)

Event	Event Frequency	Interface	Initiated By	Event Description
Return Inventory Granule Metadata	One per inventory search	<i>Process:</i> EcDmEcsToAsterGateway <i>Library:</i> RequestProcessing <i>Class:</i> DmGwInvSearchRequest	ASTER GDS	The EcDmEcsToAsterGateway receives the inventory granule metadata identifying the scene within the granule based on an inventory search request from the ASTER GDS .
Return Browse Data	One per browse data request	<i>Process:</i> EcDmEcsToAsterGateway <i>Library:</i> DmAsGwAsterReqProc <i>Class:</i> DmAsGwAsterBroRequestor	ASTER GDS	The EcDmEcsToAsterGateway receives Browse data associated with a particular granule from the ASTER GDS .
Return Product Information	One per data request	<i>Process:</i> EcDmEcsToAsterGateway <i>Library:</i> EcsReqProc <i>Class:</i> DmAsGwEcsProRequest	ASTER GDS	The EcDmEcsToAsterGateway receives product or product information based upon a product request from the ASTER GDS .
Search ASTER Inventory	One per inventory request	ASTER GDS	<i>Process:</i> EcDmEcsToAsterGateway <i>Library:</i> RequestProcessing <i>Class:</i> DmGwInvSearchRequest	The EcDmEcsToAsterGateway submits inventory search requests to the ASTER GDS on behalf of an ECS user.
Request ASTER Browse Data Search	One per browse request	ASTER GDS	<i>Process:</i> EcDmEcsToAsterGateway <i>Library:</i> DmAsGwAsterReqProc <i>Class:</i> DmAsGwAsterBroRequestor	The EcDmEcsToAsterGateway sends browse requests, provided by users from the EOS Data Gateway within the V0 IMS, to the ASTER GDS .

Table 4.4.3.5-2. ASTER Gateway (ASTGW) CSCI Process Interface Events (5 of 5)

Event	Event Frequency	Interface	Initiated By	Event Description
Request ASTER Product Search	One per product request	ASTER GDS	<i>Process:</i> EcDmEcsToAsterGateway <i>Library:</i> EcsReqProc <i>Class:</i> DmAsGwEcsProRequest	The EcDmEcsToAsterGateway submits product requests to the ASTER GDS on behalf of an ECS external user (sent via the EOS Data Gateway).
Return Order Status	One per product order	<i>Process:</i> EcDmEcsToAsterGateway <i>Class:</i> DmGwRequestReceiver	<i>Process:</i> EcMsAcOrderSrvr <i>Library:</i> MsAcCInt <i>Class:</i> EcAcOrderCMgr	The EcMsAcOrderSrvr provides order ids and order status information for products requested by users to the EcDmEcsToAsterGateway.

Table 4.4.3.5-3. ASTER Gateway (ASTGW) CSCI Process Interface Events (1 of 5)

Event	Event Frequency	Interface	Initiated By	Event Description
Request Management Services	At system startup or shutdown and for restarts	<i>Process:</i> EcDmAsterToEcsGateway	DAAC unique startup scripts	System startup and shutdown - Please refer to the release-related, current version of the Mission Operations Procedures for the ECS Project document (611) and the current ECS Project Training Material document (625), identified in Section 2.2.1 of this document.
Request Inventory Search	One per request	<i>Process:</i> EcDmV0ToEcsGateway <i>Library:</i> RequestProcessing <i>Class:</i> DmGwInvSearchRequest	<i>Process:</i> EcDmAsterToEcsGateway <i>Library:</i> DmAsGwAsterReqProc <i>Class:</i> DmAsGwAsterInvRequestor	The EcDmAsterToEcsGateway submits inventory search requests to the EcDmV0ToEcsGateway for data stored at other DAACs on behalf of a GDS user.

Table 4.4.3.5-3. ASTER Gateway (ASTGW) CSCI Process Interface Events (2 of 5)

Event	Event Frequency	Interface	Initiated By	Event Description
Request Browse Data	One image per request	Process: EcDmV0ToEcsGateway Library: EcsReqProc Class: DmAsGwEcsBrowseRequest	Process: EcDmAsterToEcsGateway Library: DmAsGwAsterReqProc Class: DmAsGwAsterBroRequest or	The EcDmAsterToEcsGateway submits browse data requests to the EcDmV0ToEcsGateway for data stored at other DAACS on behalf of a GDS user.
Request Product	One product per request	Process: EcDmV0ToEcsGateway Library: EcsReqProc Class: DmAsGwEcsProRequest	Process: EcDmAsterToEcsGateway Library: DmAsGwAsterReqProc Class: DmAsGwAsterProRequest or	The EcDmAsterToEcsGateway submits product requests to the EcDmV0ToEcsGateway for data stored at other DAACS on behalf of a GDS user.
Search Directory	One per directory search request	Process: EcDmDictService Library: EcDmDdClient Class: DmDdCISchemaRequest	Process: EcDmAsterToEcsGateway Library: DmAsGwAsterReqProc Class: DmAsGwDirQuery	The EcDmDictService receives directory search requests from the EcDmAsterToEcsGateway.
Request Attribute Mappings	One per data request to DDICT	Process: EcDmDictService COTS SW Library: RWDBTools.h++ Library: DmLmDbi Class: DmLmIntQuery	Process: EcDmAsterToEcsGateway Library: DmAsGwCommon Class: DmAsGwTranslate	The EcDmAsterToEcsGateway requests data collection attribute and valid keyword mappings, on behalf of a user, from the EcDmDictService to translate requests from the GDS to the ECS and back again.
Return Inventory Granule Metadata	One per inventory search	Process: EcDmAsterToEcsGateway Library: DmAsGwAsterReqProc Class: DmAsGwDirQuery	Process: EcDmDictService Library: EcDmDdClient Class: DmDdCISchemaRequest	The EcDmAsterToEcsGateway receives the inventory granule metadata identifying the scene within the granule based on a directory search request of the EcDmDictService .

Table 4.4.3.5-3. ASTER Gateway (ASTGW) CSCI Process Interface Events (3 of 5)

Event	Event Frequency	Interface	Initiated By	Event Description
Return Attribute Mappings	One per request	<i>Process:</i> EcDmAsterToEcsGateway <i>Library:</i> DmAsGwCommon <i>Class:</i> DmAsGwTranslate	<i>Process:</i> EcDmDictService COTS SW <i>Library:</i> RWDBTools.h++ <i>Library:</i> DmLmDbi <i>Class:</i> DmLmIntQuery	The EcDmDictService returns the data collection attribute and valid keyword mappings to the EcDmAsterToEcsGateway to translate requests from the GDS to the ECS and back again.
Return Authentication Response	One per request	<i>Process:</i> EcDmAsterToEcsGateway <i>Libraries:</i> EcDmDdClient, DmDdReqProc, DmDdServer <i>Classes:</i> DmDdCISchemaRequest, DmDdCIRequest, DmDdMapper, DmDdProcMsg, DmDdSearchRequest	Process: DCE Security Server <i>Libraries:</i> EcSelogin, EcSeLogincontext <i>Classes:</i> EcSelogin, EcSeLogincontext Library: EcPf <i>Classes:</i> EcPfManagedServer, EcPfclient Library (Common): EcUr <i>Class:</i> EcUrServerUR Library: Event <i>Class:</i> EcLgErrorMsg	The EcDmAsterToEcsGateway receives an authentication or error message for a user for access to ECS data and services from the DCE Security Server .

Table 4.4.3.5-3. ASTER Gateway (ASTGW) CSCI Process Interface Events (4 of 5)

Event	Event Frequency	Interface	Initiated By	Event Description
Request Communications Support	Request service(s) as required	<p>Process: DCE Security Server</p> <p>Libraries: EcSelogin, EcSeLogincontext</p> <p>Classes: EcSelogin, EcSeLogincontext</p> <p>Library: EcPf</p> <p>Classes: EcPfManagedServer, EcPfclient</p> <p>Library (Common): EcUr</p> <p>Class: EcUrServerUR</p> <p>Library: Event</p> <p>Class: EcLgErrorMsg</p> <p>Process: EcCsRegistryServer</p> <p>Library: EcCsRegistryClient</p> <p>Class: EcRgRegistryServer_C</p>	<p>Process: EcDmAsterToEcsGateway</p> <p>Libraries: EcDmDdClient, DmDdReqProc, DmDdServer</p> <p>Classes: DmDdCISchemaRequest, DmDdCIRequest, DmDdMapper, DmDdProcMsg, DmDdSearchRequest</p>	<p>The DCCI CSCI provides a library of services available to each SDPS and CSMS CSCI. The CSCI services required to perform specific assignments are requested from the DCCI CSCI. These services include:</p> <ul style="list-style-type: none"> • DCE Support • File Transfer Services • Network & Distributed File Services • Bulk Data Transfer Services • Name/Address Services • Password Services • Server Request Framework (SRF) • Universal Reference (UR) • Error/Event Logging • Fault Handling Services • User Authentication Services • Mode Information • (Query Registry) Retrieving the requested configuration attribute-value pairs from the Configuration Registry • Distribution Media Options from the Configuration Registry
Return Configuration Parameters	One set per request	<p>Process: EcDmAsterToEcsGateway</p>	<p>Process: EcCsRegistryServer</p> <p>Library: EcCsRegistryClient</p> <p>Class: EcRgRegistryServer_C</p>	<p>The EcCsRegistryServer returns the attribute-value pairs (configuration parameters) to the EcDmAsterToEcsGateway upon request.</p>

Table 4.4.3.5-3. ASTER Gateway (ASTGW) CSCI Process Interface Events (5 of 5)

Event	Event Frequency	Interface	Initiated By	Event Description
Return Dist. Media Options	One set per request	<i>Process:</i> EcCsRegistryServer <i>Library:</i> EcCsRegistryClient <i>Class:</i> EcRgRegistryServer_C	<i>Process:</i> EcDmAsterToEcsGateway	The EcCsRegistryServer returns the requested distribution media options to the EcDmAsterToEcsGateway.
Return Inventory Granule Metadata	One per inventory search	<i>Process:</i> EcDmV0ToEcsGateway <i>Library:</i> RequestProcessing <i>Class:</i> DmGwInvSearchRequest	<i>Process:</i> EcDmAsterToEcsGateway <i>Library:</i> DmAsGwAsterReqProc <i>Class:</i> DmAsGwAsterInvRequestor	The EcDmAsterToEcsGateway receives the inventory granule metadata identifying the scene within the granule based on an inventory search request to the user via the EcDmV0ToEcsGateway .
Return Browse Data	One per browse data request	<i>Process:</i> EcDmV0ToEcsGateway <i>Library:</i> EcsReqProc <i>Class:</i> DmAsGwEcsBrowseRequest	<i>Process:</i> EcDmAsterToEcsGateway <i>Library:</i> DmAsGwAsterReqProc <i>Class:</i> DmAsGwAsterBroRequestor	The EcDmAsterToEcsGateway receives Browse data associated with a particular granule via the EcDmV0ToEcsGateway .
Return ECS Product	One per data request	<i>Process:</i> EcDmV0ToEcsGateway <i>Library:</i> EcsReqProc <i>Class:</i> DmAsGwEcsProRequest	<i>Process:</i> EcDmAsterToEcsGateway <i>Library:</i> DmAsGwAsterReqProc <i>Class:</i> DmAsGwAsterProRequestor	The EcDmAsterToEcsGateway receives ECS data (including Landsat 7 data archived within the ECS) via the EcDmV0ToEcsGateway based upon a product request. The ASTER GDS can only receive Landsat 7 fixed scenes because they do not have the means to handle floating scenes.

Table 4.4.3.5-4. ASTER Gateway (ASTGW) CSCI Process Interface Events (1 of 3)

Event	Event Frequency	Interface	Initiated By	Event Description
Request Management Services (RMS)	One per service request	N/A	N/A	The EcMsAcRegUserSrvr and EcMsAcOrderSrvr provide a basic management library of services to the processes, implemented as client or server applications, using the DCCI CSCI Process Framework. The basic management library of services includes:
RMS (cont.)	One per request	<i>Process:</i> EcMsAcRegUserSrvr <i>Libraries:</i> MsAcCInt MsAcComm <i>Class:</i> MsAcUserProfile	<i>Process:</i> EcDmAsterToEcsGateway <i>Class:</i> DmGwRequestReceiver	<ul style="list-style-type: none"> • User Profile Request – The EcMsAcRegUserSrvr provides requesting processes with User Profile parameters such as e-mail and shipping addresses to support their processing activities.
RMS (cont.)	One per product order	<i>Process:</i> EcMsAcOrderSrvr <i>Library:</i> MsAcCInt <i>Class:</i> EcAcOrderCMgr	<i>Process:</i> EcDmAsterToEcsGateway <i>Class:</i> DmGwRequestReceiver	<ul style="list-style-type: none"> • Order/Request Tracking – The V0 GTWAY interfaces with the Order/Request tracking service, EcMsAcOrderSrvr, to create a user product order.
Return User Profiles	One per request	<i>Process:</i> EcDmAsterToEcsGateway <i>Class:</i> DmGwRequestReceiver	<i>Process:</i> EcMsAcRegUserSrvr <i>Libraries:</i> MsAcCInt, MsAcComm <i>Class:</i> MsAcUserProfile	The EcMsAcRegUserSrvr returns user profile information requested by users or ECS processes to the EcDmAsterToEcsGateway.
Request ECS Directory Search	One per request	<i>Process:</i> EcDmAsterToEcsGateway <i>Library:</i> DmAsGwAsterReqProc <i>Class:</i> DmAsGwAsterInvRequestor	ASTER GDS	The ASTER GDS submits directory search requests to the EcDmAsterToEcsGateway on behalf of a GDS user.

Table 4.4.3.5-4. ASTER Gateway CSCI Process Interface Events (2 of 3)

Event	Event Frequency	Interface	Initiated By	Event Description
Request ECS Inventory Search	One per request	<i>Process:</i> EcDmAsterToEcsGateway <i>Library:</i> DmAsGwAsterReqProc <i>Class:</i> DmAsGwAsterInvRequestor	ASTER GDS	The ASTER GDS submits inventory search requests to the EcDmAsterToEcsGateway on behalf of a GDS user.
Request ECS Browse Data	One per browse request	<i>Process:</i> EcDmAsterToEcsGateway <i>Library:</i> DmAsGwAsterReqProc <i>Class:</i> DmAsGwAsterBroRequestor	ASTER GDS	The ASTER GDS submits browse data requests to the EcDmAsterToEcsGateway on behalf of a GDS user.
Request ECS Product	One per product request	<i>Process:</i> EcDmAsterToEcsGateway <i>Library:</i> DmAsGwAsterReqProc <i>Class:</i> DmAsGwAsterProRequestor	ASTER GDS	The ASTER GDS submits product requests to the EcDmAsterToEcsGateway on behalf of a GDS user.
Request ECS Price Estimate	One per price estimate request	<i>Process:</i> EcDmAsterToEcsGateway <i>Library:</i> DmAsGwAsterReqProc <i>Class:</i> DmGwPriceEstRequest	ASTER GDS	The ASTER GDS submits price estimate requests to the EcDmAsterToEcsGateway on behalf of a GDS user.

Table 4.4.3.5-4. ASTER Gateway CSCI Process Interface Events (3 of 3)

Event	Event Frequency	Interface	Initiated By	Event Description
Request ECS Product Status	One per Media Type requested	<i>Process:</i> EcDmAsterToEcsGateway <i>Library:</i> DmAsGwAsterReqProc <i>Class:</i> DmAsGwAsterProductStatusRequest	ASTER GDS	The ASTER GDS submits product status requests to the EcDmAsterToEcsGateway on behalf of a GDS user.
Return Inventory Granule Metadata	One per inventory search	ASTER GDS	<i>Process:</i> EcDmAsterToEcsGateway <i>Library:</i> RequestProcessing <i>Class:</i> DmGwInvSearchRequest	The EcDmAsterToEcsGateway returns the inventory granule metadata identifying the scene within the granule based on an inventory search request from the ASTER GDS .
Return Browse Data	One per browse data request	ASTER GDS	<i>Process:</i> EcDmAsterToEcsGateway <i>Library:</i> DmAsGwAsterReqProc <i>Class:</i> DmAsGwAsterBroRequest or	The EcDmAsterToEcsGateway returns Browse data associated with a particular granule to the ASTER GDS .
Return ECS Product	One per data request	ASTER GDS	<i>Process:</i> EcDmAsterToEcsGateway <i>Library:</i> EcsReqProc <i>Class:</i> DmAsGwEcsProRequest	The EcDmAsterToEcsGateway returns data or product information based upon a product request from the ASTER GDS .
Return Price Estimate	One per request	ASTER GDS	<i>Process:</i> EcDmAsterToEcsGateway <i>Library:</i> DmAsGwAsterReqProc <i>Class:</i> DmGwPriceEstRequest	The EcDmAsterToEcsGateway returns a price estimate (received from the EDC Dorrان Billing and Accounting System) for a price estimate request to an ASTER GDS user.
Return Product Status	One per status request	ASTER GDS	<i>Process:</i> EcDmAsterToEcsGateway <i>Library:</i> DmAsGwAsterReqProc <i>Class:</i> DmAsGwAsterProductStatusRequest	The EcDmAsterToEcsGateway returns ECS data status (including Landsat 7 data archived within the ECS) to the user via the ASTER GDS based upon a product status request.

4.4.3.6 ASTER Gateway Data Stores

Table 4.4.3.6-1 describes the ASTER Gateway data stores shown in the ASTGW architecture diagram.

Table 4.4.3.6-1. ASTER Gateway (ASTGW) CSCI Data Stores

Data Store	Type	Functionality
EcDmDictService	Database	<p>The Data Dictionary database, EcDmDictService, is a Sybase relational database that persistently stores the collection and collection related information on a physical disk medium. The DDICT database is replicated wholly to each DAAC.</p> <p>The data stores in the Data Dictionary database used by the ASTGW CSCI are:</p> <ul style="list-style-type: none"> • Information managers or gateways in the ECS federation that access these collections. • Collection Types: A list of all the data types within the SDPS • Collection Attributes and Keywords: Attributes and keywords associated with collections originating within and outside the SDPS are used by the ASTGW CSCI to translate requests between the GDS IMS and the SDPS

4.4.4 Data Management Subsystem Hardware

The primary components of the Data Management Subsystem include two hardware CIs, Data Management Hardware CI (DMGHW) and Interface Hardware CI (INTHW), co-owned by the Interoperability Subsystem, as described below. Custom code and applications are loaded on the internal disks of all hosts to prevent dependencies on specific hosts or peripherals. The general-purpose workstations are standalone hosts without fail-over capability. In the event of a host failure, any of the available workstations could be used to support end user DAAC maintenance.

4.4.4.1 Data Management Hardware CI (DMGHW) Description

The DMGHW CI includes general-purpose low-end SUN and HP workstations, and one mid-range HP Server. These workstations are used as end user workstations in maintenance of each of the respective DAAC sites. The Server is used to support Sybase database replication and backup.

4.4.4.2 Interface Hardware CI (INTHW) Description, as used by the Data Management Subsystem

The INTHW CI includes two Interface Servers. The Interface Servers support the Client Subsystem and a portion of the Communications Subsystem. The servers are SUN class machines with detailed specifications in the site specific hardware design diagram, baseline document number 920-TDx-001. Because of their common configuration, these hosts can be configured interchangeably. DMS software runs on these hosts: DDICT and V0 GTWAY. The Data Dictionary Server (EcDmDictService) allows authorized users to perform data searches,

inserts, updates and deletions to data within the Data Dictionary Database. The V0 GTWAY consists of multiple processes to allow access to data and services between the ECS Data Server and the V0 IMS System. Detailed information can be found in the site-specific hardware/software mapping, baseline document number 920-TDx-002.

A SUN SPARC Storage Array, Model 114, is dual ported between both hosts and provides storage for the Data Dictionary Database and Sybase Replication software. A detailed configuration is specified in baseline document number 920-TDx-009.

The Interface Servers are both “hot” and share the resident RAID device. In the event of a host failure, the operational server assumes total ownership of the RAID and all processes. In this state, the server is recognized to be running in degraded mode until recovery is completed.