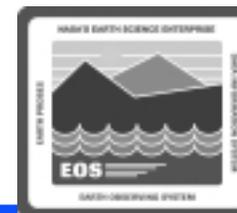


PRODUCTION PLANNING AND PROCESSING

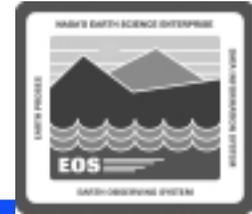
ECS Release 6A Training

Overview of Lesson



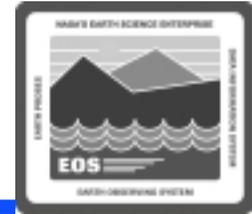
- **Introduction**
- **Production Planning and Processing (Context)**
- **Production Requests (Including Production Rules)**
- **Launching the Production Request Editor**
- **Creating/Updating/Deleting a Production Request**
- **Reviewing/Deleting Data Processing Requests**
- **Launching Planning Workbench-Related GUIs**

Overview of Lesson (Cont.)



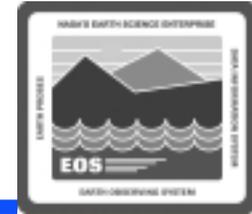
- **Creating a New Production Plan (Including Defining a Production Strategy and Reviewing a Plan Timeline)**
- **Resetting/Cleaning the PDPS Database**
- **Troubleshooting Production Planning Problems**
- **Launching the AutoSys GUI Control Panel**
- **Configuring AutoSys Screens/Displays**
- **Reviewing Hardware Status, DPR Dependency, DPR Production Timeline, Alarms, and Job Activities**
- **Modifying Job Status**

Overview of Lesson (Cont.)



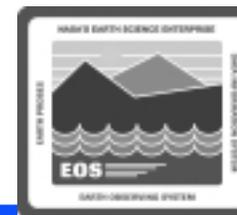
- **Reviewing Activity and Job Dependency Reports**
- **Defining and Running Monitors/Browsers**
- **Changing the Database Maintenance Time**
- **Tuning System Parameters**
- **Troubleshooting Processing Problems**
- **Launching the Quality Assurance (QA) Monitor**
- **Performing Science Product Quality Assurance**
- **Regenerating Granules in Response to a Loss of Files from the Archive**

Overview of Lesson (Cont.)



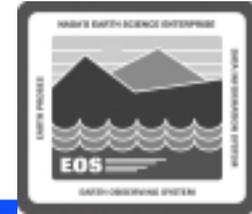
- **Practical Exercise**
 - **Launching the Production Request Editor**
 - **Creating a New Production Request**
 - **Editing/Modifying a Production Request**
 - **Deleting a Production Request**
 - **Reviewing Data Processing Requests**
 - **Deleting a Data Processing Request**
 - **Launching the Production Strategies GUI**
 - **Launching Production Workbench-Related GUIs**
 - **Defining a Production Strategy**
 - **Creating a New Production Plan**
 - **Reviewing a Plan Timeline**

Overview of Lesson (Cont.)



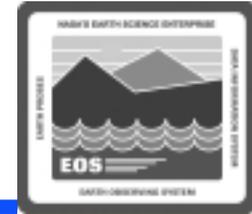
- **Practical Exercise (Cont.)**
 - **Cleaning the PDPS Database**
 - **Troubleshooting Production Planning Problems**
 - **Launching the AutoSys GUI Control Panel**
 - **Configuring AutoSys Runtime Options**
 - **Reviewing Hardware Status (Including Changing Hardware Status Views)**
 - **Reviewing DPR Dependencies**
 - **Reviewing the DPR Production Timeline**
 - **Reviewing Alarms (Including Selecting Alarms to Be Displayed)**
 - **Specifying Job Selection Criteria and Reviewing Job Activities**
 - **Determining the Ownership of an AutoSys Job**

Overview of Lesson (Cont.)



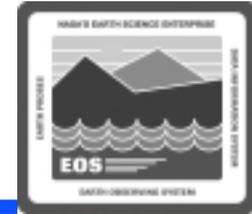
- **Practical Exercise (Cont.)**
 - **Modifying Job Status (Including Sending an Event to a Job) Using AutoSys**
 - **Reviewing Activity Reports and Job Dependency Reports**
 - **Defining and Running Monitors/Browsers**
 - **Reviewing the Database Maintenance Time**
 - **Troubleshooting Processing Problems**
 - **Launching the QA Monitor GUI**
 - **Updating QA Metadata**
 - **Regenerating Granules in Response to a Loss of Files from the Archive**

Objectives



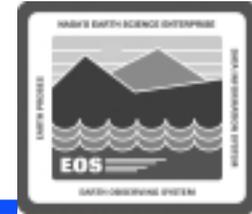
- **OVERALL:**
 - Develop proficiency in the procedures that apply to production planning and production processing operations
- **SPECIFIC:**
 - Describe the general functions and processes included in the Planning and Data Processing Subsystems (in the context of ECS operations)
 - Perform the steps involved in...
 - » launching the production request editor
 - » creating a new production request
 - » modifying a production request
 - » deleting a production request
 - » reviewing data processing requests

Objectives (Cont.)



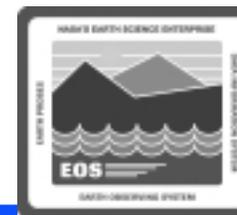
- **SPECIFIC (Cont.):**
 - **Perform the steps involved in...**
 - » **deleting a data processing request**
 - » **launching the production strategies GUIs**
 - » **launching planning workbench-related GUIs**
 - » **defining a production strategy**
 - » **creating a new production plan**
 - » **reviewing a production plan timeline**
 - » **cleaning the PDPS database**
 - » **troubleshooting production planning problems**
 - » **launching the AutoSys GUI Control Panel**
 - » **configuring AutoSys runtime options**
 - » **reviewing hardware status (including changing hardware status views) using AutoSys**

Objectives (Cont.)



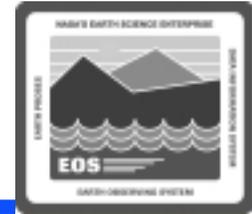
- **SPECIFIC (Cont.):**
 - **Perform the steps involved in...**
 - » reviewing DPR dependencies
 - » reviewing the DPR production timeline
 - » reviewing AutoSys alarms (including selecting alarms to be displayed)
 - » specifying job selection criteria and reviewing job activities using AutoSys
 - » determining the ownership of an AutoSys job
 - » modifying job status (including sending an event to a job) using AutoSys
 - » reviewing activity reports and job dependency reports
 - » defining and running monitors/browsers
 - » reviewing the database maintenance time

Objectives (Cont.)



- **SPECIFIC (Cont.):**
 - **Perform the steps involved in...**
 - » **troubleshooting processing problems**
 - » **launching the QA Monitor GUI**
 - » **updating QA metadata**
 - » **regenerating granules in response to a loss of files from the archive**
- **STANDARDS:**
 - **Lesson content (procedures in the lesson)**
 - **Mission Operation Procedures for the ECS Project (611-CD-600-001)**

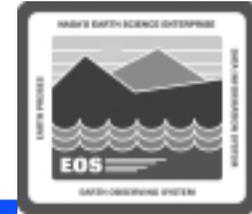
Production Planning and Processing



- **ECS Context**

- **ECS production planning and processing processes are accomplished at the Distributed Active Archive Centers (DAACs)**
- **People involved in production planning and processing activities are...**
 - » **Production Planners**
 - » **Production Monitors**

Production Planning and Processing (Cont.)



- **ECS Context (Cont.)**

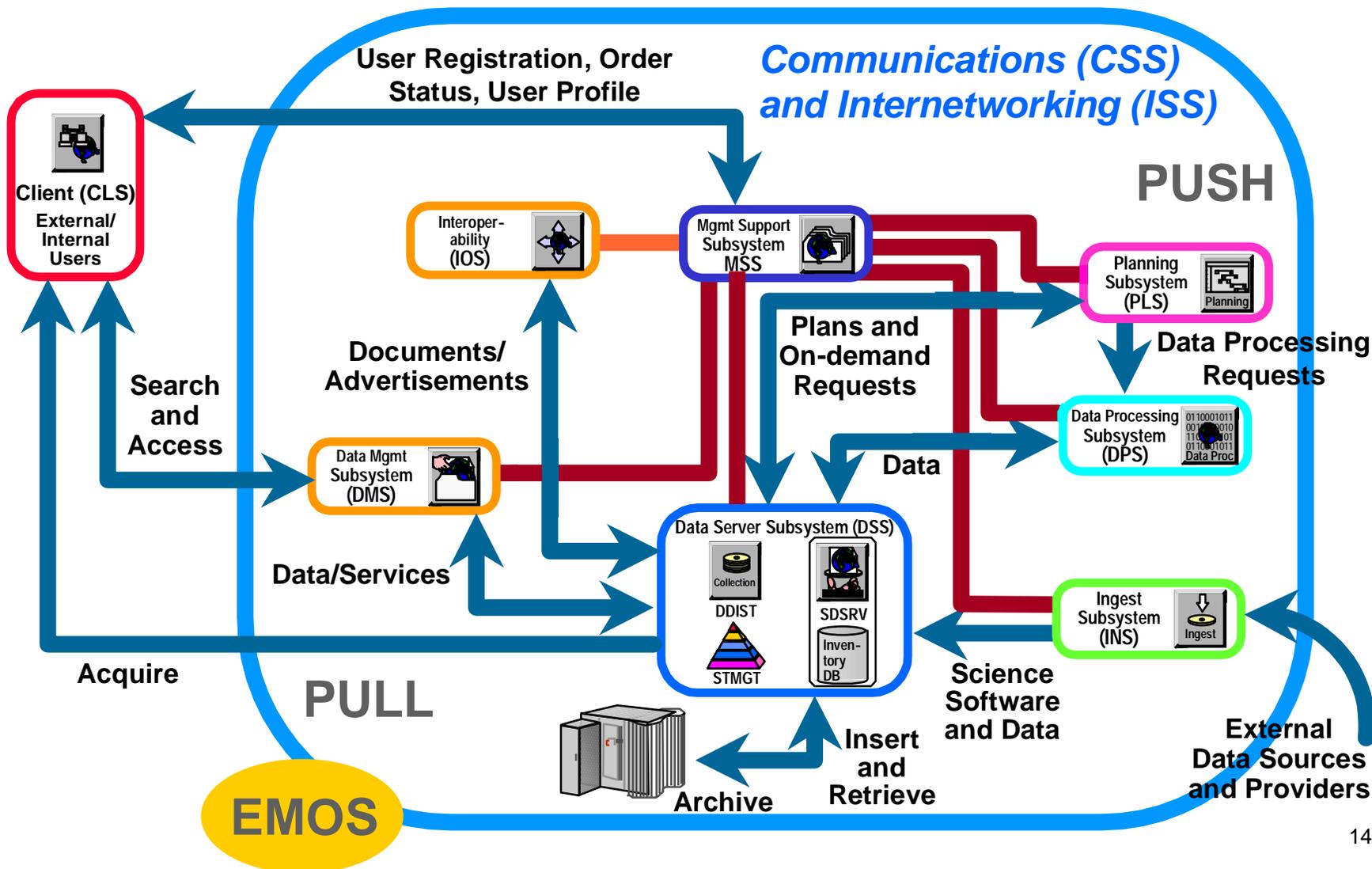
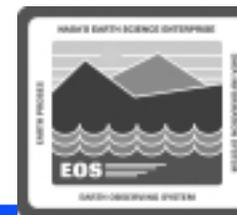
- **Production Planner**

- » performs planning functions; especially, using the **Planning Subsystem (PLS)** to create **Data Processing Requests** and specify which requests are to be processed as part of a particular **Production Plan**

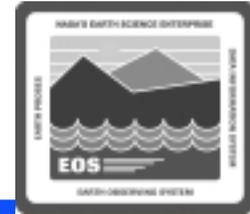
- **Production Monitor**

- » keeps track of operations in the **Data Processing Subsystem**, especially the execution of science data processing jobs (creation of data products)

ECS Context Diagram



Production Planning and Processing (Cont.)

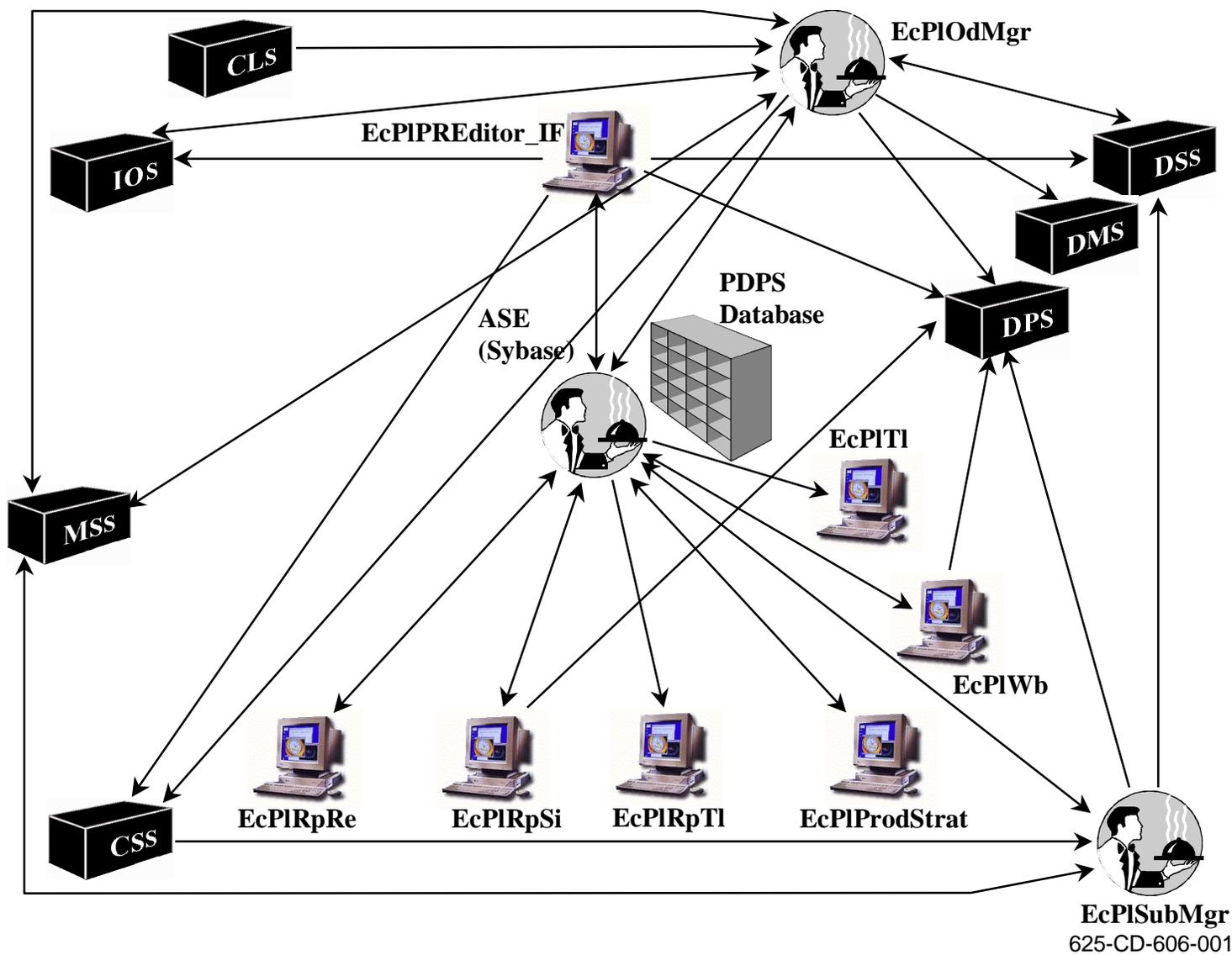
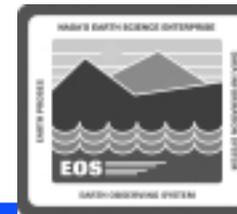


- **Planning Subsystem**

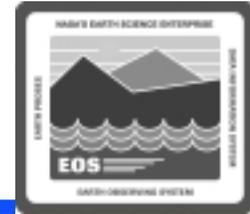
- **provides a mechanism for accomplishing the following general functions:**

- » **Defining DAAC production resources**
 - » **Scheduling production resources for non-production-related activities**
 - » **Defining data processing jobs to be performed at the DAAC**
 - » **Generating efficient plans for scheduling defined data processing jobs**
 - » **Coordinating production with the Data Server Subsystem and Data Processing Subsystem to achieve a highly automated production system**

Planning Architecture

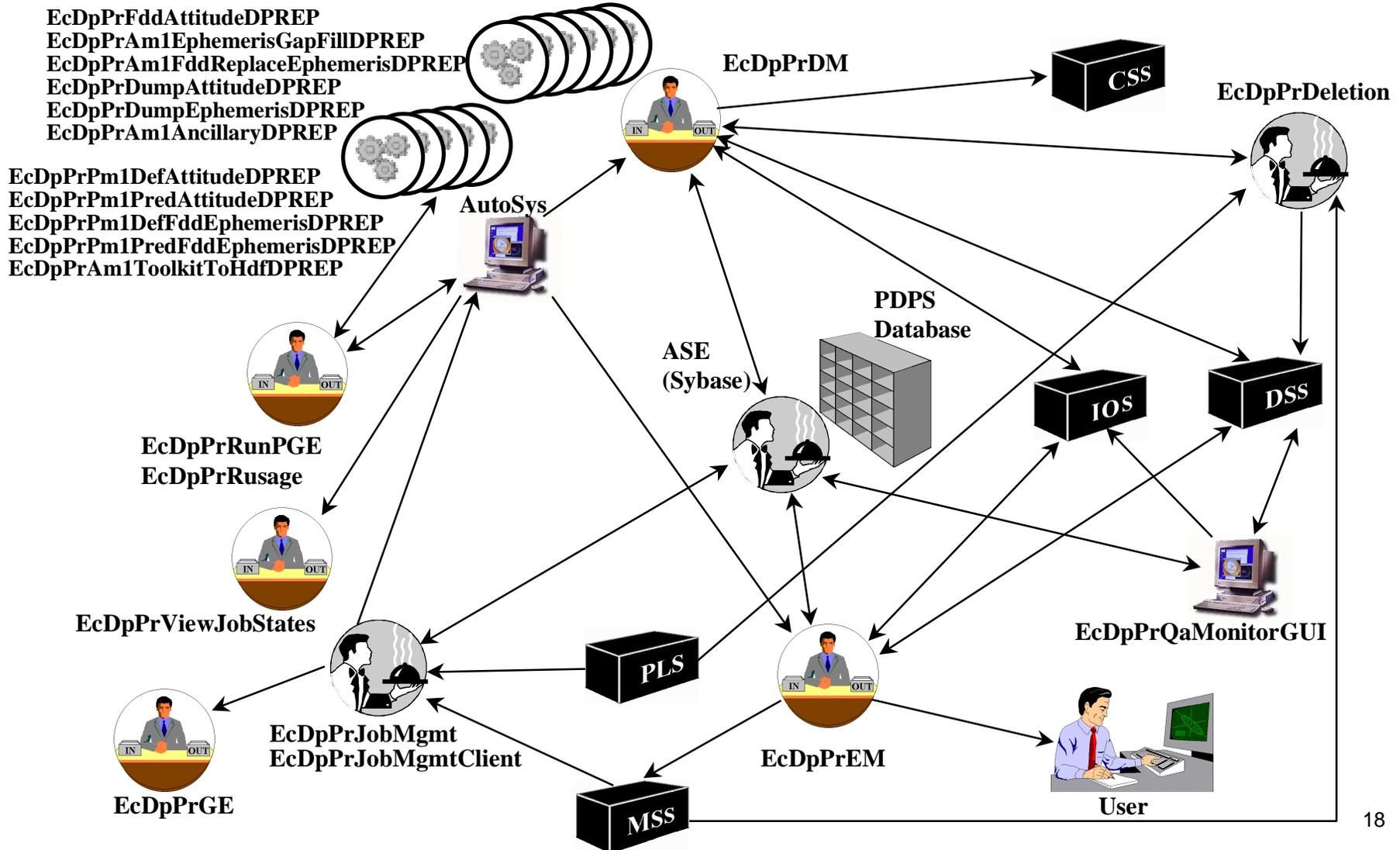
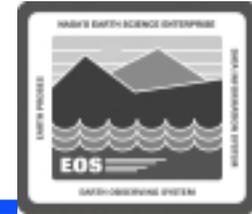


Production Planning and Processing (Cont.)

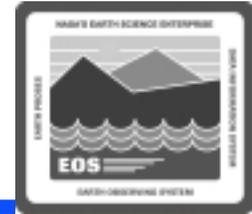


- **Data Processing Subsystem**
 - provides a mechanism for accomplishing the following general functions:
 - » Managing the allocation of data processing jobs to the site's data processing resources
 - » Managing, queuing, and executing data processing jobs to produce data products
 - » Supporting preliminary processing of ancillary data sets

Data Processing Architecture (PRONG)

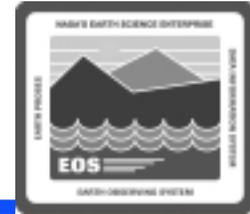


Production Planning and Processing (Cont.)



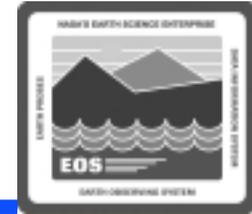
- **PLANG is the Planning Subsystem computer software configuration item (CSCI)**
 - **Resource Planning Workbench**
 - » **Resource Editor (EcPIRpRe)**
 - » **Resource Scheduler (EcPIRpSi)**
 - » **Resource Reservation Planning Master Timeline GUI (EcPIRpTI)**
 - **Production Request Editor (EcPIPREditor)**
 - **Production Planning Workbench**
 - » **Planning Workbench GUI (EcPIWb)**
 - » **Production Strategies GUI (EcPIProdStrat)**
 - » **Planning Master Timeline GUI (EcPITI)**

Production Planning and Processing (Cont.)



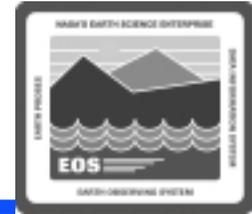
- **PLANG (Cont.)**
 - **On-Demand Manager (EcPIOdMgr)**
 - **Subscription Manager (EcPISubMgr)**
 - **Sybase Adaptive Server Enterprise (ASE) Server**
 - **Message Handler (EcPIMsh)**
 - **System Name Server (EcPISns)**
 - **Resource Model (EcPIRpRm, EcPIRm)**

Production Planning Concepts (Cont.)



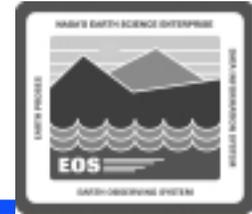
- **PLANG (Cont.)**
 - **Start-up and shutdown scripts used by planning personnel (/usr/ecs/MODE/CUSTOM/utilities directory)**
 - » **EcPISomeStart**
 - » **EcPIAllStart**
 - » **EcPIPRE_IFStart**
 - » **EcPIProdStratStart**
 - » **EcPIRpAllStart**
 - » **EcPIRpReStart**
 - » **EcPIRpSiStart**
 - » **EcPISubsEditStart**
 - » **EcPITISStart**
 - » **EcPIWbStart**

Production Planning Concepts (Cont.)



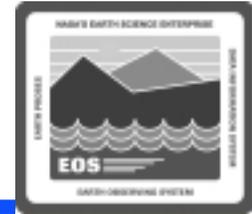
- **PLANG (Cont.)**
 - **Start-up and shutdown scripts used by planning personnel (/usr/ecs/MODE/CUSTOM/utilities directory) (Cont.)**
 - » **EcDpPrQaMonitorGUIStart**
 - » **EcPISlay**
 - » **EcPISlayAll**
 - » **EcPIRpSlayAll**

Production Planning Concepts (Cont.)



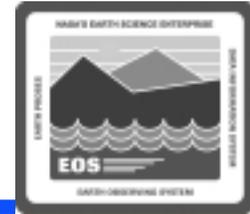
- **PLANG (Cont.)**
 - **Start-up scripts called by other applications (not normally invoked directly by planning personnel)**
 - » **EcPIMshStart**
 - » **EcPIRmStart**
 - » **EcPIRpRmStart**
 - » **EcPISnsStart**
 - » **EcPIStart**

Production Planning Concepts (Cont.)



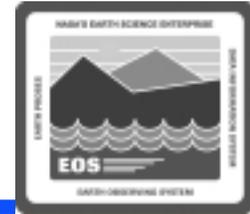
- **PLANG (Cont.)**
 - **Other scripts**
 - » **EcPICdsPingServers**
 - » **EcPIDbClean**
 - » **EcPIDbBuild**
 - » **EcPIDbDrop**
 - » **EcPIDbDump**
 - » **EcPIDbMigrate**
 - » **EcPIDbPatch**
 - » **EcPIRpFetchBaseline**
 - » **reset_db**
 - » **list_db**
 - » **save_db**

Production Planning and Processing (Cont.)



- **Data Processing Subsystem is composed of three computer software configuration items (CSCIs):**
 - **PRONG**
 - » Provides the services required to manage and monitor the Science Data Processing environment, which executes Science Software items (PGEs) and produces data products
 - **Algorithm Integration & Test Tools (AITTL)**
 - » Set of tools used for test and integration of new science software, new versions of science software, and user methods into the Science Data Processing operational environment
 - **Science Data Processing (SDP) Toolkit**
 - » Provides a set of software libraries which are used to integrate Science Software into the ECS environment

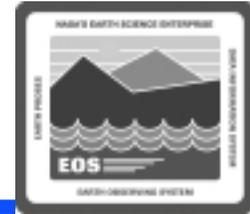
Production Planning and Processing (Cont.)



- **PRONG CSCI**

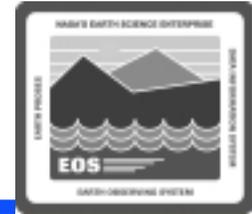
- Job Management (EcDpPrJobMgmt)
- Ground Event process (EcDpPrGE)
- Job Management Client (EcDpPrJobMgmtClient)
- AutoSys/AutoXpert
 - » Event Processor (AutoSys daemon)
 - » Event Server
 - » AutoSys GUIs
 - » AutoXpert GUIs
- Execution Management (EcDpPrEM)
- Data Management (EcDpPrDM)
- PGE Execution Manager (EcDpPrRunPGE)

Production Planning and Processing (Cont.)



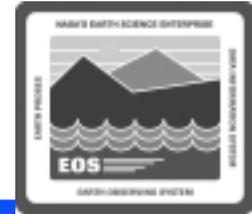
- **PRONG CSCI (Cont.)**
 - **Resource Usage (EcDpPrRusage)**
 - **View Job States (EcDpPrViewJobStates)**
 - **Terra Data Preprocessing (DPREP)**
 - » **AM1Eph or Step 1
(EcDpPrAm1EdosEphAttDPREP_PGE)**
 - » **FddAtt or Step 2
(EcDpPrAm1FddAttitudeDPREP_PGE)**
 - » **RepEph or Step 3
(EcDpPrAm1FddEphemerisDPREP_PGE)**
 - » **EcDpPrDumpAttitudeDPREP**
 - » **EcDpPrDumpEphemerisDPREP**

Production Planning and Processing (Cont.)



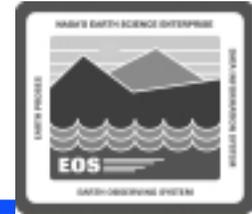
- **PRONG CSCI (Cont.)**
 - **Aqua DPREP**
 - » **Aqua Predictive Orbit DPREP
(EcDpPrPm1PredFddEphemerisDPREP)**
 - » **Aqua Definitive Orbit DPREP
(EcDpPrPm1DefFddEphemerisDPREP)**
 - » **Aqua Quick Attitude DPREP
(EcDpPrPm1PredAttitudeDPREP)**
 - » **Aqua Refined Attitude DPREP
(EcDpPrPm1DefAttitudeDPREP)**
 - **Deletion Server (EcDpPrDeletion)**
 - **Sybase ASE Server**
 - **Quality Assurance Monitor (EcDpPrQaMonitorGUI)**

Production Planning Concepts (Cont.)



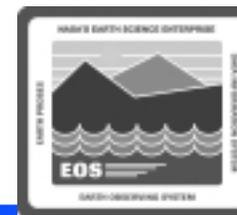
- **PRONG (Cont.)**
 - **Start-up script used by production personnel (/usr/ecs/MODE/CUSTOM/utilities directory)**
 - » **EcDpPrAutosysStart**
 - **Start-up scripts called by other applications (not normally invoked directly by production personnel)**
 - » **EcDpPrDeletionStart**
 - » **EcDpPrJobMgmtClientStart**
 - » **EcDpPrJobMgmtStart**
 - » **EcDpPrStart**
 - » **EcDpProcessingAppStart**
 - » **EcEcsAppStart**
 - » **EcPIPlanningAppStart**
 - » **EcPIStart**
 - » **EcPISubMgrStart**

Production Planning Concepts (Cont.)



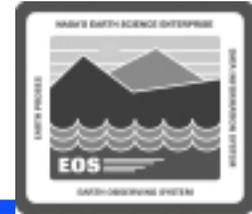
- **PRONG (Cont.)**
 - **Start-up script used by production personnel (/usr/ecs/MODE/CUSTOM/utilities directory on the Planning/Management Workstation)**
 - » **EcDpPrQaMonitorGUIStart**
 - **Other scripts available on the Queuing Server:**
 - » **EcDpPrCleanup**
 - » **EcDpPrRmFilesWOGranules.pl**

Production Planning Concepts (Cont.)



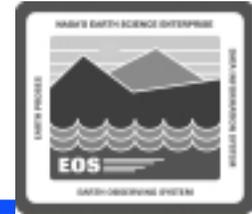
- **System Changes for Release 6A**
 - Increased data processing load at certain DAACs in support of...
 - » Reprocessing of Terra satellite data in addition to routine processing of Terra data (essentially doubles the previous Terra processing load)
 - » Processing of data from the Aqua satellite [Release 5B supported Aqua Science Software Integration and Test (SSI&T) only]
 - Greater volume of data to be ingested
 - » Supports more interfaces and a larger number of Earth Science Data Types (ESDTs)
 - Higher volume of data products to be distributed
 - Hardware configuration upgrades

Production Planning Concepts (Cont.)



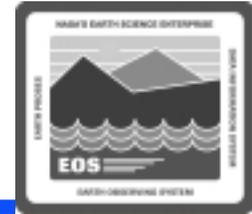
- **Hardware configuration upgrades for Release 6A**
 - Replacement of the Fiber Distributed Data Interface (FDDI) networks with gigabit Ethernet networks at two DAACs [i.e., Goddard Spaceflight Center (GSFC) and Earth Resources Observation Systems Data Center (EDC)]
 - » Gigabit Ethernet networks are expected to handle the increased throughputs of Terra reprocessing along with routine processing for Aqua
 - Addition of an SGI Origin processor to the Science Processing configuration at GSFC to handle the additional Aqua MODIS processing load
 - Replacement of SGI Challenge archive machines with SGI Origin machines

Production Planning Concepts (Cont.)



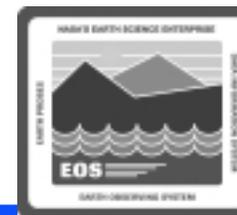
- **Hardware configuration upgrades for Release 6A (Cont.)**
 - **Upgrading of Science Data Server configurations (both the SDSRV and Sybase/SQS hosts) at EDC and GSFC so that the request load is shared between two separate host configurations**
 - **Additional staging disks in the Release 6A configuration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

Production Requests



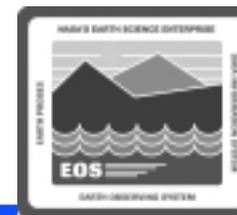
- **Production planning at the Distributed Active Archive Centers (DAACs)**
 - process by which the Production Planner notifies the Planning Subsystem (PLS) of the science processing jobs that are to be processed and what data to process
- **Science Software (SS)**
 - does the actual data processing
 - is developed at Science Computing Facilities (SCFs)
 - is embodied in Product Generation Executives (PGEs) when the software is integrated into the ECS production processing environment

Production Requests (Cont.)



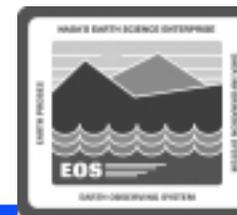
- **PGEs**
 - science software code (e.g., executable programs or shell scripts) that contain the instructions for processing data to create the desired products
- **Production Request (PR)**
 - Production Planner defines ECS science data processing jobs in terms of PRs
 - A PR is an order for data to be produced by the data processing system
 - A single PR may specify...
 - » several jobs that are to be run over a period of time
 - » a single job producing a single set of data

Production Requests (Cont.)



- **Production Request (Cont.)**
 - may apply to the processing of new data (standard PRs or standing orders)
 - may apply to the reprocessing of existing data (reprocessing PRs)
 - each PR identifies a specific PGE for generating a particular type of product
 - » some PGEs are dependent on others; i.e., some PGEs require input data that are the output of other PGEs
 - planning software will recognize and reject a PR when the PR specifies a PGE that requires data from another PGE that has not yet been specified in a PR

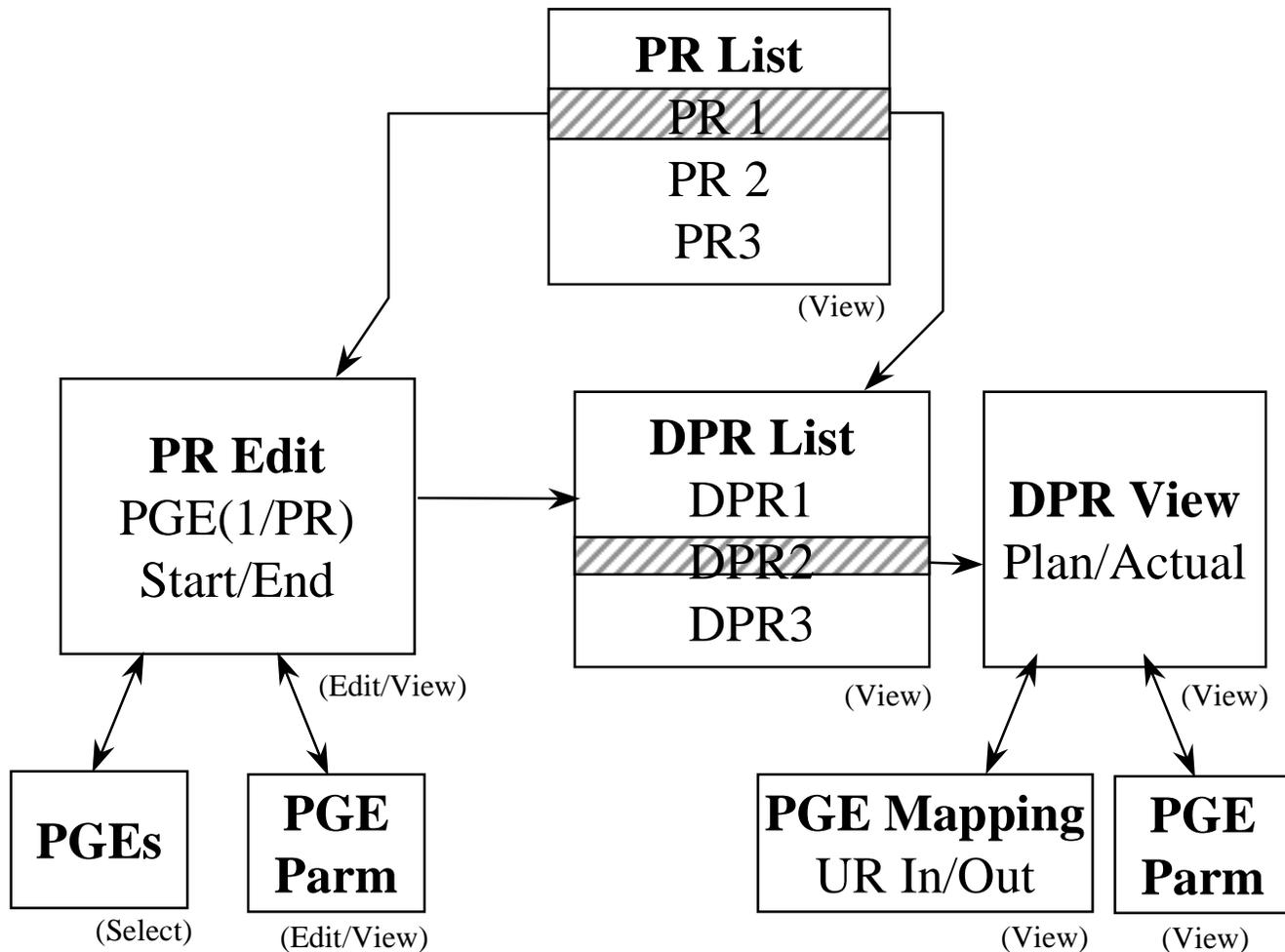
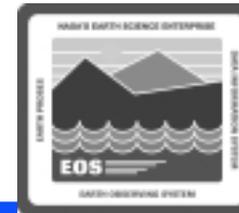
Production Requests (Cont.)



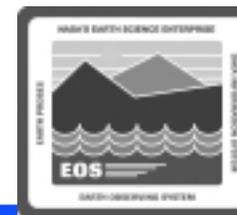
- **Planning Subsystem**

- uses each PR to generate either one or a series of **Data Processing Requests (DPRs)**
 - » each DPR corresponds to one execution of a single **PGE**
 - » each DPR contains the information that is needed by the **SDPS processing function**
- checks the availability of the data required for the **DPR**
- determines what data will be included in the **DPR output**
 - » so the system can make predictions concerning the **future availability of data**

Production Requests (Cont.)

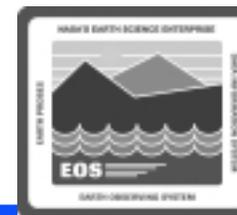


Production Requests (Cont.)



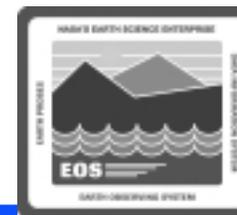
- **Types of Processing**
 - **Routine Processing**
 - » pre-defined software production processing that is periodic and keyed to data arrival
 - **Reprocessing**
 - » using a new, improved PGE to process data that had previously been processed with an older version of the PGE
 - **Regeneration**
 - » a type of reprocessing performed for the purpose of replacing a missing or damaged product
 - **On-Demand Processing**
 - » ad-hoc processing initiated by an end-user (as opposed to the Production Planner)

Production Requests (Cont.)



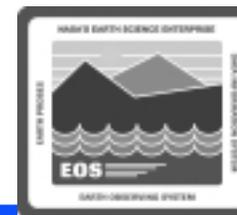
- **SCF Processing Requests**
 - Reference:
 - » **Interface Control Document Between EOSDIS Core System (ECS) and Science Computing Facilities (SCF) [505-41-33]**
 - **SCFs may request the DAACs to process or reprocess data produced using SCF-provided science software**
 - **SCFs' processing/reprocessing request messages can include optional run-time parameters, in case of changes from the original processing parameters**

Production Requests (Cont.)



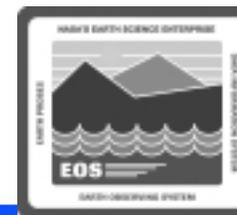
- **SCF Processing Requests (Cont.)**
 - **SCF staff send Processing Requests to the DAAC staff using one of the following three protocols:**
 - » e-mail
 - » X11/internet
 - » X11/modem
 - **SCFs must use the e-mail interface unless the DAAC has authorized their use of the X11 Interfaces**
 - » **Specific protocol used in each instance will have been defined in an Operations Agreement (or lower-level type of document) between SCF and DAAC**

Production Requests (Cont.)



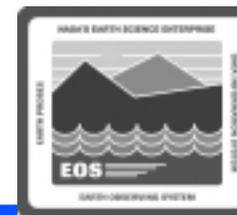
- **SCF Processing Requests (Cont.)**
 - **SCF Processing Requests provide DAAC operations staff with the following information:**
 - » **PGE Name**
 - » **PGE Version**
 - » **Optional PGE Profile (number 1-99 defining how the PGE is to be run)**
 - » **Time window for which the product should be regenerated**
 - » **Optional run-time parameters**
 - » **Optional comment**
 - **DAAC operations personnel acknowledge receipt of an SCF's Processing Request by replying to the SCF in an e-mail message that includes the SCF's original request and the following statement:**
 - » **"This is an acknowledgment of the receipt of the following Processing Request: . . . "**

Production Requests (Cont.)



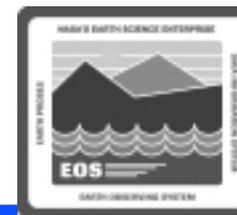
- **Production Rules**
 - Instructions about how a particular PGE is to be run
 - Specify a wide range of information such as...
 - » input and output data types
 - » frequency of execution
 - » activation conditions
 - » error handling instructions
 - **PGE profiles**
 - » permit a PGE to use different sets of production rules
 - » allow running a PGE with different input data sets, or activation conditions

Production Requests (Cont.)



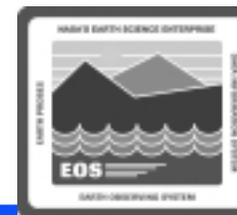
- **Production Rules (Cont.)**
 - Are entered when a PGE undergoes Science Software Integration and Test (SSI&T) at the DAAC
 - Where applicable, default parameter values are entered during SSI&T
 - Some parameters can be overridden when a Production Request is entered
 - Types of conditions that can be specified for each PGE:
 - » time period for which the PGE will run
 - » PGE inputs
 - » PGE outputs
 - » runtime parameter values
 - Some (but not all) production rules can work with other production rules

Production Requests (Cont.)



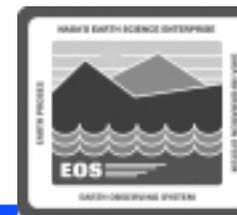
- **Production Rules (Cont.)**
 - **Production rules are often used for the selection of dynamic inputs**
 - » **dynamic internal inputs are produced by other PGEs (they are called dynamic internal inputs because they are produced at an ECS DAAC)**
 - » **dynamic external inputs are periodically ingested and stored in the Data Server Subsystem (they are termed dynamic external inputs because they are produced outside of the DAAC)**
 - » **static inputs are granules that are inserted during the SSI&T process and are retrieved not on the basis of time but by Earth Science Data Type (ESDT) and science group**

Production Requests (Cont.)



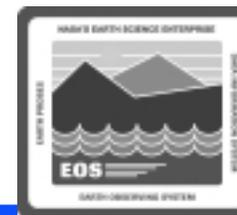
- **Production Rules (Cont.)**
 - **Methods of defining production rules**
 - » **science metadata is entered in various types of files during the SSI&T process**
 - » **parameter values are entered when a Production Request is created to schedule the PGE**
 - **During SSI&T at the DAAC information concerning the production rule(s) applicable to the PGE is included in Object Description Language (ODL) files**
 - **ODL files use 'parameter equals value' format**

Production Requests (Cont.)



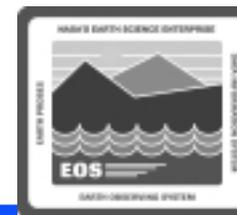
- **Production Rules (Cont.) - Categories of ODL files**
 - PGE Science Metadata ODL Files
 - ESDT Science Metadata ODL Files
 - Production Rule-Specific Science Metadata ODL Files
 - » Orbit Definition ODL Files
 - » Path Map Definition ODL Files

Production Requests (Cont.)



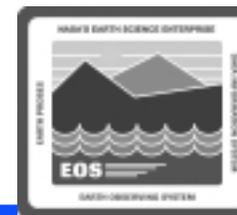
- **Release 6A Production Rules**
 - **Basic Temporal**
 - » Temporal (time) range of inputs matches the temporal range of outputs
 - **Advanced Temporal**
 - » Temporal range of inputs is offset from the expected temporal range of inputs and outputs
 - **Alternate Inputs**
 - » PGE is run with different inputs based on the availability or quality of various alternate input data sets
 - **Optional Inputs**
 - » PGE is run with specified optional inputs if available; otherwise, PGE is run without them

Production Requests (Cont.)



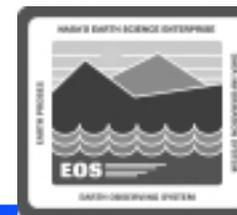
- **Release 6A Production Rules (Cont.)**
 - **Minimum/Maximum Number of Granules**
 - » **Minimum number of input granules needed for full data coverage and maximum number of input granules to search for may be specified**
 - » **Minimum and maximum number of outputs expected from the PGE may be specified**
 - **Optional DPRs**
 - » **The only DPRs executed are those for which the non-routine key input data actually become available (i.e., are either produced in data processing or can be acquired from the archive)**

Production Requests (Cont.)



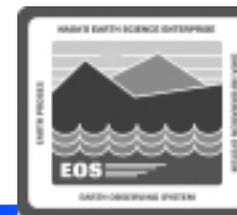
- **Release 6A Production Rules (Cont.)**
 - **Metadata Checks**
 - » DPR is run only if input data's metadata value(s) meet(s) certain criteria
 - **Metadata Query**
 - » Input granule selection is based on metadata value
 - **Spatial Query/Spatial Pad**
 - » Input granule selection is based on the spatial coverage of another input (i.e., the key input)
 - » Spatial Pad involves adding area to all sides of the key input's spatial shape

Production Requests (Cont.)



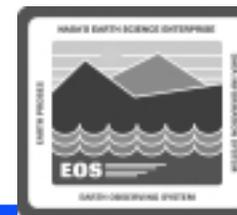
- **Release 6A Production Rules (Cont.)**
 - **Closest Granule**
 - » DPR is generated if a required input granule within a particular time range (rather than an exact time) is available; otherwise, no DPR is generated
 - » Supersedes the Most Recent Granule Production Rule
 - **Orbital Processing**
 - » Selection of input times is based on orbit information

Production Requests (Cont.)



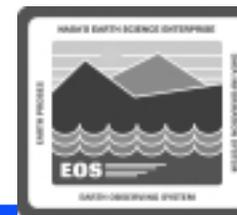
- **Basic Temporal Production Rule**
 - Defines the time frame for the PGE along with its input and output data
 - Typically scheduled to run using input data that become available periodically (every hour, every day, etc.)
 - Use input data for a particular period of time
 - Produce output for a specified length of time
 - Data the PGE takes in (its input) and the data it produces (its output) have the same period (or some subset of the same period) as the PGE

Production Requests (Cont.)



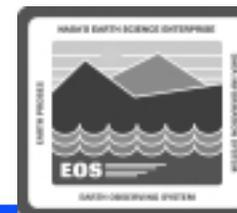
- **Basic Temporal Production Rule (Cont.)**
 - **Example One:**
 - » **A MODIS PGE processes data for five-minute intervals, producing Level 1B granules**
 - » **The PGE requires as input the specific five-minute Level 1A granule that is contemporaneous with (covers the same five-minute time period as) the Level 1B granule to be produced**
 - » **Using the Basic Temporal Production Rule, a five-minute Level 1A granule is staged as input to the PGE and a five-minute Level 1B granule is expected as output, both matching the time frame for which the PGE is run**

Production Requests (Cont.)



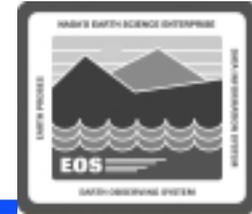
- **Basic Temporal Production Rule (Cont.)**
 - **Example Two:**
 - » **A CERES PGE processes data for 24-hour intervals, producing 24-hour Level 1A granules as output**
 - » **As input the PGE takes Level 0 data that is ingested every two hours**
 - » **Using the Basic Temporal Production Rule, twelve two-hour Level 0 granules are staged as input to the PGE and a 24-hour Level 1A granule is expected as output, matching the time frame for which the PGE is run**

Production Requests (Cont.)



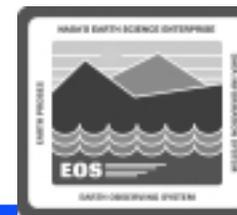
- **Basic Temporal Production Rule (Cont.)**
 - **Fundamental elements used to define the Basic Temporal Production Rule are...**
 - » **period**
 - » **boundary**
 - **Period is the length of time for which a PGE processes data or the length of time for which input and output data is collected**
 - » **A PGE that is subject to the Basic Temporal Production Rule only and that processes data in two-hour blocks, takes in data that relates to a particular two-hour interval and produces output data for that same two-hour period**
 - » **Data that has a period of 15 minutes was collected or produced for a 15-minute time period**

Production Requests (Cont.)



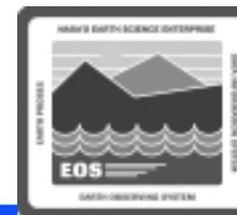
- **Basic Temporal Production Rule (Cont.)**
 - **Boundary is the starting point for the data or PGE**
 - » Depending on the characteristics of the data or PGE, the boundary may be the start of a minute or hour or day or week (etc.)
 - » If a PGE's boundary is the start of the hour, it processes data that starts every hour and runs on data for the length of its period
 - » If data comes in every day, PDPS predicts that the data is going to be available at the start of the day and allows scheduling of PGEs that use the data as input accordingly

Production Requests (Cont.)



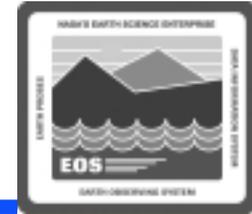
- **Basic Temporal Production Rule (Cont.)**
 - Both the PGE itself and the input data have a boundary and period associated with them
 - » So PDPS can determine the frequency of processing for a Basic Temporal PGE and the time period for its inputs and outputs
 - PDPS uses period and boundary in combination to plan the processing of each PGE, including determining its input requirements and anticipated output (which may be input to other PGEs)
 - » If a PGE has a period of one hour and a boundary of “start of day,” it is scheduled every hour, beginning at midnight
 - » If an input has a period of 15 minutes and boundary of “start of hour,” PDPS predicts it every 15 minutes beginning on the hour

Production Requests (Cont.)



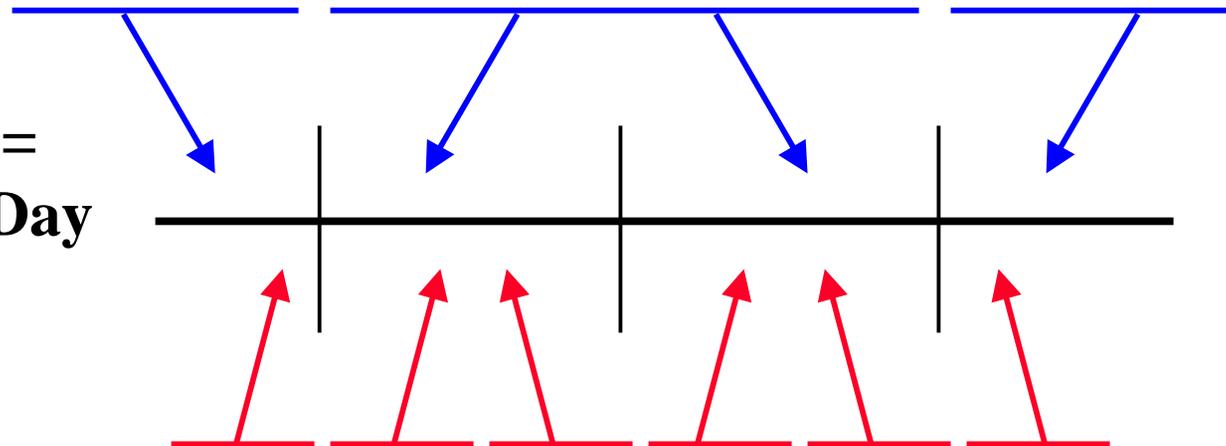
- **Basic Temporal Production Rule (Cont.)**
 - **Additions to the Basic Temporal Production Rule**
 - » **boundary offset**
 - » **end-of-month anomaly**
 - **Illustration of the Basic Temporal Production Rule**
 - » **PGE boundary is “start of day”**
 - » **PGE period is one hour**
 - » **PGE is scheduled for every hour through the day**
 - » **If a Production Request were entered for two full days of processing, a DPR would be created for the PGE to run every hour; i.e., 48 DPRs total**
 - » **If a Production Request were created for a four-hour period in the middle of a single day (for example, from 12:00 noon to 4:00 p.m.), then four DPRs would be created**

Example of Basic Temporal Production Rule



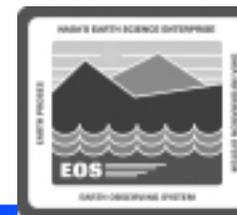
**Input One: Boundary = Start of Day
Period = 2 hours**

**PGE
Boundary =
Start of Day
Period =
1 hour**



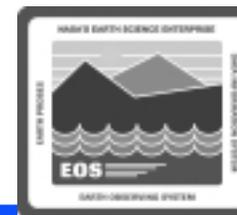
**Input Two: Boundary = Start of Day
Period = 1/2 hour**

Production Requests (Cont.)



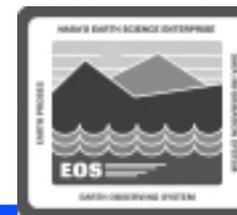
- **Advanced Temporal Production Rule**
 - Allows for input data to be acquired for a time period other than that of the PGE or its planned inputs/outputs
 - Offset mechanism
 - » specifies on an input basis that the data required for processing is some number of seconds earlier or later than the planned time period for the PGE
 - Example One:
 - » A PGE requires data from its previous execution for interpolation purposes (e.g., one of its inputs is the output of the very same PGE the last time that it ran)
 - » If the PGE processes data for each one-hour interval (producing an hourly product), the Advanced Temporal Production Rule is specified with an offset of minus 3600 seconds (one hour) for the input of the ESDT produced by previous runs

Production Requests (Cont.)



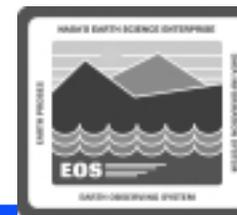
- **Advanced Temporal Production Rule (Cont.)**
 - **Example Two:**
 - » **A PGE takes as input two-hour Level 0 data to produce an L1A product**
 - » **Because the edges of the Level 0 data can be difficult to process without preceding and succeeding data, the PGE requires three Level 0 granules, one from the time period before it runs, one for the time period it is currently processing and one for the next time period**
 - » **The PGE is defined as having three inputs, the first with an Advanced Temporal offset of minus 7200 seconds (two hours), the second with no Advanced Temporal offset and the third with an Advanced Temporal offset of plus 7200 seconds (two hours)**

Production Requests (Cont.)



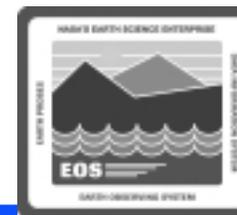
- **Advanced Temporal Production Rule (Cont.)**
 - Uses the times specified in the Basic Temporal Production Rule as a reference point for specifying offset(s) to request data from a “period” and/or “boundary” different from that of the DPR or its input
 - **Offsets ...**
 - » are specified as either negative or positive numbers
 - » indicate whether the time period of the input data is before or after that of the DPR (a particular run of a PGE)

Production Requests (Cont.)



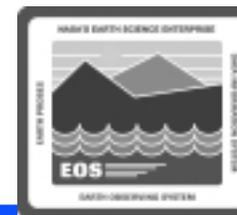
- **Advanced Temporal Production Rule (Cont.)**
 - **Begin Period Offset**
 - » an amount of time (in seconds) that is specified with respect to the DPR start time
 - » negative beginning offset requests data that was collected before the DPR start time
 - » positive beginning offset requests data with a collection time after the start time of the DPR
 - **End Period Offset**
 - » an amount of time (in seconds) that is specified with respect to the DPR end time
 - » negative ending offset requests data that ended collection before the DPR end time was reached
 - » positive ending offset requests data that ended collection after the end time of the DPR boundaries
 - **Beginning and ending offsets are not absolute cut-offs for data (overlapping granules are staged)**

Production Requests (Cont.)



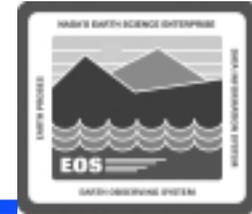
- **Advanced Temporal Production Rule (Cont.)**
 - **Illustration of the Advanced Temporal Production Rule**
 - » **PGE processes data for every one-hour interval**
 - » **Input One comes in at two-hour intervals**
 - » **Input Two is produced every 1/2 hour**
 - » **Input One: both the Begin Period Offset and End Period Offset are - 7200 seconds (minus two hours)**
 - » **Every DPR will stage the "previous" Input One (this could be used to get the "previous" or "next" granule of an input)**

Production Requests (Cont.)



- **Advanced Temporal Production Rule (Cont.)**
 - **Illustration of the Advanced Temporal Production Rule (Cont.)**
 - » **Input Two Begin Period Offset for is zero (it will match the Start Time of the DPR)**
 - » **Input Two End Period Offset is +1800 seconds (plus 1/2 hour)**
 - » **All Input Two granules will be staged that fall within the time period of the DPR plus 1/2 hour**
 - » **All Input Two granules within the time period of the DPR are acquired, plus the one from the next 1/2-hour time period, for a total of three granules**
 - » **The additional granule acquired by means of the End Period Offset might be used for interpolation purposes at the end point**

Example of the Advanced Temporal Production Rule



Input One: Boundary = Start of Day

Period = 2 hours

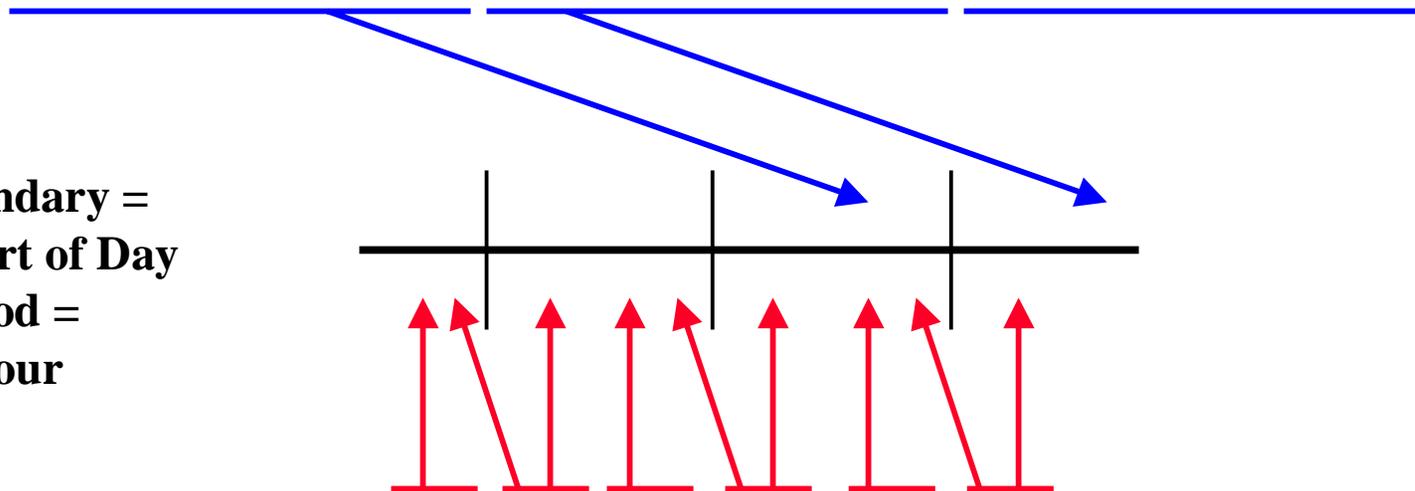
Begin Period Offset = -7200 (-2 hours)

End Period Offset = -7200 (-2 hours)

PGE

**Boundary =
Start of Day**

**Period =
1 hour**



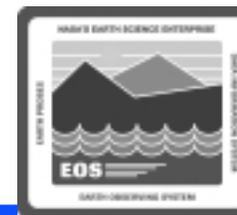
Input Two: Boundary = Start of Day

Period = 30 minutes (1/2 hour)

Begin Period Offset = 0

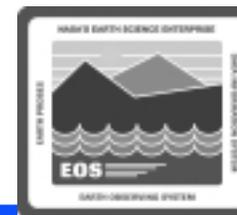
End Period Offset = +1800 (+1/2 hour)

Production Requests (Cont.)



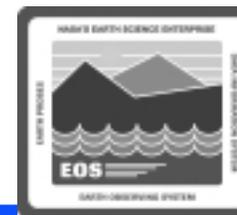
- **Alternate Inputs and Optional Inputs Production Rules**
 - Very similar rules that involve much the same processing in PDPS
 - Allow a PGE to select various inputs based on timers and priority lists
 - Major difference:
 - » Alternate Inputs requires that one of alternates on the list be used
 - » Optional Inputs allows successful execution of the PGE if no optional input on the list is available

Production Requests (Cont.)



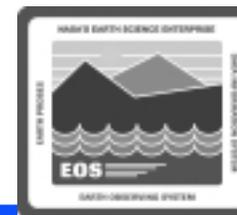
- **Alternate Input Production Rule**
 - A list of inputs for a PGE is evaluated in priority order
 - » PGE is scheduled and executed with the best priority input that could be found
 - A timer can be used to specify how long to wait for a given alternate choice before proceeding with a choice of lesser priority
 - PGE is not executed until one of the alternate choices has been found

Production Requests (Cont.)



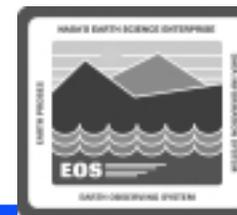
- **Alternate Input Production Rule (Cont.)**
 - **Example:**
 - » **PGE requires model wind data as an input but is capable of accepting wind data from a Data Assimilation Office (DAO) model, a National Centers for Environmental Prediction (NCEP) model, or climatology**
 - » **Each input is considered in priority order**
 - » **A timer value indicates how long to wait before trying the next input**
 - » **DAO is listed as first choice or "primary" data**
 - » **NCEP is the second choice**
 - » **Climatology is the last choice**
 - » **PGE waits for the DAO timer to expire before running with either NCEP data or climatology**
 - » **PGE waits for the NCEP timer to expire before running with the climatology data**

Production Requests (Cont.)



- **Optional Input Production Rule**
 - There is a list of inputs that are desired but not required for execution of a PGE
 - Inputs are ranked in priority order
 - Timers are set to wait before choosing a lower-priority type of input
 - If none of the inputs on the list becomes available, the PGE starts because the alternatives are classified as "optional"

Production Requests (Cont.)

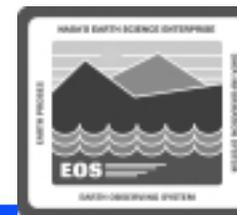


- **Optional Input Production Rule (Cont.)**

- **Example:**

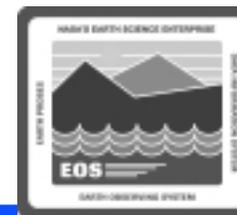
- » **It would be preferable to run a particular MODIS PGE with the output of a MISR PGE as input**
 - » **However, the MISR output may not be produced every day**
 - » **So the MODIS PGE lists the MISR input as optional with a two-hour timer**
 - » **On those occasions when no MISR output is produced, the MODIS PGE waits for two hours and then is executed without the MISR input**

Production Requests (Cont.)



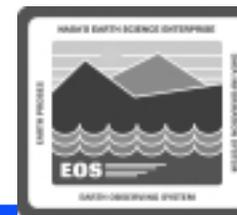
- **Illustration of the Alternate Inputs and Optional Inputs Production Rules**
 - PGE has two inputs that are “required” so they must be available for the PGE to be run
 - PGE has one input that is “alternate”
 - » Alternate input can be one of three choices
 - After the pair of required inputs has become available, the alternate inputs are evaluated:
 - » If the primary alternate is available, it is used as input and the PGE is scheduled for execution
 - » One-hour timer on the primary alternate
 - » If the primary alternate is unavailable, the PGE waits until the primary alternate becomes available or the one-hour timer expires, whichever occurs first
 - » If the second alternate is available after the timer for the primary alternate has expired, the second alternate is used as input

Production Requests (Cont.)



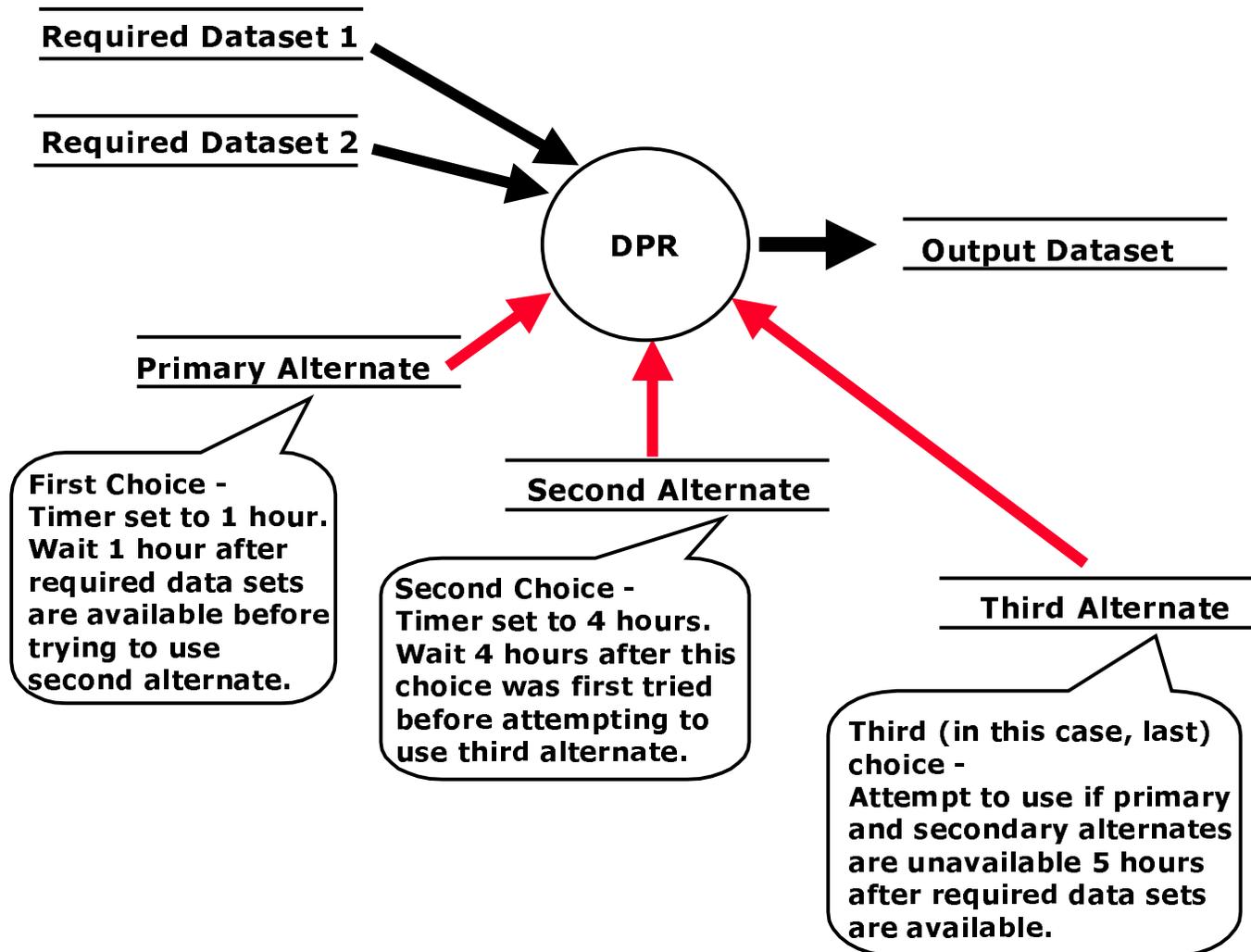
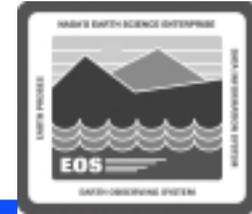
- **Illustration of the Alternate Inputs and Optional Inputs Production Rules (Cont.)**
 - There is a four-hour timer on the second alternate
 - If the second alternate is unavailable, the PGE waits until either the primary alternate or the secondary alternate becomes available or the four-hour timer expires, whichever occurs first
 - If the third alternate is available after the timer for the second alternate has expired, the third alternate is used
 - There is no timer on the third alternate
 - If the third alternate is not available, the PGE waits until either the primary alternate, the secondary alternate, or the third alternate becomes available, whichever occurs first
 - The PGE does not start processing until one of the alternates becomes available

Production Requests (Cont.)

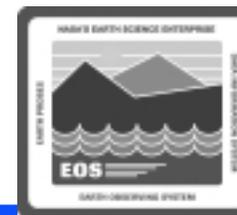


- **Illustration of the Alternate Inputs and Optional Inputs Production Rules (Cont.)**
 - If instead of an alternate the third input for the PGE had been defined as an optional input...
 - » The preceding scenario would have been the same, except that if neither the primary alternate, the second alternate nor the third option was available after the timers had expired, the PGE would not wait
 - » It would be scheduled for execution without the third input
 - » It would run with the two required inputs only

Example of Alternate Inputs Production Rule

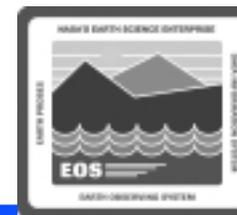


Production Requests (Cont.)



- **Minimum/Maximum Number of Granules Production Rule**
 - **Makes it possible to specify a range of possible granules for a given input or output for a PGE**
 - **Inputs**
 - » **Minimum number of granules the PGE needs for full data coverage**
 - » **Maximum number of granules for the time period**
 - **Outputs**
 - » **Minimum number of outputs that the PGE is expected to produce**
 - » **Maximum number of outputs that the PGE is expected to produce**

Production Requests (Cont.)

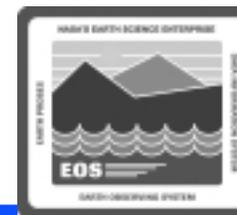


- **Minimum/Maximum Number of Granules Production Rule (Cont.)**

- **Example:**

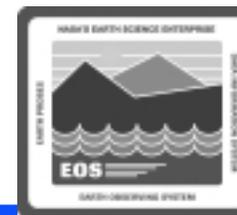
- » **PGE processes data for every 90-minute interval, has a period of 90 minutes, and takes as input a granule with a period of two hours**
- » **In many instances one granule of the input will satisfy the PGE**
- » **In other instances, because of the way the two-hour and 90-minute periods overlap, the PGE needs two input granules to cover the time period**
- » **Minimum Number of Granules = 1**
- » **Maximum Number of Granules = 2**

Production Requests (Cont.)



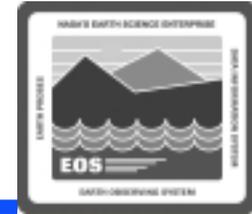
- **Minimum/Maximum Number of Granules Production Rule (Cont.)**
 - Different because it works for both input and output
 - PGE can request of a range of inputs (i.e., 1-10)
 - If a PGE needs at least three granules of an input...
 - » Minimum number of granules is defined as three
 - » PGE is not executed until at least three granules are available
 - Optional outputs are defined when the Minimum Number of Granules is set to zero
 - » PGE can produce none of the particular type of output and still be considered successful
 - If a PGE has a non-zero value for a Minimum Number of Granules associated with an output, and fails to produce any granules of that output type, it is marked as failed

Production Requests (Cont.)



- **Illustration of Minimum/Maximum Number of Granules Production Rule**
 - PGE processes data related to a one-hour period and takes in both Input 1 and Input 2
 - Input 1 has a PERIOD of 1/2 hour
 - » Every PGE run requires two Input 1 granules
 - Input 2 has a PERIOD of 15 minutes
 - » There are four Input 2 granules for every PGE run
 - PGE produces three Output 1 granules for each run
 - In this case it does not produce any Output 2 granules

Example of Minimum/Maximum Number of Granules Rule

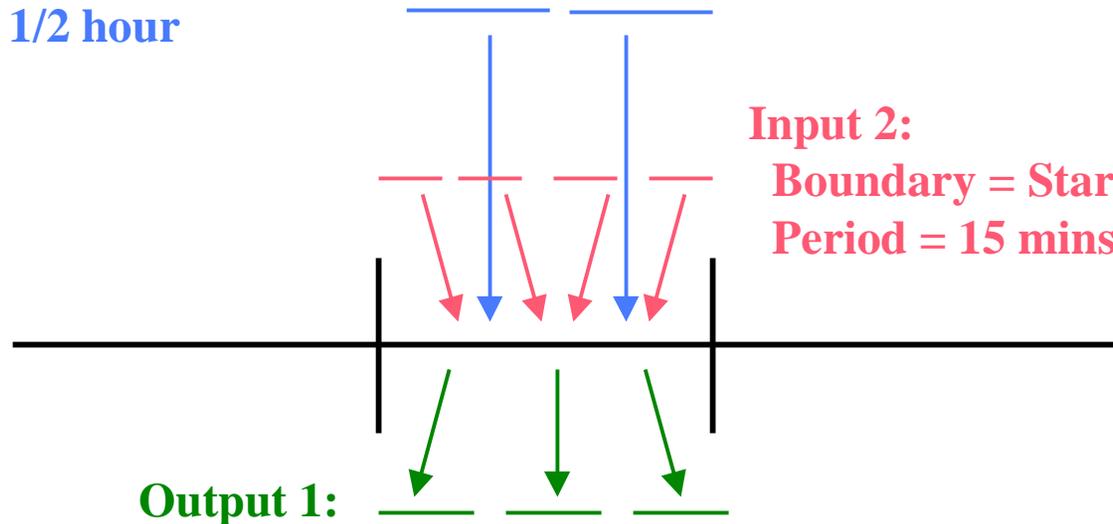


Input 1:

Boundary = Start of Hour

Period = 1/2 hour

PGE



Input 2:

Boundary = Start of Hour

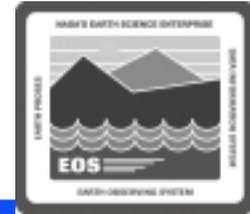
Period = 15 mins

Output 1:

Output 2:

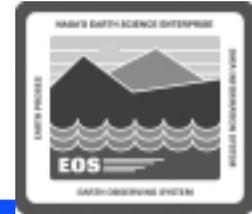
(No Output)

Production Requests (Cont.)



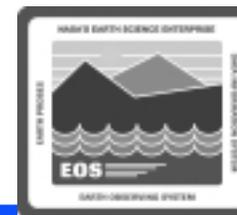
- **Illustration of Minimum/Maximum Number of Granules Production Rule (Cont.)**
 - Minimum and maximum values can affect each input and output
 - Input 1:
 - » If Minimum Granules is set to anything equal to or less than two for Input 1, the PGE is executed
 - » If Minimum Granules is set to three, the PGE is not scheduled (there are not enough Input 1 granules to make the minimum)
 - » If Maximum Granules is set to anything equal to or greater than two for Input 1, the PGE is executed
 - » If Maximum Granules is set to one, the PGE is not scheduled (there are too many Input 1 granules - the number exceeds the maximum that the PGE can process)

Production Requests (Cont.)



- **Illustration of Minimum/Maximum Number of Granules Production Rule (Cont.)**
 - **Input 2:**
 - » If the **Minimum Granules** is set to anything equal to or less than four for Input 2, the PGE is executed
 - » If **Minimum Granules** is set to five, the PGE is not scheduled (there are not enough Input 2 granules to make the minimum)
 - » If **Maximum Granules** is set to anything equal to or greater than four for Input 2, the PGE is executed
 - » If **Maximum Granules** is set to three, the PGE is not scheduled (there are too many Input 2 granules - the number exceeds the maximum that the PGE can process)

Production Requests (Cont.)



- **Illustration of Minimum/Maximum Number of Granules Production Rule (Cont.)**

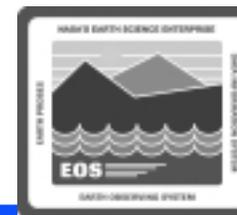
- **Output 1:**

- » If Minimum Granules is set to anything equal to or less than three, the PGE executes successfully
 - » If Minimum Granules is set to four, the PGE is marked as failed (did not produce the expected number of output granules)
 - » If Maximum Granules is set to anything equal to or greater than three, the PGE executes successfully
 - » If Maximum Granules is set to two, the PGE is marked failed (produced too many output granules)

- **Output 2:**

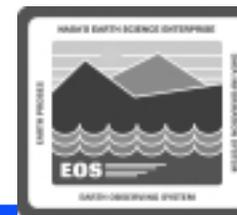
- » If Minimum Granules is set to anything other than zero, the PGE is marked failed (did not produce the expected number of output granules)
 - » If Maximum Granules is set to anything equal to or greater than zero for Output 2, PGE is successful

Production Requests (Cont.)



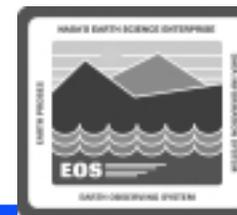
- **Optional DPRs Production Rule**
 - Also called the **Data-Scheduled Production Rule**
 - Makes the execution of a PGE subject to the availability of a “key input”
 - System generates DPRs for every possible instance of the key input data but executes only the DPRs for which data are either produced in data processing or can be acquired from the archive
 - Applies to PGEs that process certain kinds of non-routine data
 - » **Routine Data:** Data that can be predicted, that come in at specific intervals and are always of a specified length
 - » **Non-Routine Data:** Data that cannot be predicted because they come in at random periods and/or their length is variable (Examples include an "optional" output of an upstream PGE, or data that are archived at random periods; e.g., some forms of ASTER data)

Production Requests (Cont.)



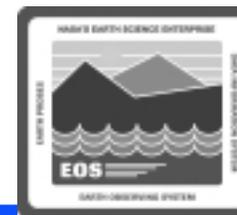
- **Optional DPRs Production Rule (Cont.)**
 - An Optional DPR has as its key input a non-routine data type
 - There are two sets of circumstances that lead to the scheduling of Optional DPRs:
 - » Every possible time that the input is produced in data processing (i.e., the key input is produced as an "optional" output by an upstream PGE)
 - » Whenever a new granule (of a particular data type) can be acquired from the archive (e.g., archived data that were inserted at unpredictable times)

Production Requests (Cont.)



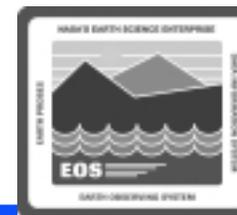
- **Optional DPRs Production Rule (Cont.)**
 - **Example 1: Key input is produced as an "optional" output by an upstream PGE**
 - » **One MODIS PGE produces a certain product only when the input data were collected during the satellite's "Day" mode**
 - » **A second MODIS PGE is scheduled to use the optional ("Day"-mode) product from the first MODIS PGE as its key input**
 - » **Second MODIS PGE is scheduled to run after every instance of the first MODIS PGE**
 - » **Only the DPRs that can use the optional products resulting from runs of the first MODIS PGE are executed**
 - » **The remaining DPRs cannot be executed because there is no input data for them**

Production Requests (Cont.)



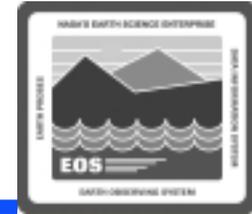
- **Optional DPRs Production Rule (Cont.)**
 - **Example 2: Key input granules were inserted into the archive at unpredictable times**
 - » **ASTER routine processing**
 - » **DAAC ingests and archives ASTER production data from tapes supplied by the ASTER Ground Data System on a frequent but not predictable basis**
 - » **When creating a Production Request, the Production Planner specifies the insertion time range as opposed to the collection time**
 - » **Insertion time range = time period when the desired data were archived**
 - » **Collection time = when the satellite instrument gathered the data**
 - » **DPRs specifying the ASTER PGE are scheduled and executed for the data granules that were actually inserted in the archive during the specified time range**

Production Requests (Cont.)



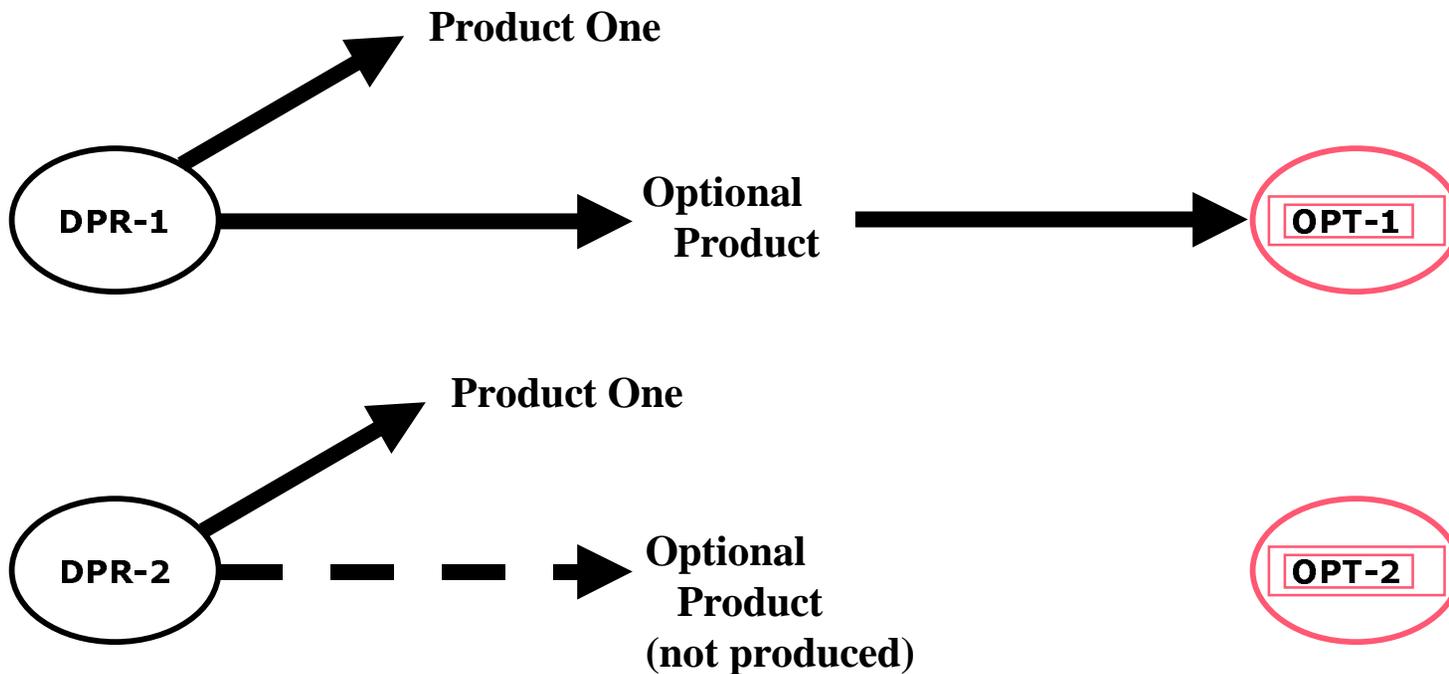
- **Illustration of the Optional DPRs Production Rule**
 - Two DPRs (i.e., DPR- 1 and DPR- 2) for the upstream PGE
 - Two DPRs (i.e., OPT- 1 and OPT- 2) for the PGE subject to the Optional DPRs Production Rule
 - “Optional DPRs” PGE takes as input the optional output of the upstream PGE
 - When it is executed, DPR- 1 produces the optional output, so the dependent DPR (OPT- 1) is executed
 - DPR- 2 (on which OPT- 2 depends) does not produce the optional output so OPT- 2 is not executed

Example of Optional DPRs Production Rule

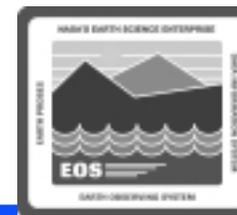


Upstream PGE

Optional DPRs

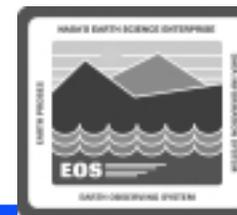


Production Requests (Cont.)



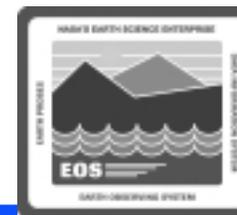
- **Metadata Checks and Metadata Query Production Rules**
 - Similar in definition and use
 - Both allow the PGE to specify granule-level metadata values that define whether the PGE can accept one (or more) of its inputs
 - Difference is in the results of metadata search

Production Requests (Cont.)



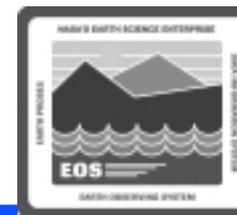
- **Metadata Checks and Metadata Query Production Rules (Cont.)**
 - **Metadata Checks Production Rule**
 - » When PLS requests the Science Data Server to search for the input(s), the Science Data Server "checks" the metadata of all granules that match the time frame with respect to the allowed value(s)
 - » If any granule fails to match the specified value(s), the PGE is not executed
 - **Metadata Query Production Rule**
 - » When PLS requests the Science Data Server to search for the input(s), the Science Data Server adds to the query the PGE's desired metadata value(s)
 - » Only the granules that match the time frame of the PGE plus the granule-level metadata value(s) specified by the PGE are staged as input to the PGE
 - » If no granules are found matching the conditions and the input is not optional, the PGE is not executed

Production Requests (Cont.)



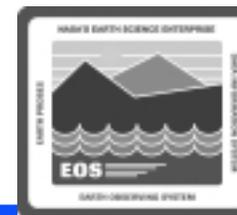
- **Metadata Checks and Metadata Query Production Rules (Cont.)**
 - **Example of Metadata Checks:**
 - » **A MODIS PGE is run when the Percent Cloud Cover of its inputs is greater than 25 percent**
 - » **The Metadata Checks Production Rule is used to specify the granule-level metadata value of greater than 25**
 - » **When the PGE is scheduled and is ready to start, two granules match the timeframe of the Production Request for the input with the Metadata Check**
 - » **If both granules have a Percent Cloud Cover greater than 25 percent, execution of the PGE starts and both granules are staged**
 - » **If one of the granules has a Percent Cloud Cover of 15 percent, the PGE is not executed**

Production Requests (Cont.)



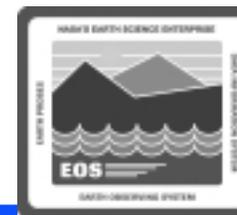
- **Metadata Checks and Metadata Query Production Rules (Cont.)**
 - **Example of Metadata Query:**
 - » **A MODIS PGE is run when as many granules as possible of one of its inputs have a QA Value = "Good"**
 - » **The Metadata Query Production Rule is used to specify the granule- level metadata value = "Good"**
 - » **When the PGE is scheduled and is ready to start, two granules match the time frame of the production request for the input with the Metadata Query**
 - » **If both granules have a QA Value = "Good", execution of the PGE starts and both granules are staged**
 - » **If one of the granules has a QA Value = "Bad", the PGE executes but with only one granule (the one with QA Value = "Good")**

Production Requests (Cont.)



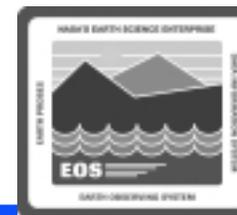
- **Metadata Checks and Metadata Query Production Rules (Cont.)**
 - **Metadata Checks and Metadata Query Production Rules are used in conjunction with the times specified in the Basic Temporal Production Rule or other production rules**
 - **Metadata Check or Query is added information that further refines what granules are sought by the PGE**

Production Requests (Cont.)



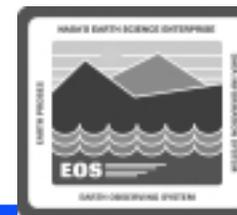
- **Metadata Checks and Metadata Query Production Rules (Cont.)**
 - **For past data**
 - » **Production Request Editor performs the Metadata Query or Metadata Check immediately**
 - » **Depending on what other production rules may be applicable, if no data is found to match the “query” (or data is found that does not match the “check”), the DPR fails to be created**
 - **For future data**
 - » **Metadata Query/Metadata Check is put off until the DPR Data Collection Stop Time passes plus the value defined in the ODL for QUERY_DELAY**
 - » **Delay allows the Metadata Query/Metadata Check to be put off until it's likely that all matching data will be present**

Production Requests (Cont.)



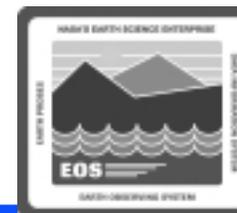
- **Metadata Checks and Metadata Query Production Rules (Cont.)**
 - **Multi-Granule ESDTs are a special case of the Metadata Query Production Rule**
 - » **Used for PGE inputs or outputs when more than one granule of the same ESDT exists for the same temporal range (time period)**
 - » **Multi-Granule ESDT mechanism employs a metadata parameter to differentiate between "equal in time" granules**

Production Requests (Cont.)



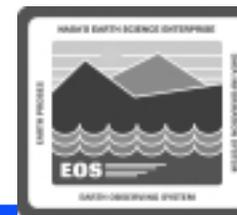
- **Illustration of the Metadata Checks and Metadata Query Production Rules**
 - If no Metadata Check or Query were applicable, a particular PGE would use three granules of input (i.e., Granules A through C)
 - However, in the illustration the metadata value `%CloudCover` is to be checked/queried
 - » Granules A through C each have a different value for `%CloudCover`
 - There can be more than one Metadata Check or Metadata Query on a given input
 - » A Metadata Check on `%CloudCover` can be combined with a Metadata Query on another parameter to further limit the input

Production Requests (Cont.)



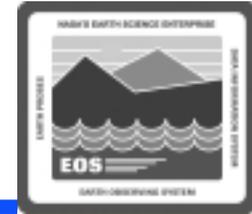
- **Illustration of the Metadata Checks and Metadata Query Production Rules (Cont.)**
 - The following results demonstrate differences between Metadata Checks and Metadata Query:
 - » Metadata Check of `%CloudCover < 80`: All three granules are acquired and the PGE is executed
 - » Metadata Query of `%CloudCover < 80`: All three granules are acquired and the PGE is executed
 - » Metadata Check of `%CloudCover = 50`: PGE is not scheduled because only one of the three granules (Granule C) meets the criterion
 - » Metadata Query of `%CloudCover = 50`: Granule C is found and if the PGE's Min/Max Granules parameters are set to allow one granule, that one granule is acquired and the PGE is executed

Production Requests (Cont.)



- **Illustration of the Metadata Checks and Metadata Query Production Rules (Cont.)**
 - The following results demonstrate differences between Metadata Checks and Metadata Query:
 - » **Metadata Check of %CloudCover = 20: PGE is not scheduled because only one of the three granules (Granule B) meets the criterion**
 - » **Metadata Query of %CloudCover = 20: Granule B is found and if the PGE's Min/Max Granules parameters are set to allow one granule, the granule is acquired and the PGE is executed**
 - » **Metadata Check of %CloudCover < 20: PGE is not scheduled because only one of the three granules (Granule A) meets the criterion**
 - » **Metadata Query of %CloudCover < 20: Granule C is found and if the PGE's Min/Max Granules parameters are set to allow one granule, the granule is acquired and the PGE is executed**

Example of Metadata Checks/Query



Input:

Metadata:
%CloudCover = 0

Granule A

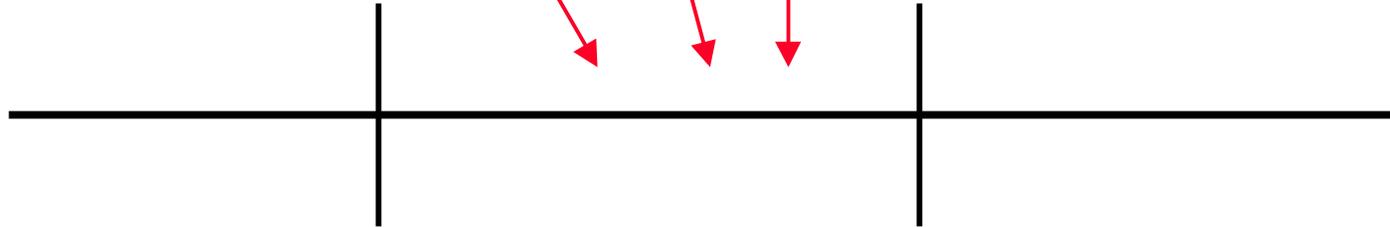
Metadata:
%CloudCover = 20

Granule B

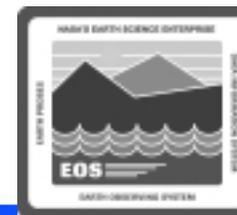
Metadata:
%CloudCover = 50

Granule C

PGE

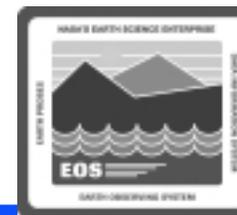


Production Requests (Cont.)



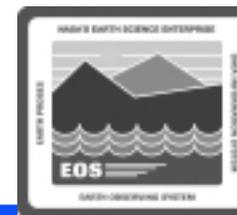
- **Spatial Query Production Rule**
 - PGE selects input(s) based on the spatial coverage of another input (called the key input)
 - PDPS queries the Science Data Server for the spatial coverage of the key input
 - PDPS uses key input's spatial coverage in acquiring any subsequent inputs that the PGE has requested that have the same spatial coverage
 - Without specifying coordinates, PDPS can match inputs against the spatial constraint of the key input, and give to a PGE only those granules which overlap in area

Production Requests (Cont.)



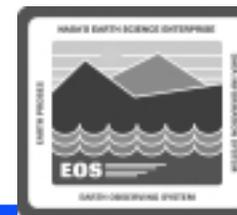
- **Spatial Query Production Rule (Cont.)**
 - **Example:**
 - » **Level 0 input data for an ASTER DPR covers a small section of the Earth**
 - » **The PGE requires ancillary data that covers the same area to complete its processing**
 - » **The PGE uses the Spatial Query Production Rule to mark the geographic input as its key input**
 - » **The PGE specifies that the ancillary input is to be retrieved for the same spatial coverage as that of the key input**
 - » **When PDPS finds an input granule for the PGE, it performs a Spatial Query to acquire the ancillary input with the same spatial coverage as that of the key input**

Production Requests (Cont.)



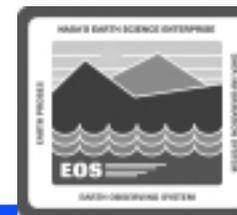
- **Spatial Query Production Rule (Cont.)**
 - **Spatial Pad is an addition to the Spatial Query Production Rule**
 - » **Spatial Pad is a means of padding the spatial constraints of the key input**
 - » **The specified pad is added to all sides of the key input's spatial shape**
 - » **All granules that intersect the expanded area are retrieved**

Production Requests (Cont.)



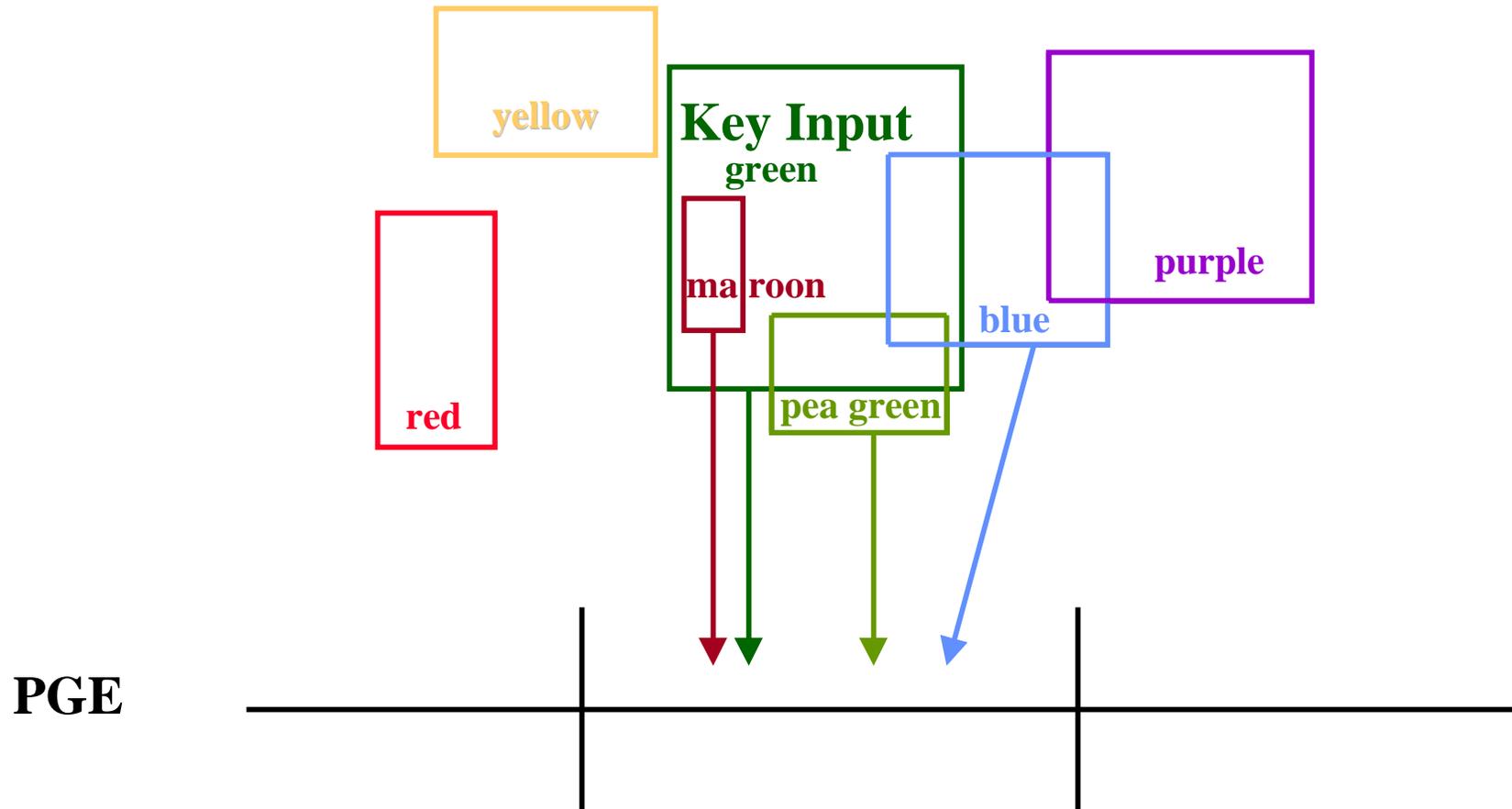
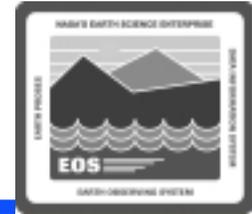
- **Illustration of the Spatial Query Production Rule**
 - **PGE has two input types**
 - » One is the key input
 - » The other type of input has granules labeled with the names of various colors
 - One granule (i.e., “green”) of the key input is found
 - Spatial coordinates of the granule are retrieved
 - All inputs of the second ESDT are checked for overlap with the key input’s coordinates

Production Requests (Cont.)

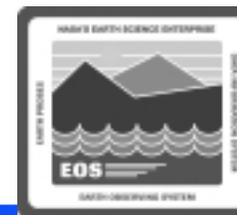


- **Illustration of the Spatial Query Production Rule (Cont.)**
 - Assuming that all granules relate to the same time period, the granules are evaluated as follows:
 - » “yellow” granule is not retrieved as an input (spatial coordinates do not overlap with those of the key)
 - » “red” granule is not retrieved as an input (same as “yellow”)
 - » “blue” granule is retrieved as an input (spatial coordinates overlap with those of the key input)
 - » “maroon” granule is retrieved as an input (same as “blue”)
 - » “pea green” granule is retrieved as an input (same as “blue”)
 - » “purple” granule is not retrieved as an input (same as “yellow”)

Example of Spatial Query

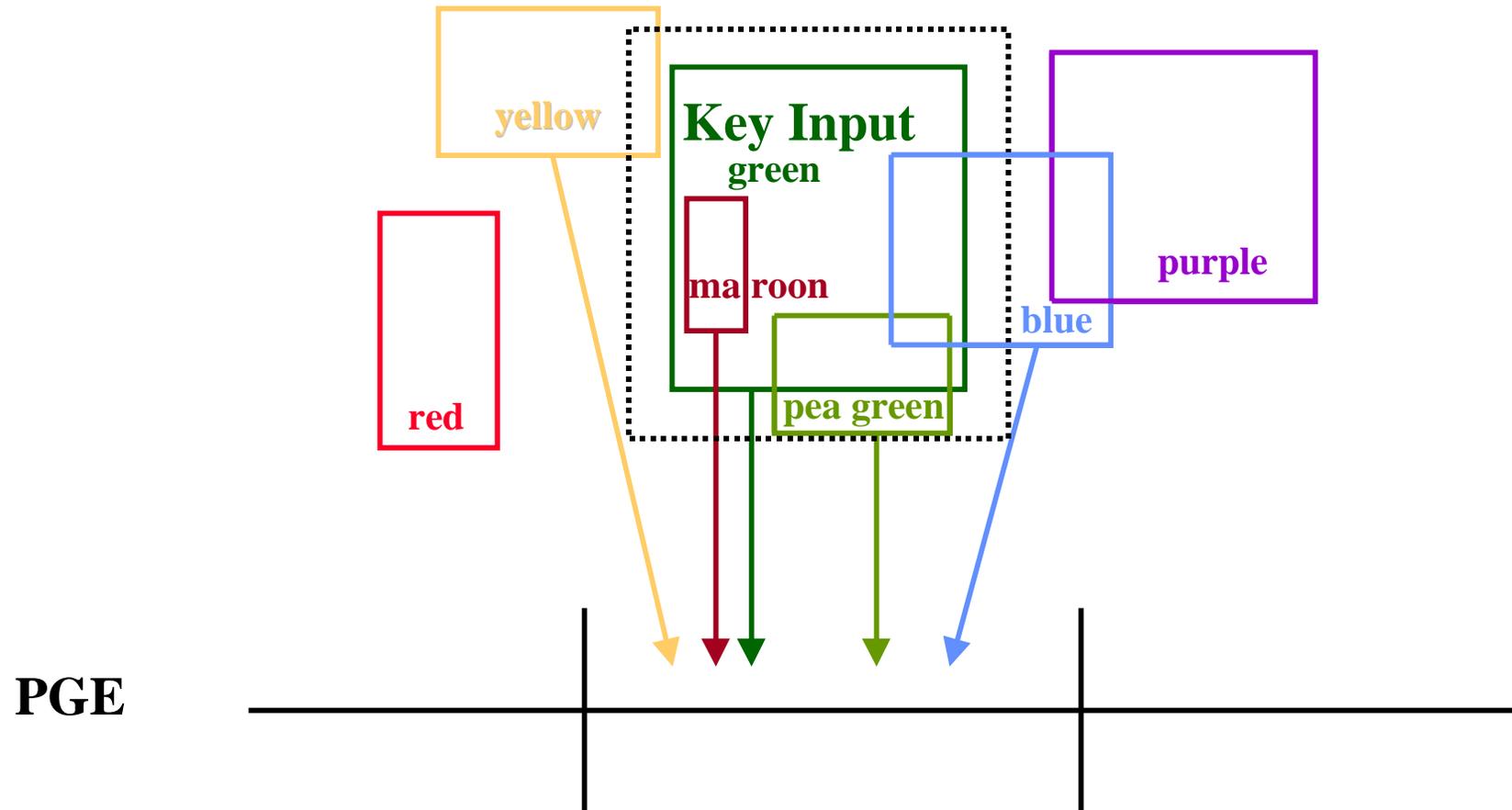
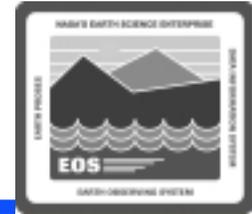


Production Requests (Cont.)

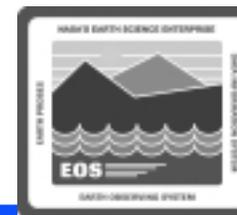


- **Illustration of Spatial Query with Spatial Pad**
 - Assuming that all granules relate to the same time period, the granules are evaluated as follows:
 - period, the granules are evaluated as follows:
 - » “yellow” granule is retrieved as an input (spatial coordinates do not overlap with those of the key but do overlap the padded area)
 - » “red” granule is not retrieved as an input (spatial coordinates do not overlap with either the key or pad)
 - » “blue” granule is retrieved as an input (spatial coordinates overlap with the key)
 - » “maroon” granule is retrieved as an input (same as “blue”)
 - » “pea green” granule is retrieved as an input (same as “blue”)
 - » “purple” granule is not retrieved as an input (same as “red”)

Example of Spatial Query with Spatial Pad

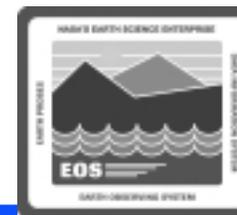


Production Requests (Cont.)



- **Closest Granule Production Rule**
 - PGE requests the nearest input granule from the Data Processing Request time
 - PDPS requests a search forward or backward for a specified period of time until it finds a granule that matches the request; however, ...
 - » Number of queries performed is limited
 - » Period length of the query is limited
 - **Supersedes the Most Recent Granule Production Rule**
 - » Allowed the search for inputs to go back only, not forward

Production Requests (Cont.)

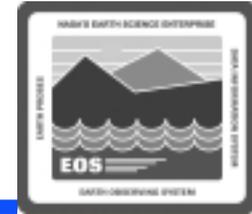


- **Closest Granule Production Rule (Cont.)**

- **Example:**

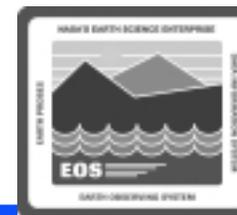
- » **A PGE processes data at daily intervals and could use a particular type of calibration granule that would allow it to determine the nearest parameters of the instrument**
 - » **Although most calibration coefficients are defined as static granules, in this case there is a dynamic granule that is received about once a month**
 - » **The closest such granule would be optimum, so the PGE uses the Closest Granule Production Rule to search forward or backward from the time of the DPR to find the nearest calibration granule**

Production Requests (Cont.)



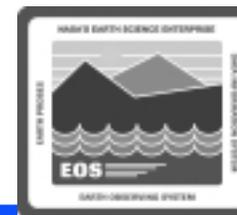
- **Closest Granule Production Rule (Cont.)**
 - Three values determine the period of the query
 - » **Period (Offset)**
 - » **Direction**
 - » **Maximum Number of Queries**

Production Requests (Cont.)



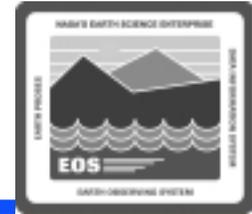
- **Closest Granule Production Rule (Cont.)**
 - **Period (Offset)**
 - » Tells the PDPS software the query duration
 - **Direction**
 - » Indicates whether the query goes forward (positive) or backward (negative) in time
 - » In the PIDataTypeReq table in the PDPS database, the Direction and the Period information are combined, so the sign of value (+ or -) indicates the Direction and the magnitude indicates the Period
 - **Maximum Number of Queries**
 - » Tells the PDPS software how many time periods (as defined by the Offset) to search (either forward or backward in time) for a matching granule

Production Requests (Cont.)



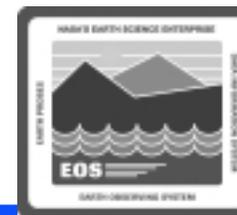
- **Closest Granule Production Rule (Cont.)**
 - PDPS does a Basic Temporal query before using Closest Granule to find the input
 - If the desired input is not found within the time period of the DPR, PDPS performs a query (in the specified direction) against the Science Data Server for the period defined by the offset
 - If no matching granule is found, PDPS repeats the query, going backward or forward in time by the value specified in the offset
 - If no acceptable granule has been found before the maximum number of queries is reached, PDPS fails to generate the DPR due to insufficient input data
 - special case for the forward search:
 - » when the next search interval exceeds the current time, the search stops at the current time

Production Requests (Cont.)



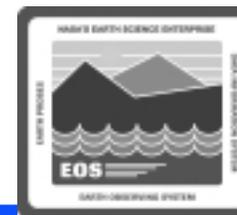
- **Closest Granule Production Rule (Cont.)**
 - If the DPR is planned for a future time, the DPR is created using place-holder granules and a timer is activated
 - When the current time reaches the stop time of DPR, the timer invokes the **Closest Granule** method to search for the actual granules, which are then used to replace the dummy granules

Production Requests (Cont.)



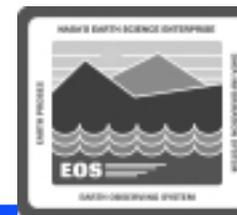
- **Illustration of the Closest Granule Production Rule**
 - PGE boundary is “start of day”
 - PGE period is one hour
 - » PGE is scheduled to run for one hour’s worth of input data
 - Input period is one hour
 - » Can come in at any hour of the day
 - PGE requests one granule of input
 - Offset is 6
 - » Queries in six-hour intervals
 - Direction is backward
 - Maximum number of queries is two

Production Requests (Cont.)



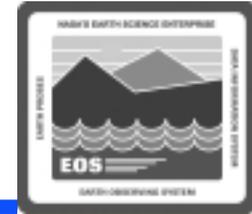
- **Illustration of the Closest Granule Production Rule (Cont.)**
 - PDPS performs a query for the input based on the time period of the DPR
 - » No matching data is found
 - PDPS uses the Closest Granule information to query for a six-hour period beginning six hours before the start time of the DPR
 - » Again nothing is found
 - A second Closest Granule query is performed, this one six hours before the last Closest Granule query
 - » Two granules are found that match the query
 - PDPS selects the granule that is later in time and schedules the PGE to use it as input

Production Requests (Cont.)



- **Illustration of the Closest Granule Production Rule (Cont.)**
 - If the **Closest Granule Production Rule** were used in conjunction with the **Minimum/Maximum Number of Granules Production Rule**, it might be possible for both granules to be selected in the previously described **Closest Granule** query
 - » If the example included setting the **Maximum Number of Granules** to two, both granules would be selected as input to the **PGE**

Example of Closest Granule

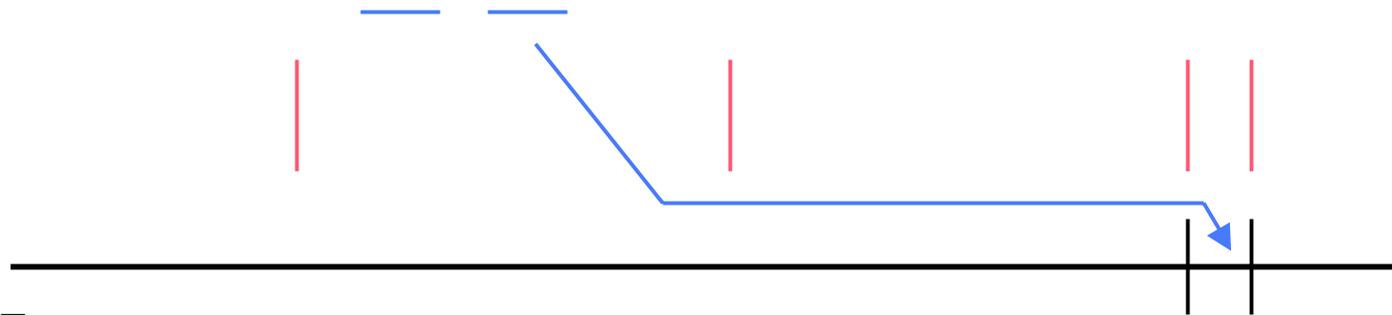


Input: Boundary = Start of Hour
Period = 1 hour

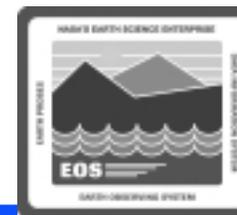
PGE:

Boundary =
Start of Day
Period =
1 hour

Closest Granule Query:
Query Period = -6 hours
Max Queries = 2

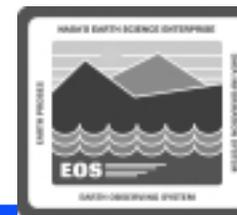


Production Requests (Cont.)



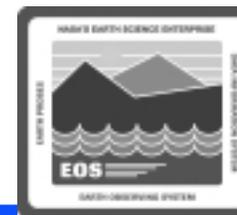
- **Orbital Processing Production Rule**
 - Uses the orbit of the spacecraft to determine the time period for the inputs and outputs of the PGE
 - Example:
 - » A PGE processes Level 0 data related to each orbit of the Terra satellite
 - » The Terra satellite has an orbital period of 98 minutes so the PGE is scheduled to process data for each 98-minute interval
 - » Since Level 0 data are received every two hours, the data staged for the PGE include every Level 0 granule that falls within the 98-minute PGE interval
 - » Only one granule of Level 0 data is relevant to some 98-minute orbits
 - » Two granules of Level 0 data are relevant to other 98-minute orbits

Production Requests (Cont.)



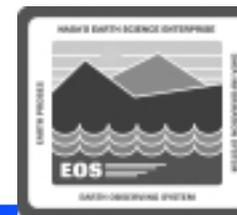
- **Orbital Processing Production Rule (Cont.)**
 - Uses the “period” and “boundary” concepts just like the Basic Temporal Production Rule
 - » Orbit of the spacecraft is taken into account when a PGE or its data are marked as orbit scheduled
 - When responding to a Production Request for orbit-scheduled processing, PDPS determines the orbit of the satellite via information from SSI&T
 - Information in the PDPS database gives the start time and length of a particular orbit or set of orbits
 - PDPS extrapolates (or interpolates in the case of an orbit between two orbital periods stored in the database) the start and end times of the PGE that is specified in the Production Request
 - Data are sought on the basis of the derived start and stop times and the appropriate data granule(s) is/are staged before the PGE is executed

Production Requests (Cont.)



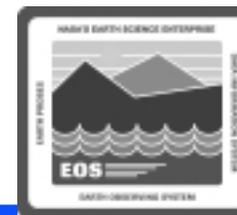
- **Orbital Processing Production Rule (Cont.)**
 - **Orbit model is a model of the satellite's orbits that allows PDPS to perform extrapolations for the Orbital Processing Production Rule**
 - » **Model is a combination of a database table and a simple algorithm**
 - » **Database table stores Orbit Number/Orbit Start Time/Orbital Period combinations**
 - » **Algorithm uses the data to compute the same type of data relevant to subsequent orbits**
 - » **Works by extrapolation (unable to calculate data for any orbit that precedes the earliest entry in the database table)**
 - » **Data for the Orbit Model is specified in the Orbit Model ODL file, which is read only if the PGE requires orbital information**

Production Requests (Cont.)



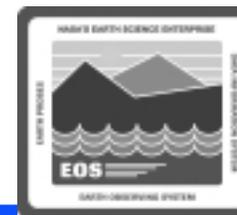
- **Orbital Processing Production Rule (Cont.)**
 - **Orbital path is the path of the satellite over the Earth**
 - » **Number from 0-233 that indicates the region of the Earth covered by a particular orbit**
 - » **Because of the implementation of Orbital Path, there needs to be a mapping between the orbital path calculated by PDPS and the orbital path number expected by the PGEs**
 - **Runtime parameters can be set to values associated with Orbital Processing**
 - **The following orbital parameters can be placed under runtime parameters:**
 - » **Orbit Number**
 - » **Orbital Path Number**
 - » **Orbit Number within the Day**
 - » **Granule Number within the Orbit**

Production Requests (Cont.)



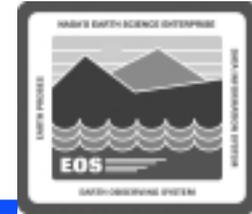
- **Orbital Processing Production Rule (Cont.)**
 - **Orbit Number**
 - » Number of the orbit (starting from zero) and continually increasing
 - **Orbital Path Number**
 - » Number of the path that maps to the orbit number
 - » Orbital path number is the 0-233 orbital path traversed by the satellite
 - **Orbit Number within the Day**
 - » Number of the orbit within the given day
 - » Includes any orbit that starts within the given day
 - **Granule Number within the Orbit**
 - » Number of the granule within a given orbit
 - » Includes any granule that starts within the given orbit

Production Requests (Cont.)



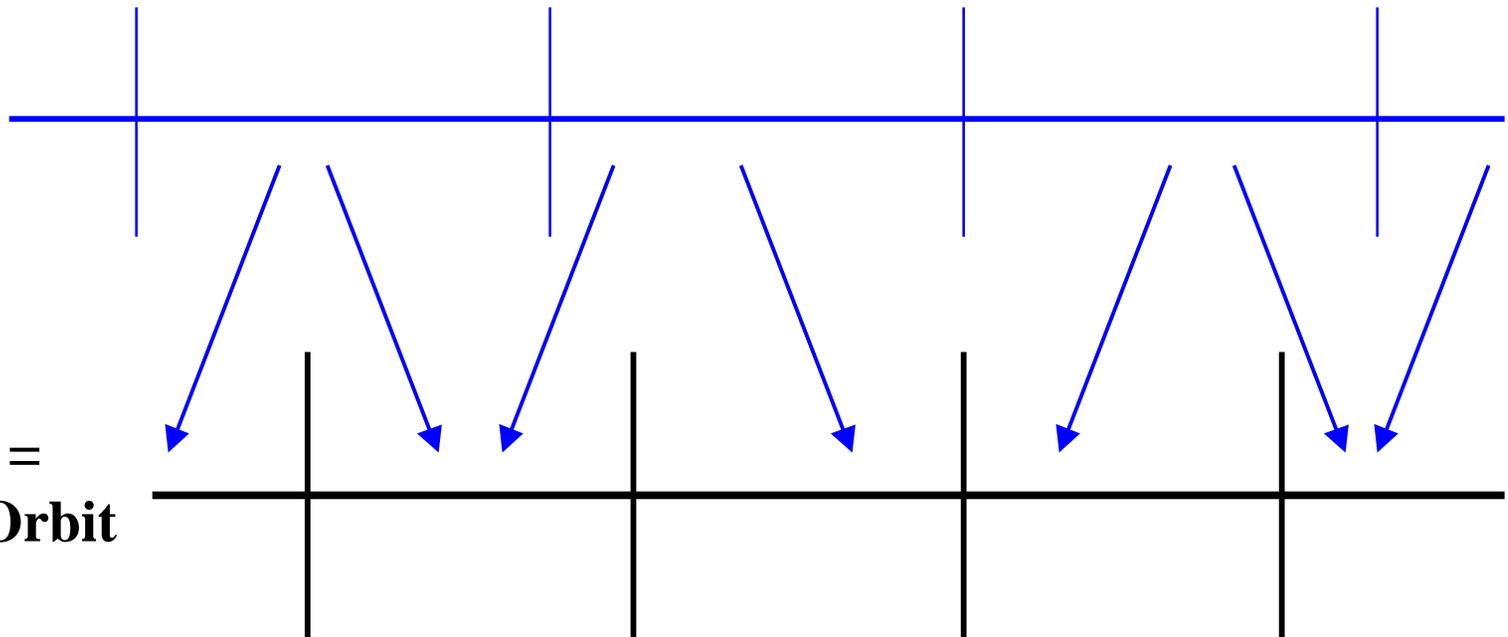
- **Illustration of the Orbital Processing Production Rule**
 - **PGE takes a two-hour input, but is scheduled based on the orbit time and period of the satellite**
 - **PDPS uses the data collected at SSI&T to predict the time of the orbit and performs the query to the Science Data Server for the input based on that extrapolated or interpolated orbital time**
 - **Granules of input data are allocated to DPRs based on their ability to cover the DPR's time period**
 - » **Length of an orbit is less than the period of the two-hour input**
 - » **Sometimes a single granule may cover the input time range of a PGE execution**
 - » **At other times two granules are required**
 - » **Rule would work equally well if the data were of a shorter period than the orbit of a satellite**

Example of the Orbital Processing Production Rule

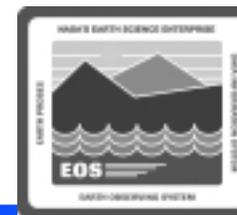


Input: Boundary = Start of Hour
Period = 2 hours

PGE:
Boundary =
Start of Orbit
Period =
1 orbit

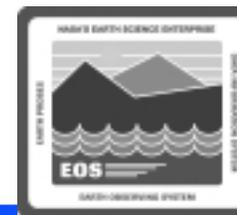


Production Requests (Cont.)



- **Production Planning Considerations**
 - **Production Request (PR) is a template request to generate a particular data product**
 - » **results in a production run of the associated SCF-provided PGE**
 - **PR specifies a range over which the data products are to be produced or the PGEs are to be scheduled**
 - » **time**
 - » **snapshot**
 - » **data**
 - » **orbit**

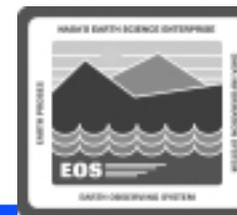
Production Requests (Cont.)



- **Production Planning Considerations (Cont.)**

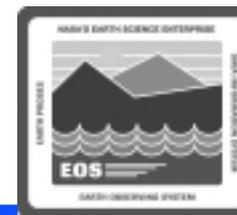
- **During normal operations Production Planner should not have to add PRs to the PDPS database very frequently**
 - » **PR might request that the data product be produced for only a single day's data**
 - » **PR might request that data products be produced for every opportunity of input data for several months**
 - » **Early in a mission the SCF may prefer to request processing for a short time period only**
 - » **SCF reviews the quality of the products and notifies the DAAC of the need for any changes to the PR**
 - » **When the SCF has developed a good understanding of the instrument's behavior, the team may be comfortable requesting processing for months at a time**

Production Requests (Cont.)



- **Production Planning Considerations (Cont.)**
 - **DAAC operations may have operational reasons for wanting to issue processing requests for a limited time period**
 - **Production Planner has to balance the various considerations when determining whether or not to create or update a PR**
 - **Planning decisions are made on the basis of locally defined planning strategies for supporting the SCFs' data processing needs**
 - **Production Planner must coordinate with the Resource Planner**
 - » **before planning production**
 - » **resolve all resource allocation issues**
 - » **determine what resources are available for use in processing**

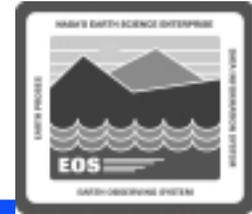
Production Requests (Cont.)



- **Chain Heads**

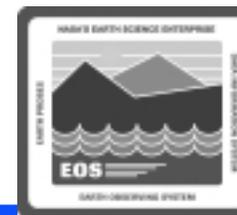
- Production Request Editor provides a means by which the Production Planner can identify a PR as the first in a chain of PRs
- The outputs of the DPR(s) that PLS creates from the PR at the head of the chain (or "chain head") are used as inputs to one or more subsequent DPR(s) specified in other PRs
 - » Any downstream DPR (i.e., that requires the output of a preceding DPR as its input) is known as a "child" DPR
 - » Any DPR that provides output for use as an input to a child DPR is a "parent" DPR
 - » Chain heads are parent DPRs

Production Requests (Cont.)



- **Chain Heads (Cont.)**
 - In addition to designating chain heads in a PR, the Production Planner may select a particular virtual computer for running the chain-head DPRs
 - » Selection of a virtual computer is optional
 - » If no machine is specified, the system tries to schedule the DPR on the machine where the bulk of its accepted inputs (both static and dynamic inputs) are staged

Production Requests (Cont.)

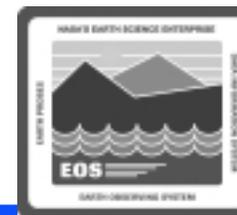


- **Chain Heads (Cont.)**

- **Implementation of chain heads includes**

- » **Addition of chainFlag and scheduledMachine columns to the PIDataProcessingRequest and PIProductionRequest database tables in the PDPS database**
 - » **Addition of chainId column to the PIDataProcessingRequest database table in the PDPS database**
 - » **The Production Request Editor sets the chainFlag and scheduledMachine values based on Production Planner input when a PR is created**
 - » **It is also possible to set the chainFlag value using the Planning Workbench GUI at plan activation time for DPRs that have no "parent" DPRs producing data used for their input**

Production Requests (Cont.)

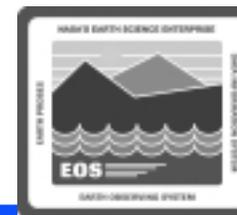


- **Chain Heads (Cont.)**

- The Planning Workbench GUI calls the "Determine Chain" script when a plan is activated

- » `/usr/ecs/MODE/CUSTOM/bin/PLS/EcPIDetermineChain.pl`
 - » At that time, chainFlag values for previously unflagged chain heads can be set and a chainId can be assigned to each DPR
 - » If the Determine Chain script fails for some reason, the plan is not activated

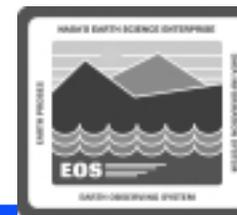
Production Requests (Cont.)



- **Intermittent Activation**

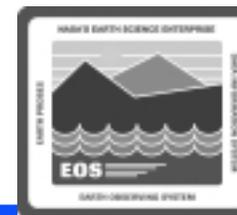
- PGE is set up to run on every *n*th instance of input data
- To implement Intermittent Activation the Production Planner supplies the following information (via the Production Request Editor) when creating a production request:
 - » “Skip” field on the Production Request Editor: Number of DPRs to be skipped (not executed) is entered in the field
 - » “Keep” field on the Production Request Editor: Number of DPRs to keep (after skipping the specified number of DPRs) is entered in the field
 - » “Skip First” button on the Production Request Editor: Selected to skip the first DPR (not selected if the first DPR is to be run)

Production Requests (Cont.)



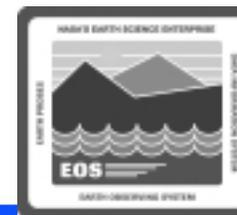
- **Intermittent Activation (Cont.)**
 - **Planning Subsystem uses the “Intermittent DPR” information from the PR to establish a pattern of execution**
 - **Pattern is effective for the single PR in which the “number to skip” and the “number to keep” are specified**
 - » **Pattern is not maintained between PRs**

Production Requests (Cont.)



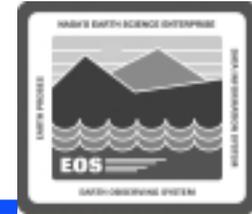
- **Illustration of Intermittent Activation**
 - **Production Planner prepares a production request for a 14-day period, generating 14 DPRs**
 - **Production Planner made the following selections on the Production Request Editor:**
 - » **Entered “4” in the Number to Skip field**
 - » **Entered “1” in the Number to Keep field**
 - » **Did not select the Skip First button**

Production Requests (Cont.)



- **Illustration of Intermittent Activation (Cont.)**
 - **The following results are obtained:**
 - » **First DPR runs**
 - » **Four DPRs (second through fifth) are skipped**
 - » **Sixth DPR runs**
 - » **Four DPRs (seventh through tenth) are skipped**
 - » **Eleventh DPR runs**
 - » **Remaining three DPRs (twelfth through fourteenth) are skipped**

Example of Intermittent Execution



Run PGE on same data set every five days

DAY 1:



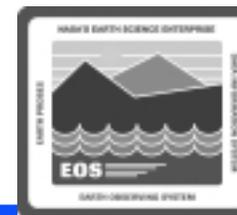
DAY 6:



DAY 11:

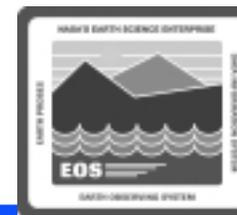


Production Requests (Cont.)



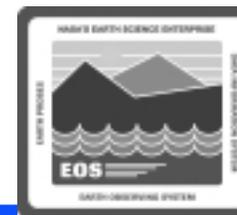
- **Data Preprocessing (DPREP)**
 - DPREP (data preprocessing) consists of sets of PGEs that use a statistical approach to convert Level 0 (L0) ephemeris and attitude ancillary data for a particular satellite (e.g., Terra, Aqua) into SDP Toolkit native binary format without altering or modifying the scientific content of the data sets
 - DPREP PGEs are supplied by ECS, unlike most PGEs
 - » Most PGEs are provided by the Science Computing Facilities that ECS supports
 - Release 6A DPREP supports Terra and Aqua operations

Production Requests (Cont.)



- **Terra DPREP**
 - **Three PGEs:**
 - » **AM1Eph or Step 1**
(EcDpPrAm1EdosEphAttDPREP_PGE)
 - » **FddAtt or Step 2**
(EcDpPrAm1FddAttitudeDPREP_PGE)
 - » **RepEph or Step 3**
(EcDpPrAm1FddEphemerisDPREP_PGE)

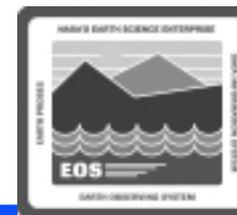
Production Requests (Cont.)



- **Terra DPREP (Cont.)**

- **Sources of information on the DPREP PGEs and how to run them:**
 - » **184-TP-001-001, Terra Spacecraft Ephemeris and Attitude Data Preprocessing**
 - » **611-CD-600-001, Mission Operation Procedures for the ECS Project, Chapter 11**
 - » **Two files installed on the science processor hosts (e.g., e0spg01, g0spg01, l0spg01) in the /usr/ecs/MODE/CUSTOM/data/DPS directory; i.e., “DPREP_README” and “HowtoRunDPREP”**

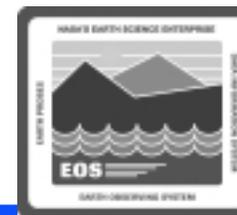
Production Requests (Cont.)



- **Terra DPREP (Cont.)**

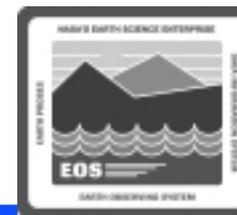
- The DPREP PGEs process Level Zero (L0) Terra (AM- 1) spacecraft data (e.g., ESDT AM1ANC) provided by EDOS
- The output files/granules of the DPREP PGEs are subsequently used in the processing of data from various instruments on the satellite. They provide the following types of ancillary (non-science) data:
 - » **Ephemeris - Spacecraft location: ephemeris (or orbit) data include: latitude, longitude, and height**
 - » **Attitude - Orientation of the satellite, including yaw, pitch, and roll angles; and angular rates about three axes**

Production Requests (Cont.)



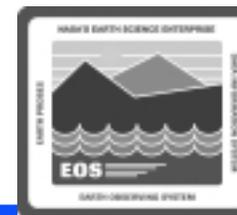
- **Terra DPREP (Cont.)**
 - **AM1Eph (Step 1 DPREP: EDOS Level 0 Ancillary Data)**
 - » Reads in two sets of AM- 1 L0 (EDOS) ancillary data set (ESDT AM1ANC) (the second set ensures that incomplete orbits in the first data set get complete orbit metadata records)
 - » Reads in ephemeris and attitude data (ESDT AM1EPHN0 and ESDT AM1ATTN0) (the last ephemeris/attitude data sets generated from a previous run of the PGE)
 - » If a short gap in the data is detected, the gap is filled
 - » PGE produces attitude (ESDTs AM1ATTN0 and AM1ATTH0) and ephemeris (ESDTs AM1EPHN0 and AM1EPHH0) data sets

Production Requests (Cont.)



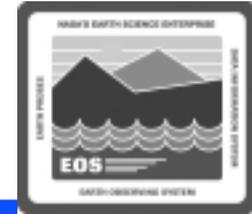
- **Terra DPREP (Cont.)**
 - **FddAtt (Step 2 DPREP: Definitive Attitude Data)**
 - » Reads in both the current Flight Dynamics Division (FDD) attitude data set (AM1ATTF) and the next FDD attitude data set
 - » Reads in the attitude data set it produced with its last run
 - » Output is native format attitude file (ESDT AM1ATTNF), HDF format attitude file (ESDT AM1ATTHF) and associated metadata files

Production Requests (Cont.)



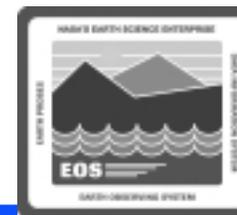
- **Terra DPREP (Cont.)**
 - **RepEph (Step 3 DPREP: Repaired Ephemeris Data)**
 - » If Step 1 finds too many missing data points in the ephemeris data (e.g., AM1EPHH0 and AM1EPHN0 granules have gaps of greater than 60 seconds), it signals that there are problems with the data
 - » Production Planner receives an e- mail message indicating the problems in the preprocessed Terra ephemeris granules and notifies the FDD (e.g., by telephone) that a repaired ephemeris file (AM1EPHF) is needed for the time span of the granule that has the gap
 - » RepEph (Step 3) reads in the definitive ephemeris data set received from FDD and the EOS_AM1 ephemeris data and produces replacement ephemeris data sets (ESDTs AM1EPHH0 and AM1EPHN0)

Production Requests (Cont.)



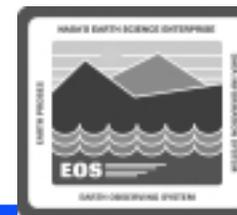
- **Terra DPREP (Cont.)**
 - **Operationally, Steps 1 and 2 are scheduled daily and run independently of one another**
 - **Step 3 is scheduled and run on an as-needed basis**

Production Requests (Cont.)



- **Terra DPREP (Cont.)**
 - **DPREP processing has data requirements beyond the current two-hour segment (data from the preceding and following segments are used for performing consistency checks)**
 - » **There is no guarantee that data from the preceding and following segments will always be available**
 - » **Consequently, four data processing profiles have been developed for each of the three DPREP steps to accommodate the various permutations of data availability**

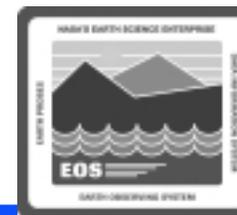
Production Requests (Cont.)



- **Terra DPREP (Cont.)**

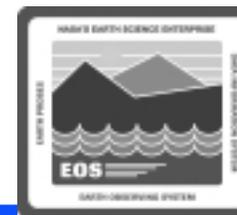
- Profile 1 (preceding and following data available) is used for nominal DPREP operation
 - » It is the profile of each DPREP step that is run on a routine basis
- Profile 2 (no preceding data, but following data is available) initializes DPREP's processing of a given step's ephemeris and/or attitude data stream
 - » When Profile 2 has been run on a data segment, Profile 1 assumes processing responsibility on all data segments thereafter until data dropout
- Profile 3 (preceding data available, but no following data) processes the data segment that immediately precedes data dropout (terminates processing on a given step's ephemeris and/or attitude data stream)
- Profile 4 is used for processing isolated data segments (not likely to be scheduled operationally)

Production Requests (Cont.)



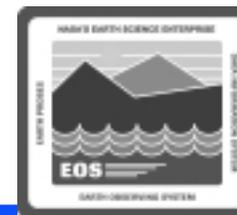
- **Aqua DPREP**
 - Aqua DPREP processes:
 - » Aqua Predictive Orbit DPREP
(EcDpPrPm1PredFddEphemerisDPREP)
 - » Aqua Definitive Orbit DPREP
(EcDpPrPm1DefFddEphemerisDPREP)
 - » Aqua Quick Attitude DPREP
(EcDpPrPm1PredAttitudeDPREP)
 - » Aqua Refined Attitude DPREP
(EcDpPrPm1DefAttitudeDPREP)
 - Sources of information on the Aqua DPREP PGEs and how to run them:
 - » "HowtoRunPm1DPREP" file installed on the science processor hosts (e.g., e0spg01, g0spg01, l0spg01) in the `/usr/ecs/MODE/CUSTOM/data/DPS` directory

Production Requests (Cont.)



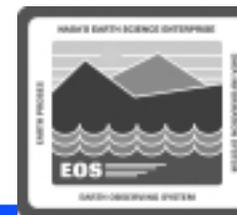
- **Aqua DPREP (Cont.)**
 - Includes the processing of both orbit and attitude data
 - Orbit data
 - » Is received from the FDF in both predictive and definitive orbit data files
 - » Predictive orbit data for a particular day would arrive about fourteen to sixteen hours before the end of the UTC day (or eight to ten hours after the start of day)
 - » Predictive orbit data would arrive at the DAAC at about the same time as the first two-hour chunk of Level 0 science data for the day
 - » Definitive orbit data arrives at the DAAC daily about eight to ten hours after the end of the UTC day
 - » Aqua predictive orbit data is less accurate than definitive orbit data but predictive orbit data are available earlier and some instrument teams find the accuracy acceptable for science processing

Production Requests (Cont.)



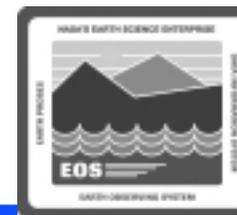
- **Aqua DPREP (Cont.)**
 - **Attitude data**
 - » **Ground-Based Attitude Determination (GBAD) data is used in the processing of attitude data**
 - » **GBAD data is received from the ECS Mission Operations Segment (EMOS) in "carry-out" files**
 - » **GBAD carry-out files (PMCOGBAD) are used in conjunction with predictive orbit data to produce "quick" attitude data**
 - » **GBAD carry-out files are used in conjunction with definitive orbit data to prepare "refined" attitude data**

Production Requests (Cont.)



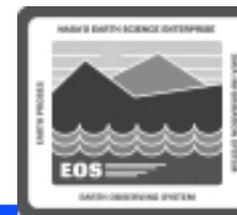
- **Aqua DPREP (Cont.)**
 - **Aqua Orbit Processing**
 - » Includes reformatting the FDD definitive and predictive ephemeris data sets into toolkit native format and HDF format
 - » In addition, orbit metadata records are generated for the product data sets
 - **Aqua Predictive Orbit and Aqua Definitive Orbit DPREP PGEs process Aqua ancillary data sets (i.e., PM1EPHP, predictive ephemeris data and PM1EPHD, definitive ephemeris data respectively) supplied by FDF**
 - **Output files/granules of the Aqua DPREP PGEs provide satellite ephemeris data and are subsequently used in the processing of Aqua satellite attitude data**

Production Requests (Cont.)



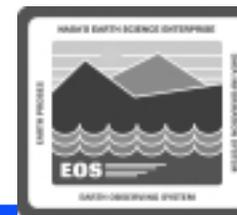
- **Aqua DPREP (Cont.)**
 - **Aqua Predictive Orbit DPREP PGE**
 - » Reads in both the current PM1EPHP predictive ephemeris data set and a previous PM1EPHND preprocessed platform definitive ephemeris data set in native format
 - » Outputs are preprocessed Aqua platform predictive ephemeris data sets in native format (PM1EPHNP) and HDF format (PM1EPHHP) and a metadata file for each data file
 - **Aqua Definitive Orbit DPREP PGE**
 - » Reads in both the current PM1EPHD definitive ephemeris data set and a previous PM1EPHND preprocessed platform definitive ephemeris data set in native format
 - » Outputs are preprocessed Aqua platform definitive ephemeris data sets in native format (PM1EPHND) and HDF format (PM1EPHHD) and a metadata file for each data file

Production Requests (Cont.)



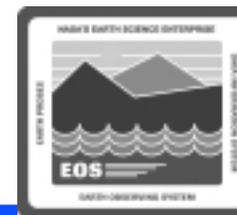
- **Aqua DPREP (Cont.)**
 - **Aqua Attitude Processing**
 - » **Two streams of Aqua Attitude DPREP; i.e., Aqua Quick Attitude DPREP and Aqua Refined Attitude DPREP**
 - » **Difference in the streams is the orbit data used for input**
 - **Aqua Quick Attitude DPREP**
 - » **Inputs are from ESDTs PMCOGBAD [Aqua (PM1) carry-out ground-based attitude determination] and PM1EPHNP (preprocessed Aqua platform predictive ephemeris data in native format)**
 - » **Outputs are PM1ATTHQ (Aqua quick attitude data in HDF-EOS format) and PM1ATTNQ (Aqua quick attitude data in native format)**

Production Requests (Cont.)



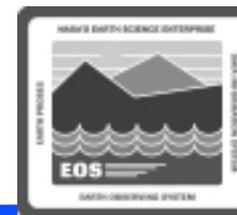
- **Aqua DPREP (Cont.)**
 - **Aqua Refined Attitude DPREP**
 - » **Inputs are from ESDTs PMCOGBAD and PM1EPHND (preprocessed Aqua platform definitive ephemeris data in native format)**
 - » **Outputs are PM1ATTHR (Aqua refined attitude data in HDF-EOS format) and PM1ATTNR (Aqua refined attitude data in native format)**
 - **Each of the attitude DPREP streams (i.e., “quick” and “refined”) executes twelve times per day at two-hour intervals**
 - » **The PMCOGBAD data is received at the DAAC approximately every two hours**
 - » **The predicted orbit data arrives ahead of the PMCOGBAD data and the definitive orbit data arrives after the PMCOGBAD data**

Production Requests (Cont.)



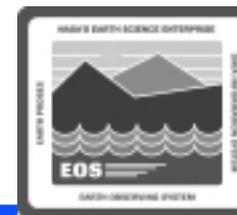
- **Aqua DPREP (Cont.)**
 - **Aqua Attitude Processing (Cont.)**
 - » Interpretation of the attitude data depends on the value of the GNCC status word contained in the carry-out file GBAD data
 - » If the value of the GNCC status word is 110 (which specifies "fine pointing" mode) the attitude is good for science processing
 - » Any other value indicates a mode that provides inadequate attitude for science data

Production Requests (Cont.)



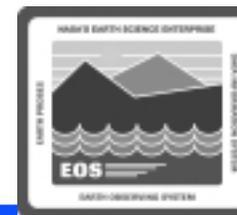
- **Aqua DPREP (Cont.)**
 - **Profile 1 is used when both current and previous data sets are available**
 - » Is used for nominal Aqua DPREP operation
 - » Is run on a routine basis
 - **Profile 2 is used when the current data set only is available (no previous or next data sets)**
 - » Initializes DPREP's processing of a data stream
 - » When Profile 2 has been run on a data segment, Profile 1 assumes processing responsibility

Production Requests (Cont.)



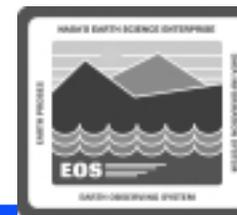
- **ASTER Expedited Data Processing**
 - ECS supports the ingest of ASTER expedited data sets (EDSs) from the EOS Data and Operations System (EDOS) and their immediate availability to selected ASTER Scientists
 - In addition, ECS supports the production of ASTER Level 1A/1B expedited data products from the ingested expedited data sets
 - The higher-level expedited data products are produced at the EDC DAAC

Production Requests (Cont.)



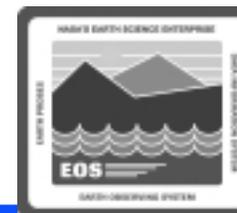
- **Process for ASTER expedited data processing**
 - **ASTER EDS data granules are transferred to EDC from GSFC via cross-DAAC transfer mechanism**
 - **ASTER Ground Data System (GDS) produces a daily Observation Schedule File (OSF)**
 - » **Including the ASTER Observation Schedule and the ASTER One-Day Schedule**
 - **OSF file is sent daily to EDC (outside the context of ECS at the DAAC)**
 - **OSF is processed by the ASTER OSF Parser tool at EDC (outside the ECS context)**
 - » **Output is referred to as Parsed OSF (POSF) data files**
 - **At EDC the POSF files are inserted into the ECS system via the Science Investigator-Led Processing Systems (SIPS) interface mechanism**

Production Requests (Cont.)



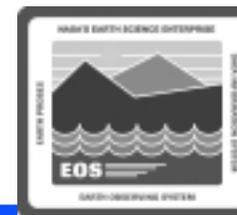
- **Process for ASTER expedited data processing (Cont.)**
 - Production Planner deletes all successfully completed L1AE and L1BE DPRs from PDPS
 - Production Planner runs the ASTER Expedited Planning Script (i.e., "GetGranTimes.pl")
 - » Script queries the SDSRV for the temporal metadata of any AST_EXP and AST_L1AE granules that were inserted to SDSRV since the last time it was run
 - » Output is a set of candidate DPR start/stop times
 - Production Planner generates a set of Production Requests (PRs) for both the L1AE PGE and the L1BE PGE using the DPR start/stop times identified using the GetGranTimes.pl script
 - » PGEs are configured to run with Collection Time (rather than Insertion Time) production rules

Production Requests (Cont.)



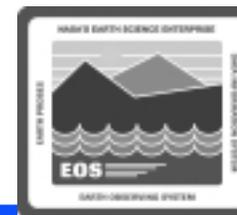
- **Process for ASTER expedited data processing (Cont.)**
 - **Production Planner generates PRs (Cont.)**
 - » If the matching AST_POSF granule has not been inserted, a L1AE PR is still generated with a subscription for AST_POSF
 - » L1BE PGEs being planned are not those corresponding to the L1AE PGEs being planned; L1AE PGEs must be finished and their DPRs deleted from PDPS prior to planning the corresponding L1BE PGEs
 - **Production Planner creates a new production plan, merging the newly created L1AE and L1BE PRs with any PRs from the currently active plan**
 - **Production Planner activates the new plan for execution of L1AE and L1BE DPRs**
 - **Subsequent processing, archiving and access activities are the same as for other data types**

Production Requests (Cont.)



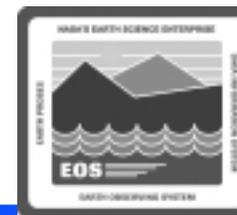
- **ASTER On-Demand Processing**
 - ECS supports authorized ASTER scientists' requests for on-demand high-level production
 - Authorized ASTER scientists may submit requests that can be divided into several different categories:
 - » Pre-defined (standard) ASTER high-level products
 - » High-level products with nonstandard input parameters
 - » Digital Elevation Model (DEM) products
 - ASTER scientist selects the granule to be used and/or the additional non-standard parameters to generate the high-level product and submits a request for the system to create the high-level product
 - Granules produced by on-demand processing are not permanently archived

Production Requests (Cont.)



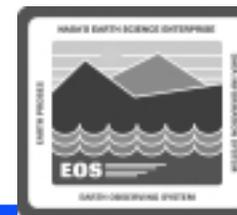
- **ASTER On-Demand Processing:
Standard On-Demand Processing**
 - Supports requests from ASTER scientists for processing of ASTER L1A and L1B data to higher information levels
 - A request may require a sequence of algorithms to be run on the specified data
 - ODFRM HTML interface in the Client Subsystem allows authorized scientists/researchers to create ASTER On-Demand Product Requests
 - On-Demand Manager (EcPIOdMgr) in PLS manages on-demand orders received from the ODFRM in CLS
 - » Determines the order type
 - » Creates the PRs and DPRs necessary to fill the order
 - » If all input data are available, the DPR(s) is (are) submitted to the Data Processing Subsystem

Production Requests (Cont.)



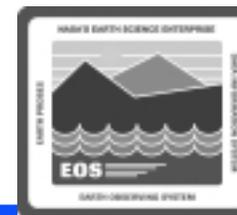
- **ASTER On-Demand Processing:
Standard On-Demand Processing (Cont.)**
 - **Job Management (EcDpPrJobMgmt) gets activated on-demand DPRs from PLS**
 - **If the on-demand DPRs are waiting for data to arrive or if there are not enough processing resources, Job Management places them in the On-Demand Queue**
 - **When all input data are available and there are adequate processing resources, the on-demand DPRs are released to AutoSys for processing**
 - **Execution Management (EcDpPrEM) sends updates to MSS concerning the status of the on-demand jobs**

Production Requests (Cont.)



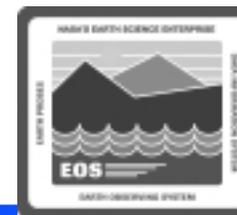
- **ASTER On-Demand Processing:
Standard On-Demand Processing (Cont.)**
 - In Release 6A, ECS provides the additional capability for a **ASTER** scientist to specify a **DPR** associated with the submission of an **ASTER Data Acquisition Request (DAR)**
 - When the **Level 1B** product specified in the **DAR** is ingested at the **EDC DAAC**, the associated **DPR** is automatically submitted for processing
 - **Attached DPRs** are supported for **ECS generated products only**

Production Requests (Cont.)



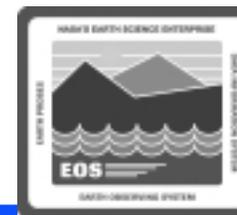
- **ASTER On-Demand Processing: Non-Standard L1B Production**
 - Allows authorized ASTER scientists to request an L1B data product to be generated using nonstandard input parameters
 - Processing of a non-standard L1B product is conducted at the GDS in Japan
 - An ASTER scientist submits a request to ECS using the ODFRM On-Demand Form web page, which is supported by the ECS Client Subsystem (CLS)
 - » The web page enables the ASTER scientist to choose from a list of non-standard parameters
 - Upon receipt of an on-demand order, ODPRM determines the order type
 - ODPRM sends the request to GDS via the ASTER gateway

Production Requests (Cont.)



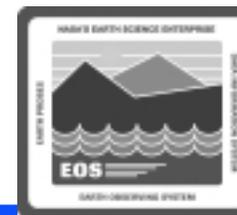
- **ASTER On-Demand Processing:
Non-Standard L1B Production (Cont.)**
 - The ODPRM creates a dummy production request and DPR along with a placeholder granule
 - Processing of the non-standard L1B product occurs at the GDS in Japan
 - The final product is delivered on tape to the ECS DAAC (i.e., EDC) from the GDS in Japan
 - The final product is archived at the ECS DAAC
 - When the non-standard L1B product is inserted, the Subscription Manager updates the placeholder granule with a Universal Reference (UR) and marks it as accepted
 - The ASTER scientist is notified of final product availability

Production Requests (Cont.)



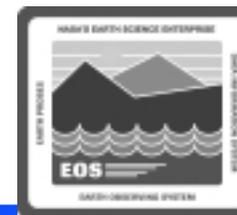
- **ASTER On-Demand Processing: DEM Production**
 - Requests for ASTER on-demand DEM production are submitted to ECS through the On Demand Form Request Manager (ODFRM) and are forwarded to the ASTER DEM SIPS for processing
 - » The ASTER DEM SIPS is located at EDC in close proximity to the ECS DAAC
 - When the ASTER DEM SIPS has created the requested product, ECS ingests it and distributes the product to the requester

Production Requests (Cont.)



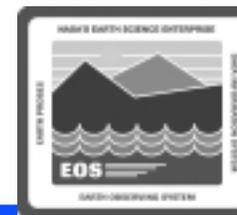
- **ASTER On-Demand Processing: DEM Production (Cont.)**
 - The ASTER scientist submits a request for ASTER on-demand DEM production to ECS through the ODFRM
 - Upon receipt of an on-demand order, ODPRM determines the order type
 - The ODPRM submits a subscription (to the subscription server) to be notified when the ASTER DEM product has been inserted in the archive
 - The ODPRM sends an e-mail message to the ASTER DEM Operator
 - The ASTER DEM Operator creates the DEM in accordance with the order information

Production Requests (Cont.)



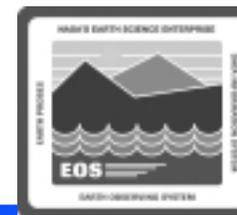
- **ASTER On-Demand Processing: DEM Production (Cont.)**
 - When the requested product has been created, the ASTER DEM operator puts a PDR file on the PDR server
 - » The PDR file identifies the location of the ASTER DEM data file and the corresponding metadata file
 - ECS ingests the DEM product using the polling-with-delivery-record interface
 - Upon successful insertion of the DEM product in the archive, the science data server triggers the appropriate "insert event" qualified with the UR of the inserted granule
 - The subscription server queries the subscription database to determine which subscriptions need to be activated (fired)

Production Requests (Cont.)



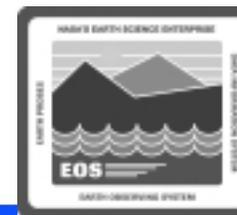
- **ASTER On-Demand Processing: DEM Production (Cont.)**
 - The status of the on-demand request is updated to “Processing Complete”
 - ODPRM receives subscription notification and sends a "user acquire" request to the science data server to have the on-demand product sent to the requester
 - The DEM product is sent to the requester via the requested medium
 - » The data may be sent via ftp or on a physical medium (e.g., tape)

Production Requests (Cont.)



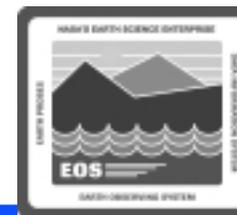
- **Reprocessing**
 - **"Reprocessing" has been used in the following two ways in the ECS context:**
 - » **A PGE has been run in the past and produced a product and for some reason (e.g., a file has been corrupted/deleted) the PGE needs to be run again to reproduce the exact same outputs**
 - » **A PGE that was run in the past over a given time period or set of data has been improved (software or static inputs) by the Instrument Team, who would like to have the modified PGE run on the data from the previously processed time period/data set**
 - **The second case is the more important**
 - » **Leads to the requirement that ECS be able to support a workload for reprocessing that is equal in size to the current or first-time processing load**

Production Requests (Cont.)



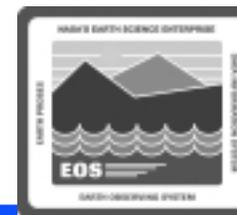
- **Reprocessing (Cont.)**
 - **PGE changes leading to reprocessing may occur for any of the following reasons:**
 - » **Correct an error in the software**
 - » **Improve the algorithm on the basis of better understanding of the instrument or physical phenomena**
 - » **Use updated static files (e.g., calibration data)**
 - » **Use new or different ancillary data files**
 - » **Use different production rules**
 - » **Use changed/additional run-time parameters**
 - » **Use improved input resulting from changes to an upstream PGE**

Production Requests (Cont.)



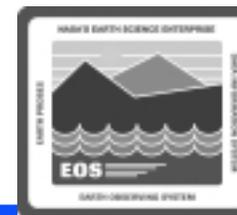
- **Reprocessing:
Operations Concepts**
 - A PGE that is being used for reprocessing represents a new version of a PGE
 - A reprocessing PGE may specify new static or dynamic inputs rather than new PGE software
 - Output granules from reprocessing PGEs are represented under the existing ESDT used for the previous generation or version of the data granules
 - The distinction between generations of the data can be made through the **ReprocessingActual** attribute that is associated with each granule
 - » Other mechanisms for distinguishing reprocessing levels include the **ProductionDateTime** and **PGEVersion** attributes

Production Requests (Cont.)



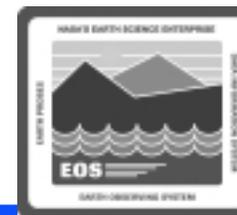
- **Reprocessing:
Operations Concepts (Cont.)**
 - DPRs specifying the exact same PGE may be scheduled for both reprocessing and routine processing in the same production plan
 - For example, first-time processing may have been carried out for the time period from Day 1 to Day N, at which point an improved PGE is introduced
 - The improved PGE is used for processing from Day N+1 forward, and is also used concurrently in reprocessing from Day 1 to Day N
 - For Release 6A it is expected that in a typical planning session the Production Planner will plan time ranges for reprocessing that are comparable in extent with the routine processing
 - » For example, the Production Planner may plan both routine processing and reprocessing for data acquired during 24-hour periods

Production Requests (Cont.)



- **Reprocessing:
Operations Concepts (Cont.)**
 - DPRs created via planning are organized and managed in separate queues by processing type
 - » A fixed number of processing "slots" are reserved for on-demand processing, routine processing, and reprocessing
 - » DPRs are dispatched for processing from either queue against the appropriate slot when the slot becomes available, i.e., as a job of that slot's type finishes and the input data become available
 - » Operations personnel can configure the number of slots of each type
 - » Operations personnel can change the number of slots of each type (and as a result the total number of concurrent processing slots) at run time
 - » There is no dynamic slot allocation (allocation is done by Operations personnel)

Production Requests (Cont.)



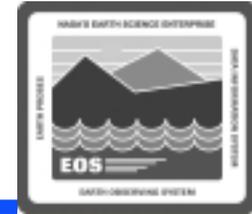
- **Regeneration**

- Produce replacements for previously generated granules that have been lost or corrupted due to failure in the ECS archive

- **General Process:**

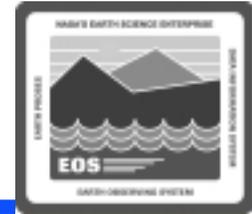
- » Retrieve the Production History file (PH) for the lost granule to determine parameters for the generation of replacement granules
 - » Create Production Requests for the generation of replacement granules
 - » Create and activate a Production Plan that includes the Production Requests for the generation of replacement granules
 - » Prepare (if applicable) a “PDPS Residual Granules List,” which identifies granules that either cannot or should not be regenerated at the DAAC
 - » Some granules do need not be reproduced; e.g., if there is a more recent version of the product

Regenerating Granules (Cont.)



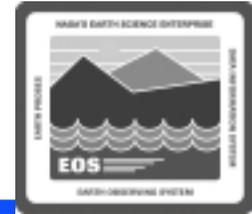
- **Considerations that apply to the regeneration of granules:**
 - **All outputs of the PGE [not just those equivalent to the lost granule(s)] are to be produced and archived**
 - **Various factors could make it impossible to reproduce granules identical to the originals**
 - » **There is no guarantee that when a PGE is re-run it will use the same inputs as were used during the original execution of the PGE; consequently, the output may be different from the original granule(s)**
 - » **Variability of Optional/Alternate inputs, Ad Hoc Reprocessing, Metadata Checks, Metadata Query and other production rules affects PGE output**

Launching the Production Request Editor



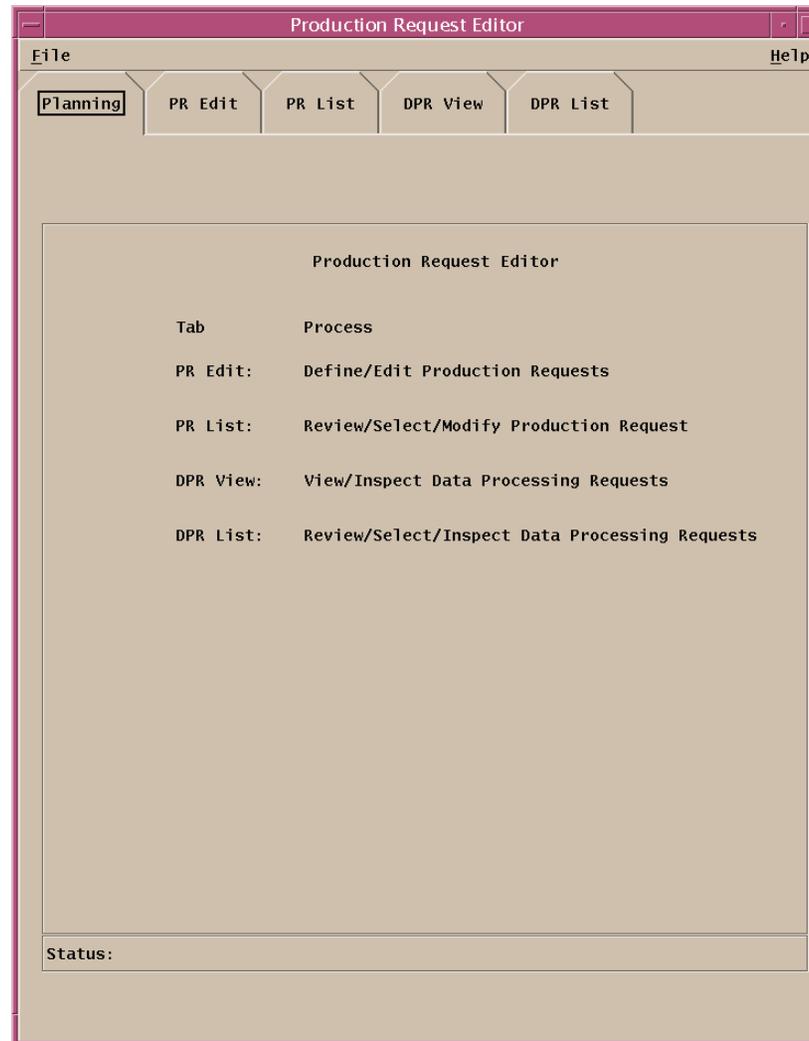
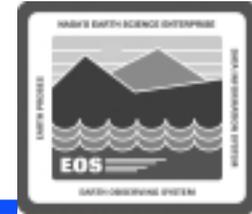
- **Production Request Editor-Associated Applications**
 - Production Request Editor
 - Subscription Manager
 - Sybase ASE Server for the PDPS database

Launching the Production Request Editor (Cont.)

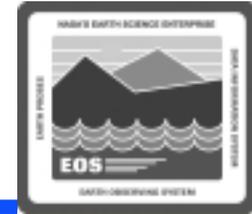


- **Procedure**
 - **Access the command shell**
 - **Set the DISPLAY environmental variable**
 - **Log in to the Planning/Management Workstation using secure shell**
 - **Perform DCE login**
 - **Set the ECS_HOME environmental variable if necessary**
 - **Start the Production Request Editor GUI in the appropriate mode**

PR Editor Introductory GUI



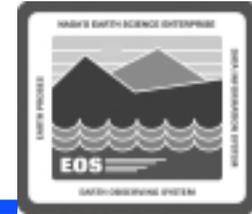
Creating a PR



- **Procedure**

- **Select the PR Edit tab of the Production Request Editor GUI**
- **Select the PGE to be included in the Production Request**
- **If applicable, specify new metadata check value**
- **If applicable, modify alternate input parameters**
- **Specify the data requirements**
 - » **Beginning and ending dates and times**
 - » **Orbits (from/to)**
- **Indicate whether the DPRs will be chain heads**
- **If applicable, select the virtual computer for running the PGE**
- **Save the Production Request**

PR Edit GUI



Production Request Editor

File Edit Help

Planning PR Edit PR List DPR View DPR List

PR Name: Origination Date:
PR Type: Originator:
User Type: Priority (1 to 10):

Satellite Name: PGE ...
Instrument Name: PGE Parameters...
PGE Name: Metadata Checks...
PGE Version:
Profile Id: Alternate Input Values..

◆ Collection Time ▼ Insertion Time

Duration ◆ UTC Time ▼ Orbit

Collection Time

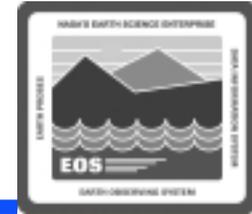
Begin From
End To
Tile Id

PGE Chain Head Computer:
◆ Yes ▼ No

Intermittent DPR
Skip Keep SkipFirst

Comment:

PGE Selection GUI



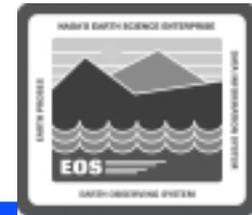
PGE Selection

PGE Name	PGE Version	Profile Id	Satellite Name	Instrument Name
ACT	OnDemand	1	AM1	ASTER
ACT	OnDemand	2	AM1	ASTER
ACT	OnDemand	3	AM1	ASTER
ACT	OnDemand	4	AM1	ASTER
ACT	syn1	1	AM1	ASTER
ACVS	OnDemand	1	AM1	ASTER
ACVS	OnDemand	2	AM1	ASTER
ACVS	OnDemand	3	AM1	ASTER
ACVS	OnDemand	4	AM1	ASTER
AM1Eph	30101	1	AM1	AT1
AM1Eph	30101	2	AM1	AT1
BTS	OnDemand	1	AM1	ASTER
BTS	syn1	1	AM1	ASTER
DSTSD	OnDemand	1	AM1	ASTER
DSTTD	OnDemand	1	AM1	ASTER
DSTVD	OnDemand	1	AM1	ASTER
ETS	OnDemand	1	AM1	ASTER
ETS	OnDemand	2	AM1	ASTER
ETS	OnDemand	3	AM1	ASTER
ETS	OnDemand	4	AM1	ASTER
ETS	syn1	1	AM1	ASTER
FddAtt	30101	1	AM1	AT1
FddAtt	30101	2	AM1	AT1
MISRLIKE	syn1	1	AM1	MISR
MISRLIKE	syn1	2	AM1	MISR
MODPGE01	syn1	1	AM1	MODIS
MODPGE02	syn1	1	EOSAM1	MODIS
MoPGE01	syn1	1	AM1	MODIS
MoPGE02	syn1	1	EOSAM1	MODIS
MoPGE03	syn1	1	EOSAM1	MODIS

Find

OK Cancel Help

PGE Parameter Mappings GUI



PGE Parameter Mappings

PGE ID:

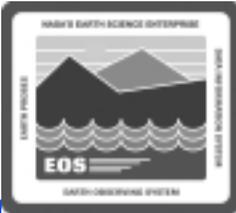
Parameter Name	Logical Id	Def
Spacecraft Name	950	EOS
AlternateInputOne	970	0
AlternateInputTwo	980	0
PGE Version	990	30101
Profile ID	999	1
Toolkit Format Attitude Data Logical ID	1255	100
Toolkit Format Ephemeris Data Logical ID	1256	115
Maximum QA Check Window Size (number of records)	5000	75
Minimum QA Check Window Size (number of records)	5001	23
Position Vector Yellow Limit (st dev or absolute)	5004	8.6
Position Vector Red Limit (st dev or absolute)	5005	15.5
Velocity Vector Yellow Limit (st dev or absolute)	5006	8.6
Velocity Vector Red Limit (st dev or absolute)	5007	15.5
Ephemeris Long Gap Threshold (number of records)	5008	60
Attitude Long Gap Threshold (number of records)	5009	1
Limits Threshold Unit; 0 = st dev, 1 = absolute	5025	0
Ephemeris QA Uncertainty (st dev)	5026	0.0
Generate Attitude Data; 0 = FALSE, else TRUE	5028	1
Generate Ephemeris Data; 0 = FALSE, else TRUE	5029	1
Maximum S/C Distance from ECI center (meters)	5030	7384
Minimum S/C Distance from ECI center (meters)	5031	6500
Maximum S/C Velocity about ECI center (meters/sec)	5032	8300
Minimum S/C Velocity about ECI center (meters/sec)	5033	6850
Ignore replacement request; 0 = FALSE, else TRUE	5038	0
Euler Angle Order, 1st angle; 1 = X, 2 = Y, 3 = Z	5039	3
Euler Angle Order, 2nd angle; 1 = X, 2 = Y, 3 = Z	5040	1
Euler Angle Order, 3rd angle; 1 = X, 2 = Y, 3 = Z	5041	2
Expected Data Interval (seconds)	5050	1.0
Maximum Orbital Period (seconds)	5053	6420
Minimum Orbital Period (seconds)	5054	5250

Find

Override Value

OK Apply Cancel Help

Metadata Checks GUI



MetaDataChecks

PGE ID:

InputDataType

- AM1ANC#001
- AM1EPHN#001
- AM1ATTN#001

Find

MetaDataField Operator Value Type

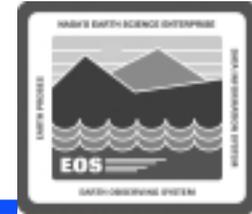
MetaDataField	Operator	Value	Type
---------------	----------	-------	------

Find

MetaDataField:

Value:

Alternate Input Values GUI



AlternateInputValues

PGE ID: AM1Eph#30101#001

AlternateListName
ANC
ATTNO
EPHNO

Find

Order	DataType	LogicalID	Timer
1	AM1ANC#001	1010	14400

Find

Order

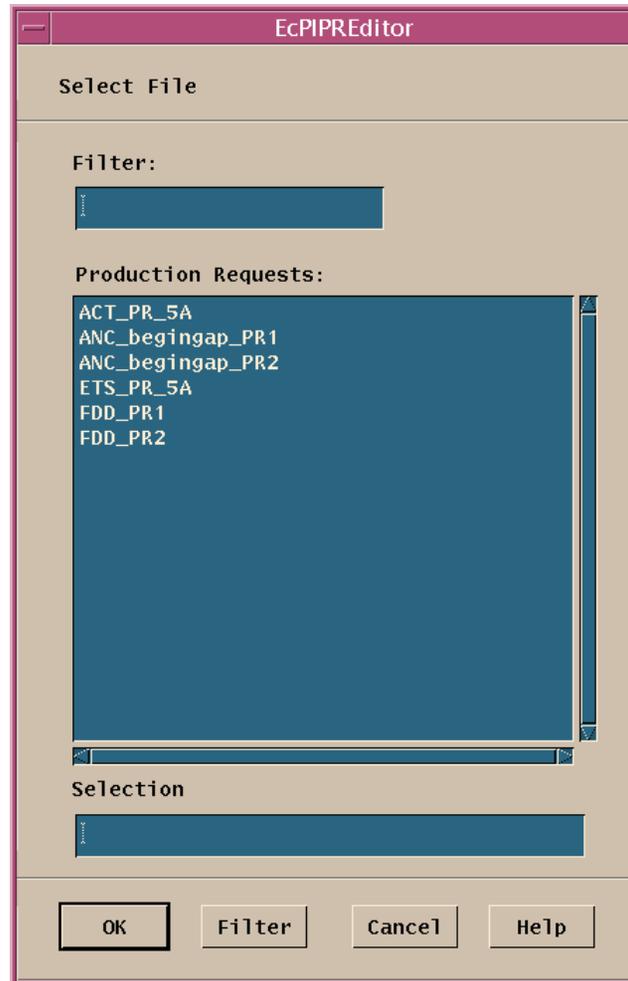
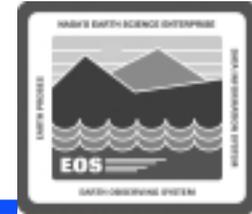
▲
▼

DataType: AM1ANC#001

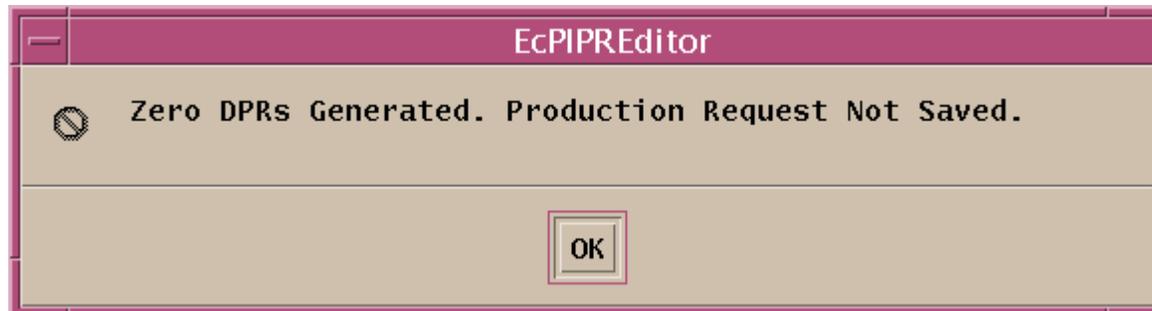
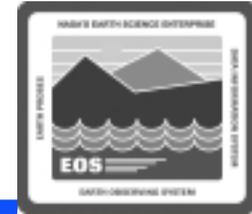
Timer: :04 : :00 : :00

Ok Apply Cancel Help

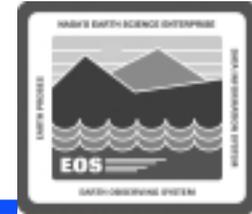
PRE File Selection Window ("Open" or "Save As")



Production Request Explosion into DPRs Dialogue Box



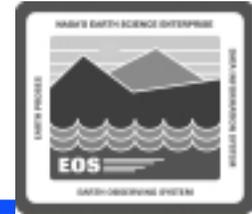
Editing/Modifying a PR



- **Procedure**

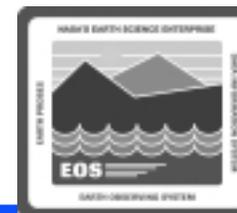
- **Select the PR Edit tab of the Production Request Editor GUI**
- **Open the PR to be edited/modified**
- **Make the necessary edits/modifications**
- **Save the PR**

Deleting a PR



- **Procedure**
 - **Select the PR List tab of the Production Request Editor GUI**
 - **Select the PR to be deleted from those listed**
 - **Select Edit→Delete**
 - **Select OK**
 - **Select OK**

PR List GUI



Production Request Editor

File Edit Help

Planning PR Edit **PR List** DPR View DPR List

PR Type: All

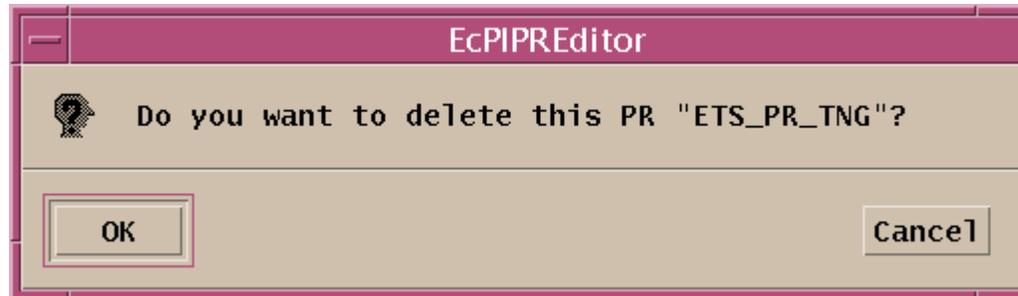
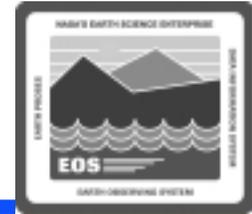
Production Requests

PRName	PGEID	Priority	StartTime	EndTime
260000427	ODL1B#syn1#001	0	05/03/2000 19:02:08	05/03/2000
ACT_Routine_1	ACT#syn3#001	0	02/14/1998 02:00:00	02/14/1998
AM1Eph_PR_Cen_1	AM1Eph#30001#002	0	12/31/1999 22:00:00	01/01/2000
AM1Eph_PR_Cen_2	AM1Eph#30001#001	0	01/01/2000 00:00:00	01/01/2000
BTS_Routine_1	BTS#syn1#001	0	07/04/1997 13:01:23	07/04/1997
ETS_Routine_1	ETS#syn1#001	0	02/14/1998 02:00:00	02/14/1998
FddAtt_PR_Cen_2	FddAtt#30001#001	0	01/01/2000 00:00:00	01/01/2000
MODIS_PR1	MoPGE01#syn1#001	0	01/01/2000 00:05:00	01/01/2000
MODIS_PR2	MoPGE02#syn1#001	0	01/01/2000 00:05:00	01/01/2000
MODIS_PR3	MoPGE03#syn1#001	0	01/01/2000 00:05:00	01/01/2000
PGE01_PR	MIP1CA#211P501#001	0	07/01/1998 16:40:14	07/01/1998
PGE07_PR	MIP7#211P5#001	0	07/01/1998 16:40:14	07/01/1998

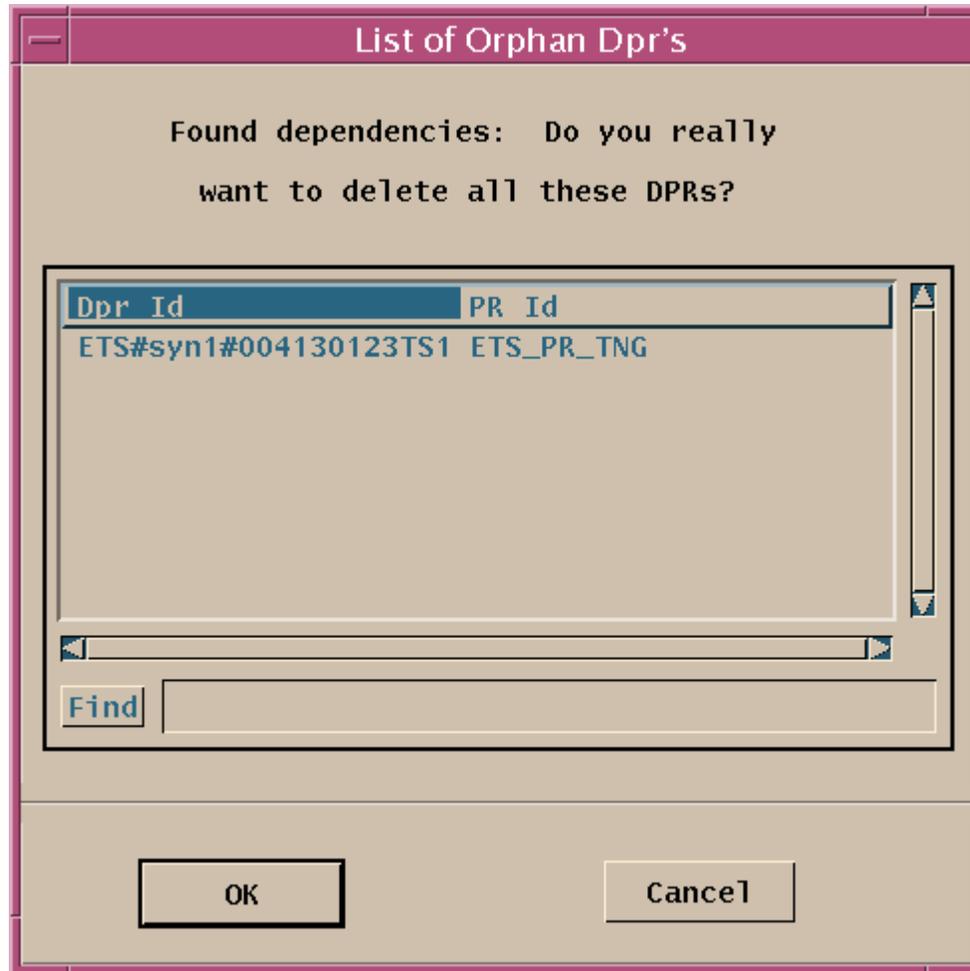
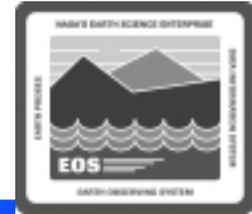
Find

Status:

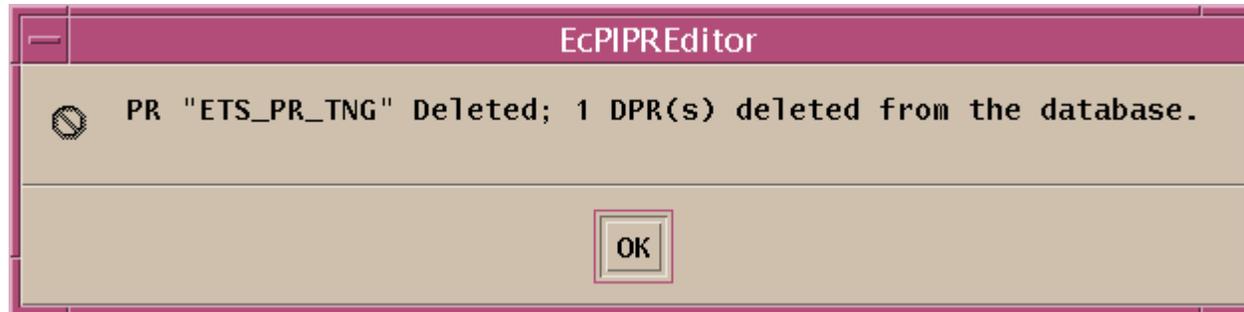
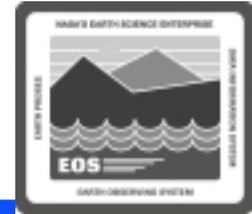
Production Request Deletion Confirmation Dialogue Box



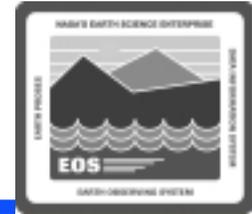
Production Request List of Orphan DPRs Dialogue



Production Request Deletion Completed Dialogue Box

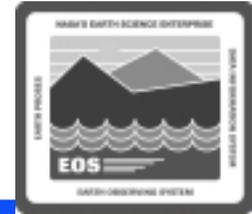


Reviewing/Deleting Data Processing Requests (DPRs)



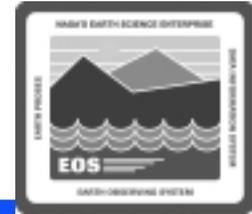
- **Data Processing Requests (DPRs)**
 - generated automatically by the PDPS
 - generated automatically from a PR (which specifies a PGE)
- **DPR information is used by...**
 - Data Processing Subsystem
 - AutoSys production scheduling software
- **The Production Planner can review DPRs**
- **Operations personnel cannot edit DPR fields**

Reviewing/Deleting DPRs (Cont.)



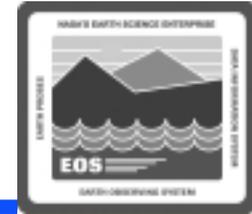
- **DPR List (Production Request Editor)**
 - Each line represents a DPR, i.e., a job that will be run when all data and resource needs have been satisfied
 - For each DPR the list includes...
 - » DPR identification
 - » relevant PGE
 - » name of the corresponding PR
 - » data start date and time, etc.
 - may be filtered, so that only DPRs with certain characteristics are displayed

Reviewing/Deleting DPRs (Cont.)



- **Data concerning an individual DPR (Production Request Editor)**
 - PGE parameters
 - UR File Mappings (PGE File Mappings)
 - » input and output files for a particular DPR on the PGE File Mappings GUI
 - » GUI displays one line of information for each file that may be used by or be produced by the PGE

UR File Mappings GUI



UR File Mappings

File Mappings

Input Data

LogicalId	GranuleId	StartTime(UTC)	Stop
1200	AST_ANC#001L1004	01/01/1901 00:00:01	01/01/1901 00:00:01
1100	AST_L1B#00107031997004900000	07/03/1997 00:49:00	07/03/1997 00:49:00
1101	GDAS_OZF#00101003	01/01/1901 00:00:01	01/01/1901 00:00:01

Find

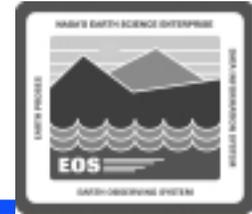
Output Data

LogicalId	GranuleId	StartTime(UTC)	Stop
2000	AST_09T#00107031997004900000	07/03/1997 00:49:00	07/03/1997 00:49:00

Find

OK Help

DPR List GUI

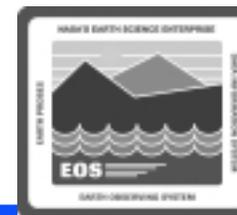


The screenshot shows the "Production Request Editor" window. At the top, there is a menu bar with "File", "Edit", and "Help". Below the menu bar are several tabs: "Planning", "PR Edit", "PR List", "DPR View", and "DPR List". The "PR List" tab is currently selected. Below the tabs, there are two input fields: "PR Name:" followed by a text box and a dropdown arrow, and "PR Type:" followed by a dropdown menu showing "ALL".

The main area of the window is titled "Data Processing Requests" and contains a table with a "Filter" button above it. The table has the following columns: "DPRId", "PGEId", "PRName", "TileId", "DataStartTime(UTC)", and "DataStopTime(UTC)". The table is currently empty. Below the table is a "Find" input field.

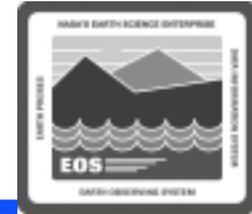
At the bottom of the window, there is a "Status:" label followed by a text box.

Reviewing/Deleting DPRs (Cont.)



- **Procedure (Reviewing DPRs)**
 - **Select the Data Processing Request List by clicking on the DPR List tab**
 - **Select a Production Request from the list on the option button**
 - **Select a DPR to be reviewed from the list of Data Processing Requests, then click on the DPR View tab**
 - **Select File → Open from the pull-down menu**
 - **Select the DPR to be reviewed from the list of DPRs**
 - **Review the selected DPR**
 - » **Click on the PGE Parameters... button to view the PGE parameters associated with the DPR**
 - » **Click on the PGE File Mappings... button to view the UR file mappings (PGE input and output data)**

DPR View GUI



Production Request Editor

File Edit Help

Planning PR Edit PR List **DPR View** DPR List

All Times In UTC

Data Processing Request Identification

DPR Name: PR Name:

Origination Date:

Originator:

PGE ID: PGE Parameters...

Data Start Time:

Data Stop Time: PGE File Mappings...

Request Data and Status

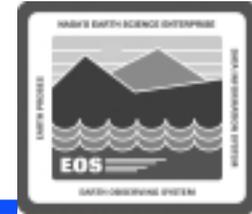
Predicted Start

Time: Priority:

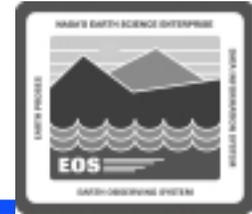
Actual Start

Time: Status:

DPR File Selection GUI

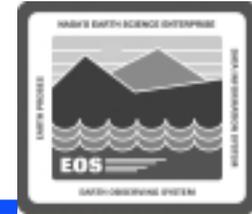


Reviewing/Deleting DPRs (Cont.)

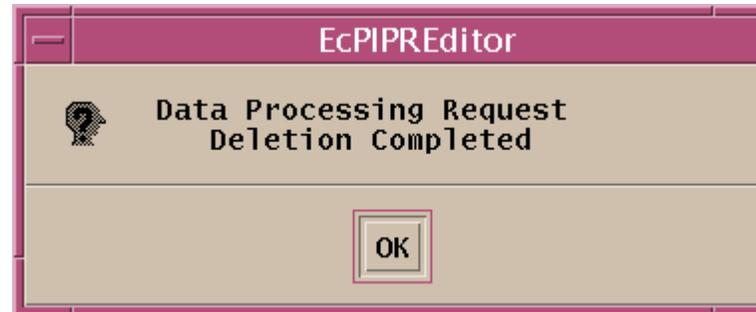
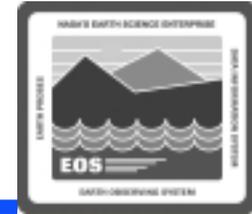


- **Procedure (Deleting a DPR)**
 - **Select DPR List tab on the Production Request Editor GUI**
 - **Select the appropriate Production Request from the list on the option button**
 - **Select the DPR to be deleted from the list of Data Processing Requests**
 - **Select Edit→Delete**
 - **Select OK**
 - **Select OK**

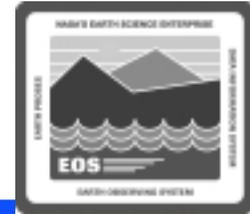
DPR Deletion Confirmation Dialogue Box



DPR Deletion Completed Dialogue Box

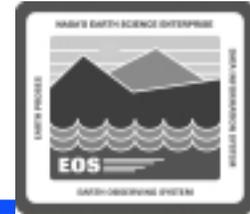


Reviewing/Deleting DPRs (Cont.)



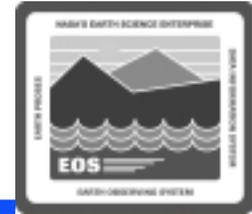
- **Deleting or Aborting an On-Demand Processing Request**
 - **The Planning Subsystem detects changes in the status of ASTER on-demand processing requests**
 - » **Whether the changes were made by the system or by operations personnel**
 - **PLS is not able to determine why operations personnel have canceled or aborted a request**
 - **Consequently, if it is necessary to cancel or abort an on-demand processing request, notify User Services personnel**
 - » **So they can send an e-mail message to the requester explaining why the request was canceled or aborted**

Launching Planning Workbench-Related GUIs



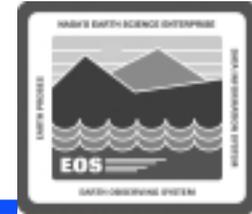
- **Launching the Production Strategies GUI**
 - **Software applications associated with the Production Strategies GUI**
 - » **Production Strategies GUI**
 - » **Sybase ASE Server for the PDPS database**
 - **Production Strategies are high-level sets of priorities that the Production Planner makes available to the Planning Workbench for determining the priorities and preferences in the processing of DPRs**
 - **Values included in the selected strategy are read by the Planning Workbench when prioritizing the DPRs in a production plan**

Launching Planning Workbench-Related GUIs (Cont.)



- **Launching the Production Strategies GUI: Procedure**
 - Access the command shell
 - Set the DISPLAY environmental variable
 - Log-in to the Planning/Management Workstation using secure shell
 - Set the ECS_HOME environmental variable if necessary
 - Start the Production Strategies GUI in the appropriate mode

Production Strategies GUI



ProductionStrategies

File Edit Options Help

Production Strategies Default

PR Type User Type PGE Type

Weight 50.000000 Weight 0.000000 Weight 0.000000

Default 5 Default 5 Default 5

Value	Priority
Routine	5
OnDemand	7
Reprocessing	3

Find

Weight 50.000000

Total Weight (must total 100)

100.000000

Normalize

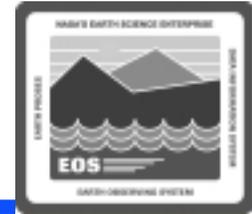
Priority 1

Type List

Add Modify Delete

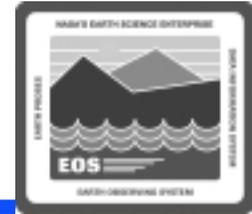
Late Start Delta Priority 0

Launching Planning Workbench-Related GUIs (Cont.)



- **Planning Workbench-Related Applications**
 - **System Name Server**
 - **Message Handler**
 - **Resource Model**
 - **Planning Workbench**
 - **Production Timeline**
 - **Production Strategies**
 - **Sybase ASE Server for the PDPS database**

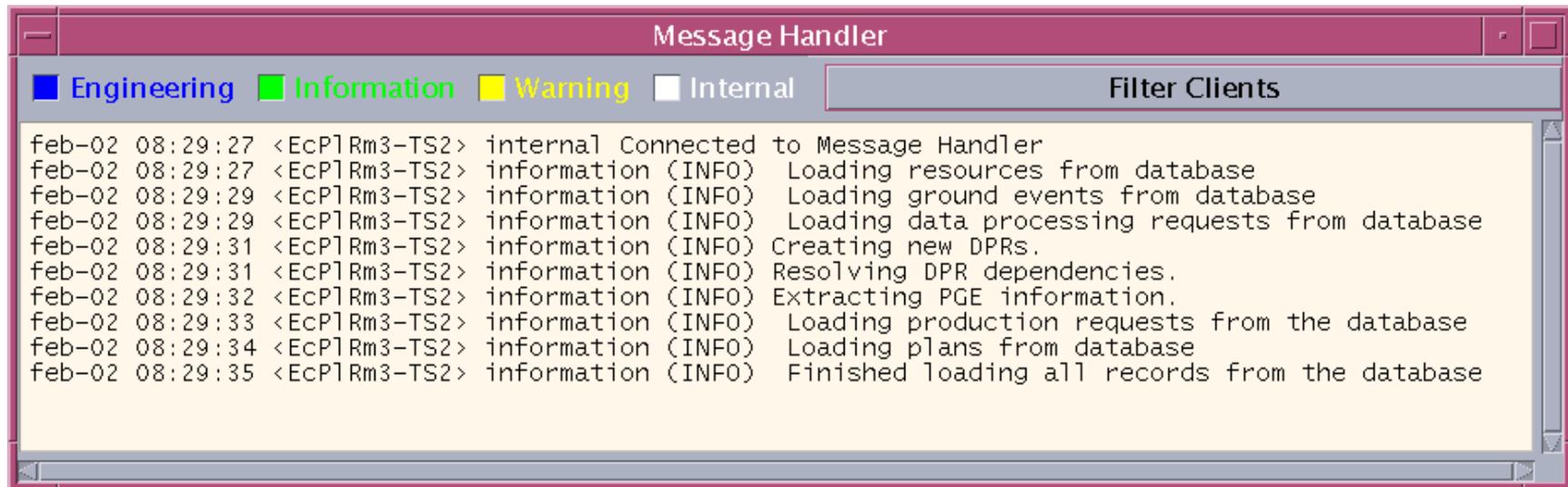
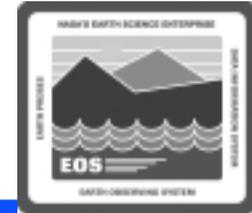
Launching Planning Workbench-Related GUIs (Cont.)



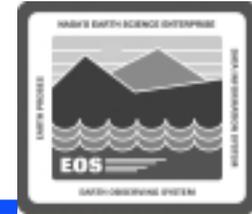
- **Launching Planning Workbench-Related GUIs: Procedure**
 - Access the command shell
 - Set the `DISPLAY` environmental variable
 - Log-in to the Planning/Management Workstation using secure shell
 - Set the `ECS_HOME` environmental variable if necessary
 - Start the Planning Workbench GUI in the appropriate mode

NOTE: Normally, the `EcPIAllStart` script is used to start all processes. But if the number of DPRs in the PDPS database is very high (~4000), the `EcPISomeStart` script is used to start the underlying processes. Then additional scripts are used to start the Planning Workbench GUI and the Timeline GUI.

Message Handler GUI



Planning Workbench



Planning Workbench

File Options Help

Plan Name: orbitTest2_9
Status: ACTIVE
Strategy: Default

Baseline
Activate Rollover Time:

Comments:

Production Requests

Unscheduled:

NAME	PRIORITY
ACT_PR_TNG	2
ETS_PR_TNG	2

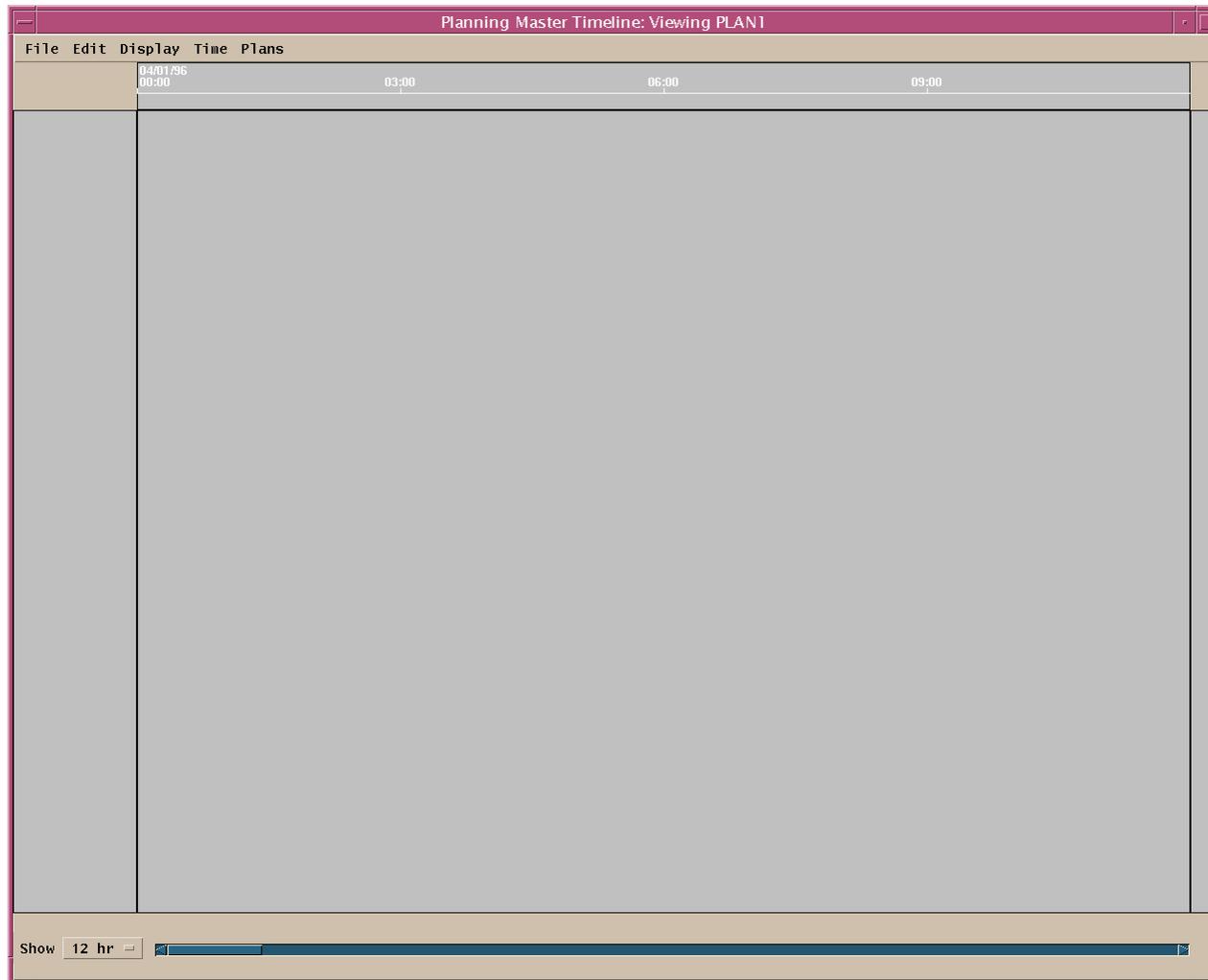
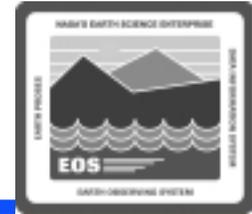
schedule: [v] unschedule: [^]

Scheduled:

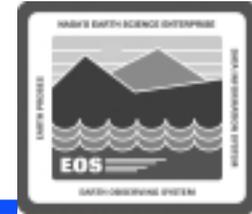
NAME	PRIORITY
ACT_PR 1	250

Prioritize Refresh

Planning Timeline GUI

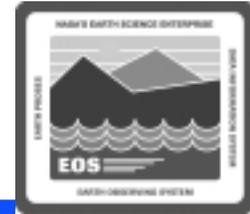


Creating a New Production Plan



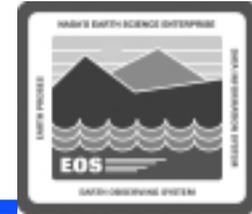
- **Planning process**
 - Involves the Production Planner preparing monthly and weekly production plans as well as a daily production schedule from the most current weekly plan
 - » Much of the planning occurs off line
 - » However, the Production Planner uses the Planning Workbench GUI to create and activate the current or active plan
- **Each DAAC has created its own policy and process for creating, reviewing, publishing and distributing production plans**
 - Daily plans may be...
 - » posted on a Worldwide Web page
 - » distributed in hardcopy form
 - » distributed via e- mail

Creating a New Production Plan (Cont.)



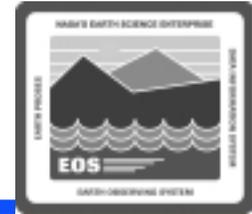
- **Most important factor in production planning is meeting the customers' needs**
 - **Ultimate customers are the Science Computing Facilities that have provided science software to ECS to be run on a routine basis**
 - » They expect timely generation and archiving of products using their science software
 - **Factors to consider when creating production plans**
 - » Keeping up to date with routine processing of products using the SCFs' science software
 - » Performing reprocessing of data using new versions of science software
 - » Regenerating products (as needed) that have been damaged or lost from the archive
 - » Taking into account the effects of ASTER on-demand processing, which circumvents the normal planning process but uses processing resources

Creating a New Production Plan (Cont.)



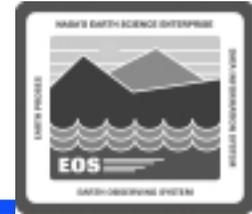
- **Monthly plans**
 - developed for the coming month and one or two months in advance
 - produced, reviewed, updated, published and distributed approximately two weeks before the beginning of the month
 - used to establish a baseline against which production targets can be measured
- **Weekly plans**
 - produced, reviewed, updated, published and distributed approximately five days before the beginning of the coming week
 - used to produce a baseline for comparison of planned vs. actual production results

Creating a New Production Plan (Cont.)



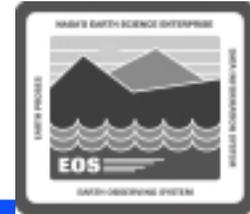
- **Daily plan or schedule**
 - produced each day for the next processing day
 - developed from the current weekly plan
 - » adjusted to reflect the actual processing accomplished and the actual resources available at the time the daily schedule is generated
- **Current (active) plan**
 - activated as needed (one or more plans a day, depending on circumstances) using the Planning Workbench
 - implements the daily plan (or some portion of the daily plan)

Creating a New Production Plan (Cont.)



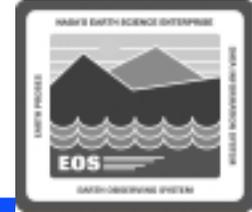
- During normal processing, when reasonably accurate predictions of the processing time for the PGEs are available, the processing schedule should result in a reasonably accurate prediction of when data products will be generated
- In abnormal situations (e.g., hardware or software failure), what is actually accomplished could depart significantly from the plan

Creating a New Production Plan (Cont.)



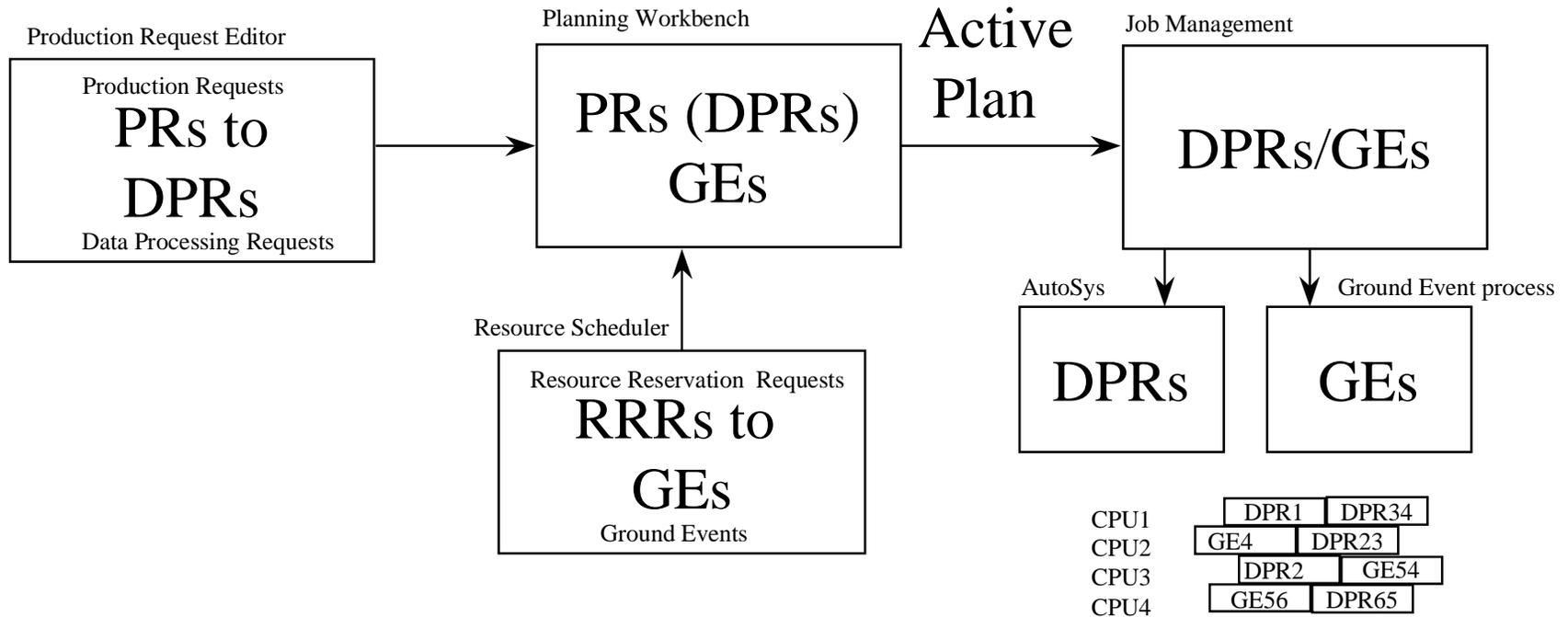
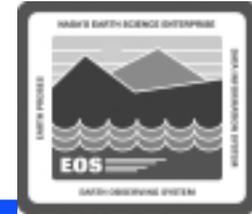
- **A daily plan may be divided into several segments to be activated separately**
 - In such situations, the Production Planner is likely to develop a new current plan to continue processing or to change the processing priorities
 - The process is known as “replanning”
- **Production Planner uses the Planning Workbench when creating a current (active) plan for production data processing at the DAAC**
 - Planning Workbench provides the means by which the Production Planner selects and schedules specific PRs whose DPRs are to be run
 - Planning Master Timeline provides a forecast of the start and completion times of the jobs based upon experience in running the PGEs during SSI&T

Creating a New Production Plan (Cont.)

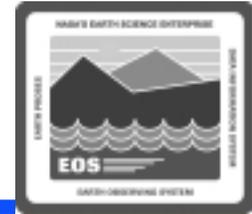


- **When a plan is “activated” through the Planning Workbench, information in the plan is transferred to Job Management in the Data Processing Subsystem**
 - **Job Management creates and releases jobs into the Platinum AutoSys tool, where production processing is managed**

Creating a New Production Plan: Planning Workbench

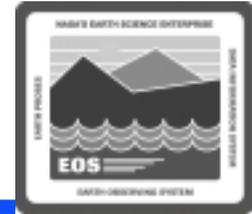


Production Strategy



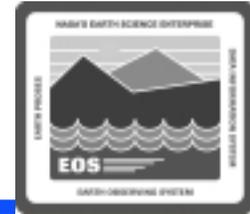
- **High-level set of priorities created by the Production Planner**
- **Made available for selection on the Planning Workbench**
- **Production Planner's choice of a strategy for a current production plan determines the priorities and preferences in the processing of associated DPRs**

Production Strategy (Cont.)



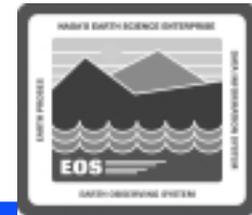
- **Production Strategies work on two levels:**
 - Updating lists of DPR attributes so that each value an attribute can have is tied to a particular priority
 - Changing the weight that each attribute's priority is given
- **In addition, weight is given to the priority selected by the user who entered the request**

Production Strategy (Cont.)



- **Total weights assigned to PR Type, User Type, PGE Type and Production Request Editor [Priority] must equal 100**
- **The values included in a strategy are read by the Planning Workbench to prioritize the DPRs in a plan**
- **Late Start Delta can be used to increase the priority of all jobs that have been waiting in the Production Queue for more than a day**

Production Strategy: Calculating Priority for a DPR



DPR id:
MOD09:L2G_060199_14_1234
 User Type:
 Scientist
 PGE:
 MOD09:L2G
 Routine request
 Tile 14
 Cluster id: 4
 Priority (Production Request Editor): 7

PR TYPE	
Weight	.45
On Demand	10
Routine	6
Reprocessing	4
Default	5

PGE	
Weight	.20
MODIS 01	5
MOD09:L2G	3
MOD09:L3	6
MODIS 02	5
Default	5

USER TYPE	
Weight	.15
Operator	5
DAAC Manager	7
Researcher	10
Scientist	8
Default	5

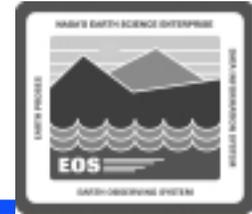
Production Request Editor	
Weight	.20

The operator can also change the weights given to each list according to the DAACs current production priorities

$$\begin{aligned}
 \text{Priority} &= 6 * .45 + \\
 & 3 * .20 + \\
 & 8 * .15 + \\
 & 7 * .20 \\
 & = 5.9 = 6
 \end{aligned}$$

The operator can change any weight or priority on any strategy list.

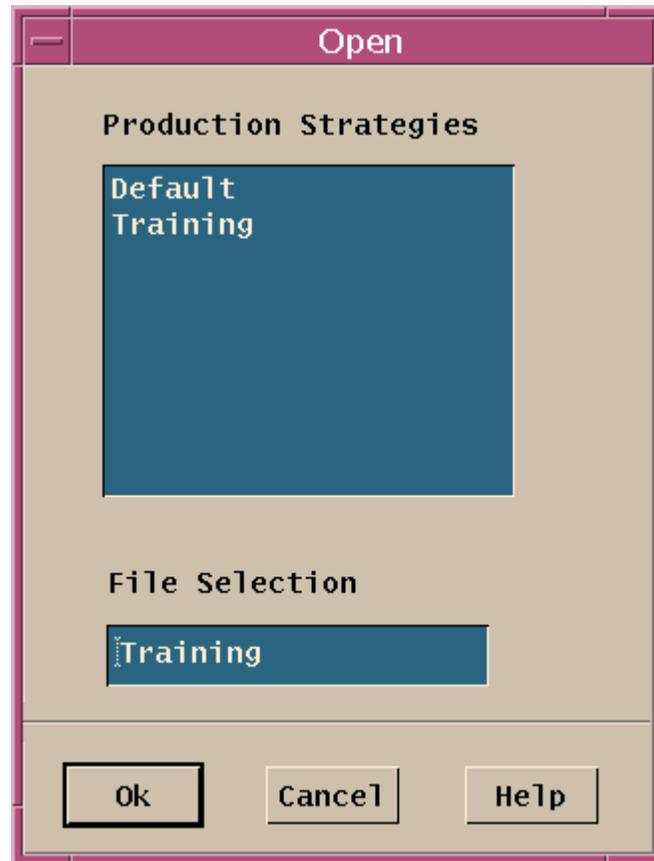
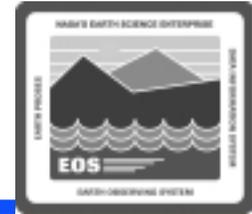
Defining a Production Strategy



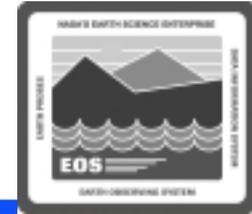
- **Procedure**

- **Select priorities for the values for each of the following three DPR attributes (as needed):**
 - » **PR Type**
 - » **User Type**
 - » **PGE Type**
- **Type weights for the preceding three DPR attributes (as needed)**
- **Type a weight in the Production Request Editor field**
- **Click on the Normalize button**
- **Type delta priority for Late Start Delta (if needed)**
- **Save the Production Strategy**

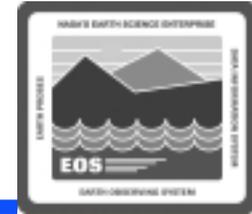
Production Strategies “Open” Window



Production Strategies “Save As” Window



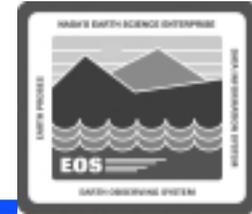
Reviewing the Current Active Strategy



- **Procedure**

- **Select Options → activeStrategy from the pull-down menu of the Production Strategies GUI**
- **Review the data displayed in the Active Production Strategy window**
 - » **PR Type values/weight**
 - » **User Type data values/weight**
 - » **PGE Type values/weight**
 - » **Production Request Editor weight**
 - » **Late Start Delta Priority value**

Active Production Strategy Window



Active ProductionStrategy

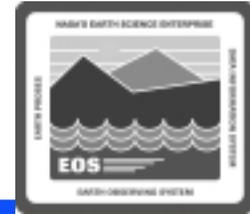
Current Active Strategy

PR Type	User Type	PGE Type												
Weight: 50.000000	Weight: 0.000000	Weight: 0.000000												
Default: 5	Default: 5	Default: 5												
<table border="1"><thead><tr><th>Value</th><th>Priority</th></tr></thead><tbody><tr><td>Routine</td><td>5</td></tr><tr><td>OnDemand</td><td>7</td></tr><tr><td>Reprocessing</td><td>3</td></tr></tbody></table>	Value	Priority	Routine	5	OnDemand	7	Reprocessing	3	<table border="1"><thead><tr><th>Value</th><th>Priority</th></tr></thead><tbody></tbody></table>	Value	Priority	<table border="1"><thead><tr><th>Value</th><th>Priority</th></tr></thead><tbody></tbody></table>	Value	Priority
Value	Priority													
Routine	5													
OnDemand	7													
Reprocessing	3													
Value	Priority													
Value	Priority													
Find: <input type="text"/>	Find: <input type="text"/>	Find: <input type="text"/>												

Production Request Editor Weight: 50.000000 Late Start Delta Priority: 0

Cancel

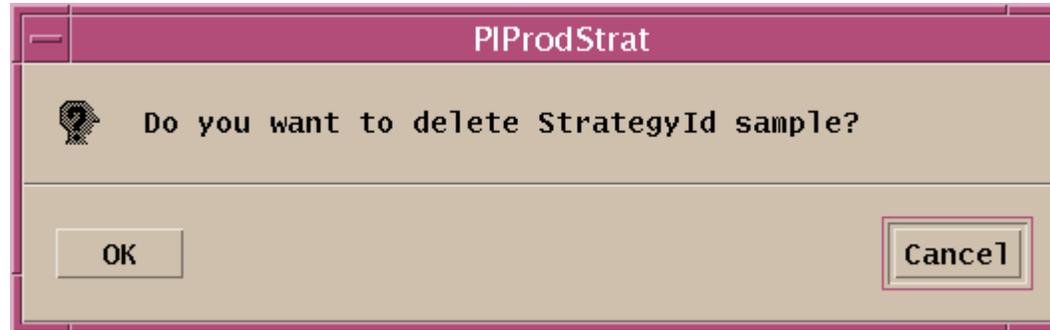
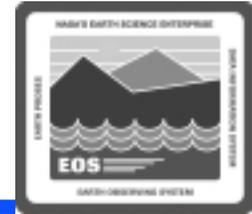
Deleting a Production Strategy



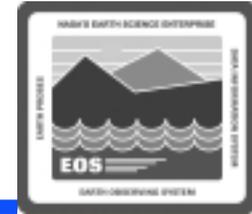
- **Procedure**

- On the Production Strategies GUI click on the option button associated with the Production Strategies field, then highlight (in the option menu) the name of the production strategy to be deleted
 - » Alternatively, it is possible to select File → Open from the pull-down menu, select the desired production strategy from the list on the Open window, and click on the Ok button to open the production strategy
- Select Edit → Delete from the pull-down menu
- Click on the OK button

Production Strategy Deletion Confirmation Dialogue Box

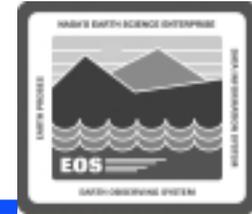


Creating a New Production Plan



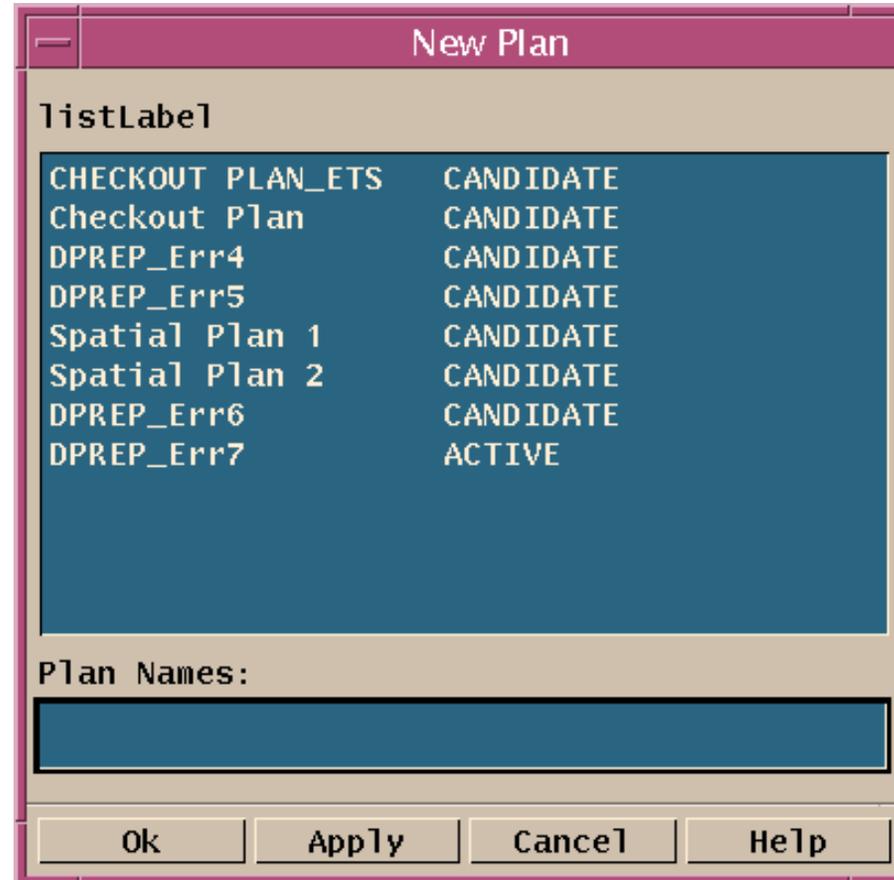
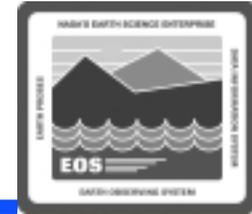
- **Production Planner creates a plan for production data processing at the DAAC**
 - selects specific PRs whose DPRs are to be run
 - selects PRs from two lists of PRs
 - » list of available “Unscheduled” PRs
 - » list of “Scheduled” PRs
 - uses arrow buttons to move PRs between lists until the “Scheduled” list contains the desired set of PRs that define the new plan

Creating a New Production Plan (Cont.)

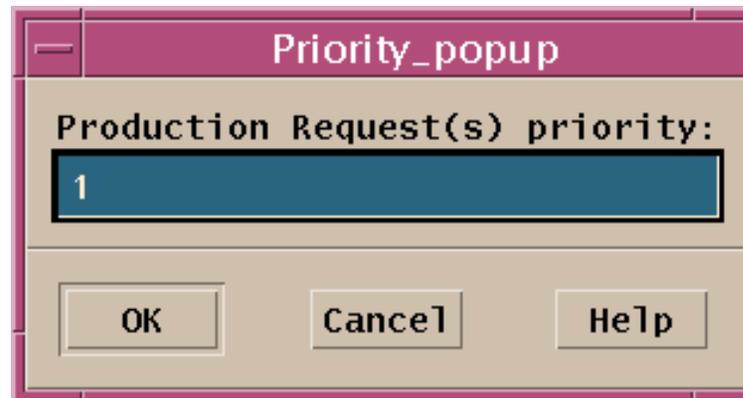
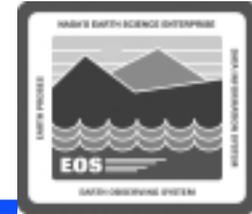


- **Procedure**
 - **Select applicable Production Strategy**
 - **Move PRs between the Unscheduled and Scheduled lists**
 - **Save the plan**
 - **Activate the plan if applicable**
 - **Save the plan as a baseline plan if applicable**
 - **To quit the Planning Workbench GUI: File → Exit**
 - **After quitting the Planning Workbench GUI, type the command to shut down the Message Handler, System Name Server, and Resource Model**
 - **Verify that the Message Handler, System Name Server, and Resource Model have shut down**

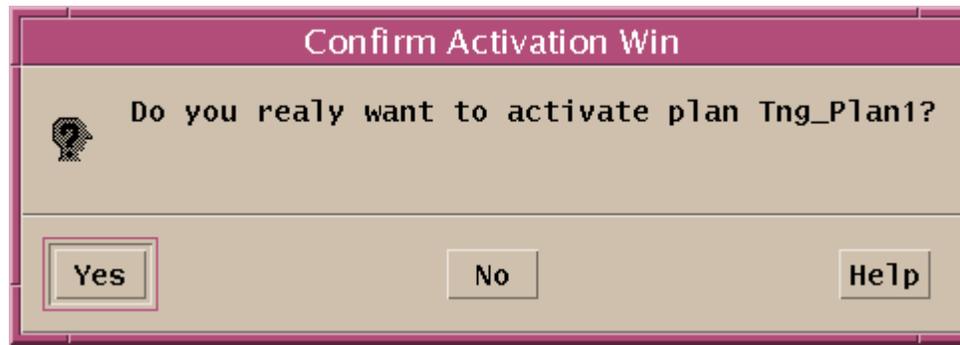
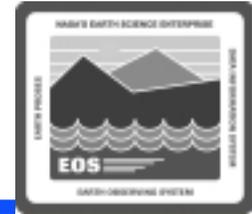
Planning Workbench “New Plan” GUI



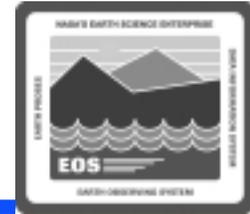
Planning Workbench Priority Popup Window



Planning Workbench Confirm Activation Dialogue Box

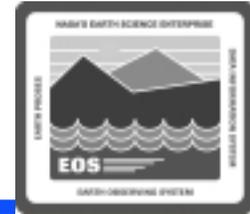


Creating a New Production Plan (Cont.)



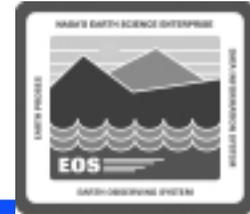
- **Reactivation/Replanning**
 - Assumes that there is a current plan
 - Current plan may or may not have DPRs associated with it
 - » If there are no DPRs in a plan, it may be because all the DPRs that were in the plan have run to completion
 - » Alternatively, there may never have been any DPRs associated with the plan because an empty plan was activated to cancel DPRs from a previously activated plan
 - Occurs in the following three types of situations:
 - » No DPR in old plan but DPR(s) in new plan
 - » DPR(s) in old plan but not in new plan
 - » DPR(s) in both old plan and new plan

Creating a New Production Plan (Cont.)



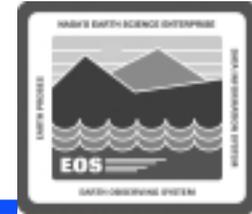
- **Reactivation/Replanning (Cont.)**
 - **No DPR in Old Plan but DPR(s) in New Plan**
 - » **Enter a new plan name (the plan is created using the Planning Workbench GUI)**
 - » **Select the PRs to be included**
 - » **Schedule the PRs to be activated**
 - » **Save the new plan**
 - » **Activate the new plan (new plan is activated and the new DPRs are ready to run)**
 - » **Check on the state of the jobs in AutoSys (new DPRs should be in AutoSys and should begin to run)**

Creating a New Production Plan (Cont.)



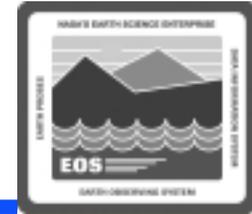
- **Reactivation/Replanning (Cont.)**
 - **DPR(s) in Old Plan but Not in New Plan**
 - » **Verify that DPRs in the active plan are in the Job Management queue (current DPRs should be in the queue)**
 - » **Create and save a new plan without PRs/DPRs to replace the old plan (with DPRs) - do not schedule any PRs to be activated**
 - » **Activate the new plan**
 - » **Verify the state of the new plan's DPRs (use the AutoSys JobScape GUI)**
 - » **Verify the state of the old (existing) plan's DPRs (only jobs that are in the Job Management queue are cancelled; jobs that have already been released to AutoSys are not deleted during the replan - they continue processing to termination)**

Creating a New Production Plan (Cont.)



- **Reactivation/Replanning (Cont.)**
 - **DPR(s) in Both Old Plan and New Plan**
 - » **Verify that DPRs in the active plan are in the queue (current DPRs should be in the Job Management queue)**
 - » **Enter a new plan name**
 - » **Select the PRs to be included (include relevant PRs used in the old plan; i.e., those PRs with DPRs to be re-prioritized that are in the Job Management queue)**
 - » **Schedule the PRs to be activated**
 - » **Save the new plan**
 - » **Activate plan**
 - » **Verify the priorities of the plan's DPRs in the Job Management queue (new DPRs must be in the Job Management queue; old DPRs must be cancelled)**

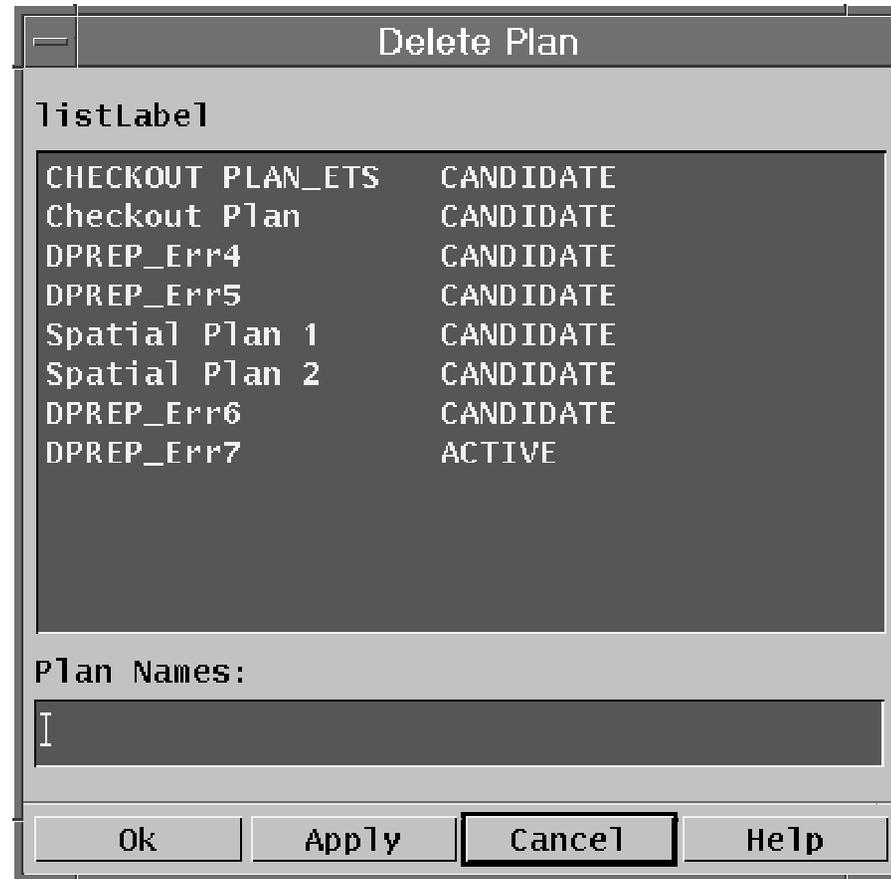
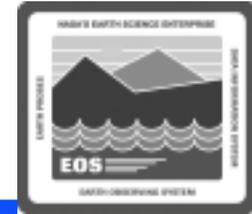
Deleting a Production Plan



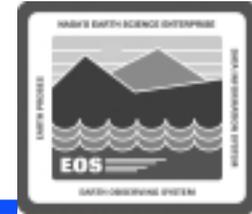
- **Procedure**

- **Select File → Delete on the Planning Workbench GUI**
- **Select (highlight) the production plan to be deleted by clicking on the corresponding name in the list of plans**
- **Click on the OK button**

Planning Workbench Delete Plan Window



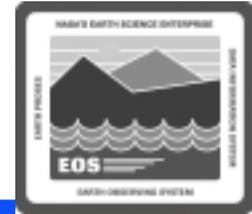
Reviewing a Plan Timeline



- **Production Plan Timeline**

- **graphic, timeline-oriented depiction of a production plan**
- **displays a set of processing equipment, arranged along the left side of the GUI**
- **displays some period of time across the top edge of the GUI**
- **bars on the timeline represent either...**
 - » **execution of DPRs on processing equipment over a period of time**
 - » **resource reservations for non-production-related purposes (also called “ground events”)**
- **ground events include such activities as testing, preventive maintenance, or system upgrades**

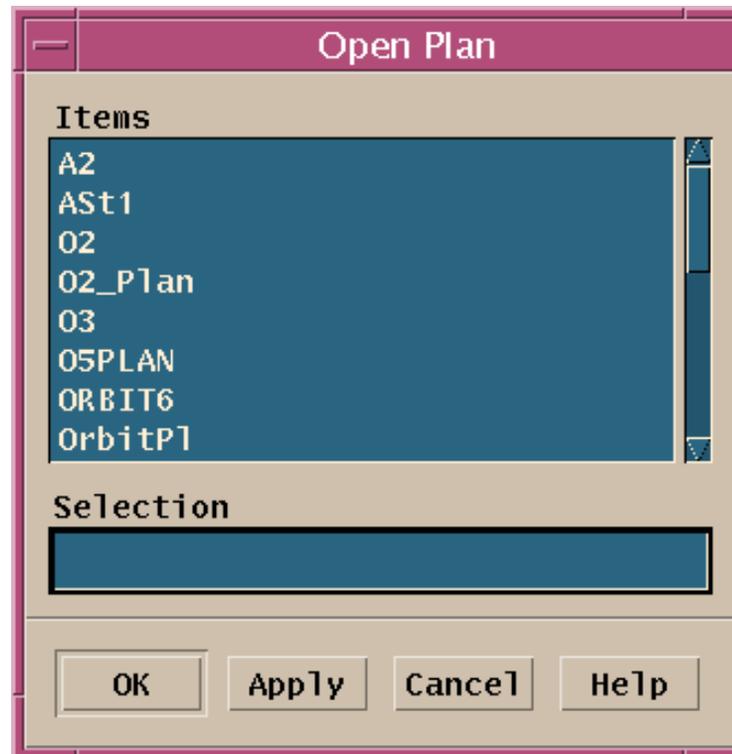
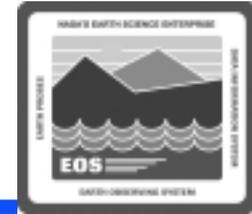
Reviewing a Plan Timeline (Cont.)



- **Procedure**

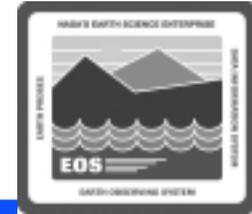
- **Adjust the Production Planning Timeline window size and the view of the timeline as necessary**
- **Select a different plan to be viewed if necessary**
- **Adjust the time scale (start and end dates and times) as necessary**
- **Adjust the time span if desired**
- **Adjust the resources to be displayed on the timeline as necessary**
- **Adjust timeline color coding if desired/necessary**

Planning Timeline Open Plan Window



Planning Timeline

Plan Window Edit Window



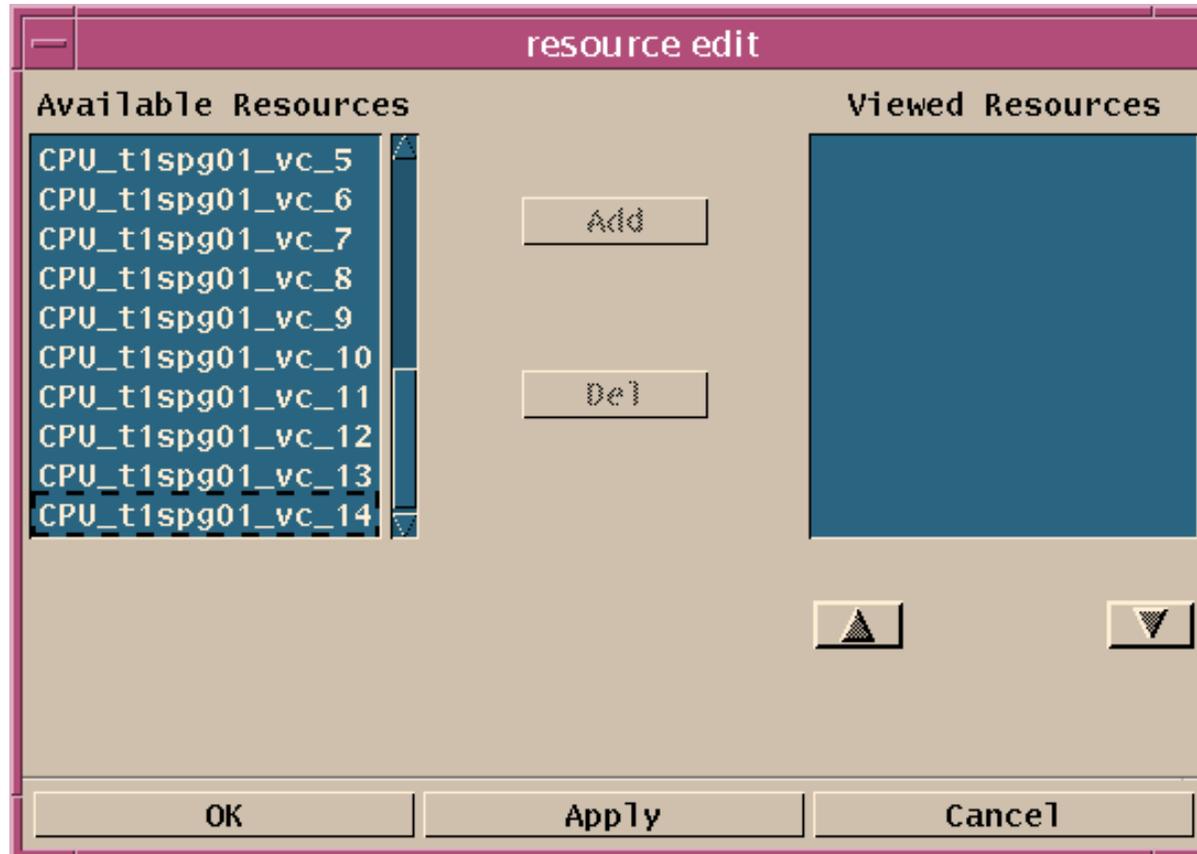
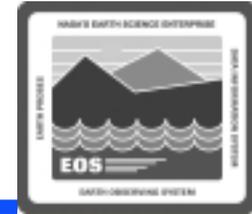
plan window edit

Plan Win Start: 13 FEB 2000 19:57:44

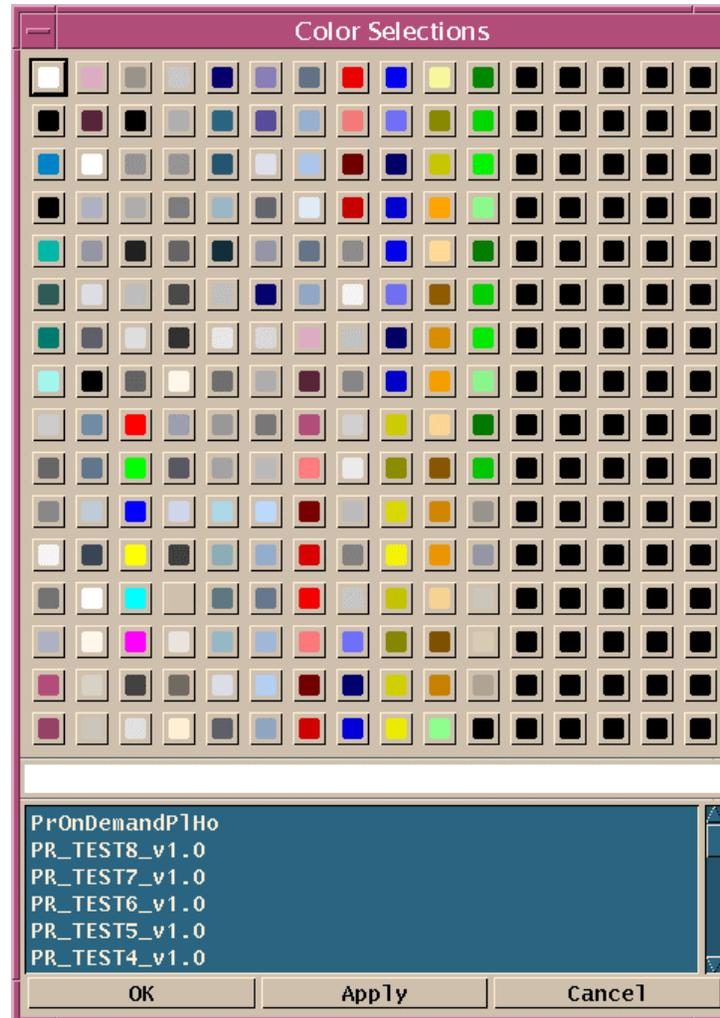
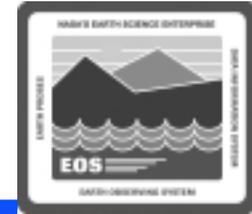
Plan Win End : 13 FEB 2000 19:57:44

OK Apply Cancel

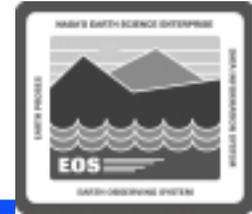
Planning Timeline: Resource Edit Window



Planning Timeline Color Selections Window

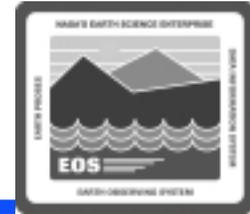


Resetting/Cleaning the PDPS Database



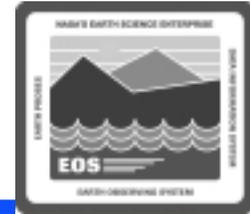
- **Saving and Resetting the PDPS Database**
 - **Scripts used in saving and resetting the database**
 - » **reset_db**
 - » **list_db**
 - » **save_db**
 - **Saving the database (using save_db) produces one ASCII file (with a “.dat” extension) for each database table**
 - **Resetting the database involves clearing (“wiping out”) the data in the database tables and loading values from a specified “saved database” file**

Resetting/Cleaning the PDPS Database (Cont.)



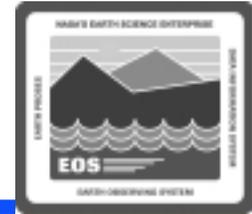
- **Saving and Resetting the PDPS Database (Cont.)**
 - **It is important to take into consideration the consequences of resetting the database before performing the procedure**
 - » **Removes and replaces all Resource Definitions, Resource Reservations (Ground Events), Production Requests, Data Processing Requests, and Production Plans**
 - » **Coordinate with all affected parties, including the Resource Planner, Production Planner, and Production Monitors concerning the effects of resetting the database as well as its after-effects (e.g., recreating resource definitions, resource reservations, and production requests)**

Resetting/Cleaning the PDPS Database (Cont.)



- **Saving and Resetting the PDPS Database (Cont.)**
 - **Whenever the PDPS database is reset (not including database cleanup using the EcPIDbClean script) it is also necessary to remove all PLS subscriptions in the Communications Subsystem (CSS) Subscription Server database**
 - » **Production personnel can remove the subscriptions using the Subscription Server GUI (EcSbSubServerGUI) if they have access to the GUI**
 - » **Otherwise, they can request User Services personnel to remove the subscriptions**
 - » **As a result of removing the subscriptions, no subscription notification will come through for existing jobs in the newly loaded database**
 - » **Only new jobs generated using the Production Request Editor will work normally with regard to subscriptions**

Saving/Resetting the PDPS Database

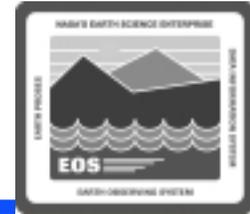


- **Procedure**

NOTE: It is important to log in as a user who has “write” permission in the saved_dumps directory; otherwise it will not be possible to save database contents

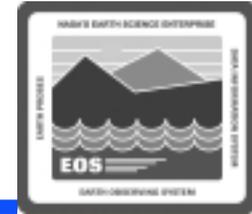
- Log in to the Planning/Management Workstation using secure shell
- Set the ECS_HOME environmental variable if necessary
- If desired, save the database
- If desired, obtain a listing of saved databases
- If desired, reset the database

Resetting/Cleaning the PDPS Database (Cont.)



- **EcPIDbClean script in the /usr/ecs/MODE/CUSTOM/utilities directory on the Planning/Management Workstation**
 - **Cleans up some tables in a PDPS database**
 - **Tries to delete applicable records in the following order:**
 - » **Data Processing Requests based on timeStamp and completionState(SUCC_DEL)**
 - » **Production Requests that have no associated DPRs**
 - » **Dynamic data granules that are not used by any DPR or by the Data Processing Subsystem**
 - » **PGEs that are marked with a deleteFlag**
 - » **Science Software that has no associated PGE**
 - **Compiles a list of data granules that are not deleted because the Data Processing Subsystem needs to use them**

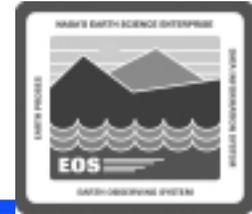
Cleaning the PDPS Database



- **Procedure**

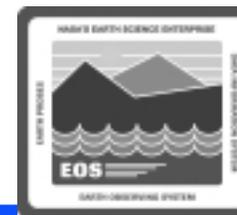
- Log in to the Planning/Management Workstation using secure shell
- Set the **ECS_HOME** environmental variable if necessary
- Start the **EcPIDbClean** script using the following arguments:
 - » **MODE**
 - » **dbserver** (name of the PDPS database server)
 - » **dbuser** (user name for logging in to interactive structured query language (isql))
 - » **dbpassword** (password for isql login)
 - » **months** (number specifying the removal of records that are older than that number of months)
 - » **days** (optional) (number that specifies the removal of records that are older than that number of days)

Cleaning DPS Disks



- **EcDpPrRmFilesWOGranules.pl script on the Queuing Server**
 - **Is run to ensure consistency between the file references in various tables in the PDPS database and the files actually staged on the data processing disks**
 - » **Generates a list of files with consistent references among various tables in the PDPS database for the specified mode**
 - » **Checks for files on the disk that are not included in the list of files referenced in the PDPS database and either lists the inconsistent files or generates a script to delete them (as requested)**
 - » **Checks to determine whether the disk partitions referenced in the PDPS database actually exist on the disk(s)**
 - » **Removes all file references in the PDPS database that are not included in the list of files**

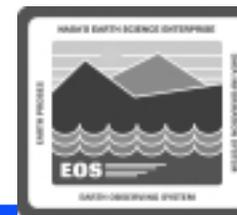
Cleaning DPS Disks (Cont.)



- **Procedure**

- Log in to the Queuing Server using secure shell
- Type `cd /usr/ecs/MODE/CUSTOM/utilities`
- Type `EcDpPrRmFilesWOGgranules.pl dbuser dbpassword MODE dbserver fix [or nofix]`

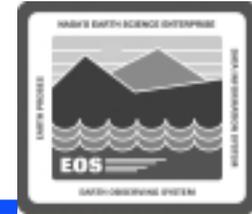
Troubleshooting Production Planning Problems



- **Troubleshooting:**

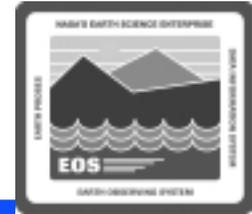
process of identifying the source of problems on the basis of observed trouble symptoms

Troubleshooting Production Planning Problems (Cont.)



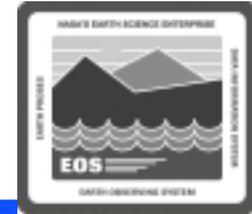
- **Problems with production planning can usually be traced to...**
 - **some part of the Planning Subsystem**
 - **problems in other ECS subsystems, including (but not necessarily limited to):**
 - » **Data Processing Subsystem (DPS)**
 - » **Data Server Subsystem (DSS)**
 - » **Interoperability Subsystem (IOS)**
 - » **Communications Subsystem (CSS)**

Troubleshooting Production Planning Problems (Cont.)



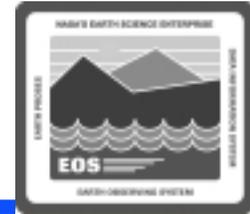
- **Troubleshooting table**
 - describes actions to be taken in response to some common Production Planning problems
 - if the problem cannot be identified and fixed without help within a reasonable period of time, call the help desk and submit a trouble ticket in accordance with site Problem Management policy

Troubleshooting Production Planning Problems (Cont.)



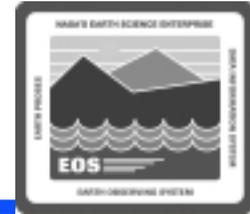
Symptom	Response
Unable to log in to the Planning Subsystem host (e.g., g0pls01).	Check with the Operations Controller/System Administrator to ensure that the host is "up."
GUI not displayed when the start-up script has been properly invoked.	Ensure that the DISPLAY variable was set properly. [For detailed instructions refer to the applicable procedure, either Launching the Production Request Editor or Launching Planning Workbench-Related GUIs (previous sections of this lesson).]
Error message indicating that SNS (System Name Server) and/or Resource Model is/are in use using the selected Application ID.	<ol style="list-style-type: none"> 1. Use another Application ID if working in a different mode from the person using the selected Application ID. 2. If working in the same mode as the other user, coordinate use of Planning applications with the other user and/or the System Administrator. [For detailed instructions refer to the procedure for Launching Planning Workbench-Related GUIs (previous section of this lesson).]
Error message associated with the Production Request Editor.	Refer to Table 2, Production Request Editor User Messages (adapted from the corresponding table in 609-CD-600-001, <i>Release 6A Operations Tools Manual for the ECS Project</i>).
Error message associated with the Production Strategies GUI.	Refer to Table 3, Production Strategy User Messages (adapted from the corresponding table in 609-CD-600-001, <i>Release 6A Operations Tools Manual for the ECS Project</i>).

Troubleshooting Production Planning Problems (Cont.)



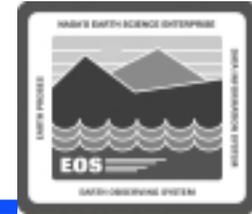
Symptom	Response
Error message associated with the Planning Workbench.	Refer to Table 4, Planning Workbench User Messages (adapted from the corresponding table in 609-CD-600-001, <i>Release 6A Operations Tools Manual for the ECS Project</i>).
Production Request fails (DPR generation fails).	<ol style="list-style-type: none"> 1. Ensure (e.g., using ECS Assistant) that the necessary hosts and servers (listed in Table 5) are “up.” 2. If hosts/servers have gone down, notify the Operations Controller/System Administrator to have servers brought back up. 3. If hosts/servers are all “up,” perform the procedure for Handling a Failure to Generate DPRs (subsequent section of this lesson). 4. Retry generating DPRs by resaving the Production Request. [For detailed instructions refer to the section on Editing/Modifying a Production Request (previous section of this lesson).]

Troubleshooting Production Planning Problems (Cont.)



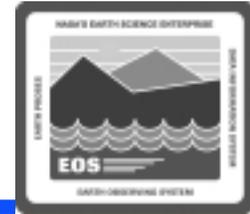
Symptom	Response
PR or DPR deletion hangs.	<ol style="list-style-type: none"> 1. Ensure that enough time has passed to allow DPR deletion (deleting a DPR can require as much time as creating a DPR). 2. Ensure (e.g., using ECS Assistant) that the necessary hosts and servers (especially Job Management server and Deletion Server – list in Table 5) are “up.” (Both the Job Management Server and Deletion Server are called to clean up all PDPS database tables associated with the DPR or PR.) 3. If hosts/servers have gone down, notify the Operations Controller/System Administrator to have servers brought back up. 4. If hosts/servers are all “up,” check for a database lock or resource lock in the PDPS database. <p>[For detailed instructions refer to the section on Responding to PR or DPR Deletion that Hangs (subsequent section of this lesson).]</p>

Troubleshooting Production Planning Problems (Cont.)



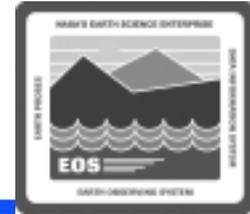
Symptom	Response
DPR deletion fails.	<ol style="list-style-type: none">1. Ensure that enough time has passed to allow DPR deletion (deleting a DPR can require as much time as creating a DPR).2. Ensure (e.g., using ECS Assistant) that the necessary hosts and servers (especially Job Management server and Deletion Server – list in Table 5) are “up.” (Both the Job Management Server and Deletion Server are called to clean up all PDPS database tables associated with the DPR or PR.)3. If hosts/servers have gone down, notify the Operations Controller/System Administrator to have servers brought back up.4. If hosts/servers are all “up,” check the Deletion Server Debug log (EcDpPrDeletionDebug.log). <p>[For detailed instructions refer to the section on Responding to DPR Deletion that Fails (subsequent section of this lesson).]</p>

Troubleshooting Production Planning Problems (Cont.)



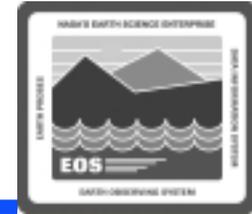
Symptom	Response
<p>DPR scheduling fails (DPR is not passed to Data Processing).</p>	<ol style="list-style-type: none"> 1. Ensure (e.g., using ECS Assistant) that the necessary hosts and servers (listed in Table 5) are “up.” 2. If hosts/servers have gone down, notify the Operations Controller/System Administrator to have servers brought back up. 3. If hosts/servers are all “up,” perform the procedure for Handling a DPR Scheduling Failure (subsequent section of this lesson). 4. If necessary, delete the affected DPRs. [For detailed instructions refer to the section on Creating a New Production Plan (previous section of this lesson).] 5. If affected DPRs were deleted, recreate the DPRs. [For detailed instructions refer to the section on Editing/Modifying a Production Request (previous section of this lesson).] 6. If affected DPRs were recreated, create a new production plan. [For detailed instructions refer to the section on Creating a New Production Plan (previous section of this lesson).]

Troubleshooting Production Planning Problems (Cont.)



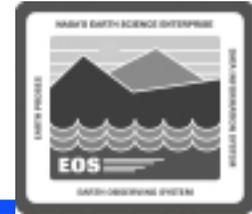
Symptom	Response
Other problems.	<ol style="list-style-type: none">1. Ensure (e.g., using ECS Assistant) that the necessary hosts and servers (listed in Table 5) are “up.”2. If hosts/servers have gone down, notify the Operations Controller/System Administrator to have servers brought back up.3. If hosts/servers are all “up,” check the log files (e.g., EcPIPEditor.ALOG, EcPIPEditorDebug.log, EcPIWb.ALOG, EcPIWbDebug.log, EcPITI.ALOG) in the /usr/ecs/MODE/CUSTOM/logs directory for error messages. [For detailed instructions refer to the procedure for Checking Log Files (subsequent section of this lesson).]

Hosts, Servers, Clients and Other Software Relevant to Planning



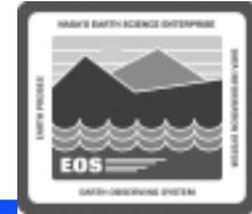
HOST	SERVER/CLIENT/OTHER SOFTWARE
Planning/Management Workstation	Production Request Editor (EcPIPREditor) Planning Workbench GUI (EcPIWb) Production Strategies GUI (EcPIProdStrat) Production Planning Master Timeline (EcPITI) Message Handler (EcPIMsh) System Name Server (EcPISns) Resource Model (EcPIRm)
PDPS DBMS Server	Subscription Manager (EcPISubMgr) Sybase server (e.g., x0pls01_srvr)
Queuing Server (e.g., x0sps04)	Job Management Server (EcDpPrJobMgmt) Deletion Server (EcDpPrDeletion) On-Demand Manager (EcPIOdMgr)
SDSRV Server (e.g., x0acs03)	Science Data Server (EcDsScienceDataServer)
Ingest Server (e.g., x0icg01)	Registry Server (EcCsRegistry)
Interface Server 01 (e.g., x0ins02)	Advertising Server (EcIoAdServer)
Interface Server 02 (e.g., x0ins01)	Subscription Server (EcSbSubServer)

Troubleshooting Production Planning Problems (Cont.)



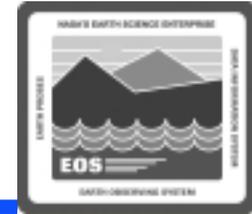
- **Handling a Failure to Generate DPRs**
 - Checking the Production Request Editor ALOG File
 - Using ISQL to check database tables
 - Checking the PDPS database for causes of failure to generate DPRs
 - Determining whether DPR explosion fails because Production Request Editor does not query DSS for data
 - Checking the Production Request Editor debug file for evidence of metadata queries
- **Responding to PR or DPR Deletion that Hangs**
 - Checking for database deadlocks
 - Checking for resource locks in the PDPS database

Troubleshooting Production Planning Problems (Cont.)



- Responding to DPR Deletion that Fails
- Handling a DPR Scheduling failure
 - Responding to a "DPR Validation Failed" error
 - Responding to an "information (INFO) Production Request {Production Request Id} has unschedulable DPR {DPR Id}" error
- Checking Log Files
- Checking Database Connections

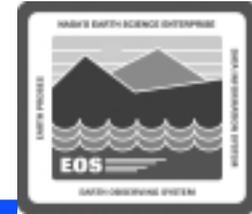
Production Processing



- **DPR Chaining**

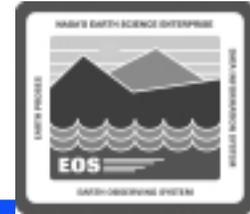
- The identification of chain heads was described in a previous section of the lesson
- The Job Management server in the DPS schedules chains of DPRs through the use of stored procedures in the PDPS database
- To improve the processing of chains of DPRs the following two new tables were added to the PDPS database for use by Job Management:
 - » **DpPrPgeLimits**
 - » **DpPrClassSchedulingLimits**

Production Processing (Cont.)



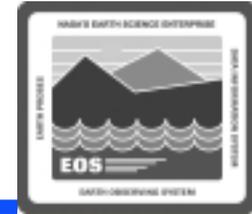
- **DPR Chaining (Cont.)**
 - **DpPrPgeLimits** limits the number of chain-head DPRs of a particular PGE that can run simultaneously on the same virtual machine
 - » A record should be defined for each PGE ID and virtual computer combination that will be run
 - **DpPrPgeLimits** table has the following columns:
 - » **pgeld**
 - » **computerName** – virtual computer (vc) name
 - » **maxConcurrent** - maximum number of chain heads that can run at the same time on a specified vc
 - » **numConcurrent** - how many chain heads with that PGE ID are running at the same time on that vc
 - » **numScheduled** - how many chain heads with that PGE ID are currently scheduled on that vc

Production Processing (Cont.)



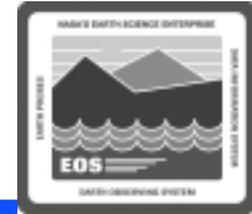
- **DPR Chaining (Cont.)**
 - If there were no record in the DpPrPge table for a particular PGE ID/computer combination ...
 - » the DPR would not be prevented from running
 - » there would be no limits placed on how many of those DPRs could run on the same virtual machine
 - The DpPrPgeLimits table can be loaded by running the script EcDpPrLoadTable.pl from the Job Management Client Tool
 - » Script updates an input file for each table that contains the needed values
 - Instructions for using the script are available on the Queuing Server host:
 - » `/usr/ecs/MODE/CUSTOM/data/DPS/EcDpPrLoadTable.README`

Production Processing (Cont.)



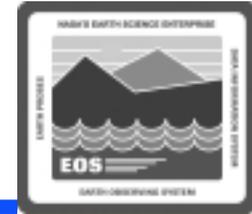
- **DPR Chaining (Cont.)**
 - **DpPrClassSchedulingLimits** limits the classes of DPRs that can run at any point in time
 - » **Classes correspond to the types of processing**
 - **DpPrClassSchedulingLimits** table has three records, one for each type of processing
 - **Each record has the following fields:**
 - » **dprClass** - assigned value identifies the type of processing (0 = Routine Processing, 1 = On-Demand Processing, 2 = Reprocessing)
 - » **maxDprs** - maximum number of jobs of the type (in dprClass) that are allowed to run on the system
 - » **minDprs** - currently not used
 - » **currentDprs** - number of jobs of the type (in dprClass) that are currently running

Production Processing (Cont.)



- **DPR Chaining (Cont.)**
 - If the **DpPrClassSchedulingLimits** table has no record for a particular type of processing, DPRs of that type are not allowed into AutoSys
 - Values for the **maxDprs** and **minDprs** columns in the **DpPrClassSchedulingLimits** table are loaded at Job Management Server startup using data from two configuration parameters:
 - » **DpPrMaxConcurrentDPRs** - maximum allowed jobs
 - » **DpPrMinConcurrentDPRs** - minimum allowed jobs
 - Each parameter has three integer values; the first for routine processing; the second for on-demand processing; and the third for reprocessing jobs

Production Processing (Cont.)



- **DPR Chaining (Cont.)**

- **Example: Configuration Registry may have the following entries:**

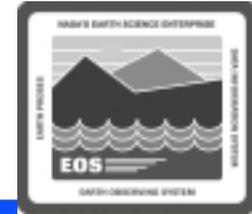
- » **DpPrMaxConcurrentDPRs = 100 60 40**

- » **DpPrMinConcurrentDPRs = 0 0 0**

- **In this case the maximum allowed jobs is 100 for routine processing, 60 for on-demand processing, and 40 for reprocessing**

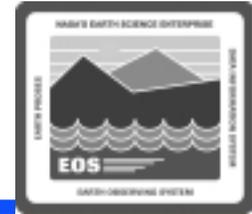
- **Minimum allowed jobs is 0 for each type of processing**

Production Processing (Cont.)



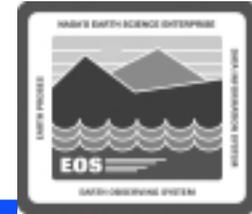
- **DPR Chaining (Cont.)**
 - Total number of completed jobs allowed in AutoSys is defined by a new configuration parameter:
 - » `DpPrAutoSysMaxDPRs`
 - Within the restrictions of the `DpPrClassSchedulingLimits` and `DpPrPgeLimits` database tables classes of DPR chains are scheduled by DPS with chains of DPRs (identified by their chain heads) being scheduled on the same machine whenever possible
 - When scheduling a chain-head DPR, attempts are made to schedule it on the machine that has the highest number of accepted inputs if accepted inputs are found
 - The chain-head DPR's children should be scheduled on the same machine

Production Processing (Cont.)



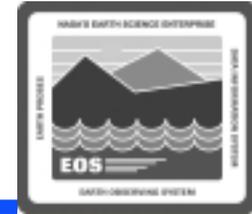
- **DPR Chaining (Cont.)**
 - Load balancing is done among virtual computers on the same string when selecting a computer for a DPR chain
 - If a DPR does not have its PGE identified in the DpPrPgeLimits table, that does not prevent it from being scheduled on a particular machine if most of the DPR's inputs are staged on that machine
 - If there is more than one chain head for a set of DPRs, the DPRs are combined into a single chain
 - For example...
 - » DPR#1 and DPR#2 are both parents of DPR#3
 - » Marking DPRs#1 and #2 as chain heads results in a single chain consisting of all three DPRs

Production Processing (Cont.)



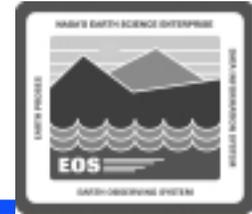
- **DPR Chaining (Cont.)**
 - **Another example (MODIS processing)...**
 - » **If the Production Planner defines both the MODPGE01 PR and the MODPGE02 PR as chain heads, they are combined in one chain with the MODPGE01 DPR ID as the chainId**
 - » **MODPGE01 is designated the chain head because its outputs are used as inputs to MODPGE02 and MODPGE08**
 - » **MODPGE02 outputs are used as input to MODPGE08**
 - **The PGEs that will be used as chain heads should be identified before installation**
 - **In selecting potential chain heads, it is recommended that PGEs which create substantial (i.e., large or many) inputs for other PGEs be so designated**

Production Processing (Cont.)



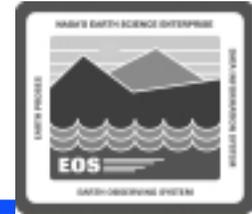
- **Copy on Demand Feature**
 - A feature whereby the DPS code stages granules locally; i.e., granule files are staged to the processor on which the PGE is running
 - The implementation of the copy on demand feature included taking the following actions:
 - » Addition of an onDemandCopy column to the PIDataTypeMaster database table in the PDPS database (value of the onDemandCopy flag is used by the system to determine whether input files need to be locally staged)
 - » Addition of the following flag to the ESDT ODL files after DATA_TYPE and DATA_TYPE_VERSION:
 - ON_DEMAND_COPY = “Y”
 - » Modifying code to remove files from all science processors when delete on a granule is invoked

Production Processing (Cont.)



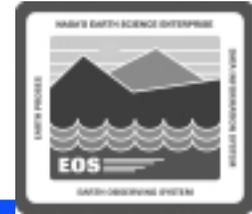
- **Copy on Demand Feature (Cont.)**
 - The **ON_DEMAND_COPY** flag (in the ESDT ODL files) indicates whether or not the DPS code should always stage the granule locally
 - Whenever a PGE that uses the ESDT is registered, the value assigned to **ON_DEMAND_COPY** is put in the **onDemandCopy** column in the **PIDataTypeMaster** table of the PDPS database

Production Processing (Cont.)



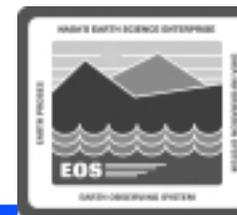
- **DPR Output Files Immediately Available as Input**
 - **Output files are immediately available as input when generated as output of a DPR**
 - **No longer necessary to wait for Subscription Server notification before using the output of a parent DPR as input to a child DPR**

Production Processing (Cont.)



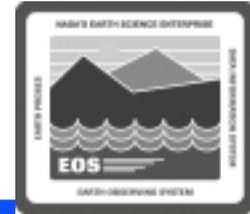
- **AutoSys/AutoXpert (Cont.)**
 - displays DPRs as job boxes
 - recognizes the following three categories of jobs:
 - » box jobs
 - » command jobs
 - » file-watcher jobs

Production Processing (Cont.)



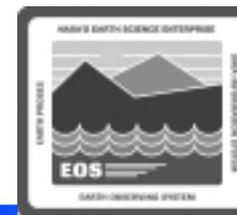
- **Box job**
 - collection of other jobs
 - provides an organizational structure for a group of jobs that should be run within the same time period
 - » performs no processing action
- **Command job**
 - “command” can be a shell script, the name of an executable program, a file transfer, or any other command that causes execution of a UNIX command on client machine

Production Processing (Cont.)



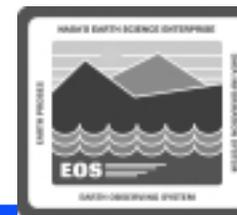
- **File-watcher job**
 - functions similarly to a command job
 - monitors the creation and size of a particular operating system file
 - allows AutoSys to know the status of external files that are needed in the processing of command jobs or box jobs

Production Processing (Cont.)



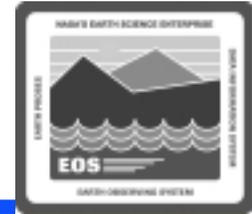
- **AutoSys Job Starting Parameters**
 - Date and time scheduling parameters are met
 - Starting Conditions specified in the job definition evaluate to “true”
 - For jobs in a box, the box must be in the **RUNNING** state
 - The current status of the job is not **ON_HOLD** or **ON_ICE**
- **AutoSys finds all jobs that may be affected by any change in the truth of the starting parameters and determines whether or not to start the jobs**

Production Processing (Cont.)



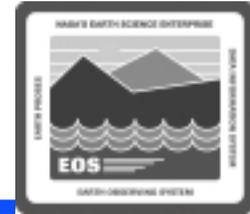
- **AutoSys Jobs (ECS)**
 - Each DPR generated by the Planning Subsystem defines a box job for AutoSys
 - Every DPR/box job is composed of three command jobs that run in the following order:
 - » Preprocessing (EcDpPrEM and EcDpPrDM)
 - » Execution (EcDpPrRunPGE)
 - » Postprocessing (EcDpPrEM and EcDpPrDM)
 - The number of command jobs in an AutoSys Job box was reduced from seven to three in order to reduce overhead
 - » Reduces the load on the AutoSys Event Processor by about one half
 - » Has no effect on the DPS Queueing Server CPU loading

Production Processing (Cont.)



- **AutoSys Jobs (ECS)**
 - To create the new Preprocessing job the following old command jobs were combined:
 - » Allocation
 - » Staging
 - » Pre-processing
 - To create the new Postprocessing job the following old command jobs were combined:
 - » Post-processing
 - » Destaging
 - » Deallocation
 - The value in the database column `dprState` correlates to the seven old job states

Production Processing (Cont.)



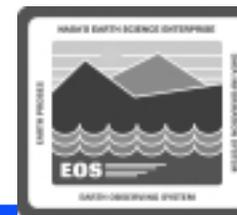
- **ECS Job Names**

- Indicate the PGE and the mode in which the DPR was generated and the stage of processing

- Example:

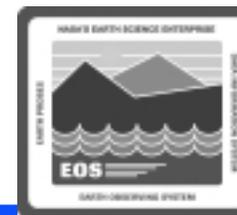
- » AM1Eph#2.012302200TS2
 - » AM1Eph#2.012302200TS2R
 - » AM1Eph#2.012302200TS2E
 - » AM1Eph#2.012302200TS2P

Production Processing (Cont.)



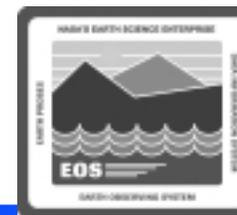
- **ECS Job Names (Cont.)**
 - **The first job name in the list is a DPR/box job-level name**
 - » **First few characters identify the PGE (i.e., AM1Eph - Step 1 DPREP)**
 - » **Last three characters of the DPR/box job-level name (i.e., TS2) indicate the mode in which the DPR was generated**
 - » **Last four characters of the remaining (command) job names in the list indicate the mode (i.e., TS2) and the stage of processing**
 - » **Job name ending in “R” is the preprocessing job; job name ending in “E” is the execution job; job name ending in “P” is the postprocessing job**

Production Processing (Cont.)



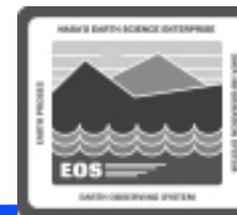
- **Preprocessing depends on the box job having started**
- **Execution depends on successful completion of the command job that precedes it (preprocessing)**
- **Postprocessing depends on Execution having completed (not necessarily “successful,” just done)**
 - **If execution failed, postprocessing handles failed PGE processing**

Production Processing (Cont.)



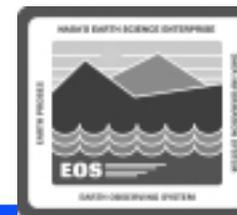
- **DPR (box job) may be dependent on the successful completion of some other DPR**
 - usually involving a need for the output of another DPR as input
- **Effects of DPR dependencies**
 - dependent DPRs are "held" by AutoSys until their data availability subscriptions are fulfilled
 - subscription manager software (in the PLS) informs the DPS to release the AutoSys jobs after all data subscriptions for a given DPR are fulfilled
 - DPS (as monitored by the AutoSys Job Scheduling engine) runs the PGEs and associated jobs as the resources required for the tasks become available
 - procedure continues until all DPRs scheduled for the day have completed

Production Processing (Cont.)



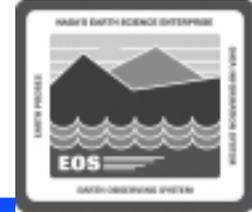
- **Starting in Release 6A each mode has multiple Job Management queues**
 - One queue for each type of processing
 - There is a maximum number of jobs allowed in AutoSys for each type of processing
 - For example, in each mode a DAAC would have queues for the following types of processing:
 - » Routine Processing
 - » On-Demand Processing
 - » Reprocessing

Production Processing (Cont.)



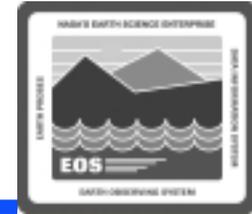
- **DAAC Production Monitor uses AutoSys/ AutoXpert for...**
 - transferring/deleting/suspending/resuming DPRs as required (e.g., requests, resource problems, input data schedule problems, special events, schedules replans, etc.)
 - monitoring and providing processing status upon request

Launching the AutoSys GUI Control Panel



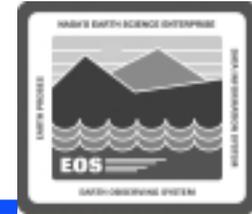
- **Production Processing Applications**
 - **Subscription Manager**
 - **Job Management**
 - **Data Management**
 - **Execution Management**
 - **PGE Management**
 - **Deletion Server**
 - **AutoSys/AutoXpert**
 - » **Event Processor**
 - » **Event Server**
 - » **AutoSys GUIs**
 - » **AutoXpert GUIs**

Launching the AutoSys GUI Control Panel



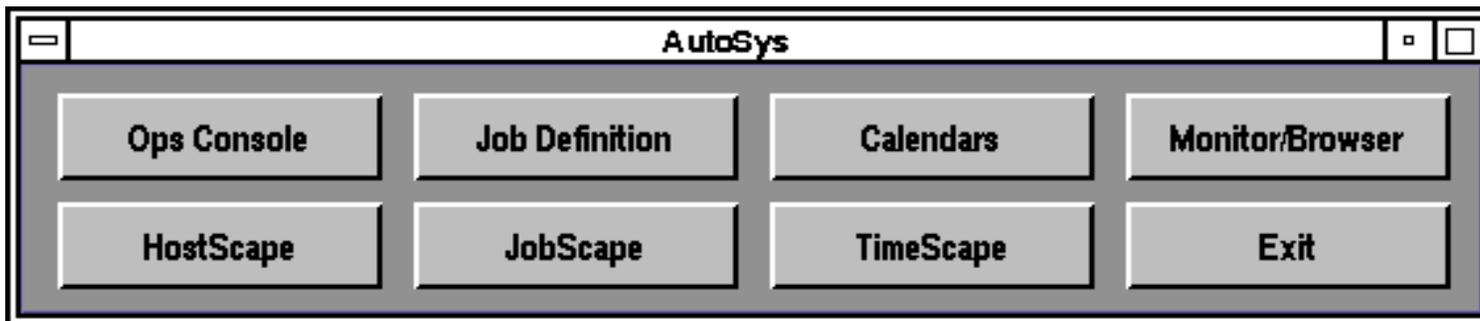
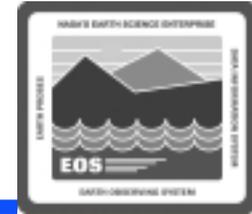
- **Production Processing Applications (Cont.)**
 - QA Monitor
 - Sybase ASE Server

Launching the AutoSys GUI Control Panel (Cont.)

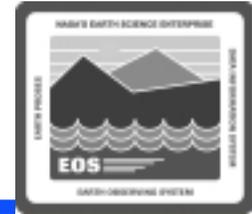


- **Procedure**
 - **Access the command shell**
 - **Set the DISPLAY environmental variable**
 - **Log-in to the Queuing Server host using secure shell**
 - **Set the ECS_HOME environmental variable if necessary**
 - **Source the appropriate file**
 - **Start AutoSys in the appropriate mode**

AutoSys GUI Control Panel

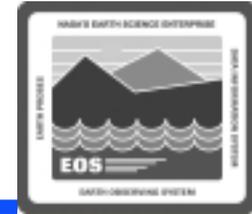


Configuring AutoSys Screens/Displays



- **Configuring AutoSys Runtime Options**
 - **Refresh Interval**
 - » determines how often the View Region will be updated
 - **Ping Interval**
 - » defines how often the connectivity will be evaluated
 - **Hang Time**
 - » specifies the length of time jobs will continue to be displayed within a machine after they have completed running
 - **Inches/Hr**
 - » indicates how much information is displayed on the screen

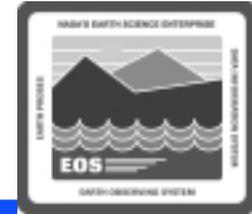
Configuring AutoSys (Cont.): Configuring Runtime Options



- **Procedure**

- **Click on either the HostScope, TimeScope, or JobScope button to display the corresponding AutoXpert GUI**
- **Select Options → Edit Runtime Options from the pull-down menu to display the Runtime Options dialog box**
- **Enter new values for the runtime options as necessary**
 - » **refresh interval**
 - » **ping interval**
 - » **hang time**
 - » **number of inches/hour**
- **Apply the modifications**

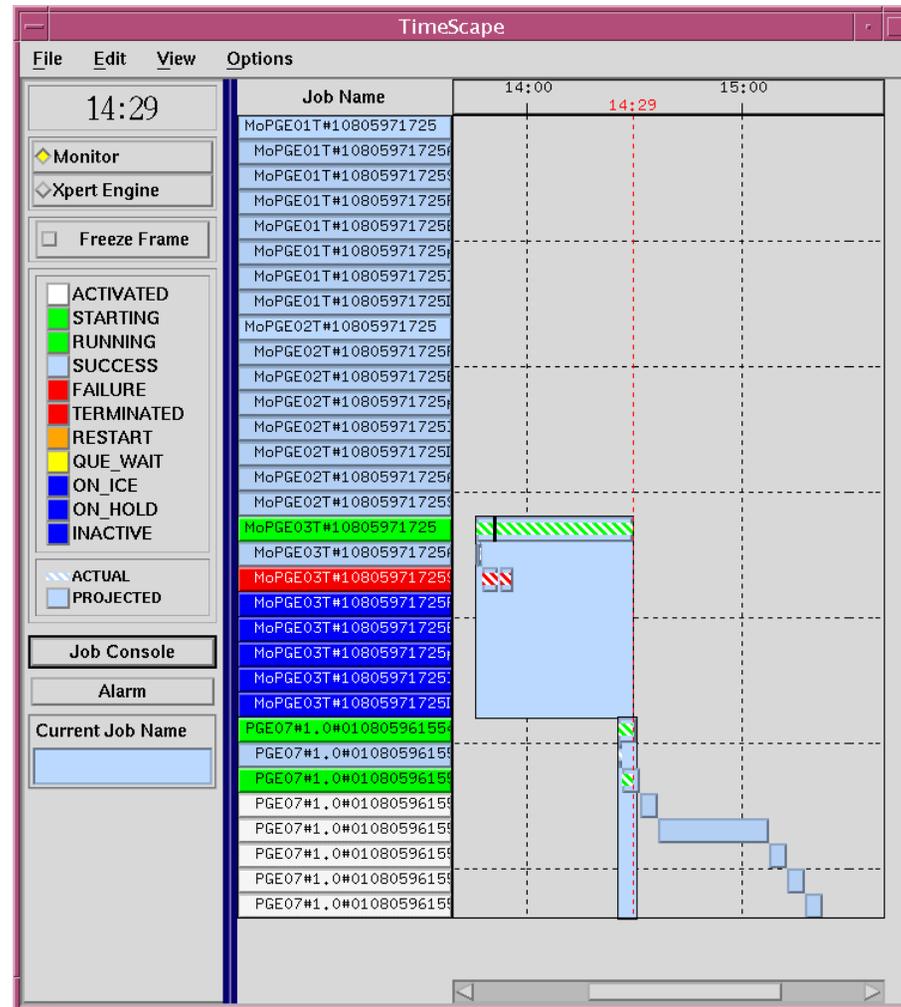
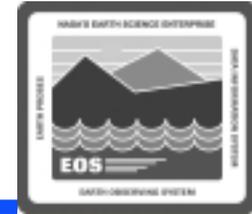
AutoXpert HostScape GUI



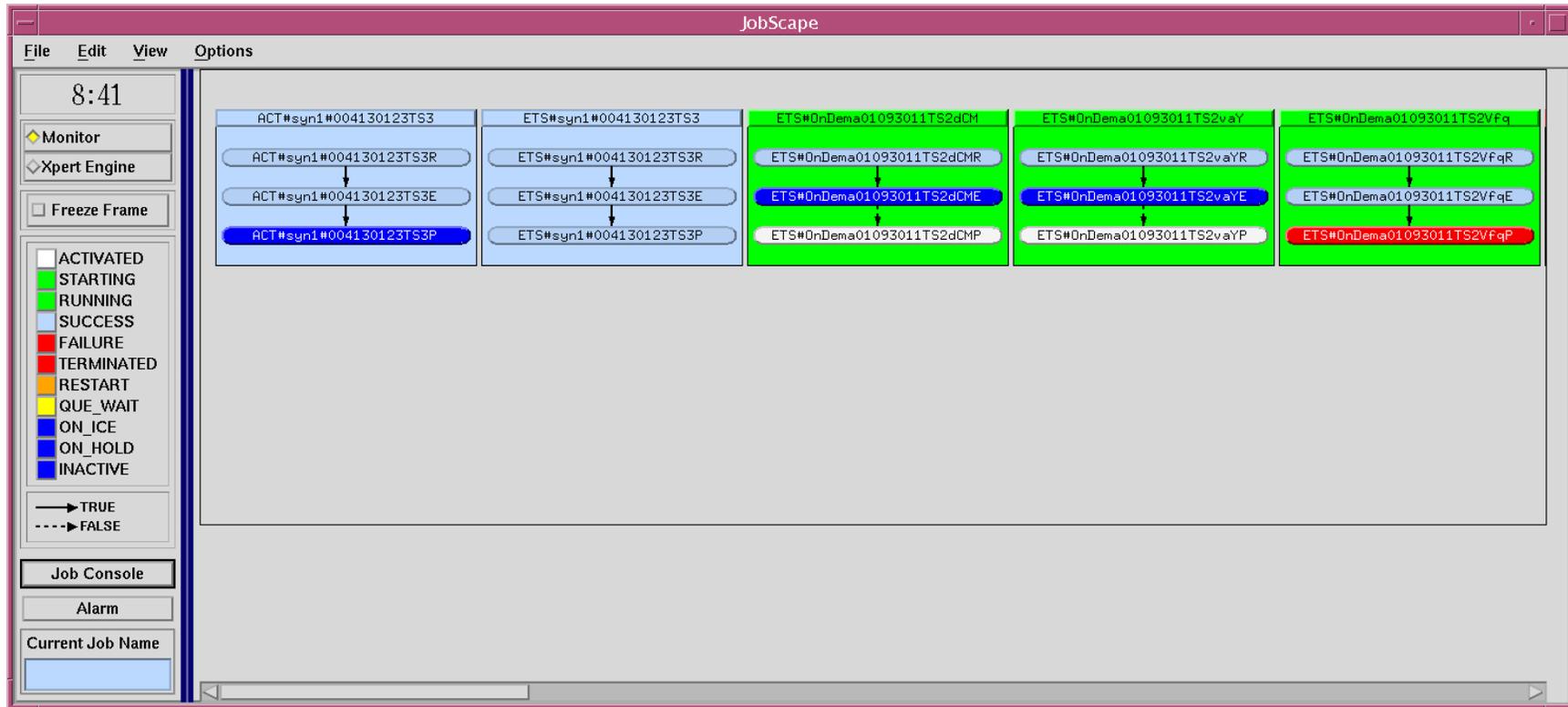
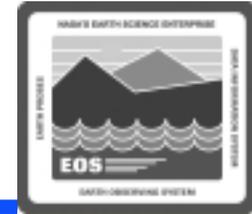
The screenshot displays the HostScape GUI interface. At the top, the window title is "HostScape". Below the title bar is a menu bar with "File", "Edit", "View", and "Options". The main area is divided into several sections:

- Top Left:** A clock showing "8:29". Below it are expandable sections for "Monitor" and "Xpert Engine", and a "Freeze Frame" checkbox.
- Left Panel:** A legend for system states and machine status. The legend includes: ACTIVATED (white), STARTING (green), RUNNING (green), SUCCESS (light blue), FAILURE (red), TERMINATED (red), RESTART (yellow), QUE_WAIT (yellow), ON_ICE (blue), ON_HOLD (blue), INACTIVE (blue). Below this are "MACHINE UP" (green) and "MACHINE DOWN" (red).
- Job Console:** A section with "Job Console", "Alarm", and "Current Job Name" fields.
- Main Monitoring Area:** Five panels, each representing an event processor:
 - t1ais01:** Shows "0" and "Alarm". The status bar is red and labeled "Event Processor".
 - t1pls02:** Shows "0" and "Alarm". The status bar is red and labeled "Event Processor".
 - t1spg01:** Shows "0" and "Alarm". The status bar is red and labeled "Event Processor".
 - t1sps02:** Shows "0" and "Alarm". The status bar is green and labeled "Event Processor 1" and "t1sps02_svr".
 - t1spg03:** Shows "0" and "Alarm". The status bar is empty.

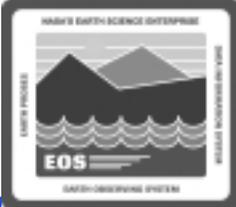
AutoXpert TimeScape GUI



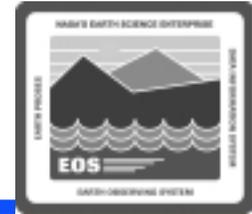
AutoXpert JobScape GUI



AutoXpert JobScape GUI Runtime Options Dialogue Box

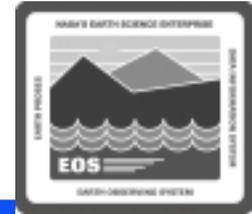


Configuring AutoSys (Cont.): Selecting Jobs to be Displayed



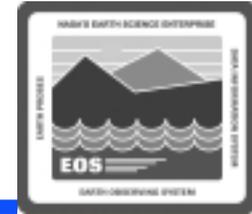
- **Jobs can be selected on the basis of the following criteria:**
 - Job Name
 - Job Status
 - Machine
- **Default values**
 - All Jobs
 - All Statuses
 - All Machines

Configuring AutoSys (Cont.): Selecting Jobs to be Displayed



- **Procedure**
 - **Select an AutoXpert GUI**
 - **Select View → Select Jobs to Display**
 - **For the Select by Name option select all jobs by clicking on the All Jobs button; to select jobs by pattern matching, enter the appropriate characters/wild cards**
 - **To select all job statuses click on the All Statuses button; to select jobs by status click on the appropriate Select by Status toggle buttons**
 - **To select jobs on all machines click on the All Machines button; to select jobs by machine click on the applicable machine name(s) in the Select by Machine area**
 - **Select OK (or Apply)**

Job Selection Dialogue Box



Job Selection

Select by Name

All Jobs

Box Hierarchies
Show Number of Levels: all

Name Matching Patterns

	Lookup

Select by Status

All Statuses

- Starting
- Running
- Success
- Failure
- Terminated
- Restart
- Que Wait
- Activated
- Inactive
- On Hold
- On Ice

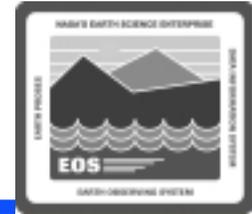
Select by Machine

All Machines

t1 spg01
t1 sps02
t1 pls02

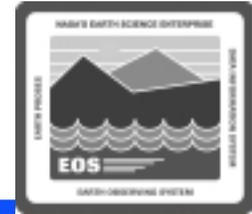
OK Apply Cancel

Configuring AutoSys (Cont.): Setting the Current Job



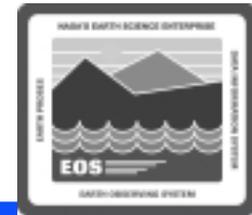
- **Setting the current job causes the job name to be displayed in the Current Job Name field in the Control Region of the AutoXpert GUI**
 - Subsequently clicking on the Job Console button on the AutoXpert GUI causes the Job Activity Console GUI (also known as the Ops Console GUI) to be displayed with information concerning the current job
- **There are two methods for setting the current job:**
 - Click on the name of a job displayed on an AutoXpert GUI
 - Set the current job using the AutoXpert GUI pull-down menu

Configuring AutoSys (Cont.): Setting the Current Job

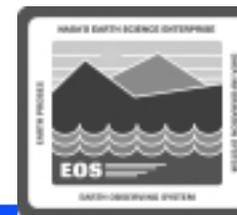


- **Procedure**
 - **Select an AutoXpert GUI**
 - **Select View → Set Current Job**
 - **Type the *jobname* or a portion of the *jobname* in the Filter field**
 - » **The asterisk (*) wildcard character can be used for entering a partial job name**
 - **Click on the Filter button**
 - **Select (highlight) the job to be designated the “current job” from the jobs listed in the Jobs field**
 - **Select OK (or Apply)**

Set Current Job Dialogue Box

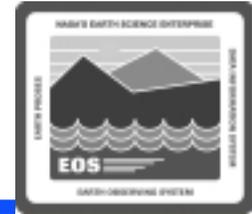
The image shows a screenshot of a software dialog box titled "Set Current Job". The dialog box has a light gray background and a dark border. At the top, there is a title bar with the text "Set Current Job". Below the title bar, there are four main sections: 1. "Filter": A text input field containing an asterisk (*). 2. "Jobs": A large, empty rectangular area, likely intended for a list of jobs. 3. "Selected Job": A text input field, currently empty. 4. Buttons: Four buttons are located at the bottom of the dialog box: "OK", "Apply", "Filter", and "Cancel".

Configuring AutoSys (Cont.)



- **Configuring Hardware Groups**
 - makes it easier to monitor the hardware associated with a particular function (e.g., testing, training, or a certain type of processing)
 - default group is “All Machines”
 - Production Monitor defines a specific set of machines to be monitored as a group
 - » must know which machines are to be included in the group
 - » should devise a useful name for the group

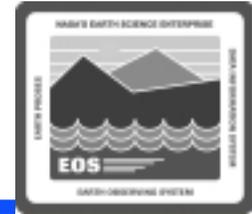
Configuring AutoSys (Cont.): Configuring Hardware Groups



- **Procedure**

- If necessary, log in to the Queuing Server host using secure shell
- If necessary, source the appropriate set-up file
- Type `vi xpert.groups.AutoSysInstance`
- Using vi editor commands create/modify hardware groups as necessary
- Press the Esc key
- Save the `xpert.groups.AutoSysInstance` file
- Launch AutoSys/HostScape
- Select View → Select Machine Group from the pull-down menu

Configuring AutoSys (Cont.): AutoSys Hardware Group File



groupname: Training

g0pls02

g0sps06

g0spg01

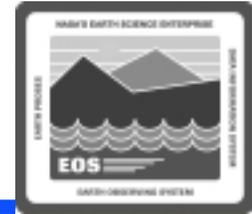
groupname: SSI&T

g0ais01

g0sps06

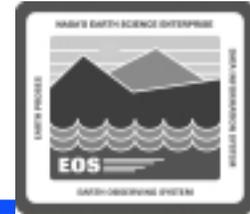
g0spg01

Reviewing Hardware Status, DPR Dependency, etc.



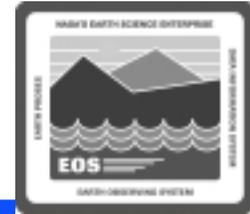
- **Reviewing Hardware Status**
 - **Hardware status is displayed on the HostScape GUI**
 - **Production Monitor can determine the following conditions (among others):**
 - » **status of processors**
 - » **condition of the AutoSys queue**
 - » **whether any processors are overloaded while others are idle**
 - » **whether there are any system problems**

Reviewing Hardware Status etc. (Cont.)



- **Reviewing Hardware Status (Cont.)**
 - **HostScape displays jobs on a machine-by-machine basis**
 - » **which AutoSys server/client machines are up and active**
 - » **which jobs are running or have recently run on each machine**
 - **HostScape can display hardware status in real-time**

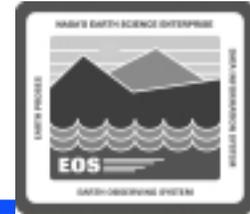
Reviewing Hardware Status etc. (Cont.)



- **Procedure**

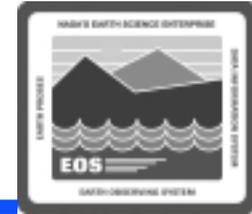
- **Click on the HostScape button on the AutoSys GUI Control Panel**
- **Review the Control Region to identify the color codes for the status of the machines**
- **Review the machine type in the View Region**
- **Review the machine boxes in the View Region to determine the status of individual machines**
- **Review the Alarm indicating buttons of individual machines in the View Region**
- **Review the machine connection status in the View Region**

Reviewing Hardware Status etc. (Cont.)



- **Changing the Hardware Status View**
 - **View Options** provide three methods of viewing hardware status:
 - » **normal**
 - » **global**
 - » **zoom**

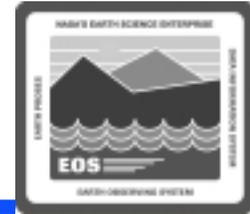
Reviewing Hardware Status etc. (Cont.): Changing Status Views



- **Procedure**

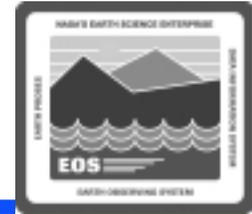
- **Select a machine in the View Region by clicking on its name, then select...**
 - » **first Select View Level...**
 - » **then Global View**
- **Select a specific machine by clicking on its name, then select Zoom in Machine**
 - » **zoom view is displayed**
 - » **table listing relevant data is displayed**
- **Select Dismiss**
 - » **global view is displayed**
- **Select View → Select View Level then select Normal View**
 - » **normal view is displayed**

Reviewing Hardware Status etc. (Cont.)



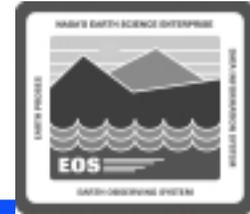
- **Reviewing DPR Dependencies**
 - **DPR dependencies are displayed on the JobScape GUI**
 - » presents a Pert-like view of job processing from a logical (or job dependency) point of view
 - » depicts all job types; i.e., command jobs, box jobs, and file-watcher jobs
 - » depicts the nesting of jobs within boxes and the dependencies between jobs.
 - » can be used for monitoring job flow in real-time
 - » allows the Production Monitor to identify potential problems before they become actual problems
 - **AutoSys defines job status in the terms listed in the table**
 - » different states are color-coded

Reviewing Hardware Status etc. (Cont.)



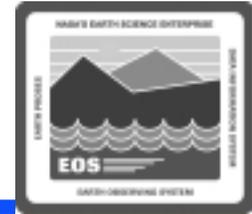
- **Job States**
 - Activated (white)
 - Starting (green)
 - Running (green)
 - Success (light blue)
 - Failure (red)
 - Terminated (red)
 - Restart (orange)
 - Que_Wait (yellow)
 - On_Ice (dark blue)
 - On_Hold (dark blue)
 - Inactive (dark blue)

Reviewing Hardware Status etc. (Cont.)



- **ON_HOLD vs ON_ICE**
 - **ON_HOLD**
 - » Lose a Turn. (Can start anytime from stop point.)
 - **ON_ICE**
 - » Go to Jail. Do not pass GO. Do not collect \$200. (ALL conditions must be reset before starting again.)

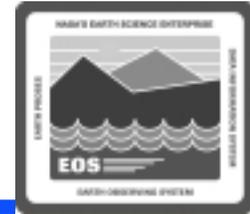
Reviewing Hardware Status etc. (Cont.): DPR Dependencies



- **Procedure**

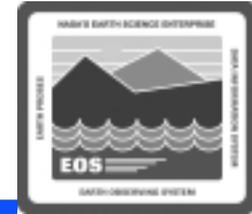
- **Click on the JobScape button on the AutoSys GUI Control Panel**
- **Review the Job Display to determine the status (color-coded) of DPRs**
- **Review the Job Display to determine the types of jobs**
- **Select a job (for which descendants are to be determined)**
- **Review the job's descendants**
- **Select Show Children from the pop-up menu**
- **Select Show All Descendants from the pop-up menu**
- **Select Hide All Descendants from the pop-up menu**

Reviewing Hardware Status etc. (Cont.): Changing JobScape View



- **Changing the view affects the level of detail displayed in the View Region of the GUI**
- **The view can be changed in two ways**
 - **Simply clicking with the right mouse button on the name of a job displayed on an AutoXpert GUI and selecting the desired option from the pop-up menu**
 - » **Show Children**
 - » **Show All Descendants**
 - » **Hide All Descendants**
 - » **Show Job Arrows**
 - » **Hide Job Arrows**
 - » **Show Box Arrows**
 - » **Hide Box Arrows**
 - **Using the View pull-down menu**
 - » **Additional options can be selected**

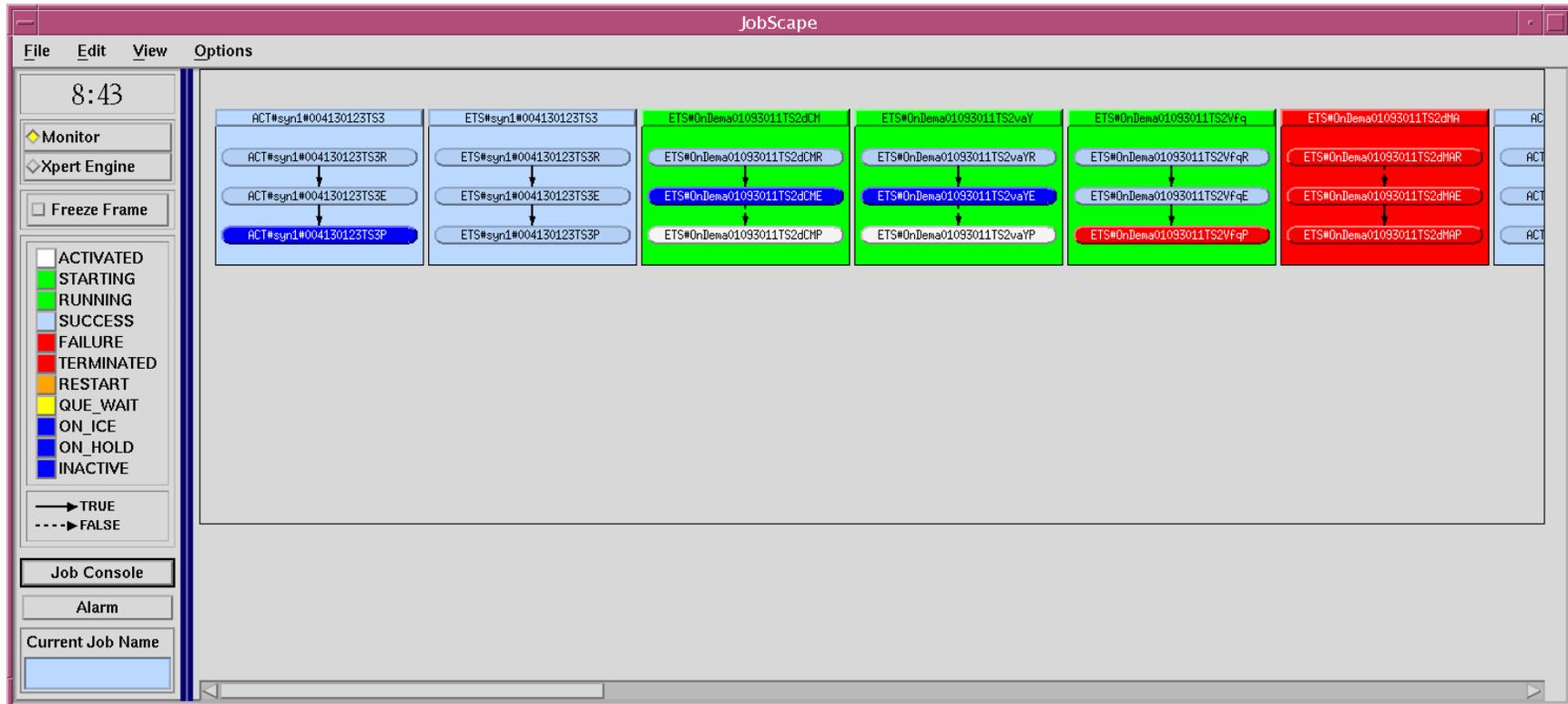
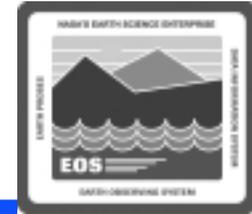
Reviewing Hardware Status etc. (Cont.): Changing JobScope View



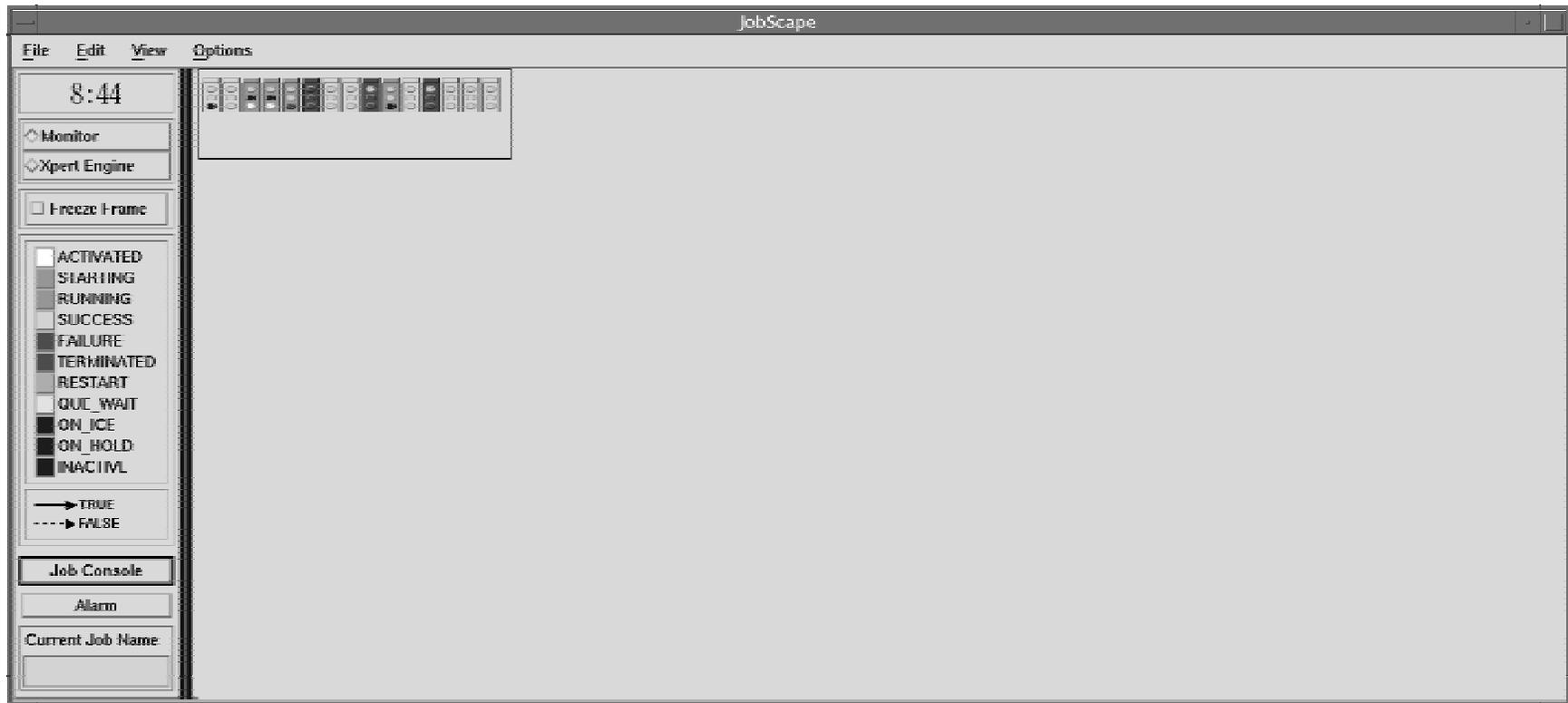
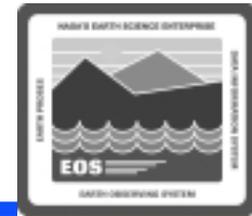
- **Procedure**

- **Select View → Set View from the pull-down menu**
- **Select the desired option from the pull-down menu**
 - » **Normal Text View**
 - » **Small Text View**
 - » **No Text View**
 - » **Show Arrows**
 - » **Hide Arrows**
 - » **View by Id**
- **Select View → Set Display Levels**
- **Select the desired option from the pull-down menu**
 - » **All is the default type of view**

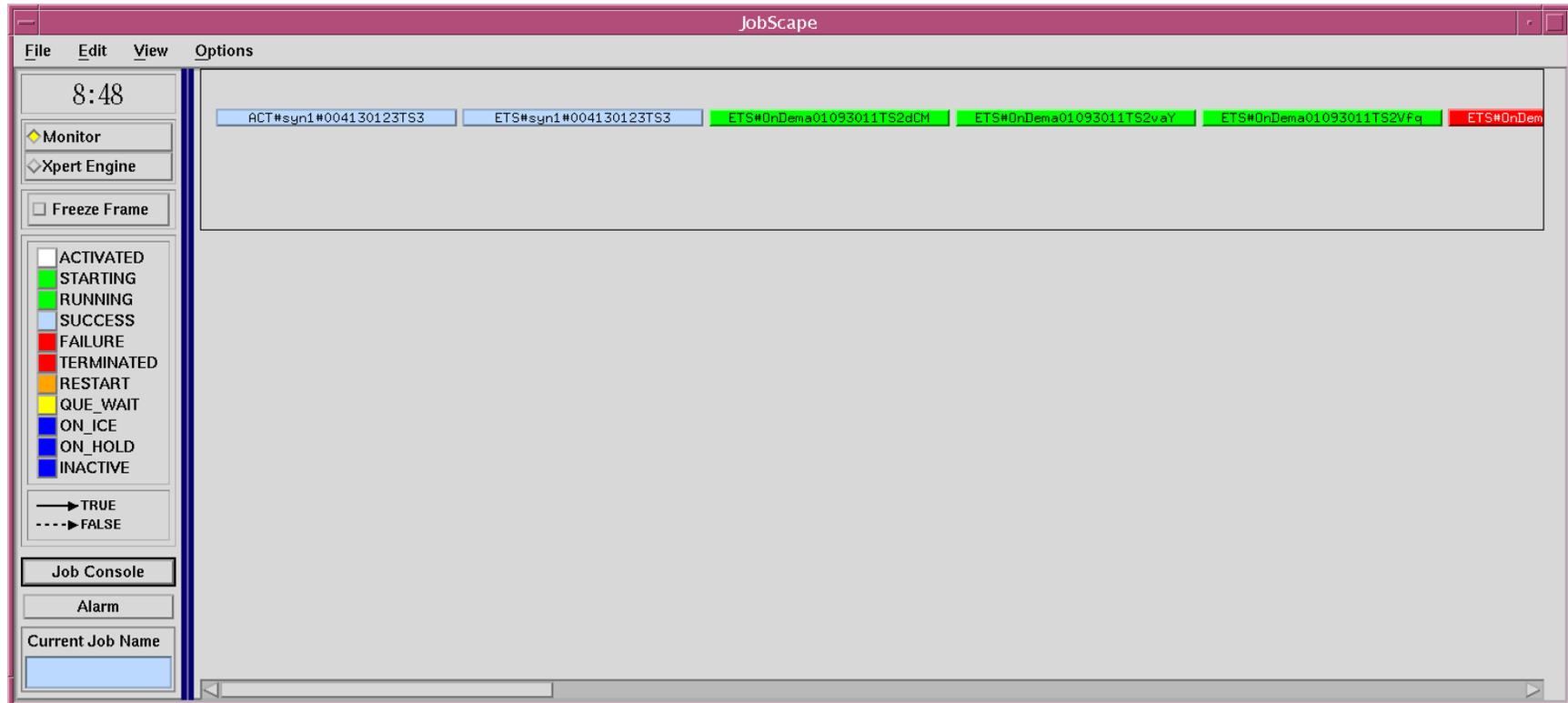
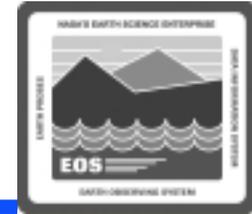
JobScape GUI “Small Text” View



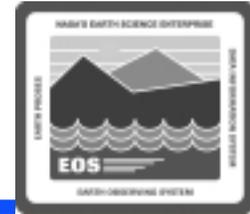
JobScape GUI “No Text” View



JobScape GUI “One Level” View

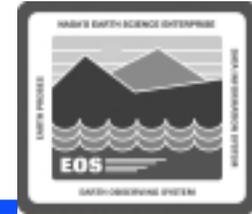


Reviewing Hardware Status etc. (Cont.)



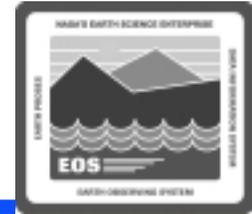
- **Reviewing the DPR Production Timeline**
 - **The DPR Production Timeline is displayed on the TimeScape GUI**
 - » **presents a Gantt-like view of a job processing from a temporal (time-related) point of view**
 - » **depicts all job types; i.e., Command Jobs, Box Jobs, and File Watcher Jobs**
 - » **depicts the nesting of jobs within boxes**
 - » **depicts the duration of time it will take for jobs to complete**
 - » **used for monitoring job flow in real-time**

Reviewing Hardware Status etc. (Cont.): DPR Production Timeline



- **Procedure**
 - **Select TimeScape**
 - **Review a job's descendants by clicking on the job**
 - » **Select Show Children from the pop-up menu**
 - » **Select Show All Descendants from the pop-up menu**
 - » **Select Hide All Descendants from the pop-up menu**

Reviewing Hardware Status etc. (Cont.): Procedure



Good vs Bad

Projected



Looks Good!

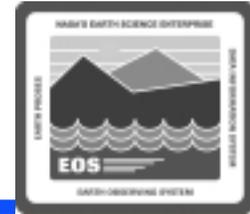
Projected



Actual

Trouble!

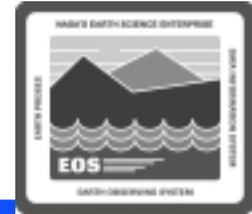
Reviewing Hardware Status etc. (Cont.)



- **Reviewing Alarms**

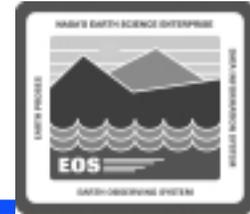
- **Alarms indicate problems with job processing**
 - » failure of job processing
 - » database problem
 - » communication problem
 - » hardware or software failure
 - » some other error in the data processing system
- **Production Monitor reviews alarms using the AutoSys Alarm Manager**
 - » view alarms as they arrive
 - » provide a response to an alarm
 - » change alarm status

Reviewing Hardware Status etc. (Cont.)



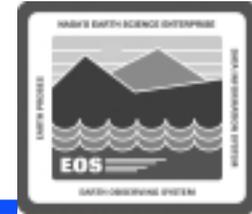
- **Reviewing Alarms (Cont.)**
 - **Production Monitor can configure the Alarm Manager to display certain types of alarms only**
 - » type of alarm
 - » alarm state
 - » time of the alarm

Reviewing Hardware Status etc. (Cont.): Reviewing Alarms



- **Procedure**
 - Click on the Ops Console button on the AutoSys GUI Control Panel)
 - Click on the Alarm button to display the Alarm Manager GUI
 - Configure alarm selection as described in the procedure for Configuring Alarm Selection
 - Click on an alarm in the Alarm List
 - Click the Response edit box and type in a response, if desired
 - Update the Alarm State by clicking on the appropriate radio button
 - Click on the Apply button
 - Repeat steps as necessary to review and update multiple alarms

Job Activity Console (OPS Console)



Job Activity Console

File View Options

Job Name	Description	Status	Command	Machine
----------	-------------	--------	---------	---------

Currently Selected Job: Machine Time:

Description:

Command:

Start Time: Status: Machine: Priority:

End Time: Exit Code: Queue Name: Num. Of Tries:

Run Time: Next Start:

Starting Conditions

Atomic Condition	Current State	T/F
------------------	---------------	-----

Job Report

Actions

Start Job On Hold Jobs Completed

Kill Job Off Hold Jobs Waiting

Force Start Job Send Event Client Tool

Show

Job Definition

Dependent Jobs

Freeze Frame

Reports

Summary

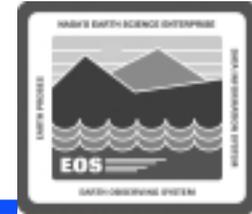
Event

None

Alarm

Exit

Alarm Manager GUI



Alarm Manager

View Options

Alarm Type	Job Name	Time	State	Comment
JOBFAILURE	PM1DefAtt#063002000PSE	02/01/2001 16:	Open	
JOBFAILURE	PM1DefAtt#063002000PS	02/01/2001 15:	Open	
JOBFAILURE	PM1DefAtt#063004000PSE	02/01/2001 15:	Open	
JOBFAILURE	PM1DefAtt#063002000PSE	02/01/2001 15:	Open	
JOBFAILURE	PM1DefAtt#063004000PS	02/01/2001 15:	Open	
JOBFAILURE	PM1DefAtt#063002000PS	02/01/2001 15:	Open	
EVENT_HDLR_E	PM1DefAtt#102010000PSD	02/01/2001 14:	Open	Couldnt get row for joid = 71233
JOBFAILURE	PM1DefAtt#102010000PS	02/01/2001 14:	Open	
JOBFAILURE	PM1DefAtt#102010000PSE	02/01/2001 14:	Open	
JOBFAILURE	PM1DefAtt#102010000PS	02/01/2001 14:	Open	

Currently Selected Alarm

Response

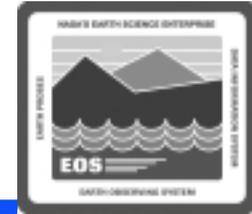
User: _____

Alarm State

- Open
- Acknowledged
- Closed

Freeze Frame

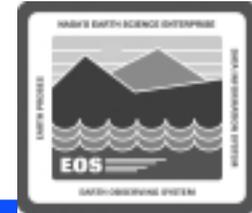
Reviewing Hardware Status etc. (Cont.): Alarm Selection



- **Procedure**

- **Select View → Select Alarms from the pull-down menu to display the Alarm Selection GUI**
- **Click on the desired alarm(s) in the Select by Type alarm list; to select all types of alarms, click on the All Types button**
- **Click on the All States button to select all alarm states; to select alarms by state click on whichever of the Select by State toggle buttons properly describe(s) the state(s) to be selected**
- **Click on the All Times button to select all times; to select alarms by time type the starting date/time and ending date/time in the applicable fields**
- **Apply selections**

Alarm Selection GUI



Alarm Selection

Select by Type

All Types

- AUTO_PING
- CHASE
- DATABASE_COMM
- DB_PROBLEM
- DB_ROLLOVER
- DUPLICATE_EVENT
- EP_HIGH_AVAIL
- EP_ROLLOVER
- EP_SHUTDOWN
- EVENT_HDLR_ERROR
- EVENT_QUE_ERROR
- FORKFAIL

Select by State

All States

Open

Acknowledged

Closed

Select by Time

All Times

From Date: 02/03/2001 (MM/DD/[YY]YY)

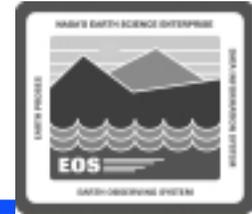
From Time: 08:52 (hh:mm)

To Date: 02/03/2001 (MM/DD/[YY]YY)

To Time: 08:52 (hh:mm)

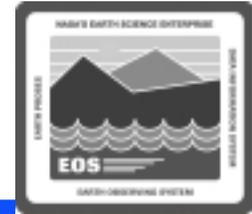
OK Apply Cancel

Reviewing Hardware Status etc. (Cont.)



- **Specifying Job Selection Criteria**
 - **Production Monitor reviews job activities using the AutoSys Job Activity Console**
 - **AutoSys Job Selection GUI is used for...**
 - » **specifying (filtering) jobs the Production Monitor will review**
 - » **setting the criteria for displaying jobs by name, status and/or machine**

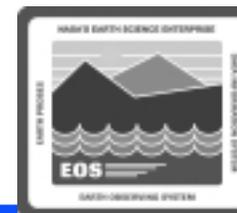
Specifying Job Selection Criteria



- **Procedure**

- **Click on the Ops Console button on the AutoSys GUI Control Panel**
- **Choose View → Select Jobs from the pull-down menu to display the Job Selection GUI**
- **For the Select by Name option select all jobs by clicking on the All Jobs button**
- **To select all job statuses click on the All Statuses button; to select jobs by status click on the appropriate Select by Status toggle buttons**
- **To select all machines click on the All Machines button; to select individual machines click on the machines in the list in the Select by Machine area**
- **Click on the desired order in the Sort Order area**
- **Apply the selections**

Job Selection GUI



Job Selection

Select by Name

All Jobs

◆ Job Name
[]

◇ Box Name
[]

Box Levels
[all]

Select by Status

All Statuses

Starting

Running

Success

Failure

Terminated

Restart

Que Wait

Activated

Inactive

On Hold

On Ice

Select by Machine

All Machines

g0spg01
g0sps06
g0ais01

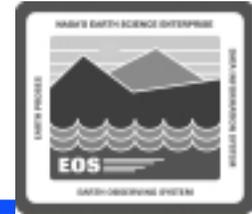
Sort Order

◇ Start Time ◇ Job Name ◇ Machine Name

◇ End Time ◇ Job Status ◆ Unsorted

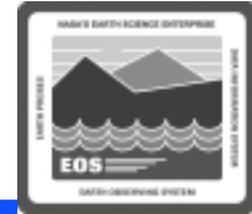
OK Apply Cancel

Reviewing Hardware Status etc. (Cont.)



- **Reviewing Job Activities**
 - **Production Monitor reviews job activities using the AutoSys Job Activity Console**
 - » **primary interface for monitoring all jobs that have been defined for AutoSys**
 - » **based on criteria defined using the Job Selection GUI**

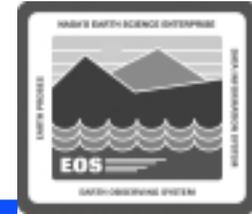
Reviewing Hardware Status etc. (Cont.): Reviewing Job Activities



- **Procedure**

- **Click on the Ops Console button on the AutoSys GUI Control Panel**
- **Generate a list of jobs using the procedure for Specifying Job Selection Criteria**
- **Review the job data in the Job List region of the Job Activity Console**
- **Click anywhere on a job row to have detailed information for that job displayed**
- **Review the data in the Currently Selected Job region of the display**
- **Review the data in the Starting Conditions region of the display**
- **In the Reports list click on the type of report to be reviewed then review the report**

Reviewing Hardware Status etc. (Cont.): Procedure



Nuke'm

Job Console

Atomic Condition	Current State	T/F
SUCCESS(JOBOPSR)	RUNNING	F

JobScape GUI

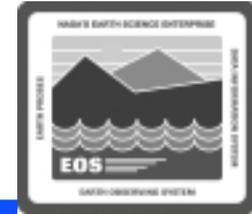
JOBOPS

JOBOPSR
False

JOBOPSE
False

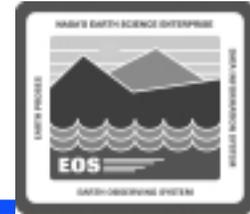
JOBOPSP

Example of A Summary Report on the Job Activity Console



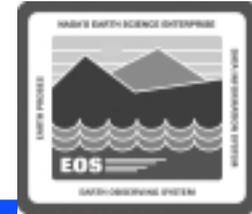
Job Name	Last Start	Last End	ST	Run	Pri/Kit
ACT#syn1#004130123TS3	11/22/2000 11:51	11/22/2000 11:58	SU	8068/1	
ACT#syn1#004130123TS3R	11/22/2000 11:52	11/22/2000 11:57	SU	8068/1	
ACT#syn1#004130123TS3E	11/22/2000 11:57	11/22/2000 11:57	SU	8068/1	
ACT#syn1#004130123TS3P	11/22/2000 11:57	11/22/2000 11:58	OH	8068/1	

Modifying Job Status



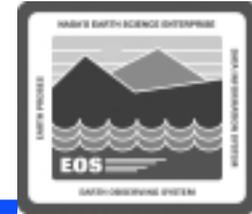
- **Methods for Modifying Job Status**
 - **Production Monitor may need to modify a particular job in any of the following ways:**
 - » **start the job**
 - » **kill the job**
 - » **force the job to start**
 - » **place the job on hold**
 - » **take the job off hold**
 - **Three methods for making those types of modifications to a particular job:**
 - » **Buttons in the Actions region of the Job Activity Console (Ops Console)**
 - » **Menu accessed by clicking the right mouse button on the relevant job name on JobScape or TimeScape**
 - » **AutoSys Send Event GUI**

Modifying Job Status



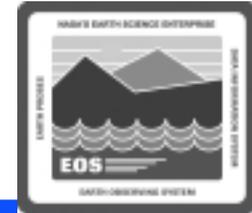
- **Methods for Modifying Job Status**
 - In AutoSys terms a control action such as starting or killing a job is accomplished by sending an “event” to the job
 - An event is basically a message
 - For example, clicking on the Start Job button on the AutoSys Job Activity Console begins the process by which AutoSys sends a “start” message to the Currently Selected Job

Modifying Job Status



- **Methods for Modifying Job Status (Cont.)**
 - In addition to the previously mentioned modifications to job status, the buttons in the Actions region of the Job Activity Console (Ops Console) allow the Production Monitor to generate the following types of reports:
 - » Jobs Completed
 - » Jobs Waiting
 - Menu accessed using the right mouse button on one of the AutoXpert GUIs allows the Production Monitor to initiate either of the following actions (in addition to the previously mentioned modifications to job status):
 - » Put the job on ice
 - » Take the job off ice

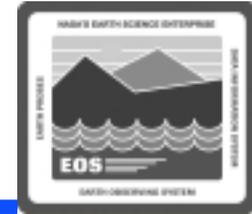
Jobs Completed Report



```
emacs@t1sps02.vatc.ecs.nasa.gov
Buffers File Edit Utilities Coding Help
#####
#### JOBS COMPLETED ####
#####

DPR ID          COMPLETION STATE  PRIORITY  DATA START TIME  AUTOSYS
MISRLIKE#s03050000TS  SUCCESS          2750    12/03/93 00:00:00.000  VAT
BTS#OnDema01093011TS  SUCCESS          120     04/01/95 04:30:11.000  VAT
ACT#syn1#004130123TS  SUCCESS          2750    07/04/97 09:01:23.000  VAT
BTS#syn1#004130123TS  SUCCESS          2750    07/04/97 09:01:23.000  VAT
FddAtt#30112312200TS  SUCCESS          2750    12/31/99 17:00:00.000  VAT
AM1Eph#30101010000TS  CANCELED         2750    12/31/99 19:00:00.000  VAT
FddAtt#30101010000TS  SUCCESS          2750    12/31/99 19:00:00.000  VAT
MoPGE01#sy01010000TS  CANCELED         2750    12/31/99 19:00:00.000  VAT
MoPGE02#sy01000500TS  CANCELED         2750    12/31/99 19:05:00.000  VAT
MoPGE03#sy01000500TS  CANCELED         2750    12/31/99 19:05:00.000  VAT
MoPGE02#sy01001000TS  CANCELED         2750    12/31/99 19:10:00.000  VAT
MoPGE03#sy01001000TS  CANCELED         2750    12/31/99 19:10:00.000  VAT
MoPGE02#sy01001500TS  CANCELED         2750    12/31/99 19:15:00.000  VAT
MoPGE03#sy01001500TS  CANCELED         2750    12/31/99 19:15:00.000  VAT
MoPGE02#sy01002000TS  CANCELED         2750    12/31/99 19:20:00.000  VAT
-----Emacs: jobsCompleted.txt,11451 (Fundamental)--L1--Top-----
For information about the GNU Project and its goals, type C-h C-p.
```

Jobs Waiting Report



```
emacs@t1sps02.vafcc.ecs.nasa.gov
Buffers File Edit Utilities Coding Help
#####
#### JOBS WAITING #####
#####

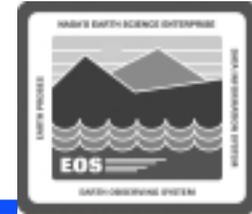
DPR ID          COMPLETION STATE  PRIORITY  PREDICTED START TIME

AM1 Eph#2.0073106200PS  CQ_HOLD      250      10/27/98 18:44:01.000
AM1 Eph#2.0073108200PS  CQ_HOLD      250      10/27/98 18:44:16.000
AM1 Eph#2.0073110200PS  CQ_HOLD      250      10/27/98 18:44:31.000
AM1 Eph#2.0073112200PS  CQ_HOLD      250      10/27/98 18:44:43.000

TOTAL JOBS WAITING = 4
TOTAL JOBS WAITING ON DATA (CQ_HOLD) = 4
TOTAL JOBS WAITING ON RESOURCES (CQ_RELEASE) = 0

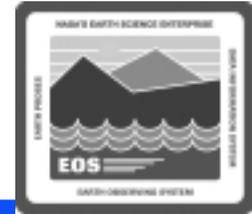
----- Emacs: jobsWaiting.txt.11851 (Fundamental) --L1-- All -----
For information about the GNU Project and its goals, type C-h C-p.
```

Modifying Job Status (Cont.)



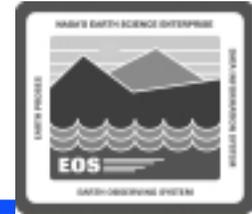
- **Send Event GUI allows the Production Monitor to initiate any of the following actions:**
 - » **Start the job**
 - » **Kill the job**
 - » **Force the job to start**
 - » **Place the job on hold**
 - » **Take the job off hold**
 - » **Change the job's status**
 - » **Change the job's priority**
 - » **Put the job on ice**
 - » **Take the job off ice**
 - » **Stop the daemon (stop the Event Processor in an emergency)**
 - » **Set a global value**
 - » **Send a signal concerning the job**
 - » **Make a comment (for example, why a job start was forced)**

Modifying Job Status (Cont.)



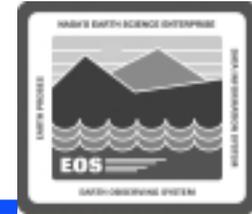
- **Guidelines for Reporting Unsuccessful Completion of On-Demand Jobs**
 - Under any of the following circumstances involving an on-demand job notify User Services of the problem in accordance with the applicable local policy
 - » Job is killed
 - » Job terminates and cannot be restarted
 - » A FAILPGE granule is created
 - The DAAC is obliged to send an e- mail message to the requester of an unsuccessful on-demand job to explain why the request cannot be fulfilled

Modifying Job Status (Cont.)



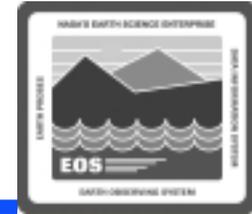
- **Guideline for Putting Jobs “On Ice” or “On Hold”**
 - Ensure that the job to be put either “on hold” or “on ice” is not already in a “starting” or “running” state
 - » A job that is either “starting” or “running” cannot be put “on hold” or “on ice”

Modifying Job Status (Cont.)



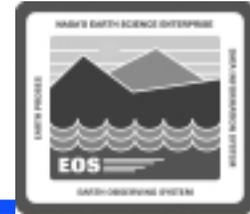
- **Guidelines for Force-Starting Jobs**
 - **Force-start command jobs (e.g., preprocessing or preprocessing) only**
 - **Do not attempt to force-start a box job**
 - » **The software does not support box job force-starts**
 - » **Force-starting a box job can cause the PDPS database to get out of sync and prevent the DPR (and possibly other DPRs) from running successfully**
 - » **If a box job were force-started, the allocation portion of the preprocessing job would run again and might choose a different science processor than was chosen the previous time the job ran, which could cause failure of the job**
 - » **Box job force-starts lack the code needed to check the state of the box and perform the database cleanup activities necessary for starting over**

Modifying Job Status (Cont.)



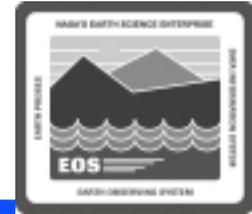
- **Guidelines for Force-Starting Jobs (Cont.)**
 - **Ensure that the GUI has refreshed and the job to be force-started is not already running before trying to force-start a job**
 - » **If a job is already running, it should not be force-started**
 - » **If using AutoSys/AutoXpert 3.4.2 or a later version, it should not be possible to force-start jobs that are already running**
 - **If any command job other than execution fails, force-start the job that failed only**
 - **Do not force start any preceding or succeeding jobs in the box**

Modifying Job Status (Cont.)



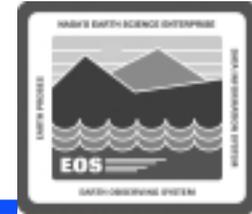
- **Determining the Ownership of an AutoSys Job**
 - **AutoSys is very much ownership-aware**
 - » Only the “owner” of a job has “edit” privileges and can make changes to the status of an owned job
 - **AutoSys recognizes ownership in terms of two factors:**
 - » **UserID**
 - » **Machine where the operator (user) logged in**
 - **Example:**
 - » **cmshared@g0sps06 identifies the Production Monitor who logged in as “cmshared” at g0sps06**
 - » **Any operator who logs in as “cmshared” at another machine (e.g., g0pls01) would not be able to change the status of a job “owned” by cmshared@g0sps06**
 - » **To have any real effect on a job first it is necessary to log in as the job’s owner and launch AutoSys GUIs**

Modifying Job Status (Cont.)



- **Procedure (Determining the ownership of a Job)**
 - **Click on the JobScape button (or TimeScape button) on the AutoSys GUI Control Panel**
 - **Place the mouse cursor on the relevant job and click and hold the right mouse button**
 - **Select (highlight) Job Definition from the pop-up menu (release the right mouse button)**
 - **Review the entry in the Owner field of the Job Definition GUI**
 - **To exit from the Job Definition GUI, click on the Exit button**

Job Definition GUI



Job Definition

Clear Delete Save Adv Features Exit

Job Name Job Type

Edit OneTime Over-Rides? Name of Box this Job is IN

Owner

Description

Starting Parameters

Is the Start Date/Time Dependent?

Starting Condition

Command & File Watch Information

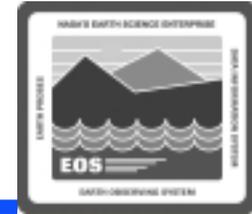
Execute On Machine

Command To Execute

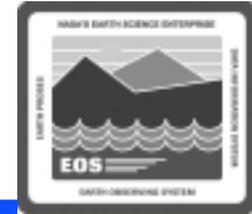
File To Watch for...

Job Definition GUI

Job Security MESSAGE Window

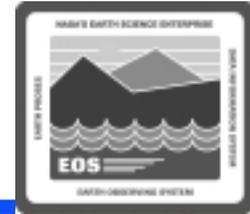


Modifying Job Status (Cont.)



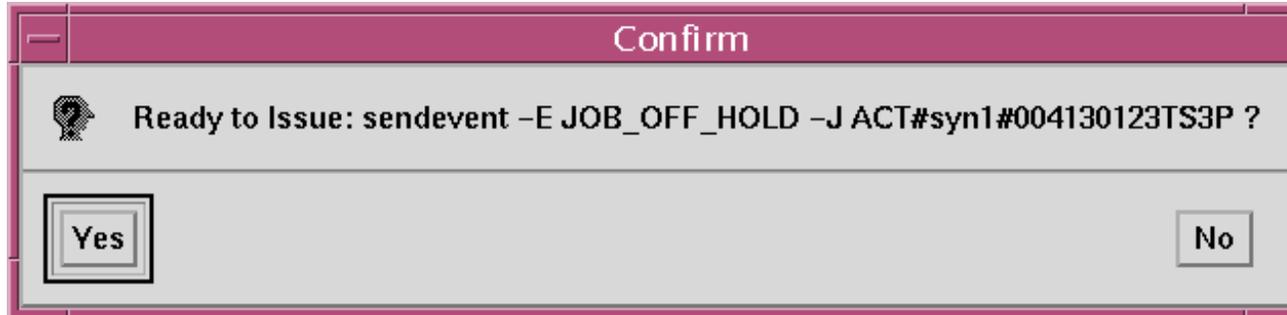
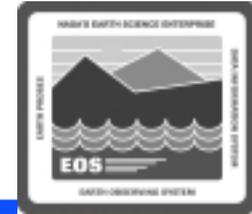
- **Sending an Event to a Job**
 - **As previously mentioned there are three methods for making certain types of modifications (e.g., start or kill) to a particular job**
 - » **Menu accessed by clicking the right mouse button on the relevant job name on either the JobScape or TimeScape GUI**
 - » **Buttons in the Actions region of the Job Activity Console (Ops Console)**
 - » **AutoSys Send Event GUI**

Modifying Job Status (Cont.)

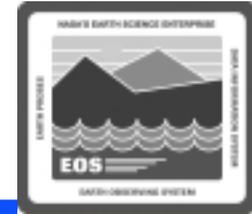


- **Procedure (Sending an Event to a Job from an AutoXpert GUI)**
 - **Select either JobScape or TimeScape from the AutoSys GUI Control Panel**
 - **Place the mouse cursor on the relevant job and click and hold the right mouse button**
 - **Select the event (e.g., Force Start Job) to be sent to the job from the pop-up menu**
 - » **If there is no option corresponding to the desired action, modify job status from either the Job Activity Console or the Send Event GUI**
 - **Select Yes to confirm sending the event**

Confirmation Dialogue Box

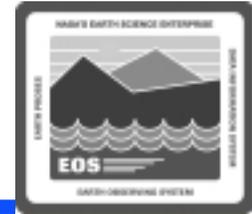


Modifying Job Status (Cont.)



- **Procedure (Sending an Event to a Job from the Job Activity Console)**
 - **Select jobs for display on the Job Activity Console (Ops Console)**
 - **Verify that the job with the status to be modified is listed in the Currently Selected Job field of the Job Activity Console**
 - **Click on the button corresponding to the desired action to be taken with respect to the selected job**
 - » **If there is no button corresponding to the desired action, modify job status using the Send Event GUI**
 - **Click on Yes to send the event to the job**

Modifying Job Status (Cont.)

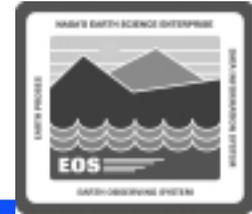


- **Sending an Event to a Job from the Send Event GUI**

CAUTION

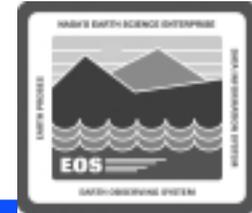
Once an event has been sent from the Send Event dialog, it may not be possible to cancel or modify it.

Modifying Job Status (Cont.)



- **Procedure (Sending an Event to a Job from the Send Event GUI)**
 - Click on the Ops Console button and list jobs
 - In the Job List region of the Job Activity Console click on the job row corresponding to the job
 - Click on the Send Event button
 - Select the Event Type
 - Enter the desired date and time when the job status is to be modified
 - Change the Queue Priority entry if Change Priority was selected
 - Select Status to send if Change Status was selected
 - Select the Send Priority
 - Click on the Execute button

Send Event GUI



Send Event

Event Type

- Start Job
- Force Start Job
- Change Priority
- Job On Hold
- Job On Ice
- Set Global
- Job Off Hold
- Job Off Ice
- Send Signal
- Comment
- Kill Job
- Stop Demon
- Change Status

Cancel Previously Sent Event Match on Time

Job Name:

Now Future

Date: (MM/DD/[YY]YY)

Time: (hh:mm) A.M. P.M.

Comment:

AUTOSERV Instance:

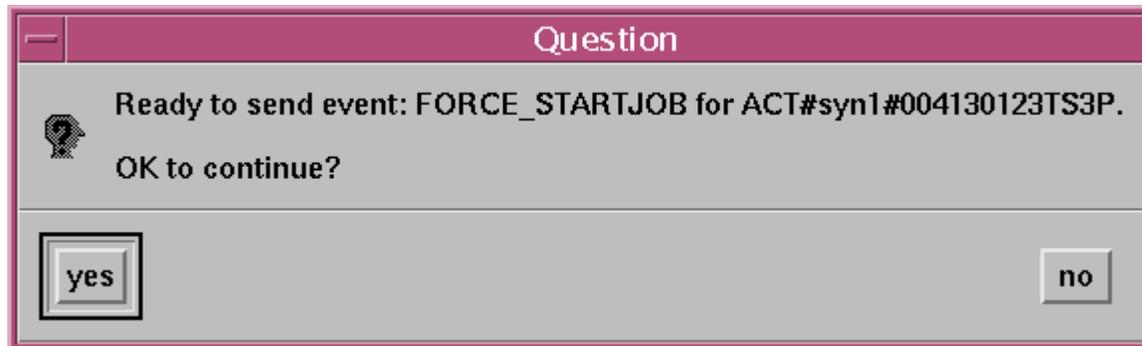
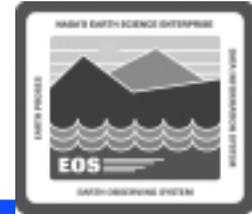
Global Name: Global Value:

Signal: Queue Priority:

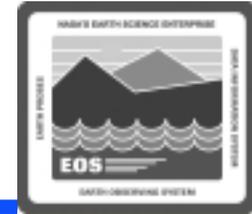
Status:

Send Priority: Normal High

Send Event GUI: Confirmation Dialogue Box

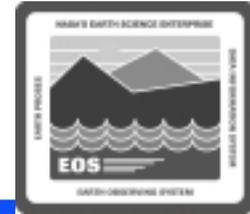


Modifying Job Status (Cont.)



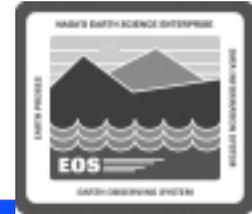
- **Procedure (Canceling a Sent Event)**
 - Click on the **Send Event** button in the **Actions Region** of the **Job Activity Console**
 - Click on **Event Type** to select the type of event that was sent to the job and is to be canceled
 - Click on the **Cancel Previously Sent Event** button
 - Verify that the correct job is listed in the **Job Name** field of the **Send Event GUI**
 - Click on the **Execute** button
 - Click on **Yes** to confirm canceling the sent event

Modifying Job Status (Cont.)



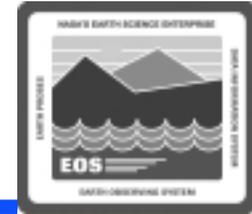
- **Performing Job Management Client Functions**
 - **Job Management Client tool is a set of utility programs intended primarily for use by software developers**
 - **Get access to any of the following Job Management Client functions from AutoSys by clicking on the Client Tool button in the Actions region of the Job Activity Console**
 - » **Create DPR Job**
 - » **Release DPR Job**
 - » **Cancel DPR Job**
 - » **Change DPR ID**
 - » **View Job Management DPR Queue**
 - » **Create Ground Event Job**
 - » **Cancel Ground Event Job**
 - » **Change Max Jobs for Autosys Instance**

Modifying Job Status (Cont.)



- **Procedure (Performing Job Management Client Functions)**
 - **Verify that the job with the status to be modified is listed in the Currently Selected Job field of the Job Activity Console (Ops Console)**
 - **Click on the Client Tool button**
 - **Enter the number corresponding to the desired function at the “enter an option” prompt**
 - **Enter responses to Job Management Client prompts**

Job Activation User Interface Window



```
Jobs Activation User Interface
4c09d76c-a3bf-11d4-a0b5-c676e820aa77@ncacn_ip_tcp:198.118.232.44[]
02/03/01 09:45:04: Thread ID : 1 : EcNsServiceLocClient.C - Trying binding:
4c09d76c-a3bf-11d4-a0b5-c676e820aa77@ncacn_ip_tcp:198.118.232.44[5872]
02/03/01 09:45:04: Thread ID : 1 : EcNsServiceLocClient.C - Binding to be returned:
4c09d76c-a3bf-11d4-a0b5-c676e820aa77@ncacn_ip_tcp:198.118.232.44[5872]
***** After Retrieving of RGY: Name = EcDpPrJobMgmtClient
ProgramID = 9001274
ApplicationID = 9000001
Site = VATC
Release = B
MajorVersion = 1
MinorVersion = 0
SubSysName = DPS
AppLogLevel = 0
AppLogSize = 200000
DebugLevel = 3
AppStrtNum = 12345
DBHandleList = PDPS
DBName = pdps
DBModeOverride = NONE
DBServer = t1pls01_srvr
DBLibrary = SYBASE_CT
SYBASE = /tools/syb0Cv11.1.1
SYBINTERFACES = /tools/syb0Cv11.1.1/interfaces

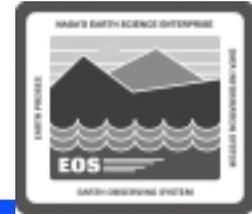
***** Finish the dump *****

*** Current DprId:ACT#syn1#004130123TS2 Current Mode:TS2 ***

0) Exit
1) Create Dpr Job
2) Release Dpr Job
3) Cancel Dpr Job
4) Change Dpr Id
5) View Job Management Dpr Queue
6) Create Ground Event Job
7) Cancel Ground Event Job
8) Change Max Jobs for Autosys Instance

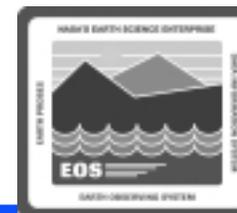
enter an option: █
```

Reviewing Activity and Job Dependency Reports



- **Reviewing a Job Activity Report**
 - **Production Monitor reviews a job activity report to determine...**
 - » **which jobs are currently in the AutoSys queue**
 - » **which jobs have been completed**
 - » **the completion status of jobs that have been completed**
 - » **which jobs are currently running**

Sample Job Activity Report

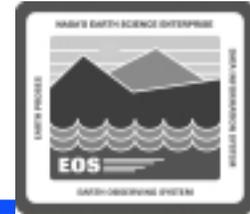


```
Terminal
Window Edit Options Help
5/2001 14:38 01/25/2001 14:38 SU 8508/1
t1sps02:/usr/ecs/TS2/CUSTOM/utilities[62] > autorep -J ETS#OnDema01093011TS2
Job Name                Last Start            Last End             ST   Run   Pri/Xit
-----
ETS#OnDema01093011TS2   01/25/2001 18:01     -----              RU  8511/1
ETS#OnDema01093011TS2R 01/25/2001 18:01     01/25/2001 18:07     SU  8511/1
ETS#OnDema01093011TS2E 01/25/2001 18:07     01/25/2001 18:07     SU  8511/1   255
ETS#OnDema01093011TS2P -----              -----              OH  8511/0

t1sps02:/usr/ecs/TS2/CUSTOM/utilities[63] > autorep -J ETS#OnDema01093011TS2
Job Name                Last Start            Last End             ST   Run   Pri/Xit
-----
ETS#OnDema01093011TS2   01/25/2001 18:01     -----              RU  8511/1
ETS#OnDema01093011TS2R 01/25/2001 18:01     01/25/2001 18:07     SU  8511/1
ETS#OnDema01093011TS2E 01/25/2001 18:07     01/25/2001 18:07     SU  8511/1   255
ETS#OnDema01093011TS2P -----              -----              OH  8511/0

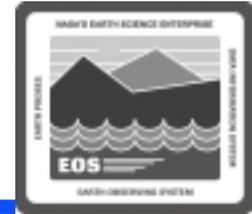
t1sps02:/usr/ecs/TS2/CUSTOM/utilities[64] > █
```

Reviewing Reports (Cont.): Job Activity Report

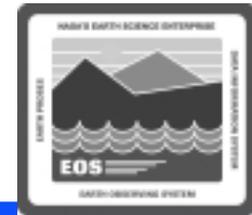


- **Procedure**
 - **Set up AutoSys**
 - **Type autorep -J ALL unless the command needs to be modified to:**
 - » **specify a particular job**
 - » **obtain a machine report**
 - » **obtain a summary report**
 - » **obtain a detailed report**
 - » **obtain a query report**
 - » **print the document**
 - » **save the document in a file**
 - **Review the Job Activity Report to identify job states**

Reviewing Reports (Cont.)



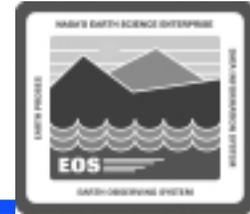
- **Reviewing a Job Dependency Report**
 - **Production Monitor reviews a job dependency report using the AutoSys `job_depends` command**
 - **`job_depends` command reports information about the dependencies and conditions of jobs**
 - » **current state of a job**
 - » **job's dependencies**
 - » **dependencies and nested hierarchies (for boxes) as specified in the job definition**
 - » **forecast of what jobs will run during a given period of time**



Sample Job Dependency Report

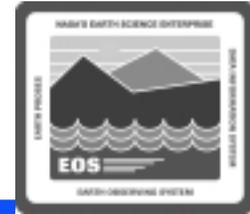
```
Terminal
Window Edit Options Help
t1sps02:/usr/ecs/TS2/CUSTOM/utilities[64] > job_depends -c -J ETS#OnDema01093011TS2E
-----
Job Name                Status          Date Cond?      Start  Dependent
-----                -
ETS#OnDema01093011TS2E SUCCESS         No              Yes    Yes
Condition: success(ETS#OnDema01093011TS2R)
Atomic Condition                Current Status T/F
-----                -
SUCCESS(ETS#OnDema01093011TS2R) SUCCESS         T
Dependent Job Name                Condition
-----                -
ETS#OnDema01093011TS2P            DONE(ETS#OnDema01093011TS2E)
-----
t1sps02:/usr/ecs/TS2/CUSTOM/utilities[65] > █
```

Reviewing Reports (Cont.): Job Dependency Report



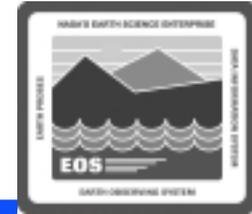
- **Procedure**
 - **Set up AutoSys**
 - **Type `job_depends -c -J ALL` unless the command needs to be modified to:
 - » **specify a particular job**
 - » **obtain the current condition status**
 - » **obtain the dependencies only**
 - » **obtain the time dependencies**
 - » **print the document**
 - » **save the document in a file****
 - **Review the Job Dependency Report to determine job states**

Defining and Running Monitors/Browsers



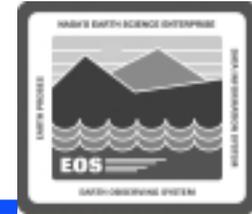
- **Defining Monitors/Browsers**
 - ECS does not currently support AutoSys monitor/browser capabilities
 - » However, they are functional and available
 - Production Monitor can use the AutoSys Monitor/Browser GUI to define monitors and browsers
 - » With no expectation of ECS support if problems are encountered
 - monitor function can limit monitoring to alarms and changes of job status (e.g., from “running” to “success” or “failure”)
 - browser function can be used to determine the eventual status of jobs run during the preceding shift or day; e.g., which jobs were successful, which jobs failed, and which jobs are still running

Sample Browser Screen



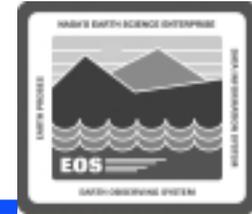
```
BROWSER: Browser
Code=0
Job: PM1DefAtt#063002000PSP STARTING 02/01/2001 16:14:29 Run# 8582:1
Job: PM1DefAtt#063002000PSP RUNNING 02/01/2001 16:14:33 Run# 8582:1
Job: PM1DefAtt#063002000PSP SUCCESS 02/01/2001 16:15:00 Run# 8582:1 Exit
Code=0
Job: PM1DefAtt#063002000PSE STARTING 02/01/2001 16:15:07 Run# 8582:1
Job: PM1DefAtt#063002000PSE RUNNING 02/01/2001 16:15:09 Run# 8582:1
Job: PM1DefAtt#063002000PSE SUCCESS 02/01/2001 16:15:12 Run# 8582:1 Exit
Code=200
Job: PM1DefAtt#063002000Psp STARTING 02/01/2001 16:15:18 Run# 8582:1
Job: PM1DefAtt#063002000Psp RUNNING 02/01/2001 16:15:21 Run# 8582:1
CHK_MAX_ALARM Job: PM1DefAtt#063004000PSE Machine: t1spg01
02/01/2001 16:15:24 Run# 8581:1
Job: PM1DefAtt#063002000PSE FAILURE 02/01/2001 16:15:30 Run# 8582:0 Exit
Code=0
Alarm: JOBFailure Job: PM1DefAtt#063002000PSE 02/01/2001 16:15:34 Run# 858
2:0 Exit Code=0
Job: PM1DefAtt#063002000Psp SUCCESS 02/01/2001 16:15:44 Run# 8582:1 Exit
Code=1
CHK_MAX_ALARM Job: PM1DefAtt#063002000PSE Machine: t1spg01
02/01/2001 16:46:09 Run# 8582:1
```

Monitors/Browsers (Cont.): Defining Monitors/Browsers



- **Procedure**
 - **Click on the Monitor/Browser button on the AutoSys GUI Control Panel**
 - **Type a name for the monitor or browser in the Name field near the top of the GUI**
 - **Select Types of Events**
 - **Select Job Status Events**
 - **Select the desired Job Selection Criteria**
 - **Select the desired Monitor Options if applicable**
 - **Select the desired Current Run Time and/or Events After Date/ Time, which are the Browser Time Criteria if applicable**
 - **Select the desired Mode**
 - **Save the monitor/browser**

Monitor/Browser GUI



Monitor/Browser

Clear Delete Save Run MonBro Exit

Name Mode Monitor
 Browser

Monitor/Browse these Types of Events

ALL EVENTS

Alarms

ALL Job CHANGE-STATUS Events

Job CHANGE_STATUS Events

Running Starting
 Success ReStart
 Failure Terminated

Job Selection Criteria

Job Filter ALL Jobs
 Box with its Jobs
 Single Job

Job Name

Monitor Options

Sound

Verification Required for Alarms

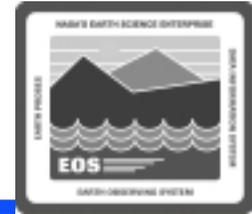
Browser Time Criteria

Current Run Only Yes
 No

- or -

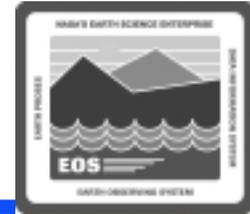
Events After Date/Time
(MM/DD/YY hh:mm)

Monitors/Browsers (Cont.)



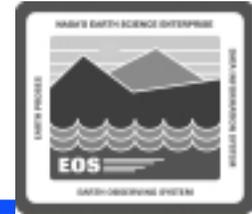
- **Running Monitors/Browsers**
 - may be run from the Monitor/Browser GUI as described in the preceding procedure
 - may be run using a UNIX command

Monitors/Browsers (Cont.): Running Monitors/Browsers



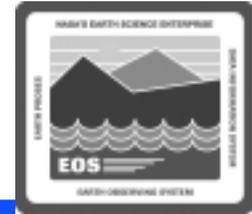
- **Procedure (Running Monitors/Browsers from the Monitor/Browser GUI)**
 - Click on the Monitor/Browser button on the AutoSys GUI Control Panel
 - Enter the name of the monitor/browser in the Name field
 - Click on the Run MonBro button
 - Click on the Exit button to exit from the Monitor/Browser GUI
 - Review the monitor/browser results
 - Type Ctrl-C in the browser/monitor window to exit from the browser or monitor

Monitors/Browsers (Cont.): Running Monitors/Browsers



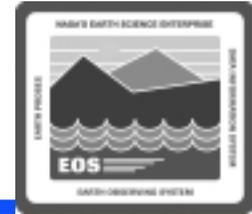
- **Procedure (Running Monitors/Browsers Using UNIX Commands)**
 - Set up AutoSys
 - Type `monbro -N name &`
 - Review the monitor/browser results
 - Type **Ctrl-C** in the browser/monitor window to exit from the browser or monitor

Changing the Database Maintenance Time



- **Database Maintenance Time**
 - Once a day the Event Processor (also known as the AutoSys daemon) goes into an internal database maintenance cycle
 - During this time, it does not process any events
 - It waits for the maintenance activities to be completed before resuming normal operations
 - Time of day for start-up of the maintenance cycle is pre-set to 3:30 AM
 - Database maintenance cycle takes approximately one minute
 - If it is necessary to change the time when the maintenance cycle occurs, whoever has “write” access to the configuration file can reset it
 - » Preferably to a time when there is minimal activity

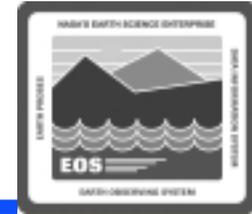
Changing the Database Maintenance Time (Cont.)



- **Procedure**

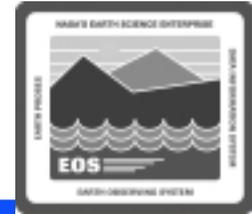
- Access the command shell
- Set the `DISPLAY` environmental variable
- Log in to the Queuing Server host using secure shell
- Change directory to the directory containing the config. *AutoSysInstance* file
- Use the vi editor to find `DBMaintTime=03:30` and replace the existing time with the desired time in 24 hour format (hh:mm)
- Save the edited file

Tuning System Parameters



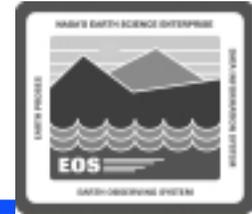
- **System parameters may be subject to control by Configuration Management (CM)**
 - When making or requesting a change to system parameters, the CM process at the particular site must be followed (if applicable)
- **Two databases where parameters can be set:**
 - PDPS database
 - Configuration Registry database

Tuning System Parameters (Cont.)



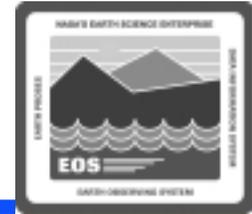
- **Configuration Registry**
 - **Configuration Registry Server provides a single interface (via a Sybase server) for retrieving configuration attribute-value pairs for ECS servers from the Configuration Registry database**
 - » **When ECS servers are started they access the Configuration Registry database to obtain needed configuration parameters**
 - **Database Administrator has access to a Configuration Registry GUI for viewing and editing configuration data in the database**
 - **It is necessary to coordinate with the Database Administrator when changes to configuration parameters are needed**
 - **Changes to configuration-controlled parameters are subject to approval through the site CM process**

Tuning System Configuration Parameters (Cont.)



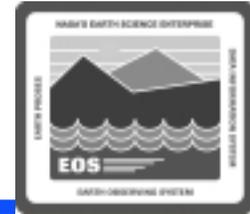
- **Default and adjusted values assigned to system parameters vary from site to site**
 - **For guidance concerning the assignment of values to parameters included in the Configuration Registry refer to document 910-TDA-022, Custom Configuration Parameters**
 - » **Document is available at <http://cmdm.east.hitc.com/baseline/>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

Tuning System Parameters (Cont.)



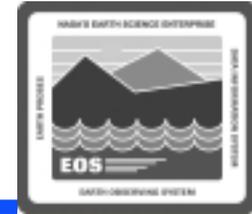
- **Parameters whose values may be modified to enhance system functioning or performance**
 - **AppLogSize**
 - » **Maximum size of the application log (ALOG) file for a particular application**
 - **AppLogLevel**
 - » **Level of detail provided in the ALOG file for a particular application**
 - **DebugLevel**
 - » **Level of detail provided in the debug log file for a particular application**
 - **DpPr_MAX_RETRIES**
 - » **Number of retries to the Science Data Server for acquires/inserts before giving up**

Tuning System Parameters (Cont.)



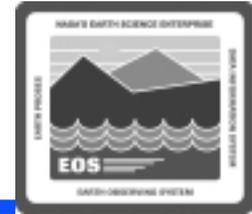
- **Tuning Parameters (Cont.)**
 - **DpPr_WAIT_PERIOD**
 - » Time (in seconds) to wait between retries to the Science Data Server
 - **ListenThreads**
 - » Number of listen threads assigned to a particular application
 - **DpPrRM_MAX_RETRIES**
 - » Number of retries when creating a Data Manager object (trying to allocate)
 - **DpPrRM_RETRY_PERIOD**
 - » Amount of time (in seconds) between retries when creating a Data Manager object (trying to allocate)

Tuning System Parameters (Cont.)



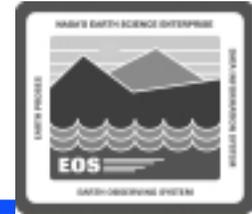
- **Tuning Parameters (Cont.)**
 - **DpPrMaxConcurrentDPRs**
 - » Maximum allowed jobs
 - » Three integer values - for routine processing, on-demand processing, and reprocessing jobs
 - **DpPrMinConcurrentDPRs**
 - » Minimum allowed jobs
 - » Three integer values - for routine processing, on-demand processing, and reprocessing jobs
 - **DpPrAutoSysMaxDPRs**
 - » Total number of completed jobs allowed in AutoSys
 - **MaxSlippagePerc**
 - » Percentage by which a granule can slip and still be considered a match

Tuning System Parameters (Cont.)



- **Tuning Parameters (Cont.)**
 - **AcceptableCertainty**
 - » Minimum overlap a granule must have
 - **DBConnections**
 - » Number of connections needed by a particular application
 - » Subscription Manager maintains only one connection to the database
 - **SleepDelayForFailures**
 - » Amount of time (in seconds) to wait before reprocessing failed notifications
 - » If the specified value is less than 60, a default value of 60 seconds would be assumed

Tuning System Parameters (Cont.)

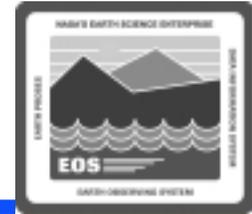


- **Tuning Parameters (Cont.)**

- **SleepDelayForTimers**

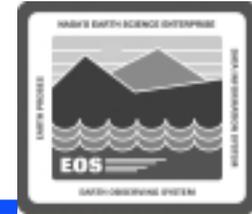
- » **Amount of time (in seconds) the Subscription Manager should sleep between checking for expired timers**
 - » **Should be set to the minimum amount of time a timer will be set for at this DAAC**
 - » **Minimum it can be set to is 60 seconds**

Modifying System Parameters (Cont.)



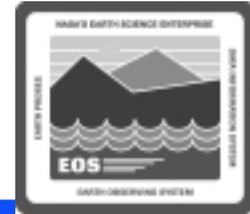
- **When the value assigned to a parameter has been changed and saved in the Configuration Registry, the modified value does not take effect until the affected server has been restarted**
- **Example**
 - **Debug level for the Subscription Manager log has been changed from “2” to “3” in the Configuration Registry**
 - **Modification does not affect the recording of data in the log until after a warm restart of the Subscription Manager (at which time the server would read the parameters in the Configuration Registry)**

Tuning System Parameters (Cont.)



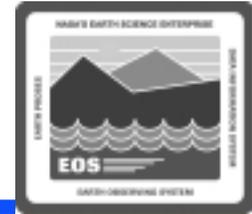
- **Production Planner and Production Monitor should work with the Resource Planner to make optimum use of processing resources**
 - Resource Planner allocates the disk partitions, CPUs, and RAM available for processing among the active modes (e.g., OPS, TS1, TS2)
 - Production Planner and Production Monitor monitor the load on the processing resources

Tuning System Parameters (Cont.)



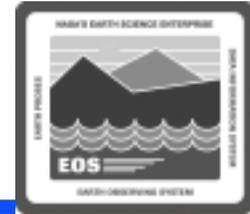
- **Resource Planner assigns the bulk (typically 60% - 80%) of the processing resources to the OPS mode**
 - The remainder of the processing assets are divided among the modes used for SSI&T and new version software checkout
- **The Production Planner and Production Monitor monitor the load on the processing resources to identify whether the actual load is appropriately distributed among modes**
 - They inform the Resource Planner of under- or over-use of resources as allocated

Tuning System Parameters (Cont.)



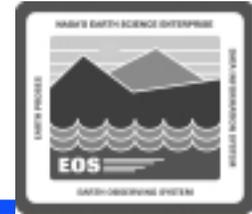
- **Disk space allocation**
 - Disk space allocated to OPS mode is likely to be used to capacity
 - Disk space assigned to the other two modes may not fill up
- **CPU allocation**
 - There is no one-to-one mapping of CPU allocation with actual CPUs on the science processor
 - The operating system(OS) takes care of true CPU and RAM allocation
 - » Actual CPU usage during processing is limited by OS
 - » If ten CPUs have been specified for a particular mode, only ten DPRs can be running the Execute job at a given time
 - » What is really being defined is the maximum number of DPRs that will execute at a given time

Tuning System Parameters (Cont.)



- **CPU allocation (Cont.)**
 - CPUs can be over-allocated or under-allocated as necessary to get the most out of the CPUs on each science processor
 - » If monitoring indicates that the processor is underused when OPS mode is at full processing capacity, the number of CPUs allocated to OPS mode could probably be increased
 - » If the science processor is at full capacity when OPS mode is at full processing capacity (and the processor may be overworked) the number of CPUs allocated to OPS mode should be reduced
- **Random-access memory (RAM) allocation**
 - Subject to the same considerations as CPUs
 - RAM can be over-allocated or under-allocated as necessary to get the most out of the memory on each science processor

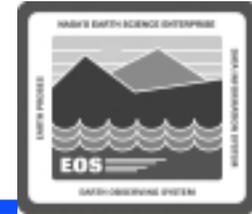
Troubleshooting Processing Problems



- **Troubleshooting:**

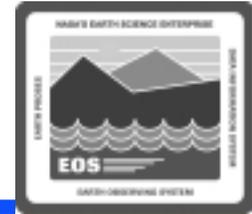
process of identifying the source of problems on the basis of observed trouble symptoms

Troubleshooting Processing Problems



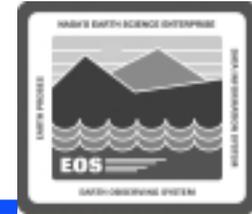
- **Problems with production planning can usually be traced to...**
 - **some part of the Data Processing Subsystem**
 - **problems in other ECS subsystems, including (but not necessarily limited to):**
 - » **Planning Subsystem (PLS)**
 - » **Data Server Subsystem (DSS)**
 - » **Interoperability Subsystem (IOS)**
 - » **Communications Subsystem (CSS)**

Troubleshooting Processing Problems (Cont.)



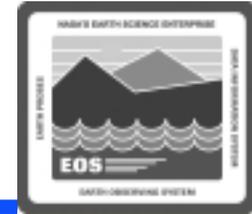
- **Troubleshooting table**
 - describes actions to be taken in response to some common Processing problems
 - if the problem cannot be identified and fixed without help within a reasonable period of time, call the help desk and submit a trouble ticket in accordance with site Problem Management policy

Troubleshooting Processing Problems (Cont.)



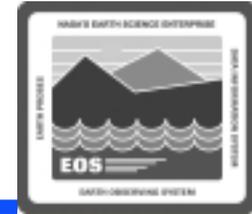
Symptom	Response
Unable to log in to the Queuing Server host (e.g., g0sps06).	Check with the Operations Controller/System Administrator to ensure that the host is "up."
GUI not displayed when the start-up script has been properly invoked.	Ensure that the DISPLAY variable was set properly. [For detailed instructions refer to the procedure for Launching the AutoSys GUI Control Panel (previous section of this lesson).]
Entire processing system hangs (no jobs change state over time).	Refer to the procedure for Responding to Hanging of the Processing System (subsequent section of this lesson).
Jobs are activated but do not get started in AutoSys.	Refer to the procedure for Responding to Failure of Jobs to Start in AutoSys (subsequent section of this lesson).
AutoSys box job hangs (does not change state over time).	Refer to the procedure for Handling a Box Job that is Hanging in AutoSys (subsequent section of this lesson).
"Preprocess" function fails (job either does not change state over time or has turned red on JobScape or TimeScape).	Refer to the procedure for Handling a Hanging or Failed Preprocessing Job (subsequent section of this lesson).
"Execute" job hangs (job has turned orange or oscillates between orange and green on JobScape or TimeScape).	Refer to the procedure for Handling a Hanging Execution Job (subsequent section of this lesson).
"Execute" job fails (job has turned red on JobScape or TimeScape).	Refer to the procedure for Handling a Failed Execution Job (subsequent section of this lesson).

Troubleshooting Processing Problems (Cont.)



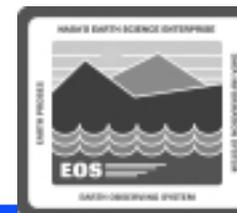
Symptom	Response
“Postprocess” job fails (job has turned red on JobScape or TimeScape).	Refer to the procedure for Handling a Failed Postprocessing Job (subsequent section of this lesson).
Both the “Execute” and “Postprocess” jobs fail (jobs have both turned red on JobScape or TimeScape).	Refer to the procedure for Handling Failure of Both Execution and Postprocessing Jobs (subsequent section of this lesson).
On-Demand Processing Request fails.	Refer to the procedure for Handling a Failed On-Demand Processing Request (subsequent section of this lesson).
Other problems.	Check the log files (e.g., EcDpPrJobMgmt.ALOG, EcDpPrJobMgmt.Debug.log, EcDpPrDeletion.ALOG, <i>DPR#.ALOG</i> , <i>DPR#.err</i> , etc.) in the /usr/ecs/ <i>MODE</i> /CUSTOM/logs directory for error messages. [For detailed instructions refer to the procedure for Checking Log Files (subsequent section of this lesson).]

Hosts, Servers, Clients and Other Software Relevant to Processing



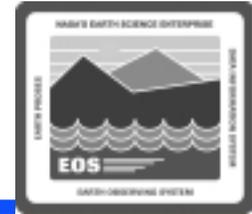
HOST SERVER/CLIENT/OTHER SOFTWARE NOTE: Depending on the installation, software may be loaded on hosts other than the examples provided.	PROCESSING PHASE		
	PRE-PROCESS	EXECUTE	POST-PROCESS
Science Processor (e.g., x0spg01)	X	X	X
PGE Management (EcDpPrRunPGE)		X	
Resource Usage (EcDpPrRusage)		X	
PGE		X	
Queuing Server (e.g., x0sps04)	X	X	X
Job Management Server (EcDpPrJobMgmt)	X	X	X
Deletion Server (EcDpPrDeletion)	X	X	X
Data Management (EcDpPrDM)	X		X
Execution Management (EcDpPrEM)	X		X
AutoSys Event Processor (event_demon)	X	X	X
AutoSys Event Server (Sybase server) (e.g., x0sps03_svr)	X	X	X
On-Demand Manager (EcPIOdMgr)	X	X	X
PDPS DBMS Server			
Subscription Manager (EcDpPISubMgr)			
Sybase server (e.g., x0pls01_svr)	X	X	X
Distribution Server (e.g., x0dis02)	X		X
Distribution Server (EcDsDistributionServer)	X		X

Hosts, Servers, Clients and Other Software Relevant to Processing



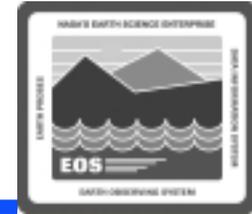
HOST SERVER/CLIENT/OTHER SOFTWARE NOTE: Depending on the installation, software may be loaded on hosts other than the examples provided.	PROCESSING PHASE		
	PRE-PROCESS	EXECUTE	POST-PROCESS
SDSRV Server (e.g., x0acs05)	X		X
Science Data Server (EcDsScienceDataServer)	X		X
APC Server (e.g., x0acg01)	X		X
Archive Server (EcDsStArchiveServer)	X		X
FTP Distribution Server (EcDsStFtpDisServer)	X		X
Staging Monitor Server (EcDsStStagingMonitorServer)	X		X
Staging Disk Server (EcDsStStagingDiskServer)	X		X
Pull Monitor Server (EcDsStPullMonitorServer)			
Ingest Server (e.g., x0icg01)			
Registry Server (EcCsRegistry)			
Interface Server 01 (e.g., x0ins02)	X		X
Advertising Server (EcIoAdServer)	X		X
Interface Server 02 (e.g., x0ins01)	X		X
Subscription Server (EcSbSubServer)	X		X
Event Server (EcSbEventServer)			
Data Dictionary (EcDmDictServer)			

Troubleshooting Processing Problems (Cont.)



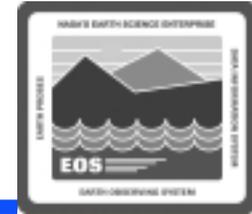
- **Responding to hanging of the processing system**
 - Checking AutoSys status
- **Responding to failure of jobs to start in AutoSys**
 - Checking Job Management server status
 - Checking to determine whether the DPR is waiting in the AutoSys queue (never got released)
 - Responding to a DPR that was released but failed due to an AutoSys ID failure
 - Responding to a DPR that was released but failed due to invalid DPR
 - Responding to a DPR that was released but failed to be received by Job Management server

Troubleshooting Processing Problems (Cont.)



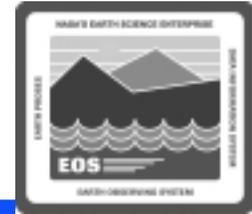
- **Responding to a single DPS job that has failed or is hanging**
 - Handling a box job that is hanging in AutoSys
 - Handling a hanging Allocation function
 - Handling a failed Allocation function
 - Handling a hanging Staging function
 - Handling a failed Staging function
 - Handling a failed Preprocessing job
 - Handling a hanging Execution job
 - Handling a failed Execution job
 - Handling a failed Post-Processing job
 - Handling a failed Insertion function

Troubleshooting Processing Problems (Cont.)



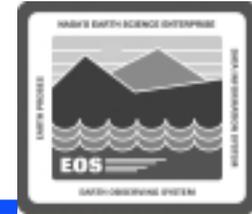
- **Handling a failed On-Demand Processing Request**
 - Responding to a DPR that failed in OdMgr because the PGE ID could not be found
- **Checking log files**

Launching the QA Monitor



- **Procedure**
 - Access the command shell
 - Set the **DISPLAY** environmental variable
 - Log in to the **Planning/Management Workstation** using secure shell
 - Set the **ECS_HOME** environmental variable if necessary
 - Start the **QA Monitor GUI** in the appropriate mode

QA Monitor GUI: QRU Data Tab



Q/A Monitor

File Help

QRU data Visualize data

Data Types

- DAP
- FAILPGE
- MOD00
- MOD01
- MOD02HKM
- MOD03
- MOD03LUT
- MOD10_L2**
- MOD35_L2

Data Granule Insert (mm/dd/yyyy)

Begin 08 / 04 / 1998

End 08 / 06 / 1998

Query

Find

Data Granules:

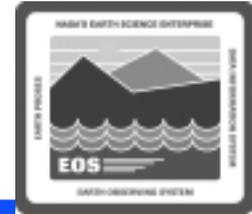
Acquisition Date	Acquisition Time	First FileName	Granule FileSize (K)	Prod.History FileName
08/05/96	11:55:01	:SC:MOD10_L2:1411:1.HDF-EOS	21.3	PGE07#1.0#010805961
08/05/96	11:55:01	:SC:MOD10_L2:1325:1.HDF-EOS	21.3	PGE07#1.0#010805961
08/05/96	11:55:01	:SC:MOD10_L2:1279:1.HDF-EOS	21.3	PGE07#1.0#010805961

Find

Retrieve DataGranule Retrieve ProdHistory Update Metadata

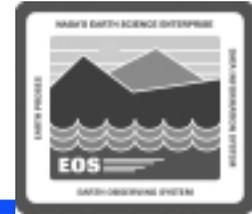
Status: ...Done Querying Data Server ...

Performing Science Product Quality Assurance (QA)



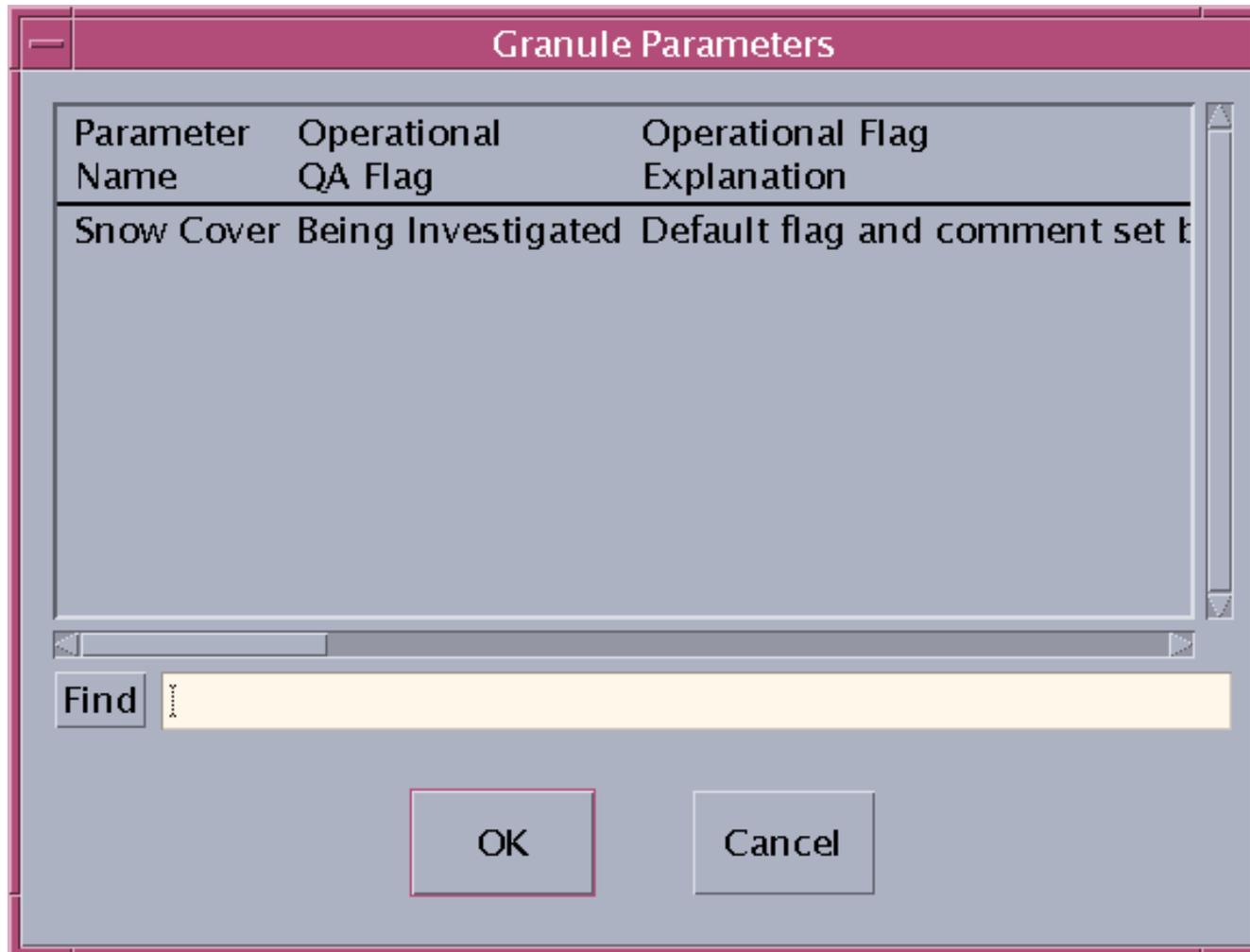
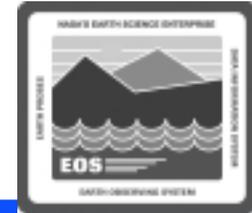
- **Uses the QA Monitor application**
- **Science Computing Facility Personnel**
 - responsible for performing QA of their products
- **Production Monitor**
 - updates QA metadata in response to a request from SCF personnel to set the metadata flags on specified granule(s)

Updating Quality Assurance (QA) Metadata

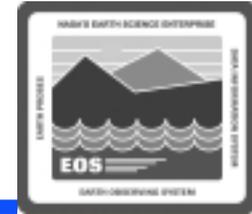


- **Procedure**
 - **Set up and query the database using the QA Monitor GUI**
 - **Select the granule with QA metadata to be updated**
 - **Set the operational and SCF quality flags to the appropriate value (as specified by the SCF personnel)**
 - **Verify that the flags have actually been set in the database by repeating the set-up and query processes**

QA Monitor GUI: Granule Parameters Window



QA Monitor GUI: Update Meta Data Window

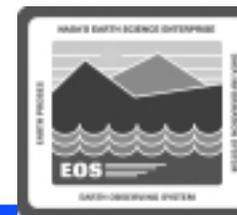


The screenshot shows a window titled "Update Meta Data" with a light blue background. It contains three rows of data, each with a label, a dropdown menu, and a text area for an explanation.

		Explanation
Operational Quality Flag	Being Investigated	Default flag and comment set by system.
SCF Quality Flag	Being Investigated	Default flag and comment set by system.
Auto Quality Flag	Passed	Passed if algorithm ran within bounds of executi

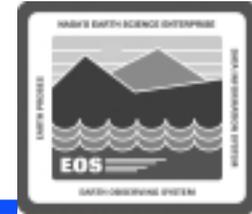
At the bottom of the window are three buttons: "OK", "Cancel", and "Help".

Regenerating Granules



- **Produce replacements for previously generated granules that have been lost or corrupted due to failure in the ECS archive**
- **General Process:**
 - **Retrieve the Production History file (PH) for the lost granule to determine parameters for the generation of replacement granules**
 - **Create Production Requests for the generation of replacement granules**
 - **Create and activate a Production Plan that includes the Production Requests for the generation of replacement granules**
 - **Prepare (if applicable) a “PDPS Residual Granules List,” which identifies granules that either cannot or should not be regenerated at the DAAC**
 - **Some granules do need not be reproduced; e.g., if there is a more recent version of the product**

Regenerating Granules (Cont.)



- **Procedure**

- Retrieve the Production History tar file for each granule in the Granules for PDPS Re-Generation list that needs to be reproduced
- Launch the SSIT Manager GUI
- Re-register the PGE (if not currently registered)
- Launch the Production Request Editor
- Create a Production Request for the relevant PGE/version/profile ID
- Launch the Planning Workbench
- Create and activate a production plan that includes the newly created Production Request(s)
- Send the PDPS Residual Granules list to the originator of the Granules for PDPS Re-Generation list