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EOSDIS Maintenance and Development Project

Training Material for the EMD Project
Volume 8: Ingest

Revision 01

July 2005

Raytheon Company
Upper Marlboro, Maryland

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Preface

This document is a formal contract deliverable. It requires Government review and approval within 45 business days. Changes to this document will be made by document change notice (DCN) or by complete revision.

Any questions should be addressed to:

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Abstract

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

***Keywords**:* training, instructional design, course objective, Ingest, Release 7.

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Contents

Preface

Abstract

Introduction

Identification 1

Scope 1

Purpose 1

Status and Schedule 1

Organization 1

Related Documentation

Parent Documents 3

Applicable Documents 3

Information Documents 3

Information Documents Referenced 3

Information Documents Not Referenced 4

Ingest Overview

Lesson Overview 9

Lesson Objectives 9

Importance 13

Ingest Concepts

System Context 15
Ingest Subsystem 15
Storage Management (STMGT) 22
Science Data Server (SDSRV) 25
The Ingest Process 27
Ingest Activities 28
Ingest Categories 29
Ingest Polling Messages 30
Physical (Hard) Media Messages 31
Data Transfer and Staging 32
Ingest Scenarios 33
Polling Ingest with Delivery Record 33
Polling Ingest without Delivery Record 36
Hard Media Ingest Using the INGEST Media Tape Reader GUI 38
Cross-DAAC Ingest 41
Ingest Graphical User Interface (GUI) Tools 47

Logging in to System Hosts

Logging in to System Hosts 49

Launching the ECS Ingest and Storage Management Control GUIs

Launching the ECS Ingest GUI 51
Launching the Storage Management Control GUI 53

Handling Cross-DAAC or Cross-Mode Ingest

Handling Cross-DAAC or Cross-Mode Ingest 57

Monitoring Ingest Status

Monitoring/Controlling Ingest Requests 63
Resuming Ingest Requests 69
Canceling Ingest Requests 72
Viewing the Ingest History Log 74
Verifying the Archiving of Ingested Data 82

Cleaning Directories

Cleaning Polling Directories 85

Performing Hard (Physical) Media Ingest

Types of Hard Media Ingest 87
Using the ECS Ingest GUI Media Interface to Perform Media Ingest 87
Labeling Tape Cartridges with Bar Codes 88
Performing Media Ingest from 8mm Tape Using the ECS Ingest GUI Media Interface ...88
Unloading and Loading Stackers 91
Performing Media Ingest from DTF-2 Tape Using the ECS Ingest GUI Media Interface 102
Loading a DTF-2 Drive for Use with the ECS Ingest GUI 104
Unloading a DTF-2 Drive for Use with the ECS Ingest GUI 109
Using the INGEST Media Tape Reader GUI to Perform Media Ingest 113
Performing Media Ingest Using the INGEST Media Tape Reader GUI 113
Manually Loading an 8mm Tape Cartridge into a Tape Drive in an 8mm Tape Stacker ..119
Manually Unloading an 8mm Tape Cartridge from a Stacker 120
Unloading and Loading 8mm Tape Stackers for Sequential Mode Operation 121
Performing DTF-2 Drive Loading 123
Performing DTF-2 Drive Unloading 124
Using UNIX Commands to Perform Media Ingest 124
Performing Media Ingest Using UNIX Commands 125
Performing Ingest of Data from EDOS DTF-2 Archive Tapes 133

Modifying Ingest Tunable Parameters and Performing File Transfers

Operator Tools Tab 143
External Data Provider Data and Thresholds 145
System Parameters on the Ingest GUI 150
File Transfer 153
Tuning System Configuration Parameters 156
Modifying System Parameters in the Configuration Registry Database 156
Modifying System Parameters in the Ingest Database 161

Troubleshooting Ingest Problems

Trouble Symptoms 167
Fault Recovery 167
Fault Handling 168
Client Crash and Restart 170
Server Crash and Restart 171
Troubleshooting a Data Ingest Failure 172
Troubleshooting Procedures 186
Checking Connections to Hosts 186
Checking Log Files 188
Recovering from a Data Ingest Failure 190
Checking Ingest Notification Files (Polling with Delivery Record) 191
Recovering from a Faulty PDR or Other File Problems (Polling with Delivery Record) .195
Recovering from Exceeding the Volume Threshold 207
Recovering from Exceeding the Maximum Number of Concurrent Requests 209
Recovering from Insufficient Disk Space 210
Recovering from Exceeding the Expiration Date/Time Period 210
Recovering from File Transfer (ftp) Error 210
Recovering from Processing Errors 212
Recovering from Failure to Store Data 213
Checking the Request Manager Server Debug Log 215

Practical Exercise

Introduction 229
Equipment and Materials 229
Logging in to System Hosts 229
Launching the ECS Ingest GUI 229
Launching the Storage Management Control GUI 230
Handling Cross-DAAC or Cross-Mode Ingest 230
Monitoring/Controlling Ingest Requests 230
Viewing the Ingest History Log 231
Verifying the Archiving of Ingested Data 231
Cleaning the Polling Directories 231
Performing Hard Media Ingest 232
Modifying External Data Provider Information 232
Modifying System Parameters Using the ECS Ingest GUI 232
Transferring Files Using the ECS Ingest GUI 233
Modifying System Parameters Using ISQL 233
Troubleshooting Ingest Problems 234

Slide Presentation

Slide Presentation Description 235

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Introduction

Identification

Training Material Volume 8 is part of Contract Data Requirements List (CDRL) Item 23, which is a required deliverable under the Earth Observing System Data and Information System (EOSDIS) Maintenance and Development (EMD) Contract (NAS5-03098).

Scope

Training Material Volume 8 describes the process and procedures for ingest of data into the system. 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 the current baseline of the system. Revisions are 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 Documents

The parent documents are the documents from which the EMD Training Material's scope and content are derived.

423-41-01	Goddard Space Flight Center, EOSDIS Core System (ECS) Statement of Work
423-46-03	EMD Task 101 Statement of Work For ECS SDPS Maintenance
423-46-02	Contract Data Requirements Document for EMD Task 101 ECS SDPS Maintenance

Applicable Documents

The following documents are referenced within this EMD 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) (ECS F&PRS)
423-46-01	Goddard Space Flight Center, Functional and Performance Requirements Specification for the Earth Observing System Data and Information System (EOSDIS) Core System (ECS) Science Data Processing System (EMD F&PRS)

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 EMD Training Material.

609-EMD-001	Release 7.10 Operations Tools Manual for the EMD Project
611-EMD-001	Release 7.10 Mission Operation Procedures for the EMD Project
910-TDA-022	Custom Code Configuration Parameters for ECS

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 EMD Training Material.

305-EMD-001	Release 7.10 Segment/Design Specification for the EMD Project
311-EMD-001	Release 7.10 Data Management Subsystem (DMS) Database Design and Database Schema Specifications for the EMD Project
311-EMD-002	Release 7.10 INGEST (INS) Database Design and Schema Specifications for the EMD Project
311-EMD-003	Release 7.10 Planning and Data Processing Subsystem Database Design and Schema Specifications for the EMD Project
311-EMD-004	Release 7.10 Science Data Server Database Design and Schema Specifications for the EMD Project
311-EMD-005	Release 7.10 Storage Management and Data Distribution Subsystems Database Design and Database Schema Specifications for the EMD Project
311-EMD-006	Release 7.10 Subscription Server Database Design and Schema Specifications for the EMD Project
311-EMD-007	Release 7.10 Systems Management Subsystem Database Design and Schema Specifications for the EMD Project
311-EMD-008	Release 7.10 Registry Database Design and Schema Specifications for the EMD Project
311-EMD-009	Release 7.10 Product Distribution Subsystem (PDS) Database Design and Database Schema Specifications for the EMD Project
311-EMD-010	Release 7.10 NameServer Database Design and Schema Specifications for the EMD Project
311-EMD-011	Release 7.10 Order Manager Database Design and Database Schema Specifications for the EMD Project
311-EMD-012	Release 7.10 Spatial Subscription Server (SSS) Database Design and Schema Specifications for the EMD Project
311-EMD-013	Release 7.10 Data Pool Database Design and Schema Specifications for the EMD Project
313-EMD-001	Release 7.10 Internal Interface Control Document for the EMD Project
508-EMD-001	ACRONYMS for the EOSDIS Maintenance and Development (EMD) Project
152-TP-003	Glossary of Terms for the EOSDIS Core System (ECS) Project

423-35-01	Interface Control Document (ICD) between the Earth Observing System (EOS) Mission Support network (EMSn) and Earth Observing System Data and Information System (EOSDIS) Core System (ECS) Elements: ECS Distributed Active Archive Center (DAAC), EOSDIS Operations Center (EOC), and Systems Monitoring and Coordination Center (SMC)
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

423-41-57-8	Interface Control Document between the EOSDIS Core System (ECS) and the Science Investigator-Led Processing Systems (SIPS), Volume 8: Microwave Limb Sounder (MLS) ECS Data Flows
423-41-57-9	Interface Control Document between the EOSDIS Core System (ECS) and the Science Investigator-Led Processing Systems (SIPS), Volume 9: Machine-to-Machine Search and Order Gateway
423-41-57-10	Interface Control Document between the EOSDIS Core System (ECS) and the Science Investigator-Led Processing Systems (SIPS), Volume 10: Tropospheric Emission Spectrometer (TES) ECS Data Flows
423-41-57-11	Interface Control Document between the EOSDIS Core System (ECS) and the Science Investigator-Led Processing Systems (SIPS), Volume 11: ICESat Science Investigator-Led Processing System Data Flows
423-41-57-12	Interface Control Document between the EOSDIS Core System (ECS) and the Science Investigator-Led Processing Systems (SIPS), Volume 12: High Resolution Dynamics Limb Sounder (HIRDLS) ECS Data Flows
423-41-57-13	Interface Control Document between the EOSDIS Core System (ECS) and the Science Investigator-Led Processing Systems (SIPS), Volume 13: Ozone Monitoring Instrument (OMI) ECS Data Flows
423-41-57-14	Interface Control Document between the EOSDIS Core System (ECS) and the Science Investigator-Led Processing Systems (SIPS), Volume 14: SOlar Radiation and Climate Experiment (SORCE) Data Flows
423-41-57-15	Interface Control Document between the EOSDIS Core System (ECS) and the Science Investigator-Led Processing Systems (SIPS), Volume 15: OMI Dutch Processing System (ODPS) ECS Data Flow
423-41-58	Interface Control Document between EOSDIS Core System (ECS) and the Land Processes Distributed Active Archive Center (LP DAAC)
423-41-66	Interface Control Document for ECS Interfaces That Support External Subsetters Located at DAACs
423-ICD-EDOS/EGS	Interface Control Document [ICD] 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
505-41-33	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
505-41-36	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 (GFSC) Earth Sciences (GES) 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-GDAAC-Aqua	Earth Observing System (EOS) Aqua/PM Flight Dynamics System (FDS)/Goddard Distributed Active Archive Center (GDAAC) Interface Control Document (ICD)

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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 personnel involved in maintenance and operation of the Earth Observing System Data and Information System (EOSDIS) Core System (ECS) to develop proficiency in the procedures that apply to data ingest.

Condition - The student will be given a workstation console with access to Ingest graphical user interface (GUI) tools, a copy of 609-EMD-001, *Release 7.10 Operations Tools Manual for the EMD Project*, and a copy of 611-EMD-001, *Release 7.10 Mission Operation Procedures for the EMD 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 the system and an overview of the ingest process.

Condition - The student will be given a copy of 609-EMD-001, *Release 7.10 Operations Tools Manual for the EMD Project*, and a copy of 611-EMD-001, *Release 7.10 Mission Operation Procedures for the EMD Project*.

Standard - The student will correctly state the ingest role in the system, 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 logging in to system hosts.

Condition - The student will be given a statement of the requirements for logging in to system hosts, access to the Ingest Subsystem (through a workstation or X terminal), a copy of 609-EMD-001, *Release 7.10 Operations Tools Manual for the EMD Project*, and a copy of 611-EMD-001, *Release 7.10 Mission Operation Procedures for the EMD Project*.

Standard - In accordance with the lesson content, the applicable procedure, and the statement of requirements the student will access the command shell, set the DISPLAY environmental variable, and log in to the specified host using secure shell and the specified user ID.

Specific Objective 3 - 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-EMD-001, *Release 7.10 Operations Tools Manual for the EMD Project*, and a copy of 611-EMD-001, *Release 7.10 Mission Operation Procedures for the EMD 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 4 - 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-EMD-001, *Release 7.10 Operations Tools Manual for the EMD Project*, and a copy of 611-EMD-001, *Release 7.10 Mission Operation Procedures for the EMD 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 5 - The student will perform the steps involved in handling cross-DAAC or cross-mode ingest.

Condition - The student will be given a statement of the requirements for handling cross-DAAC or cross-mode ingest, access to the previously launched ECS Ingest GUI in the Ingest Subsystem (through a workstation or X terminal), a copy of 609-EMD-001, *Release 7.10 Operations Tools Manual for the EMD Project*, and a copy of 611-EMD-001, *Release 7.10 Mission Operation Procedures for the EMD Project*.

Standard - In accordance with the lesson content, the applicable procedure, and the statement of requirements the student will submit a request to have data transferred, monitor request processing to ensure that the data are received and ingested, and identify/correct problems (if any).

Specific Objective 6 - 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-EMD-001, *Release 7.10 Operations Tools Manual for the EMD Project*, and a copy of 611-EMD-001, *Release 7.10 Mission Operation Procedures for the EMD Project*.

Standard - In accordance with the lesson content, the applicable procedure, and the statement of requirements the student0 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 7 - 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-EMD-001, *Release 7.10 Operations Tools Manual for the EMD Project*, and a copy of 611-EMD-001, *Release 7.10 Mission Operation Procedures for the EMD 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 8 - 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-EMD-001, *Release 7.10 Operations Tools Manual for the EMD Project*, and a copy of 611-EMD-001, *Release 7.10 Mission Operation Procedures for the EMD 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 9 - 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-EMD-001, *Release 7.10 Operations Tools Manual for the EMD Project*, and a copy of 611-EMD-001, *Release 7.10 Mission Operation Procedures for the EMD 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 10 - 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-EMD-001, *Release 7.10 Operations Tools Manual for the EMD Project*, and a copy of 611-EMD-001, *Release 7.10 Mission Operation Procedures for the EMD Project*.

Standard - In accordance with the lesson content, the applicable procedure, and the statement of requirements the student will load the tape cartridge, read data from the tape, monitor the data transfer, and unload the tape cartridge.

Specific Objective 11 - 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-EMD-001, *Release 7.10 Operations Tools Manual for the EMD Project*, and a copy of 611-EMD-001, *Release 7.10 Mission Operation Procedures for the EMD 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 12 - 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-EMD-001, *Release 7.10 Operations Tools Manual for the EMD Project*, and a copy of 611-EMD-001, *Release 7.10 Mission Operation Procedures for the EMD 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 13 - 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-EMD-001, *Release 7.10 Operations Tools Manual for the EMD Project*, and a copy of 611-EMD-001, *Release 7.10 Mission Operation Procedures for the EMD 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 14 - 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-EMD-001, *Release 7.10 Operations Tools Manual for the EMD Project*, and a copy of 611-EMD-001, *Release 7.10 Mission Operation Procedures for the EMD 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 15 - 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-EMD-001, *Release 7.10 Operations Tools Manual for the EMD Project*, and a copy of 611-EMD-001, *Release 7.10 Mission Operation Procedures for the EMD 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 Technicians at the Distributed Active Archive Centers (DAACs) with the knowledge and skills needed for effective ingest of 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 polling ingest.
- Monitoring/controlling ingest request processing.
- Hard media ingest.

- Adjusting ingest tunable parameters.
- Troubleshooting and recovering from ingest problems.

Ingest Concepts

System Context

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

The Context Diagram (Figure 1) shows the relationships among subsystems within the Science Data Processing component of the system. The Ingest Subsystem (INS) is the point of entry to the system 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 the system. 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 the system, 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).
  - 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 Science Data Processing component that the Ingest Technician uses when getting data from external data providers into the system. The Ingest Technician has access to Ingest primarily through the ECS Ingest graphical user interface (GUI).

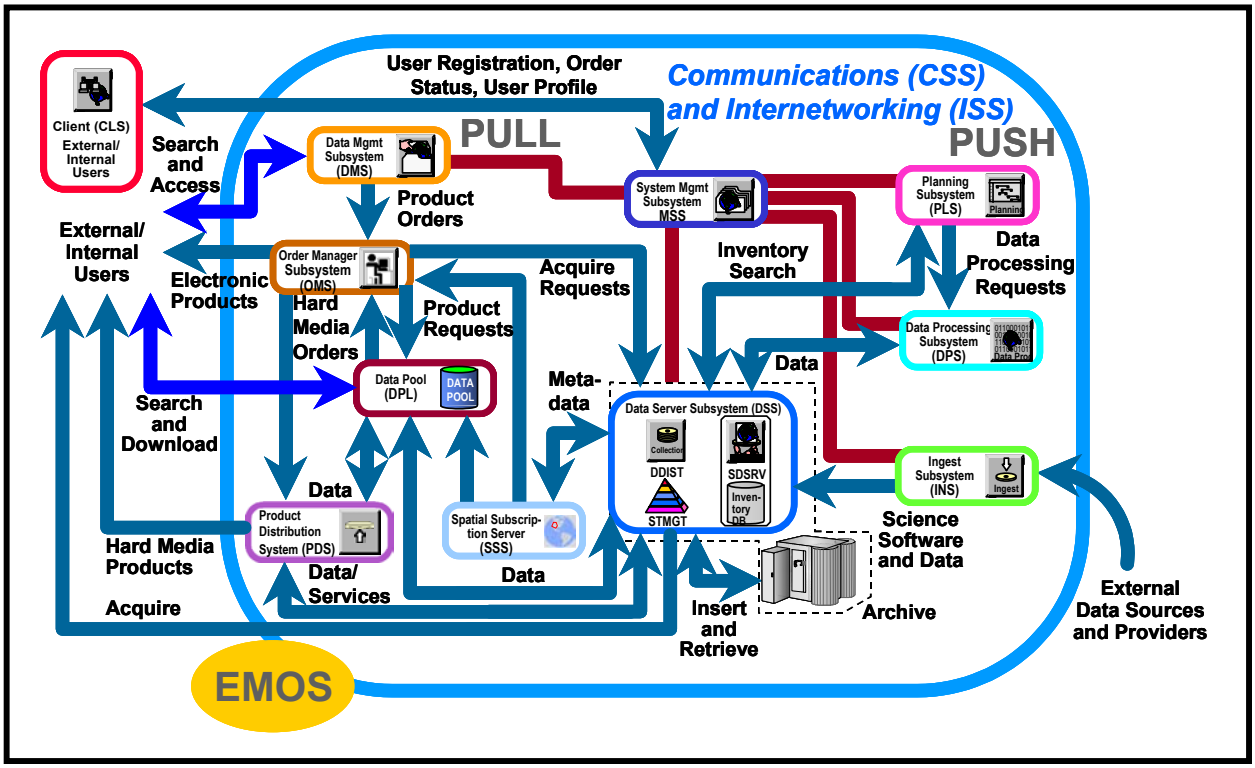

Figure 1. Context Diagram

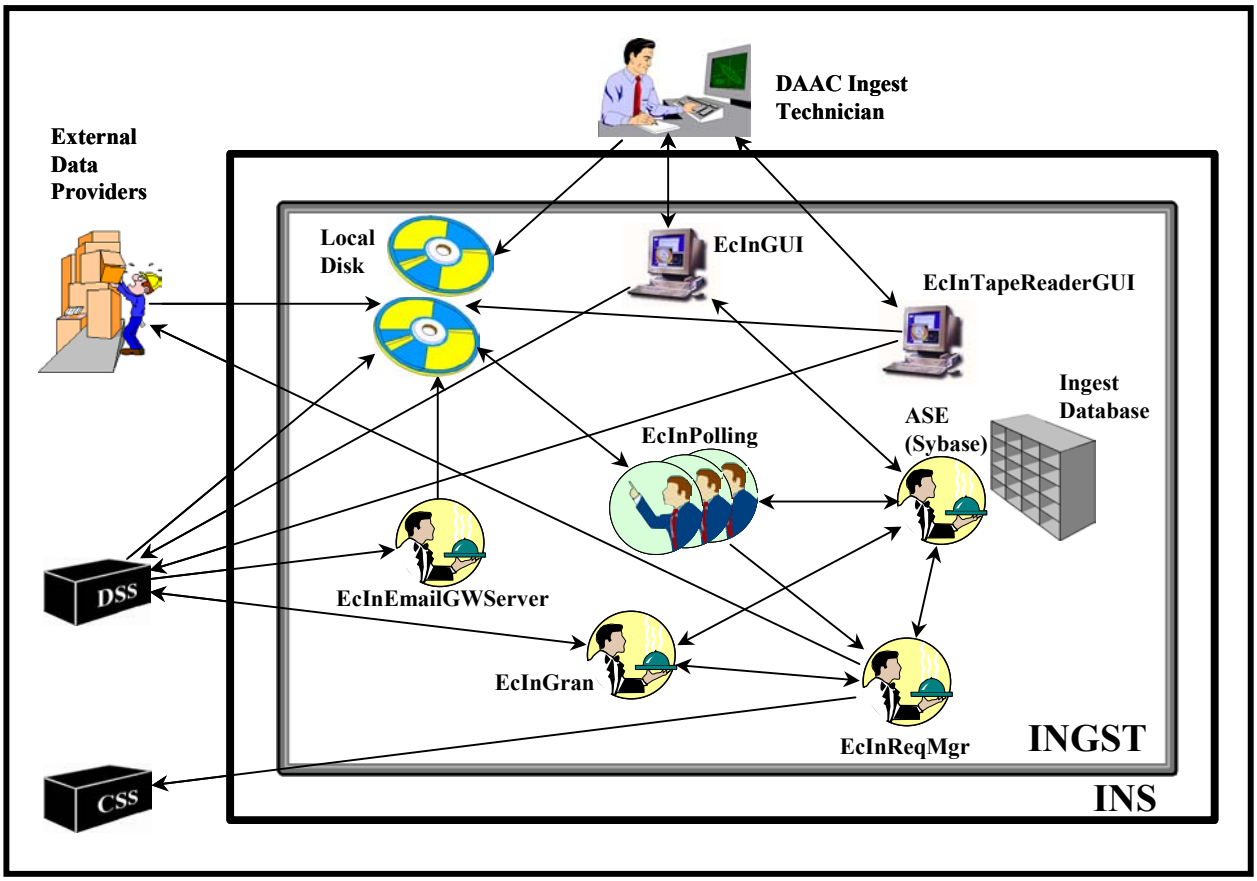

Figure 2. Ingest Subsystem (INGST CSCI) Architecture Diagram

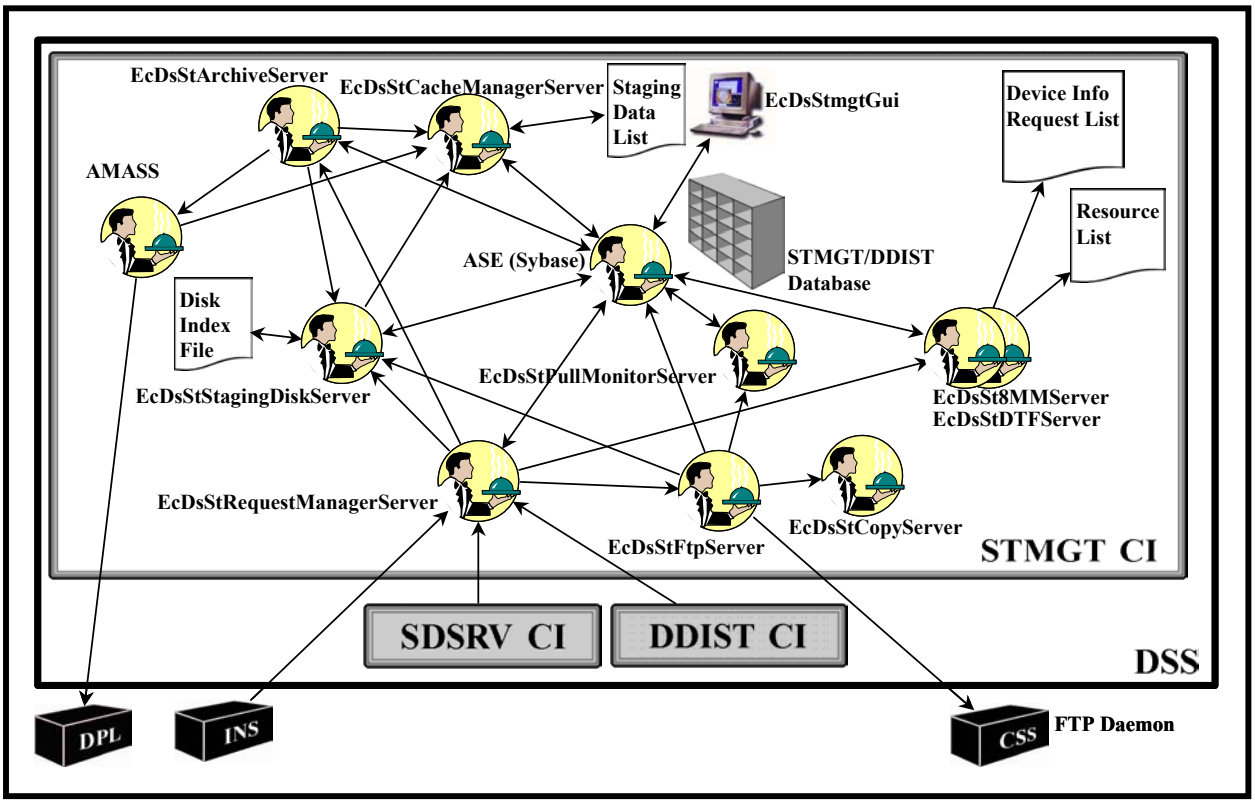

Figure 3. DSS Storage Management (STMGT) CSCI Architecture

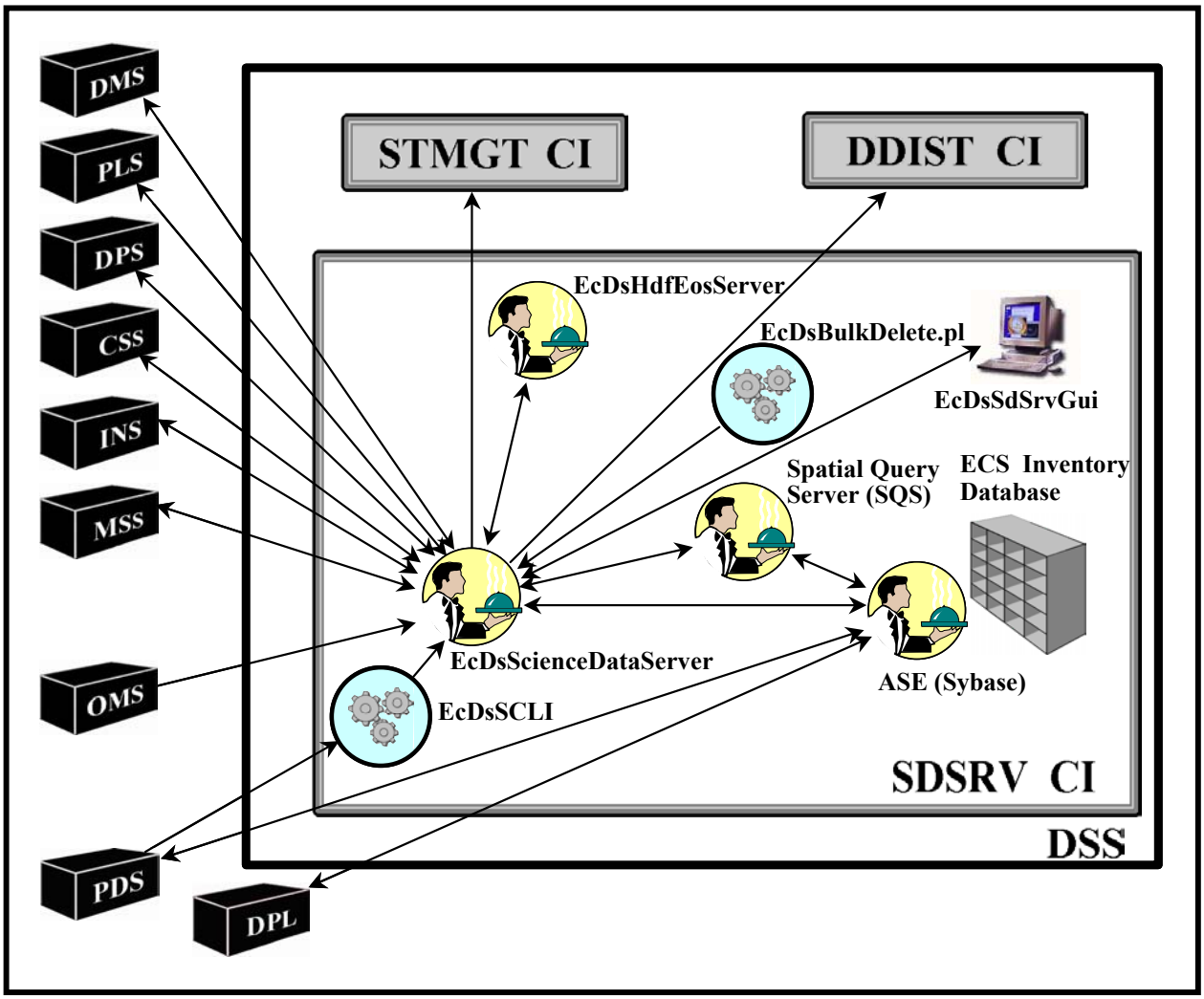

Figure 4. DSS Science Data Server (SDSRV) CSCI Architecture

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

- 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 Technician with the capability to monitor the Ingest history log, monitor the status of ongoing ingest requests, and modify Ingest configuration parameters.
- INGEST Media Tape Reader GUI (EcInTapeReaderGUI).
  - GUI that provides the Ingest Technician with the capability to perform hard media ingest.
- 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.

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

- EcInTapeReaderGUI.
  - Launches the INGEST Media Tape Reader 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:

- 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.
- EcInCopyAM1ANC (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.

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 system 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; maintains a request queue based on priority and time of request receipt.
  - DTF-2 Server (EcDsStDTFServer) - Server that schedules access to the DTF-2 (second-generation Sony Digital Tape Format) cartridge tape 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.
  - Copy Server (EcDsStCopyServer) - Server that executes secure copy (scp) requests on behalf of EcDsStFtpServer.
- 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 Operations Workstation:

- 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, Sun Consolidation Internal Server host, and/or File and Storage Management System (FSMS) Server host 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.
- EcDsStDTFServerStart.
  - Starts the DTF-2 (Drive) 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 and/or FSMS Server host:

- EcDsCheckArchive.
- EcDsStConfigVolGrps.
- EcDsStDbBuild.
  - Creates and empties database and pre-loads initialization data.
- EcDsStDbDrop.
- EcDsStDbDump.
  - Dumps the database to a backup device.
- EcDsStDbDumpTrans.
- EcDsStDbLoad.
  - Restores the database from a backup copy.
- 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 subsystems). The Ingest 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.
- Science Data Server (SDSRV) Command Line Interface (SCLI) (EcDsSCLI).
  - Provides a command line interface that receives requests (via product request parameter files) for acquiring granules from the archive.
  - Supports the S4PM [reprocessing system for Moderate-Resolution Imaging Spectroradiometer (MODIS) data] and the Product Distribution System (PDS).
- 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 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 Operations Workstation:

- EcDsSdSrvGuiStart.
  - Launches the Science Data Server GUI.

The following scripts are available in the /us/ecs/*MODE*/CUSTOM/utilities directory on the SDSRV Server host:

- EcTsDsClientDriverStart.
- EcDsSrConvertEvt.
- EcDsSrDbBuild.
- EcDsSrDbDrop.
- EcDsSrDbDump.
- EcDsSrDbLoad.
- EcDsSrDbMigrate.
- EcDsSrDbPatch.
- EcDsSrDbValids.

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 system 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 Science Data Processing.
  - Client performs ingest data preprocessing, metadata extraction, and metadata validation on any incoming data, as required.

Ingest is the responsibility of DAAC Ingest 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 the system from external data providers. The following data providers are representative:

- Ground Data System (GDS) for the Advanced Spaceborne Thermal Emission and Reflection Radiometer (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).
  - 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 polling ingest.
  - With delivery record.
    - Polling client periodically checks a network location for a delivery record file, which indicates the availability of data for ingest.
    - Polling client "gets" data (within a specified time window) from the applicable directory on a local staging server, where the data provider will have put the data.
    - Data providers include EDOS, SCFs, SIPS, and NOAA NCEP.
  - Without delivery record.
    - Polling client 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.
    - Polling client "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 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 a PDR either furnished by the data provider or constructed by the Ingest Technician.
  - Data providers include the ASTER GDS, EDOS, NOAA NCEP, and NOAA NESDIS NCDC
- Cross-DAAC/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 Polling Messages

As illustrated in Figure 5, three types of automatically generated electronic messages are typically used in polling ingest with delivery record. 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 exact number and nomenclature of messages depends on the particular data provider's agreement with EMD as specified in each Interface Control Document (ICD). The messages are sent by either ftp or e-mail. Note that no messages are passed in polling ingest without delivery record.

Figure 5 shows the messages associated with the ingest of one type of 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.

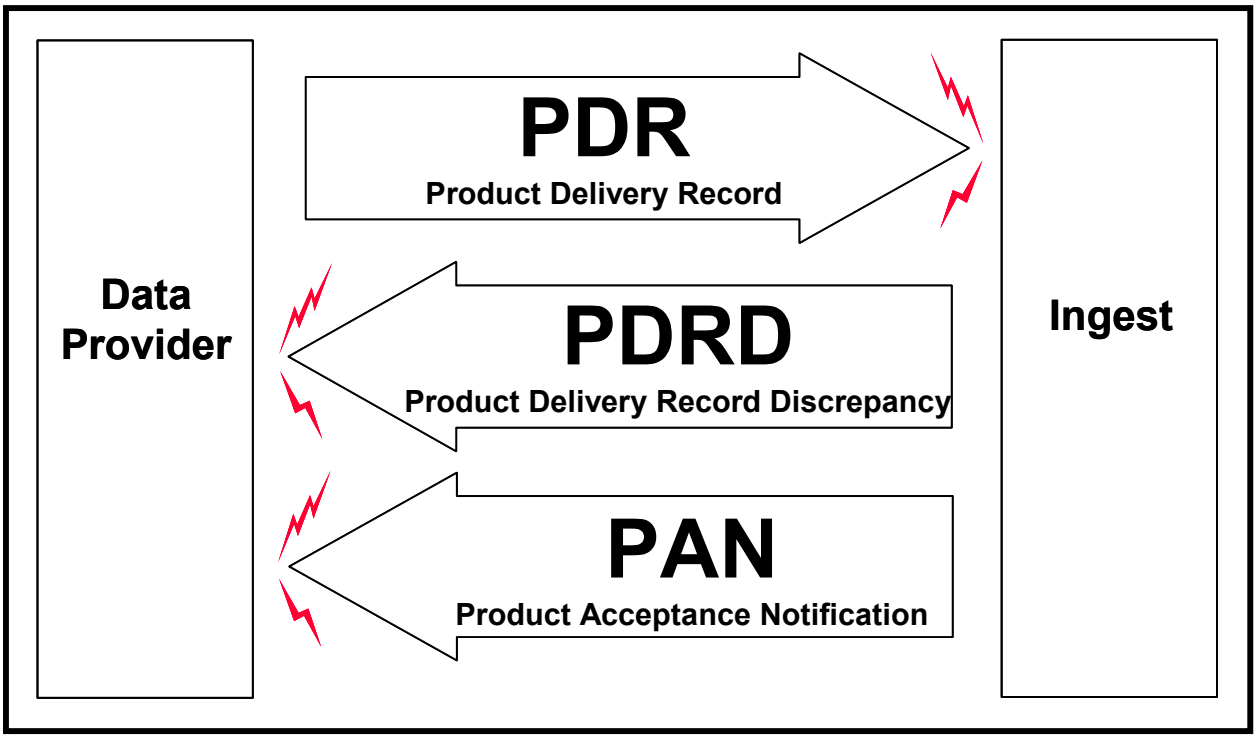

Figure 5. Ingest Polling Messages

- 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 all data files and the accompanying delivery record so the data can be ingested. The signal file is identified by an ".XFR" extension to the delivery record file name. The content of the signal file consists solely of the full name of the data file.

Physical (Hard) Media Messages

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

Like the control messages in polling ingest with delivery record some of the hard media messages are sent by ftp or e-mail. For example, the ingest of data from a hard medium typically 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 Ingest.
- 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.
- Hard media ingest (e.g., from 8mm tape) may involve 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:

- Polling ingest with delivery record.
- Polling ingest without delivery record.
- Hard media ingest.
- Cross-DAAC ingest.

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.

- 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 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 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.

- 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 Ingest.
  - In order to prevent use by Ingest 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 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 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 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.

Hard Media Ingest Using the INGEST Media Tape Reader GUI

DTF-2 tape ingest of ASTER L1A/L1B data using the **INGEST Media Tape Reader** GUI is provided as an example of a hard media ingest process.

DTF-2 Tape Ingest of ASTER L1A or L1B Data Using the INGEST Media Tape Reader GUI

The process for ingesting data from DTF-2 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 DTF-2 tapes containing AST_L1A or AST_L1B data to the Land Processes (LP) DAAC.
  - The DTF-2 tapes contain data collected and processed in response to users’ Data Acquisition Requests (DARs) as well as data that was not requested via DAR.
- The DAAC Ingest Technician launches the ECS Ingest GUI (EcInGUI) using the EcInGUIStart script.
- The DAAC Ingest Technician loads the DTF-2 Tape in the DTF tape drive.
- The DAAC Ingest Technician launches the **INGEST Media Tape Reader** GUI (EcInTapeReaderGUI).

- The DAAC Ingest Technician uses the **INGEST Media Tape Reader** GUI (EcInTapeReaderGUI) to initiate reading of the tape in the tape drive.
  - The first tar (tape archive) file is read from the tape.
  - The information in the first tar file is parsed and each tar file on the tape is displayed as a colored block on the GUI for further processing.
  - 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.
- After the first tar file has been read the DAAC Ingest Technician selects the tar file(s) to be read.
- EcInTapeReaderGUI process reads the selected tar files from the tape and saves the data files in the data directory.
- EcInTapeReaderGUI process generates PDR files, and saves the PDR files in the PDR directory.
- Appropriate EcInPolling client detects the PDR files.
- EcInPolling client packages the PDR information into an Ingest Request.
- EcInPolling client 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 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 data directory 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 Receiving DAAC and a Transmitting DAAC.

- When the system is started, EcInPolling.DDIST at the Receiving 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 Receiving 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 Receiving DAAC either uses the EOS Data Gateway web client to create an order for the desired data or contacts User Services at the Transmitting 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.
- If a technician at the Receiving DAAC contacted User Services at the Transmitting DAAC to have a subscription entered for the desired data, User Services personnel at the Transmitting DAAC enter the subscription in the Subscription Server database using the Subscription Service GUI.
- Either the Subscription Server or Client at the Transmitting DAAC submits an Acquire Request for granules of the desired data to be distributed via ftpPush to the Receiving 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 Receiving DAAC.
- The Science Data Server at the Transmitting DAAC verifies access privileges for the granules to be distributed.
- The Science Data Server at the Transmitting 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 Transmitting 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 Transmitting 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 Transmitting 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 Transmitting 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 Transmitting DAAC allocates space and passes back a reference to the disk space.
- The Distribution Server at the Transmitting 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 Transmitting 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 Transmitting 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 Transmitting 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 Transmitting DAAC links the files from the read-only cache into the staging disk.
- The Distribution Server at the Transmitting 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 Transmitting 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 Transmitting DAAC requests the ftp daemon in the Communications Subsystem to perform the actual ftp of the files to the Receiving DAAC.
- The ftp daemon at the Transmitting DAAC performs the actual ftp of the files to the Receiving DAAC.
- The Distribution Server at the Transmitting 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 Transmitting DAAC sends the Distribution Notice to Ingest at the Receiving DAAC via e-mail.
- The Ingest E-Mail Parser at the Receiving 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 Receiving DAAC detects files matching the *.notify mask.
- The Ingest E-Mail Parser at the Receiving DAAC parses the Distribution Notice file.

- The Ingest E-Mail Parser at the Receiving 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 Receiving DAAC copies the PDR file to the polling directory for EcInPolling.DDIST at the Receiving DAAC.
- EcInPolling.DDIST at the Receiving DAAC detects files matching the *.PDR mask.
- EcInPolling.DDIST at the Receiving DAAC packages the PDR information into an Ingest Request.
- EcInPolling.DDIST at the Receiving DAAC passes the identity of the originating system (i.e., DDIST) to the Ingest Request Manager.
- The Ingest Request Manager at the Receiving 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 Receiving DAAC connects to the appropriate Science Data Server (EcDsScienceDataServer) to begin a session.
  - The appropriate Science Data Server was retrieved.
    - The appropriate Science Data Server is based on the data type.
- The Ingest Granule Server at the Receiving DAAC replaces the InputPointers in the .met file with "RE-INGEST FROM DISTRIBUTION – INPUTS UNKNOWN."
- The Ingest Granule Server at the Receiving DAAC requests the Science Data Server to validate the metadata, based on the granules' data type.
- The Science Data Server at the Receiving DAAC validates metadata and determines the archived names of the files.

- The Ingest Granule Server at the Receiving 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 Receiving 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 Receiving DAAC copies the files directly from the Ingest staging disks on which they reside.
- The Science Data Server at the Receiving DAAC parses the validated metadata and adds the metadata to its inventory.
- The Ingest Granule Server at the Receiving 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 Receiving 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 Receiving 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 Receiving DAAC creates a PAN indicating success (or failure) of data insertion.
- The Ingest Request Manager at the Receiving DAAC transfers the PAN by ftp to the data user.

Ingest Graphical User Interface (GUI) Tools

The **ECS Ingest** tool, illustrated in Figure 6, 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 using the **ECS Ingest** GUI.

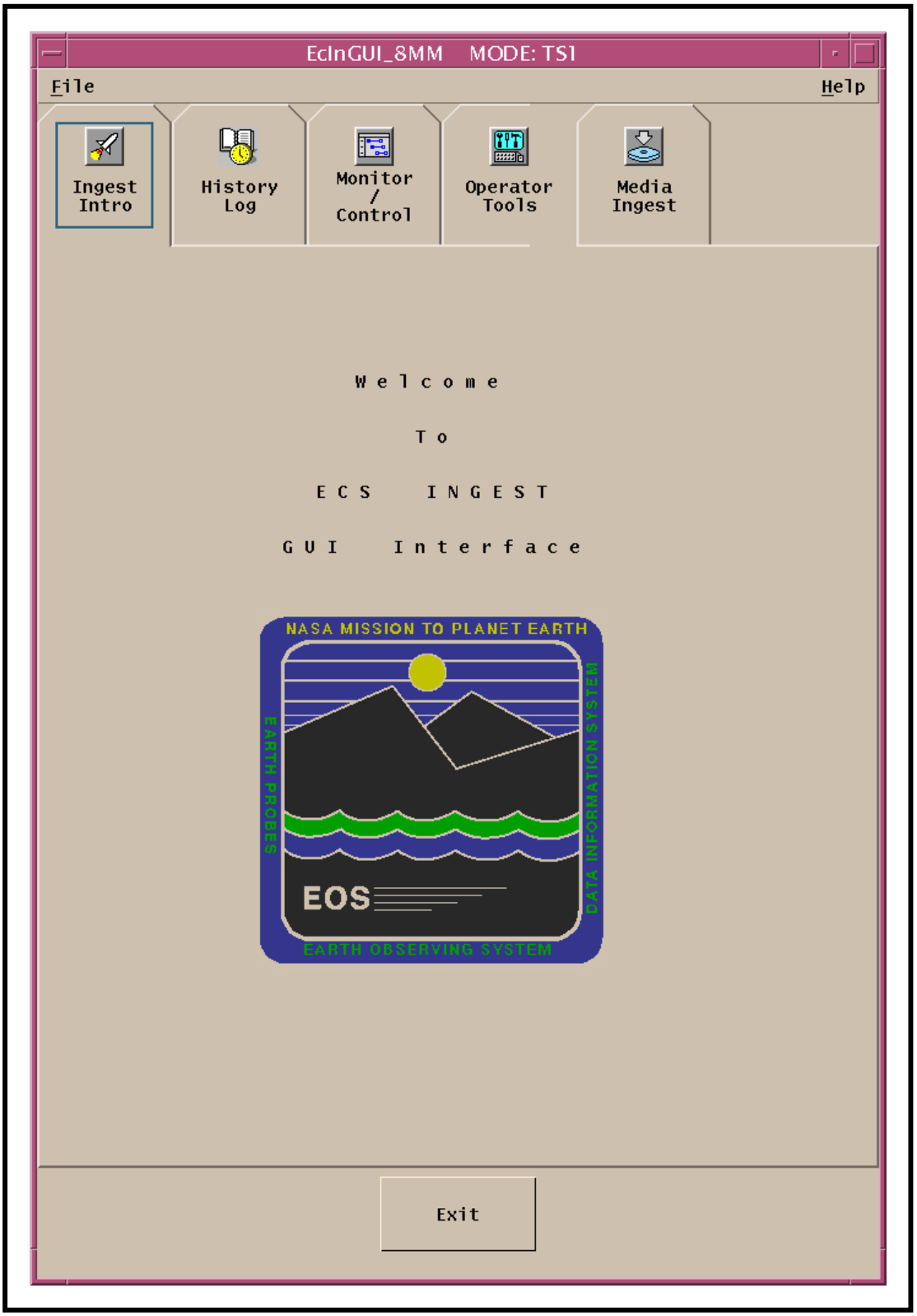

Figure 6. ECS Ingest GUI Intro Screen

Logging in to System Hosts

Logging in to System Hosts

Logging in to system hosts is accomplished from a UNIX command line prompt. It is an initial set of steps that is performed when accomplishing many other Ingest tasks.

Logging in to system hosts starts with the assumption that the applicable hosts are operational and the Ingest Technician has logged in to a workstation or X-term that has access to the applicable network in the system.

Logging in to System Hosts

NOTE: Commands in Steps 1 and 2 are typed at a UNIX system prompt.

1 At the UNIX command line prompt 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 client name.
- 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 In the terminal window (at the command line prompt) start the log-in to the appropriate host by typing **/tools/bin/ssh *hostname*** then press **Return/Enter**.

- The **-l** option can be used with the ssh command to allow logging in to the remote host (or the local host for that matter) with a different user ID. For example, to log in to x0icg01 as user cmops enter:

  /tools/bin/ssh -l cmops x0icg01

- An alternative method of logging in with a different user ID is to type the command in the format **ssh *userid@hostname***. For example:

  /tools/bin/ssh cmops@x0icg01

- Depending on the set-up it may or may not be necessary to include the path (i.e., /tools/bin/) with the ssh command. Using ssh alone is often adequate. For example:

  ssh x0icg01

  - or -

  ssh -l cmops x0icg01

- or -

ssh cmops@x0icg01

- Examples of Ingest Server host names include **e0icg11, g0icg01, l0acg02**, and **n0acg01**.
- Examples of Operations Workstation host names include **e0acs12**, **g0acs02**, **l0acs01**, and **n0acs03**.
- Examples of Access/Process Coordinators (APC) Server host names include **e0acg11**, **g0acg01**, **l0acg02**, and **n0acg01**.
- Examples of FSMS Server host names include **e0drg11**, **g0drg01**, **l0drg01**, and **n0drg01**.
- Examples of Sun Consolidation External Server host names include **e0ins01, g0ins01**, **l0ins01**, and **n0ins02**.
- Examples of Sun Consolidation Internal Server host names include **e0acs11, g0acs11, l0acs03, and n0acs04**.
- 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)?"** enter **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 **Return/Enter**.

- If a command line prompt is displayed, log-in is complete.
- If the passphrase is unknown, press **Return/Enter**, which should cause a **<user@remotehost>'s password:** prompt to appear (after the second or third try if not after the first one), then go to Step 4.
- If the passphrase is entered improperly, a **<user@remotehost>'s password:** prompt should appear (after the second or third try if not after the first one); go to Step 4.

4 If a prompt for **<*user@remotehost*>'s password:** appears, type your ***password*** then press **Return/Enter**.

- A command line prompt is displayed.
- Log-in is complete.

Launching the ECS Ingest and Storage Management Control GUIs

Launching the ECS Ingest GUI

The following software applications are associated with Ingest:

- 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 Technician has logged in to the system.

Launching the ECS Ingest GUI

1 Access a terminal window logged in to the Operations Workstation host.

- Examples of Operations Workstation host names include **e0acs12**, **g0acs02**, **l0acs01,** and **n0acs03**.
- For detailed instructions refer to the procedure for **Logging in to System Hosts** (previous section of this lesson).

2 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.

3 If there are no other instances of the Ingest GUI currently running, type **EcInGUIStart *MODE*** then press **Return/Enter**.

- The **ECS Ingest** GUI **Ingest Intro** screen (Figure 6) is displayed.
- Alternatively, type **EcInGUIStart *MODE* ea_instance EcInGUI** then press **Return/Enter**.
- To determine whether there is already an instance of the Ingest GUI currently running, type **ps –ef | grep *MODE*** then press **Return/Enter** and examine the response for the following type of statement:

  cmshared 10528 1 7 08:48:49 pts/1 0:07 /usr/ecs/OPS/CUSTOM/bin/INS/EcInGUI ConfigFile /usr/ecs/OPS/CUSTOM/cfg/EcInGUI.

  - Such a statement indicates that an instance of the Ingest GUI is currently running in OPS mode.

4 If there is already an instance of the Ingest GUI running, type **EcInGUIStart *MODE* ea_instance *instance_name*** then press **Return/Enter**.

- The ***instance_name*** refers to one of the instances that have been defined in a file named .IngestGuiInstances [note the dot that precedes the name] that is located in the /usr/ecs/*MODE*/CUSTOM/data/INS/ subdirectory.
- The .IngestGuiInstances file in a particular mode might include the following instance names:
  - EcInGUI (instance set up for general ingest operations).
  - EcInGUI.8MM (instance set up for ingest from 8mm tape).
  - EcInGUI.DTF (instance set up for ingest from DTF-2 tape).
- For example to start an instance of the Ingest GUI to support ingest from DTF-2 tape enter the following command:

  EcInGUIStart OPS ea_instance EcInGUI.DTF

- The **ECS Ingest** GUI **Ingest Intro** screen (Figure 6) is displayed.
  - The GUI instance is displayed on the title bar at the top of the GUI.

NOTE: If necessary, the Ingest Technician can gain access to Science Data Server through the Science Data Server GUI, which is launched in generally the same manner as the first instance of 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).
- 8mm Server (EcDsSt8MMServer).
- DTF-2 Server (EcDsStDTFServer).
- FTP Server (EcDsStFtpServer).
- Storage Management Request Manager (EcDsStRequestManagerServer).
- Sybase ASE Server.
- Archival Management and Storage System (AMASS).

The Storage Management Control GUI is used in Ingest physical media operations for putting media IDs into the Storage Management database and for marking stackers/drives/slots as being either on line or off 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 Technician has logged in to the system.

Launching the Storage Management Control GUI

1 Access a terminal window logged in to the Operations Workstation.

- Examples of Operations Workstation host names include **e0acs12**, **g0acs02**, **l0acs01,** and **n0acs03**.
- For detailed instructions refer to the procedure for **Logging in to System Hosts** (previous section of this lesson).

2 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.

3 Type **EcDsStmgtGuiStart *MODE*** then press **Return/Enter**.

- The **Storage Management Control** GUI **Storage Config.** tab (Figure 7) is displayed.

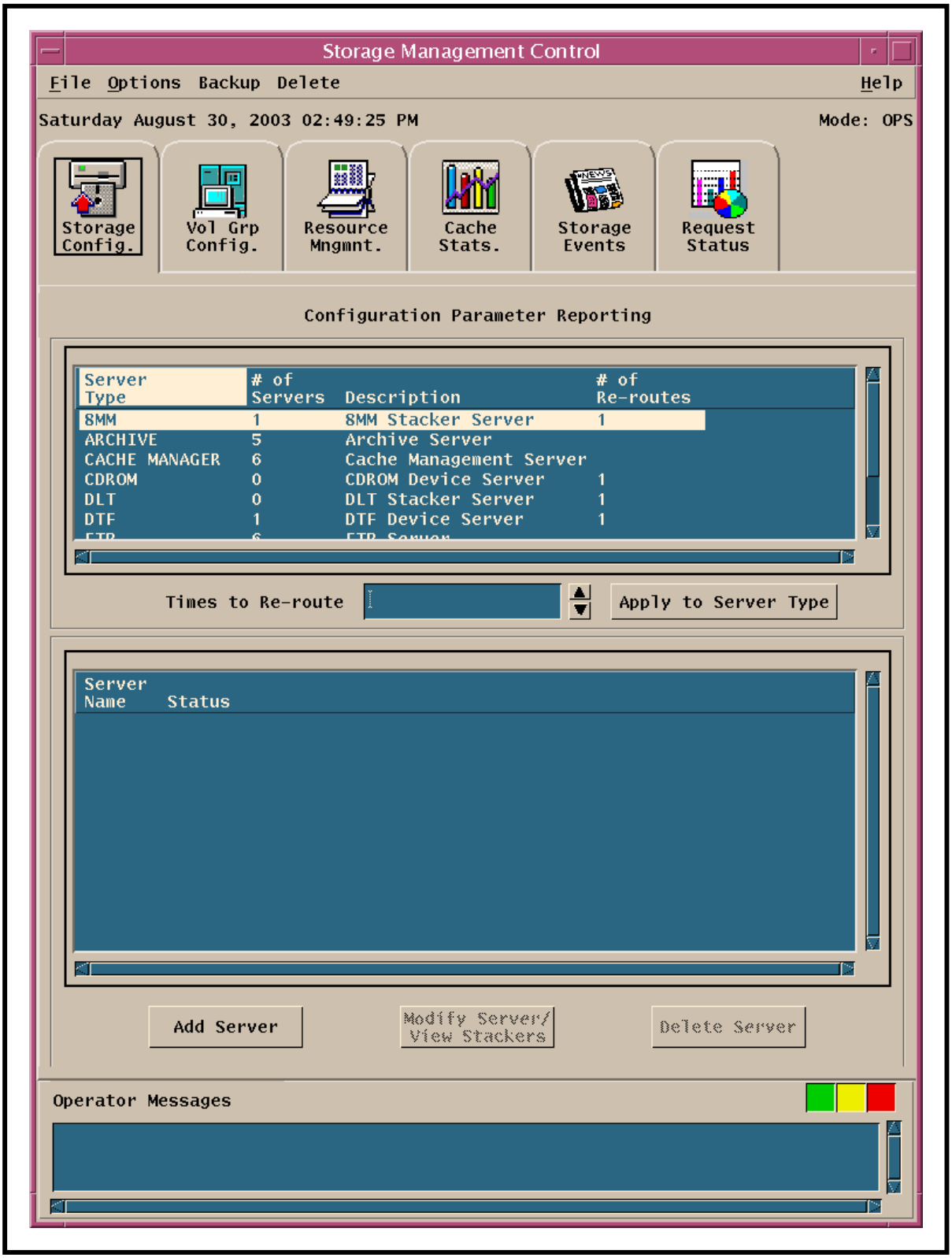

Figure 7. Storage Config. Tab (Storage Management Control GUI)

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Handling Cross-DAAC or Cross-Mode Ingest

Handling Cross-DAAC or Cross-Mode Ingest

Cross-DAAC or cross-mode ingest is launched via either an order or a subscription for the desired data.

- If the data are already in the archive, an order is submitted using the **EOS Data Gateway** (EDG) web client.
  - An order for data can be placed via the EDG from almost anyplace by almost anyone.
- If the data are not already in the archive (if future data are to be transferred), a subscription is entered using the **Subscription Service** GUI.
  - A subscription is likely to be entered by User Services personnel at the Transmitting DAAC.

In either case either a subscription or order is entered in the mode (e.g., OPS) from which the data are to be transferred. The subscription or order specifies (among other things)…

- The data to be transferred.
  - Parameters of the specific granule(s) if the data are being ordered.
  - Data type and other subscription parameters (e.g., from what date/time until what date/time) if a subscription is being entered.
- Media type is FtpPush.
- Media format is typically FILEFORMAT.
- User profile ID is the user profile ID of the nominal requester (if applicable).
- A username is specified for logging in to the ftp host at the receiving DAAC.
- A password is specified for logging in to the ftp host at the receiving DAAC.
- The ftp host is the host to which the data are to be pushed at the receiving DAAC (e.g., g0acg01u.ecs.nasa.gov).
- The ftp directory is the directory (on the ftp host) to which the data are to be pushed at the receiving DAAC/mode (e.g., /usr/ecs/OPS/CUSTOM/icl/a/data/XDAAC_Ingest/NSIDC/).

- The e-mail address is the address for the distribution notice (DN) that is sent by Data Distribution at the transmitting DAAC/mode to the Ingest E-Mail Parser (EcInEmailGWServer) in the receiving mode at the receiving DAAC.
  - For example:

    EcInEmailGWServer_OPS@g0ins01u.ecs.nasa.gov for data being sent for ingest in the OPS mode at the Goddard Space Flight Center (GSFC) Earth Sciences (GES) DAAC.

Assuming the processing of the subsequent acquire request(s) (from the subscription server or V0-ECS gateway as applicable) and processing of the distribution request(s) are successful, the following actions occur as the data are transferred from the transmitting DAAC/mode to the receiving DAAC/mode:

- The ftp daemon at the transmitting DAAC/mode performs the actual ftp of the files to the receiving DAAC/mode (e.g., /usr/ecs/OPS/CUSTOM/icl/a/data/XDAAC_Ingest/NSIDC/ on g0acg01u.ecs.nasa.gov).
- The Distribution Server at the transmitting DAAC/mode builds a distribution notice that the user's order has been fulfilled and sends the DN to Ingest at the receiving DAAC/mode via e-mail.
- The Ingest E-Mail Parser (EcInEmailGWServer) at the receiving DAAC/mode stores the DN as a text file (e.g., DDIST.notify11072001130203 shown in Figure 8) in the EmailDirectory (e.g., /usr/ecs/OPS/CUSTOM/data/INS/local/InEmailGWServerPollingDirectory on g0ins01).
- While polling the EmailDirectory, the Ingest E-Mail Parser at the receiving DAAC/mode detects files matching the *.notify mask.
- The Ingest E-Mail Parser at the receiving DAAC/mode parses the Distribution Notice file.
- The Ingest E-Mail Parser at the receiving DAAC/mode generates a PDR file (e.g., DDIST11072001130203.PDR shown in Figure 9).
  - 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 (e.g., /usr/ecs/OPS/CUSTOM/data/INS/local/InEmailGWServerFailedDirectory).

```
From cmshared@n0ins01u.ecs.nasa.gov  Wed Nov  7 13:02:03 2001
Received: from n0ins01u.ecs.nasa.gov (n0ins01.nsidcb.ecs.nasa.gov [198.118.205.144])
        by g0ins01u.ecs.nasa.gov (8.8.6/8.8.4) with ESMTP
        id NAA02224 for <EcInEmailGWServer_OPS@g0ins01u.ecs.nasa.gov>; Wed, 7 Nov 2001
13:02:02 -0500 (EST)
Received: from n0dis02 (n0dis02.nsidcb.ecs.nasa.gov [198.118.205.131])
      by n0ins01u.ecs.nasa.gov (8.8.8+Sun/8.8.8) with ESMTP id LAA20693
      for <EcInEmailGWServer_OPS@g0ins01u.ecs.nasa.gov>; Wed, 7 Nov 2001 11:02:01 -0700 (MST
From: CM SHARED (CM Code Delivery) <cmshared@n0ins01.nsidcb.ecs.nasa.gov>
Received: by n0dis02 (8.8.8+Sun) id LAA02437; Wed, 7 Nov 2001 11:02:01 -0700 (MST)
Date: Wed, 7 Nov 2001 11:02:01 -0700 (MST)
Message-Id: <200111071802.LAA02437@n0dis02>
To: EcInEmailGWServer_OPS@g0ins01u.ecs.nasa.gov
Subject: ECS Notification

Thank you for using the Earth Observing System Distribution System.   For more information on your
request contact the DAAC.

Please include the data below in any correspondence with the DAAC.

The data distributed for this request can be found on the FTPHOST below in the directory specified by
FTPDIR below.
Thank You!

Support Contacts:
NSIDC User Services
449 UCB
University of Colorado
Boulder, CO  80309
e-mail: nsidc@kryos.colorado.edu
phone: 303-492-6199
fax: 303-492-2468



++++++++++

ORDERID: NONE
REQUESTID: NONE
USERSTRING: Insert of NISE granule
FINISHED: 11/07/2001 11:01:31

MEDIATYPE: FtpPush
FTPHOST: g0acg01u.ecs.nasa.gov
FTPDIR: /usr/ecs/OPS/CUSTOM/icl/a/data/XDAAC_Ingest/NSIDC/
MEDIA 1 of 1
MEDIAID:

      GRANULE:
UR:10:DsShESDTUR:UR:15:DsShSciServerUR:13:[NSC:DSSDSRV]:18:SC:NISE.001:739154
      ESDT: NISE.001

            FILENAME: NISE_SSMIF13_20011107.HDFEOS
            FILESIZE: 2224001

            FILENAME: NISE_SSMIF13_20011107.HDFEOS.met
```

Figure 8. Example of a Distribution Notice Used for Cross-DAAC (NSIDC to GSFC) Ingest

```
DAN_SEQ_NO = 100;
ORIGINATING_SYSTEM = DDIST;
EXPIRATION_TIME = ;
TOTAL_FILE_COUNT = 2;

AGGREGATE_LENGTH = 2272903;

OBJECT = FILE_GROUP;
  DATA_TYPE = NISE;
  NODE_NAME = g0acg01u.ecs.nasa.gov;
  DATA_VERSION = 001;
  OBJECT = FILE_SPEC;
    DIRECTORY_ID = "/usr/ecs/OPS/CUSTOM/icl/a/data/XDAAC_Ingest/NSIDC/";
    FILE_TYPE = "DDIST";
    FILE_ID = "NISE_SSMIF13_20011107.HDFEOS";
    FILE_SIZE = 2224001;
  END_OBJECT = FILE_SPEC;
  OBJECT = FILE_SPEC;
    DIRECTORY_ID = "/usr/ecs/OPS/CUSTOM/icl/a/data/XDAAC_Ingest/NSIDC/";
    FILE_TYPE = "METADATA";
    FILE_ID = "NISE_SSMIF13_20011107.HDFEOS.met";
    FILE_SIZE = 48902;
  END_OBJECT = FILE_SPEC;
OBJECT=XAR_ENTRY;
  XAR_INFO_COUNT=0;
END_OBJECT = XAR_ENTRY;
END_OBJECT = FILE_GROUP;
```

Figure 9. Example of a PDR Derived from a Distribution Notice Used for Cross-DAAC (NSIDC to GSFC) Ingest

- The Ingest E-Mail Parser at the receiving DAAC/mode copies the PDR file to the EcInPolling.DDIST polling directory (e.g., /usr/ecs/OPS/CUSTOM/data/INS/local/IngestPollingDirectory on g0ins01) at the receiving DAAC/mode.
- EcInPolling.DDIST at the receiving DAAC/mode detects files matching the *.PDR mask.

- EcInPolling.DDIST at the receiving DAAC/mode packages the PDR information into an Ingest Request.
- Ingest processing proceeds as a typical polling ingest with delivery record.

To handle cross-DAAC or cross-mode ingest use the procedure that follows.

Handling Cross-DAAC or Cross-Mode Ingest

---

1 Submit a request to User Services (at the DAAC where the data are currently available) to create an order or subscription (as applicable) to have data transferred to a different mode or DAAC.

- The following data (as applicable) are needed to create the order or subscription:
  - Parameters of the data to be transferred, including parameters of the specific granule(s) if the data are being ordered or data type and other subscription parameters (e.g., from what date/time until what date/time) if a subscription is being entered.
  - Media type (FtpPush).
  - Media format (typically FILEFORMAT).
  - User profile ID (if applicable).
  - Username for logging in to the ftp host at the receiving DAAC.
  - Password for logging in to the ftp host at the receiving DAAC.
  - ftp host to which the data are to be pushed at the receiving DAAC (e.g., g0acg01u.ecs.nasa.gov).
  - ftp directory (on the ftp host) to which the data are to be pushed at the receiving DAAC/mode (e.g., /usr/ecs/OPS/CUSTOM/icl/a/data/XDAAC_Ingest/NSIDC/).
  - e-mail address for the DN sent to the Ingest E-Mail Parser (EcInEmailGWServer) in the receiving mode at the receiving DAAC (e.g., EcInEmailGWServer_TS1@e0ins01u.ecs.nasa.gov).
    - The e-mail address for the Ingest E-Mail Parser has the following format:

      EcInEmailGWServer_*MODE@host*
    - For example:

      EcInEmailGWServer_TS1@e0ins01u.ecs.nasa.gov for data being sent for ingest in the TS1 mode at the LP DAAC.

2 At the receiving DAAC monitor request processing to ensure that the data are received and ingested.

- For detailed instructions refer to the procedure for **Monitoring/Controlling Ingest Requests** (subsequent section of this lesson).

3 If the data are not received as expected, contact (e.g., by telephone or e-mail) User Services at the DAAC where the order or subscription was submitted to determine the nature of the problem and have it corrected.

Monitoring Ingest Status

Monitoring/Controlling Ingest Requests

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 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 PDR files have been received and logged by the system; this results in the specific ingest processes being assigned request IDs.

Figures 10 and 11 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 Ingest has received a PDR, and which therefore have been assigned a request ID.

EcInGUI_8MM MODE: TS1

File Help

Ingest Intro | History Log | Monitor / Control | Operator Tools | Media Ingest

Search By:

- Request ID
- Data Provider
- All Requests

Graphical View Text View

Monitoring...

Request Information

Req ID	Seq ID	Status	Data Provider	Ingest Type	Priority
1725766	1725766	Active	DAO	Polling_w/DR	VHIGH
1725765	97	Active	EDOS	Polling_w/DR	XPRESS
1725764	49	Active	EDOS	Polling_w/DR	XPRESS
1725763	1	Active	EDOS	Polling_w/DR	XPRESS
1725762	1725762	Active	EDOS	Polling_w/DR	XPRESS
1725761	1725761	Active	EDOS	Polling_w/DR	XPRESS
1725760	1725760	Active	EDOS	Polling_w/DR	XPRESS
1725759	1725759	Active	DAO	Polling_w/DR	VHIGH
1725758	97	Active	EDOS	Polling_w/DR	XPRESS
1725757	49	Active	EDOS	Polling_w/DR	XPRESS
1725756	1	Active	EDOS	Polling_w/DR	XPRESS
1725755	1725755	Active	EDOS	Polling_w/DR	XPRESS
1725754	1725754	Active	EDOS	Polling_w/DR	XPRESS

Find

Resume Cancel

OK Clear All

Figure 10. Ingest Monitor/Control Screen Text View

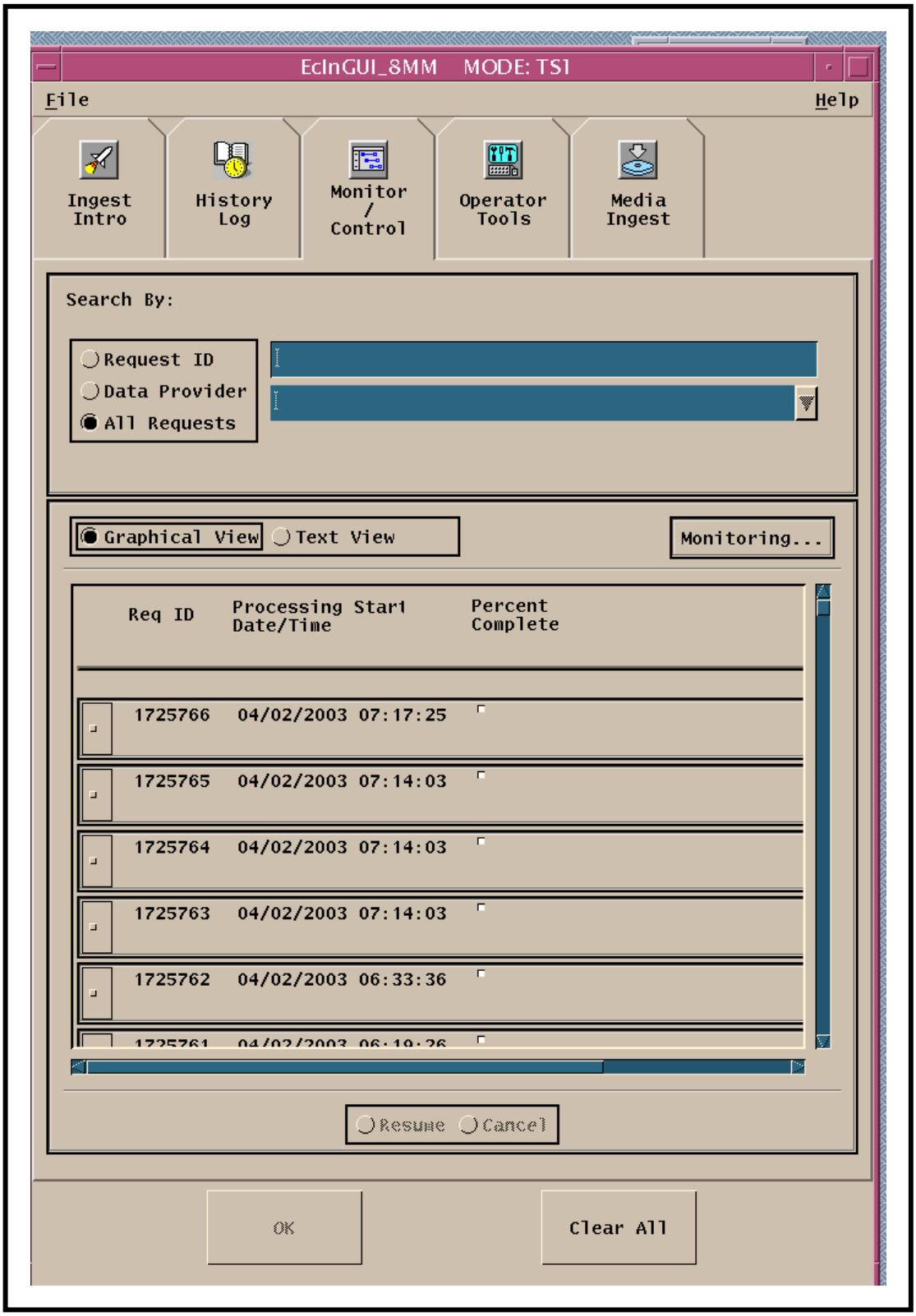

Figure 11. Ingest Monitor/Control Screen Graphical View

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).**
  - **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 two radio buttons (i.e., **Resume** and **Cancel**) for controlling requests. At the bottom of the screen are two buttons labeled **OK** (which is 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 6) is being displayed.

Monitoring/Controlling Ingest Requests

---

1 Click on the **ECS Ingest** GUI **Monitor/Control** tab.

- The **Monitor/Control** screen (Figure 12) is displayed.

2 Click on the appropriate button from the following selections:

- **Request ID** - to display the status of a particular **ingest request**.
  - Go to Step 3.
- **Data Provider** - to display the status of current and recent ingest requests for a particular **data provider** (e.g., **EDOS**).
  - Go to Step 4.
- **All Requests** - to display the status of **all** current and recent ingest requests.
  - All ongoing and recently completed ingest requests are displayed.

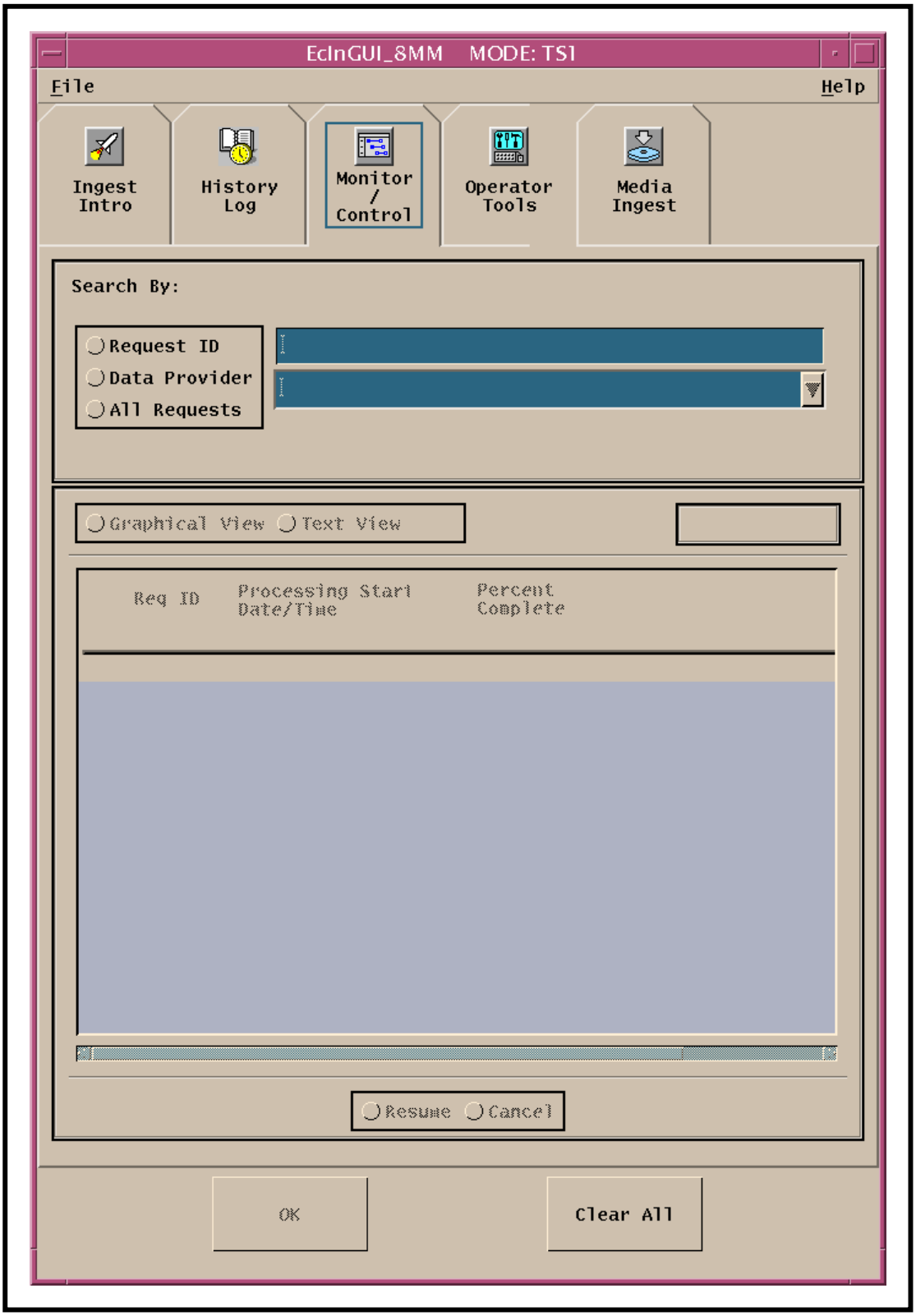

Figure 12. ECS Ingest GUI Monitor/Control Screen

- Go to Step 5

3 If the status of a particular **ingest request** is to be displayed, type the ***requestID*** in the **Request ID** field.

- An alternative method of designating the request ID is to copy and paste (if possible) the request ID into the **Request ID** field.
- Go to Step 5

4 If the status of current and recent ingest requests for a particular **data provider** (e.g., **EDOS**) is to be displayed, 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), then release the mouse button.

- An alternative method of designating the data provider is to first type it in the **Data Provider** field.
- Ongoing requests from the selected data provider are displayed.

5 Click on the appropriate button from the following selections:

- **Graphical View** - to display 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** - to display 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.**
  - **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].

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

7 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).

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

9 If there is a data ingest failure, perform the applicable procedure(s) in the **Troubleshooting Ingest Problems** section of this lesson.

10 Repeat Steps 2 through 9 as necessary to monitor ingest requests.

11 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 Dialogue Box** (Figure 13) is displayed.

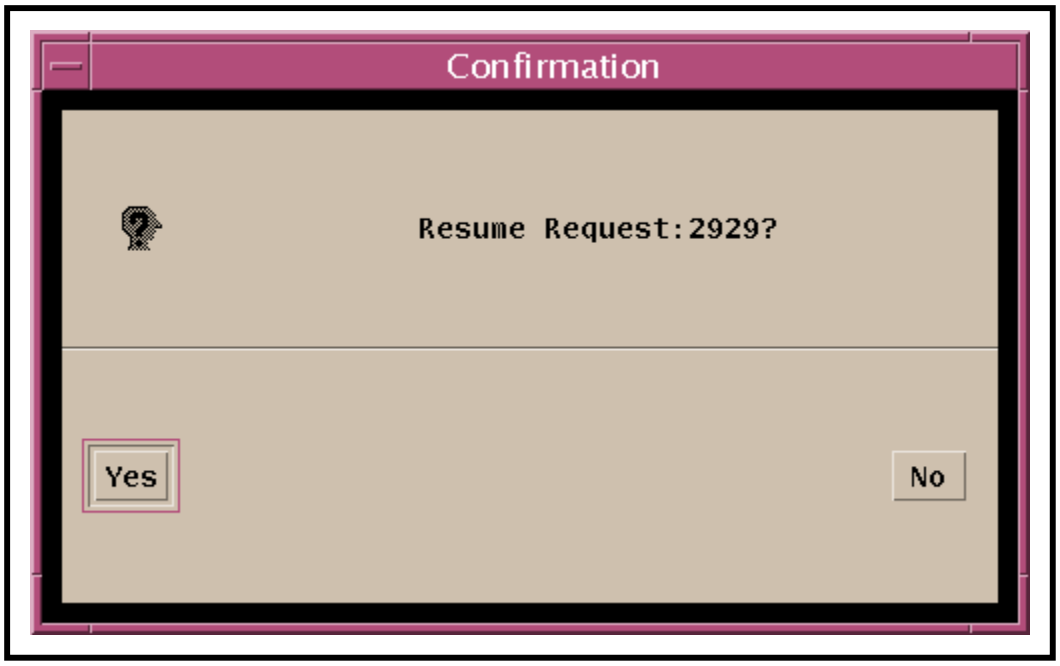

Figure 13. Resume Request Confirmation Dialogue Box

7 Click on the appropriate button from the following selections:

- **Yes** – to confirm resuming processing of the request or granule.
  - The **Resume Request Confirmation Dialogue Box** (Figure 13) is dismissed.
  - The selected ingest request or granule resumes processing.
  - 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 14) is displayed.
- **No** – to cancel resuming processing of the request or granule.
  - The **Resume Request Confirmation Dialogue Box** (Figure 13) is dismissed.
  - The selected ingest request or granule remains in a "Suspended" state.
  - Proceed to Step 9.

Figure 14. Request Control Status Information Dialogue Box

8 Click on the **OK** button.

- The **Request Control Status Information Dialogue Box** (Figure 14) 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**.

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 15) is displayed.

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 15) is dismissed.
  - The selected ingest request or granule is canceled.
  - A **Request Control Status Information Dialogue Box** (Figure 14) is displayed.
- **No** – to prevent canceling the processing of the request or granule.
  - The **Cancel Request Confirmation Dialogue Box** (Figure 15) is dismissed.
  - The selected ingest request is not canceled.
  - Proceed to Step 9.

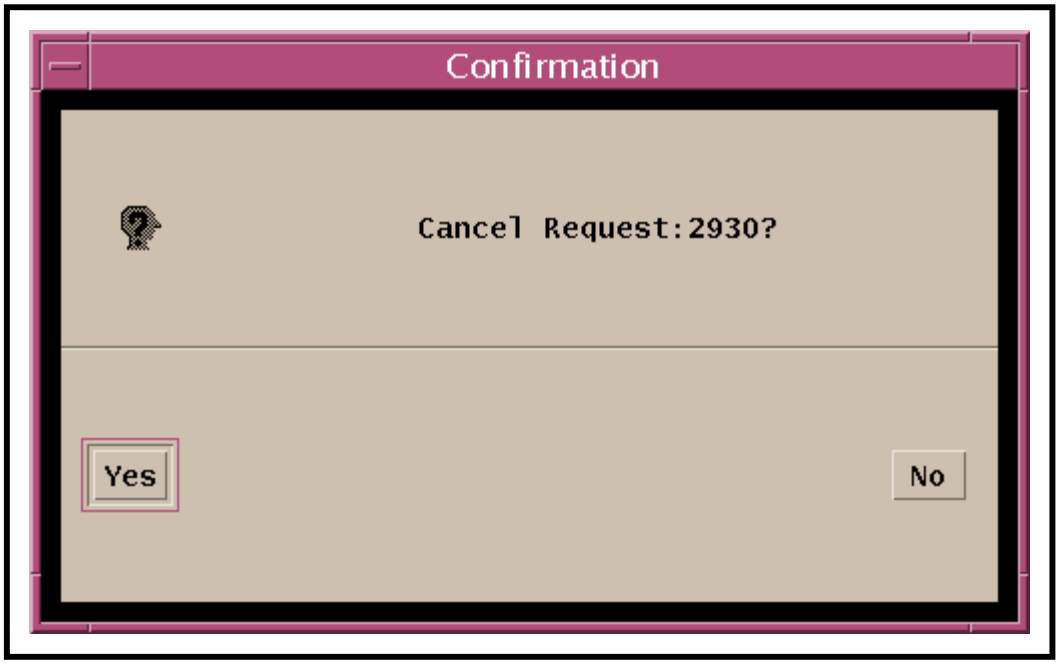

Figure 15. Cancel Request Confirmation Dialogue Box

8 Click on the **OK** button.

- The **Request Control Status Information Dialogue Box** (Figure 14) 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 Ingest.
- 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 6) is being displayed.

1 Click on the Ingest GUI **History Log** tab.

- The **History Log** screen (Figure 16) 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.

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.

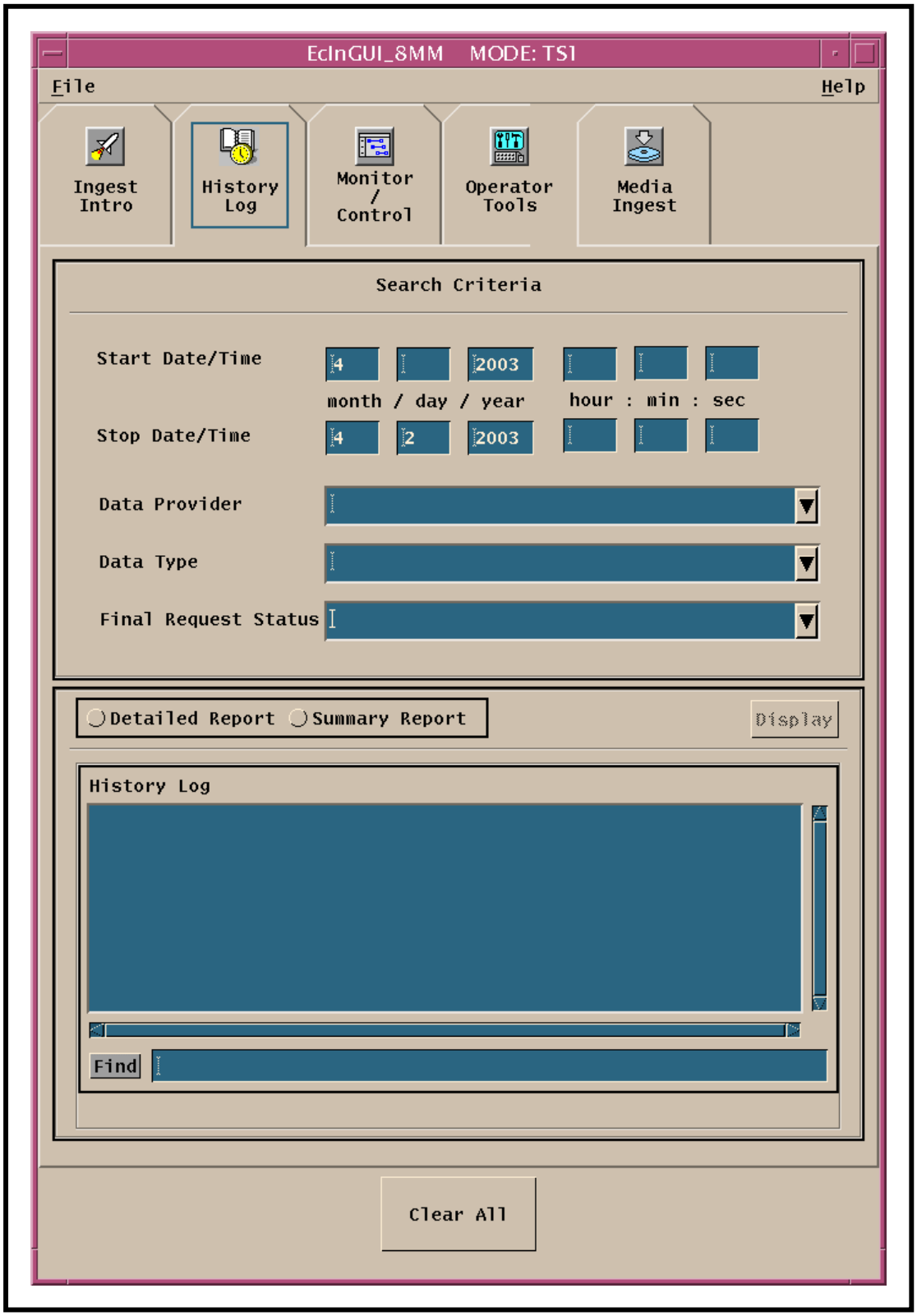

Figure 16. ECS Ingest GUI History Log Screen

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 17) 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.)

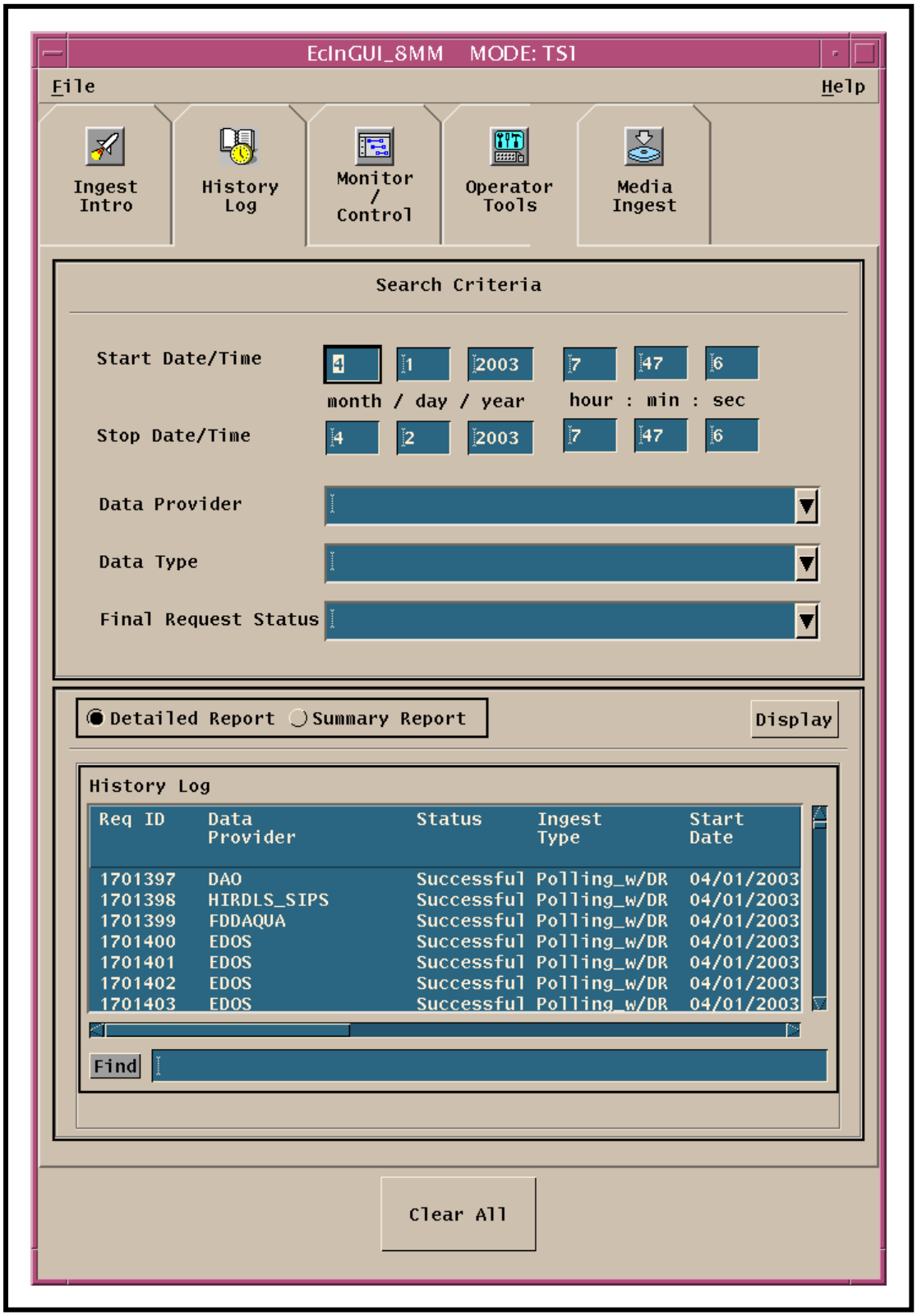

Figure 17. Detailed Report (ECS Ingest GUI History Log)

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 18) 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 19) 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.**

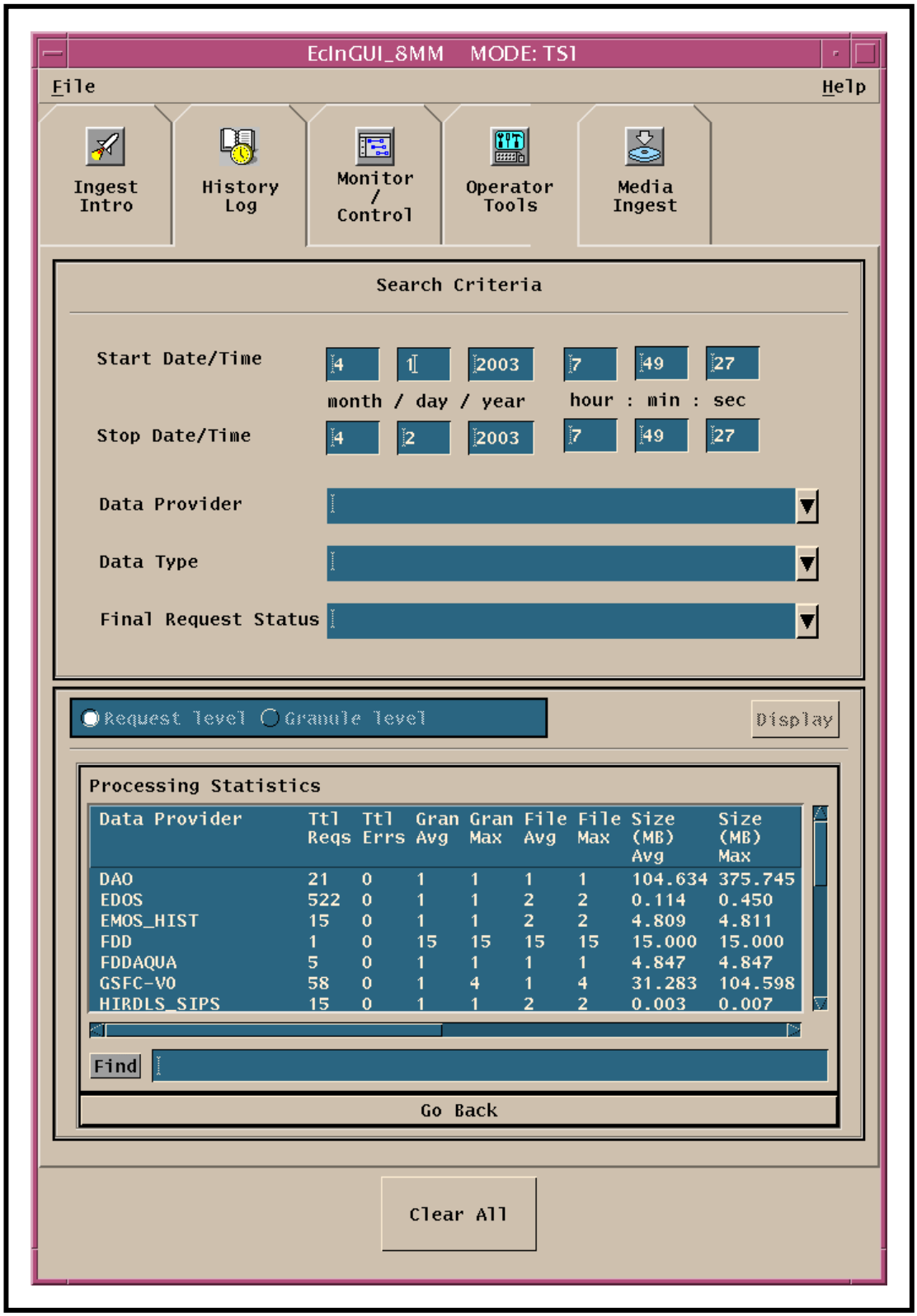

Figure 18. Request Level Summary Report (ECS Ingest GUI History Log)

EcInGUI_8MM MODE: TS1

File Help

Ingest Intro | History Log | Monitor / Control | Operator Tools | Media Ingest

Search Criteria

Start Date/Time 4 1 2003 7 51 52

month / day / year hour : min : sec

Stop Date/Time 4 2 2003 7 51 52

Data Provider

Data Type

Final Request Status

Request level Granule level Display

Processing Statistics

Data Provider	Data Type	Total Granules	Total Errors	File Avg	File Max	Size (MB) Avg	Si (M Ma
DAO	DFLAPCHM	2	0	1	1	8.348	8.
DAO	DFLAPMIS	1	0	1	1	300.620	30
DAO	DFLAXCHM	2	0	1	1	0.578	0.
DAO	DFLAXCLD	2	0	1	1	29.517	29
DAO	DFLAXENG	1	0	1	1	67.310	67
DAO	DFLAXLSM	1	0	1	1	25.316	25
DAO	DFLAXMIS	1	0	1	1	46.313	46

Find

Go Back

Clear All

Figure 19. Granule Level Summary Report (ECS Ingest GUI History Log)

- **Transfer Time (mins) Avg.**
- **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/*MODE*/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 proper directory on the appropriate File and Storage Management System (FSMS) host (e.g., g0drg01).

- The directories are identified by the type of data (e.g., aster, ceres, or 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 Technician has logged in to the system.

Verifying the Archiving of Ingested Data

---

1 Access a terminal window logged in to the appropriate FSMS Server host.

- Examples of FSMS Server host names include **e0drg11**, **g0drg01**, **l0drg01,** and **n0drg01**.
- For detailed instructions refer to the procedure for **Logging in to System Hosts** (previous section of this lesson).

2 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).

3 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 were 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.

4 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.

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 Technician has logged in to the system.

Cleaning the Polling Directories

1 Access a terminal window logged in to the Operations Workstation host.

- Examples of Operations Workstation host names include **e0acs12**, **g0acs02**, **l0acs01,** and **n0acs03**.
- For detailed instructions refer to the procedure for **Logging in to System Hosts** (previous section of this lesson).

2 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).

3 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 :

4 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 (Physical) Media Ingest

Types of Hard Media Ingest

There are three (3) general methods for performing hard media ingest. Each one uses one of the following interfaces:

- **ECS Ingest** GUI media interface.
- **INGEST Media Tape Reader** GUI.
- UNIX commands for reading data from tape and generating PDR and signal files.

Both the **ECS Ingest** GUI (EcInGUI) media interface and the **INGEST Media Tape Reader** GUI (EcInTapeReaderGUI) are used for ingesting data from either 8mm or DTF-2 tape cartridges. The GUIs support hard media ingest of ASTER L1A/L1B data from DTF-2 tape.

NOTE: Currently the **INGEST Media Tape Reader** GUI is the preferred interface for media ingest of ASTER L1A/L1B data. Eventually the **ECS Ingest** GUI (EcInGUI) **media interface** may be phased out.

UNIX commands are used primarily for performing ingest of EDOS L0 replacement data from DTF-2 tape. However, it is possible to use UNIX commands under other circumstances to transfer data from either 8mm or DTF-2 tapes into directories where the data can be picked up by an appropriate polling process.

In all cases of media ingest the Ingest Technician uses the **ECS Ingest** GUI (**Monitor/Control** screen) to monitor and control ingest request processing after the data have been copied from tape and an ingest request has been generated.

Using the ECS Ingest GUI Media Interface to Perform Media Ingest

The Ingest Technician uses the **ECS Ingest** GUI to put the PDR and data files into the applicable directories and create the appropriate ingest request(s), which is (are) sent to the Ingest Request Manager. The Ingest Request Manager packages each request into granules and sends them to the Granule Server, which requests the Science Data Server to insert the data and/or metadata into the archive and/or catalog.

Labeling Tape Cartridges with Bar Codes

DAAC policy may require a bar-code label on each tape that contains data to be ingested. The labels are typically already on the tape when received from the data provider. However, the Ingest Technician may affix the labels to the tape cartridges if necessary.

Performing Media Ingest from 8mm Tape Using the ECS Ingest GUI Media Interface

To perform hard media ingest from 8mm tape with the **ECS Ingest** GUI media interface use the procedure that follows. The procedure starts with the following assumptions:

- The PDR/PMPDR file is available, either placed on the network by the data provider or embedded in the media.
- If applicable, the contents of the PDR/PMPDR on the tape have been compared with the contents of the hardcopy version of the PDR/PMPDR and there are no discrepancies.
  - If there had been any discrepancies between the contents of the PDR/PMPDR on the tape and the contents of the hardcopy version of the PDR/PMPDR, the data provider (e.g., IGS) was notified and subsequently supplied a corrected tape.
- All applicable servers are currently running.

Performing Media Ingest from 8mm Tape Using the ECS Ingest GUI Media Interface

---

1 Load the tape containing the data to be ingested into a stacker as described in the procedure for **Unloading and Loading Stackers** (subsequent section of this lesson).

2 Launch an additional instance of the **ECS Ingest** GUI.

- Refer to the procedure for **Launching the ECS Ingest GUI** (previous section of this lesson).
- The **ECS Ingest** GUI (Figure 6) is displayed.
- During data transfer from tape, the instance of the **ECS Ingest** GUI being used for media ingest prevents any other function from being selected by that instance of the GUI until the transfer has been completed.

3 Click on the Ingest GUI **Media Ingest** tab.

- The **Media Ingest** screen (Figure 20) is displayed.

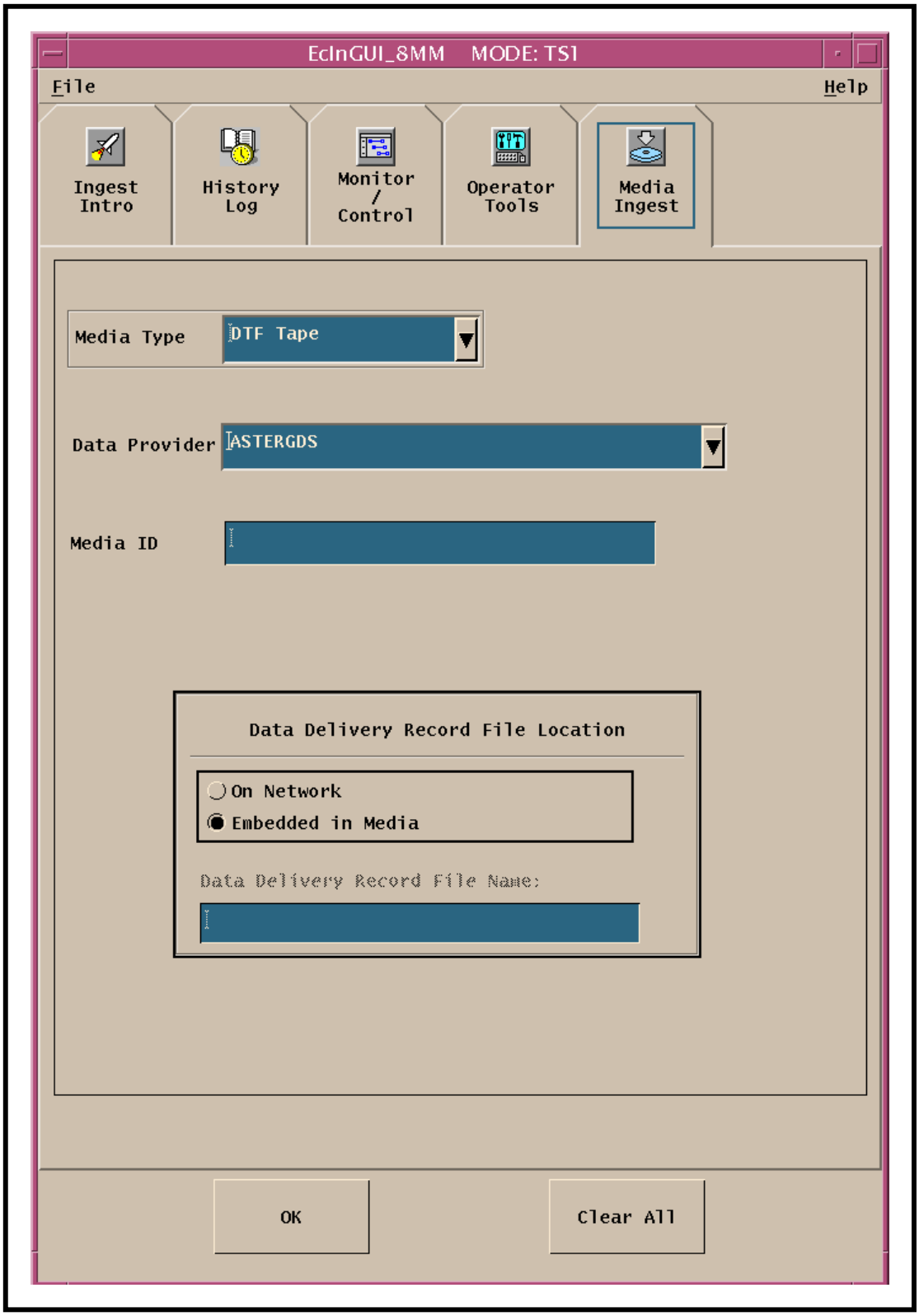

Figure 20. Media Ingest Screen

4 To enter the type of medium (i.e., **8mm 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.

5 To enter the data provider (e.g., **IGSASA_Media**) 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.

6 Type the media ID in the **Media ID** field.

7 Click on the appropriate radio button in the **Data Delivery Record File Location** box.

- Click on the **On Network** button if the PMPDR file is located on the network.
- Click on the **Embedded in Media** button if the PMPDR file is recorded on the tape.

8 Type the data delivery record file name (e.g., **IGSASA.19991020123845.PMPDR**) in the **Data Delivery Record File Name** field.

9 Click on the **OK** button at the bottom of the GUI.

- Data transfer is initiated.

10 While waiting for completion of data transfer from the tape, monitor request processing by performing the procedure for **Monitoring/Controlling Ingest Requests** (previous section of this lesson) using another instance of the **ECS Ingest** GUI.

- During data transfer from tape, the **ECS Ingest** GUI prevents any other function from being selected from the media-ingest instance of the GUI until the transfer has been completed.
- A **Media-Ingest Request Completed** pop-up window is displayed when data transfer from the tape has been completed.

11 Click on the **OK** button on the **Media-Ingest Request Completed** pop-up window associated with the **ECS Ingest** GUI.

- The **Media-Ingest Request Completed** pop-up window is dismissed.

12 To exit from the **ECS Ingest** GUI select **File → Exit** from the pull-down menu.

- The **ECS Ingest** GUI is dismissed.

Unloading and Loading Stackers

The procedure that follows applies to ingest from 8mm tape cartridges only. It involves the use of the **Storage Management Control** GUI to perform the following activities:

- Unload a tape stacker.
- Load a tape stacker.

The procedure starts with the following assumptions:

- All applicable servers are currently running.
- The **Storage Management Control** GUI is running.
  - The **Storage Config.** screen (Figure 7) is being displayed.

Unloading and Loading Stackers

---

1 Click on the **Resource Mngmnt** tab on the **Storage Management Control** GUI.

- The **Storage Management Control** GUI **Resource Mngmnt** tab (Figure 21) is displayed.

2 Click and hold the **Media Type** option button to display a menu of media, move the mouse cursor to the appropriate type of medium (highlighting it), then release the mouse button.

- The selected type of medium is displayed on the **Media Type** option button.
- The relevant server(s) is (are) displayed in the **Media Type** window below the **Media Type** option button.
- The following type of information is displayed for each server displayed in the window below the **Media Type** option button:
  - **Server ID.**
  - **Status.**

3 Click on the line corresponding to the relevant server in the **Media Type** window.

- The selected server is highlighted.

4 Click on the **Manage Hardware** button on the **Resource Mngmnt** tab.

- The **Manage Stackers** window (Figure 22) is displayed.
- The available stackers are listed in the stacker information window near the top of the **Manage Stackers** window.

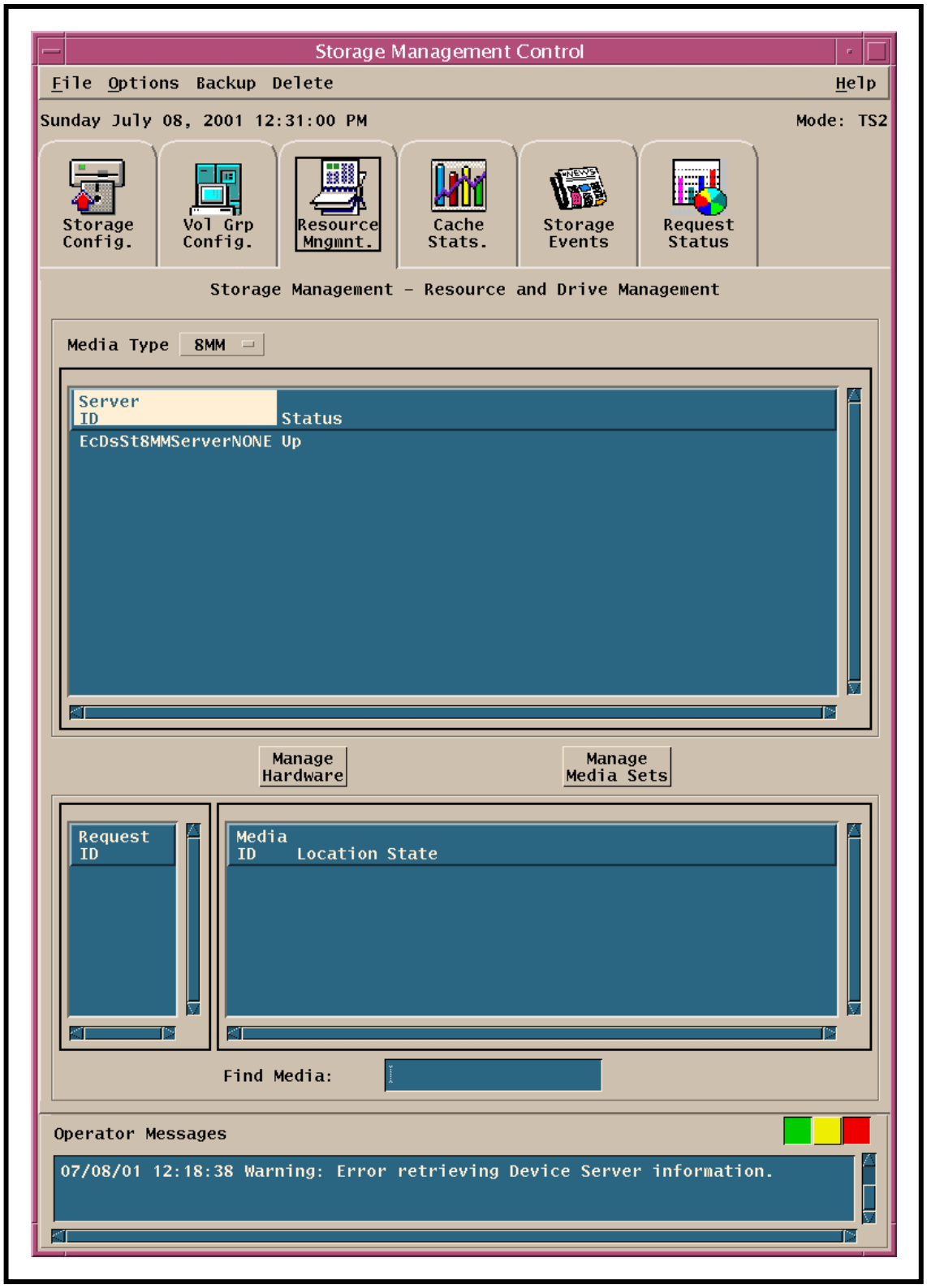

Figure 21. Resource Mngmnt Tab (Storage Management Control GUI)

Figure 22. Manage Stackers Window (Storage Management Control GUI)

5 Select (highlight) the line(s) in the stacker information window corresponding to the stacker(s) to be loaded (or unloaded and reloaded).

- The stacker(s) to be loaded (or unloaded and reloaded) is (are) highlighted.
- The **Select All** button below the stacker information window can be selected if all listed stackers are to be unloaded/loaded.

6 Observe the status of tapes/slots and drives in the stacker to ensure that stacker tapes can be unloaded/loaded without interfering with any ongoing operations.

- The status of tapes/slots in the stacker is displayed in the slot information window near the bottom of the **Manage Stackers** window.
  - **Loaded Status** column indicates whether the slot is loaded or empty. If the slot is "loaded," it has been assigned a particular tape (as described in Steps 21 through 25). If the slot is "empty," no tape has been identified for the slot.
  - **Allocated Status** column indicates whether or not the slot has been allocated for use by a request.
- The status of stacker drives is displayed in the drive information window near the middle of the **Manage Stackers** window.

7 If one of the drives is unavailable for 8mm ingest, select (highlight) the line in the drive information window corresponding to the unavailable drive.

- A drive may be unavailable for 8mm ingest if it is being used in a manual mode for reading or writing to a tape or if it is out of service for maintenance.

8 If one of the drives is unavailable for 8mm ingest and its **Online Status** is not **Offline**, click and hold the **Online Status** option button below the drive information window to display a menu of statuses, move the mouse cursor to **Offline** (highlighting it), then release the mouse button.

- If one of the drives is unavailable for 8mm ingest, it should be marked offline in the database (via the **Storage Management Control GUI**) so Storage Management will assign the 8mm ingest to the drive that is available.
  - Stacker operations are managed through tables in the Storage Management database.
  - If an offline drive is not marked **Offline** in the database, the stacker may attempt to use the offline drive in response to an ingest request. In such a case the ingest request would fail and an “Unable to request mount media service” error message would be displayed.

9 Turn the key in the key-lock of the stacker to stop stacker unit operation.

10 Wait for the stacker cartridge handling mechanism to finish the current operation and move to the "park" position.

- When the handling mechanism reaches the "park" position, the stacker unit's door interlock mechanism releases and a **Status: Unlocked** message is displayed on the unit.

11 Open the front door of the stacker.

12 Remove the magazine (cartridge holder) by pulling out, first from the top, then the bottom.

13 If applicable, remove the tape cartridge(s) by gently pulling each one straight out from its slot.

- Tapes can be removed and replaced individually without having to unload and load the entire stacker.

14 Verify that the write-protect switch (e.g., red tab) on each tape cartridge to be loaded is set correctly for the desired operation.

- Options are:
  - **REC** (writable).
  - **SAVE** (read only).
- Either position is acceptable for Ingest but **SAVE** is typically used.

15 If required by DAAC policy, verify that there is a bar-code label properly attached to the tape cartridge.

16 Hold the tape cartridge with the write-protect switch toward the right.

17 Insert the tape cartridge by pushing gently straight into a slot in the magazine (cartridge holder).

18 Repeat Steps 14 through 17 for each tape cartridge to be loaded into the tape stacker.

19 Click on the line(s) in the slot information window near the bottom of the **Manage Stackers** window corresponding to the slot(s) to be loaded (or unloaded and reloaded).

- The slot(s) to be loaded (or unloaded and reloaded) is (are) highlighted.
- The **Select All** button below the stacker information window can be selected if all slots are to be unloaded/loaded.

20 If loading a stacker and the slot(s) to be loaded has (have) **Online Status** of **Offline**, click and hold the **Online Status** button, move the mouse cursor to the **Online** option (highlighting it), then release the mouse button.

21 Click and hold the **Media ID Assignment** button on the **Manage Stackers Window** (Figure 22) to display a menu of media assignment options, move the mouse cursor to the desired option (highlighting it), then release the mouse button.

- Options are:
  - **Manual** (the technician must manually enter the "Media ID" for each tape loaded).
  - **Auto Increment** (the technician enters the first Media ID; any additional slots to be filled are assigned Media IDs that sequentially follow the Media ID entered by the technician).
- When using a handheld bar-code reader, the **Media ID Assignment** button should be set to **Manual**.

22 Click and hold the **Media Operations** button to display a menu of media operations, move the mouse cursor to the appropriate selection (highlighting it), then release the mouse button.

- The **Media Operations** pull-down menu offers the following options for loading and unloading media:
  - **Load Media** [allows the operator to load one or more pieces of media (e.g., to load a tape with data to be ingested into a currently empty slot)].
  - **Unload Media** [allows the operator to unload one or more pieces of media (e.g., to remove a tape with data that have just been ingested)].
  - **Replace Media** [allows the operator to both load and unload pieces of media as a single operation].
  - **Load Media Set** [allows the operator to load a group of associated media that have been identified as a media set. Media sets must be predefined using the **Manage Media Sets** window, which is accessible through the **Manage Media Sets** button on the **Resource Mngmnt** tab of the **Storage Management Control** GUI].
- In general **Load Media** should be selected if the slot is empty; **Replace Media** should be selected if the slot is loaded (already contains a tape that has to be removed so another tape can be loaded).
  - If **Load Media** is selected, a stacker management **Load Media** window (Figure 23) is displayed.
  - If **Replace Media** is selected, a **Replace Media** window (Figure 24) is displayed.

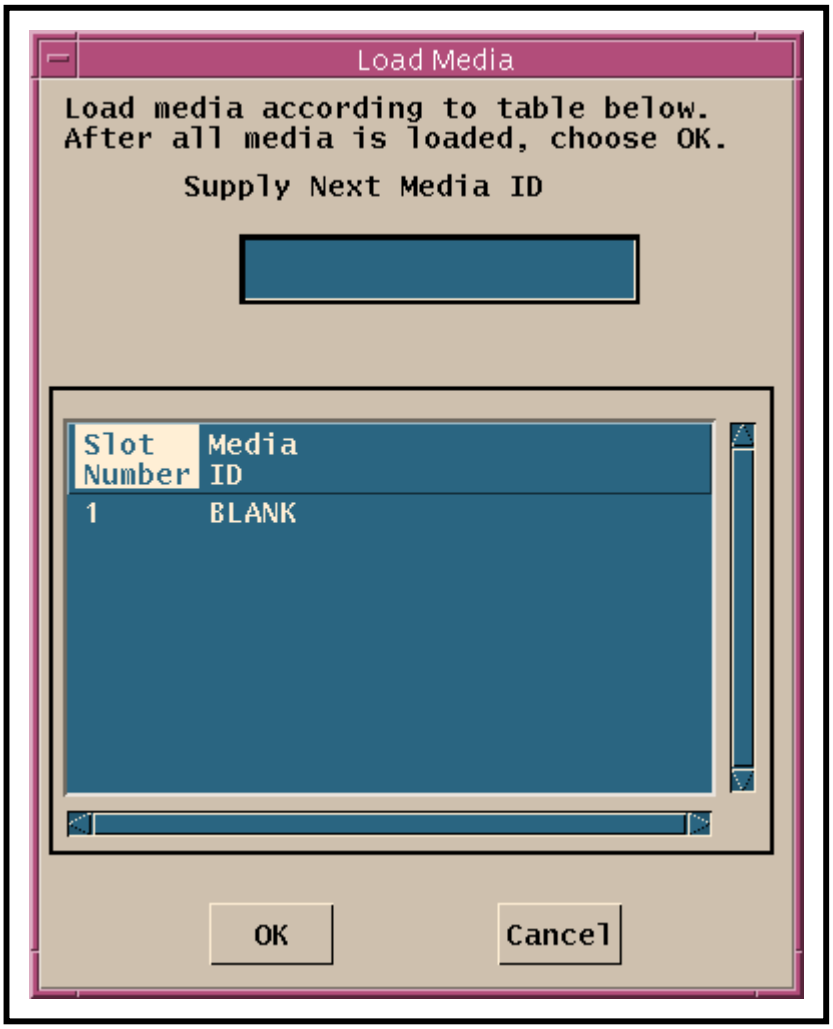

Figure 23. Load Media Window (Stacker Management)

Figure 24. Replace Media Window

– If **Unload Media** is selected, a stacker management **Unload Media** (Figure 25) window is displayed.

– If **Load Media Set** is selected, a **Load Media Set** window (Figure 26) is displayed.

23 Click on a line in the media window corresponding to a slot that was loaded (or unloaded and reloaded).

- A slot that was loaded (or unloaded and reloaded) is highlighted.

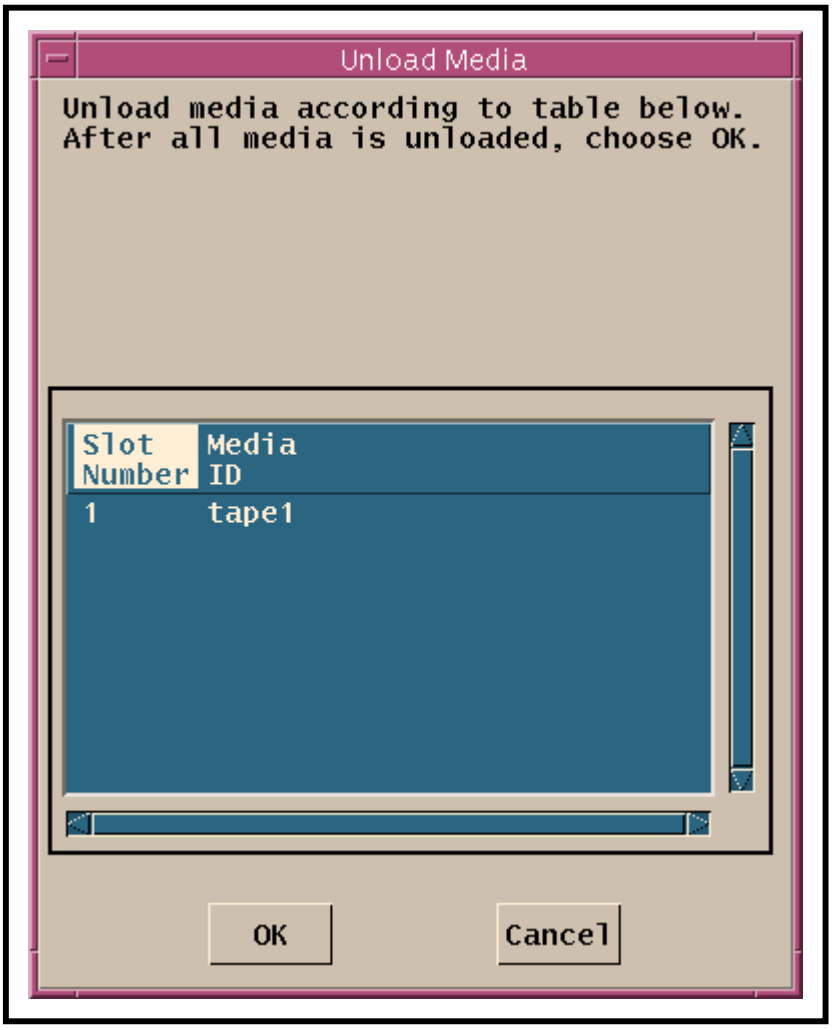

Figure 25. Unload Media Window (Stacker Management)

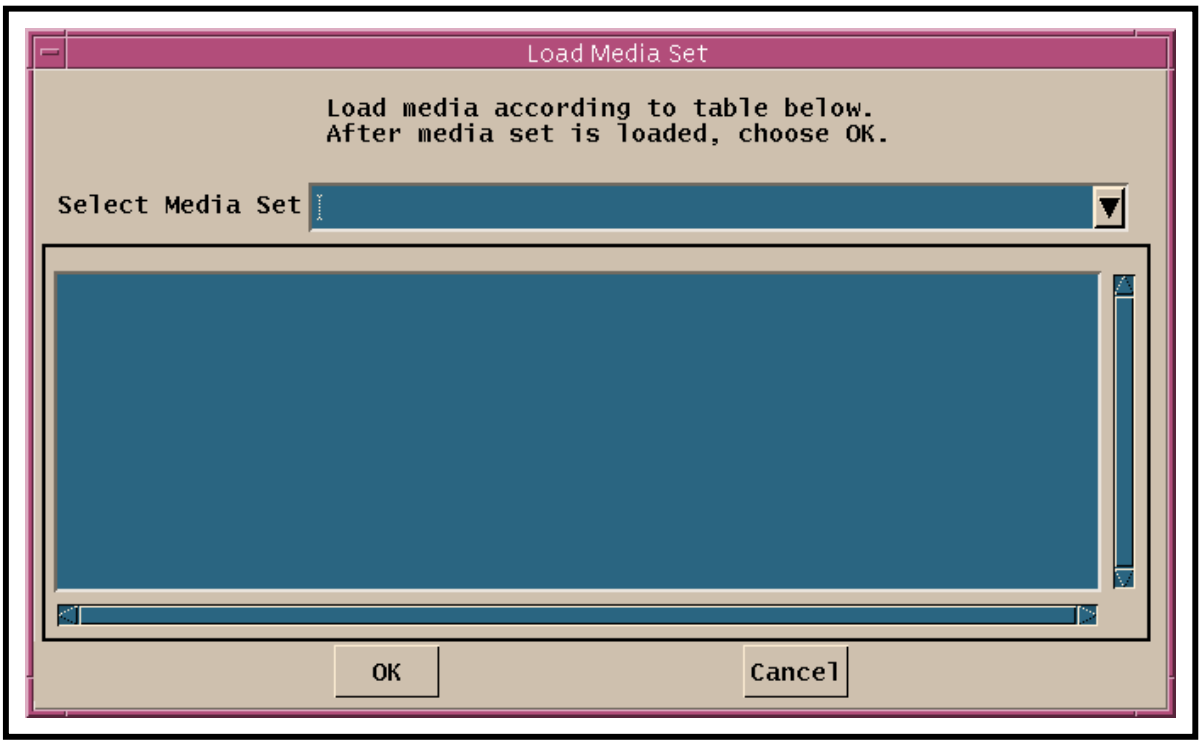

Figure 26. Load Media Set Window

24 If applicable, type the media ID in the **Supply Next Media ID** field of the media window then press **Return/Enter**.

- The media ID is the identification of the tape specified on the label attached to the tape cartridge that was put in the corresponding slot.
- The media ID may be entered either by typing the information or using a hand-held bar-code reader (if available).
- When typing media IDs, be sure to press the **Return/Enter** key after typing each ID in the **Supply Next Media ID** field.
  - The media ID is displayed in the media window on the line corresponding to the selected slot.

25 Repeat Steps 23 and 24 if multiple tapes are being loaded.

26 Click on the appropriate button from the following selections:

- **OK** – to save the changes to media ID(s) and dismiss the media window.
  - The media window is dismissed.

- If **Load Media** or **Replace Media** was the selected action, the media ID(s) is (are) displayed in the **Media ID** column of the slot information window near the bottom of the **Manage Stackers** window.
- If **Unload Media** was the selected action, there is no media ID displayed in the **Media ID** column of the slot information window.

- **Cancel** – to dismiss the media window without saving changes to media ID(s).
  - The media window is dismissed.
  - The media ID information in the slot information window near the bottom of the **Manage Stackers** window (Figure 22) is unchanged.

27 Replace the magazine (cartridge holder) in the stacker by inserting the two orientation features on the bottom of the magazine into the bottom of the plate then pressing on the top and snapping the magazine in place.

28 Close the door to start the process of resuming tape stacker operation.

29 Lock the door by turning the key in the key-lock.

30 Observe the information displayed in the slot information window at the bottom of the **Manage Stackers** window (Figure 22) to determine whether the "Access Mode" associated with each slot number is consistent with the setting of the write-protect switch on each tape loaded.

- The "Access Mode" associated with each slot number must be consistent with the setting of the write-protect switch on each tape loaded. (Refer to Step 14.)
- The following "Access Modes" are available:
  - **RO** - read only.
  - **RW** - read/write.
- If the "Access Mode" associated with any slot number does not need to be changed, go to Step 34; otherwise, continue with Step 31.

31 If the "Access Mode" for a slot is to be changed, click on the line in the slot information window corresponding to the slot with the "Access Mode" to be changed.

- The **Select All** button below the slot information window can be selected if all listed slots are to be set to the same "Access Mode."

32 Click and hold the **Access Mode** button to display a menu of access mode options, move the mouse cursor to the desired option (highlighting it), then release the mouse button.

- The following "Access Modes" are available:
  - **RO**.

– **RW**.

- The **Access Mode** entry in the slot information window corresponding to the selected **Slot Number** changes to the selected value.

33 Repeat Steps 31 and 32 for each tape cartridge with an "Access Mode" to be changed.

34 To close the **Manage Stackers** window click on the **Close** button at the bottom of the window.

- The **Manage Stackers** window (Figure 22) is dismissed.

35 To exit from the **Storage Management Control** GUI select **File → Exit** from the pull-down menu.

- The **Storage Management Control** GUI is dismissed.

Performing Media Ingest from DTF-2 Tape Using the ECS Ingest GUI Media Interface

The DAAC Ingest Technician may have to ingest data from a DTF-2 tape utilizing the **ECS Ingest** GUI and a Sony DTF-2 drive.

To perform hard media ingest from a DTF-2 tape use the procedure that follows. The procedure starts with the assumption that the PDR file is available, either placed on the network by the data provider or embedded in the media.

Performing Media Ingest from DTF-2 Tape Using the ECS Ingest GUI Media Interface

---

1 Load the tape containing the data to be ingested into a DTF-2 drive as described in the procedure for **Loading a DTF-2 Drive for Use with the ECS Ingest GUI** (subsequent section of this lesson).

2 Launch a DTF instance of the **ECS Ingest** GUI.

- Refer to the procedure for **Launching the ECS Ingest GUI** (previous section of this lesson).
- The **ECS Ingest** GUI (Figure 6) is displayed.
- During data transfer from tape, the instance of the **ECS Ingest** GUI being used for media ingest prevents any other function from being selected (using that instance of the GUI) until the transfer has been completed.

3 Click on the Ingest GUI **Media Ingest** tab.

- The **Media Ingest** screen (Figure 20) is displayed.

4 To enter the type of medium (i.e., **DTF 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.

5 To enter the data provider (e.g., **ASTERGDS**) 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.

6 Type the media ID in the **Media ID** field.

- The media ID must be same as the media ID entered on the **Storage Management Control** GUI when performing the procedure for **Loading a DTF-2 Drive for Use with the ECS Ingest GUI** (subsequent section of this lesson).

7 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.
  - Embedded in Media is the likely choice.

8 Type the data delivery record file name (e.g., **SDA048C.PDR**) in the **Data Delivery Record File Name** field.

- The PDR (PMPDR) name is either specified on the label attached to the Sony DTF tape cartridge or is included in the accompanying documentation.

9 Click on the **OK** button at the bottom of the GUI.

10 While waiting for completion of data transfer from the tape, monitor request processing by performing the procedure for **Monitoring/Controlling Ingest Requests** (previous section of this lesson) using another instance of the **ECS Ingest** GUI.

- During data transfer from tape, the **ECS Ingest** GUI prevents any other function from being selected from the media-ingest instance of the GUI until the transfer has been completed.
- A **Media-Ingest Request Completed** pop-up window is displayed when data transfer from the tape has been completed.

11 Click on the **OK** button on the **Media-Ingest Request Completed** pop-up window associated with the **ECS Ingest** GUI.

- The **Media-Ingest Request Completed** pop-up window is dismissed.

12 Unload the tape from the DTF-2 drive as described in the procedure for **Unloading a DTF-2 Drive for Use with the ECS Ingest GUI** (subsequent section of this lesson).

13 To exit from the **ECS Ingest** GUI select **File → Exit** from the pull-down menu.

- The **ECS Ingest** GUI is dismissed.

Loading a DTF-2 Drive for Use with the ECS Ingest GUI

A DTF-2 drive supports the reading of data from several types of cassettes, including (but not limited to) cassettes of the following types:

- DTF-2 L [large] cassette.
- DTF-2 S [small] cassette.
- DTF-1 L [large] cassette.
- DTF-1 S [small] cassette.

The procedure that follows applies to ingest from DTF-2 cassettes (although it should work for DTF-1 cassettes as well). It involves the use of the **Storage Management Control** GUI when loading a DTF-2 drive.

The procedure starts with the following assumptions:

- All applicable servers are currently running.
- The **Storage Management Control** GUI is running.
  - The **Storage Config.** screen (Figure 7) is being displayed.
- The DTF-2 drive is in service.

Loading a DTF-2 Drive for Use with the ECS Ingest GUI

---

1 Ensure that the PDR (PMPDR) name has been written down so it will be available to be entered on the **ECS Ingest** GUI when performing media ingest from DTF-2 tape.

- The PDR (PMPDR) name should be specified on the label attached to the Sony DTF tape cartridge or included in accompanying documentation.
- If the PDR (PMPDR) name is not specified on the label attached to the Sony DTF tape cartridge or included in accompanying documentation, read the file name from the tape as described in Steps 1 through 4 of the procedure for **Performing Ingest of Data from EDOS DTF-2 Archive Tapes** (subsequent section of this lesson).

2 Ensure that the media ID has been written down so it will be available to be entered on the **Storage Management Control** GUI and **ECS Ingest** GUI.

- The media ID should be specified on the label attached to the Sony DTF tape cartridge.
- If the media ID is not specified on the label attached to the Sony DTF tape cartridge, invent a unique ID for the tape.

3 Verify that **No Tape 0H** is indicated on the DTF tape drive's display window.

- If **No Tape 0H** is not indicated on the DTF tape drive's display window, wait until the ongoing operation (if any) has terminated, then push the **UNLOAD** button on the front of the DTF tape drive and remove the tape from the drive after it has completed the unloading process.

4 Insert the Sony DTF tape containing the granules to be ingested into the cassette slot of the DTF tape drive.

5 Wait for **Loaded [00]** to be indicated on the DTF tape drive's display window.

6 Click on the **Resource Mngmnt** tab on the **Storage Management Control** GUI.

- The **Storage Management Control** GUI **Resource Mngmnt** tab (Figure 21) is displayed.

7 Click and hold the **Media Type** option button to display a menu of media, move the mouse cursor to the appropriate type of medium (highlighting it), then release the mouse button.

- The selected type of medium (e.g., DTF) is displayed on the **Media Type** option button.
- The relevant server(s) is (are) displayed in the **Media Type** window below the **Media Type** option button.
- The following type of information is displayed for each server displayed in the window below the **Media Type** option button:
  - **Server ID.**
  - **Status.**

8 Click on the line corresponding to the relevant server (e.g., EcDsStDTFServerNONE) in the **Media Type** window.

- The selected server is highlighted.

9 Click on the **Manage Hardware** button on the **Resource Mngmnt** tab.

- The **Manage Drives** window (Figure 27) is displayed.

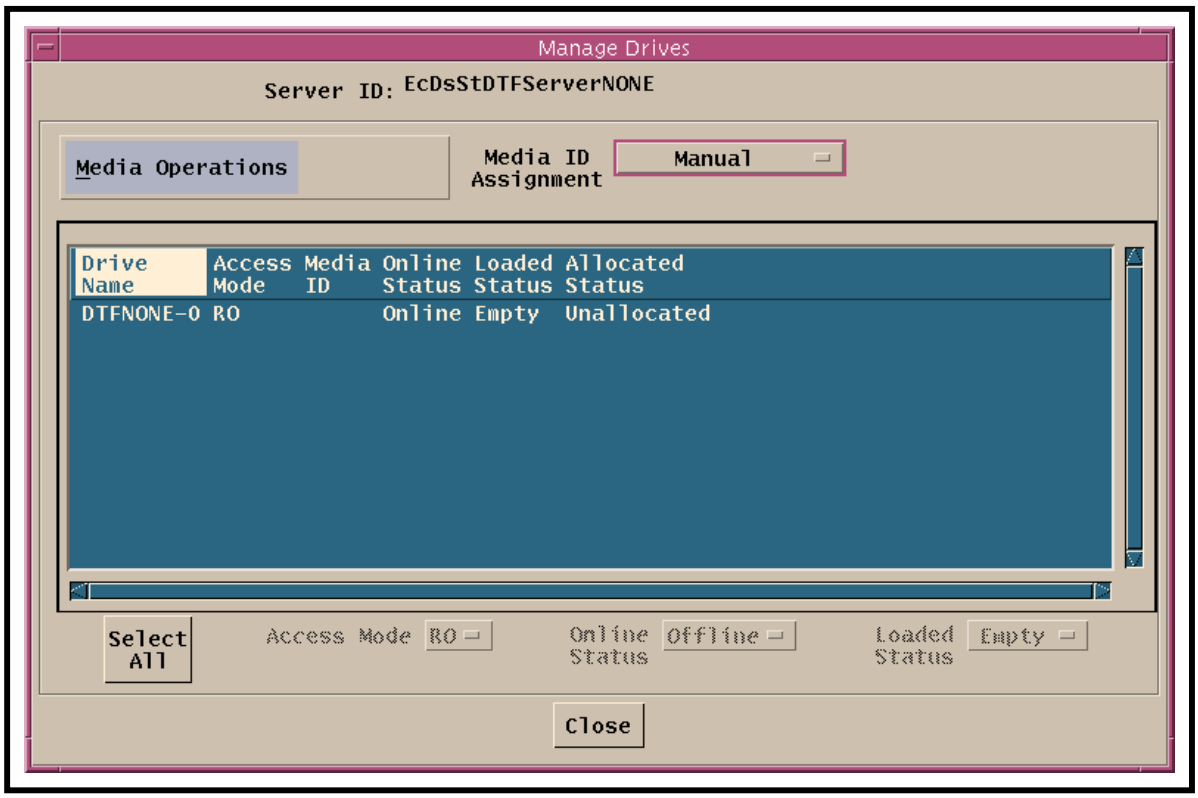

Figure 27. Manage Drives Window

- The available drive(s) is (are) listed in the drive information area of the **Manage Drives** window.
- The following fields describe the drive(s) listed in the drive information area of the **Manage Drives** window:
  - **Drive Name.**
  - **Access Mode.**
  - **Media ID.**
  - **Online Status.**
  - **Loaded Status.**
  - **Allocated Status.**

10 Select (highlight) the line in the drive information window corresponding to the drive to be loaded.

- The drive to be loaded is highlighted.

- The **Select All** button below the drive information window can be selected if all listed drives are to be loaded.

11 Verify that the **Media ID Assignment** button on the **Manage Drives** window (Figure 27) is set at the **Manual** option.

- If necessary, click and hold the **Media ID Assignment** button on the **Manage Drives** window (Figure 27) to display a menu of media assignment options, move the mouse cursor to the **Manual** option (highlighting it), then release the mouse button.

12 Click and hold the **Media Operations** button to display a menu of media operations, move the mouse cursor to the **Load Media** option (highlighting it), then release the mouse button.

- A drive management **Load Media** window (Figure 28) is displayed.

13 Type the media ID in the **Media ID** field of the **Load Media** window then press **Return/Enter**.

- The media ID (e.g., DTF1) is the identification of the tape specified on the label attached to the tape cartridge.
- When typing media IDs, be sure to press the **Return/Enter** key after typing the ID in the **Media ID** field.
  - The media ID is displayed in the media window.

14 Click on the appropriate button from the following selections:

- **OK** – to save the media ID and dismiss the media window.
  - The media window is dismissed.
  - The media ID is displayed in the **Media ID** column of the drive information area of the **Manage Drives** window.
  - **Online** is displayed in the **Online Status** column of the drive information area of the **Manage Drives** window.
    - If **Offline** is displayed in the **Online Status** column of the drive information area of the **Manage Drives** window, perform Steps 15 and 16.
  - **Loaded** is displayed in the **Loaded Status** column of the drive information area of the **Manage Drives** window.
- **Cancel** – to dismiss the media window without saving the media ID.
  - The media window is dismissed.

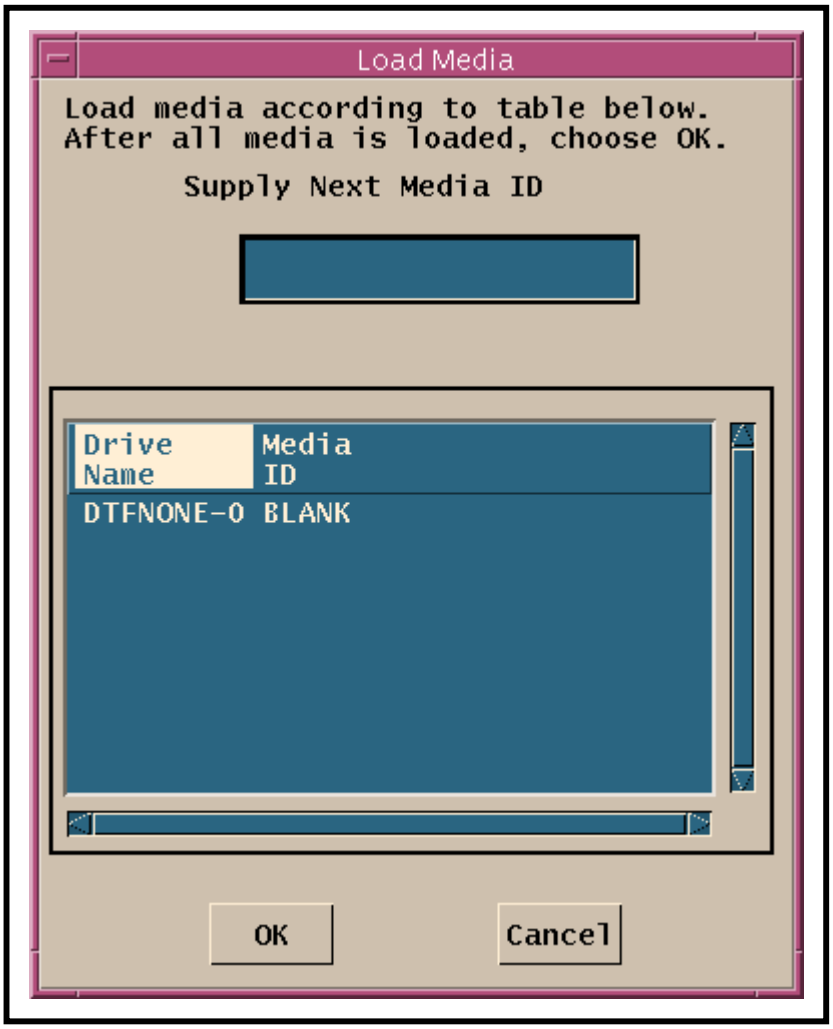

Figure 28. Load Media Window (Drive Management)

– The media ID information in the drive information area of the **Manage Drives** window is unchanged.

15 If **Offline** is displayed in the **Online Status** column of the drive information area of the **Manage Drives** window, first select (highlight) the line in the drive information window corresponding to the drive being loaded.

16 If **Offline** is displayed in the **Online Status** column of the drive information area of the **Manage Drives** window, click and hold the **Online Status** button, move the mouse cursor to the **Online** option (highlighting it), then release the mouse button.

NOTE: It may be desirable (but it is not essential) to leave the **Manage Drives** window open while **Performing Media Ingest from DTF-2 Tape Using the ECS Ingest GUI Media Interface** and **Unloading a DTF-2 Drive for Use with the ECS Ingest GUI** (subsequent sections of this lesson) because the window is used when unloading the drive.

17 To close the **Manage Drives** window click on the **Close** button at the bottom of the window.

- The **Manage Drives** window (Figure 27) is dismissed.

18 If it is necessary to exit from the **Storage Management Control** GUI, select **File → Exit** from the pull-down menu.

- The **Storage Management Control** GUI is dismissed.

Unloading a DTF-2 Drive for Use with the ECS Ingest GUI

The procedure that follows involves the use of the **Storage Management Control** GUI when unloading a DTF-2 drive.

The procedure starts with the following assumptions:

- All applicable servers are currently running.
- The DTF-2 drive is in service.
- There is a DTF-2 tape in the drive.

Unloading a DTF-2 Drive for Use with the ECS Ingest GUI

---

1 Push the **UNLOAD** button on the front of the DTF tape drive.

- The tape goes through an unloading process.
- At the end of the unloading process the tape is ejected from the drive.

2 After it has completed the unloading process, remove the DTF-2 tape cartridge from the tape drive cassette slot.

3 If an instance of the **Storage Management Control** GUI is not currently running, launch the GUI as described in the procedure for **Launching the Storage Management Control GUI** (previous section of this lesson).

- The **Storage Management Control** GUI **Storage Config.** tab (Figure 7) is displayed.

4 Click on the **Resource Mngmnt** tab on the **Storage Management Control** GUI.

- The **Storage Management Control** GUI **Resource Mngmnt** tab (Figure 21) is displayed.

5 Click and hold the **Media Type** option button to display a menu of media, move the mouse cursor to the appropriate type of medium (highlighting it), then release the mouse button.

- The selected type of medium (e.g., DTF) is displayed on the **Media Type** option button.
- The relevant server(s) is (are) displayed in the **Media Type** window below the **Media Type** option button.
- The following type of information is displayed for each server displayed in the window below the **Media Type** option button:
  - **Server ID.**
  - **Status.**

6 Click on the line corresponding to the relevant server (e.g., EcDsStDTFServerNONE) in the **Media Type** window.

- The selected server is highlighted.

7 Click on the **Manage Hardware** button on the **Resource Mngmnt** tab.

- The **Manage Drives** window (Figure 27) is displayed.
- The available drive(s) is (are) listed in the drive information area of the **Manage Drives** window.
- The following fields describe the drive(s) listed in the drive information area of the **Manage Drives** window:
  - **Drive Name.**
  - **Access Mode.**
  - **Media ID.**
  - **Online Status.**
  - **Loaded Status.**
  - **Allocated Status.**

8 Select (highlight) the line in the drive information window corresponding to the drive to be unloaded.

- The drive to be unloaded is highlighted.
- The **Select All** button below the drive information window can be selected if all listed drives are to be unloaded.

9 Click and hold the **Media Operations** button to display a menu of media operations, move the mouse cursor to the **Unload Media** option (highlighting it), then release the mouse button.

- A drive management **Unload Media** window (Figure 29) is displayed.

10 Select (highlight) the line in the **Unload Media** window corresponding to the tape to be unloaded.

11 Click on the appropriate button from the following selections:

- **OK** – to remove the media ID and dismiss the media window.
  - The media window is dismissed.
  - The media ID is removed from the **Media ID** column of the drive information area of the **Manage Drives** window.
  - **Offline** should be displayed in the **Online Status** column and **Empty** should be displayed in the **Loaded Status** of the drive information area of the **Manage Drives** window.
    - If the conditions are as they should be, go to Step 17.
    - If **Online** is displayed in the **Online Status** column or **Loaded** is displayed in the **Loaded Status** of the drive information area of the **Manage Drives** window, perform Steps 12 and 13.
- **Cancel** – to dismiss the media window without removing the media ID.
  - The media window is dismissed.
  - The media ID information in the drive information area of the **Manage Drives** window is unchanged.

12 If **Loaded** is displayed in the affected drive's **Loaded Status** column or **Online** is displayed in the affected drive's **Online Status** column of the **Manage Drives** window, first click on the **Close** button at the bottom of the window.

- The **Manage Drives** window (Figure 27) is dismissed.

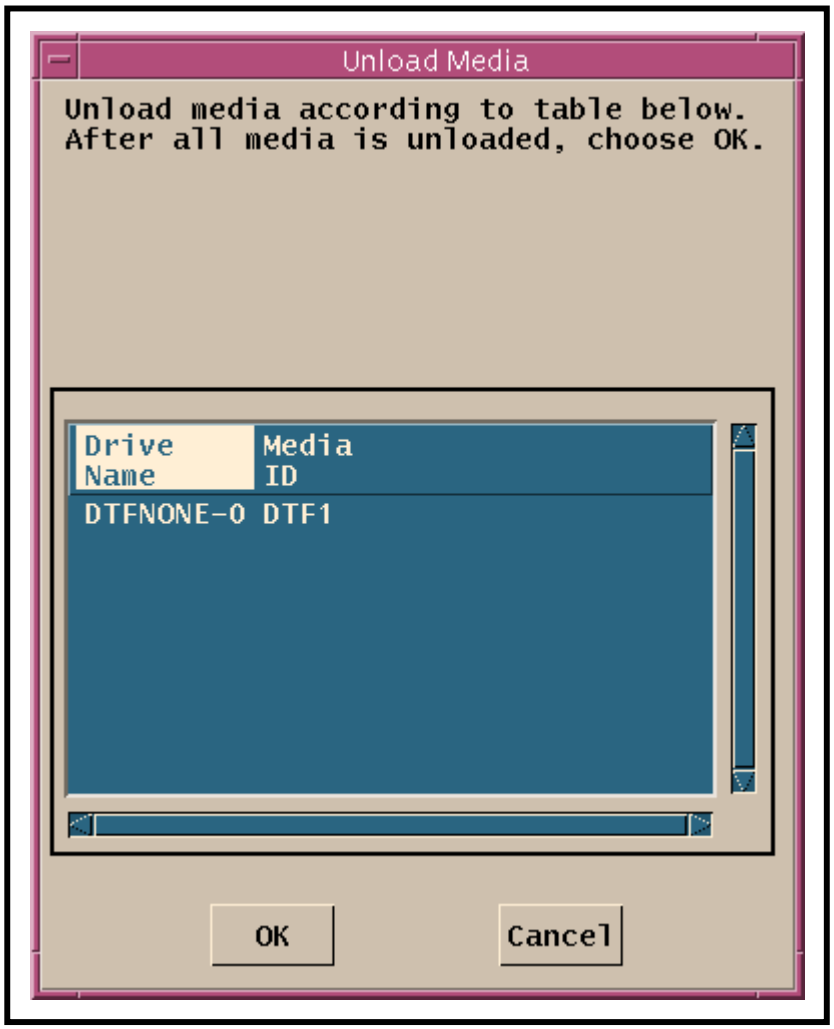

Figure 29. Unload Media Window (Drive Management)

13 If **Loaded** was displayed in the affected drive's **Loaded Status** column or **Online** was displayed in the affected drive's **Online Status** column of the **Manage Drives** window, click on the **Manage Hardware** button on the **Resource Mngmnt** tab.

- The **Manage Drives** window (Figure 27) is displayed.
- **Empty** should be displayed in the affected drive's **Loaded Status** column and **Offline** should be displayed in the affected drive's **Online Status** column of the **Manage Drives** window.
  - If the conditions are as they should be, go to Step 17.
  - If **Loaded** is displayed in the **Loaded Status** column or **Online** is displayed in the **Online Status** column of the **Manage Drives** window, perform Steps 14 through 16 (as necessary).

14 If **Loaded** is displayed in the affected drive's **Loaded Status** column or **Online** is displayed in the affected drive's **Online Status** column of the **Manage Drives** window, first select (highlight) the line in the drive information window corresponding to the drive that was unloaded.

15 If **Loaded** is displayed in the affected drive's **Loaded Status** column of the **Manage Drives** window, click and hold the **Loaded Status** button, move the mouse cursor to the **Empty** option (highlighting it), then release the mouse button.

- **Empty** is displayed in the **Loaded Status** column of the **Manage Drives** window.

16 If **Online** is displayed in the affected drive's **Online Status** column of the **Manage Drives** window, click and hold the **Online Status** button, move the mouse cursor to the **Offline** option (highlighting it), then release the mouse button.

- **Offline** is displayed in the **Online Status** column of the **Manage Drives** window.

17 To close the **Manage Drives** window click on the **Close** button at the bottom of the window.

- The **Manage Drives** window (Figure 27) is dismissed.

18 To exit from the **Storage Management Control** GUI select **File → Exit** from the pull-down menu.

- The **Storage Management Control** GUI is dismissed.

Using the INGEST Media Tape Reader GUI to Perform Media Ingest

The Ingest Technician uses the **INGEST Media Tape Reader** GUI to generate the PDR(s) for the data files on the tape and put the PDR(s) and data files into the proper PDR and data directories for polling. Then the corresponding ingest polling process picks up the PDRs in the polling directory and creates the appropriate ingest request(s), which is (are) sent to the Ingest Request Manager. The Ingest Request Manager packages each request into granules and sends them to the Granule Server, which requests the Science Data Server to insert the data and/or metadata into the archive and/or catalog.

Performing Media Ingest Using the INGEST Media Tape Reader GUI

To perform hard media ingest from either 8mm or DTF-2 tape with the **INGEST Media Tape Reader** GUI use the procedure that follows. The procedure starts with the following assumptions:

- All applicable servers are currently running.
- The **ECS Ingest** GUI has been launched and is being displayed.

1 Load the tape containing the data to be ingested as described in the appropriate procedure:

- **Manually Loading an 8mm Tape Cartridge into a Tape Drive in an 8mm Tape Stacker** (subsequent section of this lesson).
- **Unloading and Loading 8mm Tape Stackers for Sequential Mode Operation** (subsequent section of this lesson).
- **Performing DTF-2 Drive Loading** (subsequent section of this lesson).

2 Access a terminal window logged in to the Sun Consolidation Internal Server host.

- Examples of Sun Consolidation Internal Server host names include **e0acs11, g0acs11, l0acs03, and n0acs04**.
- For detailed instructions refer to the procedure for **Logging in to System Hosts** (previous section of this lesson).

3 Type **cd /usr/ecs/*MODE*/CUSTOM/utilities** then press **Return/Enter**.

- Change directory to the directory containing the **INGEST Media Tape Reader** GUI startup script (e.g., EcInTapeReaderGUI).
- 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.

4 Type **EcInTapeReaderGUI *INSTANCE*** then press **Return/Enter**.

- The **INGEST Media Tape Reader** GUI **Welcome Screen** (Figure 30) is displayed.
- ***INSTANCE*** is the appropriate instance of the GUI, typically either **8mm** or **DTF1**.
  - To determine the available instances, check the names of the configuration files in the cfg subdirectory (i.e., /usr/ecs/*MODE*/CUSTOM/cfg).
  - The instances are included in the names of the configuration files; i.e., the portion of a file name between “EcInTapeReaderGUI.” and “.CFG”.

Figure 30. INGEST Media Tape Reader GUI: Welcome Screen

– For example, if the following files are among those listed in the cfg subdirectory:

  EcInTapeReaderGUI.8mm.CFG
  EcInTapeReaderGUI.DTF1.CFG

  there are two possible instances of the **INGEST Media Tape Reader** GUI; i.e., **8mm** and **DTF1**.

– Only one instance of the **INGEST Media Tape Reader** GUI may be run for each tape drive at a time (e.g., instances of the **INGEST Media Tape Reader** GUI for 8mm and DTF1 can run simultaneously but if there is only one DTF drive, only one DTF instance of the GUI should be launched).

- Multiple instances of the **INGEST Media Tape Reader** GUI may run simultaneously on multiple tape drives as long as they have different instance names [e.g., if there are two instances of the **INGEST Media Tape Reader** GUI for DTF, with configuration files named EcInTapeReaderGUI.DTF1.CFG and EcInTapeReaderGUI.DTF2.CFG, it is permissible to run two instances (i.e., DTF1 and DTF2) of the **INGEST Media Tape Reader** simultaneously].

5 Click on the **INGEST Media Tape Reader** GUI **Read Tape** button.

- The **INGEST Media Tape Reader** GUI **Monitor Screen** (Figure 31) is displayed.
- The **INGEST Media Tape Reader** GUI initiates reading of the tape in the tape drive.
  - The first tar file is read from the tape.
  - For DTF tape, the information in the first tar file is parsed and each tar file on the tape is displayed as a colored block on the GUI for further processing.
  - For 8mm tape, there is only one tar file on the tape to be displayed on the GUI.

6 Observe information displayed on the **INGEST Media Tape Reader** GUI **Monitor Screen**.

- Tar files are represented as colored blocks on the monitor pane.
- The first tar file is marked as "TarFile 0," the second as "TarFile 1," etc.
  - On 8mm tape there is only one tar file to be displayed on the GUI.
  - On DTF tape there are multiple tar files to be displayed on the GUI.
- Each tar file block is color-coded to draw attention to file status:
  - White New.
  - Green Running.
  - Red Error.
  - Yellow Selected.
  - Blue Successful.
- To select a specific tar file displayed on the GUI single-click on the block that represents the tar file.
  - The color of the block turns yellow, indicating that it has been selected.
  - Single-clicking on the block again deselects it.
  - Single-clicking on multiple blocks causes them to be selected (color of the blocks turns yellow).

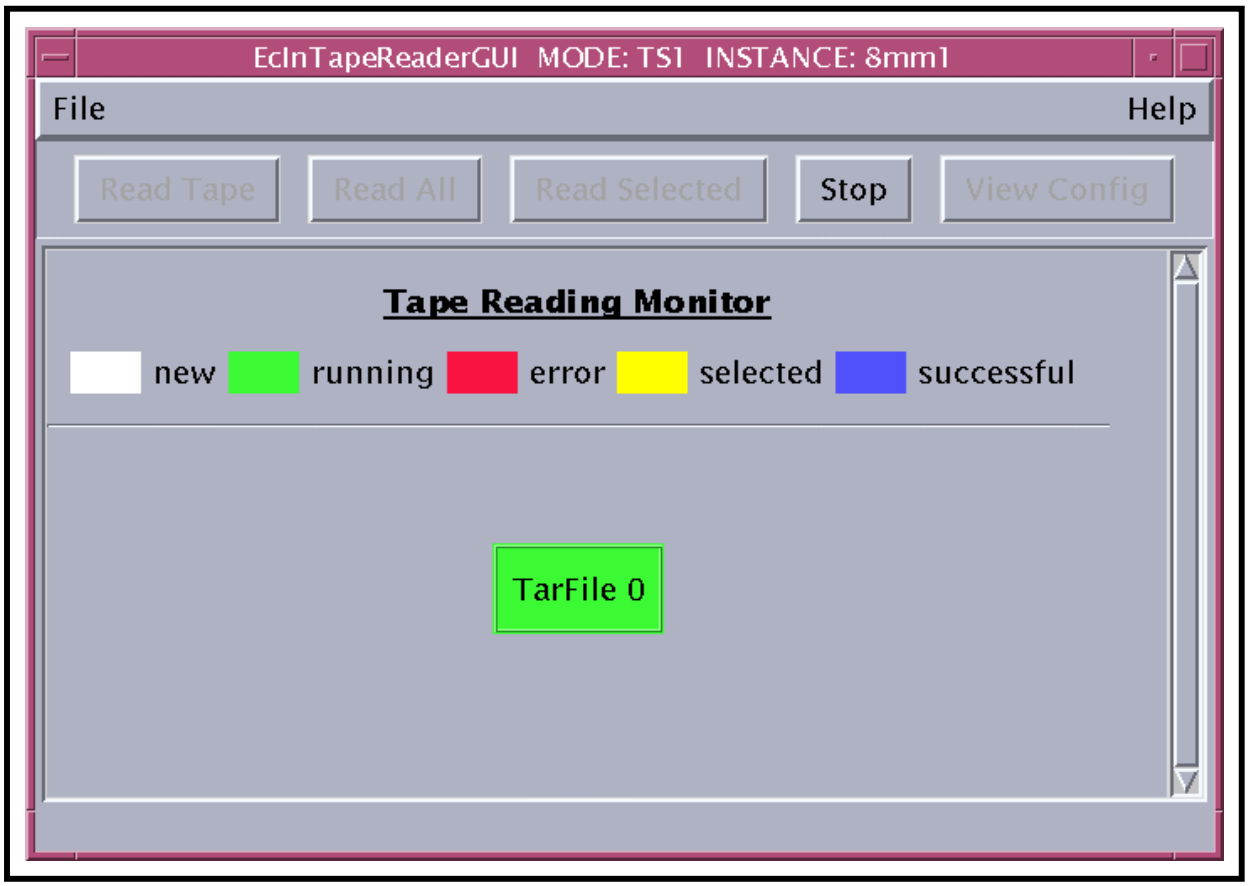

Figure 31. INGEST Media Tape Reader GUI: Monitor Screen

- To see a list of files in a specific tar file displayed on the GUI (after the tar file has been read from the tape successfully – color-coded blue) double-click on the block that represents the tar file.
- If a problem is detected, clicking on the **Stop** button stops the ongoing tape reading process.
- Clicking on the **View Config** button causes the GUI **Current Configuration Screen** to be displayed (Figure 32).
  - Clicking on the **Go Back** button causes the previous screen to be displayed.
- Selecting **Help** → **Usage** from the pull-down menu causes the EcInTapeReaderGUI.usage document to be displayed in a pop-up window
- Selecting **Help** → **Notes** from the pull-down menu causes the EcInTapeReaderGUI.notes document to be displayed in a pop-up window.

Figure 32. INGEST Media Tape Reader GUI: Current Configuration Screen

- If reading an 8mm tape, when the file has been read successfully, (block color turns blue) go to Step 10.

7 After the first tar file has been read (block color turns blue) if reading a DTF tape and all files are to be read, click on the **Read All** button.

- All remaining tar files on the tape are read, the data files are saved in the data directory, PDR files are generated, and the PDR files are saved in the PDR directory.
- To see a list of files in a specific tar file displayed on the GUI (after the tar file has been read from the tape successfully – color-coded blue) double-click on the block that represents the tar file.
- If a problem is detected, clicking on the **Stop** button stops the ongoing tape reading process.
- If no problem is detected and the **Read All** button has been selected, go to Step 10.

8 After the first tar file has been read (block color turns blue) if reading a DTF tape and not all files are to be read, first click on each tar file to be read.

- The color of each clicked-on block turns yellow, indicating that it has been selected.
  - Single-clicking again on a selected block deselects it.

9 To initiate the process of reading selected tar file(s) from a DTF tape click on the **Read Selected** button.

- The selected tar files are read from the tape, the data files are saved in the data directory, PDR files are generated, and the PDR files are saved in the PDR directory.
- To see a list of files in a specific tar file displayed on the GUI (after the tar file has been read from the tape successfully – color-coded blue) double-click on the block that represents the tar file.
- If a problem is detected, clicking on the **Stop** button stops the ongoing tape reading process.

10 To monitor Ingest request processing perform the procedure for **Monitoring/Controlling Ingest Requests** (previous section of this lesson) using an instance of the **ECS Ingest** GUI.

11 To exit from the **INGEST Media Tape Reader** GUI when all data have been read from the tape(s) select **File → Exit** from the pull-down menu.

- The **INGEST Media Tape Reader** GUI is dismissed.

12 Unload the tape drive as described in the appropriate procedure:

- **Manually Unloading an 8mm Tape Cartridge from a Stacker** (subsequent section of this lesson).
- **Unloading and Loading 8mm Tape Stackers for Sequential Mode Operation** (subsequent section of this lesson).
- **Performing DTF-2 Drive Unloading** (subsequent section of this lesson).

Manually Loading an 8mm Tape Cartridge into a Tape Drive in an 8mm Tape Stacker

The procedure that follows applies to ingest from 8mm tape cartridges only. It involves manually loading a tape cartridge into a tape drive in an 8mm tape stacker.

The procedure starts with the following assumptions:

- The stacker is in service.

- Both stacker tape drives are empty (unloaded).

Manually Loading an 8mm Tape Cartridge into a Tape Drive in an 8mm Tape Stacker

1 Turn the key in the key-lock of the stacker to the "open" position.

2 Wait for the stacker cartridge handling mechanism to finish the current operation and move to the "park" position.

- When the handling mechanism reaches the "park" position, the stacker unit's door interlock mechanism releases and a **Status: Unlocked** message is displayed on the unit.

3 Open the front door of the stacker.

- If the cartridge handling mechanism starts slowly settling downward, wait until it reaches the bottom of the stacker.

4 Insert the 8mm tape cartridge containing the granules to be ingested into the cartridge slot of the appropriate tape drive.

- Stackers have two tape drives.
- Hold the tape cartridge to be loaded into the tape drive with the write-protect switch toward the right.

5 Close the front door of the tape stacker.

6 Lock the door by turning the key in the key-lock.

Manually Unloading an 8mm Tape Cartridge from a Stacker

The procedure that follows applies to ingest from 8mm tape cartridges only. It involves manually unloading a tape cartridge from a tape drive in an 8mm tape stacker.

The procedure starts with the following assumptions:

- The stacker is in service.
- There is an 8mm tape cartridge in one of the stacker tape drives.

Manually Unloading an 8mm Tape Cartridge from a Stacker

1 Turn the key in the key-lock of the stacker to the "open" position.

2 Wait for the stacker cartridge handling mechanism to finish the current operation and move to the "park" position.

- When the handling mechanism reaches the "park" position, the stacker unit's door interlock mechanism releases and a **Status: Unlocked** message is displayed on the unit.

3 Open the front door of the stacker.

- If the cartridge handling mechanism starts slowly settling downward, wait until it reaches the bottom of the stacker.

4 Press the eject button to the left of the cartridge slot of the appropriate tape drive.

- Green light to the left of the cartridge slot starts to flash.
- After a few seconds the tape cartridge is ejected from the tape drive.

5 Remove the tape cartridge from the tape drive.

6 If no replacement tape cartridge is to be loaded in the tape drive, close the front door of the tape stacker.

Unloading and Loading 8mm Tape Stackers for Sequential Mode Operation

The procedure that follows applies to ingest from 8mm tape cartridges only. It involves the following activities:

- Unload a tape stacker.
- Load a tape stacker.

The procedure starts with the assumption that the stacker is in service.

Unloading and Loading 8mm Tape Stackers for Sequential Mode Operation

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1 Observe the front panel display of the stacker.

- If the message **Seq. Wait for Drive** or **Seq. Mode Done** is displayed on the front panel of the stacker, go to Step 15; otherwise, continue with Step 2.

2 Turn the key in the key-lock of the stacker to the closed position.

3 Press the **Escape** key.

4 Press the arrow keys as necessary to move the cursor to **Interface Menu**.

5 Press the **Enter** key (to select **Interface Menu**).

6 Press the **Enter** key again (to select **Control Mode Menu**).

7 Press the arrow keys as necessary to move the cursor to **Sequential 1**.

8 Press the **Enter** key (to select **Sequential 1**).

- The following type of message is displayed on the front panel of the stacker:

  ACTIVE INTERFACE:
  From: SCSI
  To: SEQ1
  Status: DONE

9 Press the **Enter** key.

- An asterisk is displayed in front of **Sequential 1**.

10 Press the **Escape** key.

11 Press the **Escape** key again.

12 Press the arrow keys as necessary to move the cursor to **Main Screen**.

13 Press the **Enter** key.

14 Observe the front panel display of the stacker.

- If the message **Seq. Wait for Drive** is displayed on the front panel of the stacker, go to Step 15; otherwise, return to Step 3.

15 Turn the key in the key-lock of the stacker to the open position.

16 Wait for the stacker cartridge handling mechanism to finish the current operation and move to the "park" position.

- When the handling mechanism reaches the "park" position, the stacker unit's door interlock mechanism releases and a **Status: Unlocked** message is displayed on the unit.

17 Open the front door of the stacker.

18 Remove the magazine (cartridge holder) by pulling out, first from the top, then the bottom.

19 If applicable, remove the tape cartridge(s) by gently pulling each one straight out from its slot.

20 Hold a tape cartridge to be loaded into the tape stacker with the write-protect switch toward the right.

21 Insert the tape cartridge by pushing gently straight into the top-most empty slot in the magazine (cartridge holder).

22 Repeat Steps 20 and 21 for each tape cartridge to be loaded into the tape stacker.

23 Replace the magazine (cartridge holder) in the stacker by inserting the two orientation features on the bottom of the magazine (cartridge holder) into the bottom of the plate then pressing on the top and snapping the magazine (cartridge holder) in place.

24 Close the door to start the process of resuming tape stacker operation.

25 Lock the door by turning the key in the key-lock.

- The message **Seq. Wait for Drive** should be displayed on the front panel of the stacker.
- The stacker should check all slots and drives for tapes then take the tape from Slot 1 and insert it into a drive.

Performing DTF-2 Drive Loading

A DTF-2 drive supports the reading of data from several types of cassettes, including (but not limited to) cassettes of the following types:

- DTF-2 L [large] cassette.
- DTF-2 S [small] cassette.
- DTF-1 L [large] cassette.
- DTF-1 S [small] cassette.

The procedure that follows applies to ingest from DTF-2 cassettes (although it should work for DTF-1 cassettes as well).

The procedure starts with the following assumptions:

- All applicable servers are currently running.
- The DTF-2 drive is in service.

Performing DTF-2 Drive Loading

---

1 Verify that **No Tape 0H** is indicated on the DTF tape drive's display window.

- If **No Tape 0H** is not indicated on the DTF tape drive's display window, wait until the ongoing operation (if any) has terminated, then push the **UNLOAD** button on the front of the DTF tape drive, wait for the tape to complete the unloading process, and remove the tape from the drive.

2 Insert the Sony DTF tape containing the granules to be ingested into the cassette slot of the DTF tape drive.

3 Wait for **Loaded [00]** to be indicated on the DTF tape drive's display window.

Performing DTF-2 Drive Unloading

The procedure starts with the following assumptions:

- All applicable servers are currently running.
- The DTF-2 drive is in service.
- There is a DTF-2 tape in the drive.

Performing DTF-2 Drive Unloading

---

1 Push the **UNLOAD** button on the front of the DTF tape drive.

- The tape goes through an unloading process.
- At the end of the unloading process the tape is ejected from the drive.

2 After it has completed the unloading process, remove the DTF-2 tape cartridge from the tape drive cassette slot.

Using UNIX Commands to Perform Media Ingest

Many ICDs between EMD and data providers state that tape media (especially 8mm tape) may be used as a backup method of ingest in case of emergency. If neither the **ECS Ingest** GUI nor the **INGEST Media Tape Reader** GUI has been set up for media ingest from a data provider that elects to supply some data on a hard medium, it is possible to ingest the data using UNIX commands.

A special case of media ingest using UNIX commands involves the ingest of EDOS L0 replacement data from DTF-2 tape.

There are two procedures related to using UNIX commands to perform media ingest:

- Performing Media Ingest Using UNIX Commands.
- Performing Ingest of Data from EDOS DTF-2 Archive Tapes.

In both instances the Ingest Technician uses UNIX commands to read the data from the tape, then ensures that any necessary delivery records (and signal files, if applicable) are available in

the polling directory. The applicable ingest polling process picks up the delivery records (PDRs) in the polling directory and creates the appropriate ingest requests, which are sent to the Ingest Request Manager. The Ingest Request Manager packages each request into granules and sends them to the Granule Server, which requests the Science Data Server to insert the data into the archive and catalog the metadata.

Performing Media Ingest Using UNIX Commands

If a data provider furnishes data on a hard medium for ingest with delivery record, the following three types of files should be present on the medium:

- Physical Media Product Delivery Record (PMPDR) or Product Delivery Record (PDR).
- Metadata file(s).
- Data file(s), typically in tar format.

If a data provider furnishes data on a hard medium for ingest without delivery record, only the data file(s) will be present on the medium.

Each medium should have a label and there should be a separate hardcopy document identifying the names of files contained on the medium and the order in which the files have been written.

To perform hard media ingest using UNIX commands (except hard media ingest from an EDOS archive tape) use the procedure that follows. The procedure starts with the following assumptions:

- All applicable servers are currently running.
- The **ECS Ingest** GUI has been launched and is being displayed for use in monitoring ingest request processing.

Performing Media Ingest Using UNIX Commands

NOTE: Steps 1 through 5 describe the process for determining the type of polling and the polling directory(ies) for the type(s) of data to be ingested from the hard medium. If that information is already known, skip Steps 1 through 5 and proceed to Step 6.

1 Access a terminal window logged in to the applicable Ingest polling host (e.g., Ingest Server or APC Server) for the type(s) of data to be ingested.

- Examples of Ingest Server host names include **e0icg11, g0icg01, l0acg02**, and **n0acg01**.
- Examples of Access/Process Coordinators (APC) Server host names include **e0acg11**, **g0acg01**, **l0acg02**, and **n0acg01**.

- For detailed instructions refer to the procedure for **Logging in to System Hosts** (previous section of this lesson).

2 Type **cd /usr/ecs/*MODE*/CUSTOM/cfg** then press **Return/Enter**.

- Change to the directory path where the configuration files for the various polling clients are located.

3 Type **ls -al** then press **Return/Enter**.

- List the files in the directory.

4 Type **pg *filename*** then press **Return/Enter**.

- ***filename*** represents the file name of the configuration file for the relevant polling client.
- Although the official configuration parameters are likely to be in the registry database, the information in the configuration file in the cfg directory is probably accurate enough for the purposes of this procedure.
- For example:

  pg EcInPolling.IGSASA.CFG.rgy

- 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 configuration file.

5 Observe the contents of the configuration file to identify the type of polling and the polling directory(ies).

- For example (extract of EcInPolling.IGSASA.CFG):

```
# Polling with delivery record parameters
PollingTimerInterval          = 120
CompareFileContentsFlag       = no
PollingDirectory              = /usr/ecs/OPS/CUSTOM/data/INS/pollIGSASA
HostName                      = x0icg01
```

- Another example (extract of EcInPolling.FDD.CFG):

```
# Polling without delivery record parameters
PollingTimerInterval          = 120
CompareFileContentsFlag       = no
PollingDirectoryCount         = 2
PollingDirectory1             =
usr/ecs/OPS/CUSTOM/data/INS/pollAM1ATTF
DataType1                     = AM1ATTF
```

HostName1 = x0icg01
IngestFileType1 = DATA
MaximumFileSize1 = 1000000
PollingDirectory2 =
/usr/ecs/OPS/CUSTOM/data/INS/pollAM1EPHF
DataType2 = AM1EPHF
HostName2 = x0icg01
IngestFileType2 = SCIENCE
MaximumFileSize2 = 100000000

6 Load the medium containing the data to be ingested in the appropriate drive.

- Refer to the appropriate procedure; e.g., …
  - **Performing DTF-2 Drive Loading** (previous section of this lesson).
  - **Manually Loading an 8mm Tape Cartridge into a Tape Drive in an 8mm Tape Stacker** (previous section of this lesson)

7 Access a terminal window logged in to the host (e.g., Sun Consolidation Internal Server) with access to the applicable drive.

- Examples of Sun Consolidation Internal Server host names include **e0acs11, g0acs11, l0acs03, and n0acs04**.
- For detailed instructions refer to the procedure for **Logging in to System Hosts** (previous section of this lesson).

8 Type **cd** ***path*** then press **Return/Enter**.

- ***path*** represents the directory path to the location where the data from the medium should be copied.
  - Using an empty directory would help identify the data copied from the medium.

9 Type **tar xvf** ***device*** then press **Return/Enter**.

- ***device*** is the drive device name (e.g., /dev/rmt/2n) as it is known to the shell.
- For example:

  tar xvf /dev/rmt/2n

- As files are read from the medium the file names, file sizes (in bytes), and number of blocks are listed on the screen.
  - For example:

    x IGSFUI.PMPDR, 17393 bytes, 34 tape blocks

10 At the command line prompt type **scp2** ***filename user@remotehost*:*path*/*filename*** then press **Return/Enter**.

- ***filename*** is the name of the file to be copied.
- ***user@remotehost*** identifies the current user ID and the host to which the file is to be copied.
- ***path*** is the full path to the directory (on the remote host) into which the file is to be copied.
- For example:

  scp2 L7FUI196027200001240.MTA cmops@x0icg01:/mog_data/EDC/L7IGS/L7FUI196027200001240.MTA

- A wildcard (*) may be used if some of the files have common characteristics.
  - For example:

    scp2 *.MTA cmops@x0icg01:/mog_data/EDC/L7IGS

- The following type of response should be displayed:

  *****

12 If a prompt for ***<user@remotehost>*'s password:** appears, type ***password*** then press **Return/Enter**.

- The following type of response should be displayed:

  L7FUI196027200001240.MTA | 8.7kB | 8.7 kB/s | TOC: 00:00:01 | 100%

13 Repeat Steps 10 through 12 as necessary to transfer all relevant data/metadata files.

NOTE: If the data provider has furnished data on a hard medium for ingest without delivery record, skip Steps 14 through 21 and go to Step 22.

14 If the data provider has furnished data on a hard medium for ingest with delivery record, type **cp** ***old_PDR_filename new_PDR_filename*** then press **Return/Enter**.

- ***old_PDR_filename*** represents the file name of an old PDR that is being used as a template for creating a PDR for the data files to be ingested.
- ***new_PDR_filename*** represents the file name of the new PDR that is being created for the data files to be ingested.
  - ***new_PDR_filename*** must end with a .PDR file name extension.

15 Type **vi** ***new_PDR_filename*** then press **Return/Enter**.

- The PDR template file is opened (displayed by the vi text editor).
- Although this procedure has been written for the **vi** editor, any UNIX editor can be used to create the PDR.

16 Using vi editor commands modify the PDR file to ensure that there are appropriate entries for **ORIGINATING_SYSTEM**, **NODE_NAME**, and **DIRECTORY_ID**.

- **ORIGINATING_SYSTEM** refers to the data provider (as Ingest expects it to be expressed).
- **NODE_NAME** identifies the **HostName** (as specified in the configuration file for the polling client).
- **DIRECTORY_ID** is the directory (on the host/node) in which the data and/or metadata files have been staged for ingest.
- Note that there is a **NODE_NAME** (host name) entry for each **FILE_GROUP** and a **DIRECTORY_ID** entry for each **FILE_SPEC** (as shown in the example that follows).
- For example (extract from an IGS PDR):

  ORIGINATING_SYSTEM =IGSFUI;

  TOTAL_FILE_COUNT =8;

```
AGGREGATE_LENGTH = 425607;
EXPIRATION_TIME = 2004-02-22T22:22:22Z;
OBJECT =FILE_GROUP;
    DATA_TYPE =L7IGS;
    NODE_NAME =x0icg01;
    OBJECT =FILE_SPEC;
        DIRECTORY_ID =/mog_data/EDC/L7IGS;
        FILE_ID =L7FUI196027200001240.MTA;
        FILE_TYPE =METADATA0;
        FILE_SIZE =55331;
    END_OBJECT =FILE_SPEC;
END_OBJECT =FILE_GROUP;
OBJECT =FILE_GROUP;
    DATA_TYPE =L7IGS;
    NODE_NAME =x0icg01;
    OBJECT =FILE_SPEC;
        DIRECTORY_ID =/mog_data/EDC/L7IGS;
        FILE_ID =L7FUI197028200001310.MTA;
        FILE_TYPE =METADATA0;
        FILE_SIZE =49392;
    END_OBJECT =FILE_SPEC;
END_OBJECT =FILE_GROUP;
```

- 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).
- **r** (replace single character).
- **x** (delete a character).
- **dw** (delete a word).
- **dd** (delete a line).
- ***n*dd** (delete *n* lines).
- **u** (undo previous change).
- **Esc** (switch to command mode).

17 Press the **Esc** key.

18 Type **ZZ**.

- New PDR file is saved.
- UNIX prompt is displayed.

19 At the command line prompt type **scp2** ***filename user@remotehost*:*path*/*filename*** then press **Return/Enter**.

- ***filename*** is the name of the file to be copied.
- ***user@remotehost*** identifies the current user ID and the host to which the file is to be copied.
- ***path*** is the full path to the directory (on the remote host) into which the file is to be copied.
- For example:

  scp2 IGSFUI.PDR
  cmops@x0icg01:/usr/ecs/OPS/CUSTOM/data/INS/pollIGSASA/IGSFUI.PDR

- The following type of response should be displayed:

  *****

Passphrase for key "/home/cmops/.ssh2/id_dsa_1024_a" with comment "cmops@xdc ssh2":

20 If the passphrase is known, at the **Passphrase (…):** prompt type ***passphrase*** then press the **Enter** key.

- The following type of response should be displayed:

  IGSFUI.PDR | 17.0kB | 17.0kB/s | TOC: 00:00:01 | 100%

- If the passphrase is unknown, press **Return/Enter**, which should cause a ***<user@remotehost>*'s password:** prompt to appear (after the second or third try if not after the first one), then go to Step 21.

- If the passphrase is entered improperly, a ***<user@remotehost>*'s password:** prompt should appear (after the second or third try if not after the first one); go to Step 21.

21 If a prompt for ***<user@remotehost>*'s password:** appears, type ***password*** then press **Return/Enter**.

- The following type of response should be displayed:

  IGSFUI.PDR | 17.0kB | 17.0kB/s | TOC: 00:00:01 | 100%

22 To monitor Ingest request processing perform the procedure for **Monitoring/Controlling Ingest Requests** (previous section of this lesson) using an instance of the **ECS Ingest** GUI.

23 Unload the drive.

- Refer to the appropriate procedure; e.g., …
  - **Performing DTF-2 Drive Unloading** (previous section of this lesson).
  - **Manually Unloading an 8mm Tape Cartridge from a Stacker** (previous section of this lesson).

24 Verify that the data have been inserted into the archive as described in the procedure for **Verifying the Archiving of Ingested Data** (previous section of this lesson).

25 Type **cd** ***path*** then press **Return/Enter**.

- ***path*** represents the directory path to the location where the data from the hard medium were first copied.

26 Type **ls** then press **Return/Enter**.

- A listing of the files in the current directory is displayed.

27 Type **rm** ***filename1 filename2 [… filenameN]*** then press **Return/Enter**.

- ***filename1 filename2 [… filenameN]*** represent the names of the files to be removed from the directory.
- A wildcard (*) may be used if some of the files have common characteristics.
  - For example:

    rm *.MTA
- A prompt is displayed requesting whether or not a particular file should be removed.
  - For example:

    rm: remove L7FUI205024200001230.MTA (yes/no)?

28 Type **y** then press **Return/Enter**.

- The specified file is deleted and (if applicable) a prompt is displayed requesting whether or not another particular file should be removed.

29 Repeat Step 28 as necessary.

Performing Ingest of Data from EDOS DTF-2 Archive Tapes

In response to a request (via the EOS Data Re-Order web tool) from GES DAAC Operations EDOS furnishes L0 replacement data to the DAAC on DTF-2 tapes. Personnel from the Level Zero Processing Facility (LZPF) hand the DTF-2 archive tape(s) containing the requested data to personnel at GES DAAC Operations. (DAAC Operations returns each tape to the LZPF as soon as the needed data have been archived in the system.)

In addition to the requested PDS(s) each EDOS DTF-2 archive tape is likely to contain some additional (unneeded) PDSs. The Ingest Technician and/or Archive Manager need to determine which PDS(s) on the tape should be inserted into the archive.

To perform hard media ingest from an EDOS archive tape (DTF-2) use the procedure that follows. The procedure starts with the following assumptions:

- All applicable servers are currently running.
- The **ECS Ingest** GUI has been launched and is being displayed for use in monitoring ingest request processing.
- The Ingest Technician has been notified as to what data on the tape should be inserted into the archive.

1 Load the tape containing the data to be ingested as described in the procedure for **Performing DTF-2 Drive Loading** (previous section of this lesson).

2 Access a terminal window logged in to the appropriate host (e.g., Sun Consolidation Internal Server).

- Examples of Sun Consolidation Internal Server host names include **e0acs11, g0acs11, l0acs03, and n0acs04**.
- For detailed instructions refer to the procedure for **Logging in to System Hosts** (previous section of this lesson).

3 Type **cd** ***path*** then press **Return/Enter**.

- ***path*** represents the directory path to the location where the data from the EDOS archive tape should be copied.
  - Using an empty directory would help identify the data from the tape.

4 Type **tar xvf** ***device*** then press **Return/Enter**.

- ***device*** is the DTF-2 drive device name (e.g., /dev/rmt/2n) as it is known to the shell.
- For example:

  tar xvf /dev/rmt/2n

- As files are read from the tape the file names, file sizes (in bytes), and number of blocks are listed on the screen.
  - For example:

    x DZ9ZA49.MDR, 17393 bytes, 34 tape blocks

5 Type **pg** ***PPMUDR_name*** then press **Return/Enter**.

- ***PPMUDR_name*** represents the file name of the PDS Physical Media Unit Delivery Record (PPMUDR).
  - The PPMUDR file name has a **.MDR** extension.
  - The PPMUDR is the first item on the EDOS archive tape.
- For example:

  pg DZ9ZA49.MDR

- 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 PPMUDR file.

6 Observe the contents of the PPMUDR to identify the PDS(s) to be archived.

- Packet date/time ranges in the PPMUDR can be used to determine which PDS(s) is (are) to be archived.
  - In the PPMUDR the PDSs on the tape are listed in file groups, which represent data sets [i.e., science data file(s) and corresponding metadata file].
  - Each file group (data set) includes the date/time range of the data specified as FIRST_PACKET_TIME and LAST_PACKET_TIME.
- For example (extract from a PPMUDR):

```
OBJECT = FILE_GROUP
        DATA_SET_ID = P0420064AAAAAAAAAAAAAA03101231459600
        DATA_TYPE = MOD000
        FIRST_PACKET_TIME = 2003-04-10T00:00:00.000000Z
        LAST_PACKET_TIME = 2003-04-10T01:59:59.999999Z
        PACKET_COUNT = NOT USED
        OCTET_COUNT = NOT USED
        TEST_FLAG = F
        APID_COUNT = 1
        OBJECT = APID_SPEC
            APID_IN_PDS = 64
        END_OBJECT = APID_SPEC
        FILE_COUNT = 2
        OBJECT  = FILE_SPEC
                DIRECTORY_ID = NOT USED
                FILE_ID = P0420064AAAAAAAAAAAAAA03101231459600.PDS
                FILE_TYPE = METADATA
                FILE_SIZE = 384
        END_OBJECT = FILE_SPEC
        OBJECT  = FILE_SPEC
                DIRECTORY_ID = NOT USED
```

FILE_ID = P0420064AAAAAAAAAAAAAA03101231459601.PDS

FILE_TYPE = DATA

FILE_SIZE = 108000

END_OBJECT = FILE_SPEC

END_OBJECT = FILE_GROUP

- In the preceding example one data set is defined (as a "FILE_GROUP").
  - The data type for the set is MOD000.
  - The data were collected on April 10, 2003 between midnight GMT (00:00:00.000000Z) (FIRST_PACKET_TIME) and just before 2:00 A.M. GMT (01:59:59.999999Z) (LAST_PACKET_TIME).
  - There are two files in the data set (FILE_COUNT = 2).
  - One file (P0420064AAAAAAAAAAAAAA03101231459600.PDS) is a metadata file (in EDOS terminology, a "construction record").
  - The other file (P0420064AAAAAAAAAAAAAA03101231459601.PDS) is a data file.
  - Based on information embedded in the file names, the data set was created on April 11, 2003 at 11:14:59 P.M. (as described under the next bullet).

- The EDOS archive tape may contain both nominal and reprocessed PDSs but creation times in file names differentiate between the versions.
  - Ingest the latest (most recent) version if there is more than one version.
  - PDS file names consist of 40 bytes (characters) and Bytes 23 through 33 specify the creation time of the file.
  - For example, **03101231459** is the creation time in the following file name:

    P0420064AAAAAAAAAAAAAA03101231459601.PDS

    - **03** indicates the year (2003).
    - **101** specifies the Julian day (April 11, the 101st day of the year).
    - **231459** is the time of file creation (11:14:59 P.M.).

- Consult with the Archive Manager if there is any question concerning which PDSs should be archived.

7 Type **cp** ***filename1 filename2 […filenameN] path*** then press **Return/Enter**.

- ***filename1 filename2 […filenameN]*** represent the file names of the PDS files to be ingested.
  - Copy both the data and metadata files (as identified in the PPMUDR) for each data set.
- ***path*** is the directory path to the Ingest pollEDOS directory; i.e., the directory in which the software for EDOS ingest routinely looks for EDOS delivery records and data.
  - The EDOS polling directory is specified as a parameter in the Registry database or in the configuration file for EDOS polling (e.g., EcInPolling.EDOS.CFG).
- For example:

  cp P0420064AAAAAAAAAAAAAA03101231459600.PDS P0420064AAAAAAAAAAAAAA03101231459601.PDS /usr/ecs/OPS/CUSTOM/icl/x0icg01/data/pollEDOS

NOTE: If a DAAC-unique script is available for creating delivery records and signal files and placing the files in the polling directory, use the script and skip Steps 8 through 18 (go to Step 19 after running the script). Otherwise, manually generate delivery records and signal files as described in Steps 8 through 18.

8 Type **cd** ***path*** then press **Return/Enter**.

- ***path*** is the directory path to the Ingest pollEDOS directory.
- For example:

  cd /usr/ecs/OPS/CUSTOM/icl/x0icg01/data/pollEDOS

NOTE: Steps 9 through 13 describe how to use an old delivery record (PDR) as a template for generating a new PDR.

9 Type **cp** ***old_PDR_filename new_PDR_filename*** then press **Return/Enter**.

- ***old_PDR_filename*** represents the file name of an old PDR that is being used as a template for creating a PDR for PDS files to be ingested.
- ***new_PDR_filename*** represents the file name of the new PDR that is being created for PDS files to be ingested.
  - Use the EDOS file-naming convention for PDRs (refer to the EDOS ICD, 423-ICD-EDOS/EGS):
    - PDR file names consist of 38 bytes (characters).

- Byte 1 identifies the file as either a PDS Delivery Record (“X”) or EDS Delivery Record (“Y”).
- Bytes 2 through 8 identify the spacecraft ID (SCID) (three bytes) and first Applications Process Identifier (APID) (four bytes) in the data set (right-justified and, if necessary, zero-filled on the left).
- Bytes 9 through 15 identify the SCID and second APID in the data set (right-justified and, if necessary, zero-filled on the left), if applicable. If no second APID is present in the data set, this item has a value of “AAAAAAA”.
- Bytes 16 through 22 identify the SCID and third APID in the data set (right-justified and, if necessary, zero-filled on the left), if applicable. If no second APID is present in the data set, this item has a value of “AAAAAAA”.
- Bytes 23 through 33 identify the GMT/ZULU time when the data set was created.
- Byte 34 is a numeric identification in the range of “0” to “9” to aid in distinguishing the order of data set creation during the day and to provide uniqueness to the file name.
- Bytes 35 through 38 are the file name extension (i.e., “.PDR” or “.EDR”)
- For example:

X0420064AAAAAAAAAAAAAA031012314596.PDR

X identifies the file as a PDS Delivery Record.

0420064 identifies the SCID (**042** = Terra) and first APID (**0064** = MOD000 data type) in the data set.

AAAAAAA indicates that there is no second APID in the data set.

AAAAAAA indicates that there is no third APID in the data set.

03101231459 is the GMT/ZULU time when the data set was created [**03** indicates the year (2003); **101** specifies the Julian day (April 11, the 101st day of the year); **231459** is the time of data set creation (11:14:59 P.M.)].

6 is a numeric identifier (sixth data set of the day).

.PDR is the file-name extension for a PDS Delivery Record.

10 Type **vi** ***new_PDR_filename*** then press **Return/Enter**.

- The PDR template file is opened (displayed by the vi text editor).
- Although this procedure has been written for the **vi** editor, any UNIX editor can be used to create the PDR.

11 Using vi editor commands modify the PDR file to specify ingest of one of the data sets to be ingested.

- Create a separate PDR for each data set [science data file(s) and corresponding metadata file – refer to the PPUDR "file group" example in Step 6].
- 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).
  - **r** (replace single character).
  - **x** (delete a character).
  - **dw** (delete a word).
  - **dd** (delete a line).
  - ***n*dd** (delete *n* lines).
  - **u** (undo previous change).
  - **Esc** (switch to command mode).

12 Press the **Esc** key.

13 Type **ZZ**.

- New PDR file is saved.
- UNIX prompt is displayed.

14 Type **vi** ***XFR_filename*** then press **Return/Enter**.

- A new file with the specified ***XFR_filename*** is opened.
  - Use the EDOS file-naming convention for signal files (refer to the EDOS ICD, 423-ICD-EDOS/EGS):
    - Signal file name is the corresponding PDR file name plus the signal file name extension (i.e., ".XFR").
    - For example:

      X0420064AAAAAAAAAAAAAA031012314596.PDR.XFR
- The signal file indicates that the relevant data files and PDR have been put in the polling directory and are ready to be ingested.
- Although this procedure has been written for the **vi** editor, any UNIX editor can be used to create the signal file.

15 Using vi editor commands create a file that contains the name of the relevant PDR.

- A signal file contains the name of the relevant PDR only.
- For example:

  X0420064AAAAAAAAAAAAAA031012314596.PDR

16 Press the **Esc** key.

17 Type **ZZ**.

- New signal file is saved.
- UNIX prompt is displayed.
- At the next polling occasion, the EDOS polling client should detect the signal file and initiate ingest of the data specified in the corresponding PDR.

18 Repeat Steps 8 through 17 as required to create delivery records and signal files for all remaining data sets (from the EDOS archive tape) to be ingested.

19 To monitor Ingest request processing perform the procedure for **Monitoring/Controlling Ingest Requests** (previous section of this lesson) using an instance of the **ECS Ingest** GUI.

20 Unload the tape drive as described in the procedure for **Performing DTF-2 Drive Unloading** (previous section of this lesson).

21 Verify that the data have been inserted into the archive as described in the procedure for **Verifying the Archiving of Ingested Data** (previous section of this lesson).

22 When insertion into the archive has been verified, notify the Archive Manager that "set delete" can be issued for the replaced data/metadata.

- The replaced data/metadata should be marked for deletion from the archive.

23 When insertion into the archive has been verified, ensure that the EDOS archive tape is returned to the EDOS LZPF.

NOTE: Clean up (as described in Steps 24 through 28) the directory into which data were originally copied from the EDOS archive tape. If preferred, skip Steps 24 through 28 and use the script described in the procedure for **Cleaning the Polling Directories** (previous section of this lesson).

24 Type **cd** ***path*** then press **Return/Enter**.

- ***path*** represents the directory path to the location where the data from the EDOS archive tape were first copied.

25 Type **ls** then press **Return/Enter**.

- A listing of the files in the current directory is displayed.

26 Type **rm** ***filename1 filename2 […filenameN]*** then press **Return/Enter**.

- ***filename1 filename2 […filenameN]*** represent the names of the files to be removed from the directory.
- A wildcard may be used if some of the files have common characteristics.
  - For example:

    rm *.PDS
- A prompt is displayed requesting whether or not a particular file should be removed.
  - For example:

    rm: remove DZ9ZA49.MDR (yes/no)?

27 Type **y** then press **Return/Enter**.

- The specified file is deleted and (if applicable) a prompt is displayed requesting whether or not another particular file should be removed.

28 Repeat Step 27 as necessary.

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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 33). 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 [not used].
  - 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).
    - 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.
  - Screen update time.

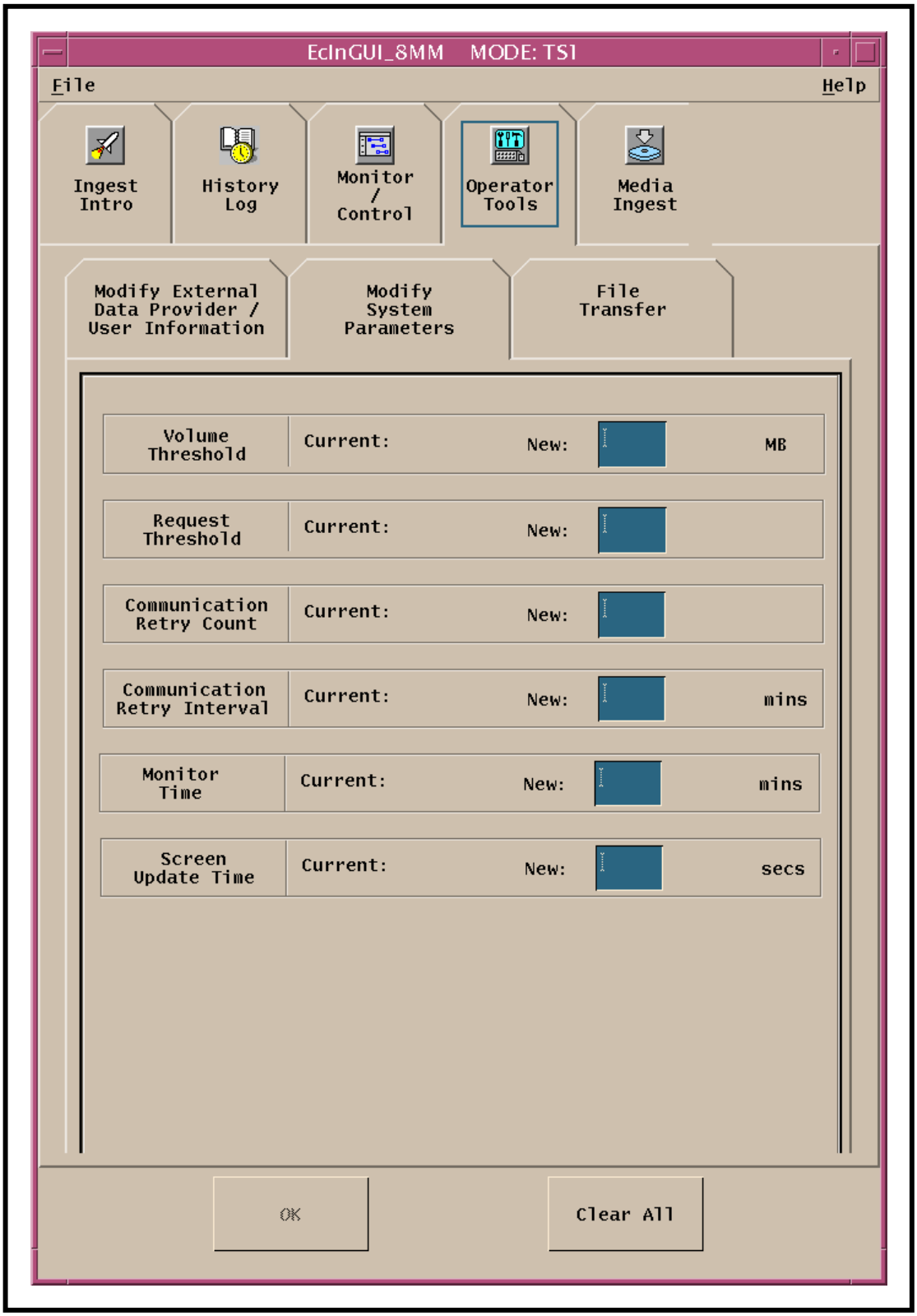

Figure 33. ECS Ingest GUI Operator Tools Tab

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

External Data Provider Data and Thresholds

Figure 34 shows the screen for modifying data provider thresholds. The screen shown in Figure 34 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 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 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 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 6) is being displayed.

Modifying External Data Provider Information

---

1 Click on the Ingest GUI **Operator Tools** tab.

- The **Operator Tools** screen (Figure 33) is displayed.

2 Click on the **Modify External Data Provider/User Information** tab.

- The **Modify External Data Provider/User Information** screen (Figure 34) 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.

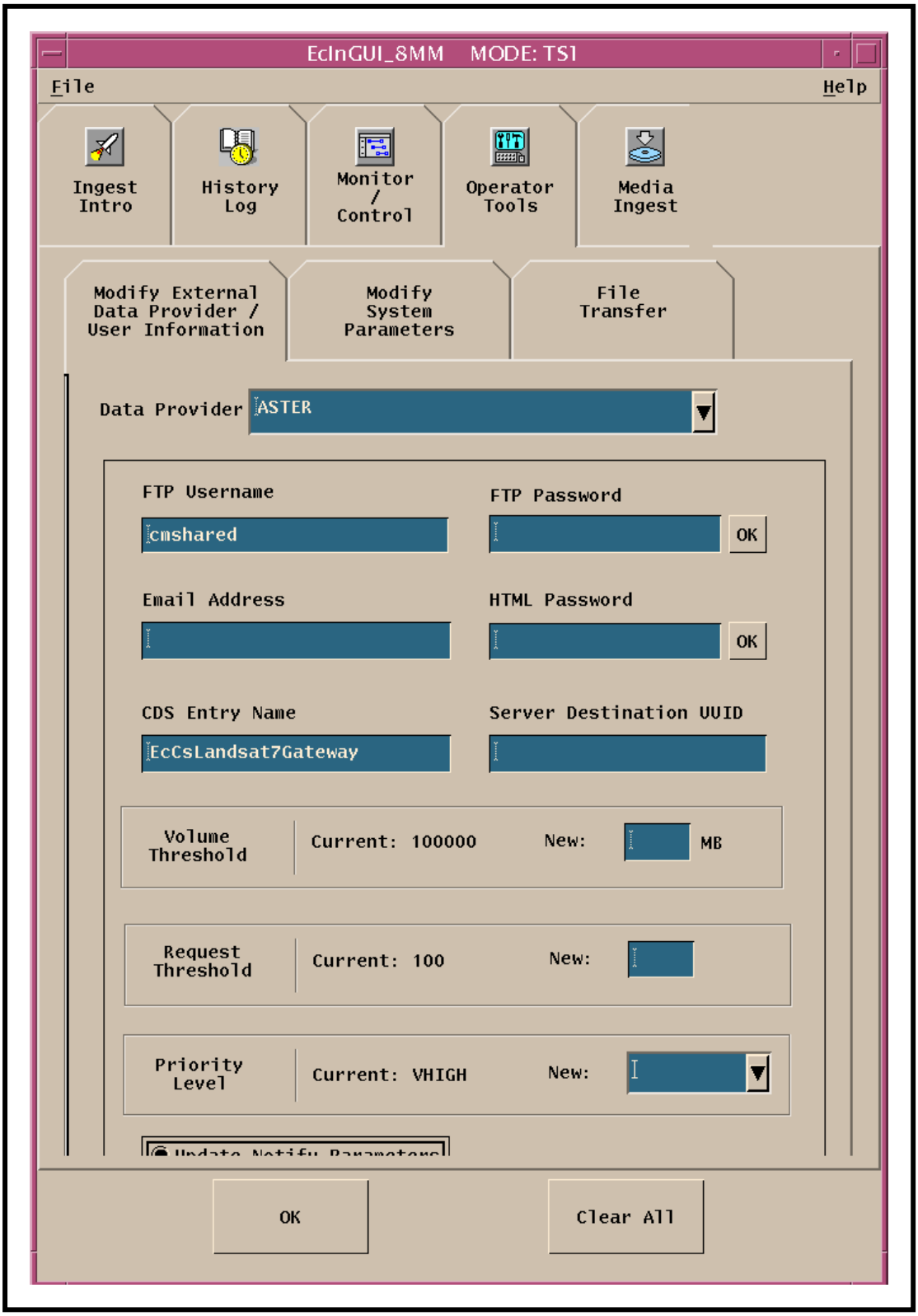

Figure 34. Ingest Data Provider Parameter Modification Screen

- 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** (not used).
  - **CDS Entry Name**, perform Step 8.
  - **Server Destination UUID**, perform Step 9.
  - **Volume Threshold**, perform Step 10.
  - **Request Threshold**, perform Step 11.
  - **Priority Level**, perform Step 12.
  - **Notify Parameters (ftp node, ftp directory, ftp username,** or **ftp password)**, perform Steps 13 through 20 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 CDS entry name first click in the **CDS Entry Name** field, then type the new CDS entry name.

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

CAUTION

The thresholds are retrieved from the Ingest database when the Ingest Request Manager comes up. However, the threshold checks are done two different ways - sometimes in memory and sometimes by a database stored procedure. The database stored procedure uses the values in the database. If the Granule Server thresholds are changed in

the database while Ingest is running there will be a mismatch between the values in memory and the values in the database. This could cause an Ingest failure.

10 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.

11 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.

12 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.

13 To update the data provider's "notify parameters" first click on the **Update Notify Parameters** button.

- The **Notify Parameters** window (Figure 35) is displayed.
- The **Notify Parameters** window provides the Ingest 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.

14 To modify the data provider's "notify ftp node" first click in the **Notify FTP Node** field, then type the new notify ftp node.

15 To modify the data provider's "notify ftp directory" first click in the **Notify FTP Directory** field, then type the new notify ftp directory.

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

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

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

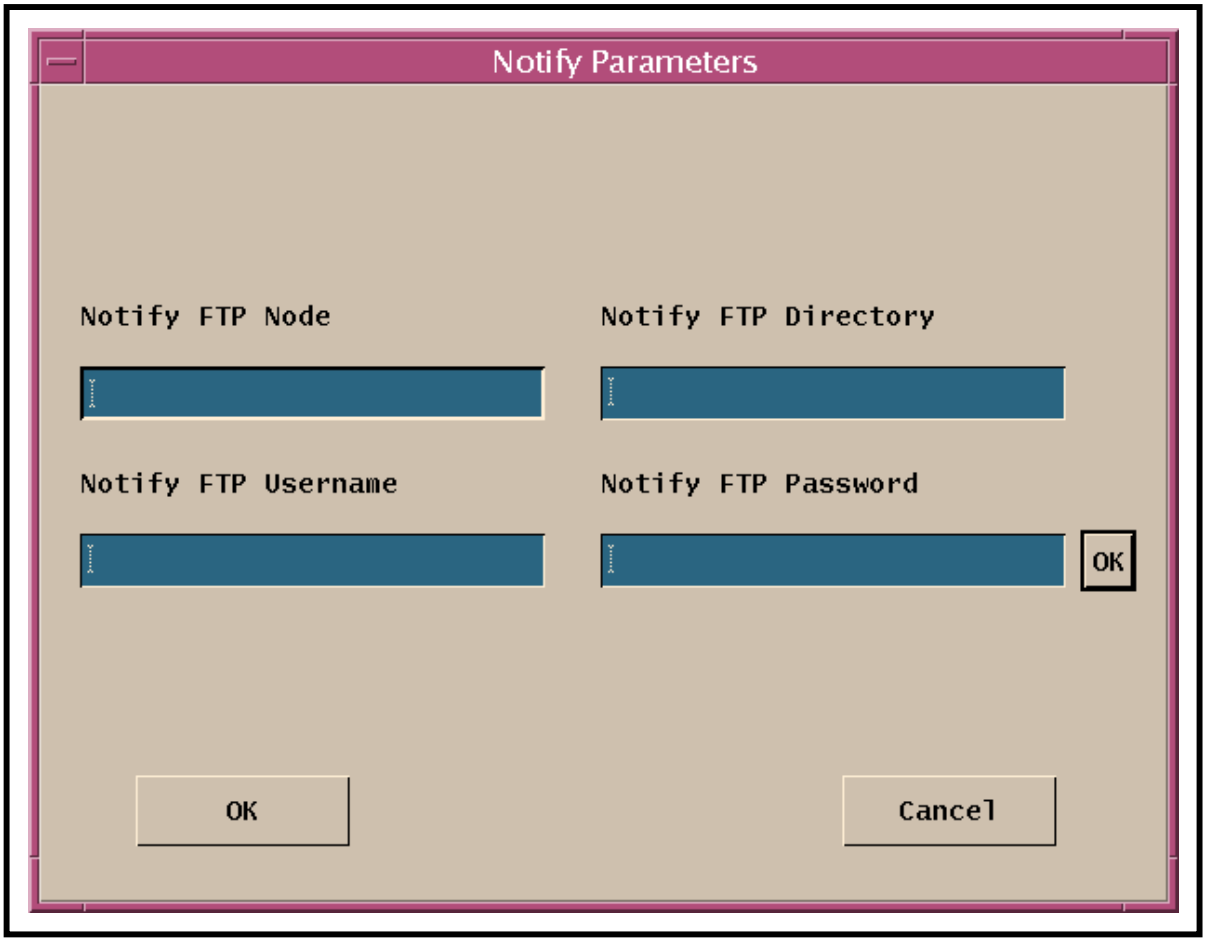

Figure 35. Notify Parameters

19 Click on the appropriate button from the following selections:

- **OK** – to save the "Notify Parameters" and dismiss the **Notify Parameters** window.
  - The **Notify Parameters** window (Figure 35) is dismissed.
- **Cancel** – to dismiss the **Notify Parameters** window without saving any changes to the "Notify Parameters."
  - The **Notify Parameters** window (Figure 35) is dismissed.

20 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.

System Parameters on the Ingest GUI

Figure 36 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 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.

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

- **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 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.

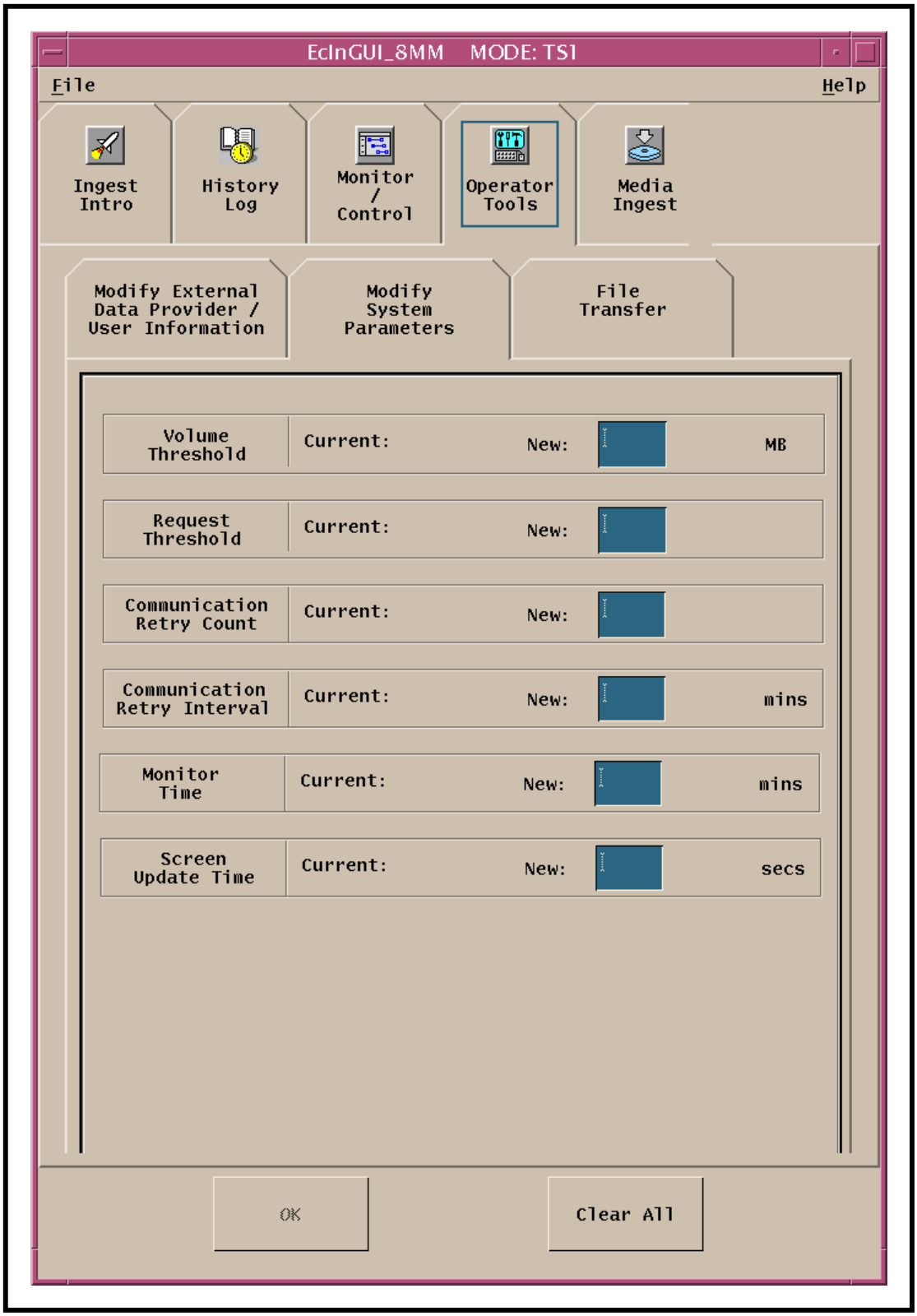

Figure 36. Ingest System Parameter Modification Screen

- 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 6) is being displayed.

Modifying System Parameters on the Ingest GUI

---

1 Click on the Ingest GUI **Operator Tools** tab.

- The **Operator Tools** screen (Figure 33) is displayed.

2 Click on the **Modify System Parameters** tab.

- The **Modify System Parameters** screen (Figure 36) 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.

CAUTION

The thresholds are retrieved from the Ingest database when the Ingest Request Manager comes up. However, the threshold checks are done two different ways - sometimes in memory and sometimes by a database stored procedure. The database stored procedure uses the values in the database. If the Granule Server thresholds are changed in the database while Ingest is running there will be a

mismatch between the values in memory and the values in the database. This could cause an Ingest failure.

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 Technician to transfer files to the science community. The file transfer tool allows the Ingest 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 6) is being displayed.

1 Click on the Ingest GUI **Operator Tools** tab.

- The **Operator Tools** screen (Figure 33) is displayed.

2 Click on the **File Transfer** tab.

- The **File Transfer** screen (Figure 37) 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:
  - SMCHeaderFile.
  - 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.

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.

Figure 37. Ingest File Transfer Screen

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:

- Configuration Registry database.
- Ingest database.

Modifying System Parameters in the Configuration Registry Database

The Configuration Registry Server provides a single interface (via a Sybase server) for retrieving configuration attribute-value pairs for system servers from the Configuration Registry database.

When system 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, *Custom Code Configuration Parameters for ECS*. The document is available at http://cmdm-ldo.raytheon.com/baseline/ under "Technical Documents."

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

- AppLogSize [parameter applies to all servers].
  - Maximum size of the application log (ALOG) file for a particular application.
  - Recommended size varies considerably depending the nature of the application for which the file is being written.
- AppLogLevel [parameter applies to all servers].
  - Level of detail provided in the ALOG file for a particular application.
  - Acceptable values are 0, 1, 2, or 3.
  - A setting of "0" provides the most data.
- DebugLevel [parameter applies to all servers].
  - Level of detail provided in the debug log file for a particular application.
  - Normally acceptable values are 0, 1, 2, or 3.
  - A setting of "0" turns off logging; a setting of "3" provides a significant amount of data.
  - STMGT offers "enhanced" debugging based on bitmaps.
    - Level 7 (the 4 bit) provides detailed database debugging.
    - Level 15 (the 8 bit) frequently dumps the in-memory request queue (in the Request Manager).
    - Both Level 7 and Level 15 quickly create enormous log files.

- INGEST_CONNECTION_POOL_SIZE [EcInPolling, EcInGUI, EcInReqMgr, and EcInGran parameter].
  - Number of database connections. The number varies with the particular program connecting to the database.
  - Single-threaded programs (i.e., 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 the LP DAAC, EcInReqMgr actually needed only three database connections.
- SAVEONEXIT [EcInReqMgr, EcInGran, and EcInGUI parameter].
  - Set to “true” for debug purposes only. (Set to "false" normally.) When “true,” staging disks do not get cleaned up and the Staging Disk Server needs to be warm-started. For Granule Server, when the SAVEONEXIT parameter is “true,” the local preprocessing disk does not get cleaned up.
- SDSRV_RETRY_INTERVAL [EcInGran parameter].
  - Amount of time in seconds (e.g., 60) that Granule Server waits before retrying a remote procedure call (RPC) to Science Data Server when the previous attempt returned a retryable error.
- SDSRV_RETRY_ATTEMPTS [EcInGran parameter].
  - Number of times (e.g., 60) the Granule Server tries to make an RPC to Science Data Server when a retryable error is returned. If it is set to one (1), then no retries are done.
- SocketLimit [EcInEmailGWServer, EcInReqMgr, EcInGran parameter].
  - Number of connections (e.g., 200) to a server through the Hubble Space Telescope (HST) sockets middleware.
  - Too low a number misses connections.
  - Too high a number may adversely affect the memory of the server's host.

- PollingTimerInterval [EcInPolling parameter].
  - Amount of time in seconds (e.g., 120) between polling instances. The parameter is specified individually for each applicable data provider. The value varies depending on the rate at which each data provider sends data to EcInPolling.
  - Applies to both categories of polling (i.e., with delivery record and without delivery record).
- CompareFileContentsFlag [EcInPolling parameter].
  - 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 [EcInPolling parameter].
  - 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 PollingDirectory*X* [EcInPolling parameter].
  - 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).
  - Used for setting the directory ID parameter in the PDRs that EcInPolling generates.
  - 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 HostName*X* [EcInPolling parameter].
  - Host (e.g., x0icg01) where the associated polling directory resides.
  - Used for setting the node name parameter in the PDRs that EcInPolling generates.

- 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).

- DataType*X* [EcInPolling parameter].
  - Identifies the data type (e.g., AM1ATTF) associated with the corresponding polling directory.
  - Used for setting the data type parameter in the PDRs that EcInPolling generates.
  - 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.
  - The data type set must be a valid data type (in the Ingest database) or ingest will fail.
- IngestFileType*X* [EcInPolling parameter].
  - Identifies the file type (e.g., SCIENCE or DATA) associated with the corresponding polling directory.
  - Used for setting the file type parameter in the PDRs that EcInPolling generates.
  - 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.
  - The file type set must be a valid file type for the associated data type (in the Ingest database) or ingest will fail.
- MaximumFileSize*X* [EcInPolling parameter].
  - Specifies the maximum file size in bytes (e.g., 1000000) allowed in the corresponding polling directory.
  - Used for setting the file size parameter in the PDRs that EcInPolling generates.
  - 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.

- If the file size is too small, the staging disk created for ftping the files will not be big enough.

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

Some of the more important tunable parameters in the Ingest Database are described in the sections that follow. There is information concerning additional tunable parameters in the "Tunable Parameters in Databases - Descriptions" section of 910-TDA-022, *Custom Code Configuration Parameters for ECS.* The document is available at http://cmdm-ldo.raytheon.com/baseline/ under "Technical Documents."

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

Limits on the Number of Queued Requests and Ingest Volume

There is no way to set the number of queued requests. Limits on Ingest volume are managed through the following database parameters:

- TotalGranuleThreshold in the InGranuleServerInfo table.
- VolumeThreshold in the InGranuleServerInfo table.
- MaximumTotalRequests in the InSystemParameters table.
- MaximumTotalVolume in the InSystemParameters table.

The Request Manager receives requests, breaks them into granules, and queues all the granules. The granule queue is maintained in the Ingest database (InGranuleQueue table) so the queue state of each granule and the Granule Server processing it can be determined should the Request Manager have to be restarted in response to a failure.

If the appropriate Granule Server is not processing the maximum number of granules that it can process at a time (TotalGranuleThreshold), one or more granule(s) is (are) removed from the queue and sent to the Granule Server. The same action occurs if the appropriate Granule Server is not processing the maximum data volume that the Granule Server can process at a time (VolumeThreshold). So the Request Manager uses the TotalGranuleThreshold and VolumeThreshold parameters to control when it sends granules to each Granule Server.

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.] If the TotalGranuleThreshold parameter is changed, the Request Manager and the appropriate Granule Server need to be restarted in order for them to see the change. If the VolumeThreshold parameter is changed, the Request Manager needs to be restarted. It is better to avoid changing either parameter while the Granule Server is in the middle of processing granules.

There is a maximum number of requests and maximum volume that can be processed by Ingest at one time (in contrast to the Granule Server limits mentioned in preceding paragraphs). 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.

Either parameter can be modified using the Ingest GUI **Operator Tools: Modify System Parameters** tab. Refer to the procedure for **Modifying System Parameters on the Ingest GUI** (previous section of this lesson) for details concerning the steps involved in changing system parameters using the 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.

Either parameter can be modified using the Ingest GUI **Operator Tools: Modify External Data Provider/User Information** tab. The value assigned to MaximumRequests may not exceed the value assigned to the MaximumTotalRequests parameter in the InSystemParameters table. The value assigned to VolumeThreshold may not exceed the value assigned to the MaximumTotalVolume parameter in the InSystemParameters table. Refer to the procedure for **Modifying External Data Provider Information** (previous section of this lesson) for details concerning the steps involved in using the GUI to change parameters related to external data providers.

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 (i.e., InRequestProcessHeader and InRequestProcessData) that allow it to be displayed on the Ingest Monitor/Control GUI window. After the specified time has elapsed the request information is moved to the database summary tables (i.e., InRequestSummaryHeader and InRequestSummaryData) and can be viewed using the Ingest GUI History Log window.

MonitorTimeForCompletedRequest can be modified using the Ingest GUI **Operator Tools: Modify System Parameters** tab. However, no change to the parameter has any effect until the Ingest Request Manager has been restarted. Refer to the procedure for **Modifying System Parameters on the Ingest GUI** (previous section of this lesson) for details concerning the steps involved in changing system parameters using the 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 **Operator Tools: Modify System Parameters** tab. Refer to the procedure for **Modifying System Parameters on the Ingest GUI** (previous section of this lesson) for details concerning the steps involved in changing system parameters using the GUI.

In the InSystemParameters table, there are the following two communication-related parameters:

- CommunicationRetryCount.
- CommunicationRetryInterval.

The CommunicationRetryCount specifies a number of times that a user retries a communication. The CommunicationRetryInterval is the time interval in seconds between user communication retries. The default values installed with the database are typically set at five for both parameters.

Either parameter can be modified using the Ingest GUI **Operator Tools: Modify System Parameters** tab. Refer to the procedure for **Modifying System Parameters on the Ingest GUI** (previous section of this lesson) for details concerning the steps involved in changing system parameters using the GUI.

Number of Granule Servers at a DAAC

Each granule server can process multiple Earth Science Data Types (ESDTs), but each ESDT can be assigned to one granule server only.

In order for a particular ESDT to be processed by a particular granule server the GranuleServerURKey entry for the data type in the InDataTypeTemplate table must be set to the integer representing the appropriate granule server. GranuleServerURKey is the granule server ID that is mapped to a specific granule server name (GranuleServerUR). GranuleServerURKey is the primary key in the InValGranuleServerUR table. The GranuleServerURKey column contains the possible values that can be used in the InGranuleServerInfo and InDataTypeTemplate tables. So each granule server requires an individual row in the InValGranuleServerUR table with values for GranuleServerURKey (e.g., 1, 2, 3) and GranuleServerUR (e.g., EcInGran, EcInGran0, EcInGran1). In addition each granule server requires an individual row in the InGranuleServerInfo table with values for GranuleServerURKey, TotalGranuleThreshold, and VolumeThreshold.

To prevent changing the mapping between GranuleServerURKey and GranuleServerUR values no changes are allowed to the values in the GranuleServerURKey column in either the InValGranuleServerUR or the InGranuleServerInfo table. However, entries can be added to both tables. If a new GranuleServerURKey entry is added to the InValGranuleServerUR table, in order for things to work correctly, a new entry for the GranuleServerURKey needs to be added to the InGranuleServerInfo table and a new granule server needs to be configured in order for the new table entry to be used. Also, if additions are made to the InGranuleServerInfo table, the Request Manager needs to be restarted in order for it to see the changes.

Manual modifications to the InGranuleServerInfo database table, InValGranuleServerUR table, or InDataTypeTemplate table must be made 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 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 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 host.

- Examples of Ingest Server host names include **e0icg11, g0icg01, l0acg02**, and **n0acg01**.
- For detailed instructions refer to the procedure for **Logging in to System Hosts** (previous section of this lesson).

2 Type **isql –U *userID* -S *DBServer*** then press **Return/Enter**.

- For example:

  isql -U ingest_role –S x0icg01_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
               90000000000
2              40
               90000000000
3              40
               90000000000
(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 the system, Ingest has interfaces with many other subsystems. Consequently, problems with Ingest can be traced to either the Ingest Subsystem or one of many other subsystems, including (but not necessarily limited to) those in the following list:

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

However, unlike many other operational areas in the system 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.

Fault Recovery

Each request that crosses a client/server boundary is assigned a system-unique identifier referred to as an RPC ID. (RPC refers to Remote Procedure Call, the mechanism by which requests are submitted from client to server.) The RPC ID facilitates the automatic fault recovery events that occur whenever there is a client or server failure.

- As a request propagates through the system, each associated client/server exchange is assigned a unique RPC ID.
  - The RPC ID for each interaction is derived from the previous RPC ID received by the client for the request.
    - Consequently, all RPC IDs associated with a given request have a common portion that relates the various client/server calls to one another.
  - Given the previous RPC ID, clients consistently reproduce the same RPC ID that was submitted to the server on the subsequent event.
- The concept of reproducible RPC IDs is central to the system fault recovery capability.
  - When requests are retried from client to server, they are always submitted with the same RPC ID that was used in the original submission of the request, even if either the client or server has crashed between retries.

- The RPC ID is also central to the check-pointing aspect of fault recovery.
  - As requests arrive at fault recovery-enabled servers, they are recorded in a persistent store (typically a database), tagged with the RPC ID, which identifies the request.
  - As the request is serviced, check-pointing state information may be updated in the persistent store, up to and including the completion status of the request.
  - This allows the servers to resume servicing from the last check-pointed state, particularly upon resubmission from a client.

Ingest components checkpoint the following types of information:

- **EcInGran** - Granule and granule state information.
- **EcInReqMgr** - Request state information.
- **EcInPolling** - Request information.
- **EcInEmailGWServer** - None.
- **EcInGUI** - Media Ingest request information.

Fault Handling

Failure events are classified according to the following three severity levels:

- Fatal error.
  - Returned when a request cannot be serviced, even with operator intervention.
  - For example, if a request is made to distribute data via ftp to a non-existent host, the request is failed with a fatal error.
- Retry error.
  - Potentially recoverable error.
  - Normally, a retry error would be returned to the client only when the server cannot recover from the error automatically.
  - A retry error may require operator assistance during recovery.
    - For example, a tape left in a tape drive might have to be removed manually.
- Warning.
  - Provided when operations can proceed without interruption, but an unexpected circumstance was detected.

- For example, if a client requests a file to be removed but the file does not exist, there is no error per se; however, a warning is generated to caution the client that the file to be removed did not exist in the first place.

Transient errors (such as network errors) are always retry errors.

- In general, clients and servers that experience transient retry errors first attempt to recover by retrying the operation automatically.
- One special case of this is "rebinding," which refers to the process by which a client automatically attempts to re-establish communication with a server in the event communication is disrupted.
  - The disruption may be caused by transient network failure, or by the server crashing or being brought down.
  - In any case, the client automatically attempts to reconnect to the server for a configurable period of time on a client-by-client basis.

System processes encountering an error or receiving an error from a server request can either pass the error back to a higher-level client or present it to the operator for operator intervention. The specific fault handling policies for Ingest client processes are shown in Table 1.

Table 1. Ingest Fault Handling Policies

Client Process	Fault Handling Policy
EcInGran	**Retry errors:** An error in sending a media ingest request to the Ingest Request Manager is reported to the operator and the operator can retry. Other retry errors result in the request failing. **Fatal errors:** The granule is failed. Granule failures are displayed on the Ingest GUI.
EcInReqMgr	**Retry errors:** Errors connecting to EcInGran are retried forever. Retry errors involving staging disks are retried a configurable number of times, then the request is failed. **Fatal errors:** Errors are failed immediately.
EcInGUI	**Retry errors:** Any error results in the request failing. **Fatal errors:** Any error results in the request failing.
EcInPolling	**Retry errors:** Errors are retried forever, with a delay between retries. **Fatal errors:** Errors are failed immediately, and are displayed on the Ingest GUI.
EcInEmailGWServer	**Retry errors:** N/A **Fatal errors:** E-mail that cannot be processed is moved to a failed directory, but no operator notification is provided.

Client Crash and Restart

When a client of an Ingest server crashes, the server (i.e., EcInGran or EcInReqMgr) continues to service the requests that were in process at the time of the client's crash.

When a client restarts in the system, it sends a restart notification to each server with which it interacts.

- Clients notify servers that they have come up either "cold" or "warm."
- Generally, the notification temperature sent to the server matches the temperature at which the client process is restarted.
- However, EcInGUI is an exception:
  - When EcInGUI restarts, it always informs EcDsStRequestManagerServer that it has performed a warm restart.
- When an Ingest client (e.g., EcInGran, EcInReqMgr, or EcInGUI) sends restart notification to the EcDsStRequestManagerServer, the latter calls a stored procedure to clean up the old request and staging disk created by the client, based on whether it was a cold or warm start.
  - The Storage Management Servers are not directly notified when a restart has occurred.
  - The Storage Management Servers respond to the event according to the fact that a previous request has been marked as failed and any staging disk resources they have allocated have been released.

The default server behavior in response to startup notification from a client is as follows:

- Warm Notification.
  - Outstanding requests for the restarted clients remain available in the persistent store.
  - The outstanding requests may be resubmitted by the client, and are serviced to completion upon resubmission.
  - Associated resources are left allocated until the requests are completed.
- Cold Notification.
  - All outstanding requests for the restarted client are cancelled.
  - If the client resubmits any cancelled request using the same RPC ID (e.g., by pressing the Retry button from an operator GUI), it is failed with a fatal error due to the client cold startup notification.

- Any resources associated with the cancelled requests are released and reclaimed by the system.

Server Crash and Restart

When a server crashes, clients cannot continue to submit requests for processing.

- Synchronous requests in progress result in a Distributed Computing Environment (DCE) exception being thrown back to the client process, which enters a rebinding failure recovery mode (as previously mentioned).
- Attempts to submit requests while the server is down result in the client blocking until a communication timeout has been reached.
- Although DCE has been replaced by socket-based library calls (i.e., CCS Middleware), the DCE exception code is handled by the CCS Middleware.

When a server restarts, it may perform various resynchronization activities in order to recover from an unexpected termination.

- In the event of a server cold start or cold restart, the server typically cancels all outstanding requests and reclaims all associated resources.
- In general, existing request queues are retained for warm restarts and cleared for cold starts or cold restarts.
- **EcInGran**-specific activities upon start/restart:
  - **Warm Restart:** The EcInGran server automatically restarts submitted requests from the beginning. If a file has been transferred (e.g., via ftp), it does not redo the transfer of that file.
  - **Cold Start:** All granule requests are cancelled. Existing request queues are cleared.
  - **Cold Restart:** All granule requests are cancelled. Existing request queues are retained.
- **EcInReqMgr**-specific activities upon start/restart:
  - **Warm Restart:** EcInReqMgr resynchronizes requests in progress with EcInGran, and resumes processing from the last check-pointed state.
  - **Cold Start:** All active requests are moved to the summary tables. Existing request queues are cleared.
  - **Cold Restart:** Each granule is resubmitted to the EcInGran, where it is failed. EcInReqMgr then resubmits the request to EcInGran, where it is processed as a new request. Existing request queues are retained.

- **EcInPolling**-specific activities upon start/restart:
  - **Warm Restart:** EcInPolling resubmits requests that were in progress at the time of fault. Continues polling for remaining requests in the polling directory.
  - **Cold Start or Cold Restart:** EcInPolling cleans up files and terminates any requests that had not yet been sent to EcInReqMgr. Requests remaining in the polling directory are sent as new requests.

Troubleshooting a Data Ingest Failure

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 ECS 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-EMD-001, *Release 7.10 Operations Tools Manual for the EMD Project*).
Message received indicating a data ingest failure.	1. Ensure (e.g., using EcCsIdPingServers) that it is possible to connect to the necessary hosts and servers (listed in Table 5). [For detailed instructions refer to the procedure for **Checking Connections to Hosts** (subsequent section of this lesson).] 2. If it is not possible to connect to any needed host(s)/server(s), notify the Operations Controller/System Administrator to check the hosts/servers and bring them back up if necessary. 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.	Check the log files (e.g., EcInReqMgr.ALOG, EcInPolling.ALOG, EcInGran.ALOG, EcInGUI.ALOG) in the /usr/ecs/*MODE*/CUSTOM/logs directory of the relevant host(s) for error messages. [For detailed instructions refer to the procedure for **Checking Log Files** (subsequent section of this lesson).]

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. Hard media ingest (e.g., from 8mm tape) may involve 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 (1 of 9)

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.	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/disk**). 2. Ensure that a staging disk (e.g., disk*x*) 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.
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.

Table 3. Ingest Operator GUI User Messages (2 of 9)

Message Text	Impact	Cause and Corrective Action
Can not read the request information file.	Unable to display request/granule text view information in the text browser.	1. Access a terminal window logged in to the Operations Workstation (e.g., e0acs12, g0acs02, l0acs01, or n0acs03). [For detailed instructions refer to the procedure for **Logging in to System Hosts** (previous section of this lesson).] 2. Type **cd /usr/ecs/*MODE*/CUSTOM/temp/INS** then press **Return/Enter**. 3. Type **ls -al** then press **Return/Enter**. • A listing of files, including their permissions is displayed as shown in the following example: **-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** 4. Review the file permissions to determine whether the GUI has permission to read the file to which it is trying to gain access. • 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.
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.	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.

Table 3. Ingest Operator GUI User Messages (3 of 9)

Message Text	Impact	Cause and Corrective Action
Data Delivery Record location needs to be specified.	Without this information, media ingest cannot be submitted.	1. 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. 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.	There may be no current requests that meet the search criteria. If it suspected that there are current requests that meet 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.	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.	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.
Destination MUST be provided.	Cannot perform file transfer.	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.
Detail Level needs to be set.	Unable to display History Log information.	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.

Table 3. Ingest Operator GUI User Messages (4 of 9)

Message Text	Impact	Cause and Corrective Action
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.
Media Type needs to be set.	Without this information, media ingest cannot be submitted.	1. To enter the type of medium (e.g., **DTF 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.

Table 3. Ingest Operator GUI User Messages (5 of 9)

Message Text	Impact	Cause and Corrective Action
Priority Level needs to be set.	Unable to change the priority for the selected request.	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.	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.
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.	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.

Table 3. Ingest Operator GUI User Messages (6 of 9)

Message Text	Impact	Cause and Corrective Action
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.	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/disk**). 2. Ensure that a staging disk (e.g., disk*x*) 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.
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.

Table 3. Ingest Operator GUI User Messages (7 of 9)

Message Text	Impact	Cause and Corrective Action
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.	1. Ensure (e.g., by logging in to the host) that the Ingest Server (e.g., x0icg01) is "up." 2. Ensure (e.g., by typing **ps -ef | grep EcInReqMgr**) that the Ingest Request Manager is "up." 3. If either the host or server has gone down, notify the Operations Controller/System Administrator to have host/server brought back up. 4. If host and server are "up," refer to the procedure for **Recovering from a Data Ingest Failure** (subsequent section of this lesson).
Unable to process the request.	Media ingest cannot be processed.	1. Ensure (e.g., by logging in to the host) that the Ingest Server (e.g., x0icg01) is "up." 2. Ensure (e.g., by typing **ps -ef | grep EcInReqMgr**) that the Ingest Request Manager is "up." 3. If either the host or server has gone down, notify the Operations Controller/System Administrator to have host/server brought back up. 4. 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 (8 of 9)

Message Text	Impact	Cause and Corrective Action
Unable to read the history log.	Unable to display History Log information.	1. Access a terminal window logged in to the Operations Workstation (e.g., e0acs12, g0acs02, l0acs01, or n0acs03). [For detailed instructions refer to the procedure for **Logging in to System Hosts** (previous section of this lesson).] 2. Type **cd /usr/ecs/*MODE*/CUSTOM/temp/INS** then press **Return/Enter**. 3. Type **ls -al** then press **Return/Enter**. • A listing of files, including their permissions is displayed as shown in the following example: **-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** 4. Review the file permissions to determine whether the GUI has permission to read the file to which it is trying to gain access. • 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.	1. Check the 8mm drives to determine whether the drives are loaded (if there are tapes in the drives). 2. If the 8mm drives are loaded, wait until one of the drives completes the current activity and unloads. 3. When one of the 8mm drives becomes unloaded, retry the media ingest. [For detailed instructions refer to the procedures for **Unloading and Loading Stackers** and **Performing Media Ingest from 8mm Tape Using the ECS Ingest GUI Media Interface** (previous sections of this lesson).] 4. If there is no tape in either 8mm drive or if neither drive unloads, 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 (9 of 9)

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.	1. Type the media ID in the **Media ID** 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 8mm Tape Using the ECS Ingest GUI Media Interface** or **Performing Media Ingest from DTF-2 Tape Using the ECS Ingest GUI Media Interface** (previous section of this lesson).]
Volume Threshold exceeds the system volume threshold.	Cannot update InExternalDataProviderInfo table for the specified data provider.	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 (1 of 3)

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.	1. Check the log file for error messages. [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.	1. Check the PDR(s) to ensure that file information is set correctly. [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. [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.	1. Check the PDR(s) to ensure that volumes are set correctly. [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. [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.	1. Check the log file for error messages. [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 (2 of 3)

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 that 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.	1. Check the PAN to ensure that the format is correct. [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.	1. Check the log file for error messages. [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.	1. Check the host (e.g., **e0icg11, g0icg01, l0acg02**, or **n0acg01**) for memory problems. [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.	1. Check the host (e.g., **e0icg11, g0icg01, l0acg02**, or **n0acg01**) for memory problems. [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 copy the new PDR file into the Polling directory.	The generated PDR file did not get copied to the polling directory.	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. [For detailed instructions refer to the procedure for **Checking the Polling Directory** (subsequent section of this lesson).]

Table 4. Regenerate Failed PDR Tool User Messages (3 of 3)

Message Text	Impact	Cause and Corrective Action
Unable to create all of the PDRs for the failed granules.	Not all of the failed granules had PDRs generated.	1. Observe previous error messages to determine which granule had a problem. 2. Check the log file for error messages. [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.	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. [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.	1. Check the PDR(s) to determine why the Regenerate Failed PDR Tool cannot parse the PDR file. [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)	Name Server (EcCsIdNameServer) Registry Server (EcCsRegistry) FTP Server (EcDsStFtpServer) Staging Disk Server (EcDsStStagingDiskServer) Ingest Granule Server (EcInGran) Automated Polling Ingest Client Interface (EcInPolling) Ingest Request Manager (EcInReqMgr)
Operations Workstation (e.g., x0acs02)	ECS Ingest GUI (EcInGUI) Storage Management Control GUI (EcDsStmgtGui)
Access/Process Coordinators (APC) Server (e.g., x0acg01)	Archive Server (EcDsStArchiveServer) Cache Manager Server (EcDsStCacheManagerServer) (including Pull Area Manager) FTP Server (EcDsStFtpServer) Staging Disk Server (EcDsStStagingDiskServer) Automated Polling Ingest Client Interface (EcInPolling)
FSMS Server (e.g., x0drg01)	HDF EOS Server (EcDsHdfEosServer) Archive Server (EcDsStArchiveServer) Cache Manager Server (EcDsStCacheManagerServer) FTP Server (EcDsStFtpServer) Staging Disk Server (EcDsStStagingDiskServer)
Sun Consolidation External Server (e.g., x0ins01)	Data Dictionary (EcDmDictServer) Ingest E-Mail Parser (EcInEmailGWServer)
Sun Consolidation Internal Server (e.g., x0acs11)	Science Data Server (EcDsScienceDataServer) Subscription Server (EcSbSubServer) Distribution Server (EcDsDistributionServer) 8mm Server (EcDsSt8MMServer) DTF-2 Server (EcDsStDTFServer) Staging Disk Server (EcDsStStagingDiskServer) Storage Management Request Manager (EcDsStRequestManagerServer) INGEST Media Tape Reader GUI (EcInTapeReaderGUI)

Troubleshooting Procedures

The following procedures for correcting Ingest problems are provided in this section:

- Checking Connections to Hosts
- Checking Log Files
- Recovering from a Data Ingest Failure
- Checking Ingest Notification Files
- Recovering from a Faulty PDR or Other File Problems (Polling with Delivery Record)
- Regenerating Failed PDRs
- Removing (Deleting) Generated PDRs
- Checking/Editing a PDR
- Checking PAN Contents
- Checking for Memory Problems
- Checking the Polling Directory
- Checking PAN Accessibility
- Recovering from Exceeding the Volume Threshold
- Recovering from Exceeding the Maximum Number of Concurrent Requests
- Recovering from Exceeding the Expiration Date/Time Period
- Recovering from File Transfer (ftp) Error
- Recovering from Processing Errors
- Recovering from Failure to Store Data
- Checking the Request Manager Server Debug Log

Checking Connections to Hosts

The procedure for checking connections to hosts is a part of the general troubleshooting process for a data ingest failures. The procedure starts with the assumption that the applicable hosts are operational and the Ingest Technician has logged in to a workstation or X-term that has access to the applicable network in the system.

Checking Connections to Hosts

1 Access a terminal window logged in to the Operations Workstation host.

- Examples of Operations Workstation host names include **e0acs12, g0acs02, l0acs01**, and **n0acs03**.
- Most other system hosts are acceptable for checking connections.
- Log-in is described in the procedure for **Logging in to System Hosts** (previous section of this lesson).

2 At the command line prompt type **cd /usr/ecs/*MODE*/CUSTOM/utilities** then press **Return/Enter**.

- Change directory to the directory containing the utility scripts.

3 At the command line prompt type **EcCsIdPingServers *MODE*** then press **Return/Enter**.

- The following type of response is displayed (only a few representative lines are shown):

  /usr/ecs/TS2/CUSTOM/bin/CSS/Sweeper -nsh x0icg01 -nsp 18202
  FoSwSweeper application started...
  We made a connection with EntryId =x0acs06:38709:23057 --- EcSrTransportSubServer
  We made a connection with EntryId =x0acs06:38712:23057 --- EcSrTransportSubEventServer
  We made a connection with EntryId =x0acs06:33379:17033 --- DsShQuitIDL
  […]

4 Observe the results displayed on the screen to determine whether connections can be made with the necessary hosts and servers.

- The necessary hosts and servers are listed in Table 5, Hosts, Servers, Clients and Other Software Relevant to Ingest.

5 If pinging the servers (Step 3) indicated a problem with any connection, ping the servers again (at the command line prompt type **EcCsIdPingServers *MODE*** then press **Return/Enter**).

6 Observe the results displayed on the screen to determine whether connections can be made with the necessary hosts and servers.

7 If it is not possible to connect to any needed host(s)/server(s), notify the Operations Controller/System Administrator to check the hosts/servers and bring them back up if necessary.

8 Return to the procedure that recommended checking connections to hosts.

Checking Log Files

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

- Communication 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 system and the appropriate host.

Checking Log Files

1 Access a terminal window logged in to the appropriate host.

- Operations Workstation (e.g., e0acs12, g0acs02, l0acs01, or n0acs03) has the following ingest ALOG files:
  - EcInGUI.ALOG.
  - EcDsStmgtGui.ALOG.
- Ingest Server (e.g., e0icg11, g0icg01, l0acg02, or n0acg01) host has the following ingest ALOG files:
  - EcInReqMgr.ALOG.
  - EcInPolling.ALOG.
  - EcInGran.ALOG.
  - EcInRegenFailedPDR.log.
- Sun Consolidation Internal Server (e.g., e0acs11, g0acs11, l0acs03, or n0acs04) host has the following ingest log files:
  - EcInTapeReaderGUI.8mm.log.
  - EcInTapeReaderGUI.DTF1.log
- Sun Consolidation External Server (e.g., e0ins01, g0ins01, l0ins01, or n0ins02) host has the following ingest ALOG files:
  - EcInEmailGWServer.ALOG.

- In addition to the ALOG files mentioned most of the preceding hosts have corresponding debug log files.
- For detailed instructions refer to the procedure for **Logging in to System Hosts** (previous section of this lesson).

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, EcInPolling.ALOG, EcInGran.ALOG, or EcInGUI.ALOG).

3 Type **pg *filename*** then press Return/Enter.

- ***filename*** refers to the ingest log file to be reviewed (e.g., EcInReqMgr.ALOG, EcInPolling.ALOG, EcInGran.ALOG, or 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:

- Ingest- or STMGT-related problems.
  - Perform the appropriate procedure(s) from the list near the beginning of the **Troubleshooting Procedures** section.
- Communication problems.
  - Notify the Operations Controller/System Administrator of suspected communication 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 Data Ingest Failure

The polling interfaces normally do not require intervention by the Ingest 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 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 Technician and the data provider with a brief description of the problem.

The Ingest 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).
- 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.

To recover from a data ingest failure begin with 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 10) is being displayed.

Recovering from a Data Ingest Failure

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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 Technician.

- Returns a PDRD (PDR error) or PAN (retrieval problem) to the data provider indicating the nature of the failure.
    - Note that Ingest does not send PDRDs to EDOS.

2 If a PDRD or PAN is available, review the appropriate file.

- For detailed instructions refer to the procedure for **Checking Ingest Notification Files (Polling with Delivery Record)** (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** (previous section of this lesson).

4 Perform the appropriate recovery procedure depending on the nature of the problem:

- **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.**

Checking Ingest Notification Files (Polling with Delivery Record)

Transfer errors, PDR information discrepancies, and other file problems (if any) are captured and logged in the PAN that Ingest 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 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 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, Ingest halts processing and reports the error that it just encountered for that file.

The remaining conditions in the file are not validated. Ingest processing continues with the next file in the file group. If there are no more files to process in the file group, Ingest 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 Ingest 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 Ingest indicates that a PDR has errors, Ingest 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, Ingest automatically returns a PDRD (via either e-mail or ftp) to the data provider unless no PDRDs are specified in the ICD between EMD and the data provider. (Ingest 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 Ingest server for processing until a corrected PDR is received and successfully processed. If the PDR is valid, Ingest 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 Ingest. 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 Ingest. After the ingest/archive process, Ingest 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, Ingest 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. Ingest 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 system 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:

- Ingest 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 10) is being displayed.

Checking Ingest Notification Files

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1 Access a terminal window logged in to the Ingest Server host.

- Examples of Ingest Server host names include **e0icg11, g0icg01, l0acg02**, and **n0acg01**.
- For detailed instructions refer to the procedure for **Logging in to System Hosts** (previous section of this lesson).

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.

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 10) is being displayed.
- Steps 1 through 3 of the procedure for **Recovering from 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., DTF tape).

3 If there is an Ingest process abort during file transfer (i.e., if there is a 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** (previous 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 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 detected 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.

- Examples of Ingest Server host names include **e0icg11, g0icg01, l0acg02**, and **n0acg01**.
- For detailed instructions refer to the procedure for **Logging in to System Hosts** (previous section of this lesson).

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-EMD-001, *Release 7.10 Operations Tools Manual for the EMD 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/
  P0420004AAAAAAAAAAAAAA99040150000.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/ P0420004AAAAAAAAAAAAAA99040150000.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.

- Examples of Ingest Server host names include **e0icg11, g0icg01, l0acg02**, and **n0acg01**.
- For detailed instructions refer to the procedure for **Logging in to System Hosts** (previous section of this lesson).

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.

- Examples of Ingest Server host names include **e0icg11, g0icg01, l0acg02**, and **n0acg01**.
- For detailed instructions refer to the procedure for **Logging in to System Hosts** (previous section of this lesson).

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.

- Examples of Ingest Server host names include **e0icg11, g0icg01, l0acg02**, and **n0acg01**.
- For detailed instructions refer to the procedure for **Logging in to System Hosts** (previous section of this lesson).

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.

- Examples of Ingest Server host names include **e0icg11, g0icg01, l0acg02**, and **n0acg01**.
- For detailed instructions refer to the procedure for **Logging in to System Hosts** (previous section of this lesson).

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.

- Examples of Ingest Server host names include **e0icg11, g0icg01, l0acg02**, and **n0acg01**.
- For detailed instructions refer to the procedure for **Logging in to System Hosts** (previous section of this lesson).

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**.
- The following type of response is displayed:

  Connected to x0icg03.daac.ecs.nasa.gov.
  220-NOTICE: unknown@echuser.east.hitc.com,
  220-*

- 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 P0420004AAAAAAAAAAAAAA99040150000.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 '
  P0420004AAAAAAAAAAAAAA99040150000.PDR '.
  226 Transfer complete.
  local: P0420004AAAAAAAAAAAAAA99040150000.PDR remote:
  P0420004AAAAAAAAAAAAAA99040150000.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.

- Examples of Ingest Server host names include **e0icg11, g0icg01, l0acg02**, and **n0acg01**.
- For detailed instructions refer to the procedure for **Logging in to System Hosts** (previous section of this lesson).

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

CAUTION

The thresholds are retrieved from the Ingest database when the Ingest Request Manager comes up. However, the threshold checks are done two different ways - sometimes in memory and sometimes by a database stored procedure. The database stored procedure uses the values in the database. If the Granule Server thresholds are changed in the database while Ingest is running there will be a mismatch between the values in memory and the values in the database. This could cause an Ingest failure.

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

If the system 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 10) is being displayed.
- Steps 1 through 3 of the procedure for **Recovering from 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 33) is displayed.

2 Click on the **Modify System Parameters** tab.

- The **Modify System Parameters** screen (Figure 36) 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 10) 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 PAN to the data provider indicating that the system is full and an attempt should be retried again later. If the system 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 10) is being displayed.
- Steps 1 through 3 of the procedure for **Recovering from 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 33) is displayed.

2 Click on the **Modify System Parameters** tab.

- The **Modify System Parameters** screen (Figure 36) is displayed.

3 Click in the **New:** field corresponding to **Request Threshold**, then type the numerical value for the new request 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 10) 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 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 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 PAN is sent to the data provider indicating expiration date/time exceeded. The Ingest 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 10) is being displayed.
- Steps 1 through 3 of the procedure for **Recovering from 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, operations personnel and the data provider's operations personnel have the option to coordinate data delivery via another medium (e.g., DTF 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 Technician is notified and a PAN is sent to the data provider indicating ftp failure. The Ingest 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 10) is being displayed.
- Steps 1 through 3 of the procedure for **Recovering from 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.

- Refer to the procedure for **Monitoring/Controlling Ingest Requests** (previous section of this lesson).

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 33) is displayed.

4 Click on the **Modify System Parameters** tab.

- The **Modify System Parameters** screen (Figure 36) 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** (previous section of this lesson).

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** (previous section of this lesson).

Recovering from Processing Errors

Ingest processing errors may require Ingest 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 10) is being displayed.
- Steps 1 through 3 of the procedure for **Recovering from 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 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 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**.

Recovering from Failure to Store Data

Successful data storage and retrieval functions are the heart of the system. Successful ingest of data depends on Storage Management (STMGT) inserting the product into the archive and Science Data Server (SDSRV) inserting the associated metadata into the inventory. Staging disks and cache managers for the Archive server and the FTP server are also involved in this process. To check the functioning of these elements, it is necessary that the ESDTs for the data to be inserted have been installed and are available, and that subscriptions have been registered.

Troubleshooting failures to store data (as well as other failures) often requires the review of server or application log files. The general procedure for checking log files is described in a previous section of this lesson. A procedure for reviewing the debug log file for the Storage Management Request Manager server is provided in a subsequent section of this lesson.

If it is necessary to recover from a failure to store data, use the procedure that follows. The procedure starts with the assumptions that the operator has logged in to the system and the appropriate hosts.

Recovering from Failure to Store Data

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1 Check the Storage Management Request Manager Server debug log file for error messages concerning the failure to store data.

- For detailed instructions refer to the procedure for **Checking the Request Manager Server Debug Log** (subsequent section of this lesson).

2 If necessary, check the Science Data Server debug log file for error messages concerning the failure to store data.

- Examine the section of the log with entries near the time of the problem, looking for error messages that indicate communication failure.
- If the log file entries indicate a communication problem, note the server(s) with which there is impairment or disruption of communication.
- For detailed instructions refer to the procedure for **Checking Log Files** (previous section of this lesson).

3 If necessary, check the Archive Server debug log file for error messages concerning the failure to store data.

- Examine the section of the log with entries near the time of the problem, looking for error messages that indicate communication failure.
- If the log file entries indicate a communication problem, note the server(s) with which there is impairment or disruption of communication.
- For detailed instructions refer to the procedure for **Checking Log Files** (previous section of this lesson).

4 If Step 2 and/or Step 3 resulted in detection of a problem in the interaction of SDSRV and/or Archive Server with other servers, at the host(s) for those servers, check the server debug log(s) for error messages concerning the failure to store data.

- The following logs may be involved:
  - EcDsStStagingDiskServerDebug.log (on the FSMS Server host).
  - EcDsStCacheManagerServerDebug.log (on the FSMS Server host).
  - EcDsStRequestManagerServerDebug.log (e.g., on the Sun Consolidation Internal Server host).
  - EcSbSubServerDebug.log (e.g., on the Sun Consolidation Internal Server host).

- For detailed instructions refer to the procedure for **Checking Log Files** (previous section of this lesson).

5 If the problem cannot be identified and fixed without help within a reasonable period of time, call the help desk and submit a trouble ticket in accordance with site Problem Management policy.

Checking the Request Manager Server Debug Log

The procedure for **Checking the Request Manager Server Debug Log** is a part of the procedure for **Recovering from Failure to Store Data** (previous section of this lesson). It is performed in response to an insert failure.

The Request Manager server processes requests from external clients (processes outside of Storage Management). Requests between Storage Management servers are passed directly from one server to another.

- Requests that require one of the Storage Management servers to perform processing are checkpointed [except requests that can be serviced solely through Structured Query Language (SQL)].
  - Checkpointing involves recording the request's state (e.g., "checkpointed," "failed," "completed") in the database to assist in error recovery.
- Requests that can be serviced solely through SQL are considered "trivial" requests.
  - Trivial requests are not checkpointed.
  - Examples include attaching to a staging disk, getting capacity, and getting block size.
  - Trivial requests submitted from outside Storage Management are serviced by the Request Manager server.
  - Trivial requests originating within Storage Management are passed directly from the client to the database server.

The Request Manager server (like other Storage Management servers) can manage several concurrent activities. This is accomplished through the use of threads. There are several different kinds of threads:

- Manager thread.
  - One per Storage Management server.
  - Responsible for dequeuing requests and assigning them to service threads.
  - Checks for cancelled requests.

- Service thread.
  - Multiple threads per Storage Management server.
  - Responsible for the actual servicing of requests.
  - Logs all progress including all changes of request state.
  - Notifies submitter when request has been completed.
- Receptionist thread.
  - One per Storage Management server.
  - Registers the server as "up" in the database.
  - Sits on a socket, waiting for connections from other Storage Management servers.
  - Unregisters the server at shutdown.
- Inbound RPC thread.
  - Spawned by a request from a Storage Management client.
  - Hands off the request to the manager thread and waits for completion of the request.
- Housekeeper thread.
  - Watches for completed requests that haven't previously been seen and processed.

Information concerning Request Manager server processing of requests (identified by thread) is recorded in the Request Manager server debug log (assuming some level of debug log recording is specified in the Registry database).

Trivial requests typically involve the following types of activities:

- Inbound RPC thread appears with a request.
- Manager thread dequeues the request and assigns it to a service thread.
- Service thread recognizes the thread as "trivial."
  - A "No checkpointing required -- going straight to responded" message is recorded in the Request Manager server debug log.
- Service thread executes the database transaction for results.
  - When the request is completed, a "Done servicing" message is recorded in the Request Manager server debug log.

  - If the request fails, an "Unable to service" message is recorded in the Request Manager server debug log.
- Service thread hands the results to the inbound RPC thread.
  - A "Notifying the client" message is recorded in the Request Manager server debug log.
- Inbound RPC thread silently returns to the client with the results.

Non-trivial requests are forwarded to the appropriate Storage Management server (e.g., EcDsStFtpServer, EcDsStStagingDiskServer, or EcDsStArchiveServer) for processing.

- Some of the same types of entries are made in the Request Manager server debug log for non-trivial requests as for trivial requests. For example:
  - "Waking up service thread" (Request Manager is preparing to process the request).
  - "Done servicing" (request processing has been completed).
  - "Unable to service" (the request has failed).
- Although some trivial requests include "token" statements, tokens are characteristic of non-trivial requests.
- A token includes request information that varies with the type of operation to be performed.
- For example, a token for an ftp request might include the following types of data:
  - Stored procedure (e.g., DsStFRInsert) [other types of stored procedures include DsStSDRInsert and DsStGRMapLogicalArchiveId].
  - RPC ID (e.g., RPCId=1821_535_1109-1124464729_171062001_x0acs06.xdc.ecs.nasa.gov:SBSVSDSV1DSDD1DSDD4:).
  - Username.
  - Encrypted password.
  - Host.
  - Source path.
  - Destination path.
  - External request ID.
  - Server name (e.g., EcDsStFtpServerNONE) [other types of operations might involve the EcDsStStagingDiskServerDRP1 for example].

- Type of operation (e.g., FtpPush) [other types of operations include ArRetrieve, SDAllocateDisk, SDLinkFile].
- Submitter (e.g., DSDD) [other types of operations might involve SDSV].
- Priority.

- The server to which the request was sent is identified by name (ServerName).
- Transaction ID is embedded in the RPC ID (the portion before the first colon in the RPC ID).

A "transaction" may involve multiple operations on a host or several hosts. Consequently, multiple threads may be used on each relevant host.

If it is necessary to recover from a failure to store data, use the procedure that follows. The procedure starts with the assumptions that the operator has logged in to the system and the appropriate hosts.

Checking the Request Manager Server Debug Log

---

1 Access a terminal window logged in to the Sun Consolidation Internal Server host.

- Examples of Sun Consolidation Internal Server host names include **e0acs11, g0acs11, l0acs03, and n0acs04**.
- For detailed instructions refer to the procedure for **Logging in to System Hosts** (previous section of this lesson).

2 At the UNIX command line prompt type **cd /usr/ecs/*MODE*/CUSTOM/logs** then press **Return/Enter**.

- ***MODE*** is current mode of operation.
- "**logs**" is the directory containing Request Manager Server debug log files (e.g., EcDsStRequestManagerServerDebug.log).

3 At the command line prompt type **pg *filename*** then press **Return/Enter**.

- ***filename*** refers to the appropriate Request Manager debug log file.
- For example:

  pg EcDsStRequestManagerServerDebug.log

- The content of the first page of the specified 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 At the **:** prompt type **/*date time*** then press **Return/Enter**.

- ***date time*** refers to the approximate date and time of the problem.
  - For example:

    06/18/01 12:17:31
- The file is searched for the specified text.
  - If the specified text is in the log file, the following type of response is displayed.

    ...skipping forward
    06/18/01 12:17:31: Thread ID : 105 : DsShTSStorage: creating the MutexVec for this thread
    […]
  - If the specified text is not in the log file, the following type of response is displayed.

    Pattern not found:
  - If the specified text is not in the log file, verify that the proper file was opened (Step 3) and that the date and time were entered correctly (Step 4).

5 At the **:** prompt type **/Unable to service** then press **Return/Enter**.

- **pg** searches the file for the specified text.
  - If the specified text is in the log file, the following type of response is displayed.

    ...skipping forward
    2:IngestRQ409GR1 Unable to service | Thread 52
    […]
  - If the specified text is not in the log file, the following type of response is displayed.

    Pattern not found:
- If the specified text is in the file, go to Step 7.
- If the specified text is not in the file, go to Step 6.

6 Examine the contents of the log file to determine which thread is associated with the problem being investigated.

- The following **pg** commands (at the **:** prompt) are useful:
  - ***n*** then **Return/Enter** (go to Page *n*).
  - **Return/Enter** or **+1** then **Return/Enter** (go down to the next page).

- **-1** then **Return/Enter** (go back to the preceding page).
- **+*n*** then **Return/Enter** (go down *n* number of pages).
- **-*n*** then **Return/Enter** (go back *n* number of pages).
- **+*n*l** then **Return/Enter** (go down *n* number of lines).
- **-*n*l** then **Return/Enter** (go back *n* number of lines).
- **$** then **Return/Enter** [go to the last page (end of file)].
- **q** then **Return/Enter** (exit from **pg**).

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

- To search back toward the beginning of the file enter:

  ^Waking up service thread <number>^

- To search back toward the end of the file enter:

  /Waking up service thread <number>

- For example:

  ^Waking up service thread 52^

  - The file is searched back toward the beginning of the file for the specified text.

- If the specified text is in the log file, the following type of response is displayed.

  ...skipping backward
  06/18/01 12:17:31: Thread ID : 102 : Waking up service thread 52 | Thread 102
  […]

- If the specified text is not in the log file, the following type of response is displayed.

  Pattern not found:

- The entries "Waking up service thread <number>" and "Unable to service | Thread <number>" bracket the thread servicing in which an error occurred.

NOTE: Thread IDs are reused frequently. There are likely to be many processes with the same thread ID in any particular log file. It is important to follow the correct instance of the thread.

NOTE: It is likely that the Request Manager would try again to process a failed request. Subsequent request processing may use the same thread ID or a different thread ID. However, it would involve the same transaction ID.

- A "No checkpointing required -- going straight to responded" entry associated with the thread ID indicates that the request is "trivial."

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

- The file is searched for the specified text.
  - If the specified text is in the log file, the following type of response is displayed.

    ...skipping forward
    06/18/01 12:17:31: Thread ID : 52 : SEARCHING FOR: 30148 (Found) | Thread 52
    06/18/01 12:17:31: Thread ID : 52 : SEARCHING FOR: 30148 (Found) | Thread 52
    06/18/01 12:17:31: Thread ID : 52 : DsStStoredProcedures::Execute - ERROR: Could not execute stored procedure | Thread 52
    06/18/01 12:17:31: Thread ID : 52 : Error encountered in stored procedure | Thread 52
    06/18/01 12:17:31: Thread ID : 52 : DBIF:Execute: Ultimate SQL: ROLLBACK TRANSACTION OUTER_7077776 | Thread 52
    06/18/01 12:17:32: Thread ID : 52 : 1_4501810_1217-1124633447_169062001_x0icg01.xdc.ecs.nasa.gov:IPOBIPOB1INRM1IGSA15:IngestRQ409GR1 Done servicing | Thread 52
    06/18/01 12:17:32: Thread ID : 52 : 1_4501810_1217-1124633447_169062001_x0icg01.xdc.ecs.nasa.gov:IPOBIPOB1INRM1IGSA15:IngestRQ409GR1 Unable to service | Thread 52
    06/18/01 12:17:32: Thread ID : 52 : 1_4501810_1217-1124633447_169062001_x0icg01.xdc.ecs.nasa.gov:IPOBIPOB1INRM1IGSA15:IngestRQ409GR1 Marked as unassigned | Thread 52
    06/18/01 12:17:32: Thread ID : 52 : 1_4501810_1217-1124633447_169062001_x0icg01.xdc.ecs.nasa.gov:IPOBIPOB1INRM1IGSA15:IngestRQ409GR1 Notifying the client | Thread 52
    06/18/01 12:17:32: Thread ID : 52 : Waiting for work | Thread 52
    06/18/01 12:17:32: Thread ID : 52 : Waking up manager thread | Thread 52
    […]

  - In the example the expression **SEARCHING** is associated with Thread ID 52.
  - The context of the SEARCHING statement indicates the type and source of the problem; in this case there appears to be a problem executing a stored procedure.

- If the specified text is not in the log file, the following type of response is displayed.

  Pattern not found:

9 If the expression **SEARCHING** is not associated with the specified thread in the lines displayed, repeat Step 8.

10 If necessary, at the **:** prompt type **-2l** then press **Return/Enter**.

- **pg** simulates scrolling the screen backward two lines (or any other number of lines that is typed at the prompt).
  - The file is redisplayed to include the two lines that preceded the page previously displayed.
  - For example:

    ...skipping backward
    06/18/01 12:17:31: Thread ID : 52 : DBIF:Execute: Ultimate SQL: exec DsStSDAttachDisk "/usr/ecs/TS2/CUSTOM/pdps/x0spg01/data/DpPrRm/x0spg01_disk", "SDSV", 0 | Thread 52
    06/18/01 12:17:31: Thread ID : 52 : SEARCHING FOR: 30148 (Found) | Thread 52
    06/18/01 12:17:31: Thread ID : 52 : SEARCHING FOR: 30148 (Found) | Thread 52
    06/18/01 12:17:31: Thread ID : 52 : DsStStoredProcedures::Execute - ERROR: Could not execute stored procedure | Thread 52
    06/18/01 12:17:31: Thread ID : 52 : Error encountered in stored procedure | Thread 52
    […]

  - The additional lines preceding "SEARCHING FOR" in the example indicate that the stored procedure in which the error was encountered is DsStSDAttachDisk.

11 To quit the **pg** application at the **:** prompt type **q** then press **Return/Enter**.

- **pg** exits from the Request Manager server debug log file.

12 If the request is a trivial request, go to Step 22.

13 If the request is a non-trivial request, open a separate UNIX window.

- The results of related operations on the server involved in performing copy or ftp functions for the transaction are going to be checked in a separate UNIX window.

14 Access a terminal window logged in to the appropriate server host for the server involved in performing copy or ftp functions for the transaction.

- Examples of appropriate server host names include **e0drg11, g0drg01, l0drg01**, and **n0drg01**.
- For detailed instructions refer to the procedure for **Logging in to System Hosts** (previous section of this lesson).

15 At the shell prompt type **grep '*TransactionID*' *filename* | grep 'LogProgress'** then press **Return/Enter**.

- For example:

  grep 'af610628-' EcDsStArchiveServerDebug.log | grep 'LogProgress'

- ***filename*** refers to the name of the log file for the process involved in performing copy or ftp functions for the transaction.
- ***TransactionID*** refers to the Transaction ID associated with the applicable request.
- In this example af610628-1dd1-11b2-a047-af3a589fd88e is the relevant Transaction ID.
  - However, usually it is not necessary to use the entire Transaction ID in the command; a representative sample (e.g., af610628- from the example) should be sufficient.
  - References to other Transaction IDs and entries that do not contain the string "LogProgress" are filtered out so references to the specified Transaction ID that contain the string "LogProgress" are the only log entries displayed. The string "LogProgress" is a filter for references to stored procedure DsStGRLogProgress.
  - Progress is logged for copy and ftp input/output at each block.
  - The following type of response is displayed:

    06/26/01 12:46:00: Thread ID : 65674 : myTransactionList[1]: exec DsStGRLogProgress "af610628-1dd1-11b2-a047-af3a589fd88e:PDPSSDSV1DSDD1DSDD10DSDD1DSDD1:MoPGE02#sy14182000TS2SC:MOD03.001:55732", 0, 1, "files" | Thread 65674
    06/26/01 12:46:00: Thread ID : 65674 : DBIF:Execute: Ultimate SQL: exec DsStGRLogProgress "af610628-1dd1-11b2-a047-af3a589fd88e:PDPSSDSV1DSDD1DSDD10DSDD1DSDD1:MoPGE02#sy14182000TS2SC:MOD03.001:55732", 0, 1, "files" | Thread 65674

06/26/01 12:46:43: Thread ID : 65674 : : 06/26/01 12:46:43: read ID : 2:46:43: myTransactionmyTransactionList[1]: exec DsStGRLogProgress "af610628-1dd1-11b2-a047-af3a589fd88e:PDPSSDSV1DSDD1DSDD10DSDD1DSDD1:MoPGE02#sy14182000TS2SC:MOD03.001:55732", 60, 60, "MB"List[1]: exec DsStGRLogProgress "af610628-1dd1-11b2-a047-af3a589fd88e:PDPSSDSV1DSDD1DSDD10DSDD1DSDD1:MoPGE02#sy14182000TS2SC:MOD03.001:55732", 60, 60, "MB"65714read 65674 : 74
06/26/01 12:46:43: Thread ID : 65674 : DBIF:Execute: Ultimate SQL: exec DsStGRLogProgress "af610628-1dd1-11b2-a047-af3a589fd88e:PDPSSDSV1DSDD1DSDD10DSDD1DSDD1:MoPGE02#sy14182000TS2SC:MOD03.001:55732", 60, 60, "MB"0DBIF:Execute: Ultimate SQL: exec DsStGRLogProgress "af610628-1dd1-11b2-a047-af3a589fd88e:PDPSSDSV1DSDD1DSDD10DSDD1DSDD1:MoPGE02#sy14182000TS2SC:MOD03.001:55732", 60, 60, "MB"06/26/01 12:46:43: 6/26/01 12:46:43: | Thread : 65714read 65674 : 74

- If no progress is indicated, go to Step 22.

16 **Single-click** in the UNIX window for the Sun Consolidation Internal Server host.

17 In the UNIX window for the Sun Consolidation Internal Server host at the command line prompt type **/usr/ecs/*MODE*/CUSTOM/logs** then press **Return/Enter**.

- Change to the logs directory in the appropriate mode.

18 At the command line prompt type **grep '*TransactionID*' *filename* | grep 'Done servicing'** then press **Return/Enter**.

- ***filename*** refers to the appropriate Request Manager debug log.
- For example:

  grep 'af610628-' EcDsStRequestManagerServerDebug.log | grep 'Done servicing'

- If the operation has been completed, the following type of response is displayed:

  06/26/01 12:46:00: Thread ID : 52 : af610628-1dd1-11b2-a047-af3a589fd88e:PDPSSDSV1DSDD1DSDD10DSDD1DSDD1:MoPGE02#sy14182000TS2SC:MOD03.001:55732 Done servicing | Thread 52
  06/26/01 12:46:44: Thread ID : 52 : af610628-1dd1-11b2-a047-af3a589fd88e:PDPSSDSV1DSDD1DSDD10DSDD1DSDD1:MoPGE02#sy14182000TS2SC:MOD03.001:55732 Done servicing | Thread 52

06/26/01 12:46:45: Thread ID : 52 : af610628-1dd1-11b2-a047-af3a589fd88e:PDPSSDSV1DSDD1DSDD2DSDD1DSDD3:MoPGE02#sy14182000TS2SC:MOD03.001:55732 Done servicing | Thread 52
06/26/01 12:46:47: Thread ID : 52 : af610628-1dd1-11b2-a047-af3a589fd88e:PDPSSDSV1DSDD1DSDD2DSDD1DSDD3:MoPGE02#sy14182000TS2SC:MOD03.001:55732 Done servicing | Thread 52
06/26/01 12:46:47: Thread ID : 52 : af610628-1dd1-11b2-a047-af3a589fd88e:PDPSSDSV1DSDD1DSDD2DSDD1DSDD7:MoPGE02#sy14182000TS2SC:MOD03.001:55732 Done servicing | Thread 52
06/26/01 12:46:50: Thread ID : 52 : af610628-1dd1-11b2-a047-af3a589fd88e:PDPSSDSV1DSDD1DSDD2DSDD1DSDD7:MoPGE02#sy14182000TS2SC:MOD03.001:55732 Done servicing | Thread 52
06/26/01 12:46:51: Thread ID : 52 : af610628-1dd1-11b2-a047-af3a589fd88e:PDPSSDSV1DSDD1DSDD4:MoPGE02#sy14182000TS2SC:MOD03.001:55732 Done servicing | Thread 52
06/26/01 12:46:56: Thread ID : 52 : af610628-1dd1-11b2-a047-af3a589fd88e:PDPSSDSV1DSDD1DSDD4:MoPGE02#sy14182000TS2SC:MOD03.001:55732 Done servicing | Thread 52
06/26/01 12:46:56: Thread ID : 52 : af610628-1dd1-11b2-a047-af3a589fd88e:PDPSSDSV1DSDD1DSDD8:MoPGE02#sy14182000TS2SC:MOD03.001:55732 Done servicing | Thread 52
06/26/01 12:46:59: Thread ID : 52 : af610628-1dd1-11b2-a047-af3a589fd88e:PDPSSDSV1DSDD1DSDD8:MoPGE02#sy14182000TS2SC:MOD03.001:55732 Done servicing | Thread 52

  - The statement "Done servicing" shows that the operation has been completed; however, it provides no indication as to whether the operation succeeded or failed.
  - If "Done servicing" is followed by "Unable to service," (as described in Step 19) the operation failed.

- If the operation has not been completed, no file entries are displayed (the UNIX prompt is displayed).
  - It may just be slow to complete.
- If the operation has been completed, go to Step 19.
- If the operation has not been completed, go to Step 20.

19 At the shell prompt type **grep '*TransactionID*' *filename* | grep 'Unable to service'** then press **Return/Enter**.

- ***filename*** refers to the appropriate Request Manager debug log.

- For example:

  grep '2a7d4168-' EcDsStRequestManagerServerDebug.log | grep 'Unable to service'

- If the request has failed, the following type of response is displayed:

  06/26/01 12:56:22: Thread ID : 52 : 2a7d4168-1dd2-11b2-8c52-99d0f708dce5:PDPSSDSV1:MoPGE02#sy14182000TS2MOD02OBC Unable to service | Thread 52
  06/26/01 12:56:22: Thread ID : 52 : 2a7d4168-1dd2-11b2-8c52-99d0f708dce5:PDPSSDSV4:MoPGE02#sy14182000TS2MOD02OBC Unable to service | Thread 52

  - If the operation has failed, return to Step 7.

- If the operation has not failed, no file entries are displayed (the UNIX prompt is displayed).

20 At the shell prompt type **tail -f *filename* | grep '*TransactionID*'** then press **Return/Enter**.

- ***filename*** refers to the appropriate Request Manager debug log.
- ***TransactionID*** refers to the Transaction ID associated with the applicable request.
- For example:

  tail -f EcDsStRequestManagerServerDebug.log | grep 'af610628-'

- If new entries are being posted to the log, the operation has not finished yet.
  - If the same entries continue to be repeated over and over, there could be a problem with the server.
  - Notify the Operations Controller/System Administrator of suspected server problems.
- If it is necessary to exit from a tailed log, type **^c** [Ctrl c].

21 If the operation has not finished yet, monitor the tailed log for a while.

- If the operation does not seem to finish (i.e., if entries continue to be made to the tailed log) after a reasonable period of time (e.g., 30 minutes), notify the Operations Controller/System Administrator of the problem.
- If it is necessary to exit from a tailed log, type **^c** [Ctrl c].

22 If problems were detected in the Request Manager server debug log and/or the log file for the process involved in performing copy or ftp functions for the transaction, notify the Operations Controller/System Administrator of the problem.

23 Return to the procedure for **Recovering from Failure to Store Data** (previous section of this lesson).

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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 workstation per student.

Statement of the requirements for the exercise.

Release 7.10 Operations Tools Manual for the EMD Project, 609-EMD-001, one copy per student.

Release 7.10 Mission Operation Procedures for the EMD Project, 611-EMD-001, one copy per student.

Logging in to System Hosts

The exercise involves logging in to system hosts. The exercise begins with a student acting in the role of Ingest Technician receiving the necessary information/ requirements for logging in to a system host. The student logs in to a system host as specified in the requirements.

Perform the following steps:

1. Access the command shell.
2. Set the DISPLAY environmental variable.
3. Log in to the specified host using secure shell and the specified user ID.

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 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 a terminal window logged in to the Operations Workstation host.
2. Set the necessary environmental variables.
3. 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 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 a terminal window logged in to the Operations Workstation.
2. Set the necessary environmental variables.
3. Start the Storage Management Control GUI in the appropriate mode.

Handling Cross-DAAC or Cross-Mode Ingest

The exercise involves handling cross-DAAC or cross-mode ingest. The exercise begins with a student acting in the role of Ingest Technician recognizing the need to handle cross-DAAC or cross-mode ingest. The student handles cross-DAAC or cross-mode ingest as specified in the requirements.

Perform the following steps:

1. Submit a request to User Services (at the DAAC where the data are currently available) to create an order or subscription (as applicable) to have data transferred to a different mode or DAAC (as specified in the requirements).
2. At the receiving DAAC monitor request processing to ensure that the data are received and ingested.
3. If the data are not received as expected, contact (e.g., by telephone or e-mail) User Services at the DAAC where the order or subscription was submitted to determine the nature of the problem and have it corrected.

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 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 without error 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 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 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 a terminal window logged in to the FSMS Server host.
2. Change directory to the directory containing the archive data.
3. Perform a long listing of directory contents.
4. 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 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 a terminal window logged in to the Operations Workstation host.
2. Type the command to start the clean-up script.
3. Type appropriate responses to clean-up script prompts.

Performing Hard Media Ingest

The exercise involves ingesting data from a DTF-2 tape cartridge or 8mm tape cartridge. The exercise begins with a student acting in the role of Ingest 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. Load the tape cartridge.
2. Read data from the tape.
3. Monitor the data transfer.
4. Unload the tape cartridge.

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 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 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 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 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 PDR, exceeding the volume threshold, insufficient disk space, or ftp error). The exercise begins with a student acting in the role of Ingest 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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