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EOSDIS Core System Project

ECS Project Training Material Volume 8: Ingest

March 2001

Raytheon Systems Company
Upper Marlboro, Maryland

ECS Project Training Material Volume 8: Ingest

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RESPONSIBLE ENGINEER

Ralph E. Fuller
EOSDIS Core System Project

Date

SUBMITTED BY

Gary Sloan, M&O Manager
EOSDIS Core System Project

Date

Raytheon Systems Company
Upper Marlboro, Maryland

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Preface

This document is a contract deliverable with an approval code of 3. As such, it does not require formal Government approval. This document is delivered for information only, but is subject to approval as meeting contractual requirements.

Any questions should be addressed to:

Data Management Office
The ECS Project Office
Raytheon Systems Company
1616 McCormick Dr.
Upper Marlboro, MD 20774-5301

Note: This document contains change bars to indicate the addition or revision of material since the issuance of the predecessor document containing training material for Release 5B of the Earth Observing System Data and Information System (EOSDIS) Core System (ECS).

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Abstract

This is Volume 8 of a series of lessons containing the training material for Release 6A of the Earth Observing System Data and Information System (EOSDIS) Core System (ECS). This lesson provides a detailed description of the process for receiving, logging, and marking all non-electronic media for processing and storage in the ECS system. Methods for monitoring performance of data requests, managing/processing ingest data, and ingesting hard media/metadata are also reviewed.

Keywords: training, instructional design, course objective, Ingest, Release 6A.

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Abstract

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Introduction

Identification

Training Material Volume 8 is part of Contract Data Requirements List (CDRL) Item 129, whose requirements are specified in Data Item Description (DID) 625/OP3 and is a required deliverable under the Earth Observing System Data and Information System (EOSDIS) Core System (ECS), Contract (NAS5-60000).

Scope

Training Material Volume 8 describes the process and procedures for ingest of data into ECS. This lesson is designed to provide the operations staff with sufficient knowledge and information to satisfy all lesson objectives.

Purpose

The purpose of this Student Guide is to provide a detailed course of instruction that forms the basis for understanding Ingest. Lesson objectives are developed and will be used to guide the flow of instruction for this lesson. The lesson objectives will serve as the basis for verifying that all lesson topics are contained within this Student Guide and slide presentation material.

Status and Schedule

This lesson module provides detailed information about training for Release 6A. Subsequent revisions will be submitted as needed.

Organization

This document is organized as follows:

Introduction:	The Introduction presents the document identification, scope, purpose, and organization.
Related Documentation:	Related Documentation identifies parent, applicable and information documents associated with this document.
Student Guide:	The Student Guide identifies the core elements of this lesson. All Lesson Objectives and associated topics are included.
Slide Presentation:	Slide Presentation is reserved for all slides used by the instructor during the presentation of this lesson.

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Related Documentation

Parent Document

The parent document is the document from which this ECS Training Material's scope and content are derived.

423-41-01 Goddard Space Flight Center, EOSDIS Core System (ECS) Statement of Work

Applicable Documents

The following documents are referenced within this ECS Training Material, or are directly applicable, or contain policies or other directive matters that are binding upon the content of this document:

420-05-03 Goddard Space Flight Center, Earth Observing System (EOS) Performance Assurance Requirements for the EOSDIS Core System (ECS)

423-41-02 Goddard Space Flight Center, Functional and Performance Requirements Specification for the Earth Observing System Data and Information System (EOSDIS) Core System (ECS)

Information Documents

Information Documents Referenced

The following documents are referenced herein and amplify or clarify the information presented in this document. These documents are not binding on the content of the ECS Training Material.

609-CD-600 Release 6A Operations Tools Manual for the ECS Project

611-CD-600 Mission Operation Procedures for the ECS Project

910-TDA-022 Custom Configuration Parameters for ECS Release 6A

Information Documents Not Referenced

The following documents, although not referenced herein and/or not directly applicable, do amplify or clarify the information presented in this document. These documents are not binding on the content of the ECS Training Material.

305-CD-600 Release 6A Segment/Design Specification for the ECS Project

311-CD-600 Release 6A Data Management Subsystem Database Design and Database Schema Specifications for the ECS Project

311-CD-601	Release 6A Ingest Database Design and Database Schema Specifications for the ECS Project
311-CD-602	Release 6A Interoperability Subsystem (IOS) Database Design and Database Schema Specifications for the ECS Project
311-CD-603	Release 6A Planning and Data Processing Subsystem Database Design and Schema Specifications for the ECS Project
311-CD-604	Release 6A Science Data Server Database Design and Schema Specifications for the ECS Project
311-CD-605	Release 6A Storage Management and Data Distribution Subsystems Database Design and Database Schema Specifications for the ECS Project
311-CD-606	Release 6A Subscription Server Database Design and Schema Specifications for the ECS Project
311-CD-607	Release 6A Systems Management Subsystem Database Design and Schema Specifications for the ECS Project
311-CD-608	Release 6A Registry Database Design and Schema Specifications for the ECS Project
313-CD-600	Release 6A ECS Internal Interface Control Document for the ECS Project
334-CD-600	6A Science System Release Plan for the ECS Project
601-CD-001	Maintenance and Operations Management Plan for the ECS Project
603-CD-003	ECS Operational Readiness Plan for Release 2.0
604-CD-001	Operations Concept for the ECS Project: Part 1-- ECS Overview
604-CD-002	Operations Concept for the ECS Project: Part 2B -- ECS Release B
605-CD-002	Release B SDPS/CSMS Operations Scenarios for the ECS Project
607-CD-001	ECS Maintenance and Operations Position Descriptions
152-TP-001	ACRONYMS for the EOSDIS Core System (ECS) Project
152-TP-003	Glossary of Terms for the EOSDIS Core System (ECS) Project
211-TP-005	Transition Plan 4PX to 4PY, 4PY to 5A, and 5A to 5B for the ECS Project
220-TP-001	Operations Scenarios - ECS Release B.0 Impacts
500-1002	Goddard Space Flight Center, Network and Mission Operations Support (NMOS) Certification Program, 1/90

535-TIP-CPT-001	Goddard Space Flight Center, Mission Operations and Data Systems Directorate (MO&DSD) Technical Information Program Networks Technical Training Facility, Contractor-Provided Training Specification
423-41-45	Interface Control Document between EOSDIS Core System (ECS) and the National Snow and Ice Data Center (NSIDC) Distributed Active Archive Center (DAAC) for the ECS Project
423-41-56	Interface Control Document between EOSDIS Core System (ECS) and the Data Assimilation System (DAS)
423-41-57	Interface Control Document between the EOSDIS Core System (ECS) and the Science Investigator-Led Processing System (SIPS), Volume 0: Interface Mechanisms
423-41-57-1	Interface Control Document between the EOSDIS Core System (ECS) and the Science Investigator-Led Processing System (SIPS), Volume 1: ECS ACRIM III SIPS Data Flows
423-41-57-2	Interface Control Document between the EOSDIS Core System (ECS) and the Science Investigator-Led Processing Systems (SIPS), Volume 2: ECS SAGE III SCF Data Flows
423-41-57-3	Interface Control Document between the EOSDIS Core System (ECS) and the Science Investigator-Led Processing Systems (SIPS), Volume 3: ECS-ASTER Observation Schedule File (OSF) Parser System Data Flows
423-41-57-4	Interface Control Document between the EOSDIS Core System (ECS) and the Science Investigator-Led Processing Systems (SIPS), Volume 4: ECS-ASTER DEM Data Flows
423-41-57-5	Interface Control Document between the EOSDIS Core System (ECS) and the Science Investigator-Led Processing Systems (SIPS), Volume 5: ECS-MOPITT Data Flows
423-41-57-6	Interface Control Document between the EOSDIS Core System (ECS) and the Science Investigator-Led Processing Systems (SIPS), Volume 6: ECS-MODIS SIPS (MODAPS) Data Flows
423-41-57-7	Interface Control Document between the EOSDIS Core System (ECS) and the Science Investigator-Led Processing Systems (SIPS), Volume 7: AMSR-E Science Investigator-Led Processing System Data Flows
423-41-58	Interface Control Document between EOSDIS Core System (ECS) and the Earth Resources Observation System (EROS) Data Center (EDC) Distributed Active Archive Center (DAAC)

423-ICD-EDOS/EGS	Interface Control Document between the Earth Observing System (EOS) Data and Operations System (EDOS) and the EOS Ground System (EGS) Elements
505-41-30	Interface Control Document between EOSDIS Core System (ECS) and the Version 0 System for Interoperability
505-41-32	Interface Control Document between EOSDIS Core System (ECS) and the Landsat 7 System
505-41-33	Interface Control Document between EOSDIS Core System (ECS) and Science Computing Facilities (SCF)
505-41-34	Interface Control Document between EOSDIS Core System (ECS) and Aster Ground Data System
505-41-35	Interface Control Document between EOSDIS Core System (ECS) TRMM Science Data and Information System (TSDIS)
505-41-36	Interface Control Document between the EOSDIS Core System (ECS) and the National Oceanic and Atmospheric Administration (NOAA) Affiliated Data Center (ADC) for the ECS Project
505-41-39	Interface Control Document between the EOSDIS Core System (ECS) and the Langley Research Center (LaRC) Distributed Active Archive Center (DAAC) for the ECS Project
505-41-40	Interface Control Document between the EOSDIS Core System (ECS) and the Goddard Space Flight Center (GSFC) Distributed Active Archive Center (DAAC) for the ECS Project
505-41-47	Interface Control Document between the EOSDIS Core System (ECS) and the Stratospheric Aerosol and Gas Experiment III (SAGE III) Mission Operations Center
552-FDD-96/010R0UD0	Earth Observing System (EOS) AM-1 Flight Dynamics System (FDS)/EOSDIS Core System (ECS) Interface Control Document (ICD)
586-1ICD/0398	Interface Control Document Between the Level 1 Product Distribution System (LPDS) and the EOSDIS Core System (ECS)
FDS-DAACs-Aqua	Earth Observing System (EOS) Aqua/PM Flight Dynamics System (FDS)/Distributed Active Archive Center (DAAC) Interface Control Document (ICD)

Ingest Overview

Lesson Overview

This lesson provides you with the process for Ingest status monitoring, use of Ingest operator tools, and Ingest processing. It provides practical experience in using the tools you need for monitoring the ingest history log, monitoring/controlling ingest requests, setting ingest parameters, and managing ingest processing.

Lesson Objectives

Overall Objective - The overall objective of this lesson is for Maintenance and Operations (M&O) personnel to develop proficiency in the procedures that apply to data ingest in the Earth Observing System Data and Information System (EOSDIS) Core System (ECS).

Condition - The student will be given a workstation console with access to ECS ingest graphical user interface (GUI) tools, a copy of 609-CD-600-001, *Release 6A Operations Tools Manual for the ECS Project*, and a copy of 611-CD-600-001, *Mission Operation Procedures for the ECS Project*.

Standard - The student will use the tools to perform ingest in accordance with the prescribed procedures without error.

Specific Objective 1 - The student will describe the ingest function, providing a general statement of the ingest responsibility in ECS and an overview of the ingest process.

Condition - The student will be given a copy of 609-CD-600-001, *Release 6A Operations Tools Manual for the ECS Project*, and a copy of 611-CD-600-001, *Mission Operation Procedures for the ECS Project*.

Standard - The student will correctly state the ingest role in ECS, state at least three (3) ingest activities, identify four (4) types of ingest automated messages, identify four (4) categories of ingest, and identify at least two (2) types of data transfer for ingest.

Specific Objective 2 - The student will perform the steps involved in launching the ECS Ingest GUI.

Condition - The student will be given a statement of the requirements for launching the ECS Ingest GUI, access to the Ingest Subsystem (through a workstation or X terminal), a copy of 609-CD-600-001, *Release 6A Operations Tools Manual for the ECS Project*, and a copy of 611-CD-600-001, *Mission Operation Procedures for the ECS Project*.

Standard - In accordance with the lesson content, the applicable procedure, and the statement of requirements the student will log in to the appropriate host using secure shell and launch the ECS Ingest GUI in the specified mode.

Specific Objective 3 - The student will perform the steps involved in launching the Storage Management Control GUI.

Condition - The student will be given a statement of the requirements for launching the Storage Management Control GUI, access to the Data Server Subsystem (through a workstation or X terminal), a copy of 609-CD-600-001, *Release 6A Operations Tools Manual for the ECS Project*, and a copy of 611-CD-600-001, *Mission Operation Procedures for the ECS Project*.

Standard - In accordance with the lesson content, the applicable procedure, and the statement of requirements the student will log in to the appropriate host using secure shell and launch the Storage Management Control GUI in the specified mode.

Specific Objective 4 - The student will perform the steps involved in monitoring and controlling ingest requests.

Condition - The student will be given a statement of the requirements for monitoring and controlling ingest requests (including the identification of a request by date and/or external data provider), access to the previously launched ECS Ingest GUI in the Ingest Subsystem (through a workstation or X terminal), a copy of 609-CD-600-001, *Release 6A Operations Tools Manual for the ECS Project*, and a copy of 611-CD-600-001, *Mission Operation Procedures for the ECS Project*.

Standard - In accordance with the lesson content, the applicable procedure, and the statement of requirements the student will select the ECS Ingest GUI Monitor/Control tab, select the appropriate set of ingest requests to monitor, observe ingest request processing, resume/cancel requests as directed, and respond to questions concerning the current status of ingest requests.

Specific Objective 5 - The student will perform the steps involved in viewing the ingest history log using the Ingest GUI History Log screen.

Condition - The student will be given a statement of the requirements for viewing the ingest history log (including the identification of a specific request to be viewed), access to the previously launched ECS Ingest GUI in the Ingest Subsystem (through a workstation or X terminal), a copy of 609-CD-600-001, *Release 6A Operations Tools Manual for the ECS Project*, and a copy of 611-CD-600-001, *Mission Operation Procedures for the ECS Project*.

Standard - In accordance with the lesson content, the applicable procedure, and the statement of requirements the student will select the ECS Ingest GUI History Log tab; select the specified time period, data provider, data type, and/or final request status; select the specified type of report (i.e., Detailed Report or Summary Report); display the history log report, and respond to questions concerning the history log report.

Specific Objective 6 - The student will perform the steps involved in verifying the archiving of ingested data.

Condition - The student will be given a statement of the requirements for verifying the archiving of ingested data and access to the File and Storage Management System (FSMS) (through a workstation or X terminal), a copy of 609-CD-600-001, *Release 6A Operations Tools Manual for*

the ECS Project, and a copy of 611-CD-600-001, *Mission Operation Procedures for the ECS Project*.

Standard - In accordance with the lesson content, the applicable procedure, and the statement of requirements the student will log in to the appropriate host, change directory to the directory containing the archive data, list the directory contents, and compare End Date(s)/Time(s) and Data Volume(s) for the applicable ingest request(s) shown on the Ingest GUI with the dates/times and file sizes listed for the files in the directory.

Specific Objective 7 - The student will perform the steps involved in cleaning the polling directories.

Condition - The student will be given a statement of the requirements for cleaning the polling directories and access to the Ingest Subsystem (through a workstation or X terminal), a copy of 609-CD-600-001, *Release 6A Operations Tools Manual for the ECS Project*, and a copy of 611-CD-600-001, *Mission Operation Procedures for the ECS Project*.

Standard - In accordance with the lesson content, the applicable procedure, and the statement of requirements the student will log in to the appropriate host, type the command to start the clean-up script, and type appropriate responses to clean-up script prompts.

Specific Objective 8 - The student will perform the steps involved in performing hard media ingest from a tape cartridge.

Condition - The student will be given a statement of the requirements for performing hard media ingest from a tape cartridge, a tape cartridge containing data to be ingested, access to an appropriate tape drive, and access to the previously launched ECS Ingest GUI in the Ingest Subsystem (through a workstation or X terminal), a copy of 609-CD-600-001, *Release 6A Operations Tools Manual for the ECS Project*, and a copy of 611-CD-600-001, *Mission Operation Procedures for the ECS Project*.

Standard - In accordance with the lesson content, the applicable procedure, and the statement of requirements the student will select the ECS Ingest GUI Media Ingest tab, identify the type of medium, insert the tape cartridge, select the data provider, enter the media volume ID, identify the delivery record file location, and initiate and monitor the data transfer.

Specific Objective 9 - The student will perform the steps involved in scanning a document and checking the file resulting from scanning to verify that the scanning has been accomplished properly.

Condition - The student will be given a statement of the requirements for scanning a document and checking the file resulting from scanning to verify that the scanning has been accomplished properly, a document to be scanned, access to the scanning equipment and software, a copy of 609-CD-600-001, *Release 6A Operations Tools Manual for the ECS Project*, and a copy of 611-CD-600-001, *Mission Operation Procedures for the ECS Project*.

Standard - In accordance with the lesson content, the applicable procedure, and the statement of requirements the student will start the scanning program, select the **Save Image Defer OCR** option, load documents into the HP ScanJet feeder, start the scanning process, save the

document, open the scanned document, and review the document to verify that it has been properly scanned.

Specific Objective 10 - The student will perform the steps involved in modifying external data provider information using the Ingest GUI Operator Tools: Modify External Data Provider/User Information screen.

Condition - The student will be given a statement of the requirements for modifying external data provider information (including the information to be modified), access to the previously launched ECS Ingest GUI in the Ingest Subsystem (through a workstation or X terminal), a copy of 609-CD-600-001, *Release 6A Operations Tools Manual for the ECS Project*, and a copy of 611-CD-600-001, *Mission Operation Procedures for the ECS Project*.

Standard - In accordance with the lesson content, the applicable procedure, and the statement of requirements the student will select the ECS Ingest GUI Operator Tools: Modify External Data Provider/User Information tab, select the specified data provider, modify the data provider information, and save the changes to data provider information.

Specific Objective 11 - The student will perform the steps involved in modifying Ingest Subsystem parameters using the Ingest GUI Operator Tools: Modify System Parameters screen.

Condition - The student will be given a statement of the requirements for modifying Ingest Subsystem parameters (including the parameter data to be modified), access to the previously launched ECS Ingest GUI in the Ingest Subsystem (through a workstation or X terminal), a copy of 609-CD-600-001, *Release 6A Operations Tools Manual for the ECS Project*, and a copy of 611-CD-600-001, *Mission Operation Procedures for the ECS Project*.

Standard - In accordance with the lesson content, the applicable procedure, and the statement of requirements the student will select the ECS Ingest GUI Operator Tools: Modify System Parameters tab, modify the specified Ingest operating parameters, and save the changes to Ingest operating parameters.

Specific Objective 12 - The student will perform the steps involved in transferring files using the Ingest GUI Operator Tools: File Transfer screen.

Condition - The student will be given a statement of the requirements for transferring files (including the identification of files to be transferred), access to the previously launched ECS Ingest GUI in the Ingest Subsystem (through a workstation or X terminal), a copy of 609-CD-600-001, *Release 6A Operations Tools Manual for the ECS Project*, and a copy of 611-CD-600-001, *Mission Operation Procedures for the ECS Project*.

Standard - In accordance with the lesson content, the applicable procedure, and the statement of requirements the student will select the ECS Ingest GUI Operator Tools: File Transfer tab, select either Build SMC History Files or Generic File Transfer (as specified), select the specified file(s) for transfer, enter the specified destination, and initiate and monitor the file transfer.

Specific Objective 13 - The student will perform the steps involved in modifying Ingest Subsystem parameters using interactive structured query language (isql).

Condition - The student will be given a statement of the requirements for modifying Ingest Subsystem parameters (including the parameter data to be modified), access to the Ingest

Subsystem (through a workstation or X terminal), a copy of 609-CD-600-001, *Release 6A Operations Tools Manual for the ECS Project*, and a copy of 611-CD-600-001, *Mission Operation Procedures for the ECS Project*.

Standard - In accordance with the lesson content, the applicable procedure, and the statement of requirements the student will log in to the appropriate host using secure shell, log in to the appropriate Ingest database using isql commands, check the current contents of the relevant column/table, update the relevant column/table with the new value(s), check the current contents of the relevant column/table, and exit from isql.

Specific Objective 14 - The student will perform the steps involved in troubleshooting and recovering from ingest problems.

Condition - The student will be given a statement of the requirements for troubleshooting and recovering from ingest problems (including a specific failure to troubleshoot), access to the previously launched ECS Ingest GUI in the Ingest Subsystem (through a workstation or X terminal), a copy of 609-CD-600-001, *Release 6A Operations Tools Manual for the ECS Project*, and a copy of 611-CD-600-001, *Mission Operation Procedures for the ECS Project*.

Standard - In accordance with the lesson content, the applicable procedure, and the statement of requirements the student will select the ECS Ingest GUI Monitor/Control tab, identify the faulty ingest request, review the information concerning the ingest fault, and perform the appropriate recovery procedure depending on the nature of the problem

Importance

This lesson provides students who will be Ingest/Distribution Technicians at the Distributed Active Archive Centers (DAACs) with the knowledge and skills needed for effective ingest of ECS data. It ensures development of operational capability that optimizes ingest performance to realize the potential for reliability, availability, maintainability, and security in data receipt and placement in the storage hierarchy. It provides thorough preparation for the following Ingest functions (among others):

- Automated network ingest.
- Automated polling ingest.
- Monitoring/controlling ingest request processing.
- Hard media ingest.
- Adjusting ingest tunable parameters.
- Troubleshooting and recovering from ingest problems.

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Ingest Concepts

ECS Context

Ingest for ECS is accomplished at the Distributed Active Archive Centers (DAACs). The people involved in Ingest activities are Ingest/Distribution Technicians.

The ECS Context Diagram (Figure 1) shows the relationships among subsystems within the Science Data Processing component of ECS. The Ingest Subsystem (INS) is the point of entry to ECS for data from external data providers. The Data Server Subsystem (DSS) manages access to the data repositories, where ingested data are stored. Of course, the context diagram shows a generalized (high-level) view of ECS. The Ingest architecture diagram (Figure 2) focuses on the Ingest process and its relationships with other subsystems. The Storage Management (STMGT) and Science Data Server (SDSRV) architecture diagrams (Figures 2 and 3 respectively) focus on those two individual computer software configuration items (CSCIs) of the Data Server Subsystem and their relationships with each other and with other subsystems.

- Ingest (Figure 2) transfers data into ECS, performs preprocessing, and forwards the data to DSS for archiving.
- Storage Management (Figure 3) is the part of the DSS that stores, manages, and retrieves data files on behalf of other parts of the Science Data Processing components (including Ingest).
 - Provides interfaces (which allow Ingest to obtain access to disk space) and peripheral devices (e.g., tape drives), which are resources that are shared with Data Distribution.
 - Provides for the copying of files into the archive for permanent storage.
- Science Data Server (Figure 4) is the part of the DSS that manages and provides user access to collections of non-document Earth Science data.
 - Checks/verifies metadata.
 - Issues requests to the STMGT and Data Distribution (DDIST) CSCIs to perform storage and distribution services in support of the processing of service requests, such as insertion of data into the archive or distribution of data products from the archive.

Ingest Subsystem

The Ingest Subsystem is the part of the ECS Science Data Processing component that the Ingest/Distribution Technician uses when getting data from external data providers into ECS. The Ingest/Distribution Technician has access to Ingest primarily through the ECS Ingest graphical user interface (GUI).

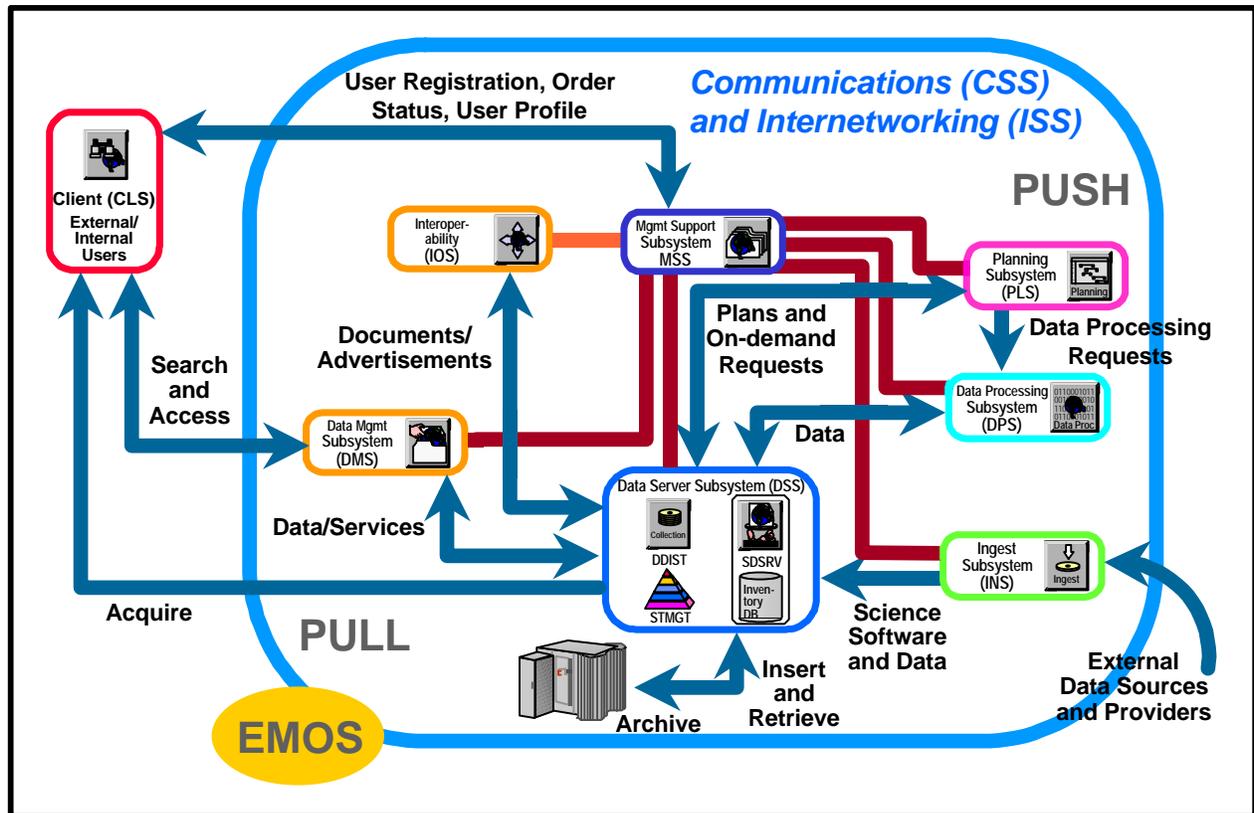


Figure 1. ECS Context Diagram

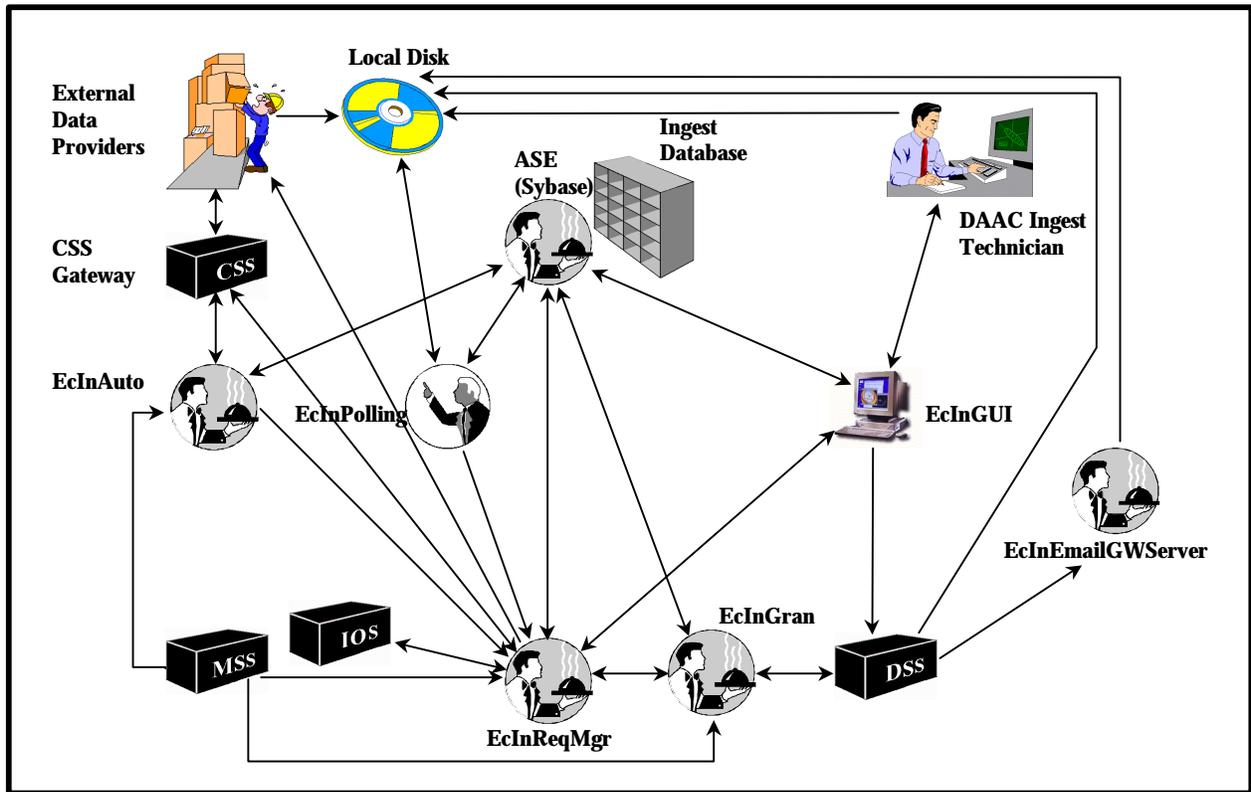


Figure 2. Ingest Subsystem (INGST CSCI) Architecture Diagram

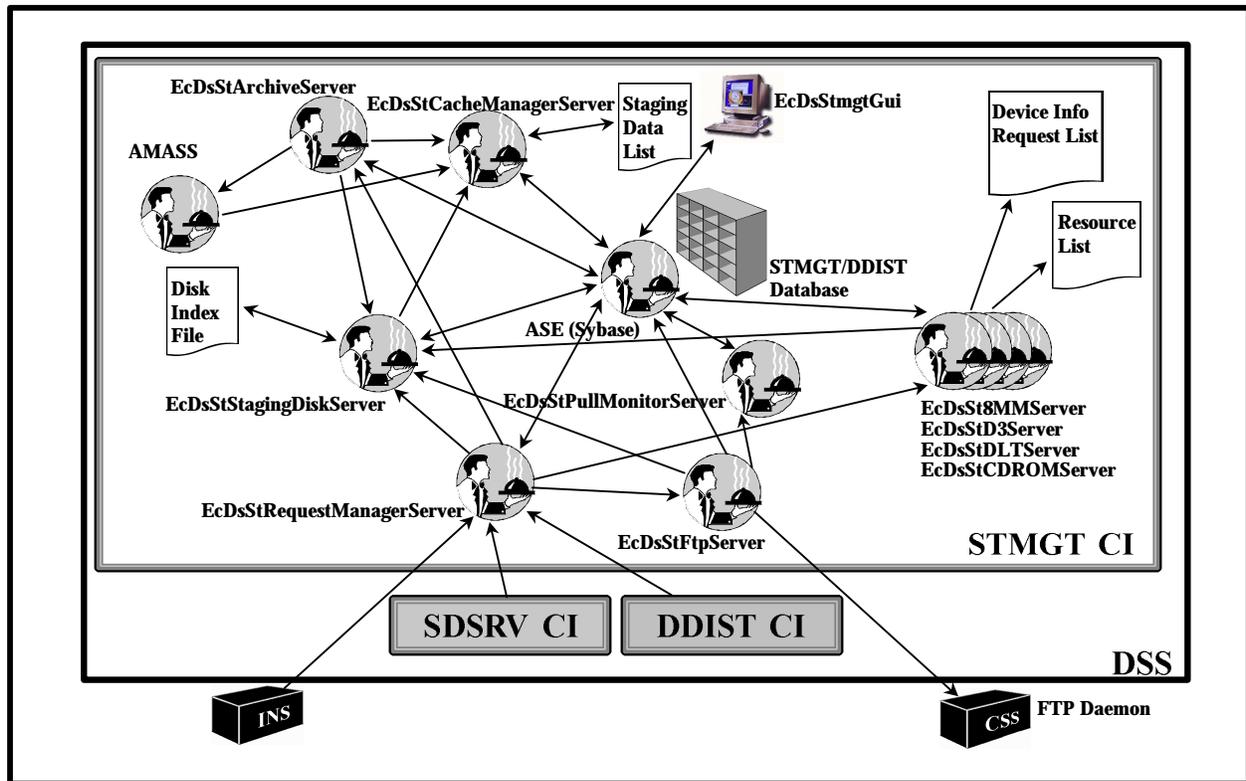


Figure 3. DSS Storage Management (STMGT) CSCI Architecture

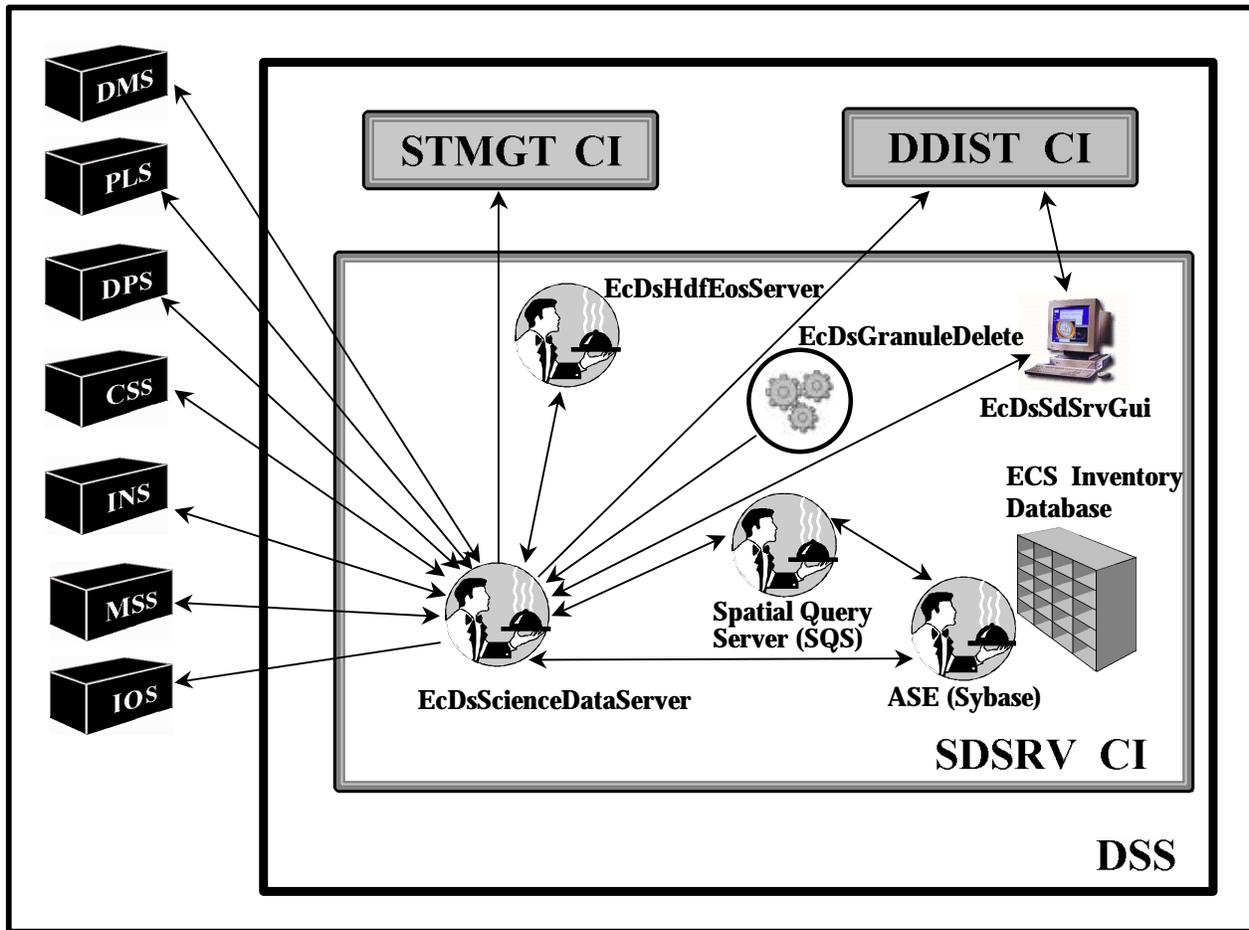


Figure 4. DSS Science Data Server (SDSRV) CSCI Architecture

The Ingest Subsystem (INS) is composed of just one CSCI; i.e., INGST. (The designation “INGST” is derived from **INGEST**.) The subsystem has the following major components as shown in Figure 2:

- Automated Network Ingest Interface (EcInAuto).
 - Server that provides basic capability to ingest data electronically from an external source.
- Automated Polling Ingest Client Interface (EcInPolling).
 - Clients that create polling requests, detect new files in a specified external location, create and submit Ingest requests.
- Ingest Request Manager (EcInReqMgr).
 - Server that manages Ingest request traffic and processing.

- Ingest Granule Server (EcInGran).
 - Server that provides services for required preprocessing of data and subsequent insertion into the Data Server Subsystem.
- Ingest E-Mail Parser (EcInEmailGWServer).
 - Server that receives e-mail distribution notification messages, stores e-mail messages into files, detects new files of interest at a regular time interval on a local disk, creates a polling request, and puts the request on a local disk location.
- ECS Ingest GUI (EcInGUI).
 - GUI that provides the Ingest/Distribution Technician with the capability to perform physical media ingest, monitor the Ingest history log, monitor the status of ongoing ingest requests, and modify Ingest configuration parameters.
- Sybase Adaptive Server Enterprise (ASE) Server.
 - Commercial off-the-shelf (COTS) software application that stores and provides access to Ingest Subsystem internal data; i.e., the Ingest operations databases.

Ingest personnel use the following start-up script that is available in the `/usr/ecs/MODE/CUSTOM/utilities` directory on the Operations Workstation:

- EcInGUIStart.
 - Launches the ECS Ingest GUI.

The following start-up scripts in the `/usr/ecs/MODE/CUSTOM/utilities` directory on the Ingest Server host, Access/Process Coordinators (APC) Server host, and/or Interface Server hosts are typically called by other applications and are not normally invoked directly by Ingest personnel:

- EcInAutoStart.
 - Starts the Automated Network Ingest Server.
- EcInGranStart.
 - Starts the Ingest Granule Server.
- EcInIngestAppStart.
- EcInInitPasswdStart.
- EcInPollingStart.
 - Starts the Ingest polling clients.
- EcInReqMgrStart.
 - Starts the Ingest Request Manager.

- EcInStart.
- EcInEmailGWServerStart.
 - Starts the Ingest E-Mail Parser.

In addition to the preceding start-up scripts the following scripts are available in the /us/ecs/*MODE*/CUSTOM/utilities directory on the Ingest Server host:

- EcInEDOSCleanupMain (available on the APC Server host and Operations Workstation also).
 - Deletes files older than a specified number of days from the EDOS polling directory or directories that is/are specified as argument(s) to the command.
- EcInPollClean (available on the APC Server host and Operations Workstation also).
 - Delete files older than a specified number of days from the polling directory or directories that is/are specified as argument(s) to the command.
- EcInCopyAMIANC (available on the APC Server host also).
- EcInDbBuild.
 - Supports installation of the Ingest Subsystem database, including database objects such as tables, stored procedures, triggers, constraints, and defaults. The script automatically invokes additional scripts; i.e., EcInDbDrop, EcInDbTables.sql, EcInDbUser, EcInDbPermissions, and EcInDbCheckObjects.sql.
- EcInDbDrop.
 - Supports the-installation of the Ingest Subsystem database. Drops/deletes all objects and users from the specified database. Invoked through ECS Assistant from within EcInDbBuild. Can be executed individually, but the routine is not compatible with database recovery.
- EcInDbDump.
 - Dumps the specified database and the master database to a flat file that can be used for database recovery. Dumping the database allows the operator to recover from the dumped state if the installation or patch routine fails. It is highly recommended to perform the dump routine before any installation or patch routines are run. The Database Operator (DBO) executing this script must have sso_role (System Security Officer) privileges in order to dump the databases or the dump fails.

- EcInDbDumpTrans.
 - Dumps the transaction log. Dumping the database allows the operator to recover from the dumped state if the installation or patch routine fails. It is highly recommended to perform the dump routine before any installation or patch routines are run. The DBO executing the script must have sso_role (System Security Officer) privileges in order to dump the databases or the dump fails.
- EcInDbLoad.
 - Loads a database from a backup device or file based on date-time stamp for database recovery purposes. Invoked through ECS Assistant.
- EcInDbLoadTrans.
 - Loads a transaction log from a backup device or file based on date-time stamp for transaction log recovery purposes.
- EcInDbPatch.
 - Used in upgrading an existing Ingest database to the next valid database version level. Patches any modified or new database (dB) structures to the database without having to re-install the entire dB. Allows for existing data to be maintained. Invoked through ECS Assistant.
- EcInGWClientDrvStart (available on the APC Server host also).
 - Starts the GwClient, which is used in testing the Automated Network Ingest Interface (EcInAuto) (e.g., for submitting Data Availability Notices for Landsat-7 data).

Storage Management (STMGT)

The Data Server Subsystem STMGT CSCI manages all physical storage resources for all DSS components including the following items:

- Tape robotic archive.
- Random Array of Inexpensive Disks (RAID) disk cache.
- On-line storage.
- Peripheral devices (e.g., various types of magnetic tape drives) used for ingesting and distributing data.

During data ingest STMGT provides interfaces that allow Ingest to obtain access to disk space, file transfer protocol (ftp) services, and peripheral devices (e.g., tape drives). STMGT archive code provides for the copying of files into the archive for permanent storage.

STMGT has the following major components (as shown in Figure 3):

- Archive Server (EcDsStArchiveServer).
 - Server that 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 medium.
- Staging Servers.
 - Cache Manager Server (EcDsStCacheManagerServer) - Server that manages a group of data files that have been retrieved from the archive and placed into a cache area on staging disk; it maintains a list of the data files so that subsequent data retrieval requests are fulfilled immediately without requiring an additional archive access.
 - Pull Monitor (EcDsStPullMonitorServer) [The pull monitor is just a symbolic link to the Cache Manager Server binary executable image.] - Server that manages the files in the user pull area; deletes files as they 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 expire).
 - Staging Disk Server (EcDsStStagingDiskServer) - Server that manages shared disk space; it allows clients to allocate disk space and reserve files between staging directories and from non-staging to staging directories.
- Resource Managers.
 - 8mm Server (EcDsSt8MMServer) - Server that schedules access to the 8mm cartridge tape drives shared between Ingest and Data Distribution; maintains a request queue based on priority and time of request receipt.
 - D3 Server (EcDsStD3Server) - Server that schedules access to the D3 cartridge tape drive(s); maintains a request queue.
 - DLT Server (EcDsStDLTServer) - Server that schedules access to the DLT drive(s); maintains a request queue.
 - CD-ROM Server (EcDsStCDROMServer) - Server that schedules access to the CD drive(s); maintains a request queue.
 - FTP Server (EcDsStFtpServer) - Server that schedules access for Ingest or distribution file transfer protocol (ftp); maintains a request queue.
- Storage Management Request Manager (EcDsStRequestManagerServer).
 - Routes requests to the appropriate server for servicing.
 - Provides the primary point of detection and recovery for unexpected client or server termination.

- Storage Management Control GUI (EcDsStmgtGui).
 - GUI to the Storage Management/Data Distribution shared database; allows the technician to set parameters and configurations that control the STMGT servers.
- Sybase ASE Server.
 - COTS software application that handles insertion and retrieval of data concerning storage management activities into/from the STMGT/DDIST database.
- Archival Management and Storage System (AMASS).
 - COTS software application that supports the functioning of the data repository hardware (e.g., archive robotics).

Ingest personnel use the following start-up script that is available in the /usr/ecs/*MODE*/CUSTOM/utilities directory on the Distribution Server host:

- EcDsStmgtGuiStart.
 - Launches the Storage Management Control GUI.

The following start-up scripts in the /usr/ecs/*MODE*/CUSTOM/utilities directory on the Ingest Server host, Access/Process Coordinators (APC) Server host, Distribution Server host, File and Storage Management System (FSMS) Server host, and/or Working Storage host are typically called by other applications and are not normally invoked directly by Ingest personnel:

EcDsStFtpServerStart.

- Starts the ftp server.

- EcDsStStagingDiskServerStart.

- Starts a staging disk server.

- EcDsStStart.

- EcDsStStorageMgmtAppStart.

- EcEcsAppStart.

- EcDsStArchiveServerStart.

- Starts an archive server.

EcDsStCacheManagerServerStart.

- Starts a cache manager server.

- EcDsStRequestManagerServerStart.

- Starts the Request Manager.

- EcDsSt8MMServerStart.
 - Starts the 8mm (Stacker) Server.
- EcDsStD3ServerStart.
 - Starts the D3 (Drive) Server.
- EcDsStDLTServerStart.
 - Starts the DLT Server.
- EcDsStCDROMServerStart.
 - Starts the CD Server.

In addition to the preceding applications the following scripts are available in the `/us/ecs/MODE/CUSTOM/utilities` directory on a variety of hosts, including the APC Server host, FSMS Server host, and/or Working Storage host:

- EcDsCheckArchive.
- EcDsStConfigVolGrps.
- EcDsStDbBuild.
- EcDsStDbDrop.
- EcDsStDbDump.
- EcDsStDbDumpTrans.
- EcDsStDbLoad.
- EcDsStDbLoadTrans.
- EcDsStDbPatch.
- EcDsStFilesPerTapeUtility.
- EcDsStVolGrpCreateMain.pl.

Science Data Server (SDSRV)

The SDSRV CSCI is the part of the Data Server Subsystem that issues requests to the STMGT and Data Distribution (DDIST) CSCIs to perform storage and distribution services in support of the processing of service requests, such as insertion of data into the archive or distribution of data products to requesters (including other ECS subsystems). The Ingest/Distribution Technician can gain access to SDSRV through the Science Data Server GUI if necessary.

SDSRV has the following major components (as shown in Figure 4):

- Science Data Server (EcDsScienceDataServer).
 - Server responsible for managing collections of Earth Science and related data and for servicing requests for the storage, search, retrieval, and manipulation of data within those collections.
- Hierarchical Data Format (HDF) EOS Server (EcDsHdfEosServer).
 - Server that provides science data subsetting capabilities for Earth Science data that have been configured with a subsetting service.
- Granule Deletion Administration Tool (EcDsGranuleDelete).
 - Provides a command line operator interface for deleting granules either in both the inventory and the archive or just the archive.
 - The associated Production History (PH), Quality Assessment (QA) and Browse granules can also be deleted.
- Science Data Server GUI (EcDsSdSrvGui).
 - GUI that allows the operator to monitor active EcDsScienceDataServer requests and receive descriptor files and dynamic link libraries (dll) for configuring Earth Science Data Types (ESDTs) in the EcDsScienceDataServer.
- Autometric Spatial Query Server (SQS).
 - COTS software application that provides the capability to manage spatial data types of earth science catalog metadata (including specialized spatial searches) for the ECS Science Data Processing Segment (SDPS).
- Sybase Adaptive Server Enterprise (ASE) Server.
 - COTS software application that 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.

The following start-up script is available in the `/usr/ecs/MODE/CUSTOM/utilities` directory on the SDSRV Server host and the Operations Workstation:

- EcDsSdSrvGuiStart.
 - Launches the Science Data Server GUI.

In addition to the preceding applications the following scripts are available in the `/usr/ecs/MODE/CUSTOM/utilities` directory on the SDSRV Server host:

- EcTsDsClientDriverStart.
- EcDsSrConvertEvt.

- EcDsSrDbBuild.
- EcDsSrDbDrop.
- EcDsSrDbDump.
- EcDsSrDbLoad.
- EcDsSrDbMigrate.
- EcDsSrDbPatch.
- EcDsSrDbValid.

System Changes for Release 6A

Release 6A involves changes in the following areas:

- Increased data processing load at certain DAACs in support of...
 - Reprocessing of Terra satellite data (in addition to routine processing of Terra data).
 - Essentially doubles the previous Terra processing load.
 - Processing of data from the Aqua satellite.
 - Release 5B supported Aqua Science Software Integration and Test (SSI&T) only.
- Greater volume of data to be ingested.
 - Supports more interfaces and a larger number of Earth Science Data Types (ESDTs).
- Higher volume of data products to be distributed.

ECS hardware configuration upgrades for Release 6A include the following changes:

- Replacement of the Fiber Distributed Data Interface (FDDI) networks with gigabit Ethernet networks at two DAACs [i.e., Goddard Spaceflight Center (GSFC) and Earth Resources Observation Systems Data Center (EDC)].
 - The gigabit Ethernet networks are expected to handle the increased throughputs of Terra reprocessing along with routine processing for Aqua.
- Addition of an SGI Origin processor to the Science Processing configuration at GSFC to handle the additional Aqua MODIS processing load.
- Replacement of SGI Challenge archive machines with SGI Origin machines.

- Upgrading of Science Data Server configurations (both the SDSRV and Sybase/SQS hosts) at EDC and GSFC so that the request load is shared between two separate host configurations.
- Additional staging disks in the Release 6A configuration to handle increased Ingest and Data Distribution loads.

The Ingest Process

The Ingest function is characterized by a collection of hardware and software that supports receiving data and transferring it to the appropriate ECS repositories on either a routine or ad hoc basis. Data to be ingested may be of several types including:

- Science data.
- Science software packages.

Ingest triggers subsequent archiving of the data, which may activate a trigger for data processing (e.g., if there are subscriptions for the data being ingested).

- Flexibility supports various data formats and structures, external interfaces, and ad-hoc ingest tasks.
- Software configuration is called an ingest client.
 - Single interface point for receipt of all external data to be archived within the Science Data Processing component of ECS.
 - Client performs ingest data preprocessing, metadata extraction, and metadata validation on any incoming data, as required.

Ingest is one of the responsibilities of DAAC Ingest/Distribution Technicians. They monitor the different types of automated ingest and set up ingest from hard media (e.g., tape cartridges).

Ingest Activities

The Ingest function brings data into ECS from external data providers. The following data providers are representative:

- Landsat Processing System (LPS).
- Landsat 7 Image Assessment System (IAS).
- Ground Data System (GDS) for the ASTER instrument on the Terra (AM-1) satellite
- EOS Data and Operations System (EDOS).
- Science Computing Facilities (SCFs).
- Science Investigator-Led Processing Systems (SIPS); for example:
 - Advanced Cavity Radiometer Irradiance Monitor (ACRIM) III.

- Advanced Microwave Scanning Radiometer (AMSR-E).
- Advanced Spaceborne Thermal Emission and Reflection Radiometer (ASTER) Observation Schedule File (OSF).
- ASTER Digital Elevation Model (DEM).
- Measurements of Pollution in the Troposphere (MOPITT).
- MODIS (Moderate-Resolution Imaging Spectroradiometer) Adaptive Processing System (MODAPS).
- Stratospheric Aerosol and Gas Experiment (SAGE) III.
- National Oceanic and Atmospheric Administration (NOAA) National Environmental Satellite, Data, and Information Service (NESDIS).
 - Central Environmental Satellite Computer System (CEMSCS) data.
 - National Climatic Data Center (NCDC) data.
- NOAA National Weather Service (NWS) National Centers for Environmental Prediction (NCEP).
- Flight Dynamics System (FDS).

Ingest includes the following activities:

- Data transfer and transmission checking.
- Data preprocessing (including data conversions if required).
- Metadata extraction (as required)
- Metadata validation (as required).
- Transferring ingested data to the Data Server Subsystem for long-term storage in the archive.

Ingest provides a single point of monitoring and control of data received from data providers outside the DAAC. The nominal ingest process is fully automated, with minimal operator intervention.

Ingest Categories

Ingest supports a wide variety of external interfaces. Different interfaces may use different protocols for data transfer, which is why there are different ingest clients. However, there are some common characteristics that permit categorizing the interfaces:

- Automated network ingest.
 - Used at Earth Resources Observation Systems (EROS) Data Center (EDC) only

- Data provider is the Landsat Processing System (LPS).
- Data Availability Notice (DAN) from LPS initiates ingest.
- ECS “gets” data from an LPS processor staging area via ftp, within a specified time window.
- Automated polling ingest.
 - With delivery record.
 - ECS periodically checks a network location for a delivery record file, which indicates the availability of data for ingest.
 - ECS “gets” data (within a specified time window) from the applicable directory on an ECS staging server, where the data provider will have put the data.
 - Data providers include EDOS, IAS, SCFs, SIPS, and NOAA NCEP.
 - Without delivery record.
 - ECS periodically checks a network location for available data.
 - All data at the location are treated as one specific data type, one file per granule.
 - If the particular polling client is configured to perform file comparisons, each file is compared with the last version that was ingested. If the new file is different from the previous one, it is ingested as a new file. If it is identical to the previous one, it is not ingested.
 - ECS “gets” data from the network location, within a system-tunable time period.
 - Data providers include FDS and NOAA NESDIS CEMSCS.
- Hard media ingest by the Ingest/Distribution Technician.
 - Ingest from hard media (e.g., tape cartridges); from authorized institutions or other providers, or as backup to other types of ingest (e.g., polling).
 - Manual transfer requires file/record information equivalent to DAN/PDR either furnished by the data provider or constructed by the Ingest/Distribution Technician.
 - Data providers include the ASTER GDS, EDOS, SCFs, NOAA NCEP, and NOAA NESDIS NCDC
- Cross-Mode Ingest Interface.
 - Ingest from other DAACs or other modes at the same DAAC.

- Ingest 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 that is put in an agreed-upon network location.
- The polling-with-delivery-record process checks the location for the delivery record files.

Ingest Automated Network Ingest Messages

As illustrated in Figure 5, there are four types of automatically generated electronic messages used in the automated network ingest process (i.e., ingesting data from LPS). They are associated with significant events that occur during an ingest transaction; consequently, their occurrence and content may be useful in troubleshooting problems that may occur with an ingest transaction. The types of messages and their fields are as follows:

- Data Availability Notice (DAN) - Notice sent to Ingest by external data provider specifying data which are available for ingest.
 - Contains the following field groups: message header (2 fields), exchange data unit label (7 fields), DAN label (7 fields), and parameter value statements (as required).
- Data Availability Acknowledgment (DAA) - Message sent from Ingest acknowledging the receipt and status of the DAN (including any DAN errors).
 - Contains the following fields: message type, message length, DAN sequence number, disposition, and transfer start time.
- Data Delivery Notice (DDN) - Notice sent from Ingest to the data provider indicating status of the transfer (including problems) and archiving of the data.
 - Contains the following fields: message type, message length, DAN sequence #, disposition, spares, time stamp, and throughput.
- Data Delivery Acknowledgment (DDA) - Message sent to Ingest acknowledging the DDN and terminating the connection.
 - Contains the following fields: message type, message length, DAN sequence #, disposition, and time stamp.

Ingest Polling Messages

As in automated network ingest, messages are passed in polling ingest with delivery record. The exact number and nomenclature of messages depends on the particular data provider's agreement with ECS as specified in each Interface Control Document (ICD). Unlike the control messages in automated network ingest, which are transmitted using Transmission Control Protocol/Internet Protocol (TCP/IP) during a data exchange session, the polling messages are sent by either ftp or e-mail.

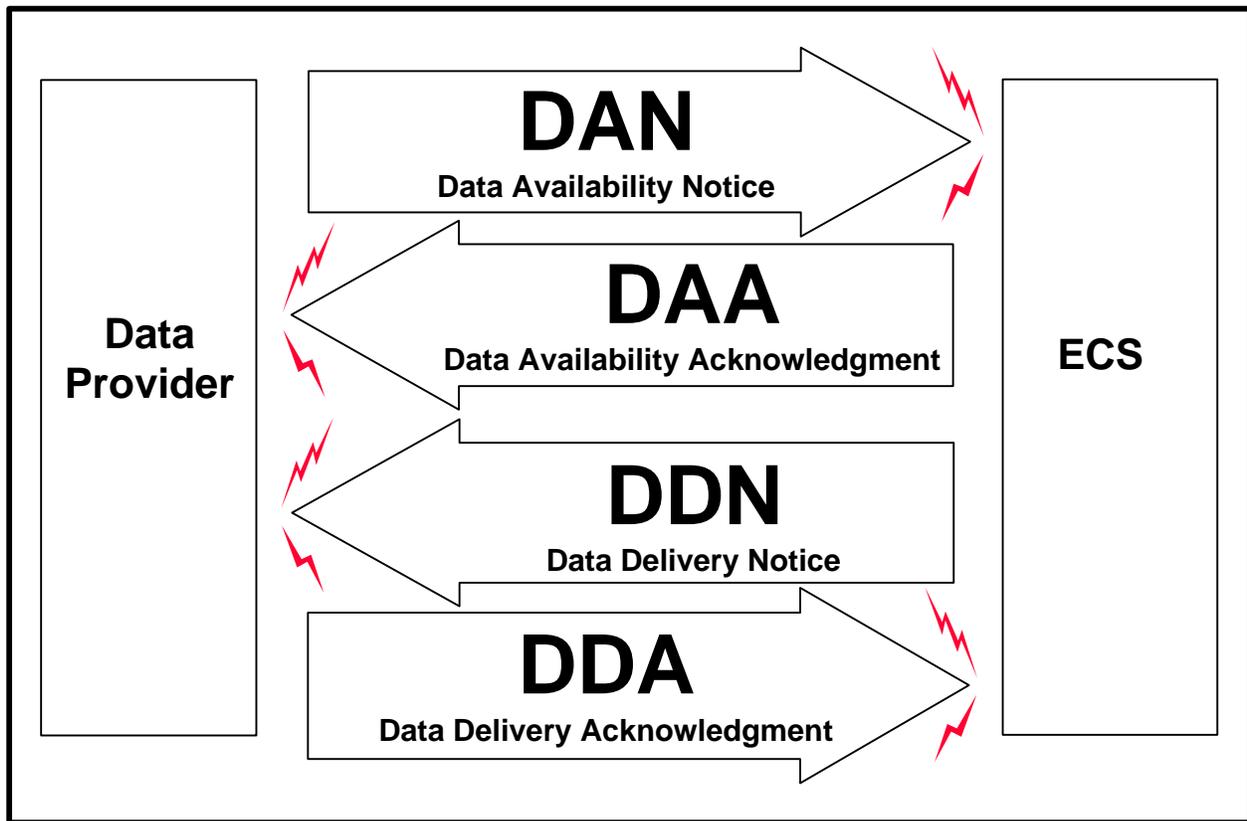


Figure 5. Ingest Automated Network Ingest Messages

Note that no messages are passed in polling ingest without delivery record.

Figure 6 shows the messages associated with the ingest of Landsat 7 Image Assessment System (IAS) data. The types of messages shown in the figure and similar messages used with other data providers are described as follows:

- Product Delivery Record (PDR) - Notice that is sent to Ingest by an external data provider specifying data that are available for ingest.
 - Alternatives include the EDOS Production Data Set (PDS) Delivery Record (PDR) and Expedited Data Set (EDS) Delivery Record (EDR).
- Product Delivery Record Discrepancy (PDRD) - Notice sent from Ingest to the data provider via ftp or e-mail indicating that the PDR cannot be successfully validated.
 - There is no PDRD in EDOS polling.

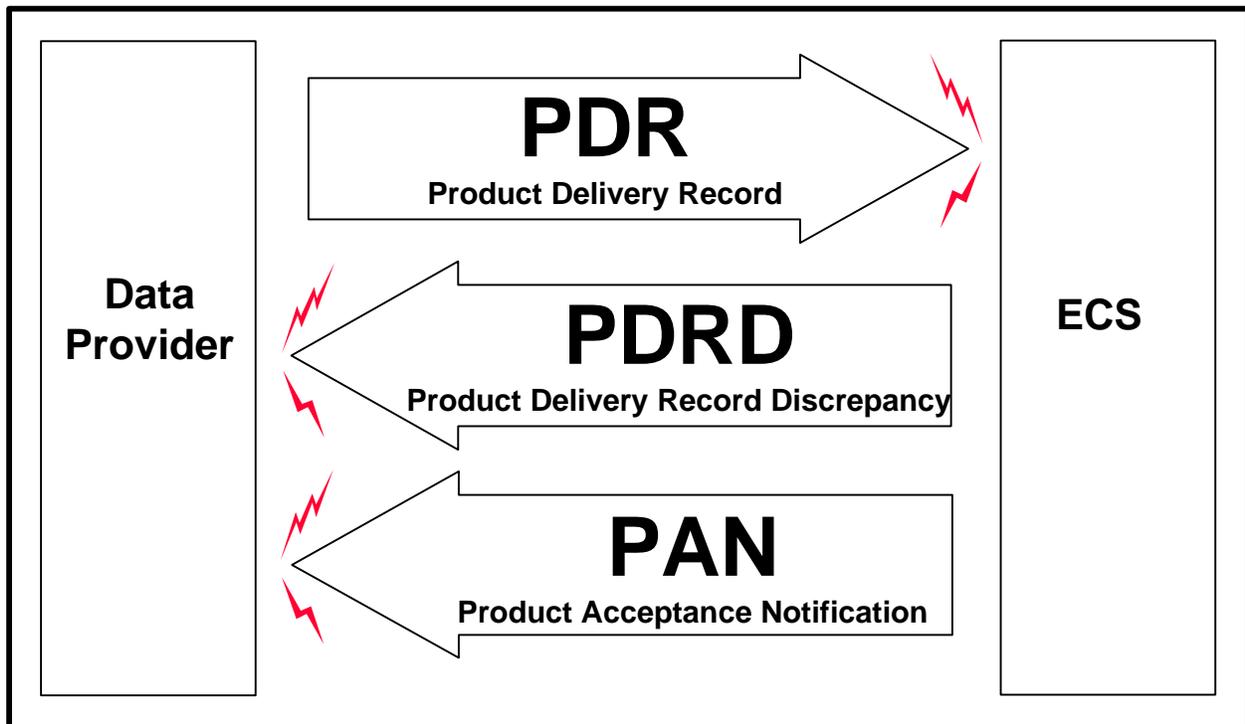


Figure 6. Ingest Polling Messages

- Product Acceptance Notification (PAN) - Message sent via ftp or e-mail to the data provider from Ingest announcing the completion of data transfer and archiving and identifying any problems with any of the files specified in the PDR.
 - Alternatives include the EDOS PDS Acceptance Notification (PAN) and EDS Acceptance Notification (EAN), which perform the same general function.

EDOS provides a signal file to indicate that EDOS has completed transfer of a data file so the data can be ingested. The signal file is identified by an “.XFR” extension to the data file name. The content of the signal file consists solely of the full name of the data file.

Physical Media Messages

As in automated network ingest or polling ingest with delivery record, physical media ingest involves the passing of messages between the data provider and ECS Ingest. The exact nomenclature of messages depends on the particular data provider’s agreement with ECS as specified in each Interface Control Document (ICD).

Like the control messages in polling ingest with delivery record some of the physical media messages are sent by ftp or e-mail. For example, the ingest of browse data from Landsat 7

International Ground Stations (IGSs) (scheduled for Release 6B) involves the following messages:

- Physical Media Product Delivery Record (PMPDR) - Notice provided on the physical medium (i.e., tape cartridge) and available via fax as hard copy (if needed).
 - Notice provided by the external data provider to identify the data on the tape that are available for ingest.
- Physical Media PDR Discrepancy (PMPDRD) - Notice sent from Ingest to the data provider via e-mail only in the event of an error in the PMPDR.
 - Indicates that the PMPDR cannot be successfully validated.
- Physical Media Production Acceptance Notification (PMPAN) - Message sent via e-mail to the data provider from Ingest announcing the completion of data transfer and archiving.
 - Identifies any problems encountered in ingesting any of the files specified in the PMPDR.

Data Transfer and Staging

Science data transfer from external data providers uses one of three methods:

- File transfer protocol (ftp) “get” by ECS.
- Ftp “put” by external source.
- Hard media transfer.

Data are staged to a working storage area.

- In general 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.
- Many types of ingest use “icl” (Ingest Client) staging areas.
- Media ingest (e.g., from D3 tape) typically involves staging in a “dip” (Distribution and Ingest Peripherals) area.
- Polling ingest for data from EDOS usually entails the use of the polling directory as the staging area.
- As previously mentioned some data are staged directly to working storage (“wks”) in the Data Server Subsystem.

After the metadata have been extracted and their quality has been checked, data are transferred to an archive data repository in the Data Server Subsystem for long-term storage.

Ingest Scenarios

Scenarios are presented for the following types of Ingest:

- Automated network ingest.
- Polling ingest with delivery record.
- Polling ingest without delivery record.
- Physical media ingest.
- Cross-DAAC ingest.

Automated Network Ingest

The process for automated network ingest of Landsat-7 data from the Landsat Processing System (LPS) is described in the statements that follow.

- Upon startup, the Ingest Request Manager (EcInReqMgr) requests the Science Data Server (SDSRV) Universal References (URs) for each data type in its database from the Advertising Server (EcIoAdServer).
- The LPS and the Landsat-7 Gateway server (EcCsLandsat7Gateway) exchange messages to begin a session.
 - Session messages include Authentication Request and Authentication Response.
- To begin the LPS data transfer the LPS first sends a DAN, letting the ECS know that data are available, what data are available, and where the data are located.
- The Landsat-7 Gateway server transfers the LPS data exchange messages (e.g., DAN) to the Automated Network Ingest Interface (EcInAuto).

- The Automated Network Ingest Interface validates the DAN and responds with a DAA.
 - In a multiple LPS DAN scenario using a single TCP connection an LPS processor may send multiple DANs over the same socket connection during a single TCP session.
 - Each DAN still must be acknowledged first with a corresponding DAA handshake prior to transmission of any subsequent DANs over the same socket connection.
 - Each LPS processor may also establish concurrent TCP connections with the ECS gateway, as necessary (subject to limitations) to transfer DANs.
 - DAAs are sent by ECS via the same socket connection used to transmit its corresponding DAN.
- When LPS has transmitted all of its DANs and have received the corresponding DAAs from ECS, LPS terminates the TCP connection(s).
- The Automated Network Ingest Interface packages the data transfer messages (i.e., DANs) into the appropriate Ingest Requests.
- The Automated Network Ingest Interface passes the identity of the data source (LPS) (defined on startup) to the Ingest Request Manager.
- The Ingest Request Manager packages the request into granules and sends them to the appropriate Ingest Granule Server (EcInGran).
- The Ingest Granule Server sends a request to the Storage Management Request Manager [which forwards the request to the FTP Server (EcDsStFtpServer)] to stage data files to be inserted into the archive.
- The FTP Server stages data files.
 - The LPS host and directory name(s) are specified in the DAN.
 - ECS uses standard ftp “mget” file transfer, pulling all files at one time related to each error-free file group from the directory name(s) specified in the DAN.
 - Through the file transfer process, the file's name and size are checked against DAN information.
 - Transfer errors, DAN information discrepancies, and other file problems are captured and logged in the DDN.
 - The DDN identifies transfer success and/or identified errors associated with all individual files for a particular DAN.
 - Only complete file groups that are transferred without error are ingested and archived.

- The Ingest Granule Server connects to the appropriate Science Data Server (EcDsScienceDataServer) to begin a session.
 - The appropriate Science Data Server is retrieved from Advertising during Ingest Request Manager startup.
 - The appropriate Science Data Server is based on the data type.
 - This is pertinent if there are multiple Science Data Servers in use at one DAAC in one mode.
- The Ingest Granule Server requests the Science Data Server to provide the metadata configuration file (MCF) for the data being inserted.
 - The data types being inserted are derived from the DAN messages sent by the LPS.
- The Ingest Granule Server performs preprocessing (current number of files for data type, extraction of metadata, etc.).
- The Ingest Granule Server builds each granule's metadata file.
- The Ingest Granule Server requests the Science Data Server to validate the metadata, based on the granule's data type.
- The Ingest Granule Server creates and sends an Insert Request for the LPS Landsat-7 LOR subinterval to be inserted into the Science Data Server.
 - An Insert Request, containing the names of the files comprising the subinterval, is created.
- The Science Data Server validates metadata and determines the archived names of the files.
- The Science Data Server sends a request to the Storage Management Request Manager (which forwards the request to the Archive Server) for the files to be inserted into the archive.
- The Archive Server copies the files directly from the Ingest staging disks on which they reside and returns Archive ID, Backup Archive ID, a checksum, file size, status for each file, and status for the request to the Science Data Server.
- The Filecopy utility (EcUtCopyExec) copies each file from the location where Ingest placed it originally to the AMASS cache for the primary Archive Server.
 - The Archive ID indicates which archive server is used and which directory path is used within the archive.
 - If the Backup Archive ID is blank, the next file in the request is processed.

- The Filecopy utility copies each file from the location where Ingest placed it originally to the AMASS cache for the backup Archive Server.
 - The Backup Archive ID indicates which Archive Server is used for backup and the directory path within that archive.
 - This is done only if the Backup Archive ID is not empty.
 - The operator is notified of an archive failure and is able to see the file and its backup status.
 - The operator can reinitiate the backup of the file at a later time.
- The Filecopy utility copies each file from the location where Ingest placed it originally to the AMASS cache for the off-site Archive Server.
 - The off-site Archive Server is determined by the value for the Offsite Archive ID.
 - This is done only if the Offsite Archive ID is not empty.
 - The operator is notified of an archive failure and is able to see the file and its backup status.
 - The operator can reinitiate the backup of the file at a later time.
- The Science Data Server parses the validated metadata and adds the metadata to its inventory.
 - The Science Data Server queries the database for L70RF1 and L70RF2 and creates L70R data.
 - After combining L70RF1 and L70RF2, Science Data Server deletes the metadata for L70RF1 and L70RF2.
- Upon successful insertion of the Landsat-7 LOR subinterval granule, the Science Data Server triggers the L70R Insert event.
 - The appropriate Subscription Server (EcSbSubServer) to receive the event is determined from the Science Data Server configuration.
 - The correct event to trigger is determined from the events file that was populated during ESDT installation.
 - The inserted granule's UR is provided when the event is triggered.
- The Subscription Server queries the Sybase database to determine which subscriptions need to be activated, or fired.
 - Each query “hit” is an activated subscription and executes independently.

- The Ingest Granule Server derives scene data for the Landsat-7 LOR subinterval granule that was inserted.
- The Ingest Granule Server requests the Science Data Server to provide the metadata configuration files (MCFs) for the scene and browse data related to the subinterval granule that was inserted.
- The Ingest Granule Server builds a metadata file for each virtual scene and browse granule.
- The Ingest Granule Server requests the Science Data Server to validate the metadata, based on the granule's data type.
- The Ingest Granule Server creates and sends requests to the Science Data Server to insert the virtual scene and browse granules.
 - An Insert Request contains the names of the metadata files created.
 - The structure of the Insert Request is hard-coded within the Ingest Granule Server process.
- The Science Data Server validates the metadata file.
- The Science Data Server parses the validated metadata and adds the metadata to its inventory.
 - The Science Data Server queries the database for L70RWRS1 and L70RWRS2 and creates L70RWRS data.
 - After combining L70RWRS1 and L70RWRS2, Science Data Server deletes the metadata for L70RWRS1 and L70RWRS2.
- The Ingest Granule Server sends a completion callback to the Ingest Request Manager when the processing of the granule is complete.
- Upon successful insertion of each Landsat-7 scene virtual granule, the L70R WRS Insert event is triggered.
 - This is a qualified event.
 - The scene's spatial metadata is passed along with the trigger.
 - The appropriate Subscription Server to receive the event is determined from the Science Data Server configuration.
 - The correct events to trigger are determined from the events file which was populated when the ESDT was installed.
 - The inserted granule's UR is provided when the event is triggered.

- The Subscription Server queries the Sybase database to determine which subscriptions need to be activated, or fired.
 - Each query “hit” is an activated subscription and executes independently.
- The Subscription Server builds an e-mail notification that users' subscriptions to the insert event have been fired.
 - The notification identifies the event, the subscription ID, the Granule UR that was inserted and the previously supplied User String.
- The Subscription Server sends the notice to users by e-mail.
 - The e-mail addresses are obtained from the User Profiles.
- The Ingest Request Manager creates a Data Delivery Notice (DDN) indicating successful insertion of the LPS data.
- The EcCsLandsat7Gateway sends the Data Delivery Notice (DDN) to the LPS.
 - LPS is free to delete successfully transferred file groups upon receipt of the DDN.
 - Files with errors as identified in the DDN must be corrected and the complete file group must be resubmitted under a new DAN.
- LPS responds to each ECS DDN with a Data Delivery Acknowledgment (DDA) message, acknowledging receipt of the DDN.
- ECS terminates the connection after receipt of the final DDA.

Polling Ingest with Delivery Record

The process for polling ingest with delivery record is described in the statements that follow using the example of ingesting EDOS ancillary data.

- Upon startup, the Ingest Request Manager (EcInReqMgr) requests the SDSRV URs for each data type in its database from the Advertising Server (EcIoAdServer).
- When the system is started, EcInPolling.EDOS begins polling its polling directory looking for file names with a *.PDR.XFR format.
 - The polling periodicity is determined from the PollingTimerInterval configuration parameter.
 - The mask of the file to look for is determined from the NotifyType parameter of the data provider in the Ingest database.
- EDOS copies Ancillary Packets to a local disk on the Ingest host for Ingest access.
- EcInPolling.EDOS detects files matching the *.PDR.XFR mask.

- EcInPolling.EDOS packages the PDR information into an Ingest Request.
- EcInPolling.EDOS passes the identity of the originating system to the Ingest Request Manager.
- The Ingest Request Manager packages the request into granules and sends them to the appropriate Ingest Granule Server.
 - Transfer errors, PDR file information discrepancies, and other file problems are captured and logged in the PAN.
 - The PAN identifies transfer success and/or identified errors associated with all individual files for a particular PDR.
 - Note that no PDRD is sent for discrepancies identified in EDOS PDRs.
 - Only complete file groups that are transferred without error are ingested and archived.
- The Ingest Granule Server connects to the appropriate Science Data Server (EcDsScienceDataServer) to begin a session.
 - The appropriate Science Data Server is retrieved from Advertising during Ingest Request Manager startup.
 - The appropriate Science Data Server is based on the data type.
 - This is pertinent if there are multiple Science Data Servers in use at one DAAC in one mode.
- The Ingest Granule Server requests the Science Data Server to provide the metadata configuration file (MCF) for the data being inserted.
 - The data types being inserted are derived from the PDR.
- The Ingest Granule Server performs preprocessing (current number of files for data type, extraction of metadata, etc.).
- The Ingest Granule Server builds each granule's metadata file.
- The Ingest Granule Server requests the Science Data Server to validate the metadata, based on the granule's data type.
- The Science Data Server validates metadata and determines the archived names of the files.
- The Ingest Granule Server creates and sends the Science Data Server an Insert Request for the EDOS Ancillary Packets to be inserted.
- The Science Data Server sends a request to the Storage Management Request Manager [which forwards the request to the Archive Server (EcDsStArchiveServer)] for the files to be inserted into the archive.

- The Archive Server copies the files directly from the Ingest staging disks on which they reside.
- The Science Data Server parses the validated metadata and adds the metadata to its inventory.
- The Ingest Granule Server sends a completion callback to the Ingest Request Manager when the processing of the granule is complete.
- Upon successful insertion of the EDOS Ancillary Packets, the Science Data Server triggers the EDOS Ancillary Packets insert event.
 - The appropriate Subscription Server (EcSbSubServer) to receive the event is determined from the Science Data Server configuration.
 - The correct event to trigger is determined from the events file that was populated during ESDT installation.
 - The inserted granule's UR is provided when the event is triggered.
- The Subscription Server queries the Sybase database to determine which subscriptions need to be activated, or fired.
 - Each query “hit” is an activated subscription and executes independently.
 - For example, Subscription Server sends notification to the Planning Subsystem Subscription Manager that there are newly inserted Ancillary Packets.
- The Subscription Server builds an e-mail notification that users' subscriptions to the insert event have been fired.
 - The notification identifies the event, the subscription ID, the Granule UR that was inserted and the previously supplied User String.
- The Subscription Server sends the notice to users by e-mail.
 - The e-mail addresses are obtained from the User Profiles.
- The Ingest Request Manager creates a PAN indicating success (or failure) of LPS data insertion.
- The Ingest Request Manager transfers the PAN to EDOS by ftp.
 - EDOS deletes successfully transferred file groups upon receipt of the PAN.
 - If the File Transfer Disposition in the PAN indicates that an error occurred, the DAAC sends a Problem Report to EDOS.

Polling Ingest without Delivery Record

The process for polling ingest with delivery record is described in the statements that follow using the example of ingesting FDS Definitive Orbit/Attitude Data.

- Upon startup, the Ingest Request Manager (EcInReqMgr) requests the SDSRV URs for each data type in its database from the Advertising Server (EcIoAdServer).
- When the system is started, EcInPolling.FDD begins polling its polling directories looking for new files.
 - The polling periodicity is determined from the PollingTimerInterval configuration parameter.
- When orbit/attitude data files are available, the FDS places the files in a pre-specified directory within the FDS, which is accessible by ECS.
 - In order to prevent use by ECS of a file while in transit, the FDS designates the orbit/attitude data file(s) with a leading dot in the file name, rendering the file(s) invisible to the ECS Ingest polling software.
 - Once the FDS completes transferring the orbit/attitude file to the pre-specified directory, the FDS renames the file (removing the leading dot), thereby rendering the file visible to the ECS Ingest software.
- EcInPolling.FDD formulates a delivery record internally.
 - If the CompareFileContentsFlag configuration parameter for EcInPolling.FDD is set to "no," EcInPolling.FDD does not check whether file contents have changed to determine whether the files are new.
- EcInPolling.FDD packages the delivery record information into an Ingest Request.
- EcInPolling.FDD passes the identity of the originating system to the Ingest Request Manager.
- The Ingest Request Manager packages the request into granules and sends them to the appropriate Ingest Granule Server.
- The Ingest Granule Server sends a request to the Storage Management Request Manager [which forwards the request to the FTP Server (EcDsStFtpServer)] to stage data files to be inserted into the archive.
- The FTP Server stages data files.

- The Ingest Granule Server connects to the appropriate Science Data Server (EcDsScienceDataServer) to begin a session.
 - The appropriate Science Data Server is retrieved from Advertising during Ingest Request Manager startup.
 - The appropriate Science Data Server is based on the data type.
 - This is pertinent if there are multiple Science Data Servers in use at one DAAC in one mode.
- The Ingest Granule Server requests the Science Data Server to provide the metadata configuration file (MCF) for the data being inserted.
 - The data types being inserted are derived from the internally formulated delivery record information.
 - The data types being inserted are derived from the internally formulated delivery record information.
- The Ingest Granule Server performs preprocessing (current number of files for data type, extraction of metadata, etc.).
- The Ingest Granule Server builds each granule's metadata file.
- The Ingest Granule Server requests the Science Data Server to validate the metadata, based on the granule's data type.
- The Science Data Server validates metadata and determines the archived names of the files.
- The Ingest Granule Server creates and sends the Science Data Server an Insert Request for the FDS definitive orbit/attitude data to be inserted.
- The Science Data Server sends a request to the Storage Management Request Manager (which forwards the request to the Archive Server) for the files to be inserted into the archive.
- The Archive Server copies the files directly from the Ingest staging disks on which they reside.
- The Science Data Server parses the validated metadata and adds the metadata to its inventory.
- The Ingest Granule Server sends a completion callback to the Ingest Request Manager when the processing of the granule is complete.

- Upon successful insertion of the FDS definitive orbit/attitude data, the Science Data Server triggers the FDS definitive orbit/attitude data insert event.
 - The appropriate Subscription Server (EcSbSubServer) to receive the event is determined from the Science Data Server configuration.
 - The correct event to trigger is determined from the events file that was populated during ESDT installation.
 - The inserted granule's UR is provided when the event is triggered.
- The Subscription Server queries the Sybase database to determine which subscriptions need to be activated, or fired.
 - Each query “hit” is an activated subscription and executes independently.
 - For example, Subscription Server sends notification to the Planning Subsystem Subscription Manager that there is newly inserted FDS definitive orbit/attitude data.
- The Subscription Server builds an e-mail notification that users' subscriptions to the insert event have been fired.
 - The notification identifies the event, the subscription ID, the Granule UR that was inserted and the previously supplied User String.
- The Subscription Server sends the notice to users by e-mail.
 - The e-mail addresses are obtained from the User Profiles.
- On a weekly basis, the FDS cleans up the directory where the orbit/attitude files reside.

Physical Media Ingest

D3 tape ingest of ASTER L1A/L1B data is provided as an example of processes for physical media ingest.

D3 Tape Ingest of ASTER L1A or L1B Data

The process for ingesting data from D3 tape is described in the statements that follow using the example of ingesting AST_L1A or AST_L1B data.

- The ASTER GDS uses a commercial shipping vendor to send D3 tapes containing AST_L1A or AST_L1B data to EDC.
 - The D3 tapes contain data collected and processed in response to ECS Data Acquisition Requests (DARs) as well as data that was not requested via ECS.
- Upon startup, the Ingest Request Manager (EcInReqMgr) requests the SDSRV URs for each data type in its database from the Advertising Server (EcIoAdServer).

- The DAAC Ingest/Distribution Technician launches the ECS Ingest GUI (EcInGUI) using the EcInGUIStart script.
- The DAAC Ingest/Distribution Technician selects the Media Ingest tab on the ECS Ingest GUI.
- The DAAC Ingest/Distribution Technician selects D3 Tape as the medium and ASTER_GDS as the data provider.
- The DAAC Ingest/Distribution Technician enters the media volume ID (barcode on the tape).
- The DAAC Ingest/Distribution Technician selects Embedded in Media as the Data Delivery Record File Location and enters the data delivery record [Physical Media Product Delivery Record (PDR)] file name.
- The DAAC Ingest/Distribution Technician selects the OK button on the ECS Ingest GUI.
- The DAAC Ingest/Distribution Technician inserts the D3 tape cartridge in the D3 tape drive.
- The EcInGUI sends requests to the EcDsStRequestManagerServer to allocate a D3 peripheral device for data ingest.
- The ECS Ingest GUI sends a request to the Storage Management Request Manager (which forwards the request to the Staging Disk Server) to create a staging disk for the PDR file.
- The Staging Disk Server creates a staging disk for the PDR file.
- The ECS Ingest GUI sends a request to the Storage Management Request Manager [which forwards the request to the D3 Server (EcDsStD3Server)] to read the PDR from the D3 tape.
- The D3 Server reads the PDR from the D3 tape.
 - The PDR is in the first tar set on the tape.
 - From the PDR the type and amount of data to be read is determined.
- The ECS Ingest GUI sends a request to the Storage Management Request Manager (which forwards the request to the Staging Disk Server) to create a staging disk for the data files.
- The Staging Disk Server creates a staging disk for the data files.
- The ECS Ingest GUI sends a request to the Storage Management Request Manager (which forwards the request to the D3 Server) to copy files from peripheral resources to staging disk areas.
- The D3 Server copies data files from the D3 tape to staging disk areas.

- The ECS Ingest GUI sends an Ingest Request to the Ingest Request Manager.
- The ECS Ingest GUI passes the identity of the data provider to the Ingest Request Manager.
- The Ingest Request Manager packages the request into granules and sends them to the appropriate Ingest Granule Server.
 - Transfer errors, PDR file information discrepancies, and other file problems are captured and logged in the PAN.
 - The PAN identifies transfer success and/or identified errors associated with all individual files for a particular PDR.
 - Only complete file groups that are transferred without error are ingested and archived.
 - If discrepancies are identified in the PDR, the Ingest Request Manager creates a PDRD.
 - If discrepancies are identified in the PDR, the Ingest Request Manager sends the PDRD to GDS by e-mail.
- The Ingest Granule Server connects to the appropriate Science Data Server to begin a session.
 - The appropriate Science Data Server is retrieved from Advertising during Ingest Request Manager startup.
 - The appropriate Science Data Server is based on the data type.
 - This is pertinent if there are multiple Science Data Servers in use at one DAAC in one mode.
- The Ingest Granule Server requests the Science Data Server to provide the MCF for the data being inserted.
 - The data type is determined from the PDR.
- The Ingest Granule Server performs preprocessing (current number of files for data type, extraction of metadata, etc.).
- The Ingest Granule Server builds each granule's metadata file.
- The Ingest Granule Server requests the Science Data Server to validate the metadata, based on the granule's data type.
- The Science Data Server validates metadata and determines the archived names of the files.
- The Ingest Granule Server creates and sends the Science Data Server an Insert Request for the AST_L1A or AST_L1B data to be inserted.

- The Science Data Server sends a request to the Storage Management Request Manager (which forwards the request to the Archive Server) for the files to be inserted into the archive.
- The Archive Server copies the files directly from the Ingest staging disks on which they reside.
- The Science Data Server parses the validated metadata and adds the metadata to its inventory.
- The Ingest Granule Server sends a completion callback to the Ingest Request Manager when the processing of the granule is complete.
- Upon successful insertion of the data granule, the Science Data Server triggers the AST_L1A:Insert or the AST_L1B:Insert event (as applicable).
 - The appropriate Subscription Server (EcSbSubServer) to receive the event is determined from the Science Data Server configuration.
 - The correct event to trigger is determined from the events file that was populated during ESDT installation.
 - The inserted granule's UR is provided when the event is triggered.
- The Subscription Server queries the Sybase database to determine which subscriptions need to be activated, or fired.
 - Each query “hit” is an activated subscription and executes independently.
 - For example, Subscription Server sends notification to the Planning Subsystem Subscription Manager that there is a newly inserted AST_L1A or AST_L1B granule.
- The Subscription Server builds an e-mail notification that users' subscriptions to the AST_L1A:Insert or AST_L1B:Insert event have been fired.
 - The notification identifies the event, the subscription ID, the Granule UR that was inserted and the previously supplied User String.
- The Subscription Server sends the notice to users by e-mail.
 - The e-mail addresses are obtained from the User Profiles.
- The Ingest Request Manager creates a PAN indicating successful insertion of the AST_L1A or AST_L1B data.
- The Ingest Request Manager transfers the PAN to GDS by e-mail.

Cross-DAAC Ingest

The process for cross-DAAC ingest is described in the statements that follow using an example of data being transferred between a Requesting DAAC and a Distributing DAAC.

- When the system is started, EcInPolling.DDIST at the Requesting DAAC begins polling its polling directory looking for file names with a *.PDR format.
 - The polling periodicity is determined from the PollingTimerInterval configuration parameter.
 - The mask of the file to look for is determined from the NotifyType parameter of the data provider in the Ingest database.
- When the system is started, the Ingest E-Mail Parser (EcInEmailGWServer) at the Requesting DAAC begins polling the EmailDirectory looking for files names with a *.notify format.
 - The polling periodicity is determined from the PollingInterval configuration parameter.
- A technician at the Requesting DAAC either uses the EOS Data Gateway web client to create an order for the desired data or contacts User Services at the Distributing DAAC to have a subscription entered for the desired data.
 - A subscription (for future data) or order (for data already in the archive) is entered in the mode from which the data are to be transferred.
 - The subscription or order specifies (among other things)...
 - The data to be transferred.
 - Ftp push as the associated action/method of data distribution.
 - Destination for the ftp push.
 - The e-mail address for the Ingest E-Mail Parser in the receiving mode in the following format:
EcInEmailGWServer_MODE@host
(e.g., **EcInEmailGWServer_TS1@e0ins01u.ecs.nasa.gov** for data being sent to the TS1 mode at the EDC DAAC)
- If a technician at the Requesting DAAC contacted User Services at the Distributing DAAC to have a subscription entered for the desired data, User Services personnel at the Distributing DAAC enter the subscription in the Subscription Server database using the Subscription Service GUI.

- Either the Subscription Server or Client at the Distributing DAAC submits an Acquire Request for granules of the desired data to be distributed via ftpPush to the Requesting DAAC.
 - The request is asynchronous, meaning that the return of the submit call of the request only contains the status of the request's submittal.
 - The Acquire Request includes a stipulation that e-mail notification be sent to Ingest at the Requesting DAAC.
- The Science Data Server at the Distributing DAAC verifies access privileges for the granules to be distributed.
- The Science Data Server at the Distributing DAAC sends a request to the Storage Management Request Manager (which forwards the request to the Staging Disk Server) to obtain a staging disk area for metadata files.
 - The amount of staging disk to request is determined from collection level metadata from the ESDT's Descriptor file.
- The Staging Disk Server at the Distributing DAAC allocates space and passes back a reference to the disk space.
 - The correct Staging Disk Server is determined from the ArchiveID metadata of the granules to be distributed.
- For each granule referenced in the Acquire Request, the Science Data Server at the Distributing DAAC creates a file containing the granule's metadata before passing the Distribution Request to the Distribution Server (EcDsDistributionServer).
- The Science Data Server at the Distributing DAAC submits a Distribution Request to the Distribution Server.
 - The Distribution Request includes, for each granule, a reference to the metadata file as well as all data files.
 - Other parameters from the Acquire Request are passed to the Distribution Server.
- The Distribution Server at the Distributing DAAC sends a request to the Storage Management Request Manager (which forwards the request to the Staging Disk Server) to obtain a staging disk area for the relevant granule files in the archive.
 - The correct Staging Disk Server is determined from the information passed by the Science Data Server in the Distribution Request, which was the ArchiveID metadata parameter of the granule to be staged.
 - The amount of staging disk to request is calculated from the file sizes in the information passed in the Distribution Request.

- The Staging Disk Server at the Distributing DAAC allocates space and passes back a reference to the disk space.
- The Distribution Server at the Distributing DAAC sends a request to the Storage Management Request Manager [which forwards the request to the Archive Server (EcDsStArchiveServer)] to retrieve data from the archive so the data can be staged for distribution.
- The Archive Server at the Distributing DAAC sends a request to the Cache Manager (EcDsStCacheManagerServer) to copy data from the archives to the read-only cache.
- The Cache Manager at the Distributing DAAC copies data from the archives to the read-only cache.
 - This means that all files needed to fulfill the distribution request are on disk, and ready to be copied.
 - The correct archive object to request is determined from the information provided by the Science Data Server in the Distribution Request.
- The Distribution Server at the Distributing DAAC sends a request to the Storage Management Request Manager (which forwards the request to the Staging Disk Server) to link the files from the read-only cache into the staging disk.
- The Staging Disk Server at the Distributing DAAC links the files from the read-only cache into the staging disk.
- The Distribution Server at the Distributing DAAC sends a request to the Storage Management Request Manager (which forwards the request to the Staging Disk Server) to copy the metadata files from the Science Data Server's staging disk into the granule file staging disk.
- The Distribution Server at the Distributing DAAC sends a request to the Storage Management Request Manager to allocate its FTP Server (EcDsStFtpServer) via a Storage Management Resource Manager Factory.
 - The appropriate resource manager is determined from the media type (ftpPush in this case) handed to the resource factory.
 - The correct FTP Server is determined from configuration within the resource factory.
 - The files, host location, username and password are all determined from the information provided in the original Acquire request.
- The FTP Server at the Distributing DAAC requests the ftp daemon in the Communications Subsystem to perform the actual ftp of the files to the Requesting DAAC.

- The ftp daemon at the Distributing DAAC performs the actual ftp of the files to the Requesting DAAC.
- The Distribution Server at the Distributing DAAC builds a Distribution Notice that the user's order has been fulfilled.
 - The notification includes the media ID, type and format of the request, UR, type and the file names and sizes for each granule as well as a DAAC-configurable preamble.
- The Distribution Server at the Distributing DAAC sends the Distribution Notice to Ingest at the Requesting DAAC via e-mail.
- The Ingest E-Mail Parser at the Requesting DAAC stores the Distribution Notice as a text file in the EmailDirectory using a Sendmail script.
 - A reference to the script is available in the /etc/mail/aliases file.
- While polling the EmailDirectory, the Ingest E-Mail Parser at the Requesting DAAC detects files matching the *.notify mask.
- The Ingest E-Mail Parser at the Requesting DAAC parses the Distribution Notice file.
- The Ingest E-Mail Parser at the Requesting DAAC generates a PDR file.
 - When generating the PDR, the Ingest E-Mail Parser uses the ESDT, FTPHOST, FTPDIR, FILENAME, and FILESIZE fields in the Distribution Notice.
 - The Ingest E-Mail Parser sets the ORIGINATING_SYSTEM in the PDR to "DDIST".
 - If there is an error in generating a PDR, the e-mail message (Distribution Notice) is moved to the directory specified in the FailedDirectory configuration parameter.
- The Ingest E-Mail Parser at the Requesting DAAC copies the PDR file to the polling directory for EcInPolling.DDIST at the Requesting DAAC.
- EcInPolling.DDIST at the Requesting DAAC detects files matching the *.PDR mask.
- EcInPolling.DDIST at the Requesting DAAC packages the PDR information into an Ingest Request.
- EcInPolling.DDIST at the Requesting DAAC passes the identity of the originating system (i.e., DDIST) to the Ingest Request Manager.
- When the Ingest Request Manager at the Requesting DAAC receives a request for which it does not already have the SDSRV URs for each data type in the request, it gets the SDSRV URs from the Advertising Server (EcIoAdServer).

- The Ingest Request Manager at the Requesting DAAC packages the request into granules and sends them to the appropriate Ingest Granule Server.
 - Transfer errors, PDR file information discrepancies, and other file problems are captured and logged in the PAN.
 - The PAN identifies transfer success and/or identified errors associated with all individual files for a particular PDR.
 - Only complete file groups that are transferred without error are ingested and archived.
- The Ingest Granule Server at the Requesting DAAC connects to the appropriate Science Data Server (EcDsScienceDataServer) to begin a session.
 - The appropriate Science Data Server was retrieved from Advertising.
 - The appropriate Science Data Server is based on the data type.
- The Ingest Granule Server at the Requesting DAAC replaces the InputPointers in the .met file with “RE-INGEST FROM DISTRIBUTION – INPUTS UNKNOWN.”
- The Ingest Granule Server at the Requesting DAAC requests the Science Data Server to validate the metadata, based on the granules' data type.
- The Science Data Server at the Requesting DAAC validates metadata and determines the archived names of the files.
- The Ingest Granule Server at the Requesting DAAC creates and sends the Science Data Server an Insert Request for the data granules to be inserted into the archive.
 - The Insert Request contains the names of the files comprising the data granules.
- The Science Data Server at the Requesting DAAC sends a request to the Storage Management Request Manager (which forwards the request to the Archive Server) for the files to be inserted into the archive.
 - The correct archive object to request is determined from collection level metadata for the ESDT, defined in the ESDT's descriptor.
- The Archive Server at the Requesting DAAC copies the files directly from the Ingest staging disks on which they reside.
- The Science Data Server at the Requesting DAAC parses the validated metadata and adds the metadata to its inventory.
- The Ingest Granule Server at the Requesting DAAC sends a completion callback to the Ingest Request Manager when the processing of the granule is complete.

- Upon successful insertion of a data granule, the Science Data Server at the Requesting DAAC triggers the corresponding insert event.
 - The appropriate Subscription Server (EcSbSubServer) to receive the event is determined from the Science Data Server configuration.
 - The correct event to trigger is determined from the events file that was populated during ESDT installation.
 - The inserted granule's UR is provided when the event is triggered.
- The Subscription Server at the Requesting DAAC queries the Sybase database to determine which subscriptions need to be activated, or fired.
 - Each query “hit” is an activated subscription and executes independently.
- The Subscription Server builds an e-mail notification that users' subscriptions to the insert event have been fired.
 - The notification identifies the event, the subscription ID, the Granule UR that was inserted and the previously supplied User String.
- The Subscription Server sends the notice to users by e-mail.
 - The e-mail addresses are obtained from the User Profiles.
- The Ingest Request Manager at the Requesting DAAC creates a PAN indicating success (or failure) of data insertion.
- The Ingest Request Manager at the Requesting DAAC transfers the PAN by ftp to the data user.

Ingest Graphical User Interface (GUI) Tools

The **ECS Ingest** tool, illustrated in Figure 7, has five major functional areas accessible through tab selection:

- Ingest Intro – has menu for saving and printing screens, and to exit the tool.
- History Log – a view-only screen to review/report completed ingest activities.
- Monitor/Control – to view and update ongoing ingest activities.
- Operator Tools – to view and set ingest thresholds.
- Media Ingest – to ingest data from hard media.

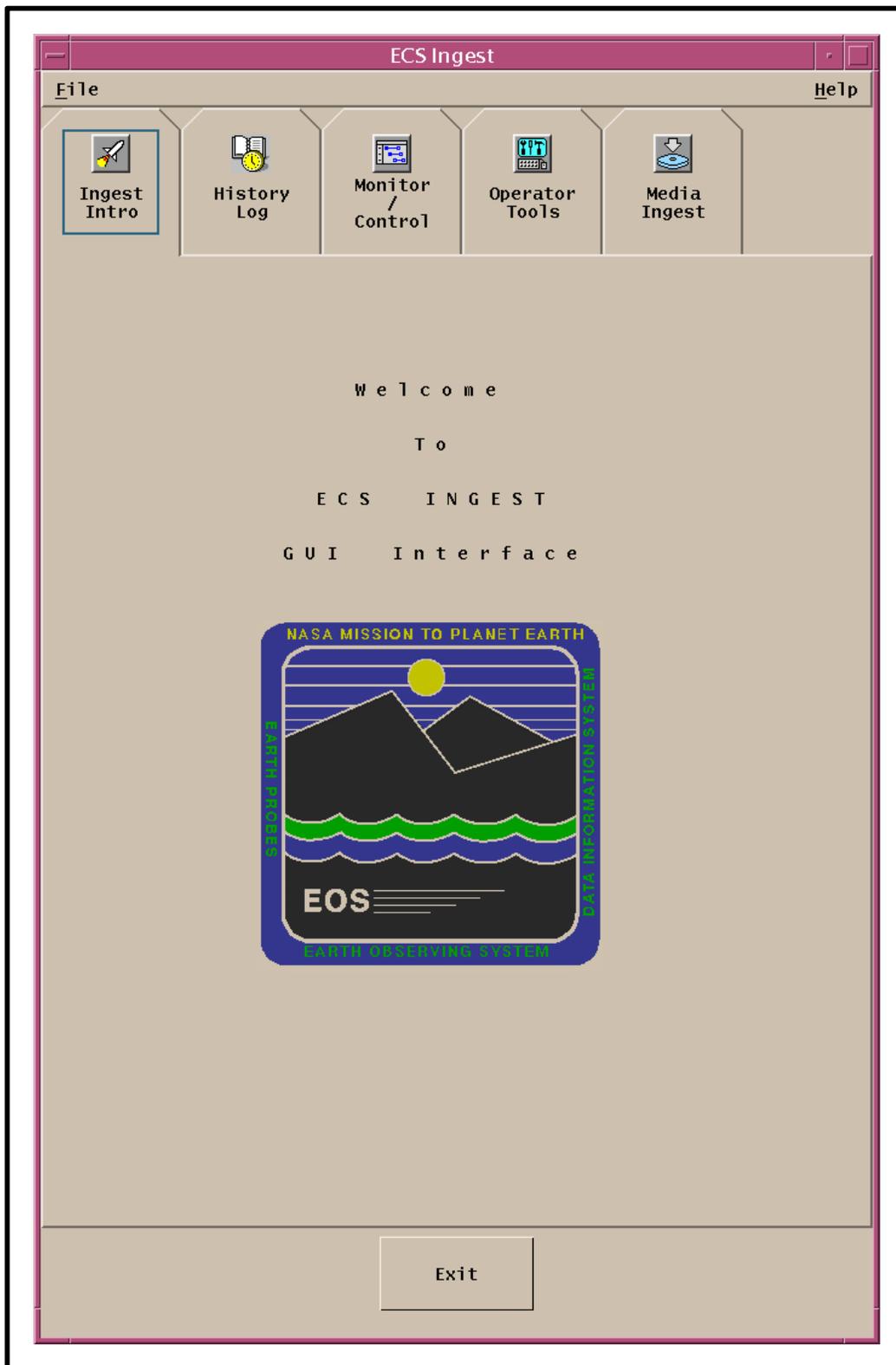


Figure 7. ECS Ingest GUI Intro Screen

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Launching the ECS Ingest and Storage Management Control GUIs

Launching the ECS Ingest GUI

The following software applications are associated with Ingest:

- Automated Network Ingest Interface (EcInAuto).
- Automated Polling Ingest (EcInPolling).
- Request Manager (EcInReqMgr).
- Granule Server (EcInGran).
- ECS Ingest GUI (EcInGUI).
- Ingest E-Mail Parser (EcInEmailGWServer).
- Sybase ASE Server.

There are normally multiple instances of some of the preceding servers (especially the polling and granule servers) in operation at one time. In addition, Ingest depends on a number of related servers, especially Science Data Server and Storage Management servers, to participate in ingest and the insertion of data into the data repositories.

Access to the ECS Ingest GUI is gained through the use of UNIX commands. Launching the ECS Ingest GUI starts with the assumption that the applicable servers are running and the Ingest/Distribution Technician has logged in to the ECS system.

Launching the ECS Ingest GUI

NOTE: Commands in Steps 1 through 6 are typed at a UNIX system prompt.

- 1 Type **setenv DISPLAY *clientname*:0.0** then press the **Return/Enter** key.
 - Use either the X terminal/workstation IP address or the machine-name for the *clientname*.
 - When using secure shell, the DISPLAY variable is set just once, before logging in to remote hosts. If it were to be reset after logging in to a remote host, the security features would be compromised.

- 2 Start the log-in to the Operations Workstation by typing `/tools/bin/ssh hostname` (e.g., `e0acs03`, `g0acs02`, `l0acs01`, or `n0acs03`) in the new window then press the **Return/Enter** key.
 - If you receive the message, **Host key not found from the list of known hosts. Are you sure you want to continue connecting (yes/no)?** type yes (“y” alone will not work).
 - If you have previously set up a secure shell passphrase and executed `sshremote`, a prompt to **Enter passphrase for RSA key '<user@localhost>'** appears; continue with Step 3.
 - If you have not previously set up a secure shell passphrase, go to Step 4.
 - 3 If a prompt to **Enter passphrase for RSA key '<user@localhost>'** appears, type your *Passphrase* then press the **Return/Enter** key.
 - Go to Step 5.
 - 4 At the `<user@remotehost>`'s **password:** prompt type your *Password* then press the **Return/Enter** key.
 - 5 Type `cd /usr/ecs/MODE/CUSTOM/utilities` then press **Return/Enter**.
 - Change directory to the directory containing the Ingest GUI startup script (e.g., `EcInGUIStart`).
 - The *MODE* will most likely be one of the following operating modes:
 - OPS (for normal operation).
 - TS1 (for SSI&T).
 - TS2 (new version checkout).
 - Note that the separate subdirectories under `/usr/ecs` apply to different operating modes.
 - 6 Type `EcInGUIStart MODE` then press **Return/Enter**.
 - The **ECS Ingest GUI Ingest Intro** screen (Figure 7) is displayed.
-

NOTE: If necessary, the Ingest/Distribution Technician can gain access to Science Data Server through the Science Data Server GUI, which is launched in generally the same manner as the Ingest GUI. The start-up script for the GUI (i.e., `EcDsSdSrvGuiStart`) should be located on the same host as the ECS Ingest GUI in the appropriate utilities directory (i.e., `/usr/ecs/MODE/CUSTOM/utilities`).

Launching the Storage Management Control GUI

The following software applications are associated with Storage Management as it relates to Ingest:

- Storage Management Control GUI (EcDsStmgtGui).
- Archive Server (EcDsStArchiveServer).
- Cache Manager Server (EcDsStCacheManagerServer).
- Pull Monitor (EcDsStPullMonitorServer).
- Staging Disk Server (EcDsStStagingDiskServer).
- D3 Server (EcDsStD3Server).
- FTP Server (EcDsStFtpServer).
- Storage Management Request Manager (EcDsStRequestManagerServer).
- Sybase ASE Server.
- Archival Management and Storage System (AMASS).

The Storage Management Control GUI can be used in Ingest physical media operations for taking media drives off line and putting the drives back on line.

Access to the Storage Management Control GUI is gained through the use of UNIX commands. Launching the Storage Management Control GUI starts with the assumption that the applicable servers are running and the Ingest/Distribution Technician has logged in to the ECS system.

Launching the Storage Management Control GUI

NOTE: Commands in Steps 1 through 6 are typed at a UNIX system prompt.

- 1** Type **setenv DISPLAY *clientname*:0.0** then press the **Return/Enter** key.
 - Use either the X terminal/workstation IP address or the machine-name for the *clientname*.
 - When using secure shell, the DISPLAY variable is set just once, before logging in to remote hosts. If it were to be reset after logging in to a remote host, the security features would be compromised.

- 2 Start the log-in to the Distribution Server host by typing `/tools/bin/ssh hostname` (e.g., `e0dis02`, `g0dis02`, `l0dis02`, or `n0dis02`) in the new window then press the **Return/Enter** key.
 - If you receive the message, **Host key not found from the list of known hosts. Are you sure you want to continue connecting (yes/no)?** type yes (“y” alone will not work).
 - If you have previously set up a secure shell passphrase and executed `sshremote`, a prompt to **Enter passphrase for RSA key '<user@localhost>'** appears; continue with Step 3.
 - If you have not previously set up a secure shell passphrase; go to Step 4.
 - 3 If a prompt to **Enter passphrase for RSA key '<user@localhost>'** appears, type your *Passphrase* then press the **Return/Enter** key.
 - Go to Step 5.
 - 4 At the `<user@remotehost>`'s **password:** prompt type your *Password* then press the **Return/Enter** key.
 - 5 Type `cd /usr/ecs/MODE/CUSTOM/utilities` then press **Return/Enter**.
 - Change directory to the directory containing the Storage Management Control GUI startup script (e.g., `EcDsStmgtGuiStart`).
 - The *MODE* will most likely be one of the following operating modes:
 - OPS (for normal operation).
 - TS1 (for SSI&T).
 - TS2 (new version checkout).
 - Note that the separate subdirectories under `/usr/ecs` apply to different operating modes.
 - 6 Type `EcDsStmgtGuiStart MODE` then press **Return/Enter**.
 - The **Storage Management Control GUI Storage Config.** tab (Figure 8) is displayed.
-

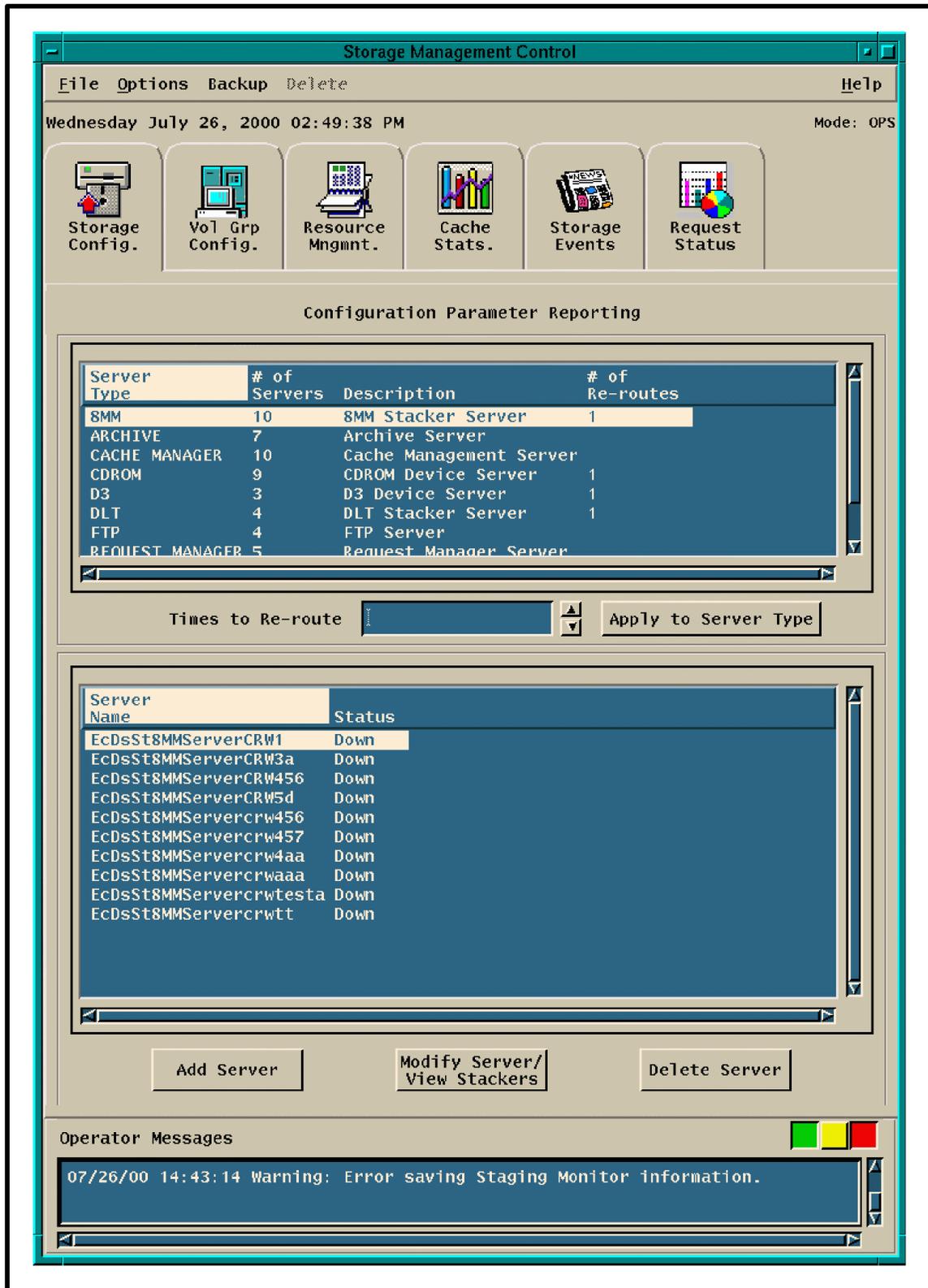


Figure 8. Storage Config. Tab (Storage Management Control GUI)

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Monitoring Ingest Status

In order to see how the Ingest GUI tools are used in ingest status monitoring it helps to look at ingest from the perspective of a DAAC Ingest/Distribution Technician. In addition, it is useful to define some operating conditions that might be encountered on the job. In this case it can be assumed that the system is operating under the following conditions:

- Ingest processes have been started.
- The system is operating normally.
- Data are ready for ingest.
- Several DAN or PDR files have been received and logged by the system; this results in the specific ingest processes being assigned request IDs.

Monitoring/Controlling Ingest Requests

Figures 9 and 10 illustrate the two main views of the Ingest Monitor/Control Screen. The Monitor/Control Screen can be used to check the status of ingest request processing. The information displayed in the center section of the GUI depends on a selection made in the radio box in the **Search By:** area of the screen:

- **Request ID**
 - Displays a single request if its specific request ID is entered.
- **Data Provider**
 - Displays all requests from a specific data provider, whose identification may either be selected from a pull-down list or be entered using the keyboard.
- **All Requests**
 - Displays all recent requests for which ECS has received a DAN or PDR, and which therefore have been assigned a request ID.

To the right of the radio box are two text entry fields permitting entry of a request ID if the **Request ID** button is selected, or permitting entry or selection of a data provider name if the **Data Provider** button is selected. The center of the window contains a display area for the request information, which appears in either of the following two formats depending on the user's selection of a radio button:

- **Text View** displays processing status for each request in terms of numerical values (percentages) for each phase of the Ingest process, including details on a number of parameters for each listed request.
 - **Transfer (Xfer).**

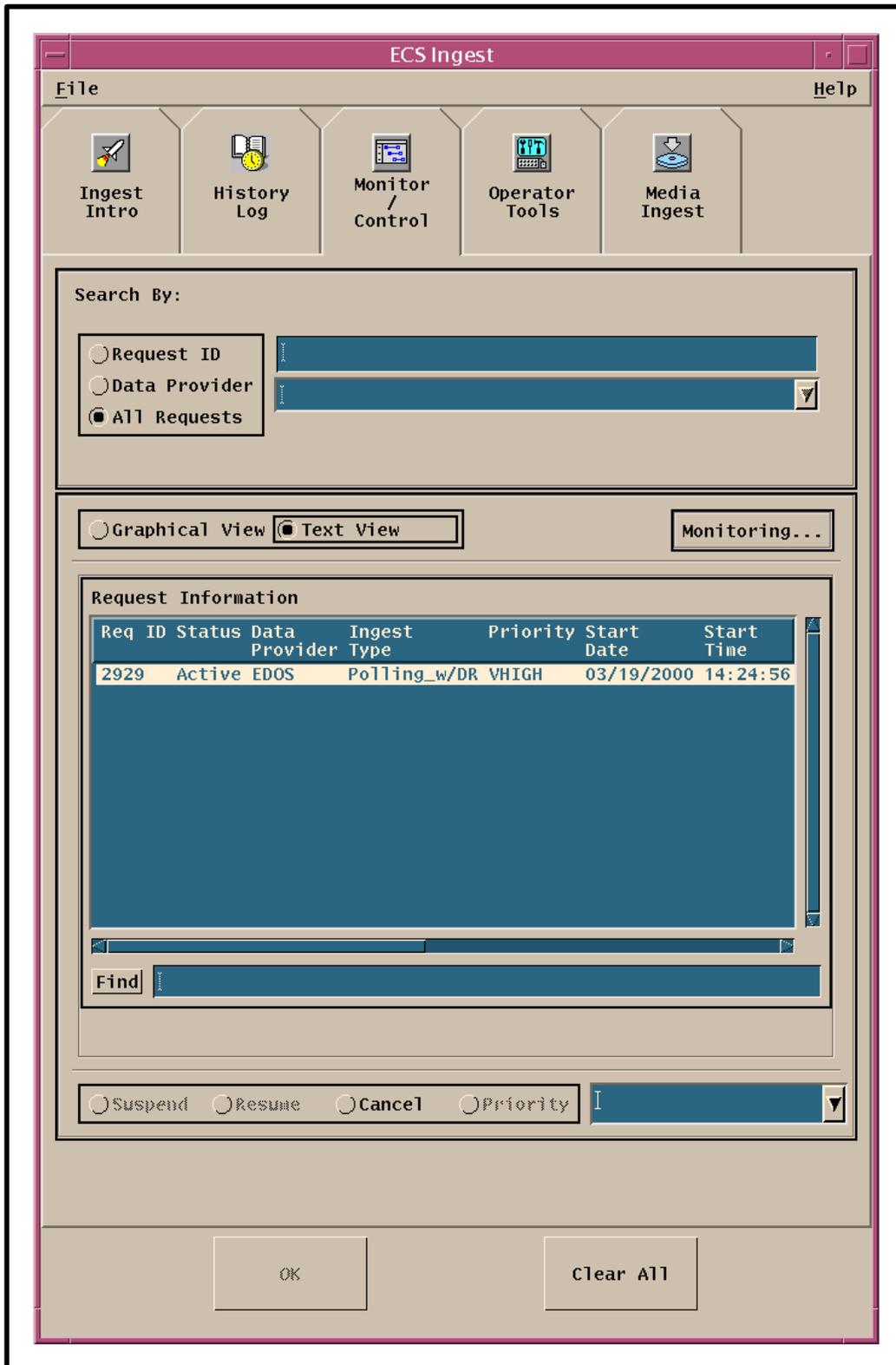


Figure 9. Ingest Monitor/Control Screen Text View

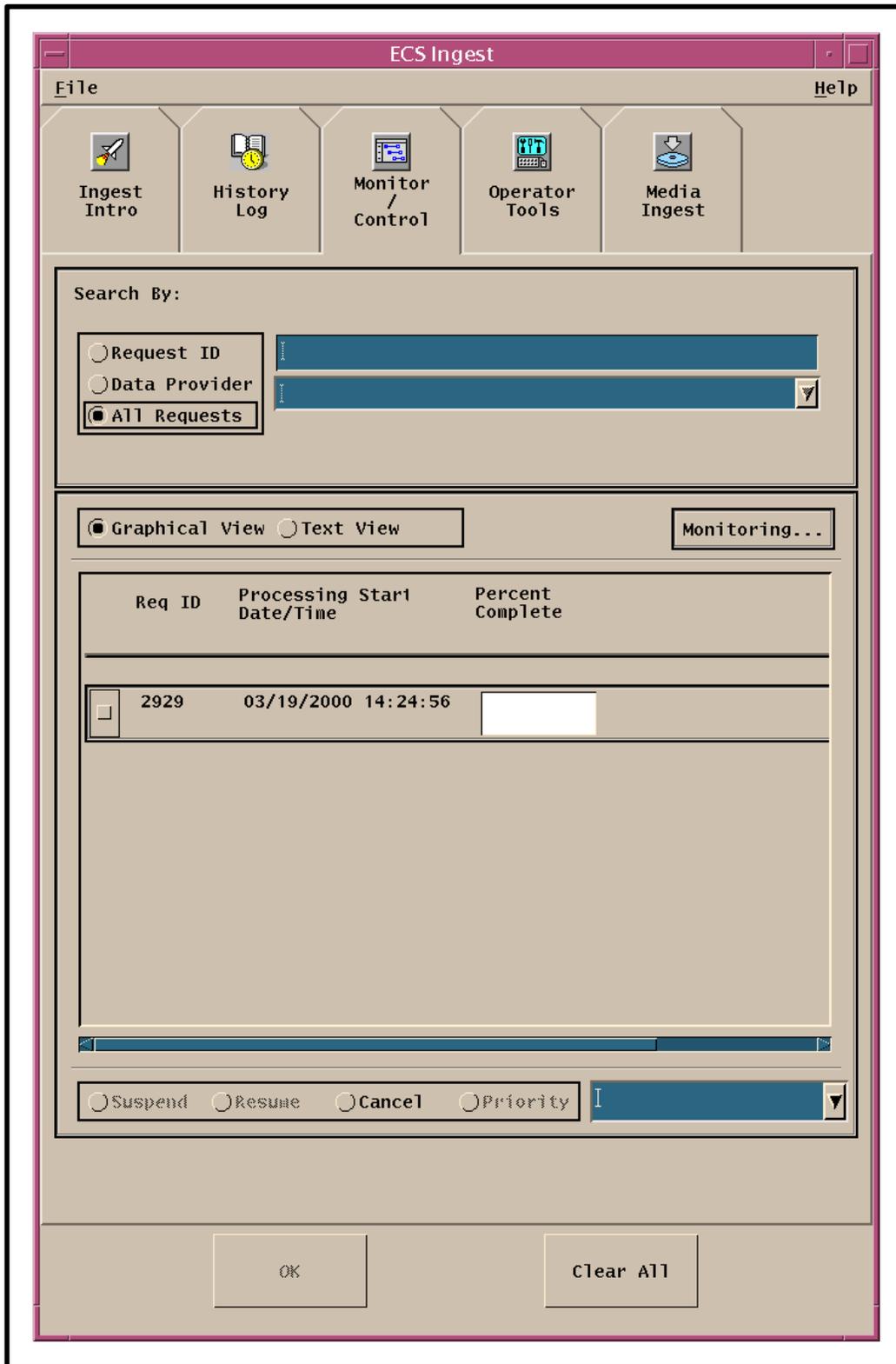


Figure 10. Ingest Monitor/Control Screen Graphical View

- **Preprocessing (Preproc).**
- **Archiving (Arch).**
- **Graphical View** displays processing status for each request in terms of a bar chart for the phases of the Ingest process. It permits a quick overview of current status and what has been happening with active requests.

Below the display area there are radio buttons that would appear to be used for controlling requests (suspending, resuming, canceling or changing the priority). The “cancel” and “resume” functions are available; however, the “suspend” and “priority” functions are not likely to be implemented at any time. At the bottom of the screen are two buttons labeled **OK** (which are used in implementing “cancel” and “resume” functions) and **Clear All** (which clears the entries).

To monitor/control ingest requests use the procedure that follows. The procedure starts with the assumption that all applicable servers and the **ECS Ingest** GUI are currently running and the **Ingest Intro** screen (Figure 7) is being displayed.

Monitoring/Controlling Ingest Requests

- 1 Click on the Ingest GUI **Monitor/Control** tab.
 - The **Monitor/Control** screen (Figure 11) is displayed.
- 2 To view the status of **all** current and recent ingest requests first click on the **All Requests** button then click on either the **Graphical View** button or the **Text View** button.
 - All ongoing and recently completed ingest requests are displayed.
 - **Graphical View** displays the following information, including a bar graph that indicates the percentage of the ingest process that has been completed:
 - **Request ID.**
 - **Processing Start Date/Time.**
 - **Percent Complete** (bar graph representing ingest completion in percent).
 - **External Data Provider.**
 - **Text View** displays numerical values representing the percentage of the ingest process that has been completed in addition to much other information concerning the ingest request.
 - **Request ID.**
 - **Status** [of the request].
 - **Data Provider.**
 - **Ingest Type.**

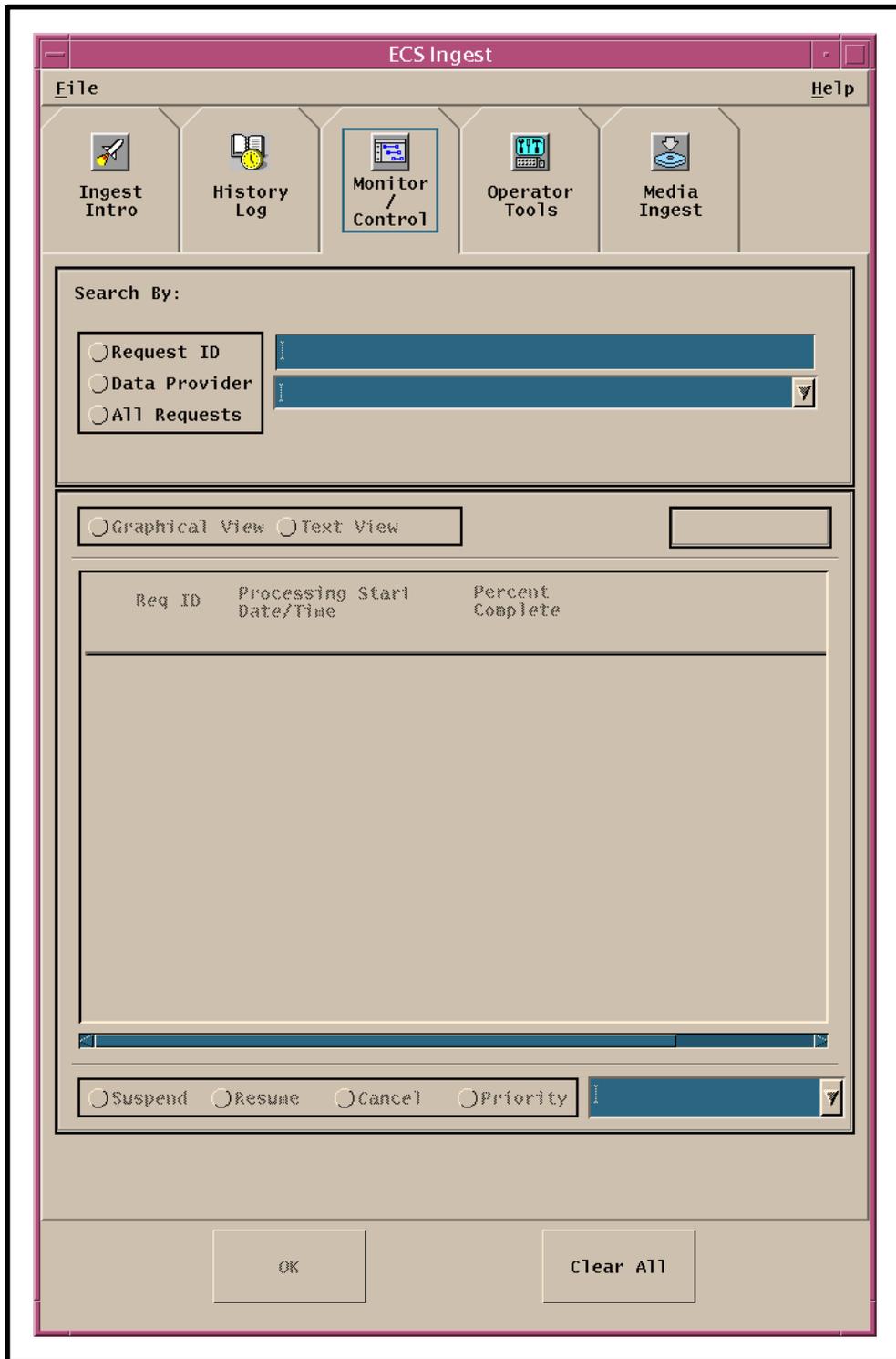


Figure 11. ECS Ingest GUI Monitor/Control Screen

- **Priority** [of the request].
- Start Date.
- Start Time.
- End Date.
- End Time.
- Ttl # Gran [total number of granules in the ingest request].
- Data Vol (MB) [volume of data in Megabytes].
- Xfer Percent Complete [percent of data transfer (into Ingest) that has been completed].
- Preproc Percent Complete [percent of preprocessing that has been completed].
- Arch Percent **Complete** [percent of data insertion into the data repository (archive) that has been completed].

3 To view the status of current and recent ingest requests for a particular **data provider** (e.g., **EDOS**) first click and hold on the option button to the right of the **Data Provider** field, move the mouse cursor to the desired selection (highlighting it), release the mouse button then click on either the **Graphical View** button or the **Text View** button.

- An alternative method of designating the data provider is to first type it in the **Data Provider** field then click on either the **Graphical View** button or the **Text View** button.
- Ongoing requests from the selected data provider are displayed.

4 To view the status of a particular **ingest request** first type the request ID in the **Request ID** field then click on either the **Graphical View** button or the **Text View** button.

- An alternative method of designating the request ID is to copy and paste (if possible) the request ID into the **Request ID** field before clicking on either the **Graphical View** button or the **Text View** button.

5 Observe ingest requests displayed in the **Request Information** list.

6 If it becomes necessary to resume processing of a suspended request or granule, perform the procedure for **Resuming Ingest Requests** (subsequent section of this lesson).

7 If it becomes necessary to cancel a request or granule, perform the procedure for **Canceling Ingest Requests** (subsequent section of this lesson).

8 Repeat Steps 2 through 7 as necessary to monitor ingest requests.

9 If it becomes necessary to exit from the **ECS Ingest** GUI select **File** → **Exit** from the pull-down menu.

Resuming Ingest Requests

If the system has suspended an ingest request or one or more granules in a request and the problem that caused the suspension has been resolved, the processing of the request/granule(s) should be resumed. Use the procedure that follows to resume request/granule processing. The procedure starts with the assumption that all applicable servers and the **ECS Ingest** GUI are currently running and the relevant ingest request is being displayed on the **Monitor/Control** tab.

Resuming Ingest Requests

- 1 If an entire request is to be resumed, click on the row corresponding to the request to be resumed on the **Monitor/Control** tab.
 - Either the selected ingest request is highlighted (Text View) or a checkmark is visible in the box to the left of the request information (Graphical View).
 - Proceed to Step 5 if processing of an entire request is to be resumed; otherwise, go to Step 2.
- 2 If resuming the processing of one or more granules in a request, ensure that **Text View** has been selected on the **Monitor/Control** tab.
 - Click on the **Text View** button if necessary.
- 3 If resuming the processing of one or more granules in a request, double-click on the row corresponding to the request containing the granule(s) to be resumed on the **Monitor/Control** tab.
 - Information concerning the state of each granule in the request is displayed (one row per granule).
- 4 If resuming the processing of one or more granules in a request, click on the row corresponding to one of the granules to be resumed.
 - The selected granule is highlighted.
- 5 Click on the **Resume** button near the bottom of the **Monitor/Control** tab.
- 6 Click on the **OK** button at the bottom of the GUI.
 - A **Resume Request Confirmation Dialog Box** (Figure 12) is displayed.
- 7 Click on the appropriate button from the following selections:
 - **Yes** – to confirm resuming processing of the request or granule.
 - The **Resume Request Confirmation Dialog Box** (Figure 12) is dismissed.
 - The selected ingest request or granule resumes processing.

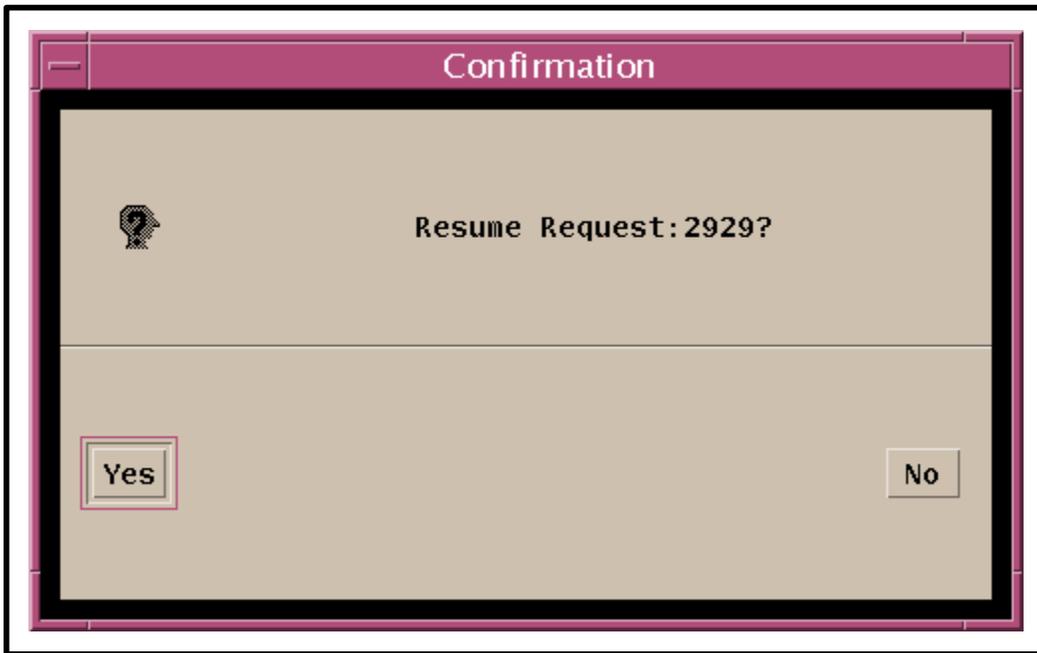


Figure 12. Resume Request Confirmation Dialogue Box

- Status of the request or granule, as displayed in the **Status** column of the **Request Information** list (if using **Text View**), changes from “Suspended” to “Resuming” then to whatever state is appropriate for the continuation of request/granule processing (depending on its status when it was suspended).
 - A **Request Control Status Information Dialogue Box** (Figure 13) is displayed.
 - **No** – to cancel resuming processing of the request or granule.
 - The **Resume Request Confirmation Dialogue Box** (Figure 12) is dismissed.
 - The selected ingest request or granule remains in a “Suspended” state.
 - Proceed to Step 9.
- 8** Click on the **OK** button.
- The **Request Control Status Information Dialogue Box** (Figure 13) is dismissed.
- 9** Return to Step 4 to resume the processing of another granule in the request (if applicable).
- 10** Return to Step 1 to resume the processing of another request (if applicable).
- 11** Return to the procedure for **Monitoring/Controlling Ingest Requests**.
-



Figure 13. Request Control Status Information Dialogue Box

Canceling Ingest Requests

Sometimes it may be necessary to cancel the processing of an ingest request or one or more granules in a request. The procedure for canceling request or granule processing starts with the assumption that all applicable servers and the **ECS Ingest** GUI are currently running and the relevant ingest request is being displayed on the **Monitor/Control** tab.

Canceling Ingest Requests

- 1** If an entire request is to be canceled, click on the row corresponding to the request to be canceled on the **Monitor/Control** tab.
 - Either the selected ingest request is highlighted (Text View) or a checkmark is visible in the box to the left of the request information (Graphical View).
 - Proceed to Step 5 if an entire request is to be canceled; otherwise, go to Step 2.
- 2** If canceling the processing of one or more granules in a request, ensure that **Text View** has been selected on the **Monitor/Control** tab.
 - Click on the **Text View** button if necessary.

- 3 If canceling the processing of one or more granules in a request, double-click on the row corresponding to the request containing the granule(s) to be canceled on the **Monitor/Control** tab.
 - Information concerning the state of each granule in the request is displayed (one row per granule).
- 4 If canceling the processing of one or more granules in a request, click on the row corresponding to one of the granules to be canceled.
 - The selected granule is highlighted.
- 5 Click on the **Cancel** button near the bottom of the **Monitor/Control** tab.
- 6 Click on the **OK** button at the bottom of the GUI.
 - A **Cancel Request Confirmation Dialogue Box** (Figure 14) is displayed.

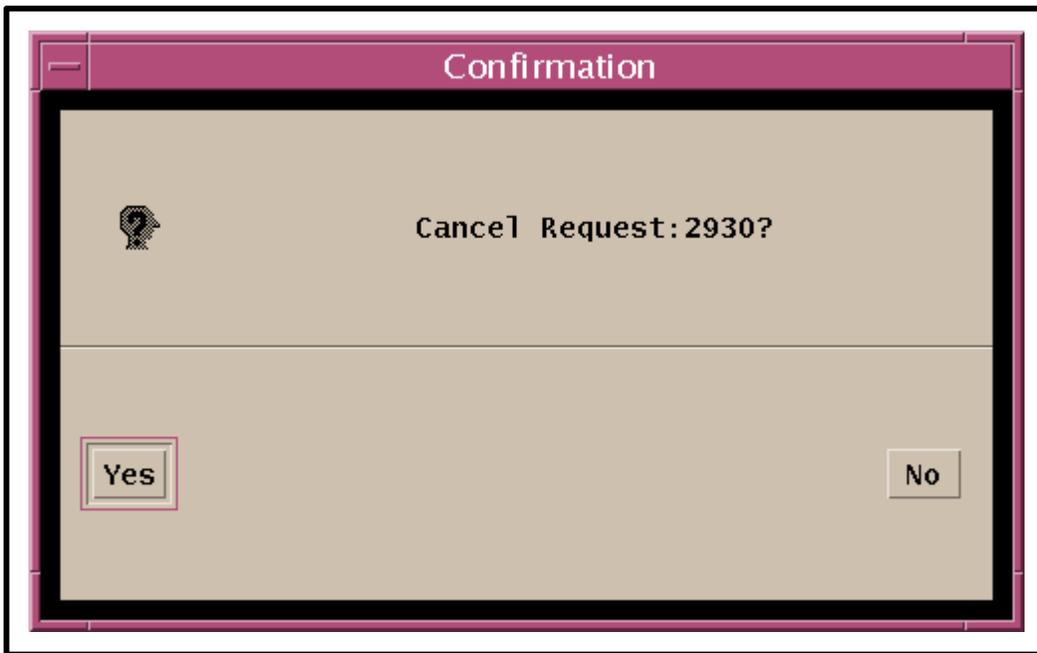


Figure 14. Cancel Request Confirmation Dialogue Box

- 7 Click on the appropriate button from the following selections:
 - **Yes** – to confirm canceling the processing of the request or granule.
 - The **Cancel Request Confirmation Dialogue Box** (Figure 14) is dismissed.
 - The selected ingest request or granule is canceled.
 - A **Request Control Status Information Dialogue Box** (Figure 13) is displayed.

- **No** – to prevent canceling the processing of the request or granule.
 - The **Cancel Request Confirmation Dialogue Box** (Figure 14) is dismissed.
 - The selected ingest request is not canceled.
 - Proceed to Step 9.
 - 8** Click on the **OK** button.
 - The **Request Control Status Information Dialogue Box** (Figure 13) is dismissed.
 - 9** Return to Step 4 to cancel the processing of another granule in the request (if applicable).
 - 10** Return to Step 1 to cancel the processing of another request (if applicable).
 - 11** Return to the procedure for **Monitoring/Controlling Ingest Requests**.
-

Viewing the Ingest History Log

When an ingest transaction has been completed, several things happen:

- A notice is automatically sent to the data provider indicating the status of the ingested data.
- The data provider sends an acknowledgment of that notice.
- Receipt of the acknowledgment is logged by ECS.
- The request ID of that ingest request is removed from the list of active requests.
- The Ingest History Log receives statistics on the completed transaction.

The following four search criteria can be used individually or in combination to view entries in the Ingest History Log:

- Time Period (Start and Stop Date/Time).
- Data Provider ID (e.g., EDOS, NOAA, or a science team).
- Data Type (e.g., AST_L1B).
- Final Request Status (e.g., Successful, Failed, or Terminated).

The Ingest History Log provides reports in the following formats:

- **Detailed Report** gives detailed information about each completed ingest request.

- **Summary Report** is a summary of ingest processing statistics, including the average and maximum time taken to perform each step in the ingest process.
 - **Request-level** Summary Report provides ingest request processing statistics.
 - **Granule-level** Summary Report provides ingest granule processing statistics organized by data provider and Earth Science Data Type (ESDT):

To view the history log, use the procedure that follows. The procedure starts with the assumption that all applicable servers and the Ingest GUI are currently running and the **Ingest Intro** screen (Figure 7) is being displayed.

Viewing the Ingest History Log

- 1 Click on the Ingest GUI **History Log** tab.
 - The **History Log** screen (Figure 15) is displayed.
 - If History Log entries are to be displayed on the basis of a particular....
 - time period, perform Step 2. (If no time period is specified, log entries for the most recent 24-hour period will be displayed.)
 - data provider, perform Step 3.
 - data type, perform Step 4.
 - final request status, perform Step 5.
 - Any of the preceding criteria (time period, data provider, data type, or final request status) may be used individually or in combination to view entries in the Ingest History Log.
- 2 To view Ingest History Log entries for a particular **time period**, click in the appropriate **Start Date/Time** and/or **Stop Date/Time** **month/day/year** and **hour/min/sec** fields and type the appropriate numerical values in *M(M)/D(D)/YYYY hh:mm:ss* format.
 - The **Tab** key may be pressed to move from field to field.
 - Use the 24-hour format to designate the hour (e.g., type **14** to designate 2 p.m.) in the **hour** fields.
 - If using the **Tab** key to advance from one field to the next, it is possible to bypass the entry of **seconds** by pressing the **Tab** key.
- 3 To view log entries for a particular **data provider** (e.g., **EDOS**) click and hold on the option button to the right of the **Data Provider** field, move the mouse cursor to the desired selection (highlighting it), then release the mouse button.
 - An alternative method of designating the data provider is to type it in the **Data Provider** field.

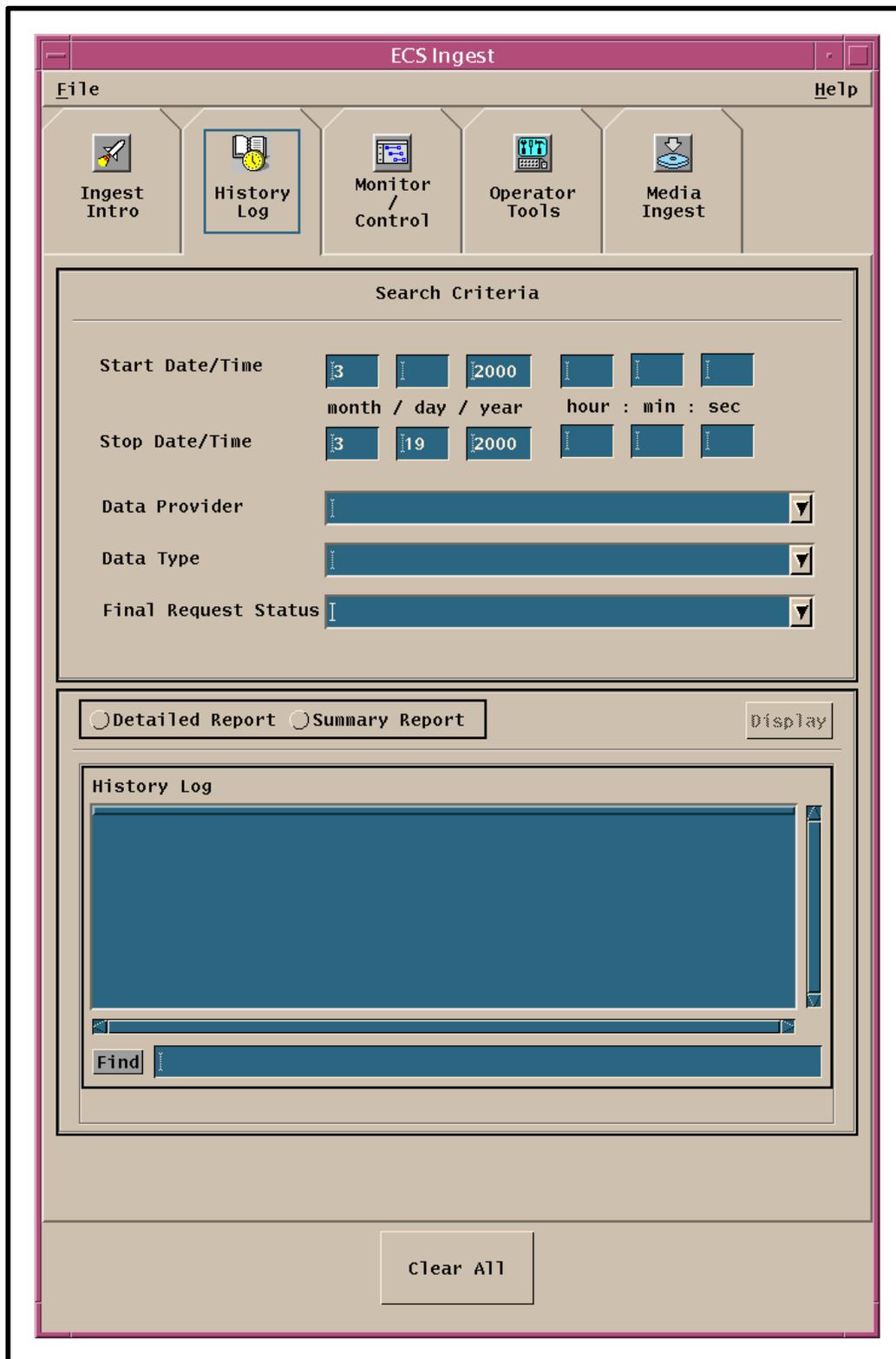


Figure 15. ECS Ingest GUI History Log Screen

- 4 To view log entries of a particular **data type** (e.g., **AST_L1B**) click and hold on the option button to the right of the **Data Type** field, move the mouse cursor to the desired selection (highlighting it), then release the mouse button.
- 5 To view log entries with a particular final request status (e.g., **Terminated**) click and hold on the option button to the right of the **Final Request Status** field, move the mouse cursor to the desired selection (highlighting it), then release the mouse button.
 - An alternative method of designating the final request status is to type it in the **Final Request Status** field.
- 6 Click on either the **Detailed Report** button or the **Summary Report** button.
 - The **Detailed Report** (Figure 16) provides the following types of information on each completed ingest request.
 - **Request ID.**
 - **Data Provider.**
 - **Status.**
 - **Ingest Type.**
 - **Start Date.**
 - **Start Time.**
 - **End Date.**
 - **End Time.**
 - **Ttl # Gran** [total number of granules in the ingest request].
 - **#Success Gran** [total number of granules in the ingest request that were successfully ingested].
 - **Data Vol (MB)** [volume of data in Megabytes].
 - **File Count.**
 - **Time to Xfer (mins)** [transfer time in minutes].
 - **Time to Preproc (mins)** [preprocessing time in minutes].
 - **Time to Archive (mins).**
 - **Priority.**
 - **Restart Flag.**
 - The **Summary Report** displays a summary that includes the average and maximum time needed to perform each step in the ingest process. (Refer to the next step for additional information.)

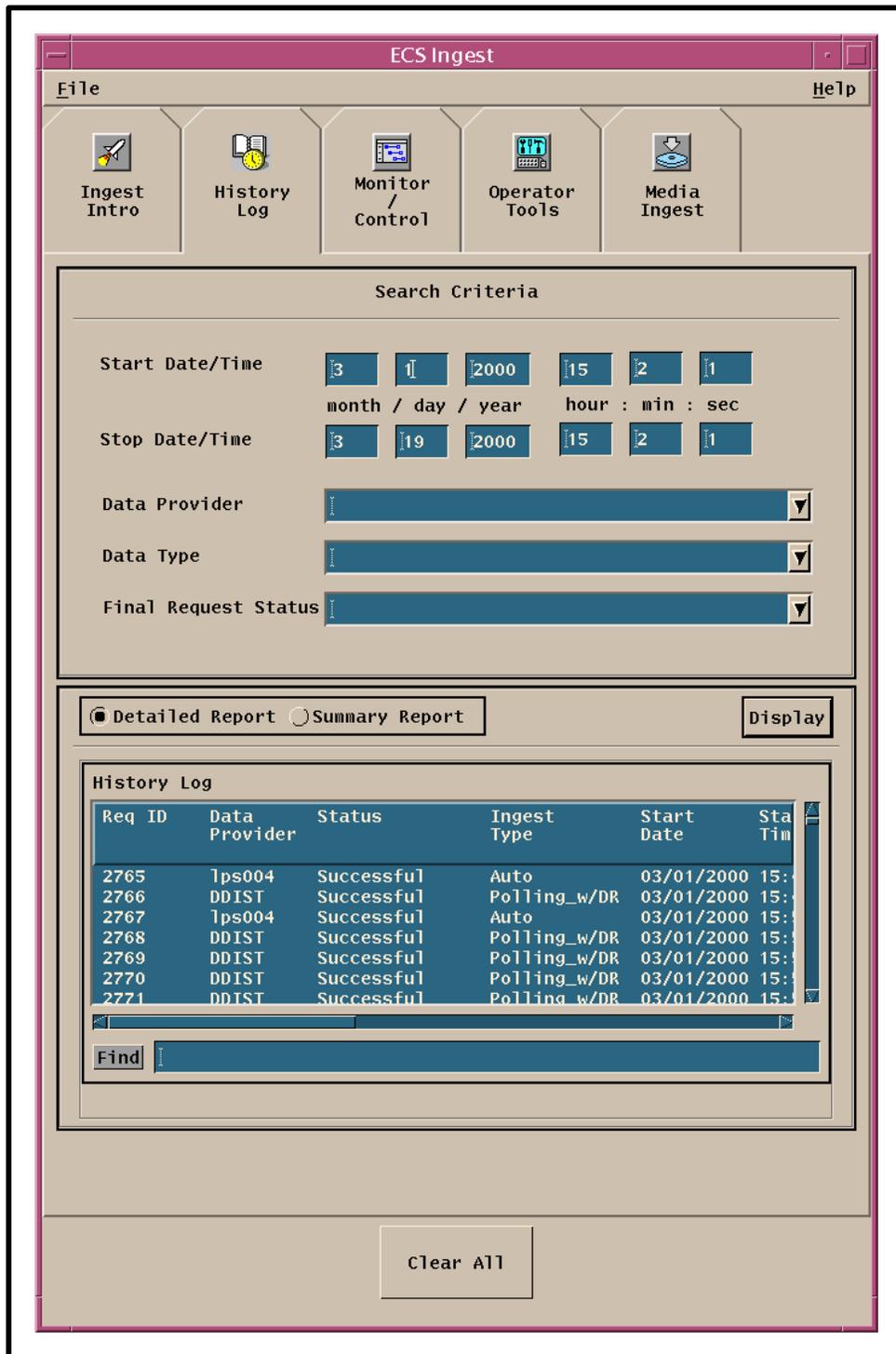


Figure 16. Detailed Report (ECS Ingest GUI History Log)

7 If the **Summary Report** button was selected in the preceding step, click on either the **Request level** button or the **Granule level** button.

- The **Request level** Summary Report (Figure 17) provides Ingest request processing statistics.
 - **Data Provider.**
 - **Ttl Reqs** [total number of requests].
 - **Total Errs** [total number of errors per request].
 - **Gran Avg** [average number of granules per request].
 - **Gran Max** [maximum number of granules in a request].
 - **File Avg** [average number of files per request].
 - **File Max** [maximum number of files in a request].
 - **Size (MB) Avg** [average request size in Megabytes].
 - **Size (MB) Max** [maximum request size in Megabytes].
 - **Transfer Time (mins) Avg** [average request transfer time in minutes].
 - **Transfer Time (mins) Max** [maximum request transfer time in minutes].
 - **Preproc Time (mins) Avg** [average request preprocessing time in minutes].
 - **Preproc Time (mins) Max** [maximum request preprocessing time in minutes].
 - **Archive Time (mins) Avg** [average request archiving time in minutes].
 - **Archive Time (mins) Max** [maximum request archiving time in minutes].
- The **Granule level** Summary Report (Figure 18) includes the following types of information organized by data provider and Earth Science Data Type (ESDT):
 - **Data Provider.**
 - **Data Type.**
 - **Total Granules.**
 - **Total Errors.**
 - **File Avg.**
 - **File Max.**
 - **Size (MB) Avg.**
 - **Size (MB) Max.**
 - **Transfer Time (mins) Avg.**

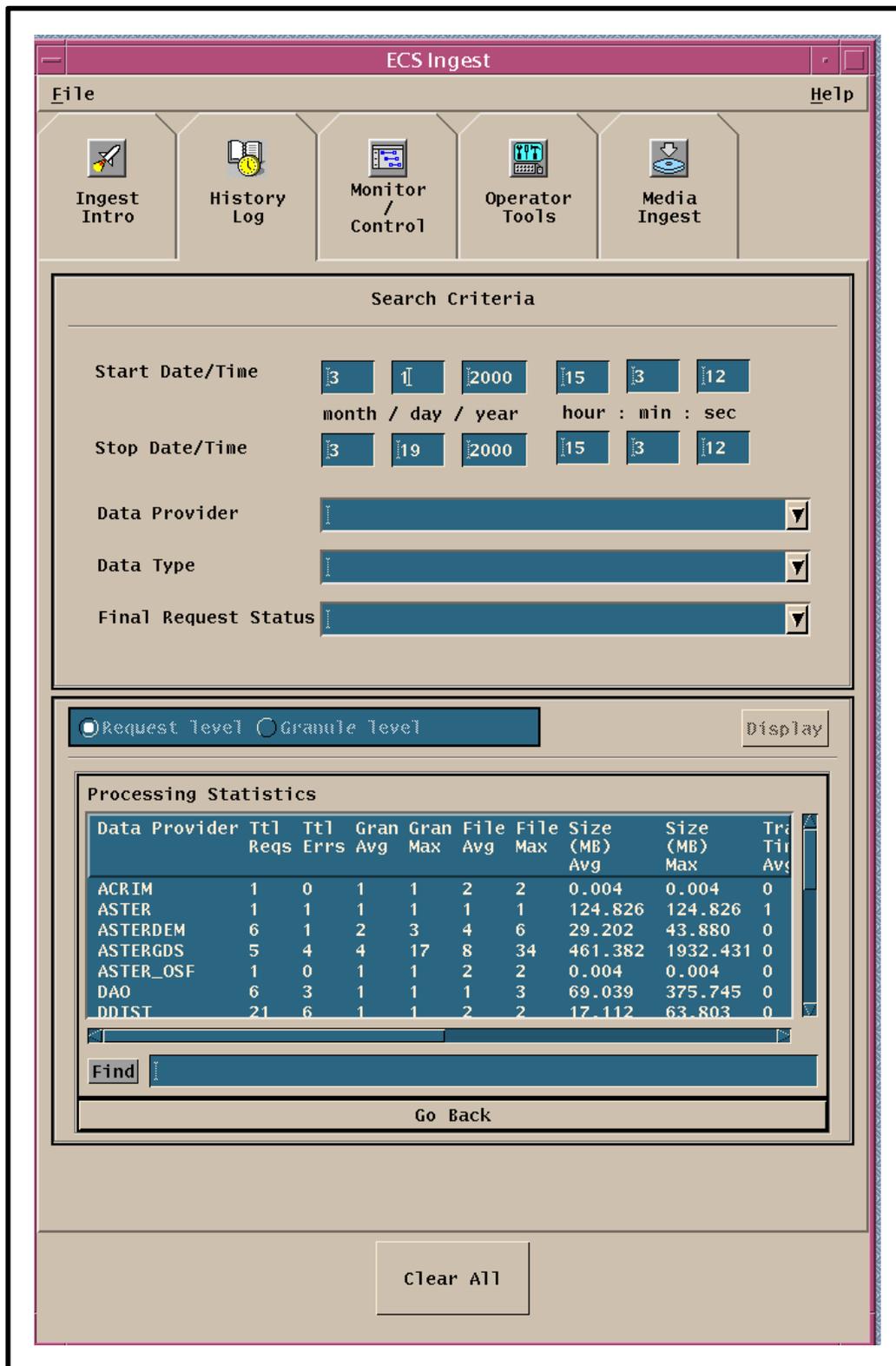


Figure 17. Request Level Summary Report (ECS Ingest GUI History Log)

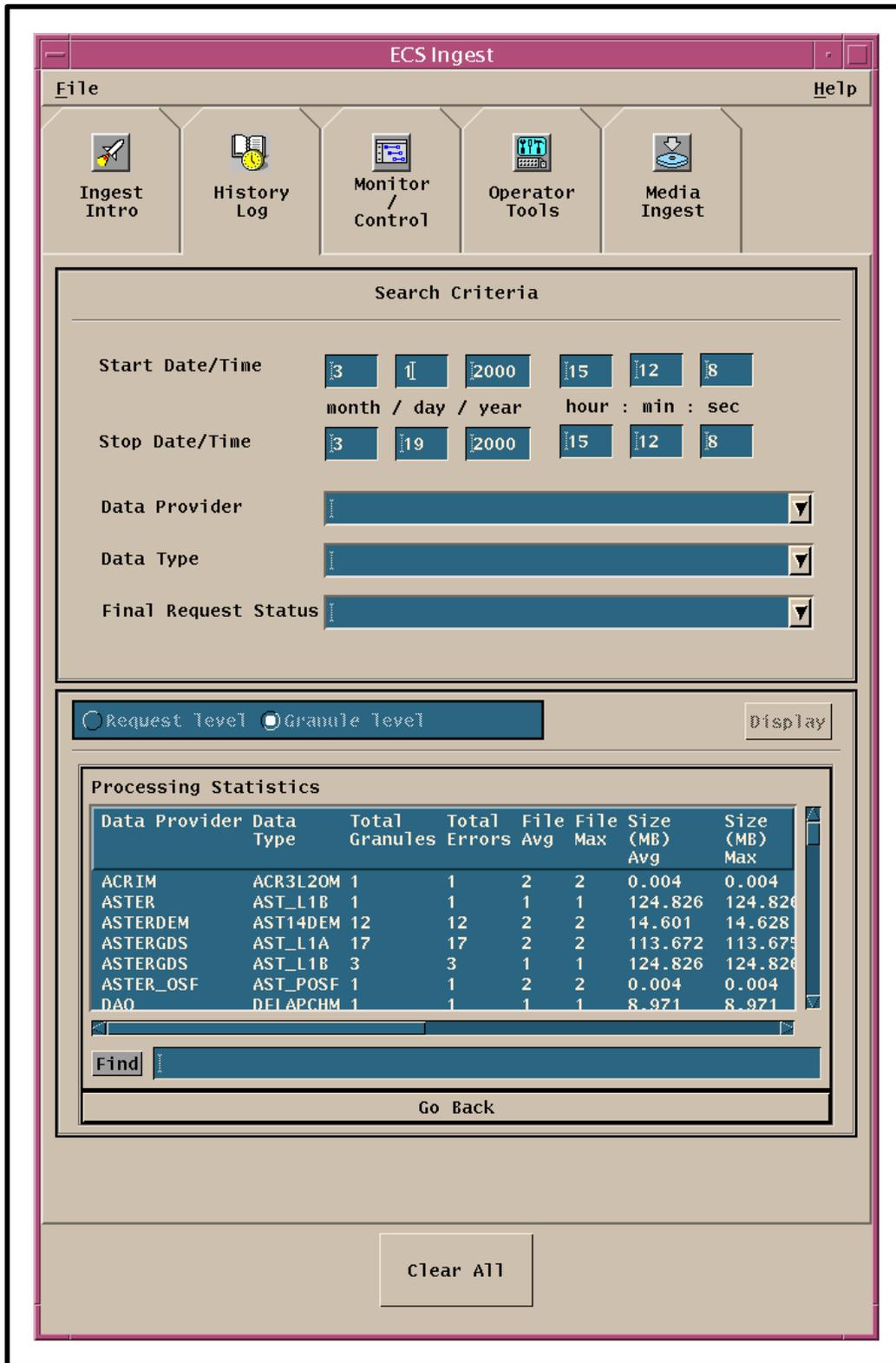


Figure 18. Granule Level Summary Report (ECS Ingest GUI History Log)

- **Transfer Time (mins) Max.**
 - **Preproc Time (mins) Avg.**
 - **Preproc Time (mins) Max.**
 - **Archive Time (mins) Avg.**
 - **Archive Time (mins) Max.**
- 8** Click on the **Display** button.
- Each ingest request that was completed, logged, and meets the specified criteria (time period, data provider, data type, and/or final status) is displayed.
- 9** Observe ingest request information displayed in the **History Log/Processing Statistics** field.
- 10** If a printed report is desired, select **Print** from the **File** pull-down menu (**File** → **Print**).
- If it is not possible to print a report from the GUI, the corresponding file is available in the **/usr/ecs/TS1/CUSTOM/temp/INS** directory and can be printed using conventional UNIX commands (e.g., `lp` or `lpr`).
- 11** To clear the display after viewing the history log data on the screen, click on either the **Go Back** button (if available) or the **Clear All** button.
- Entries in the **Search Criteria** fields and the **History Log/Processing Statistics** field are erased.
 - The **Go Back** button is not always displayed on the GUI; it depends on the type of report being displayed on the screen.
-

Verifying the Archiving of Ingested Data

It is possible to determine whether Ingest has been successful by checking the appropriate directory on the File and Storage Management System (FSMS) host (e.g., `g0drg01`).

- The directories are identified by the type of data (e.g., `aster`, `ceres`, `l7`, `modis`) in them and correspond directly to tape volumes in the system.
- As long as one is checking for a limited range of granules the procedure is not likely to interfere with archive activities because it is just a matter of checking the relevant FSMS directory to determine whether the applicable files/granules have been transferred to tape volumes in the system.
- The procedure does not involve the use of any archive software.
- Before starting it is essential to know what data to look for. For example, End Date(s)/Time(s) and Data Volume(s) for ingest requests shown on the ECS Ingest

GUI can be used for comparison with dates/times and file sizes listed for the files in the relevant directory on the FSMS host.

To verify the archiving of ingested data use the procedure that follows. The procedure starts with the assumption that the Ingest/Distribution Technician has logged in to the ECS system.

Verifying the Archiving of Ingested Data

NOTE: Commands in Steps 1 through 5 are typed at a UNIX system prompt.

- 1 Start the log-in to the FSMS Server host by typing `/tools/bin/ssh hostname` (e.g., `e0drg01`, `g0drg01`, `l0drg01`, or `n0drg01`) in the new window then press the **Return/Enter** key.
 - If you receive the message, **Host key not found from the list of known hosts. Are you sure you want to continue connecting (yes/no)?** type yes (“y” alone will not work).
 - If you have previously set up a secure shell passphrase and executed `sshremote`, a prompt to **Enter passphrase for RSA key '*<user@localhost>*'** appears; continue with Step 2.
 - If you have not previously set up a secure shell passphrase; go to Step 3.
- 2 If a prompt to **Enter passphrase for RSA key '*<user@localhost>*'** appears, type your *Passphrase* then press the **Return/Enter** key.
 - Go to Step 4.
- 3 At the `<user@remotehost>'s password:` prompt type your *Password* then press the **Return/Enter** key.
- 4 Type `cd /dss_stk1/MODE/datatype` then press the **Return/Enter** key.
 - Change directory to the directory containing the archive data (e.g., `/dss_stk1/OPS/modis/`).
 - The specific path varies from site to site and with the operating mode and type of data being ingested.
 - The *MODE* will most likely be one of the following operating modes:
 - OPS (for normal operation).
 - TS1 (for SSI&T).
 - TS2 (new version checkout).

- 5 Type **ls -la | grep 'Month Day'** then press the **Return/Enter** key to list the contents of the directory.
- For example, to list the granules inserted on March 17, enter the following statement:
ls -la | grep 'Mar 17'
 - To list the granules inserted between 2:00 P.M and 3:00 P.M. on March 17, enter the following statement:
ls -la | grep 'Mar 17' | grep 14:
 - It is important to limit the listing (e.g., to a particular day). If there are tens of thousands of granules in the directory, just doing a listing of the directory would cause serious performance problems.
 - A list of subdirectories and files in the current directory is displayed.
 - The list should include the ingested data.
 - If necessary, continue changing directory until the relevant granules/files have been located.
- 6 Compare the End Date(s)/Time(s) and Data Volume(s) for the applicable ingest request(s) shown on the Ingest GUI with the dates/times and file sizes listed for the files in the directory.
-

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Cleaning Directories

Cleaning Polling Directories

The polling directories should be cleaned up (have old files deleted) after successful archiving, otherwise they would quickly run out of disk space. Automatic clean-up should be available. However, it may still be useful to know how to use the clean-up scripts.

Cleaning the polling directories starts with the assumption that the applicable servers are running and the Ingest/Distribution Technician has logged in to the ECS system.

Cleaning the Polling Directories

NOTE: Commands in Steps 1 through 5 are typed at a UNIX system prompt.

- 1 Start the log-in to the Operations Workstation by typing `/tools/bin/ssh hostname` (e.g., `e0acs03`, `g0acs02`, `l0acs01`, or `n0acs03`) in the new window then press the **Return/Enter** key.
 - If you receive the message, **Host key not found from the list of known hosts. Are you sure you want to continue connecting (yes/no)?** type **yes** (“y” alone will not work).
 - If you have previously set up a secure shell passphrase and executed `sshremote`, a prompt to **Enter passphrase for RSA key '<user@localhost>'** appears; continue with Step 2.
 - If you have not previously set up a secure shell passphrase; go to Step 3.
- 2 If a prompt to **Enter passphrase for RSA key '<user@localhost>'** appears, type your *Passphrase* then press the **Return/Enter** key.
 - Go to Step 4.
- 3 At the `<user@remotehost>`'s **password:** prompt type your *Password* then press the **Return/Enter** key.
- 4 Type `cd /usr/ecs/MODE/CUSTOM/utilities` then press **Return/Enter**.
 - Change directory to the directory containing the ingest polling directory clean-up script (e.g., `EcInEDOSCleanupMain`, `EcInPollClean`).
- 5 Type `Scriptname /path days` then press **Return/Enter**.
 - *Scriptname* refers to the name of the appropriate ingest polling directory clean-up script (e.g., `EcInEDOSCleanupMain`, `EcInPollClean`).

- *path* refers to the directory path to the polling directory (e.g., /usr/ecs/*MODE*/CUSTOM/icl/*INS_host*/data/pollEDOS).
- *days* refers to a number of days; any files in the EDOS polling directory (and subdirectories) older than the specified number of days will be deleted.
- If there are **no** files in the directory older than the specified number of days, the script quits after displaying the following message:

```
##### There is no file in this directory older than x days.
##### Exit deletion.
```

- If there are files in the directory older than the specified number of days, a message similar to the following message is displayed:

```
##### The following are files older than x days in directory:. #####
##### pollEDOS
#####
##### Please check before deleting them.
Shall we continue deletion? Type y or n only :
```

6 If there are files in the directory older than the specified number of days, type either **y** or **n** (as appropriate) then press **Return/Enter**.

- Either lower-case or upper-case letters may be typed.
- If **n** was typed, the script quits after the following message is displayed:

```
##### The answer is No.
##### Do not continue deletion.
```

- If **y** was typed, the script continues after the following message is displayed:

```
##### The answer is Yes.
##### Continue deletion.
```

- The script quits after the files that meet the specified age criteria have been deleted.
-

Performing Hard Media Ingest

Media Ingest

ECS currently supports hard media ingest from D3 tape cartridges, although it may not be performed at all sites. In the future ECS will support ingest from other media, such as 8mm tape cartridges.

Each tape cartridge is identified by means of a bar code label that shows the media number.

Ingest of data (e.g., data from the science community) from physical media into ECS is performed by the DAAC Ingest/Distribution Technician using the **Media Ingest** tool on the Ingest GUI. In addition, the DAAC Ingest/Distribution Technician may need to use the **Storage Config.** screen on the **Storage Management Control** GUI to control media drives.

- A Product Delivery Record (PDR) or Physical Media Product Delivery Record (PMPDR) file is required for hard media ingest; it may be handled in one of two ways.
 - Embedded in (recorded on) the hard medium.
 - Made available electronically (e.g., in a specified network directory).
 - Data provider transfers the delivery record file (using ftp) to the network directory location before delivery of the hard medium.
- The Ingest/Distribution Technician uses the **Media Ingest** screen of the ECS Ingest GUI (see Figure 24), mounts the media on a specific device, and enters necessary parameters.
- The Ingest/Distribution Technician monitors and responds to error messages displayed on the Ingest GUI and reviews data errors with appropriate parties (e.g., the DAAC Archive Manager, Science Data Specialist, and/or the data provider).

Labeling Tape Cartridges with Bar Codes

Each tape containing data to be ingested must have a bar-code label. The labels are typically already on the tape when received from the data provider. However, they may be affixed to the tape cartridges by the Ingest/Distribution Technician.

Performing Media Ingest from D3 Tape

The DAAC Ingest/Distribution Technician may have to ingest data from a D3 tape utilizing the Ingest GUI and the Storage Tek Controller/Transport Redwood SD-3 for D3 tape cartridge processing.

To perform hard media ingest from a D3 tape use the procedure that follows. The procedure starts with the following assumptions:

- The PDR file is available, either placed on the network by the data provider or embedded in the media.
- All applicable servers and the **ECS Ingest** GUI are currently running, and the **Ingest Intro** screen (Figure 7) is being displayed.

Performing Media Ingest from D3 Tape

- 1 Verify that the display above the D3 tape unit indicates “*”.
- 2 Verify that there is **no** tape cartridge inserted in the D3 tape unit.
 - Remove the tape cartridge in the D3 tape unit (if applicable).
- 3 Verify that the **Ready** light is illuminated in the second row of the panel near the window of the D3 tape unit where the tape is inserted.
 - If the **Ready** light is not illuminated, push the **Ready** button.
- 4 Click on the Ingest GUI **Media Ingest** tab.
 - The **Media Ingest** screen (Figure 24) is displayed.
- 5 To enter the type of medium (i.e., **D3 Tape**) click and hold on the option button to the right of the **Media Type** field, move the mouse cursor to the desired selection (highlighting it), then release the mouse button.
 - The selected type of medium is displayed in the **Media Type** field (as shown in Figure 26).
- 6 To enter the data provider (e.g., **SCF**) click and hold on the option button to the right of the **Data Provider** field, move the mouse cursor to the desired selection (highlighting it), then release the mouse button.
 - The selected data provider is displayed in the **Data Provider** field.
- 7 Verify that there is a **Media Volume ID** sticker on the tape cartridge containing the data to be ingested.
- 8 Type the media volume ID in the **Media Volume Id (Barcode)** field.
- 9 Click on the appropriate radio button in the **Data Delivery Record File Location** box.
 - Click on the **On Network** button if the PDR file is located on the network.
 - Click on the **Embedded in Media** button if the PDR file is recorded on the tape.
- 10 Type the data delivery record file name (e.g., **scf11a.PDR**) in the **Data Delivery Record File Name** field.

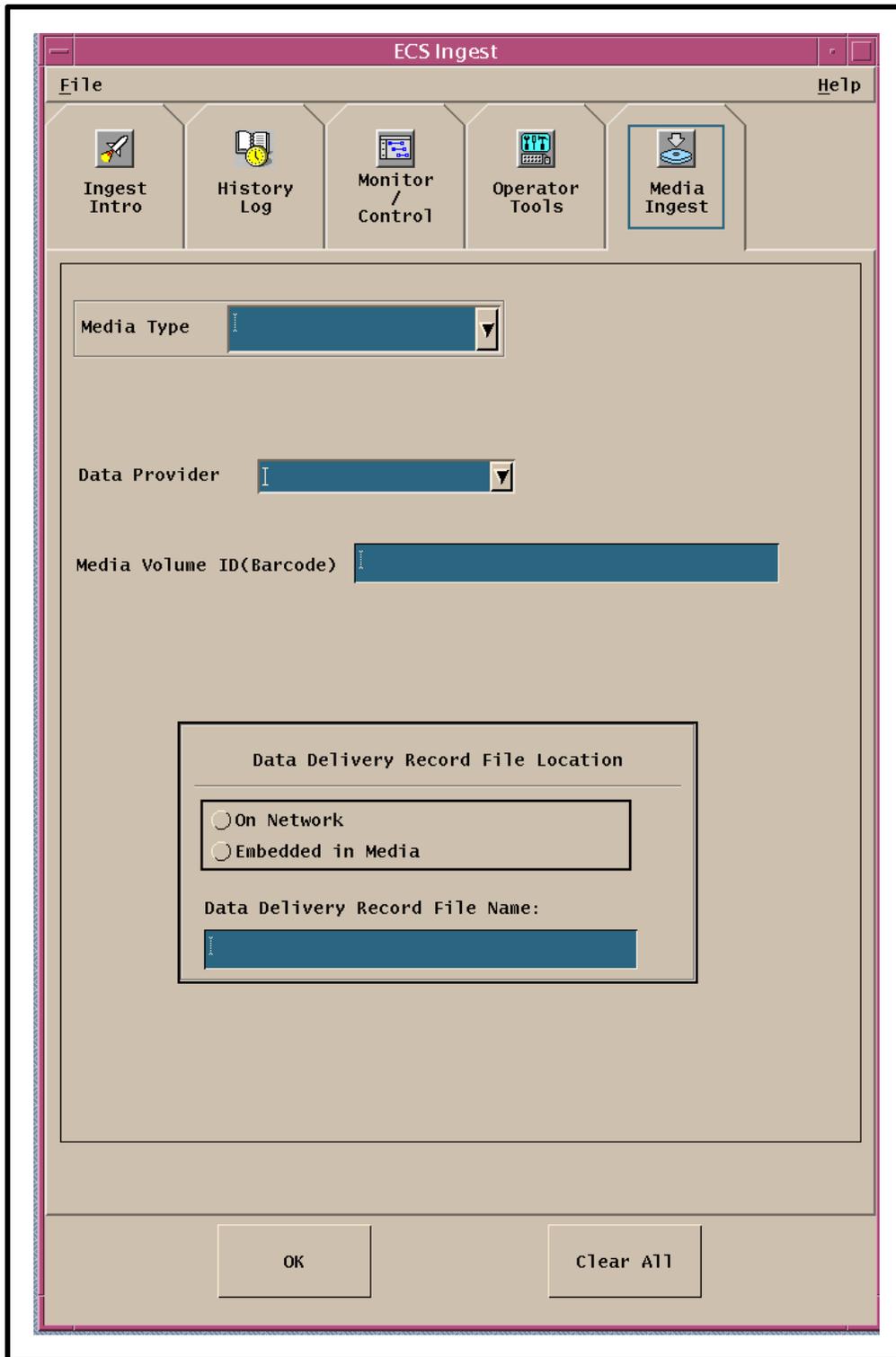


Figure 24. Media Ingest Screen

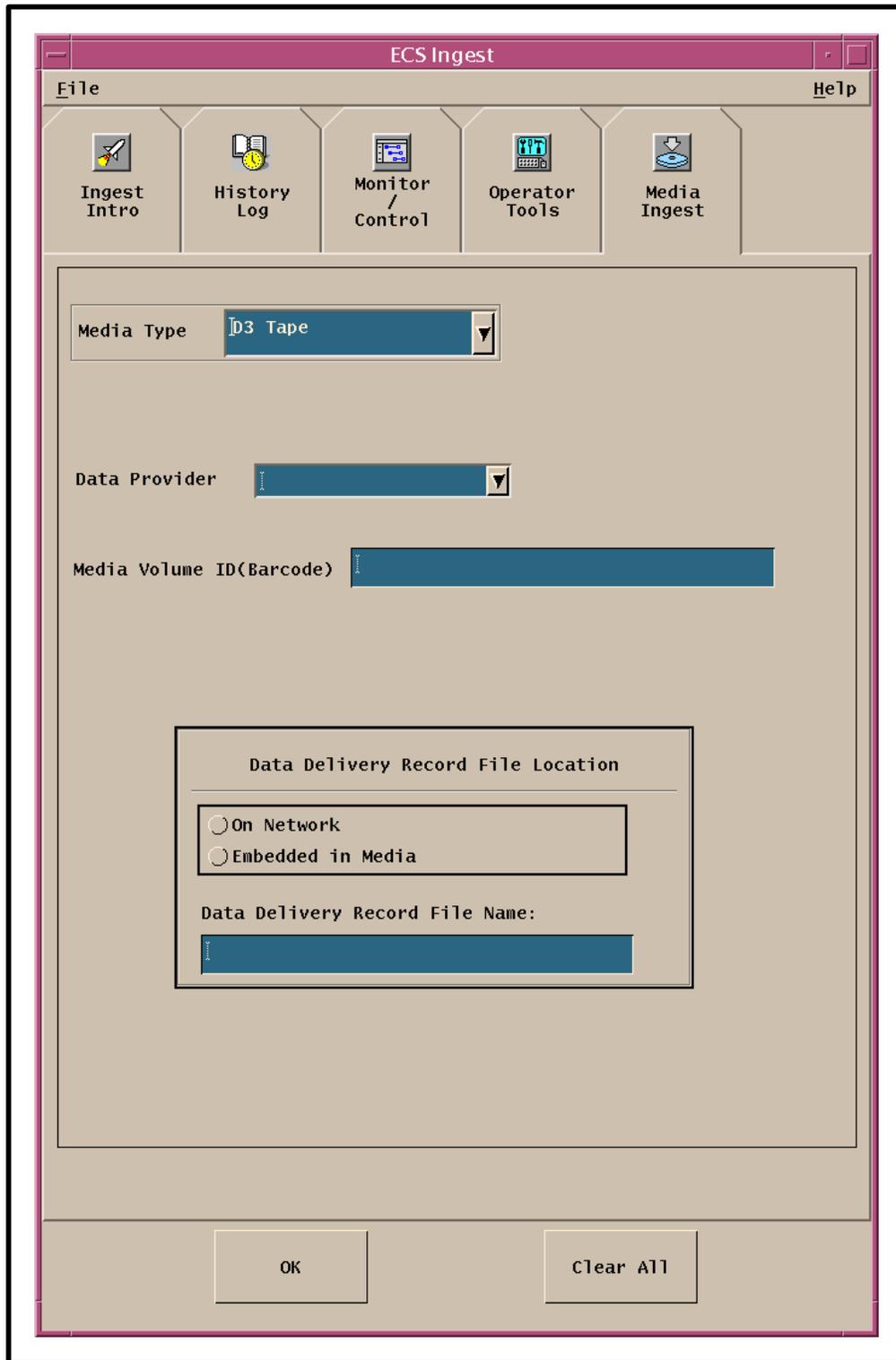


Figure 26. Media Ingest Screen (D3 Tape)

- 11** Click (**once only**) on the **OK** button at the bottom of the GUI.
- The GUI **OK** button is sensitive to being clicked more than once. It is important to click it dead center once only or D3 ingest is likely to fail.
- 12** Insert the tape cartridge in the D3 tape drive.
- The tape cartridge must be inserted within one minute of clicking on the **OK** button on the Ingest GUI.
 - The message "Loading" should be displayed on the D3 tape drive unit panel.
 - Then the message "Ready" should be displayed on the D3 tape drive unit panel and the "ready" light should blink on and off for a while.
 - Avoid clicking the mouse on the Ingest GUI while the D3 tape unit is reading the tape.
 - Once the extraction command has been executed, the system reads the D3 tape from the header label, then accesses the data needed for Ingest processing.
- NOTE:** During data transfer from tape, the Ingest GUI prevents any other function from being selected until the transfer has been completed.
- 13** When the data transfer has been completed, wait for the message "Ingest Request Completed."
- The messages "Rewinding" then "Unloading" should be displayed on the D3 tape drive unit panel as the D3 tape drive unit rewinds and unloads after the data transfer.
 - Upon completion of the process the D3 tape automatically rewinds and ejects itself from the tape drive.
- 14** Remove the tape cartridge from the D3 tape drive.
- 15** Click on the **OK** button on the **Media Ingest Complete** pop-up window associated with the **ECS Ingest** GUI.
- The **Media Ingest Complete** pop-up window is dismissed.
- 16** Monitor request processing by performing the procedure for **Monitoring/Controlling Ingest Requests** (preceding section of this lesson).
-

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Scanning Documents

Scanning Documents

The procedure for scanning documents describes the steps involved in operating the HP ScanJet scanner and creating a graphics (TIFF format) file. The software package that supports scanning is TexBridge Pro 96. The software allows scanning of documents that include both text and tables.

The procedure for scanning documents starts with the assumptions that the Ingest/Distribution Technician has logged in to Windows 95 on the applicable personal computer (PC) and the scanner power is on.

Scanning Documents

- 1 To access the TexBridge scanning software use the mouse to select **Start** → **Programs** → **TexBridge Pro 96** → **TexBridge Pro 96** from the Windows 95 menu bar.
- 2 When the **TexBridge Pro 96** window appears, ensure that the following five (5) options are listed on the toolbar as follows:

Page Quality / Page Orientation / Original Document Layout / Document Recomposition / Brightness

Auto Auto Auto Recompose All Auto

- In other words, the software parameters should be set up as follows:
 - Page Quality: Auto.
 - Page Orientation: Auto.
 - Original Document Layout: Auto.
 - Document Recomposition: Recompose All.
 - Brightness: Auto.
- 3 Click on **Read from Scanner** (the 4th icon from the left of the window).
 - An alternative is to select **File** → **Read Image from Scanner** from the pull-down menu.

- 4 Click on **Save Image Defer OCR** (the 8th icon from the left of the window).
 - 5 Set the green lever on the on the HP ScanJet at the vertical position.
 - 6 Set the stack of documents with the side to be scanned facing up on the feed tray of the HP ScanJet.
 - 7 Rotate the green lever on the on the HP ScanJet clockwise.
 - 8 Click on the **Go** icon to start the scanning process.
 - An alternative is to select **File** → **Start/Continue Processing** from the pull-down menu.
 - An **Add More Pages** window is displayed when the document has been scanned.
 - The **Add More Pages** window lists the following options.
Add more pages to the scanner and click continue
Or turn pages over in the scanner and click Flip and continue
Or, click End if you are done.
 - 9 Click on the appropriate button from the following selections:
 - **C**ontinue – if additional pages need to be scanned.
 - Return to Step 5.
 - **F**lip and continue – if the pages in the scanner need to be flipped over to scan the backs of the sheets.
 - Turn the stack of pages over and return to Step 5
 - **E**nd - if scanning has been completed.
 - A **Save Page Image As** window is displayed.
 - Go to Step 10.
 - 10 Type a file name in the **File name:** field of the **Save Page Image As** window.
 - 11 Verify that **TIFF CCITT-3 (*.TIF)** is displayed in the **Save as type:** field.
 - 12 Click on the **OK** button to save the file.
 - 13 To exit from the TexBridge scanning software select **File** → **Exit** from the pull-down menu.
-

Gaining Access to Scanned Documents

After a document has been scanned, it should be checked to ensure that it has been properly scanned and saved. The procedure for gaining access to scanned documents starts with the

assumption that the Ingest/Distribution Technician has logged in to Windows 95 on the applicable personal computer (PC).

Gaining Access to Scanned Documents

- 1** To access the TexBridge scanning software use the mouse to select **Start → Programs → TexBridge Pro 96 → TexBridge Pro 96** from the Windows 95 menu bar.
 - 2** Click on the **Read from File** icon.
 - An alternative is to select **File → Read Image from File** from the pull-down menu.
 - 3** Click on the **Preview Image** icon.
 - An **Open** window is displayed with a list of files.
 - 4** Double-click on the name of the desired file.
 - An alternative is to single-click on the name of the desired file then click on the **Open** button.
 - The image of the scanned document is displayed.
 - 5** Observe the image of the scanned document.
 - 6** Adjust the image using the **Zoom In** icon if desired.
 - An alternative is to select **View → Zoom In** from the pull-down menu.
 - 7** To exit from the TexBridge scanning software select **File → Exit** from the pull-down menu.
-

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Modifying Ingest Tunable Parameters and Performing File Transfers

Operator Tools Tab

There are three GUI screens on the **ECS Ingest GUI Operator Tools** tab (Figure 27). Two of the tabs are used for viewing and/or setting ingest parameters or thresholds:

- Data provider data and thresholds.
 - File Transfer Protocol (ftp) user name.
 - File Transfer Protocol (ftp) password.
 - Electronic mail (e-mail) address.
 - HTML password.
 - Cell Directory Service (CDS) entry name.
 - Server destination Universal Unique Identifier (UUID).
 - Maximum data volume that may be ingested concurrently.
 - Maximum number of ingest requests that may be processed concurrently.
 - Priority for ingest processing.
 - “Notify” parameters (essential data for providing data provider notification).
 - Type.
 - ftp node.
 - ftp directory.
 - ftp username.
 - ftp password.
- System thresholds.
 - Maximum data volume to be ingested concurrently.
 - Maximum number of ingest requests that may be processed concurrently.
 - Communication retry count.
 - Communication retry interval.
 - Monitor time.

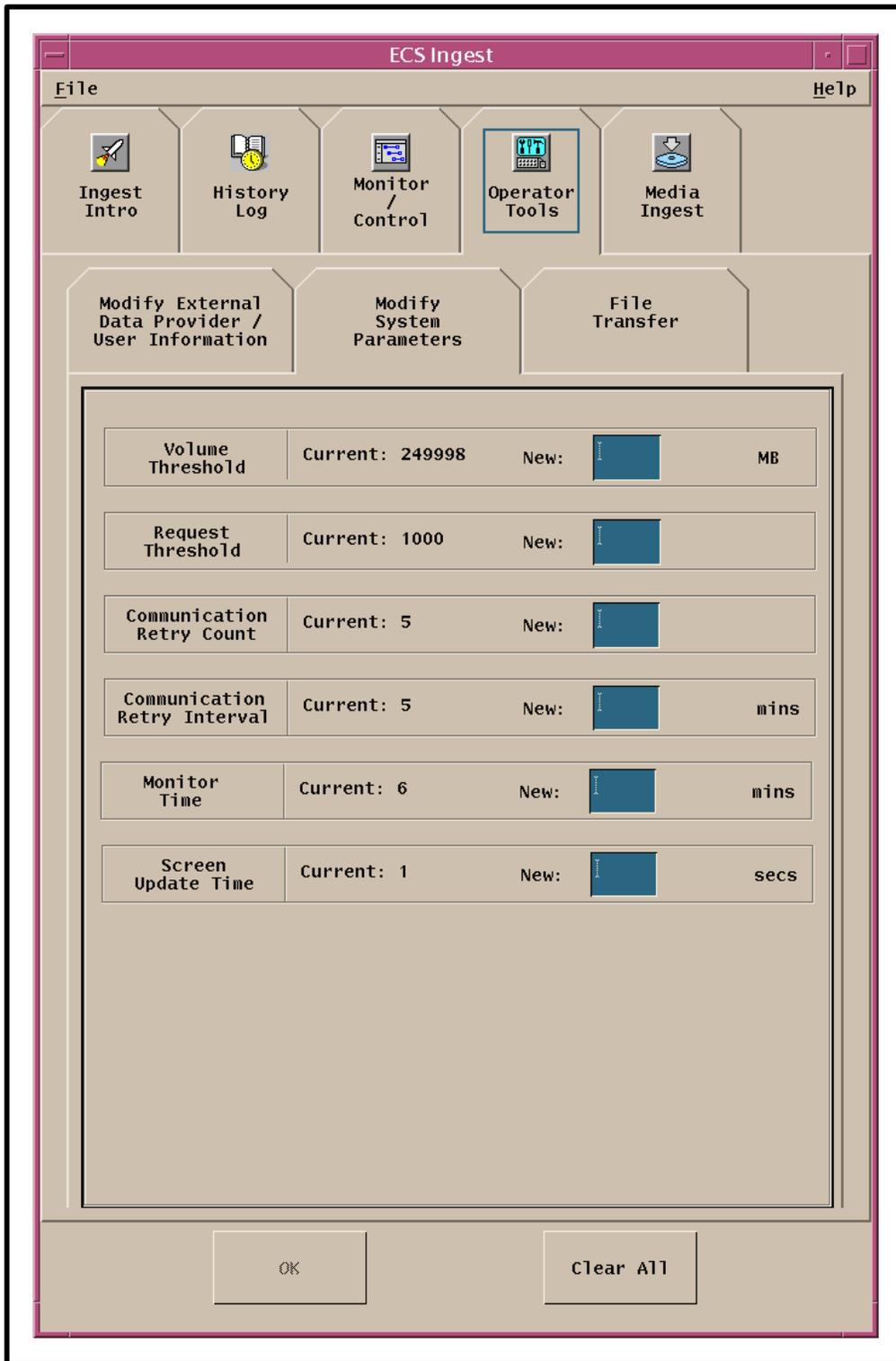


Figure 27. ECS Ingest GUI Operator Tools Tab

- Screen update time.

The third GUI screen on the **Operator Tools** tab allows the Ingest/Distribution Technician to transfer requested files to optional remote sites.

External Data Provider Data and Thresholds

Figure 28 shows the screen for modifying data provider thresholds. The screen shown in Figure 28 is used for modifying external data provider information. It has the following uses:

- Accommodate changes in data provider information (e.g., e-mail address) changes.
- Assist the Ingest/Distribution Technician in managing the ingest processing stream.

For example, the external data provider volume threshold and request threshold define the size and number of concurrent requests that are allowed from a data provider before the system notifies the Ingest/Distribution Technician of the fact that the data provider in question is taking up a significant portion of the ingest processing capacity. Although these thresholds will normally be left high so that requests are processed without restriction, there may be a time when it is desirable to lower those thresholds (e.g., to accommodate another data provider's requests). The Ingest/Distribution Technician might at the same time reduce the priority with which the data provider's requests are to be processed. For example, the Ingest GUI could be used to modify the EDOS precedence in the ingest processing stream as follows:

- Reduce the volume threshold from 20,000 megabytes to 15,000 megabytes.
- Reduce the request threshold from 100 to 75.
- Change the priority from normal to low.

To modify ingest external data provider information and parameters, use the procedure that follows. The procedure starts with the assumption that all applicable servers and the **ECS Ingest** GUI are currently running and the **Ingest Intro** screen (Figure 7) is being displayed.

Modifying External Data Provider Information

- 1 Click on the Ingest GUI **Operator Tools** tab.
 - The **Operator Tool** screen (Figure 28) is displayed.
- 2 Click on the **Modify External Data Provider/User Information** tab.
 - The **Modify External Data Provider/User Information** screen (Figure 28) is displayed.
- 3 Click and hold on the option button to the right of the **Data Provider** field, move the mouse cursor to the desired selection (highlighting it), then release the mouse button.
 - An alternative method of designating the data provider is to type it in the **Data Provider** field.

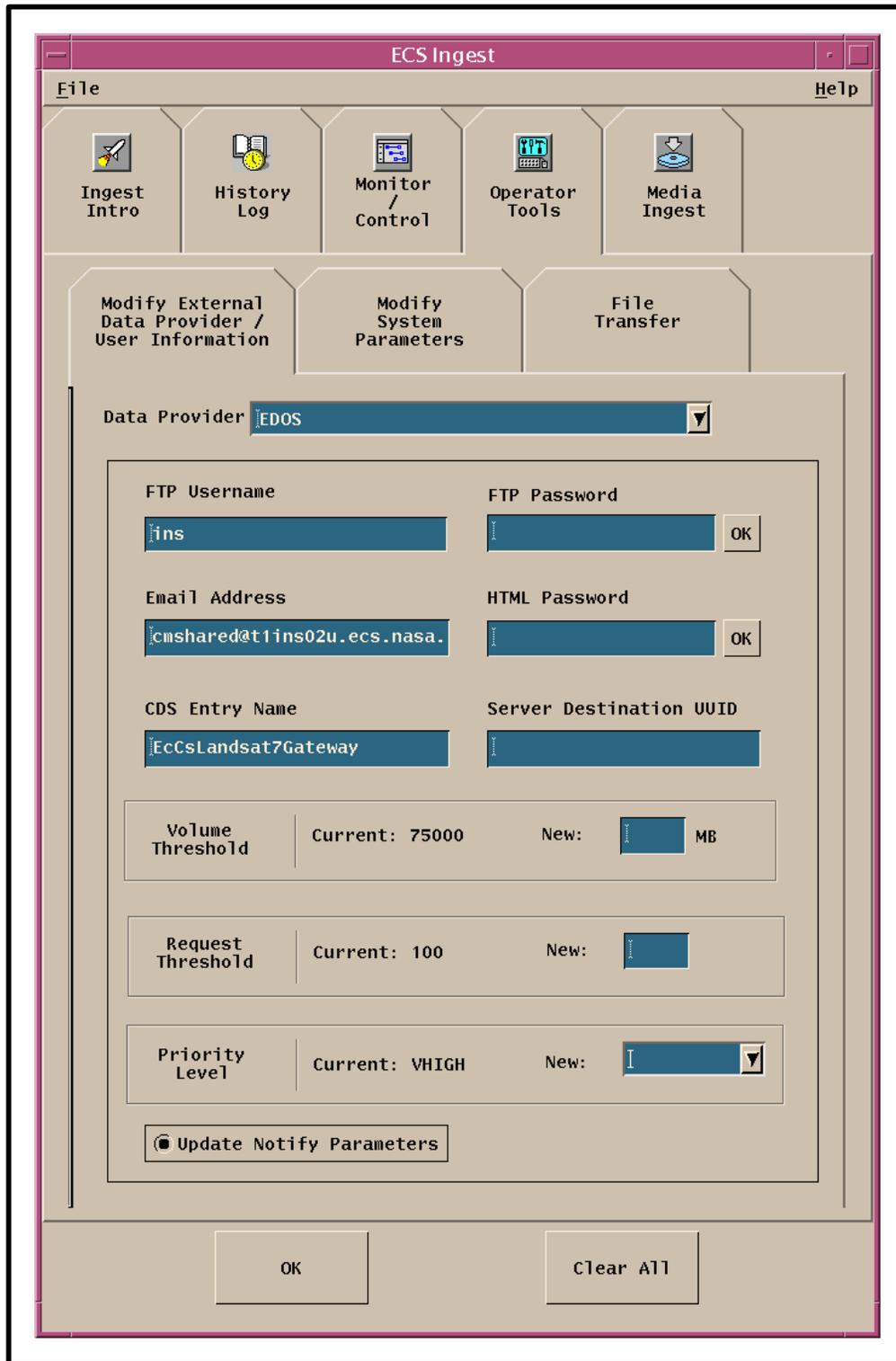


Figure 28. Ingest Data Provider Parameter Modification Screen

- If the information concerning the selected Data Provider is to be modified on the basis of....
 - **FTP Username**, perform Step 4.
 - **FTP Password**, perform Steps 5 and 6.
 - **Email Address**, perform Step 7.
 - **HTML Password**, perform Steps 8 and 9.
 - **CDS Entry Name**, perform Step 10.
 - **Server Destination UUID**, perform Step 11.
 - **Volume Threshold**, perform Step 12.
 - **Request Threshold**, perform Step 13.
 - **Priority Level**, perform Step 14.
 - **Notify Parameters (type, ftp node, ftp directory, ftp username, or ftp password)**, perform Steps 15 through 22 as appropriate.
- Any or all of the preceding criteria may be modified.

4 To modify the data provider's ftp username first click in the **FTP Username** field, then type the new ftp username.

NOTE: The **Tab** key may be used to move the cursor from one field to the next.

5 To modify the data provider's ftp password first click in the **FTP Password** field, then type the new ftp password.

6 Verify that the new ftp password is correct, then click the **OK** button adjacent to the **FTP Password** field.

7 To modify the data provider's e-mail address first click in the **Email Address** field, then type the new e-mail address.

8 To modify the data provider's HTML password first click in the **HTML Password** field, then type the new HTML password.

9 Verify that the new HTML password is correct, then click the **OK** button adjacent to the **HTML Password** field.

10 To modify the data provider's CDS entry name first click in the **CDS Entry Name** field, then type the new CDS entry name.

11 To modify the data provider's server destination first click in the **Server Destination UUID** field, then type the new server destination.

- 12 To modify the data provider's volume threshold first click in the **New:** field corresponding to **Volume Threshold**, then type the numerical value (e.g., 15000) for the new volume threshold.
 - The *current* values for the volume threshold, request threshold, and priority are printed on the corresponding lines for reference purposes.
 - 13 To modify the data provider's request threshold first click in the **New:** field corresponding to **Request Threshold**, then type the numerical value (e.g., 75) for the new request threshold.
 - 14 To modify the data provider's priority level (e.g., from **Normal** to **Low**) click and hold on the option button to the right of the **Priority Level** field, move the mouse cursor to the desired selection (highlighting it), then release the mouse button.
 - An alternative method of changing the priority level is to type the desired priority in the **Priority Level** field.
 - 15 To update the data provider's "notify parameters" first click on the **Update Notify Parameters** button.
 - The **Notify Parameters** window (Figure 29) is displayed.
 - The **Notify Parameters** window provides the Ingest/Distribution Technician with a means of changing the parameters (e.g., username or password) that the Ingest Subsystem needs in order to effectively notify a data provider of ingest activities.
 - 16 To modify the data provider's "notify type" first click in the **Notify Type** field, then type the new notify type.
 - 17 To modify the data provider's "notify ftp node" first click in the **Notify FTP Node** field, then type the new notify ftp node.
 - 18 To modify the data provider's "notify ftp directory" first click in the **Notify FTP Directory** field, then type the new notify ftp directory.
 - 19 To modify the data provider's "notify ftp username" first click in the **Notify FTP Username** field, then type the new notify ftp username.
 - 20 To modify the data provider's "notify ftp password" first click in the **Notify FTP Password** field, then type the new notify ftp password.
 - 21 Verify that the new notify ftp password is correct, then click the **OK** button adjacent to the **Notify FTP Password** field.
 - 22 Click on the **OK** button to save the "Notify Parameters" and dismiss the **Notify Parameters** window.
 - 23 Click on the **OK** button at the bottom of the **Operator Tools: Modify External Data Provider/User Information** tab to save the changes to data provider information.
 - The changes are invoked.
-

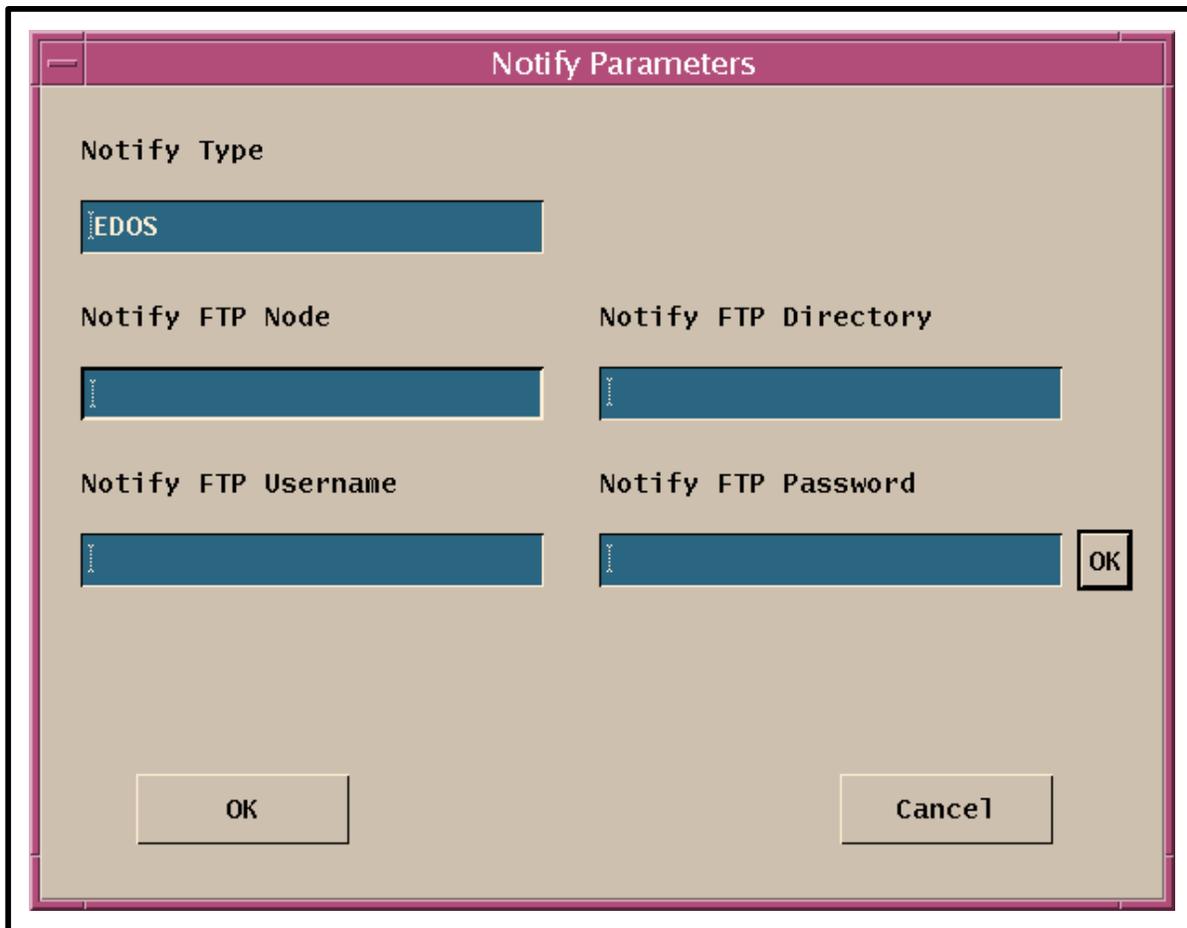


Figure 29. Notify Parameters

System Parameters on the Ingest GUI

Figure 30 shows the screen for modifying system parameters that can be modified through the Ingest GUI. It has the following uses:

- Change the thresholds at which the system notifies the Ingest/Distribution Technician of the demands on system capacity being made by ingest processing.
- Set certain other system operating and display parameters.

Normally, the thresholds are left high so that processing proceeds without restriction and without excessive notification of its operation. If more frequent or sensitive indications are desired, however (e.g., during troubleshooting), it can be helpful to lower the thresholds. For example, it may be desirable to reduce the system volume threshold from 25,749 megabytes to 15,000 megabytes, and reduce the system request threshold from 1000 to 500.

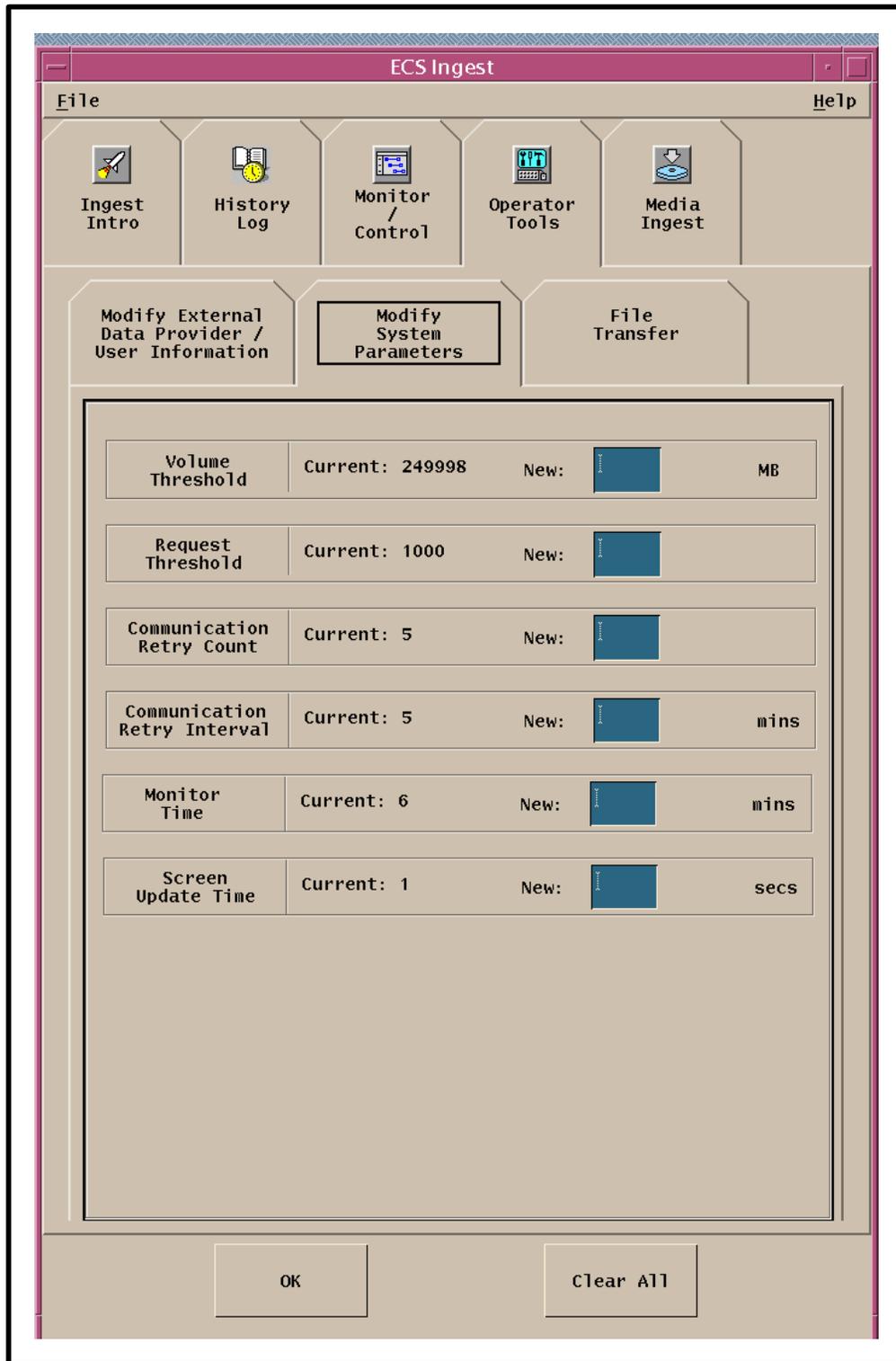


Figure 30. Ingest System Parameter Modification Screen

The following two system parameters affect communications between external data providers and ECS:

- **Communication retry count**
 - The number of successive times the system tries to establish ingest communications with a data provider before registering a communications failure and moving on to the next ingest request.
 - If there is trouble with communication (or if troubleshooting is being performed), it may be useful to increase the communication retry count until the trouble is resolved.
- **Communication retry interval**
 - The time between successive attempts to establish communication.
 - It may be desirable to reduce the time interval for the same reasons as increasing the communication retry count.

An example of how the Ingest/Distribution Technician might adjust system parameters when a communication problem is suspected involves increasing the communication retry count from five (5) to nine (9), and reducing the communication retry interval from five (5) minutes to three (3) minutes.

The following two system parameters may be used to set the behavior of the system according to operator preference:

- **Monitor time**
 - The amount of time that information about a completed ingest transaction remains available on the Monitor/Control screen after its completion.
 - During a time when the system is operating normally and ingest activity is heavy, it may be better to set a relatively short interval so excess items are removed from the monitoring display fairly quickly.
 - If information is needed about items that have been removed from the Monitor/Control screen, it can be obtained using the History Log.
- **Screen Update Time**
 - The amount of time between automatic data updates on the Monitor/Control screen.
 - Screen updates require system processing, and this interval is normally left set at no less than five (5) seconds.
 - During troubleshooting, it may be useful to obtain more frequent updates by reducing the time interval.

Use the procedure that follows to modify Ingest Subsystem parameters that can be modified through the Ingest GUI. The procedure starts with the assumption that all applicable servers and the Ingest GUI are currently running and the **Ingest Intro** screen (Figure 7) is being displayed.

Modifying System Parameters on the Ingest GUI

- 1** Click on the Ingest GUI **Operator Tools** tab.
 - The **Operator Tools** screen (Figure 28) is displayed.
 - 2** Click on the **Modify System Parameters** tab.
 - The **Modify System Parameters** screen (Figure 30) is displayed.
 - If the system parameters to be modified involve....
 - **Volume Threshold**, perform Step 3.
 - **Request Threshold**, perform Step 4.
 - **Communication Retry Count**, perform Step 5.
 - **Communication Retry Interval**, perform Step 6.
 - **Monitor Time**, perform Step 7.
 - **Screen Update Time**, perform Step 8.
 - 3** To modify the system volume threshold first click in the **New:** field corresponding to **Volume Threshold**, then type the numerical value (e.g., 15000) for the new volume threshold.
 - The *current* values for the system parameters (i.e., volume threshold, request threshold, etc.) are printed on the corresponding lines for reference purposes.
- NOTE:** The **Tab** key may be used to move the cursor from one field to the next.
- 4** To modify the system request threshold first click in the **New:** field corresponding to **Request Threshold**, then type the numerical value (e.g., 500) for the new request threshold.
 - 5** To modify the system communication retry count first click in the **New:** field corresponding to **Communication Retry Count**, then type the numerical value (e.g., 9) for the new communication retry count.
 - 6** To modify the system communication retry interval first click in the **New:** field corresponding to **Communication Retry Interval**, then type the numerical value (e.g., 3) for the new communication retry interval.
 - 7** To modify the system monitor time first click in the **New:** field corresponding to **Monitor Time**, then type the numerical value (e.g., 3) for the new monitor time.

- 8 To modify the system screen update time first click in the **New:** field corresponding to **Screen Update Time**, then type the numerical value (e.g., 4) for the new screen update time.
 - 9 Click on the **OK** button at the bottom of the **Operator Tools: Modify System Parameters** tab to save the changes to system parameters.
 - The changes are invoked.
-

File Transfer

The **File Transfer** tool allows the Ingest/Distribution Technician to transfer files to the science community. The file transfer tool allows the Ingest/Distribution Technician to build a System Monitoring and Coordination Center (SMC) History File or select any file to be transferred from a specified point of origin to a destination desired by the user.

To transfer files use the procedure that follows. The procedure starts with the assumption that all applicable servers and the Ingest GUI are currently running and the **Ingest Intro** screen (Figure 7) is being displayed.

Transferring Files

- 1 Click on the Ingest GUI **Operator Tools** tab.
 - The **Operator Tool** screen (Figure 28) is displayed.
- 2 Click on the **File Transfer** tab.
 - The **File Transfer** screen (Figure 31) is displayed.
- 3 Click on the appropriate button from the following selections:
 - **Build SMC History Files** – creates the following two types of files in the `/usr/ecs/MODE/CUSTOM/temp/INS` directory:
 - SMCHheaderFile.
 - SMCdataFile.
 - **Generic File Transfer** – allows any type of directory or file to be transferred.
- 4 Verify that the path in the **Filter** field (in the **Transfer Origin** box) is appropriate for searching for the file to be transferred.
 - If the path in the **Filter** field is **not** appropriate for searching for the file to be transferred, first click in the **Filter** field, then type the correct path.
 - Ensure that the path in the **Filter** field ends with a slash and an asterisk (`/*`); otherwise, no files will be listed.

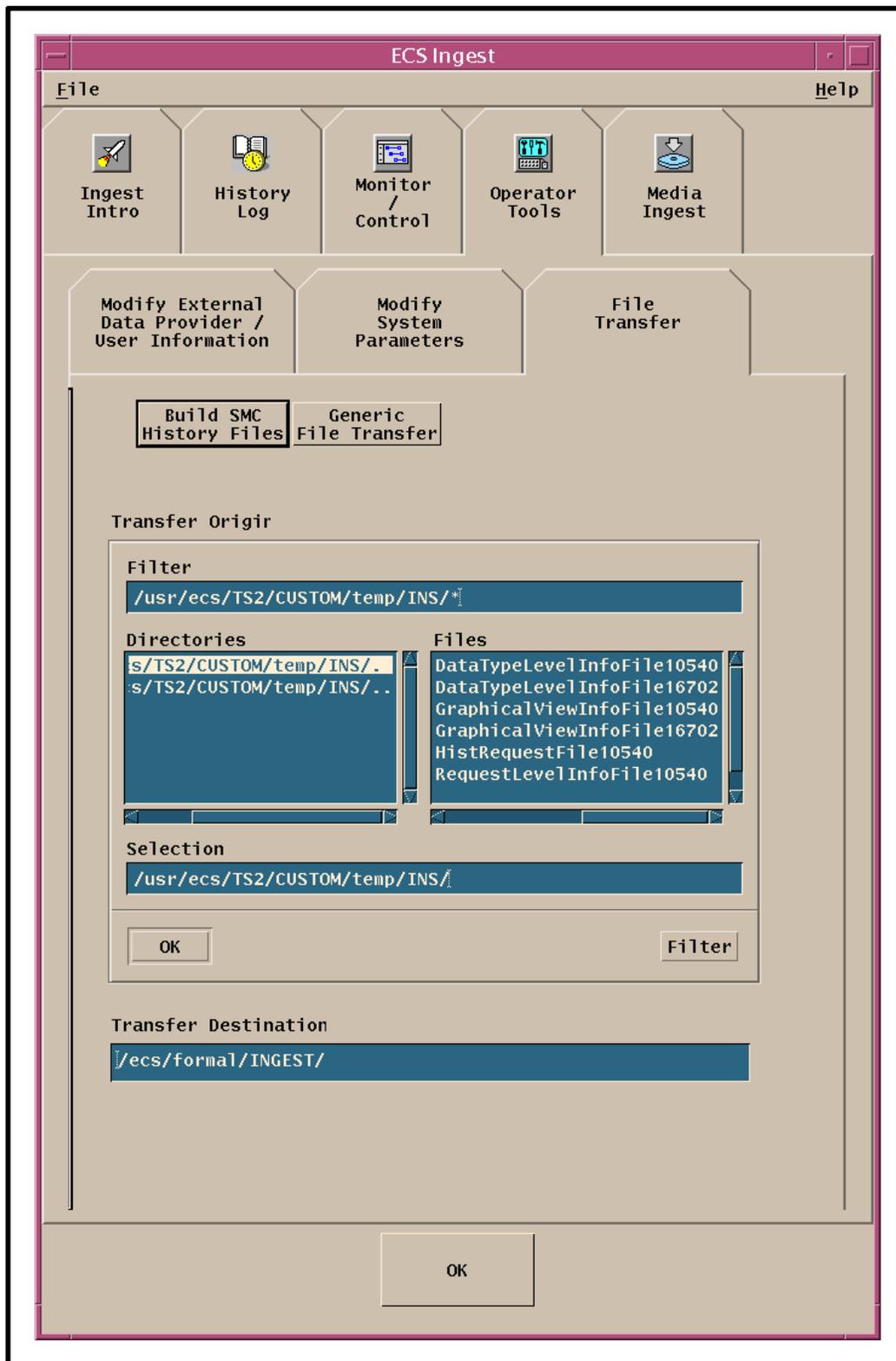


Figure 31. Ingest File Transfer Screen

- 5 Click on the **Filter** button.
 - A list of subdirectories in the last directory shown in the **Filter** field is displayed in the **Directories** field.
 - A list of files in the last directory shown in the **Filter** field is displayed in the **Files** field.
 - 6 If the file to be transferred is not listed in the **Files** field but may be in one of the subdirectories listed in the **Directories** field, select (by clicking on the desired entry to highlight it) the subdirectory where the file may be located.
 - 7 Click on the **Filter** button.
 - The path shown in the **Filter** field is modified to include the selected subdirectory.
 - A list of subdirectories in the last directory shown in the **Filter** field is displayed in the **Directories** field.
 - A list of files in the last directory shown in the **Filter** field is displayed in the **Files** field.
 - 8 Repeat Steps 6 and 7 as necessary until the file to be transferred is listed in the **Files** field.
 - 9 In the **Files** field select (by clicking on the desired entry to highlight it) the file to be transferred.
 - The highlighted file is entered into the **Selection** field.
 - 10 Click on the **OK** button in the **Transfer Origin** box.
 - 11 Verify that the file to be transferred (including the correct path to the file) is displayed in the **Selection** field.
 - Either repeat the Steps 4 through 10 as necessary to display the file to be transferred in the **Selection** field or click in the **Selection** field and type the correct path and file name of the file to be transferred.
 - 12 Click in the **Transfer Destination** field, then type *hostname/path* (e.g., g0drg01/usr/ecs/OPS/CUSTOM/data) to the directory/file where the file is to be transferred.
 - 13 Click on the **OK** button at the bottom of the **Operator Tools: File Transfer** tab to execute the file transfer.
 - The file is transferred.
-

Tuning System Configuration Parameters

The values assigned to system parameters affect the functioning and performance of the system. When certain parameters are modified, the system operates differently. Changes to some other parameters may not appear to affect the system although there may in fact be subtle effects. In any case before system parameters are modified it is essential to understand what will happen to system functioning and performance.

Many system parameters may be subject to control by Configuration Management (CM). When making or requesting a change to system parameters, the CM process at the particular site must be followed (if applicable).

Values are assigned to Ingest parameters in the following databases:

- Ingest database.
- Configuration Registry database.

The Configuration Registry Server provides a single interface (via a Sybase server) for retrieving configuration attribute-value pairs for ECS servers from the Configuration Registry database. When ECS servers are started, they access the Configuration Registry Database to obtain needed configuration parameters.

The Database Administrator has access to a Configuration Registry GUI for viewing and editing configuration data in the database. Therefore, it is necessary to coordinate with the Database Administrator when changes to configuration parameters are needed. Also, as previously mentioned, changes to configuration-controlled parameters are subject to approval through the site CM process.

Default and adjusted values assigned to system parameters vary from site to site. For guidance concerning the assignment of values to parameters included in the Configuration Registry refer to document 910-TDA-022 rev2, Custom Configuration Parameters for ECS Release 6A. The document is available at <http://cmdm.east.hitc.com/baseline/> under “Technical Documents.”

The following parameters are examples of parameters whose values may be modified to enhance system functioning or performance:

- AppLogSize
 - Maximum size of the application log (ALOG) file for a particular application.
- AppLogLevel
 - Level of detail provided in the ALOG file for a particular application.
- DebugLevel
 - Level of detail provided in the debug log file for a particular application.

- **INGEST_CONNECTION_POOL_SIZE**
 - Number of database connections. The number varies with the particular program connecting to the database.
 - Single-threaded programs (i.e., EcInAuto, EcInGUI, EcInPolling) need one database connection only.
 - The number of database connections required for EcInGran depends on the maximum number of granules that can be processed at a time (as specified in the TotalGranuleThreshold column in the InGranuleServerInfo database table). For a maximum of five granules, two database connections are probably enough.
 - For the EcInReqMgr there should be at least two database connections. During end-to-end (ETE) testing at EDC, EcInReqMgr actually needed only three database connections.
- **ListenThreads**
 - Number of listen threads assigned to a particular application.
- **RETRY_TIME_INTERVAL**
 - Number of seconds before EcInAuto retries to send a request to the Request Manager. If no value is specified for the parameter, a default value of 600 seconds is applied.
- **SAVEONEXIT**
 - Set to “true” for debug purposes only. When “true,” staging disks do not get cleaned up. For Granule Server, when the SAVEONEXIT parameter is “true,” the local preprocessing disk does not get cleaned up.
- **SDSRV_RETRY_INTERVAL**
 - Amount of time (in seconds) related to retrying remote procedure calls (RPCs) to Science Data Server.
- **SDSRV_RETRY_ATTEMPTS**
 - Number of tries related to retrying RPCs to Science Data Server.
- **ADVERTISE_RETRY_WAIT_TIME**
 - Amount of time (in seconds) related to retrying RPCs to the advertising service.
- **ADVERTISE_RETRIES**
 - Parameter (number of tries) related to retrying RPCs to the advertising service.

- **ADVERTISING_SYBASE_LIMIT**
 - Number of ESDTs sent to Advertising in one request. If the value is set to zero, all ESDTs from the Ingest database are sent at once. The parameter needs to be changed only if Advertising comes up against a limitation by Sybase as to how many ESDTs it can handle in one request.
- **PollingTimerInterval**
 - Amount of time (in seconds) between polling instances. The parameter is specified individually for each applicable data provider. The value varies depending on the data provider.
 - Applies to both categories of polling (i.e., with delivery record and without delivery record).
- **CompareFileContentsFlag**
 - Value is either "yes" or "no." (Usually set to "no".)
 - It should be set to "yes" for any data provider that reuses the same file names for its PDRs (in the case of polling with delivery record) or for its data files (in the case of polling without delivery record) so that EcInPolling checks whether file contents have changed.
 - If set to "yes," EcInPolling processing takes longer.
- **PollingDirectoryCount**
 - Number of directories to be polled by EcInPolling. There must be a corresponding number of PollingDirectory, DataType, HostName, IngestFileType, and MaximumFileSize parameters.
 - Affects polling without delivery record only.
- **PollingDirectory or PollingDirectoryX**
 - Path of the directory (e.g., /usr/ecs/TS2/CUSTOM/icl/x0icg01/data/polLEDOS) in which EcInPolling looks for new PDRs (polling with delivery record) or new data files (polling without delivery record).
 - There can be multiple instances of the parameter for polling without delivery record. For example, if the PollingDirectoryCount is "2," there should be a PollingDirectory1 and a PollingDirectory2.
- **HostName or HostNameX**
 - Host (e.g., x0icg01) where the associated polling directory resides.

- There can be multiple instances of the parameter for polling without delivery record. For example, if the PollingDirectoryCount is "2," there should be a HostName1 and a HostName2 (although both may have exactly the same value).
- **DataTypeX**
 - Identifies the data type (e.g., AM1ATTF) associated with the corresponding polling directory.
 - There can be multiple instances of the parameter. For example, if the PollingDirectoryCount is "2," there should be a DataType1 and a DataType2 and they should have different values.
 - Affects polling without delivery record only.
- **IngestFileTypeX**
 - Identifies the file type (e.g., SCIENCE or DATA) associated with the corresponding polling directory.
 - There can be multiple instances of the parameter. For example, if the PollingDirectoryCount is "2," there should be an IngestFileType1 and an IngestFileType2 (although both may have exactly the same value).
 - Affects polling without delivery record only.
- **MaximumFileSizeX**
 - Specifies the maximum file size in bytes allowed in the corresponding polling directory.
 - There can be multiple instances of the parameter. For example, if the PollingDirectoryCount is "2," there should be a MaximumFileSize1 and a MaximumFileSize2. (Both may have exactly the same value.)
 - Affects polling without delivery record only.

When the value assigned to a parameter has been changed and saved in the Configuration Registry, the modified value does not take effect until the affected server has been restarted. For example, if the debug level for the Request Manager log has been changed from “2” to “3” in the Configuration Registry, the modification does not affect the recording of data in the log until after a warm restart of the Request Manager (at which time the server would read the parameters in the Configuration Registry).

Modifying System Parameters in the Ingest Database

When making or requesting a change to system parameters, the CM process at the particular site must be followed (if applicable).

Configuring the Granule Server Listen Threads

The ListenThreads parameter for EcInGran is not used. The number of listen threads for a Granule Server is set in the software using the TotalGranuleThreshold column in the InGranuleServerInfo database table multiplied by three. The default value for the TotalGranuleThreshold is currently 40. It is not recommended that it be made greater because the Granule Server would grow too large. [If running with three modes active, especially with more than one Granule Server per mode (e.g., the Earth Resources Observation Systems Data Center (EDC) has two Granule Servers), it is possible to run out of swap space on the Ingest Server machine very quickly.] The TotalGranuleThreshold determines the maximum number of granules that a Granule Server will process at any one time.

Entries in the InGranuleServerInfo database table must be set manually via interactive structured query language (isql) commands. Refer to the section on **Modifying System Parameters in the Ingest Database Using ISQL** (subsequent section of this lesson) for the applicable procedure.

Limits on the Number of Queued Requests and Ingest Volume

The Request Manager receives requests, breaks them into granules, and queues all the granules. If the appropriate Granule Server is not processing its maximum granules (TotalGranuleThreshold from the InGranuleServerInfo table), one or more granules will be removed from the queue and sent to the Granule Server. There is no way to set the number of queued requests.

There is a maximum number of requests and maximum volume that can be processed by Ingest at one time. The corresponding parameters are specified in the MaximumTotalRequests and MaximumTotalVolume columns in the InSystemParameters database table. When a request from one of the clients (e.g., GUI or Polling) would cause one of the parameters to exceed its maximum value, the request fails and is not sent to Request Manager. The parameters can be modified using the Ingest GUI.

Limits on the Number of Requests and Data Volume from a Data Provider

For each data provider there is a maximum number of requests and a maximum data volume. The parameters are specified in the MaximumRequests and VolumeThreshold columns in the InExternalDataProviderInfo database table. When a request from one of the clients (e.g., GUI or Polling) would cause one of the parameters to exceed its maximum value, the request fails and is not sent to Request Manager. The parameters can be modified using the Ingest GUI.

Other Key Parameters for Ingest

In the InSystemParameters database table there is a parameter called MonitorTimeForCompletedRequest. The parameter specifies the number of minutes after the request has been completed that a request remains in the database tables that get displayed on the Ingest Monitor/Control GUI window. After the specified time has elapsed the request information is moved to the database summary tables and can be viewed using the Ingest GUI History Log window. The parameter can be modified using the Ingest GUI.

In the InSystemParameters table there is a ScreenUpdateInterval parameter. It specifies the number of seconds after which the GUI refreshes. The parameter can be modified using the Ingest GUI.

In the InSystemParameters table, there are the following two parameters for retrying to send a DDN to the Landsat7Gateway:

- CommunicationRetryCount.
- CommunicationRetryInterval.

The CommunicationRetryCount specifies a number of attempts to send the DDN. The CommunicationRetryInterval is in seconds. The default values installed with the database are set at five for both parameters. When a DDN is sent, the default rebinding policy of five times every five seconds is used. The CommunicationRetryCount and CommunicationRetryInterval are used for retrying the rebinding. For example, if the default values are used, then the DDN is tried a total of 25 times. The parameters can be modified using the Ingest GUI.

Number of Granule Servers at a DAAC

Each granule server can process multiple Earth Science Data Types (ESDTs), but each ESDT can only be assigned to one granule server. At EDC two granule servers are configured, one to process Landsat-7 data, the other for processing ASTER data.

Typically all granule servers run on the same machine. Distributing them to different machines would possibly do more to enhance performance.

In order to configure a granule server, there needs to be a row in the InGranuleServerInfo and InValGranuleServerUR tables. In order for a particular ESDT to be processed by a particular granule server, the GranuleServerURKey must be set to the appropriate granule server in the InDataTypeTemplate table for each data type.

Entries in the InGranuleServerInfo, InValGranuleServerUR, and InDataTypeTemplate database tables must be set manually via isql commands. Refer to the section on **Modifying System Parameters in the Ingest Database Using ISQL** (subsequent section of this lesson) for the applicable procedure.

Modifying System Parameters in the Ingest Database Using ISQL

As previously mentioned the effects on system functioning and performance must be considered before modifying system parameters. Depending on circumstances at a particular site it may be necessary to request that the Database Administrator modify parameters in the Ingest database. The procedure that follows is provided to assist Ingest/Distribution Technicians who have to make the database modifications themselves.

The procedure for changing system parameters specified in the Ingest database starts with the assumption that the Ingest/Distribution Technician has logged in to the system.

Modifying System Parameters in the Ingest Database Using ISQL

1 Access a terminal window logged in to the Ingest Server (e.g., e0icg11, g0icg01, or l0icg01).

2 Type **isql -UserID -SDBServer** then press **Return/Enter**.

- For example:

```
isql -UEcInGran -Sx0icg01_srvr
```

3 At the **Password:** prompt type *dbpassword* then press **Return/Enter**.

- The *dbpassword* is the password for logging in to the database using the specified *userID*.

4 Type **use dbname** at the **1>** prompt then press **Return/Enter**.

- The *dbname* is likely to be one of the following names:
 - **Ingest** [OPS mode].
 - **Ingest_TS1** [TS1 mode].
 - **Ingest_TS2** [TS2 mode].

5 Type **go** at the **2>** prompt then press **Return/Enter**.

6 Type **select * from TableName** at the **1>** prompt then press **Return/Enter**.

- For example:

```
1> select * from InGranuleServerInfo
```

- Alternatively, type **select columnName from TableName** at the **1>** prompt then press **Return/Enter**.

- For example:

```
1> select TotalGranuleThreshold from InGranuleServerInfo
```

- Another alternative is to type **select columnName1,columnName2[,columnName3,...] from TableName** at the **1>** prompt then press **Return/Enter**.

- For example:

```
1> select  
GranuleServerURKey,TotalGranuleThreshold,VolumeThreshold
```

```
from InGranuleServerInfo
```

7 Type **go** at the 2> prompt then press **Return/Enter**.

- Table contents are displayed.
 - If * was specified, all entries in the table are displayed.
 - If specific columnNames were entered, the data associated with those columns only are displayed.
- For example:

```
1> select * from InGranuleServerInfo
2> go
GranuleServerURKey TotalGranuleThreshold
VolumeThreshold
-----
1 40
900000000000
2 40
900000000000
3 40
900000000000
(3 rows affected)
```

8 Type **update TableName set columnName1=value1 where columnName2=value2** at the 1> prompt then press **Return/Enter**.

- For example:

```
1> update InGranuleServerInfo set TotalGranuleThreshold=10 where
GranuleServerURKey=3
```

9 Type **go** at the 2> prompt then press **Return/Enter**.

10 Start verification of the update by typing **select * from TableName** (or one of the options described in Step 6) at the 1> prompt then pressing **Return/Enter**.

11 Type **go** at the 2> prompt then press **Return/Enter**.

- Table contents are displayed.
- Specified value should have been updated.
- For example:

```
1> select * from InGranuleServerInfo
2> go
GranuleServerURKey TotalGranuleThreshold
VolumeThreshold
-----
```

```
-----  
1          40  
          90000000000  
2          40  
          90000000000  
3          10  
          90000000000
```

(3 rows affected)

12 To exit from isql type **quit** at the **1>** prompt then press **Return/Enter**.

Troubleshooting Ingest Problems

Trouble Symptoms

Troubleshooting is a process of identifying the source of problems on the basis of observed trouble symptoms. One common source of problems involves the reliance on messages or data from other subsystems. Like many other operational areas in ECS, Ingest has interfaces with many other subsystems. Consequently, problems with ingest can be traced to either the Ingest Subsystem or one of many other ECS subsystems, including (but not necessarily limited to) those in the following list:

- Data Server Subsystem (DSS).
- Interoperability Subsystem (IOS).
- Communications Subsystem (CSS).
- System Management Subsystem (MSS).

However, unlike many other operational areas in ECS Ingest has interfaces with external data providers. Consequently, some ingest problems can be traced to mistakes in the delivery records furnished by the data providers or errors in transmission of the data.

Table 2 describes actions to be taken in response to some common ingest problems. If the problem cannot be identified and fixed without help within a reasonable period of time, the appropriate response is to call the help desk and submit a trouble ticket in accordance with site Problem Management policy.

Table 2. Troubleshooting Ingest Problems

Symptom	Response
Unable to log in to any host (e.g., Operations Workstation, g0acs02).	Check with the Operations Controller/System Administrator to ensure that the host is "up."
GUI not displayed when the start-up script has been properly invoked.	Ensure that the DISPLAY variable was set properly. [For detailed instructions refer to the procedure for Launching the Ingest GUI (previous section of this lesson).]
Error message associated with the Ingest GUI.	Refer to Table 3, Ingest Operator GUI User Messages (adapted from the corresponding table in 609-CD-600-001, <i>Release 6A Operations Tools Manual for the ECS Project</i>).

Table 2. Troubleshooting Ingest Problems

Symptom	Response
Message received indicating a data ingest failure.	<ol style="list-style-type: none"> 1. Ensure (e.g., using ECS Assistant) that the necessary hosts and servers (listed in Table 5) are “up.” 2. If hosts/servers have gone down, notify the Operations Controller/System Administrator to have servers brought back up. 3. If hosts/servers are all “up,” refer to the procedure for Recovering from a Data Ingest Failure (subsequent section of this lesson).
Other problems.	<p>Check the log files (e.g., EclnReqMgr.ALOG, EclnAuto.ALOG, EclnPolling.ALOG, EclnGran.ALOG, EclnGUI.ALOG) in the /usr/ecs/MODE/CUSTOM/logs directory of the relevant host(s) for error messages.</p> <p>[For detailed instructions refer to the procedure for Checking Log Files (subsequent section of this lesson).]</p>

NOTE: When troubleshooting Ingest problems, ensure that the correct mount/host is being checked. Many types of ingest use “icl” (Ingest Client) staging areas but others may not. Media ingest (e.g., from D3 tape) typically involves staging in a “dip” (Distribution and Ingest Peripherals) area. Polling ingest for data from EDOS usually entails the use of the polling directory as the staging area. Some data are staged directly to working storage (“wks”) in the Data Server Subsystem.

Table 3. Ingest Operator GUI User Messages

Message Text	Impact	Cause and Corrective Action
Can not obtain Data Delivery Record file.	Without the data delivery record file, media ingest cannot be processed.	<ol style="list-style-type: none"> 1. If the data delivery record (e.g., sdpf31a.PDR) is embedded in the medium (recorded on the tape), change directory to the staging area from any Ingest or Data Server Subsystem host (e.g., cd /usr/ecs/OPS/CUSTOM/drp/x0drg01/data/staging). 2. Ensure that a staging disk (e.g., user1) has been created to receive the file. 3. If the data delivery record is on a network, check the applicable directory to see if the delivery record is there. 4. If the data delivery record is on a network and the delivery record is in the applicable directory, consult with the Network Administrator to determine whether there is network problem.
Can not obtain data type for selected RequestID.	Unable to display granule level information.	Notify the Database Administrator of the database problem that needs to be corrected.

Table 3. Ingest Operator GUI User Messages

Message Text	Impact	Cause and Corrective Action
Can not obtain new request id from database.	Without this information, media ingest cannot be processed.	Notify the Database Administrator of the database problem that needs to be corrected.
Can not obtain selected data provider information.	“Modify External Data Provider/User Information” screen cannot be refreshed with the updated information.	Notify the Database Administrator of the database problem that needs to be corrected.
Can not read the request information file.	Unable to display request/granule text view information in the text browser.	<ol style="list-style-type: none"> 1. Access a terminal window logged in to the Operations Workstation (e.g., e0acs03, g0acs02, l0acs01, or n0acs03). 2. Type <code>cd /usr/ecs/MODE/CUSTOM/temp/INS</code> then press Return/Enter. 3. Type <code>ls -al</code> then press Return/Enter. <ul style="list-style-type: none"> • A listing of files, including their permissions is displayed as shown in the following example: <pre>-rw-rw--w- 1 ashelton users 110 Apr 2 11:21 GraphicalViewInfoFile982 -rw-rw--w- 1 ashelton users 112 Mar 25 15:51 HistSummaryFile10535 -rw-rw--w- 1 cmops cmops 220 Mar 26 11:47 RequestLevelInfoFile11000</pre> 4. Review the file permissions to determine whether the GUI has permission to read the file to which it is trying to gain access. <ul style="list-style-type: none"> • In the preceding example “read” access to the RequestLevelInfoFile is restricted to members of the cmops group but virtually any user has “read” access to the other files. 5. Whether or not the GUI has “read” permission for the file, notify the System Administrator of the problem and/or submit a trouble ticket.
Can not retrieve data based on search criteria.	Unable to display History Log information.	Notify the Database Administrator of the database problem that needs to be corrected.
Can not update selected data provider information.	Cannot update InExternalDataProviderInfo table for the specified data provider.	Notify the Database Administrator of the database problem that needs to be corrected.

Table 3. Ingest Operator GUI User Messages

Message Text	Impact	Cause and Corrective Action
Can not update the system threshold information.	Cannot update InSystemParameters table with new values.	Notify the Database Administrator of the database problem that needs to be corrected.
Data Delivery Record filename needs to be specified.	Without this information, media ingest cannot be submitted.	<ol style="list-style-type: none"> 1. Type the data delivery record file name (e.g., sdpf31a.PDR) in the Data Delivery Record File Name field. 2. Click on the OK button at the bottom of the GUI.
Data Delivery Record location needs to be specified.	Without this information, media ingest cannot be submitted.	<ol style="list-style-type: none"> 1. Click on the appropriate radio button in the Data Delivery Record File Location box. <ul style="list-style-type: none"> • Click on the On Network button if the PDR file is located on the network. • Click on the Embedded in Media button if the PDR file is recorded on the tape. 2. Click on the OK button at the bottom of the GUI.
Data not found for search criteria.	Unable to display History Log information.	Select/enter other search criteria. [For detailed instructions refer to the procedure for Viewing the Ingest History Log (previous section of this lesson).]
Data not found for search criteria.	Unable to display the Monitor/Control screen request text view information for the search criteria.	Notify the Database Administrator of the database problem that needs to be corrected.
Data Provider ID needs to be provided.	Without this information, media ingest cannot be submitted.	<ol style="list-style-type: none"> 1. To enter the data provider (e.g., SDPF) click and hold on the option button to the right of the Data Provider field, move the mouse cursor to the desired selection (highlighting it), then release the mouse button. 2. Click on the OK button at the bottom of the GUI.
Data Provider is not authorized for ingest.	Unable to perform Media Ingest for the data provider.	Resolve the issue with the data provider.
Deallocate device failure.	Media ingest cannot be processed.	Notify the System Administrator of the problem and/or submit a trouble ticket.
Destination MUST be host/path (e.g. kodiak/tmp).	Cannot perform file transfer.	<ol style="list-style-type: none"> 1. Click in the Transfer Destination field, then type hostname/path (e.g., g0drg01/usr/ecs/OPS/CUSTOM/data) to the directory/file where the file is to be transferred. 2. Click on the OK button at the bottom of the Operator Tools: File Transfer tab to execute the file transfer.

Table 3. Ingest Operator GUI User Messages

Message Text	Impact	Cause and Corrective Action
Destination MUST be provided.	Cannot perform file transfer.	<ol style="list-style-type: none"> 1. Click in the Transfer Destination field, then type <i>hostname/path</i> (e.g., g0drg01/usr/ecs/OPS/CUSTOM/data) to the directory/file where the file is to be transferred. 2. Click on the OK button at the bottom of the Operator Tools: File Transfer tab to execute the file transfer.
Detail Level needs to be set.	Unable to display History Log information.	<ol style="list-style-type: none"> 1. Click on either the Detailed Report button or the Summary Report button. 2. If the Summary Report button was selected in the preceding step, click on either the Request level button or the Granule level button. 3. Click on the Display button.
Dismount media failure.	Media ingest cannot be processed.	Notify the System Administrator of the problem and/or submit a trouble ticket.
FTP failed.	File failed the ftp file transfer.	Notify the Network Administrator of the problem.
Invalid input value.	Unable to display History Log information.	Enter a valid input value. [For detailed instructions refer to the procedure for Viewing the Ingest History Log (previous section of this lesson).]
Invalid Old Password.	Unable to perform password confirmation.	Enter the correct old password. [For detailed instructions refer to the procedure for Modifying External Data Provider Information (previous section of this lesson).]
Invalid Start Time.	Unable to display the History Log information.	Enter a valid start time. [For detailed instructions refer to the procedure for Viewing the Ingest History Log (previous section of this lesson).]
Invalid Stop Time.	Unable to display the History Log information.	Enter a valid stop time. [For detailed instructions refer to the procedure for Viewing the Ingest History Log (previous section of this lesson).]
Invalid time interval.	Unable to display the History Log information (e.g., the specified stop time may precede the specified start time).	Enter correct start and stop times. [For detailed instructions refer to the procedure for Viewing the Ingest History Log (previous section of this lesson).]
Media Ingest Request completed.	N/A	For information only. No action is necessary.

Table 3. Ingest Operator GUI User Messages

Message Text	Impact	Cause and Corrective Action
Media Type needs to be set.	Without this information, media ingest cannot be submitted.	<ol style="list-style-type: none"> 1. To enter the type of medium (i.e., D3 Tape) click and hold on the option button to the right of the Media Type field, move the mouse cursor to the desired selection (highlighting it), then release the mouse button. 2. Click on the OK button at the bottom of the GUI.
New password does not match what was originally typed.	Unable to perform password confirmation.	Re-enter the correct new password. [For detailed instructions refer to the procedure for Modifying External Data Provider Information (previous section of this lesson).]
No data matching search criteria.	Unable to display the request text view information for the search criteria.	Notify the Database Administrator of the database problem that needs to be corrected.
Printer name is not specified.	Unable to print the currently displayed information.	Enter a valid printer name.
Priority Level needs to be set.	Unable to change the priority for the selected request.	<ol style="list-style-type: none"> 1. Click and hold the option button to the right of the Priority button to display a menu of priorities, move the mouse cursor to the desired selection (highlighting it), then release the mouse button. 2. To implement the priority change click on the OK button at the bottom of the GUI.
Request Control Status: Success.	N/A	For information only. No action is necessary.
Request Threshold exceeds the system request threshold.	Cannot update InExternalDataProviderInfo table for the specified data provider.	<ol style="list-style-type: none"> 1. Click on the Modify System Parameters tab. 2. Observe the current value for the system request threshold. 3. Click on the Modify External Data Provider/User Information tab. 4. Click and hold on the option button to the right of the Data Provider field, move the mouse cursor to the desired selection (highlighting it), then release the mouse button. 5. Click in the New: field corresponding to Request Threshold, then type the numerical value for the new request threshold, ensuring that the value entered for the new request threshold is less than the system request threshold specified on the Modify System Parameters tab. 6. Click on the OK button at the bottom of the Operator Tools: Modify External Data Provider/User Information tab to save the changes to data provider information.

Table 3. Ingest Operator GUI User Messages

Message Text	Impact	Cause and Corrective Action
RequestID selected is not a valid integer.	Unable to display granule level information.	Notify the Database Administrator of the database problem that needs to be corrected.
Select new file and push the file selection OK button.	Cannot perform file transfer.	<ol style="list-style-type: none"> 1. In the Files field select (by clicking on the desired entry to highlight it) the file to be transferred. 2. Click on the OK button in the Transfer Origin box. 3. Verify that the file to be transferred (including the correct path to the file) is displayed in the Selection field. 4. Verify that the hostname/path to which the file is to be transferred is typed in the Transfer Destination field. 5. Click on the OK button at the bottom of the Operator Tools: File Transfer tab to execute the file transfer.
SMC History File Build Failed.	Unable to build SMC history file.	Notify the Database Administrator of the database problem that needs to be corrected.
Stacker ID needs to be specified.	Without this information, media ingest cannot be submitted.	Not Currently Applicable.
Stacker Slot ID needs to be specified.	Without this information, media ingest cannot be submitted.	Not Currently Applicable.
Unable to allocate a media device.	Without the allocation of the media device, media ingest cannot be processed.	Notify the System Administrator of the problem and/or submit a trouble ticket.
Unable to copy data files to staging disk.	Without the data files, media ingest cannot be processed.	<ol style="list-style-type: none"> 1. Change directory to the staging area from any Ingest or Data Server Subsystem host (e.g., cd usr/ecs/OPS/CUSTOM/drp/x0drg01/data/staging). 2. Ensure that a staging disk (e.g., user1) has been created to receive the file. 3. Verify that there is adequate disk space to receive data files (e.g., df -k .) 4. If there is not enough disk space, notify the System Administrator of the problem and/or submit a trouble ticket.

Table 3. Ingest Operator GUI User Messages

Message Text	Impact	Cause and Corrective Action
Unable to obtain data provider list.	“Modify External Data Provider/User Information” screen cannot be used to update InExternalDataProviderInfo table.	Notify the Database Administrator of the database problem that needs to be corrected.
Unable to obtain data provider list.	Unable to build the list for Data Provider combo box on History Log screen.	Notify the Database Administrator of the database problem that needs to be corrected.
Unable to obtain data type list.	Unable to build the list for Data Type combo box on History Log screen.	Notify the Database Administrator of the database problem that needs to be corrected.
Unable to obtain final request status list.	Unable to build the list for Final Request Status combo box on History Log screen.	Notify the Database Administrator of the database problem that needs to be corrected.
Unable to obtain the data provider list.	Unable to build the list for Data Provider combo box on Monitor/Control screen.	Notify the Database Administrator of the database problem that needs to be corrected.
Unable to obtain the system information.	“Modify System Parameters” screen cannot be used to update the InSystemParameters table.	Notify the Database Administrator of the database problem that needs to be corrected.
Unable to process request control.	Unable to perform the selected request control.	<ol style="list-style-type: none"> 1. Ensure (e.g., using ECS Assistant) that the Ingest Server (e.g., x0icg01) and Ingest Request Manager (EclnReqMgr) are “up.” 2. If either the host or server has gone down, notify the Operations Controller/System Administrator to have host/server brought back up. 3. If host and server are “up,” refer to the procedure for Recovering from a Data Ingest Failure (subsequent section of this lesson).

Table 3. Ingest Operator GUI User Messages

Message Text	Impact	Cause and Corrective Action
Unable to process the request.	Media ingest cannot be processed.	<ol style="list-style-type: none"> 1. Ensure (e.g., using ECS Assistant) that the Ingest Server (e.g., x0icg01) and Ingest Request Manager (EclnReqMgr) are “up.” 2. If either the host or server has gone down, notify the Operations Controller/System Administrator to have host/server brought back up. 3. If host and server are “up,” refer to the procedure for Recovering from a Data Ingest Failure (subsequent section of this lesson).
Unable to read the history log.	Unable to display History Log information.	<ol style="list-style-type: none"> 1. Access a terminal window logged in to the Operations Workstation (e.g., e0acs03, g0acs02, l0acs01, or n0acs03). 2. Type <code>cd /usr/ecs/MODE/CUSTOM/temp/INS</code> then press Return/Enter. 3. Type <code>ls -al</code> then press Return/Enter. <ul style="list-style-type: none"> • A listing of files, including their permissions is displayed as shown in the following example: <pre data-bbox="764 919 1414 1171">-rw-rw--w- 1 ashelton users 306 Mar 31 13:43 HistDataTypeFile1428 -rw-rw--w- 1 cmops cmops 110 Apr 2 11:21 HistRequestFile12989 -rw-rw--w- 1 ashelton users 112 Mar 25 15:51 HistSummaryFile10535 -rw-rw--w- 1 ashelton users 220 Mar 26 11:47 RequestLevelInfoFile11000</pre> 4. Review the file permissions to determine whether the GUI has permission to read the file to which it is trying to gain access. <ul style="list-style-type: none"> • In the preceding example “read” access to the HistRequestFile is restricted to members of the cmops group but virtually any user has “read” access to the other files. 5. Whether or not the GUI has “read” permission for the file, notify the System Administrator of the problem and/or submit a trouble ticket.
Unable to request mount media service.	Without the mount, media ingest cannot be processed.	Notify the System Administrator of the problem and/or submit a trouble ticket.
Update is not allowed without password confirmation.	Unable to perform password update.	Click on the password confirmation OK button to perform password confirmation prior to password update. [For detailed instructions refer to the procedure for Modifying External Data Provider Information (previous section of this lesson).]

Table 3. Ingest Operator GUI User Messages

Message Text	Impact	Cause and Corrective Action
Value entered is not a valid integer.	Unable to display History Log information.	Enter a valid integer value. [For detailed instructions refer to the procedure for Viewing the Ingest History Log (previous section of this lesson).]
Value entered is not a valid integer.	Unable to monitor/control the specified request ID.	Enter a valid integer request ID. [For detailed instructions refer to the procedure for Viewing the Ingest History Log (previous section of this lesson).]
Volume ID is empty.	Without this information, media ingest cannot be submitted.	<ol style="list-style-type: none"> 1. Type the media volume ID in the Media Volume Id (Barcode) field. 2. Click on the OK button at the bottom of the GUI. [For detailed instructions refer to the procedure for Performing Media Ingest from D3 Tape (previous section of this lesson).]
Volume Threshold exceeds the system volume threshold.	Cannot update InExternalDataProviderInfo table for the specified data provider.	<ol style="list-style-type: none"> 1. Click on the Modify System Parameters tab. 2. Observe the current value for the system volume threshold. 3. Click on the Modify External Data Provider/User Information tab. 4. Click and hold on the option button to the right of the Data Provider field, move the mouse cursor to the desired selection (highlighting it), then release the mouse button. 5. Click in the New: field corresponding to Volume Threshold, then type the numerical value for the new volume threshold, ensuring that the value entered for the new volume threshold is less than the system volume threshold specified on the Modify System Parameters tab. 6. Click on the OK button at the bottom of the Operator Tools: Modify External Data Provider/User Information tab to save the changes to data provider information.

Table 4. Regenerate Failed PDR Tool User Messages

Message Text	Impact	Cause and Corrective Action
Error occurred when trying to delete the new PDR file.	The generated PDR file did not get deleted from its creation directory.	If the generated PDR file is still in the directory where the Regenerate Failed PDR Tool created it, delete the PDR file. [For detailed instructions refer to the procedure for Removing (Deleting) Generated PDRs (subsequent section of this lesson).]
InDAN::GetDataType returned an error for granule.	The PDR for this and subsequent granules cannot be generated.	<ol style="list-style-type: none"> 1. Check the log file for error messages. <ul style="list-style-type: none"> • [For detailed instructions refer to the procedure for Checking Log Files (subsequent section of this lesson). 2. When the problem has been corrected, repeat the procedure for Regenerating Failed PDRs (subsequent section of this lesson).
InDAN::GetFileInfo returned an error for granule.	This and subsequent granules cannot have their PDRs generated.	<ol style="list-style-type: none"> 1. Check the PDR(s) to ensure that file information is set correctly. <ul style="list-style-type: none"> • [For detailed instructions refer to the procedure for Checking/Editing a PDR (subsequent section of this lesson).] 2. Check the log file for error messages. <ul style="list-style-type: none"> • [For detailed instructions refer to the procedure for Checking Log Files (subsequent section of this lesson).] 3. When the problem has been corrected, repeat the procedure for Regenerating Failed PDRs (subsequent section of this lesson).
InDAN::GetGranuleVolume returned an error for granule.	This and subsequent granules cannot have their PDRs generated.	<ol style="list-style-type: none"> 1. Check the PDR(s) to ensure that volumes are set correctly. <ul style="list-style-type: none"> • [For detailed instructions refer to the procedure for Checking/Editing a PDR (subsequent section of this lesson).] 2. Check the log file for error messages. <ul style="list-style-type: none"> • [For detailed instructions refer to the procedure for Checking Log Files (subsequent section of this lesson).] 3. When the problem has been corrected, repeat the procedure for Regenerating Failed PDRs (subsequent section of this lesson).
InDAN::GetXAREntry returned an error for granule.	This and subsequent granules cannot have their PDRs generated.	<ol style="list-style-type: none"> 1. Check the log file for error messages. <ul style="list-style-type: none"> • [For detailed instructions refer to the procedure for Checking Log Files (subsequent section of this lesson). 2. When the problem has been corrected, repeat the procedure for Regenerating Failed PDRs (subsequent section of this lesson).

Table 4. Regenerate Failed PDR Tool User Messages

Message Text	Impact	Cause and Corrective Action
Number of files is not the same in the PDR and PAN.	The granule PDRs cannot be generated.	Enter a PDR and its corresponding PAN file. [For detailed instructions refer to Steps 5 and 6 in the procedure for Regenerating Failed PDRs (subsequent section of this lesson).]
PAN file is not a long PAN.	The granule PDRs cannot be generated.	Enter a PAN file name which is a long PAN. [For detailed instructions refer to Step 6 in the procedure for Regenerating Failed PDRs (subsequent section of this lesson).]
PAN file is not formatted correctly.	The rest of the granules cannot have their PDRs generated.	<ol style="list-style-type: none"> 1. Check the PAN to ensure that the format is correct. <ul style="list-style-type: none"> • [For detailed instructions refer to the procedure for Checking a PAN (subsequent section of this lesson).] 2. When the problem has been corrected, repeat the procedure for Regenerating Failed PDRs (subsequent section of this lesson).
The creation of the new PDR file failed.	This and subsequent granules cannot have their PDRs generated.	<ol style="list-style-type: none"> 1. Check the log file for error messages. <ul style="list-style-type: none"> • [For detailed instructions refer to the procedure for Checking Log Files (subsequent section of this lesson).] 2. When the problem has been corrected, repeat the procedure for Regenerating Failed PDRs (subsequent section of this lesson).
Unable to allocate memory for DataTypeList.	The rest of the granules cannot have their PDRs generated.	<ol style="list-style-type: none"> 1. Check the host (e.g., e0icg11, g0icg01, l0icg01, or n0icg01) for memory problems. <ul style="list-style-type: none"> • [For detailed instructions refer to the procedure for Checking for Memory Problems (subsequent section of this lesson).] 2. When the problem has been corrected, repeat the procedure for Regenerating Failed PDRs (subsequent section of this lesson).
Unable to allocate memory for DataTypeList.FileList.	This and subsequent granules cannot have their PDRs generated.	<ol style="list-style-type: none"> 1. Check the host (e.g., e0icg11, g0icg01, l0icg01, or n0icg01) for memory problems. <ul style="list-style-type: none"> • [For detailed instructions refer to the procedure for Checking for Memory Problems (subsequent section of this lesson).] 2. When the problem has been corrected, repeat the procedure for Regenerating Failed PDRs (subsequent section of this lesson).

Table 4. Regenerate Failed PDR Tool User Messages

Message Text	Impact	Cause and Corrective Action
Unable to copy the new PDR file into the Polling directory.	The generated PDR file did not get copied to the polling directory.	<ol style="list-style-type: none"> 1. Repeat the procedure for Regenerating Failed PDRs (subsequent section of this lesson), paying particular attention to accurate typing of the polling directory path. 2. If the Regenerate Failed PDR Tool repeats the same error message, check for the accessibility of the relevant polling directory on the host. <ul style="list-style-type: none"> • [For detailed instructions refer to the procedure for Checking the Polling Directory (subsequent section of this lesson).]
Unable to create all of the PDRs for the failed granules.	Not all of the failed granules had PDRs generated.	<ol style="list-style-type: none"> 1. Observe previous error messages to determine which granule had a problem. 2. Check the log file for error messages. <ul style="list-style-type: none"> • [For detailed instructions refer to the procedure for Checking Log Files (subsequent section of this lesson).] 3. When the problem has been corrected, repeat the procedure for Regenerating Failed PDRs (subsequent section of this lesson).
Unable to open the PAN file.	The granule PDRs cannot be generated.	<ol style="list-style-type: none"> 1. Repeat the procedure for Regenerating Failed PDRs (subsequent section of this lesson), paying particular attention to accurate typing of the PAN file name and path. 2. If the Regenerate Failed PDR Tool repeats the same error message, check for the accessibility of the relevant PAN on the host. <ul style="list-style-type: none"> • [For detailed instructions refer to the procedure for Checking PAN Accessibility (subsequent section of this lesson).]
Unable to parse the PDR file.	The PDR file cannot be used to generate granule PDRs.	<ol style="list-style-type: none"> 1. Check the PDR(s) to determine why the Regenerate Failed PDR Tool cannot parse the PDR file. <ul style="list-style-type: none"> • [For detailed instructions refer to the procedure for Checking/Editing a PDR (subsequent section of this lesson).] 2. When the problem has been corrected, repeat the procedure for Regenerating Failed PDRs (subsequent section of this lesson).

Table 5. Hosts, Servers, Clients and Other Software Relevant to Ingest

HOST	SERVER/CLIENT/OTHER SOFTWARE
Ingest Server (e.g., x0icg01)	Registry Server (EcCsRegistry) FTP Server (EcDsStFtpServer) Staging Disk Server (EcDsStStagingDiskServer) Automated Network Ingest Interface (EcInAuto) Ingest Granule Server (EcInGran) Automated Polling Ingest Client Interface (EcInPolling) Ingest Request Manager (EcInReqMgr)
Distribution Server (e.g., x0dis02)	Distribution Server (EcDsDistributionServer) D3 Server (EcDsStD3Server) Staging Disk Server (EcDsStStagingDiskServer) Storage Management Control GUI (EcDsStmgmtGui) Storage Management Request Manager (EcDsStRequestManagerServer)
Working Storage (e.g., x0wkg01)	HDF EOS Server (EcDsHdfEosServer) Archive Server (EcDsStArchiveServer) Cache Manager Server (EcDsStCacheManagerServer) FTP Server (EcDsStFtpServer) Staging Disk Server (EcDsStStagingDiskServer)
Operations Workstation (e.g., x0acs01)	Ingest GUI (EcInGUI)
SDSRV Server (e.g., x0acs03)	Science Data Server (EcDsScienceDataServer)
Access/Process Coordinators (APC) Server (e.g., x0acg01)	Archive Server (EcDsStArchiveServer) Cache Manager Server (EcDsStCacheManagerServer) FTP Server (EcDsStFtpServer) Staging Disk Server (EcDsStStagingDiskServer) Pull Monitor Server (EcDsStPullMonitorServer) Automated Polling Ingest Client Interface (EcInPolling)
FSMS Server (e.g., x0drg01)	Archive Server (EcDsStArchiveServer) Cache Manager Server (EcDsStCacheManagerServer) FTP Server (EcDsStFtpServer) Staging Disk Server (EcDsStStagingDiskServer)
Interface Server 01 (e.g., x0ins02)	Advertising Server (EcIoAdServer) Data Dictionary (EcDmDictServer)
Interface Server 02 (e.g., x0ins01)	Ingest E-Mail Parser (EcInEmailGWServer) Subscription Server (EcSbSubServer) Event Server (EcSbEventServer)

Recovering from a Data Ingest Failure

The automated ingest processes (including network and polling interfaces) normally do not require intervention by the Ingest/Distribution Technician. However, when an ingest fault (error) occurs, there may be a requirement for action to recover from the error. Recovery actions may be made necessary by invalid DAN/PDR contents or other file errors that result in data ingest failure.

When a fault (error) occurs, the following actions occur:

- The processing of the ingest request stops.
- A message is sent to the Ingest/Distribution Technician and the data provider with a brief description of the problem.

The Ingest/Distribution Technician may use the Ingest GUI Monitor/Control screen, the Ingest History Log (refer to the section on Ingest Status Monitoring) and/or the following log files (in the `/usr/ecs/MODE/CUSTOM/logs` directory on the ingest host machine) to review the failure event:

- `EcInReqMgr.ALOG` (ingest request manager log).
- `EcInAuto.ALOG` (automated network ingest log).
- `EcInPolling.ALOG` (automated polling ingest log).
- `EcInGran.ALOG` (granule server log).
- `EcInGUI.ALOG` (Ingest GUI log).
- `EcInEmailGWServer.ALOG` (Ingest E-Mail Parser log).

This section contains some examples of faults that are likely to occur, describes the notifications provided, and proposes operator actions in response to each fault situation. The specific recovery actions may vary due to operator preference or local DAAC policy.

When troubleshooting a data ingest failure, use the procedure that follows. The procedure starts with the assumption that all applicable servers and the Ingest GUI are currently running and the **Monitor/Control (All Requests)** screen (Figure 9) is being displayed.

Troubleshooting a Data Ingest Failure

- 1 Upon receipt of an operator alert or a report from a data provider (by telephone or e-mail), use the **Monitor/Control** screen scroll bars as necessary to identify the faulty ingest request.
 - When there is a data ingest failure, the system provides the following three responses:
 - Logs the error.

- Alerts the Ingest/Distribution Technician.
 - Returns a DAA/PDRD (DAN/PDR error) or DDN/PAN (retrieval problem) to the data provider indicating the nature of the failure.
 - Note that ECS does not send PDRDs to EDOS.
- 2 If a DAA/PDRD or DDN/PAN is available, review the appropriate file.
 - For detailed instructions refer to the procedure for **Checking Ingest Notification Files** (subsequent section of this lesson).
 - 3 If additional information is needed, open and read the appropriate log file in the `/usr/ecs/MODE/CUSTOM/logs` directory on the ingest host machine.
 - For detailed instructions refer to the procedure for **Checking Log Files** (subsequent section of this lesson).
 - 4 Perform the appropriate recovery procedure depending on the nature of the problem:
 - **Recovering from a Faulty DAN or Other File Problems (Automated Network Ingest).**
 - **Recovering from a Faulty PDR or Other File Problems (Polling with Delivery Record).**
 - **Recovering from Exceeding the Volume Threshold.**
 - **Recovering from Exceeding the Maximum Number of Concurrent Requests.**
 - **Recovering from Insufficient Disk Space.**
 - **Recovering from Exceeding the Expiration Date/Time Period.**
 - **Recovering from File Transfer (ftp) Error.**
 - **Recovering from Processing Errors.**
 - **Recovering from D3 Ingest Failures.**
-

Checking Ingest Notification Files

Automated Network Ingest

Transfer errors, DAN information discrepancies, and other file problems (if any) are captured and logged in the DDN that ECS sends to LPS when ingest has terminated. There are two formats for DDNs; i.e., short and long. The following final states ("dispositions") of data transfers are common to both short and long DDNs:

- Successful.

- Network Failure.
- Unable to Establish FTP Connection.
- All File Groups/Files Not Found.
- FTP Failure.
- Post-Transfer File Size Check Failure.
- FTP Command Failure.
- Duplicate File Name in Granule.
- Metadata Preprocessing Error.
- Resource Allocation Failure.
- Ingest S/W Internal Error.
- Data Base Access Error.
- Incorrect Number of Metadata Files.
- Incorrect Number of Science Files.
- Incorrect Number of Files.
- Data Conversion Failure.
- Request Cancelled.
- Unknown Data Type.
- Invalid or Missing File Type.
- File I/O Error.
- Data Archive Error.

The DDN identifies transfer success and/or errors associated with all individual files for a particular DAN. Only complete file groups that are transferred without error are ingested and archived. LPS must correct files with errors (as identified in the DDN) and resubmit the complete file group under a new DAN. The revised DAN should not include the file groups that were successfully transferred/archived.

If a DDN from ECS indicates that a DAN has errors, ECS will have processed only the file groups without errors. For DAN file groups with errors, LPS must correct the files/file information accordingly and retransmit the corrected file groups under a new DAN.

Problems with DANs are identified in the DAAs that ECS provides to LPS. There are two formats for DAAs; i.e., short and long.

The short form of the DAA is used primarily to respond to error-free DANs, DANs with message header errors and errors in DAN Parameter Value Language (PVL) that are not attributable to specific file groups. The long form of the DAA message is used when one or more file groups in a DAN have associated errors.

If there is a problem with a DAN, ECS indicates the nature of the trouble by setting the appropriate "disposition bit(s)" in the DAA to "1." There are 32 disposition bits in a short DAA and 16 disposition bits in a long DAA. If all disposition bits are set to "0," the DAN (in a short DAA) or file group (in a long DAA) has been accepted. If one or more disposition bits are set to "1," either the entire DAN has been rejected (in a short DAA) or the corresponding file group has been rejected (in a long DAA). LPS must correct the information and submit it in a new DAN.

The following dispositions can be specified in short DAAs:

- Accepted.
- Invalid DAN Sequence Number.
- Invalid File Count.
- ECS Internal Error.
- Invalid DAN Length.
- Database Failures.
- Duplicate DAN Sequence Number.
- Invalid PVL Statement.
- Missing or Invalid Originating System.
- Data Provider Request Threshold Exceeded.
- Data Provider Volume Threshold Exceeded.
- System Request Threshold Exceeded.
- System Volume Threshold Exceeded.

The following dispositions can be specified in long DAAs:

- Accepted.
- Invalid Data Type.
- Descriptor Missing.
- Invalid Directory.
- Invalid File Size Field.
- Invalid File Id.

- Invalid Node Name.
- Invalid File Type.

As previously mentioned ECS processes file groups without errors. For DAN file groups with errors, LPS must correct the files/file information accordingly and retransmit the corrected file groups under a new DAN. (File groups that were successfully transferred/archived should not be included in the revised DAN.)

Polling with Delivery Record

Transfer errors, PDR information discrepancies, and other file problems (if any) are captured and logged in the PAN that ECS sends to the data provider when ingest has terminated. Most data providers accept two formats for PANs; i.e., short and long. The following dispositions of data transfers are typical of both short and long PANs:

- Successful.
- Network Failure.
- Unable to Establish FTP/KFTP Connection.
- All File Groups/Files Not Found.
- FTP/KFTP Failure.
- Post-Transfer File Size Check Failure.
- FTP/KFTP Command Failure.
- Duplicate File Name in Granule.
- Metadata Preprocessing Error.
- Resource Allocation Failure.
- ECS Internal Error.
- Data Base Access Error.
- Incorrect Number of Metadata Files.
- Incorrect Number of Science Files.
- Incorrect Number of Files.
- Data Conversion Failure.
- Request Cancelled.
- Invalid or Missing File Type.
- File I/O Error.

- Data Archive Error.
- Linkage File Preprocessing Error.
- Referenced Granule Not Found.
- Referenced Granule Duplicated.

PDS/EDS Acceptance Notifications to EDOS have a single format that uses the following integers to indicate the disposition of the data transfer:

- 0 [Successful].
- 4 [File Not Found].
- 8 [File Unreadable].
- 9 [Invalid PDS/EDS Construction Record Data].
- 10 [Invalid PDS/EDS Delivery Record Data].

The short form of the PAN is sent to a data provider to acknowledge that all files have been successfully transferred, or to report errors that are not specific to individual files but which have precluded processing of any and all files (e.g., ftp failure). If all files in a request do not have the same disposition, the long form of the PAN is employed. For each file in a file group, if an error is encountered, ECS halts processing and reports the error that it just encountered for that file. The remaining conditions in the file are not validated. ECS processing continues with the next file in the file group. If there are no more files to process in the file group, ECS processing continues with the next file group in the PDR.

If one or more of the pointers in a linkage file cannot be resolved, the ingest fails and the PAN is sent with either the disposition message “Referenced Granule Not Found” or “Referenced Granule Duplicated.”

Exchange of data on physical media is used for data transfer back-up in emergencies. It is supported by ECS and some data providers.

The data provider must correct files with errors (as identified in the PAN) and resubmit the complete file group under a new PDR. The revised PDR should not include the file groups that were successfully transferred/archived.

If a PAN from ECS indicates that a PDR has errors, ECS will have processed only the file groups without errors. For PDR file groups with errors, the data provider must correct the files/file information accordingly and retransmit the corrected file groups under a new PDR.

In the event that a PDR is invalid, ECS automatically returns a PDRD (via either e-mail or ftp) to the data provider unless no PDRDs are specified in the ICD between ECS and the data provider. (ECS does not provide PDRDs to EDOS for example.) If an error is detected in the PDR, processing is terminated and none of the specified files are transferred to the ECS server for processing until a corrected PDR is received and successfully processed. If the PDR is valid, ECS

schedules pulling the files specified in the PDR using an ftp “get” command, and in such a case no PDRD is sent.

If the entire PDR is determined to be invalid, as reflected in a corresponding PDRD, none of the file groups listed in the PDR are processed and none of the files are transferred by ECS. The PDR must be corrected and resubmitted.

If a PDR contains multiple file groups for which one or more file groups contain errors, the file groups with errors are not processed. However, the file groups without errors are processed by ECS. After the ingest/archive process, ECS automatically returns a PAN via to the data provider indicating success/failure, including detected errors.

There are two formats for PDRDs; i.e., short and long. The short form is used when the first error encountered in each file group within the PDR is the same or the first error found applies to each group. The long form is used when one or more file groups in the PDR have invalid parameters. (Some file groups may be error-free.) For each file group, if an error is encountered when the PDR is processed, ECS halts processing and reports the error that it just encountered for that file group. None of the remaining conditions in that file group are validated. ECS processing then continues with the next file group in the PDR.

The dispositions in the Long PDRD are reported for all file groups in the order listed in the PDR. In the event that a PDRD is returned to the data provider, none of the files are transferred to the ECS for processing, and the data provider must correct the errors and resubmit the entire PDR for processing.

The following dispositions can be specified in short PDRDs:

- ECS Internal Error.
- Database Failures.
- Invalid PVL Statement.
- Missing or Invalid Originating_System Parameter.
- Data Provider Request Threshold Exceeded.
- Data Provider Volume Threshold Exceeded.
- System Request Threshold Exceeded.
- System Volume Threshold Exceeded.

The following dispositions can be specified in long PDRDs:

- Successful.
- Invalid Data Type.
- Invalid Directory.
- Invalid File Size.

- Invalid File ID,
- Invalid Node Name.
- Invalid File Type.

Checking Ingest Notification Files

When checking Ingest notification files, use the procedure that follows. The procedure starts with the assumption that the Ingest GUI **Monitor/Control (All Requests)** screen (Figure 9) is being displayed.

Checking Ingest Notification Files

- 1** Access a terminal window logged in to the Ingest Server (e.g., **e0icg11**, **g0icg01**, **l0icg01**, or **n0icg01**).
 - 2** Type **cd /path** then press **Return/Enter**.
 - Change directory to the directory (e.g., `/usr/ecs/OPS/CUSTOM/icl/x0icg01/data/remote/EDOS/Response`) containing the ingest notification files.
 - 3** Type **ls -al** then press **Return/Enter**.
 - A listing of files in the directory is displayed.
 - 4** Type **pg filename** then press **Return/Enter**.
 - *filename* refers to the ingest notification file to be reviewed (e.g., `GDA1.972858114.PAN`, `MODAPS_GSFC.20001200000000.PDRD`, `MODAPS_GSFC.20001200000000.PAN`).
 - The first page of the ingest notification file is displayed.
 - Although this procedure has been written for the **pg** command, any UNIX editor or visualizing command (e.g., **vi**, **view**, **more**) can be used to review the log file.
 - 5** Review the ingest notification file to identify problems that have occurred.
 - Final states ("dispositions") of data transfers (as specified in various types of ingest notification files) are described in the preceding sections of this lesson.
-

Checking Log Files

Log files can provide indications of the following types of problems (among others):

- DCE problems.

- Database problems.
- Lack of disk space.

The procedure for checking log files starts with the assumption that the operator has logged in to the ECS system and the appropriate host.

Checking Log Files

- 1 Access a terminal window logged in to the appropriate host.
 - Operations Workstation (e.g., e0acs03, g0acs02, l0acs01, n0acs03) has the following ingest log files:
 - EcInGUI.ALOG.
 - Ingest Server (e.g., e0icg11, g0icg01, l0icg01, n0icg01) host has the following ingest log files:
 - EcInReqMgr.ALOG.
 - EcInAuto.ALOG.
 - EcInPolling.ALOG.
 - EcInGran.ALOG.
 - EcInRegenFailedPDR.log.
 - Interface Server 02 (e.g., x0ins01) host has the following ingest log files:
 - EcInEmailGWServer.ALOG.
- 2 Type **cd /usr/ecs/MODE/CUSTOM/logs** then press **Return/Enter**.
 - Change directory to the directory containing the ingest log files (e.g., EcInReqMgr.ALOG, EcInAuto.ALOG, EcInPolling.ALOG, EcInGran.ALOG, EcInGUI.ALOG).
- 3 Type **pg filename** then press Return/Enter.
 - **filename** refers to the ingest log file to be reviewed (e.g., EcInReqMgr.ALOG, EcInAuto.ALOG, EcInPolling.ALOG, EcInGran.ALOG, EcInGUI.ALOG).
 - The first page of the log file is displayed.
 - Although this procedure has been written for the **pg** command, any UNIX editor or visualizing command (e.g., **vi**, **view**, **more**) can be used to review the log file.
- 4 Review the log file to identify problems that have occurred.

5 Respond to problems as follows:

- DCE problems.
 - Notify the Operations Controller/System Administrator of suspected DCE problems.
 - Database problems.
 - Verify that relevant database servers are running.
 - Check for lack of (or corruption of) data in the database using either a database browser or isql commands.
 - Notify the Database Administrator of suspected database problems.
 - Lack of disk space.
 - Remove unnecessary files.
 - Notify the Operations Controller/System Administrator of recurring disk space problems.
-

Recovering from a Faulty DAN or Other File Problems (Automated Network Ingest)

When working to recover from a faulty DAN or other file problems, use the procedure that follows. The procedure starts with the following assumptions:

- The Ingest GUI **Monitor/Control (All Requests)** screen (Figure 9) is being displayed.
- Steps 1 through 3 of the procedure for **Troubleshooting a Data Ingest Failure** have been completed.

Recovering from a Faulty DAN or Other File Problems (Automated Network Ingest)

- 1 If there is an ECS Ingest process abort during file transfer (i.e., if there is an ECS system failure during file transfer that suspends file transfer), access a terminal window logged in to the Ingest Server (e.g., **e0icg11**, **g0icg01**, **l0icg01**, or **n0icg01**).
 - If the problem does not involve an ECS Ingest process abort during file transfer, go to Step 12.
- 2 Type **cd /path** then press **Return/Enter**.
 - Change directory to the directory containing the DAN files.

- 3 Type **ls -al** then press **Return/Enter**.
 - A listing of files in the directory is displayed.
- 4 Type **pg filename** then press Return/Enter.
 - *filename* refers to the DAN file to be reviewed.
 - The first page of the ingest notification file is displayed.
 - Although this procedure has been written for the **pg** command, any UNIX editor or visualizing command (e.g., **vi**, **view**, **more**) can be used to review the log file.
- 5 Review the DAN file to determine whether there are any problems with the DAN.
- 6 If the DAN information has not been lost, respond to Ingest Operator GUI messages as specified in Table 3, Ingest Operator GUI User Messages.
- 7 If the DAN information was not lost and the problem has been corrected, monitor request processing by performing the procedure for **Monitoring/Controlling Ingest Requests** (preceding section of this lesson).
 - After the problem has been corrected file transfer is started from the point of the last successful file transfer.
 - ECS continues to process against the original DAN after the problem has been corrected.
 - End of procedure.
- 8 If the DAN information has been lost due to the system failure, make a request to the data provider to retransmit the DAN.
- 9 If the DAN information was lost and the data provider has agreed to retransmit the DAN, monitor request processing by performing the procedure for **Monitoring/Controlling Ingest Requests** (preceding section of this lesson).
 - End of procedure.
- 10 If there is a post-ftp file disconnect (i.e., if ECS identifies file errors in the post-ftp check of the transferred file groups), contact (e.g., by telephone or e-mail) the data provider (LPS Operator) to determine whether the data provider will re-initiate the data ingest request for the corrected file groups with a new DAN.
 - The DAN or files covered by the DAN are deemed to be invalid and the files are deleted upon failure.
 - Only the file groups (as defined by the DAN) that are transferred without error are forwarded to be ingested and archived.
 - The ECS DDN response identifies file errors.

- The file errors must be corrected and a new DAN must be issued for the corrected file groups prior to retransfer.
- 11** If there is a post-ftp file disconnect and the data provider has agreed to retransmit the data with a new DAN, monitor request processing by performing the procedure for **Monitoring/Controlling Ingest Requests** (preceding section of this lesson).
- End of procedure.
- 12** If the data provider (e.g., LPS Operator) provides notification of DDN invalid message format/contents, submit a trouble ticket.
- If ECS issues a DDN with erroneous information (e.g., invalid DAN_SEQ_NO), the LPS processor receiving the DDN rejects the DDN and flags the error for the LPS operator, who notifies the ECS operator.
 - End of procedure.
- 13** If ECS is unable to access the files after DAN processing and DAA transmission due to LPS downtime (e.g., there is LPS failure after DAN transmission), go to the procedure for **Recovering from File Transfer (ftp) Error** (subsequent section of this lesson).
- ECS issues a DDN indicating an ftp failure.
- 14** If ECS has failed so that LPS is unable to send the DDA (if there is a system failure after DDN transmission and receipt) and the LPS operator has provided notification of the inability to transmit (a specified number of attempts having occurred), submit a trouble ticket.
- If LPS has failed prior to issuing the DDA response to a DDN, the LPS operator must notify ECS of the DDN receipt.
 - If ECS has failed so that LPS is unable to send the DDA, the LPS operator must notify ECS of the inability to transmit after a specified number of attempts have occurred.
 - End of procedure.
- 15** If the data ingest request is to be re-initiated, monitor the subsequent ingest as described in the procedure for **Monitoring/Controlling Ingest Requests**.
-

Recovering from a Faulty PDR or Other File Problems (Polling with Delivery Record)

When working to recover from a faulty PDR or other file problems, use the procedure that follows. The procedure starts with the following assumptions:

- The Ingest GUI **Monitor/Control (All Requests)** screen (Figure 9) is being displayed.
- Steps 1 through 3 of the procedure for **Troubleshooting a Data Ingest Failure** have been completed.

Recovering from a Faulty PDR or Other File Problems (Polling with Delivery Record)

- 1 If the PDR/EDR fails and if appropriate (e.g., a "long PAN" message file was generated), perform the procedure for **Regenerating Failed PDRs** (subsequent section of this lesson).
 - 2 If the PDR/EDR fails and the relevant ICD and/or Operations Agreement specify(ies) that the data provider will provide a corrected PDR, contact (by telephone or e-mail) the data provider to discuss the following issues:
 - Report the ingest failure.
 - Discuss what has been discovered from reviewing the failure event data.
 - Determine whether the data provider will re-initiate the data ingest request with a new PDR or will provide the data via another medium (e.g., D3 tape).
 - 3 If there is an ECS Ingest process abort during file transfer (i.e., if there is an ECS system failure during file transfer that suspends file transfer), go to the procedure for **Recovering from File Transfer (ftp) Error** (subsequent section of this lesson).
 - During the course of data exchange via ftp, any of the following error conditions may arise:
 - Failure to establish TCP/IP connection.
 - Erroneous ftp command.
 - File not found (listed in PDR/EDR, but not found on disk).
 - File not readable due to permissions.
 - 4 If EDOS is the data provider and for any reason the File Transfer Disposition in the PAN indicates that an error occurred, send a Problem Report to EDOS to report the problem.
 - Information concerning the Problem Report to be sent to EDOS is specified in the Operations Agreement with EDOS.
 - 5 If the data ingest request is to be re-initiated, monitor the subsequent ingest as described in the procedure for **Monitoring/Controlling Ingest Requests** (preceding section of this lesson).
-

Regenerating Failed PDRs

The Regenerate Failed PDR Tool can be used whenever a PDR fails and results in a "long PAN" message file. The long PAN means that the request had more than one granule and not all granules had the same error. The purpose of the tool is to provide a means for the ECS operations staff to generate a PDR for each failed granule in a PDR and copy the generated PDRs to an Ingest polling directory, where Ingest polling would detect them and initiate ingest of the relevant granule(s). Consequently, the operations staff would not have to either manually edit the original PDR file or submit all failed granules to Ingest polling (which would create duplicate granules in the archive).

The procedure for regenerating failed PDRs starts with the assumption that all applicable servers are currently running.

Regenerating Failed PDRs

- 1 Access a terminal window logged in to the Ingest Server host (e.g., **e0icg11**, **g0icg01**, **l0icg01**, or **n0icg01**).
- 2 Type **cd /usr/ecs/MODE/CUSTOM/utilities** then press **Return/Enter**.
 - Change directory to the directory containing the Ingest utility scripts.
- 3 Type **EcInRegenFailedPDRStart MODE** then press **Return/Enter**.
 - The following message and prompt are displayed:
 1. **Generate PDRs**
 2. **Quit**>>

NOTE: If the Regenerate Failed PDR Tool displays an error message while the procedure is being performed, refer to Table 4, Regenerate Failed PDR Tool User Messages (adapted from the corresponding table in 609-CD-600-001, *Release 6A Operations Tools Manual for the ECS Project*). The table describes appropriate responses to the error messages.

- 4 At the prompt type **1** then press **Return/Enter**.
 - The following message and prompt are displayed:

```
Please enter PDR filename with path
>>
```

5 At the prompt type *path/PDR_filename* then press **Return/Enter**.

- For example:

```
>> /usr/ecs/OPS/CUSTOM/icl/x0icg01/data/pollEDOS/pdrs/  
P0420004AAAAAAAAAAAAAAAA99040150000.PDR
```

– The path varies from site to site.

- The following message and prompt are displayed:

```
Please enter PAN filename with path  
>>
```

6 At the prompt type *path/PAN_filename* then press **Return/Enter**.

- For example:

```
>> /usr/ecs/OPS/CUSTOM/icl/x0icg01/data/remote/EDOS/Response  
P0420004AAAAAAAAAAAAAAAA99040150000.PAN
```

– The path varies from site to site.

- The following message and prompt are displayed:

```
Please enter the path of the Polling directory into which the PDRs  
should be copied  
>>
```

7 At the prompt type *path* then press **Return/Enter**.

- For example:

```
>> /usr/ecs/OPS/CUSTOM/icl/x0icg01/data/pollEDOS
```

– The path varies from site to site.

- The PDR file is created in the specified directory.
- The following message and prompt are displayed:

```
The new PDR file PDR_filename was created successfully.  
Please inspect this PDR file and correct any errors found.  
Do you want this PDR to be moved to the Polling directory (y/n)?  
>>
```

8 At the prompt type *y* then press **Return/Enter**.

- The PDR file is moved to the specified polling directory.

- The following message and prompt are displayed:

```
1. Generate PDRs
2. Quit
>>
```

- If **n** were typed at the prompt, the Regenerate Failed PDR Tool would display a message inquiring as to whether the PDR file should be deleted.
- 9** To exit from the Regenerate Failed PDR Tool type **2** then press **Return/Enter**.
- A UNIX shell prompt is displayed.
-

Removing (Deleting) Generated PDRs

The procedure for removing (deleting) generated PDRs is performed in response to the following error message from the **Regenerate Failed PDR Tool**:

- Error occurred when trying to delete the new PDR file.

The Regenerate Failed PDR Tool normally deletes the PDR files it generates to allow the ingest of individual granules. If the Regenerate Failed PDR Tool is unable to delete a generated PDR file when it is no longer needed, the PDR file must be removed manually.

Removing (Deleting) Generated PDRs

- 1** Access a terminal window logged in to the Ingest Server host (e.g., **e0icg11**, **g0icg01**, **l0icg01**, or **n0icg01**).
- 2** Type **cd path** then press **Return/Enter**.
 - Change to the directory where the **Regenerate Failed PDR Tool** created the PDR file(s).
 - For example:
/usr/ecs/OPS/CUSTOM/icl/x0icg01/data/pollEDOS
- 3** Type **ls** then press **Return/Enter**.
 - A listing of the files in the directory is displayed.
- 4** Observe the files listed to determine whether the generated PDR file(s) is (are) still in the creation directory.
- 5** If the generated PDR file(s) is (are) still in the creation directory, type **rm filename** then press **Return/Enter**.
 - Request deletion of the generated PDR file(s).

- 6 If a **rm: remove *filename* (yes/no)?** message is displayed, type **y** then press **Return/Enter**.
 - The generated PDR file(s) is (are) deleted.
-

Checking/Editing a PDR

The procedure for checking/editing a PDR is performed in response to one of the following error messages from the **Regenerate Failed PDR Tool**:

- InDAN::GetGranuleVolume returned an error for granule.
- InDAN::GetFileInfo returned an error for granule.
- Unable to parse the PDR file.

Checking/Editing a PDR

- 1 Access a terminal window logged in to the Ingest Server host (e.g., **e0icg11**, **g0icg01**, **l0icg01**, or **n0icg01**).
- 2 Type **cd *path*** then press **Return/Enter**.
 - Change to the directory where the original PDR is located.
 - For example:

```
/usr/ecs/OPS/CUSTOM/icl/x0icg01/data/pollEDOS/pdrs
```
- 3 Type **ls** then press **Return/Enter**.
 - A listing of the files in the directory is displayed.
- 4 Type **vi *filename*** then press **Return/Enter**.
 - The contents of the PDR are displayed.
 - Although this procedure has been written for the **vi** command, any UNIX editor can be used to edit the file.
- 5 Observe the contents of the PDR to determine whether the format and information are correct.
 - If the error message was **InDAN::GetFileInfo returned an error for granule**, check whether the file information is set correctly.
 - If the error message was **InDAN::GetGranuleVolume returned an error for granule**, check whether the volumes are set correctly.

- If the error message was **Unable to parse the PDR file** check to see why the program cannot parse the file.
- 6 If the contents of the PDR are not correct, use **vi** editor (or other UNIX editor) commands to edit the PDR file.
- The following vi editor commands are useful:
 - **h** (move cursor left).
 - **j** (move cursor down).
 - **k** (move cursor up).
 - **l** (move cursor right).
 - **a** (append text).
 - **i** (insert text).
 - **x** (delete a character).
 - **u** (undo previous change).
 - **Esc** (switch to command mode).
 - Refer to the applicable PAN (if necessary) to determine what information in the PDR needs to be modified.
- 7 If the vi editor is being used to edit the PDR file, press the **Esc** key.
- 8 If the vi editor is being used to edit the PDR file, type either **ZZ** or **:wq!**.
- Revised PDR file is saved.
-

Checking PAN Contents

The procedure for checking PAN contents is performed in response to the following error message from the **Regenerate Failed PDR Tool**:

- PAN file is not formatted correctly.

Checking PAN Contents

- 1 Access a terminal window logged in to the Ingest Server host (e.g., **e0icg11**, **g0icg01**, **l0icg01**, or **n0icg01**).
- 2 Type **cd *path*** then press **Return/Enter**.
 - Change to the directory where the PAN is located.

- For example:
`/usr/ecs/OPS/CUSTOM/icl/x0icg01/data/remote/EDOS/Response`
- 3 Type **ls** then press **Return/Enter**.
 - A listing of the files in the directory is displayed.
 - 4 Type **vi filename** then press **Return/Enter**.
 - The contents of the PAN are displayed.
 - Although this procedure has been written for the **vi** command, any UNIX editor can be used to edit the file.
 - 5 Observe the contents of the PAN to determine what aspect of the format is incorrect.
 - 6 If the PAN format is incorrect, use **vi** editor (or other UNIX editor) commands to edit the PAN file.
 - The following vi editor commands are useful:
 - **h** (move cursor left).
 - **j** (move cursor down).
 - **k** (move cursor up).
 - **l** (move cursor right).
 - **a** (append text).
 - **i** (insert text).
 - **x** (delete a character).
 - **u** (undo previous change).
 - **Esc** (switch to command mode).
 - 7 If the vi editor is being used to edit the PAN file, press the **Esc** key.
 - 8 If the vi editor is being used to edit the PAN file, type **ZZ**.
 - Revised PAN file is saved.
-

Checking for Memory Problems

The procedure for checking for memory problems is performed in response to either of the following error messages from the **Regenerate Failed PDR Tool**:

- Unable to allocate memory for DataTypeList.

- Unable to allocate memory for DataTypeList.FileList.

Checking for Memory Problems

- 1 Access a terminal window logged in to the Ingest Server host (e.g., **e0icg11**, **g0icg01**, **l0icg01**, or **n0icg01**).
- 2 Type **vmstat 5** then press **Return/Enter**.
 - The **vmstat** UNIX command reports certain statistics concerning process, virtual memory, disk, trap, and CPU activity.
 - If an interval (e.g., **5**) is specified, **vmstat** summarizes activity over the specified number of seconds, repeating forever.
 - For example:

```
x0icg01{allmode}142: vmstat 5
procs          memory          page          disk          faults          cpu
r b w  swap  free re  mf pi po fr de sr s0 s1  in  sy  cs us sy id
0 0 0  14744 1976 0  42 7 1 2 0 0 1 0 129 1442 86 21 3 76
0 0 0  668784 8424 0  0 0 4 4 0 0 1 0 122 220 69 0 0 100
0 0 0  668760 8496 0  411 0 22 22 0 0 3 0 132 864 178 4 4 92
0 0 0  668784 8520 0  242 0 1 1 0 0 0 0 124 394 93 1 3 96
0 0 0  668784 8520 0  0 0 0 0 0 0 12 0 165 97 71 0 1 99
0 0 0  668784 8504 0  0 1 1 1 0 0 0 0 121 109 76 0 0 100
0 0 0  668784 8496 0  0 1 0 0 0 0 0 0 119 82 69 0 0 100
0 0 0  668784 8488 0  0 0 3 3 0 0 0 0 121 81 69 0 0 100
0 0 0  668784 8544 0  0 3 9 9 0 0 2 0 124 113 76 0 0 100
```

- The **memory** fields in the report indicate the usage of virtual and real memory.
 - The **swap** field shows the amount of swap space currently available (in Kilobytes).
 - The **free** field shows the size of the free list (in Kilobytes).
- 3 Report the symptoms and the results of the memory status check to the System Administrator and/or submit a trouble ticket.
-

Checking the Polling Directory

The procedure for checking the polling directory is performed in response to the following error message from the **Regenerate Failed PDR Tool**:

- Unable to copy the new PDR file into the Polling directory.

Checking the Polling Directory

- 1 Access a terminal window logged in to the Ingest Server host (e.g., **e0icg11**, **g0icg01**, **l0icg01**, or **n0icg01**).
- 2 Type **cd *path*** then press **Return/Enter**.
 - The *path* represents the path to the polling directory.
 - For example:
/usr/ecs/OPS/CUSTOM/icl/x0icg03/data/polLEDOS
 - The path varies from site to site.
- 3 If a **No such file or directory** message is displayed and the directory should be accessible to the current host machine, report the problem to the System Administrator and/or submit a trouble ticket.
 - Go to the procedure for **Regenerating Failed PDRs** (previous section of this lesson) after the problem has been fixed.
- 4 If a **No such file or directory** message is displayed and the directory is not expected to be accessible to the current host machine, type **cd *PDR_path*** then press **Return/Enter**.
 - The *PDR_path* represents the path to the directory where the PDR is located.
 - For example:
/usr/ecs/OPS/CUSTOM/icl/x0icg01/data/polLEDOS
 - Note that the path in the example in Step 2 includes **x0icg03** whereas the path in the current example specifies **x0icg01**.
- 5 Type **ftp *hostname*** then press **Return/Enter**.
 - The *hostname* represents a host that allows access to the desired polling directory; e.g., **x0icg03.daac.ecs.nasa.gov**.
 - The following type of response is displayed:

```
Connected to x0icg03.daac.ecs.nasa.gov.
220-NOTICE: unknown@echuser.east.hitc.com,
220-*****
220-
220-THIS U.S. GOVERNMENT COMPUTING SYSTEM IS FOR AUTHORIZED USERS
220-ONLY. ANYONE USING IT IS SUBJECT TO MONITORING AND RECORDING
220-OF ALL KEYSTROKES WITHOUT FURTHER NOTICE. THIS RECORD MAY BE
220-PROVIDED AS EVIDENCE TO LAW ENFORCEMENT OFFICIALS.
220-
220-*****
220 x0icg03 FTP server (UNIX(r) System V Release 4.0) ready.
```

Name (x0icg03.daac.ecs.nasa.gov:allmode):

6 In response to the **Name:** prompt type *UserID* then press **Return/Enter**.

7 In response to the **Password:** prompt type *password* then press **Return/Enter**.

- The following type of response is displayed:

```
230 User allmode logged in.  
ftp>
```

8 At the **ftp>** prompt type **cd** *path* then press **Return/Enter**.

- The *path* represents the path to the polling directory.
- For example:

```
/usr/ecs/OPS/CUSTOM/icl/x0icg03/data/pollEDOS
```

- The directory is changed to the directory that will receive the PDR.

9 At the **ftp>** prompt type **put** *PDR_filename* then press **Return/Enter**.

- For example:

```
ftp> put P0420004AAAAAAAAAAAAAAAAA99040150000.PDR
```

- The following type of response is displayed to indicate a successful file transfer:

```
200 PORT command successful.  
150 Opening ASCII mode data connection for '  
P0420004AAAAAAAAAAAAAAAAA99040150000.PDR ' .  
226 Transfer complete.  
local: P0420004AAAAAAAAAAAAAAAAA99040150000.PDR remote:  
P0420004AAAAAAAAAAAAAAAAA99040150000.PDR  
3691 bytes sent in 0.065 seconds (55 Kbytes/s)
```

10 At the **ftp>** prompt type **quit** then press **Return/Enter**.

- The ftp program is dismissed.

11 Monitor the subsequent ingest (specified in the PDR) as described in the procedure for **Monitoring/Controlling Ingest Requests**.

Checking PAN Accessibility

The procedure for checking PAN accessibility is performed in response to the following error message from the **Regenerate Failed PDR Tool**:

- Unable to open the PAN file.

Checking PAN Accessibility

- 1 Access a terminal window logged in to the Ingest Server host (e.g., **e0icg11**, **g0icg01**, **l0icg01**, or **n0icg01**).
 - 2 Type **cd *path*** then press **Return/Enter**.
 - Change to the directory where the PAN is located.
 - For example:
/usr/ecs/OPS/CUSTOM/icl/x0icg01/data/remote/EDOS/Response
 - The path varies from site to site.
 - 3 If a **No such file or directory** message is displayed and the directory should be accessible to the current host machine, report the problem to the System Administrator and/or submit a trouble ticket.
 - Go to the procedure for **Regenerating Failed PDRs** (previous section of this lesson) after the problem has been fixed.
 - 4 Type **ls** then press **Return/Enter**.
 - A listing of the files in the directory is displayed.
 - The relevant PAN should be included in the list.
 - 5 If the relevant PAN is included in the directory listing, go to the procedure for **Regenerating Failed PDRs** (previous section of this lesson) and pay particular attention to accurate typing of the PAN file name and path.
 - 6 If the relevant PAN is not included in the directory listing, go to the procedure for **Recovering from a Faulty PDR or Other File Problems (Polling with Delivery Record)** (subsequent section of this lesson).
-

Recovering from Exceeding the Volume Threshold

One reason data ingest may fail is for exceeding the specified system volume threshold. In such cases the system sends a DDN/PAN to the Data Provider indicating that the system is full and an attempt should be retried again later.

If a data provider's volume threshold has been exceeded, use the procedure that follows. The procedure starts with the following assumptions:

- The Ingest GUI **Monitor/Control (All Requests)** screen (Figure 9) is being displayed.

- Steps 1 through 3 of the procedure for **Troubleshooting a Data Ingest Failure** have been completed.

Recovering from Exceeding the Volume Threshold

- 1 If it is decided to increase the system volume threshold, first click on the **Operator Tools** tab.
 - The **Operator Tools** screen (Figure 28) is displayed.
 - 2 Click on the **Modify System Parameters** tab.
 - The **Modify System Parameters** screen (Figure 30) is displayed.
 - 3 Click in the **New:** field corresponding to **Volume Threshold**, then type the numerical value for the new volume threshold.
 - The *current* value of the volume threshold is printed on the corresponding line for reference purposes.
 - 4 Click on the **OK** button at the bottom of the **Operator Tools: Modify System Parameters** tab to save the changes to system parameters.
 - The changes are invoked.
 - 5 Click on the **Monitor/Control** tab.
 - The **Monitor/Control** screen (Figure 9) is displayed.
 - 6 Click on the **All Requests** button.
 - Alternatively, either a particular **Data Provider** or **Request ID** may be specified as described in the procedure for **Monitoring/Controlling Ingest Requests**.
 - 7 Click on the **Text View** button.
 - 8 If the data ingest request is to be re-initiated, monitor the subsequent ingest as described in the procedure for **Monitoring/Controlling Ingest Requests**.
-

Recovering from Exceeding the Maximum Number of Concurrent Requests

If the specified system request threshold has been exceeded, the system sends a DDN/PAN to the Data Provider indicating that the system is full and an attempt should be retried again later. If a data provider's request threshold has been exceeded, use the procedure that follows to increase the system request threshold. The procedure starts with the following assumptions:

- The Ingest GUI **Monitor/Control (All Requests)** screen (Figure 9) is being displayed.
- Steps 1 through 3 of the procedure for **Troubleshooting a Data Ingest Failure** have been completed.

Recovering from Exceeding the Maximum Number of Concurrent Requests

- 1 If it is decided to increase the system request threshold, first click on the **Operator Tools** tab.
 - The **Operator Tools** screen (Figure 28) is displayed.
 - 2 Click on the **Modify System Parameters** tab.
 - The **Modify System Parameters** screen (Figure 30) is displayed.
 - 3 Click in the **New:** field corresponding to **Request Threshold**, then type the numerical value for the new volume threshold.
 - The *current* value of the request threshold is printed on the corresponding line for reference purposes.
 - 4 Click on the **OK** button at the bottom of the **Operator Tools: Modify System Parameters** tab to save the changes to system parameters.
 - The changes are invoked.
 - 5 Click on the **Monitor/Control** tab.
 - The **Monitor/Control** screen (Figure 9) is displayed.
 - 6 Click on the **All Requests** button.
 - Alternatively, either a particular **Data Provider** or **Request ID** may be specified as described in the procedure for **Monitoring/Controlling Ingest Requests**.
 - 7 Click on the **Text View** button.
 - 8 If the data ingest request is to be re-initiated, monitor the subsequent ingest as described in the procedure for **Monitoring/Controlling Ingest Requests**.
-

Recovering from Insufficient Disk Space

After the receipt of the DAN/PDR, a disk space allocation is requested from the Data Server, and a time-out timer for the disk allocation is set. In the event that the Data Server has insufficient disk space, the time-out timer will expire. The Ingest Subsystem notifies the operator that the ingest request is waiting for Data Server disk allocation. Upon receipt of the alert, the Ingest/Distribution Technician must decide whether to wait for disk space to be allocated automatically or to cancel the request.

Recovering from Exceeding the Expiration Date/Time Period

If data are unavailable but the time period during which that data were to have been made available has expired, the error is logged in the event log, and a DDN/PAN is sent to the Data

Provider indicating expiration date/time exceeded. The Ingest/Distribution Technician receives an alert on his/her screen, then contacts the data provider to resolve the problem.

If a data provider's expiration date/time period has been exceeded, use the procedure that follows. The procedure starts with the following assumptions:

- The Ingest GUI **Monitor/Control (All Requests)** screen (Figure 9) is being displayed.
- Steps 1 through 3 of the procedure for **Troubleshooting a Data Ingest Failure** have been completed.

Recovering from Exceeding the Expiration Date/Time Period

- 1 Contact (by telephone or e-mail) the data provider to discuss the following issues:
 - Report the ingest failure.
 - Discuss what has been discovered from reviewing the failure event data.
 - Determine whether the data provider will re-initiate the data ingest request.
 - 2 If the data ingest request is to be re-initiated, monitor the subsequent ingest as described in the procedure for **Monitoring/Controlling Ingest Requests**.
-

Recovering from File Transfer (ftp) Error

During the course of data exchange via ftp, any of the following error conditions may arise:

- Failure to establish TCP/IP connection.
- Erroneous ftp command.
- File not found (listed in PDR, but not found on disk).
- File not readable due to permissions.

Should a problem develop during an ftp file transfer due to any of the above error conditions, an operator-tunable number of attempts are made to pull the data. In the event that problems cannot be resolved within this operator-tunable number of attempts, ECS and the Data Provider's operations personnel have the option to coordinate data delivery via another medium (e.g., D3 tape) if specified in the relevant ICD or Operations Agreement.

After numerous unsuccessful data transfer retries, an error is logged into the event log, the Ingest/Distribution Technician is notified and a DDN/PAN is sent to the Data Provider indicating ftp failure. The Ingest/Distribution Technician reviews all current ingest requests using the **Monitor/Control (All Requests)** screen of the **ECS Ingest GUI** to determine whether other communication-related failures have occurred and may consult with the data provider(s) to resolve the problem.

If it is necessary to recover from a file transfer error, use the procedure that follows. The procedure starts with the following assumptions:

- The Ingest GUI **Monitor/Control (All Requests)** screen (Figure 9) is being displayed.
- Steps 1 through 3 of the procedure for **Troubleshooting a Data Ingest Failure** have been completed.

Recovering from File Transfer (ftp) Error

- 1** Review all current ingest requests using the Ingest GUI **Monitor/Control (All Requests)** screen to determine whether there are other failures that may be communication-related.
 - 2** If there are other failures that may be communication-related, contact the DAAC Resource Manager to determine whether the ftp error is indeed communication-related and how to respond to the problem.
 - 3** If it is decided either to increase the communication retry count or to re-initiate the ingest request, click on the Ingest GUI **Operator Tools** tab.
 - The **Operator Tools** screen (Figure 28) is displayed.
 - 4** Click on the **Modify System Parameters** tab.
 - The **Modify System Parameters** screen (Figure 30) is displayed.
 - 5** Review the current value for **Communication Retry Count**.
 - 6** If it is decided to increase the communication retry count, follow the procedure for **Modifying System Parameters**.
 - 7** Contact (by telephone or e-mail) the data provider to discuss the following issues:
 - Report the ingest failure.
 - Discuss what has been discovered from reviewing the failure event data.
 - Determine whether the data provider will re-initiate the data ingest request.
 - 8** If the data ingest request is to be re-initiated, monitor the subsequent ingest as described in the procedure for **Monitoring/Controlling Ingest Requests**.
-

Recovering from Processing Errors

Ingest processing errors may require Ingest/Distribution Technician intervention. The following problems are examples of processing errors.

- **Missing Required Metadata.**
- **Unknown Data Type.**
- **Template Out of Synchronization (Sync).**
- **Unavailable File Type.**
- **Metadata Validation Error.**
- **Missing Optional Data Files.**

If it is necessary to recover from a processing error, use the procedure that follows. The procedure starts with the following assumptions:

- The Ingest GUI **Monitor/Control (All Requests)** screen (Figure 9) is being displayed.
- Steps 1 through 3 of the procedure for **Troubleshooting a Data Ingest Failure** have been completed.

Recovering from Processing Errors

- 1** If the processing error involves missing required metadata or an unknown data type, contact (by telephone or e-mail) the data provider to request the data provider to make the necessary corrections and re-initiate ingest.
- 2** If the processing error involves an out-of-sync template or an unavailable file type, submit a trouble ticket in accordance with the trouble ticketing procedures.
- 3** If the processing error involves an out-of-sync template or an unavailable file type, contact (by telephone or e-mail) the data provider to request the data provider to re-initiate ingest when the problem has been fixed.
- 4** If the processing error involves a metadata validation error or missing optional data files and if the processing template instructions indicate to continue inserting the data, contact (by telephone or e-mail) the data provider to provide notification that the data have been flagged as bad.
 - If the processing template instructions indicate to continue inserting the data, the following events occur:
 - The error is logged in the event log,
 - The data are flagged as bad.

- A preprocessing failure alert for each data granule appears on the Ingest/Distribution Technician’s screen.
 - A Metadata Problem Report is generated.
- 5** If the processing error involves a metadata validation error or missing optional data files and if the processing template instructions require the rejection of the data, contact (by telephone or e-mail) the data provider to request the data provider to make the necessary corrections and re-initiate ingest.
- If the template instructions require the rejection of the data, the normal notices and alerts are sent, including a DDN/PAN to the external data provider indicating the preprocessing failure.
- 6** If the data ingest request is to be re-initiated, monitor the subsequent ingest as described in the procedure for **Monitoring/Controlling Ingest Requests**.
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Recovering from D3 Ingest Failures

If it is necessary to recover from a D3 ingest processing error, use the procedure that follows. The procedure starts with the assumptions that the operator has logged in to the ECS system and the appropriate hosts and the Ingest GUI **Monitor/Control (All Requests)** screen (Figure 9) is being displayed.

Recovering from D3 Ingest Failures

- 1** Submit a request to the Database Administrator to change the value assigned to the SAVEONEXIT parameter (for EcInReqMgr) to “true” in the Configuration Registry.
- 2** Make a request to the Operations Controller to perform a warm restart of the Ingest Request Manager (EcInReqMgr) so the server will read the configuration change.
 - While the SAVEONEXIT parameter is true, the staging disk for each D3 ingest request will not get automatically deleted when the request has completed.
 - Each D3 staging disk will need to be manually deleted when it is no longer needed.
- 3** Make a request to the Operations Controller to set up an instance of Polling with delivery record to be used for D3 recovery.
 - Use MEDIA_RECOVERY as the “data provider” if it is available.
 - If MEDIA_RECOVERY is not available, use ASTER_GDS.

- 4 If using ASTER_GDS polling, change the TransferFlag in the InExternalDataProviderInfo database table to 0 so the files on the staging disk do not get transferred by ftp again.
 - For detailed instructions refer to the section on **Modifying System Parameters in the Ingest Database Using ISQL** (preceding section of this lesson).
- 5 Make a request to the Operations Controller to run the instance of polling that is to be used for D3 recovery.
- 6 Start a D3 ingest request using the Ingest GUI by performing the procedure for **Performing Media Ingest from D3 Tape** (preceding section of this lesson).
- 7 Verify that the D3 ingest request is successfully submitted to the Request Manager.
 - A pop-up window is displayed on the GUI when the request has been submitted successfully to the Request Manager.
- 8 Search the EcInGUI.ALLOG file for the message "Staging disk allocation succeeded for RequestID=" concerning the D3 ingest request by performing the procedure for **Checking Log Files** (subsequent section of this lesson)
 - The message includes the staging disk tag in the following format:
storagemgmtkey:Disk::n
 - The *n* corresponds to the user*n* directory (e.g., user1, user2) for the appropriate staging disk server.
 - For example, **DIP1_OPS:Disk::2** could refer to the following path:
/usr/ecs/OPS/CUSTOM/dip/x0dis01/data/staging/user2.
- 9 If the PDR is not in the *IngestGUIInputData* directory, submit a request to the Database Administrator to identify the value assigned to *IngestGUIInputData*.
 - For example:
`IngestGUIInputData = /CUSTOM/ic1/tlicg01/data/LOCALDISK`
- 10 If the PDR is not in the *IngestGUIInputData* directory, before the request completes type `cd /usr/ecs/MODE/IngestRemotePostModeBasePath/dataprovider/Request` then press the **Return/Enter** key
- 11 Type `ls -la` then press the **Return/Enter** key to list the contents of the directory.
 - A list of subdirectories and files in the current directory is displayed.
 - The list should include the PDR for the D3 ingest request.
- 12 Type `cp filename /path` then press the **Return/Enter** key
 - Copy the PDR file to another location so that it can be edited.
 - The *filename* represents the PDR file for the D3 ingest request.

- The *path* represents the path to the directory where the PDR file can be stored while it is being edited.
- 13** When the D3 ingest request completes, observe the request state on the Ingest GUI Monitor/Control window.
- If the request state is “Successful,” no recovery is necessary.
 - If the request state is “Partial_Failure” or “Failed,” a decision must be made as to whether recovery should be attempted (depending on what errors occurred).
 - The decision can be made using the PAN, the granule states, and the Ingest log files.
 - Double-clicking on the request on the Ingest GUI displays the granule states.
 - The PAN can be found in the following directory:
`/usr/ecs/MODE/IngestRemotePostModeBasePath/dataprovider/Response`
 - *IngestRemotePostModeBasePath* (for EcInReqMgr) is specified in the Configuration Registry; for example:
`IngestRemotePostModeBasePath = /CUSTOM/icl/x0icg01/data/remote`
 - If it is decided not to attempt to do any recovery or if the request state is “Successful,” go to Step 34.
- 14** Access a terminal window logged in to the appropriate host for getting access to the PAN.
- Either of the following hosts is acceptable:
 - Operations Workstation (e.g., e0acs03, g0acs02, l0acs01, n0acs03).
 - Ingest Server (e.g., e0icg11, g0icg01, l0icg01, n0icg01) host.
- 15** Type `cd /usr/ecs/MODE/IngestRemotePostModeBasePath/dataprovider/Response` then press **Return/Enter**.
- 16** Type `ls -la` then press the **Return/Enter** key to list the contents of the directory.
- A list of subdirectories and files in the current directory is displayed.
 - The list should include the PAN for the D3 ingest request.
- 17** Type `pg filename` then press Return/Enter.
- *filename* refers to the PAN file to be reviewed.
 - The first page of the PAN file is displayed.
 - Although this procedure has been written for the `pg` command, any UNIX editor or visualizing command (e.g., `vi`, `view`, `more`) can be used to review the PAN file.

- 18 Review the PAN file to identify which granule(s)/file(s) had errors.
- Even if all files in the granule do not show errors, they are all needed to perform the recovery.
- 19 If the PDR is in the *IngestGUIInputData* directory, type **cd /usr/ecs/MODE/IngestRemotePostModeBasePath/dataprovider/Request** then press the **Return/Enter** key
- 20 If the PDR is in the *IngestGUIInputData* directory, type **ls -la** then press the **Return/Enter** key to list the contents of the directory.
- A list of subdirectories and files in the current directory is displayed.
 - The list should include the PDR for the D3 ingest request.
- 21 If the PDR is in the *IngestGUIInputData* directory, type **cp filename /path** then press the **Return/Enter** key
- Copy the PDR file to another location so that it can be edited.
 - The *filename* represents the PDR file for the D3 ingest request.
 - The *path* represents the path to the directory where the PDR file can be stored while it is being edited.
- 22 Type **vi filename** then press **Return/Enter**.
- The PDR file is displayed by the vi text editor.
 - Although this procedure has been written for the **vi** command, any UNIX editor can be used to edit the file.
- 23 Using vi editor commands edit the copied PDR to use for the granule(s) to be recovered.
- Remove the file groups that are not being recovered.
 - Change the TOTAL_FILE_COUNT to reflect the number of files left in the PDR.
 - Change the ORIGINATING_SYSTEM to the data provider being used for Polling.
 - Change all DIRECTORY_ID fields from NOT_USED to the staging disk path determined in Step 8.
 - For each file group, need to add "NODE_NAME = <hostname>;" with the hostname where the files are.
 - For example, NODE_NAME = e0dis01;
 - The following vi editor commands are useful:
 - **h** (move cursor left).
 - **j** (move cursor down).

- **k** (move cursor up).
- **l** (move cursor right).
- **a** (append text).
- **i** (insert text).
- **x** (delete a character).
- **u** (undo previous change).
- **Esc** (switch to command mode).

24 Press the **Esc** key.

25 Type **ZZ**.

- New values are entered and saved in the PDR file.
- UNIX prompt is displayed.
- If desired, rename the PDR so the corresponding PAN file will have a different name from that of the original tape request.

26 Type **mv *filename* /path** then press **Return/Enter**.

- The ***path*** represents the path to the polling directory; e.g.,
/usr/ecs/TS2/CUSTOM/icl/t1icg01/data/pollMEDIA_RECOVERY or
/usr/ecs/TS2/CUSTOM/icl/t1icg01/data/pollASTER_GDS.
- The PDR file is moved to the polling directory.

27 Observe the new D3 ingest request on the Ingest GUI Monitor/Control window.

28 When the D3 ingest request completes, observe the request state on the Ingest GUI Monitor/Control window.

- If the request fails and needs to be resubmitted, go to Step 29.
- If the request completed successfully or if it is determined that retrying it will not make it successful, go to Step 30.
- If it is decided not to attempt to do any recovery or if the request state is “Successful,” go to Step 34.

29 If the request fails and needs to be resubmitted, make a request to the Operations Controller to perform a cold restart of polling (i.e., pollMEDIA_RECOVERY or pollASTER_GDS, as applicable).

- The PDR will be repolled.

- 30** Access a terminal window logged in to the appropriate host for getting access to the PDR.
- Either of the following hosts is acceptable:
 - Operations Workstation (e.g., e0acs03, g0acs02, l0acs01, n0acs03).
 - Ingest Server (e.g., e0icg11, g0icg01, l0icg01, n0icg01) host.
- 31** Type **cd /path** then press **Return/Enter**.
- The *path* represents the path to the polling directory; e.g., /usr/ecs/TS2/CUSTOM/icl/t1icg01/data/pollMEDIA_RECOVERY or /usr/ecs/TS2/CUSTOM/icl/t1icg01/data/pollASTER_GDS.
- 32** Type **ls -la** then press the **Return/Enter** key to list the contents of the directory.
- A list of subdirectories and files in the current directory is displayed.
 - The list should include the PDR for the D3 ingest request.
- 33** Type **rm filename** then press Return/Enter.
- *filename* refers to the PDR file to be deleted.
 - The PDR file is deleted.
- 34** In a terminal window type **cd /path** then press **Return/Enter**.
- The *path* represents the path to the directory above the staging disk directory; e.g., if the staging disk path is /usr/ecs/OPS/CUSTOM/dip/x0dis01/data/staging/user2, go to the /usr/ecs/OPS/CUSTOM/dip/x0dis01/data/staging directory.
- 35** Type **rm -rf usern** then press **Return/Enter** to delete the staging disk and the files in it.
- 36** Make a request to the Operations Controller to perform a warm restart of the appropriate staging disk server.
- The staging disk server will synchronize its database with the actual staging disks in use.
- 37** Repeat Steps 6 through 36 (as necessary) to perform additional D3 media ingests.
- 38** When all D3 media ingests for the session have been completed, submit a request to the Database Administrator to change the value assigned to the SAVEONEXIT parameter (for EcInReqMgr) to “false” in the Configuration Registry.
- 39** Make a request to the Operations Controller to perform a warm restart of the Ingest Request Manager (EcInReqMgr) so the server will read the configuration change.
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Practical Exercise

Introduction

This exercise is designed to give the students practice in key aspects of ingest.

Equipment and Materials

One ECS workstation per student.

Statement of the requirements for the exercise.

Release 6A Operations Tools Manual for the ECS Project, 609-CD-600-001, one copy per student.

Mission Operation Procedures for the ECS Project, 611-CD-600-001, one copy per student.

Launching the ECS Ingest GUI

The exercise involves launching the ECS Ingest GUI using UNIX commands. The exercise begins with a student acting in the role of Ingest/Distribution Technician recognizing the need to launch the ECS Ingest GUI. The student launches the ECS Ingest GUI as specified in the requirements.

Perform the following steps:

1. Access the command shell.
2. Log in to the Operations Workstation using secure shell.
3. Set the necessary environmental variables.
4. Start the ECS Ingest GUI in the appropriate mode.

Launching the Storage Management Control GUI

The exercise involves launching the Storage Management Control GUI using UNIX commands. The exercise begins with a student acting in the role of Ingest/Distribution Technician recognizing the need to launch the Storage Management Control GUI. The student launches the Storage Management Control GUI as specified in the requirements.

Perform the following steps:

1. Access the command shell.
2. Log in to the Distribution Server host using secure shell.

3. Set the necessary environmental variables.
4. Start the Storage Management Control GUI in the appropriate mode.

Monitoring/Controlling Ingest Requests

The exercise involves monitoring ingest requests using the ECS Ingest GUI Monitor/Control screen. The exercise begins with a student acting in the role of Ingest/Distribution Technician being cued to monitor ingest requests. The student monitors ingest requests and resumes or cancels requests as specified in the requirements.

Perform the following steps:

1. Select the ECS Ingest GUI Monitor/Control tab.
2. Select the appropriate set of ingest requests.
3. Select the type of view (i.e., graphical or text).
4. Observe ingest request processing.
5. Resume/cancel requests as directed.
6. Respond to questions concerning the current status of ingest requests.

Viewing the Ingest History Log

The exercise involves viewing the ingest history log using the ECS Ingest GUI History Log screen. The exercise begins with a student acting in the role of Ingest/Distribution Technician receiving the necessary information/requirements for viewing the history log entries concerning specified ingest requests. The student selects the appropriate criteria and has the GUI display the history log as specified in the requirements.

Perform the following steps:

1. Select the ECS Ingest GUI History Log tab.
2. Select the time period, data provider, data type, and/or final request status as specified in the requirements for the exercise.
3. Select Detailed Report or Summary Report as specified in the requirements for the exercise.
4. Display the history log report.
5. Respond to questions concerning the history log report.

Verifying the Archiving of Ingested Data

The exercise involves verifying the archiving of ingested data. The exercise begins with a student acting in the role of Ingest/Distribution Technician receiving the necessary information/requirements for verifying the archiving of ingested data. The student determines whether the data specified in the requirements has actually been archived.

Perform the following steps:

1. Access the command shell.
2. Log in to the FSMS host.
3. Change directory to the directory containing the archive data.
4. Perform a long listing of directory contents.
5. Compare End Date(s)/Time(s) and Data Volume(s) for the applicable ingest request(s) shown on the Ingest GUI with the dates/times and file sizes listed for the files in the directory.

Cleaning the Polling Directories

The exercise involves cleaning the polling directories using the clean-up script. The exercise begins with a student acting in the role of Ingest/Distribution Technician receiving the necessary information/requirements for cleaning the polling directories using the clean-up script. The student runs the clean-up script as specified in the requirements.

Perform the following steps:

1. Access the command shell.
2. Log in to the ingest client host.
3. Type the command to start the clean-up script.
4. Type appropriate responses to clean-up script prompts.

Performing Media Ingest

The exercise involves ingesting data from a D3 tape cartridge. The exercise begins with a student acting in the role of Ingest/Distribution Technician receiving the necessary information/requirements for performing ingest from a hard (physical) medium. The student has the Ingest Subsystem ingest data from the tape cartridge as specified in the requirements.

Perform the following steps:

1. Select the ECS Ingest GUI Media Ingest tab.
2. Identify the type of medium.
3. Insert the tape cartridge.
4. Select the data provider.
5. Enter the media volume ID.
6. Identify the delivery record file location.
7. Initiate and monitor the data transfer.

Scanning Documents and Gaining Access to Scanned Documents

The exercise involves scanning a document and checking the file resulting from scanning to verify that the scanning has been accomplished properly. The exercise begins with a student acting in the role of Ingest/Distribution Technician receiving the necessary information/requirements for scanning a document. The student scans the document and checks the resulting file as specified in the requirements for the exercise.

Perform the following steps:

1. Start the scanning program.
2. Select the **Save Image Defer OCR** option.
3. Load documents into the HP ScanJet feeder.
4. Start the scanning process.
5. Save the document.
6. Open the scanned document.
7. Review the document to verify that it has been properly scanned.

Modifying External Data Provider Information

The exercise involves modifying external data provider information (e.g., passwords, thresholds, or priority) using the ECS Ingest GUI Operator Tools: Modify External Data Provider/User Information screen. The exercise begins with a student acting in the role of Ingest/Distribution Technician receiving the necessary information/requirements for modifying the information concerning an external data provider. The student makes the appropriate modifications (as specified in the requirements) to the information concerning the data provider.

Perform the following steps:

1. Select the ECS Ingest GUI Operator Tools: Modify External Data Provider/User Information tab.
2. Select the data provider (as specified in the requirements for the exercise) whose information is to be changed.
3. Modify the data provider information as specified in the requirements for the exercise.
4. Save the changes to data provider information.

Modifying System Parameters Using the ECS Ingest GUI

The exercise involves modifying Ingest operating parameters (e.g., thresholds, intervals) using the Ingest GUI Operator Tools: Modify System Parameters screen. The exercise begins with a student acting in the role of Ingest/Distribution Technician receiving the necessary information/requirements for modifying the Ingest operating parameters. The student makes the appropriate modifications (as specified in the requirements) to the Ingest operating parameters.

Perform the following steps:

1. Select the ECS Ingest GUI Operator Tools: Modify System Parameters tab.
2. Modify the Ingest operating parameters as specified in the requirements for the exercise.
3. Save the changes to Ingest operating parameters.

Transferring Files Using the ECS Ingest GUI

The exercise involves transferring files using the ECS Ingest GUI Operator Tools: File Transfer screen. The exercise begins with a student acting in the role of Ingest/Distribution Technician receiving the necessary information/requirements for transferring files. The student transfers the file(s) specified in the requirements.

Perform the following steps:

1. Select the ECS Ingest GUI Operator Tools: File Transfer tab.
2. Select either Build SMC History Files or Generic File Transfer as specified in the requirements for the exercise.
3. Select the file(s) (as specified in the requirements for the exercise) to be transferred.
4. Enter the destination (as specified in the requirements for the exercise) of the file(s) to be transferred.
5. Initiate and monitor the file transfer.

Modifying System Parameters Using ISQL

The exercise involves modifying Ingest database parameters that cannot be modified using the Ingest GUI. The exercise begins with a student acting in the role of Ingest/Distribution Technician receiving the necessary information/ requirements for modifying system parameters in the Ingest database. The student modifies a system parameter in the Ingest database using isql as specified in the requirements.

Perform the following steps:

1. Access the command shell.
2. Log in to the Ingest Server using secure shell.
3. Log in to the appropriate Ingest database using isql commands.
4. Check the current contents of the relevant column/table.
5. Update the relevant column/table with the new value(s).
6. Check the current contents of the relevant column/table.
7. Exit from isql.

Troubleshooting Ingest Problems

The exercise involves troubleshooting and recovering from a data ingest failure (e.g., a faulty DAN, exceeding the volume threshold, insufficient disk space, or ftp error). The exercise begins with a student acting in the role of Ingest/Distribution Technician receiving the necessary information/requirements for troubleshooting a data ingest failure. The student troubleshoots the failure specified in the requirements, identifies and recovers from the problem.

Perform the following steps:

1. Select the ECS Ingest GUI Monitor/Control tab.
2. Identify the faulty ingest request.
3. Review the information concerning the ingest fault.
4. Perform the appropriate recovery procedure depending on the nature of the problem (as specified in the requirements for the exercise).

Slide Presentation

Slide Presentation Description

The following slide presentation represents the slides used by the instructor during the conduct of this lesson.

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