

11. SSIT Operational Procedures

The SSI&T operational procedures are given in this section. They are organized by activity. The order in which the procedures appear loosely follows the order in which they will usually be performed.

These procedures present the use of GUIs supplied in Release 5A. Some procedures may have a command line equivalent; these are documented in the corresponding GUI help screens but are not presented here in the interest of simplicity. Release 5A Operations Tools Manual 609-CD-500-001 should be referred to for more detailed information on how to use GUI's and command line equivalent usage.

A Note About the Order of Procedures

The science software I&T operational procedures contained within this document are ordered. The order is intended to *loosely* suggest a logical sequence which, when used as a "road map", represents an overall, sensible end-to-end SSI&T activity at the Release 4 DAACs. The ordering cannot, however, be interpreted as a detailed, step-by-step guide to SSI&T activities. In addition, since there are many factors that affect the actual SSI&T activities during Release 4 (e.g. Instrument Team deliveries, DAAC policies, agreements between the Instrument Teams and the DAACs, etc.), the ordering in this document can only be suggestive.

Many of the procedures outlined in this document are inter-related. A procedure may assume that another procedure has been completed. In general, the ordering of the procedures reflects this. The user should be aware, however, that this is not the case for all procedures. Therefore, depending on the SSI&T activity, the ordering suggested may not apply. Procedures may require other procedures that appear *after* the procedure requiring them.

Assumptions

All procedures in this paper assume the following: that the Instrument Team has delivered the science software to the DAAC and that Release 4 ECS is available at the DAAC.

Conventions

The following conventions are followed for explaining procedures:

Text that should be typed literally in the "Action" column of the procedures is displayed in `courier` font. Text within a literal command that represents a fill-in-the-blank object is displayed in *italic courier* font. (Example: `cd mydir` means type "cd" and then type the name of the correct directory.)

A command line in the "Action" column that should be typed in without a line break will be indicated by an indent in any following lines. The end of the command is indicated by <ENTER>, which stands for pressing the ENTER or RETURN key.

11.1 Science Software Integration and Test (SSI&T) Preparation and Setup

11.1.1 Key Operator Roles

Science Coordinator: Provide support to Instrument Teams for the integration and testing of science software in the ECS system at the DAAC. Perform standard checking on all delivered software including source code, scripts, process control files and related documentation.

Science Data Specialist: Serves as a point-of-contact for planning, integrating, testing, and operating science software.

CM Administrator: Record, report, manage and distribute new and updated science software.

Science Software I & T Support Engineer: Provide support to Instrument Teams for the development, integration, test and problem resolution of science software.

Production Planner: Populate, maintain and schedule the production planning database for science software.

MODIS Science Data Processing Software Version 2.0 System Description Manual

This manual should be referred to for more detailed information on how to perform the SSI&T operational procedures as they apply to MODIS PGE's. It covers the specific attributes for each individual PGE and setup criteria.

11.1.2 COTS Software Tools

ClearCase: This tool is used as the ECS software configuration management tool. ClearCase provides a mountable file system which is used to store version-controlled data, such as source files, binary files, object libraries and spreadsheets.

Distributed Defect Tracking System (DDTS): This tool is used to electronically process configuration change requests (CCRs). DDTS will prompt the user for relevant information, identify the request and will mail these requests to pre-designated personnel.

11.1.3 General Process

The SSI&T process consist of two activities:

- **Pre-SSI&T Activity** - During this activity the Delivered Algorithm Package (DAP) is inspected, and tested in a non-production environment.

- **Formal SSI&T Activity** - During this activity, the Product Generation Executives (PGEs) are integrated with the DAAC version of the SDP Toolkit and executed on the ECS PDPS platform.

Key Terms:

- **Product Generation Executives (PGEs)** - The smallest scheduled unit of science software.
- **Delivered Algorithm Package (DAP)** - An ensemble of PGE source code, makefile, documentation, and other related files delivered in a package from the SCF to the DAAC for SSI&T..
- **Process Control File (PCF)** - Relate logical identifiers to physical files and other parameters required by the PGE.
- **Strings** - The processing hardware on which the science software runs.
- **Archive** - A File Storage Type indicating that granules that will be inserted Data Server are intended for long term storage and acquisition for distribution.
- **Collection** - A related group of data granules.
- **Granule** - The smallest data element which is identified in the inventory tables.
- **Product** - A set of output values generated by a single execution of a PGE for archival by ECS. A PGE may generate one or more products whose attributes are defined by the data provider.
- **Reliability** - Software reliability means that the software runs to normal completion repeatedly over the normal range of data inputs and running conditions.
- **Safety** - Software safety means that the software executes without interfering with other software or operations.

The science software in the DAPs will be integrated onto the PDPS and be used to produce the output data as determined by the algorithms. The refined and updated DAPs and data produced by the science software will eventually be provided to the subscribing user. Before the PGE is integrated into a production environment, extensive testing on the software must be performed.

The following list provides a suggested, logical “road map” for getting science software tested and integrated into the ECS. This list is not intended to cover every situation and variations may be required.

11.1.3.1 GENERAL

- Science Software Integration and Test (SSI&T) is the process by which the science software is tested for production readiness in the DAACs in order to assure its (1) reliability and (2) safety. Prior to the delivery of the ECS software to the DAACs, SSI&T Checkout is conducted on early versions of the Products Generation Executives (PGEs) using separate system modes in the ECS Mini-DAAC, VATC (Verification and Acceptance Test Configuration), or the DAAC environments.

- SSI&T activities can be broadly separated into two categories: pre-SSI&T and formal SSI&T. Pre-SSI&T activities are those which do not involve the ECS Planning and Data Processing (PDPS) or the Science Data Server (SDSRV), but the formal SSI&T activities do involve the full ECS including the PDPS and the SDSRV.
- Most steps in the SSI&T process are inter-related and some steps may assume that another step has been completed. The ordering of the steps is very important but it cannot, however be interpreted as a detailed, step-by-step guide to SSI&T activities.
- Science Software Integration and Test consists of the following activities most of which are fully detailed in Science Software Integration & Test Operational Procedures for the ECS Project (162-TD-001).
- The activities described in the following are also depicted in a (SSI&T Process Flow Diagrams 1 and 2) see **Figure 11.1.3.1-1** and **Figure 11.1.3.1-2**.

SSI&T PROCESS FLOW DIAGRAM 1

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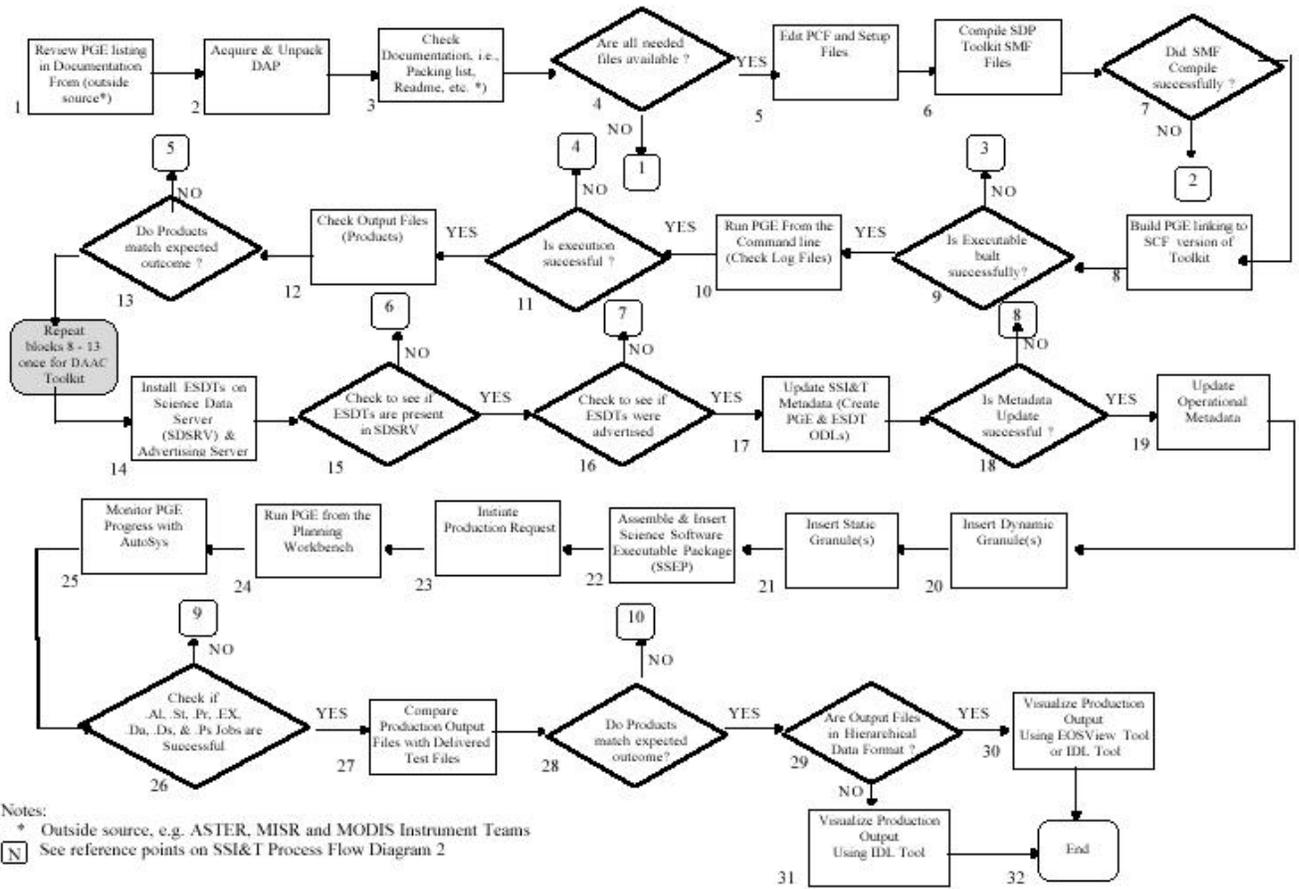


Figure 11.1.3.1-1 SSI&T Process Flow Diagrams 1

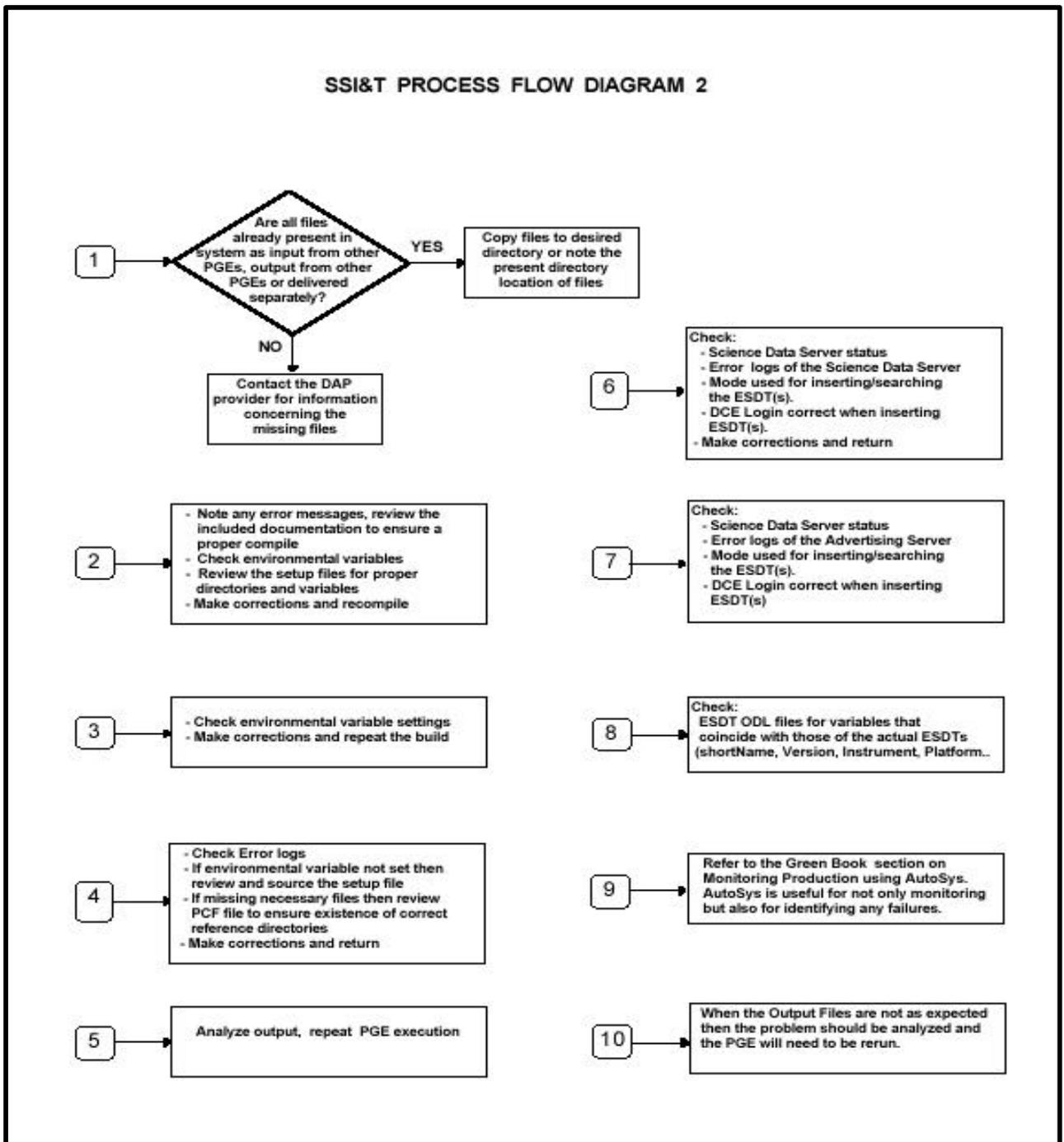


Figure 11.1.3.1-2 SSI&T Process Flow Diagrams 2

11.1.3.2 Pre-SSI&T Activities

- 1 As the DAP is delivered to a DAAC by the Instrument Team for SSI&T, the PGE listing documentation is reviewed.

- 2 The DAP is acquired and unpack and the documentation (i.e., packing list, readme, etc.) checked. The DAP contents are further checked by the Science Data Specialist to verify that the contents match the packing list, agreed-upon directory structures are employed, location of files are correct, and all intended files and directories are present.
- 3 The Science Data Specialist requests that the CM Administrator place the DAP under Configuration Management control using ClearCase.
- 4 The SSI&T team checks the science software for standards compliance using the Process Control File Checker to check process control files (PCF), and the Prohibited Function Checker to check source files. Extract and check prologs.
- 5 The SSI&T team builds the science software into PGEs using the SCF version of the SDP Toolkit. Compile all source code. Link object code with appropriate libraries. . If the SMF files compile successfully, then proceed to Step 11 below; otherwise. the problem needs to be fixed and a successful compile must occur before proceeding further. This may require one or more of the following:
 - Note any error messages and review the included documentation to ensure a proper compile;
 - Check environmental variables;
 - Review the setup files for proper directories and variables;
 - Make corrections and recompile.
 - If the executable builds successfully, proceed to Step 12. If the build fails, it may necessary to do one or more of the following before proceeding:
 - Check environmental variables;
 - Make corrections and repeat the build.
- 6 Run the PGE from the Command Line.

If it the execution is successful, then the output files (products) are checked using the SSIT Manager file comparison tools; otherwise, one or more of the following needs to be done before proceeding:

 - Check error logs;
 - Check environmental variables;
 - Review and source the setup files;
 - If necessary files are missing, then review the PCF file to ensure the existence of correct reference directories.
- 7 The SSI&T team runs and profiles the PGEs from the UNIX command line on the SGI, saving the profiling results. They will be used later when entering operational metadata into the PDPS.
- 8 The SSI&T team collects performance statistics for the PGEs.

- 9 The SSI&T team examines the output log files from the PGE runs for any anomalous message. The SSI&T team compares the output product data with the delivered test data using the file comparison tools. If the products do not match the delivered test outputs (expected outcome), the outputs should be analyzed and the PGE must be re-run. If the products match the delivered test outputs then
- 10 Steps 10 through 13 are repeated once using the DAAC Toolkit. If the products generated with the DAAC Toolkit match the delivered test output, formal SSI&T may begin.
- 11 SSI&T team reports any science software problems using the DDTS NCR process.
- 12 The SSI&T team reports any ECS problems using the DDTS NCR process.
- 13 The SSI&T team collects and logs all lessons learned.

11.3.3.3 Formal SSI&T Activities

- 1 For each ESDT used by the PGE, construct an ESDT ODL file for updating the PDPS or verify that they already exist. ESDT ODL files are also needed for all input and output data granules.
- 2 Construct a PGE ODL file for updating the PDPS database. This involves using the delivery PCF to construct an initial PGE ODL template file, which must then be hand edited to add required metadata. A mapping between logical IDs in the PCF and ESDT ShortNames must be known before this step is done.
- 3 Install ESDTs on the Science Data Server if verification indicates that they do not already exist. Installation links the PGE to all input and output ESDTs which allows the PGE to run within the PDPS. The Advertising Server must also receive notification of the update. If this fails then the ESDT's must be re-installed again after removing original ESDT's from the SDSRV. Note: While installing ESDT's the SDSRV intermittently coredumps. To clean-up you must remove the ESDT from ADSRV, SBSRV and DDICT and then try again.
- 4 The SSI&T Metadata is updated (PGE & ESDT Object Description Language or ODLs are created). This supplies metadata to the PDPS database
 - If the Metadata update is successful, then the Operational Metadata is updated; otherwise, the ESDT ODL files may have to be checked for correctness before updating the Operational Metadata.
- 5 Register the PGEs with associated data in the PDPS database. This step uses the PGE ODL from step 22 above.
- 6 For each input dynamic data granule needed by the PGE, construct a Target MCF and insert it to the Science Data Server.
- 7 For each input static granule needed by the PGE, construct a Target MCF and insert it to the Science Data Server.
- 8 Assemble the SSEP (as a tar file) and Insert it to the Science Data Server.

- 9 Initiate a Production Request (PR) that will result in one or more DPRs.
- 10 Use the Planning Workbench to plan the PR and hence, run the PGE.
- 11 Monitor the PGE run using AutoSys. The PGE's progress is monitored using the AutoSys COTS. The distinct steps that are visible on the AutoSys GUI and whose success is evident are Resource Allocation (.Al), Staging (.St), Pre-Processing (.Pr), Execution of the PGE (.EX), Post-processing (.Ps), De-staging (.Ds), and De-Allocation of resources (.Da).
- 12 If any of the steps in the execution is not successful, then each failure must be identified and corrected before proceeding to the next step.
- 13 Examine the output Production History File from the PGE runs for any anomalous messages. Compare the output product data with the delivered test data using the file comparison tools. . If any of the steps in the execution is not successful, then each failure must be identified and corrected before proceeding to the next step.
- 14 If the output files match the test output files and they are in Hierarchical Data Format (HDF), they are visualized using the EOSView tool, or the Interactive Display Language (IDL) tool. If the files are not HDF, then IDL is used.
- 15 Using the Planning subsystem, initiate more complex Production Requests if chaining is required.
- 16 Using electronic or hard media transfer methods, distribute the data products to the Instrument Teams for their review.

RECORDS

A weekly SSI&T status report is provided to NASA. This report contains the Performance Measurement Data.

PERFORMANCE MEASUREMENTS

SSI&T PGEs planned vs. actually delivered, pre-tested, and integrated is the metric used to monitor the effectiveness of the process described in the Procedure. Additionally, the Duration of Effort Required to Integrate in Work Days is used.

11.1.4 Preparation and Setup

- 1 Log into one of the AIT Sun workstations by typing: **username** then press the **Enter** key.
- 2 Enter the **password** then press the **Enter** key.

If you access the workstation through a remote login (rlogin), you must enter **xhost <remote_workstation_name>** then press the **Enter** key.

Once you have entered `xhost <remote_workstation_name>`, but prior to the remote login, enter `setenv DISPLAY <local workstation IP address>:0.0` where the local workstation IP address represents the IP address you where you are located.

You may need to setup the terminal so that the remote host is displayed on your screen. (Sun machine) This is done by clicking on the **Application Manager** icon (the file drawer located at the bottom of the screen), followed by the **Desktop Tools** icon, followed by the **Terminal Console** icon, then typing `xhost <remote_workstation_name>` .

- 3 Perform a remote login by typing `rlogin [host]` then press the **Enter** key.
The **Enter Password** prompt is displayed.
- 4 Enter the **password** then press the **Enter** key.
- 5 Enter the directory where the setup script is located by typing `cd [directory name]` then press the **Enter** key.
- 6 Source the setup script by typing `source [script name]` then press the **Enter** key.
The setup script contains directory paths, sets of alias commands, and tools for SSI&T.
 - For example, source the SSI&T script: Type `source /usr/ecs/{MODE}/CUSTOM/utilities /.buildrc <RETURN>`
Note: This step only needs to be done once per login.
 - `source .buildrc` may not be supported on a particular software drop. Therefore the SSI&T scripts will be built into other another script.
- 7 To ensure access to the multi server environment when needed, the following generic login commands have been established and should be used routinely:
 - From a terminal: `xterm -n (host) &`
 - From the xterm invoked: `telnet (host)`
 - **login cmts1**
 - **pw: ecsu\$er**
 - **dce_login awhitele awhitele**
DCE is an acronym for a Distributed Computing Environment.
 - `setenv DISPLAY:0.0`
- 8 Listed are some of the GUI tools, typical servers (examples and their Host that need to be considered for activation when conducting SSI&T:
 - **ECS Assistant, ADSRV/DM/IOS, incagold,**
 - **ECS Assistant, SDSRV/DSS, texas**
 - **ECS Assistant, DPS, taltos**
 - **ECS Assistant, SBSRV/CSS/IOS, sahara**
 - **SSIT Manager tools, AITTL/DPS calahans**

- **Production Request, PLS, odyssey**
 - **Planning Workbench, PLS, odyssey**
Note: NETSCAPE should be closed to allow for a full screen GUI to be activated.
 - **Monitor PGE, odyssey**
- 9 A second xterm should be activated with the same login procedures so as to monitor the (log files) when entering SSI&T files from GUI's.
 - 10 Servers can be brought down in any order. To bring them backup requires that they be brought up in a **sequential order to ensure connectivity**, the order is listed as follows:
 - **STMGT, MSS, DDIST, IOS, SDSRV, PDPS**
 - 11 The above servers have unique hosts assigned. Each host needs to be logged into the **generic login: cmts1, pw: ecsu\$er, dce_login awhitele awhitele** before activating ECS Assistant to carryout the downing and bringing up of servers assigned to their respective hosts.

11.1.5 SSIT Software Operating Instructions:

Starting the SSIT Manager GUI:

On workstation **x0ais##**, at the UNIX prompt in a terminal window, type as in step 1 below your user id and password.

NOTE: The **x** in the workstation name will be a letter designating your site: **g** = GSFC, **m** = SMC, **l** = LaRC, **e** = EDC, **n** = NSIDC, **o** = ORNL, **a** = ASF, **j** = JPL; the **##** will be an identifying two-digit number (e.g., **g0ais01** indicates a Data Processing Subsystem (DPS) workstation at GSFC).

If you access the workstation through a remote login (rlogin), you must enter **xhost <remote_workstation_name>** prior to the rlogin, and enter **setenv DISPLAY <local_workstation IP address>:0.0** after the rlogin, before entering the command. The **<ipaddress>** is the ip address of **x0ais##**, and **xterm** is required when entering this command on a Sun terminal.

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- 1 **Example:** Log into an Algorithm and Test Tools (AITTL) environment using using a machine so configured. At the mini-daac this machine is **calahans**. A special host has been established using the id: **cmts1** and password: **ecsu\$er**. Type: **setenv DISPLAY:0.0**
 - 2 *Login to DCE (dce_login <awhitele awhitele>)*
 What the user must do before trying SSIT functionality:
 - 3 **setenv <mode> : (cd /usr/ecs/<MODE>/CUSTOM/utilities** Note that this only has to be done once per login.

- 4 This directory should contain scripts pertaining to setting the environment for SSIT Manager. Type in: **EcDpAtMgrStart <mode> &**
- This invokes the **SSIT Manager GUI** which should be displayed.

What must be done via SSIT tools:

Since SSIT is just a calibration of various tools, there is no specific order for which they must be run. Most tools can be brought up from the SSIT Manager GUI as well as started on their own.

The File menu provides the capability to exit the manager. The Tools menu provides access to the various tools that make up SSIT. The Run menu is customizable (allowing you to add your own scripts and tools) by editing the file *ssit_run_menu* in the *data/DPS* directory.

The checklist (first window on the GUI) allows you to check off various activities by double clicking on them. You may enter a commentary on the activity in the second window when checking off a particular item. The file *checklist.sample* in the *data/DPS* directory can be edited to change the items in the checklist or its' location.

11.1.6 Updating the Leap Seconds and the Earth Motions files

The toolkit requires Leap Second and Earth Motion updates, weekly and twice weekly respectively, to accurately compute most time conversions. The following scripts have been established to accomplish these tasks as part of ECS support.

- **update_leapsec.sh**

This script updates the *leapsec.dat* file by ftp-ing to USNO and reformatting the information into the leap seconds file: *\$PGSHOME/database/common/TD/leapsec.dat*. The present script, after obtaining the required file "tai-utc.dat" in the same Series 7 mentioned above, invokes *PGS_TD_NewLeap*, a C program that performs the actual update work. The function puts the current date in the header of the new *leapsec.dat*, with a remark that the file was either "Checked" (no new leap second) or "Updated" (new leap second). The date at which the USNO file used in the updating process was put on their server is also listed in the header.

- **update_utcpole.sh**

This script updates the **utcpole.dat** file on the basis of new data obtained by ftp to the U.S. Naval Observatory in Washington, D.C (USNO). Their data file is excerpted and the required fields are reformatted and written into the *utcpole* file:
\$PGSHOME/database/common/CSC/utcpole.dat

- **The Leap Seconds file:**

leapsec - file ID: *\$PGSHOME/database/common/TD/leapsec.dat*

(Atomic time from International Earth Rotation Service)

Introduced every 12 to 24 months, announced almost 6 months in advance or as little as 90 days notice. Update available from U.S Navy Observatory (USNO).

Interval of update recommend: weekly, except Sundays 17:45 hours to 17:55 Eastern US time. Runtime is approximately 30 seconds.

- **The Earth Motion file:**

utcpole – file ID: `$PGSHOME/database/common/CSC/utcpole.dat`

(Record of the Earth's variable of slowing rotation with respect to UTC

Time.) **Interval of update recommended: Twice weekly except Sundays 17:45 hours to 17:55 Eastern US time. Recommended scripts be run in the afternoon or evening each Tuesday and Thursday.**

11.1.7 Script Name: `update_leapsec.sh`

The following processing tasks are carried out automatically by the use of this script:

- **Update via: Ftp to USNO, “maia.usno.navy.mil” file accessed for leapsec: tai-utc.dat.** (Tests connectivity by using “ping”)
- **Function to be applied: PGS_TD_NewLeap,** excerpts and reformats the new information and appends new data and date to **leapsec.dat** file. A remark that the file was either “Checked” (no new Leap second) or “Updated” (new leap second). 11.2.2 Script Name: `update_utcpole.sh`

The following processing tasks are carried out automatically by the use of this script

- **Update via: Ftp to USNO, “maia.usno.navy.mil” file accessed for utcpole: finals.data.** (Tests connectivity by using “ping”)

Function to be applied: PGS_CSC_UT1_update, excerpts and reformats the new information and appends new data to **utcpole.dat** file.

Guidelines:

- 1** The script must be run on a machine that has the Toolkit mounted and which can access the USNO site via ftp and access e-mail. (lasher used at the minidaac)
- 2** For each installed Toolkit (including all modes, such as debug, F77, F90, etc.) the scripts need to be run only once, even if different platforms or operating systems are run. However, if entirely separate Toolkits exist at your installation, with different \$PGSHOME home directories, then either the scripts need to be run in each, or the data files can be propagated from a primary Toolkit to the others.
- 3** It is highly desirable to have outgoing e-mail mounted on the machine of choice, so that error messages may be issued automatically from the scripts in case of failure.

- 4 If the updating process fails, then the script must be rerun. The Toolkit team should be contacted anytime the scripts are not giving the correct or accurate information. It is highly desirable to have outgoing e-mail mounted on the machine of choice, information. The 2 sets of scripts do also send an email message to SDP Toolkit mail address when a script fails
- 5 The Toolkit requires that the two data files not be too stale. Therefore the useful lifetime of the utcpole.dat and leapsec.dat files is 83 days. The Toolkit will issue an error message if no update was performed beyond 83 days. If this occurs you can expect geolocation accuracy to deteriorate to an extent that could require re-running for some of the more stringent users. If Toolkit requires a leap second value after this date, an error message will be returned. This generally means that production will cease.
- 6 Keep the Latest files until your updates are completed! They are useful for a backup should they be needed.

Hardware Needed and Setup Procedures

The user's environment needs to be set up by running the script `$PGSBIN/pgs-dev-env.csh` or `$PGSBIN/pgs-dev-env.ksh`, depending on the shell being used. `$PGSBIN` stands for `$PGSHOME/bin/mach`, where "mach" stands for one of: sun5, sgi64, sgi, sgi32, ibm, dec, or hp. In other words it is a shorthand for the machine "flavor" you are using, and for sgi, the compiler option. Not all versions are necessarily at each DAAC or SCF, and in some cases the path may be more complicated. For example, at Goddard Space Flight Center DAAC, typical binary directories are

`/usr/ecs/OPS/CUSTOM/TOOLKIT/toolkit/bin/sgi64_daac_f77/`, or
`/usr/ecs/OPS/CUSTOM/TOOLKIT/toolkit/bin/sgi64_daac_f90_debug/`, for example.

Once the setup script is located and sourced, `$PGSBIN` is defined and your path includes it. Furthermore, a "PCF", or process control file, `$PGS_PC_INFO_FILE` is defined, which allows the executable functions invoked by the scripts to find the old data files, which are needed for the updates.

To run the scripts successfully, you must have write permission on the data files.

After the setup is done, just run the scripts. Both scripts (`update_utcpole.sh` and `update_leapsec.sh`) are located in the directory `$PGSBIN`, which will be in your path after the Setup script has been run.

On workstation `x0spg##`, at the UNIX prompt in a terminal window, type **`source /data3/ecs/TS1/CUSTOM/daac_toolkit_f90/TOOLKIT/bin/sgi64/pgs-dev-env.csh`** . This will set up the various environment parameters, such as `PGSHOME`, to enable the 64 bit version of the FORTRAN 90 compiler to be run.

NOTE: The **x** in the workstation name will be a letter designating your site:
g = GSFC, **m** = SMC, **l** = LaRC, **e** = EDC, **n** = NSIDC, **o** = ORNL, **a** = ASF, **j** = JPL; the **##** will be an identifying two-digit number (e.g., **g0spg03** indicates a Science Processor Subsystem workstation at GSFC).

If you access the workstation through a remote login (rlogin), you must enter **xhost <remote_workstation_name>** prior to the rlogin, and enter **setenv DISPLAY <local_workstation IP address>:0.0** after the rlogin, before entering the command. The **<ipaddress>** is the ip address of **x0spg##**, and **xterm** is required when entering this command on a Sun terminal.

Example: To Update the Latest Leapsec.dat and Utcpole.dat files perform the following steps:

- 1 telnet to a machine that supports the Toolkit. (**telnet lasher**)
- 2 login: **cmops**, Password: **opsu\$er**
- 3 **setenv DISPLAY:0.0**
- 4 **setenv PGSHOME /usr/ecs/OPS/CUSTOM/TOOLKIT/toolkit**
- 5 **cd /usr/ecs/OPS/CUSTOM/TOOLKIT/toolkit/bin/sgi_daac_f77** then
- 6 **source pgs_dev-env.csh**
- 7 For leapsec: **cd /usr/ecs/OPS/CUSTOM/TOOLKIT/toolkit/database/common/TD**
- 8 **cp leapsec.dat leapsec.dat_old**
- 9 Know thread for Leap Second run:
- 10 **cd /usr/ecs/OPS/CUSTOM/TOOLKIT/toolkit/src/TD** then do **ls - select:**
update_leapsec.sh or run script for Leap Second type in: **update_leapsec.sh**

A successful update will look like the following

```
lasher{cmops}[288]->update_leapsec.sh
Status of PGS_TD_NewLeap call was (0)
Status of MOVE command was (0)
```

- 12 For utcpole:
 - 13 **cd /usr/ecs/OPS/CUSTOM/TOOLKIT/toolkit/database/common/CSC**
 - 14 **utcpole.dat utcpole.dat_old**
 - 15 Know thread for utcpole run:
 - 16 **cd /usr/ecs/OPS/CUSTOM/TOOLKIT/toolkit/src/CSC** then do **ls - select:**
update_utcpole.sh or run script for utcpole type in: **update_utcpole.sh**
 - 17 A successful update will look like the following:
lasher{cmops}[294]->update_utcpole.sh
Status of PGS_CSC_UT1_update call was (0)
Status of MOVE command was (0)
-

11.2 Science Software Integration and Test (SSIT) Manager

11.2.1 SSIT Manager Overview

The principal tool used during SSI&T is the SSIT Manager. The SSIT Manager is the top-level graphical user interface (GUI) environment presented to SSI&T personnel. Its purpose is to bring together the tools needed for SSI&T into a single, graphical environment.

Across the top of the SSIT Manager are the toolbar items **File**, **Tools**, and **Run**. Clicking on each of these invokes a pull-down menu.

Under the **File** pull-down menu, the only item is **Exit**. Clicking on this causes the SSIT Manager to terminate.

The **Tools** pull-down menu has most of the SSIT Manager's tools. The menu items are:

- **Code Analysis** contains
 - **SPARCwork** - A COTS package provided by Sun that allows for various coding activities including memory checking and debugging.
- **Office Automation** contains
 - **MSWindows** - a Microsoft Windows emulator with MS Office (Word, Excel, PowerPoint) installed.
 - **Ghostview** - for viewing PostScript formatted documents.
 - **Netscape** - WWW browser and useful for viewing HTML formatted documents.
 - **Acrobat** - for viewing PDF formatted documented.
 - **DDTS** - for entering and tracking science software problems.
- **Standards Checkers** contains
 - **FORCHECK** - for standards checking for FORTRAN 77 and Fortran 90 science software source code.
 - **Prohibited Function Checker** - for checking science software source code for prohibited functions.
 - **Process Control File Checker** - for checking Process Control Files (PCFs) delivered with science software.
 - **Prolog Extractor** - for extracting prologs from science software source code.
- **Product Examination** contains
 - **IDL** - Interactive Data Language tool supported by Sun. SSIT puts the user in the

IDL environment.

- **EOSView** - for viewing HDF and HDF-EOS files.
- **File Comparison** contains
 - **ASCII** - for comparing two output products that are in ASCII format.
 - **Binary** - for comparing two output products that are in binary format.
 - **HDF (GUI)** - for comparing two output products that are in HDF or HDF-EOS format, GUI version.
 - **HDF (**hdiff**)** - for comparing two output products that are in HDF or HDF-EOS format, command line tool.
- **Text Editors** contains
 - **Emacs**
 - **Xedit**
 - **vi**
- **PDPS Database** contains
 - **PCF ODL Template** - for converting delivered PCFs into ODL during PGE registration.
 - **Check ODL** - for verifying ODL syntax of ODL files.
 - **SSIT Science Metadata Update** - for updating the PDPS database with PGE information during PGE registration.
 - **SSIT Qopnl Metadata Update** - GUI for updating the PDPS database with PGE information during PGE registration.
 - **Copy SSIT -> Production** - for copying PGE registration database information from SSI&T mode to Production mode.
- **Data Server** contains

 - **Acquire DAP** - for acquiring a Delivered Algorithm Package (DAP).
 - **Get MCF** - Source MCF is a Metadata Configuration File used to create a Target MCF (.met) for a Dynamic/Static Granule
 - **Insert Static** - for inserting a static data file to the Data Server.
 - **Insert Test Dynamic** - for inserting a dynamic test data file to the Data Server.
 - **Insert EXE TAR** - for inserting a Science Software Executable Package (SSEP) to the Data Server.
 - **SSAP Editor** - for editing and creating a Science Software Archive Package (SSAP) and inserting it to the Data Server.

The **Run** pull-down menu initially contains no menu items. Its purpose, however, is to allow a place for SSI&T personnel to place their own custom tools and scripts.

11.2.2 SSIT Manager GUI

This GUI (Figure 11.2-1) is the starting point for SSI&T activities. It provides access to a collection of tools that will be useful for this purpose.

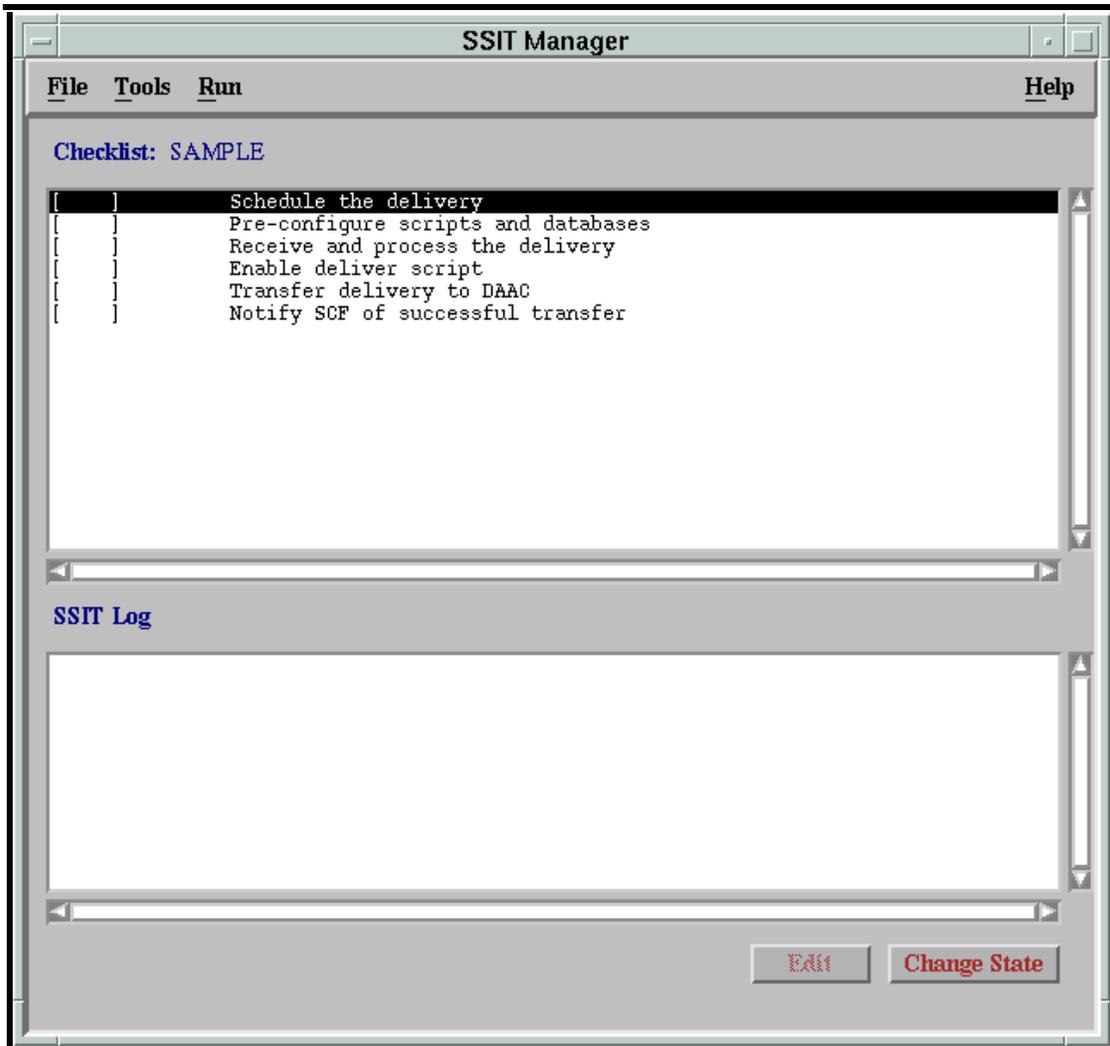


Figure 11.2-1. SSIT Manager Window

11.2.2.1 General Set Up of the SSIT Manager

The SSIT Manager requires a configured environment within which to run; it runs only on the AIT Suns. The set up steps described in this section need only be done the first time a SSI&T operator uses the SSIT Manager. At a UNIX prompt on an AIT Sun, (type in: **xhost <remote_workstation_name>**).

To set up the environment for the SSIT Manager, execute the procedure steps that follow.

(This procedure was tested by `telnet calahans`, ID: `cmts1`, PW: `ecsuser`, `setenv DISPLAY 155.157.123.34:0.0` or `setenv DISPLAY calahans:0.0` .

- 1 **login to: `dce_login awhitele awhitele`**
 - 2 **`setenv ECS_HOME /usr/ecs & setenv <mode>`**
 - 3 **`cp /usr/ecs/mode/CUSTOM/data/DPS/DpAtMgrInternal.pcf $HOME/mySSITpcf`, press **Return**.**
 - The *mode* is the ECS mode in which you are operating. This mode should be **TS1**.
 - The *mySSITpcf* is the file name of the private copy of the PCF that the SSI&T operator will use when running the SSIT Manager. The **\$HOME** is the environment variable for the user's home directory. For example, `cp /usr/ecs/TS1/CUSTOM/data/DPS/DpAtMgrInternal.pcf $HOME/myPCF`, press **Return**.
 - 4 At the UNIX prompt on the AIT Sun, type `setenv PGS_PC_INFO_FILE $HOME/mySSITpcf`, press **Return**. (Check `env` for proper home path)
 - The *mySSITpcf* is the full path name to the private copy of the PCF to be used with the SSIT Manager when you run it (from step 1).
 - It may be useful to add this line to your `.cshrc` (or other start up script) so that it is set every time you login.
 - 5 At the UNIX prompt on the AIT Sun, type `cd /usr/ecs/mode/CUSTOM/utilities`, press **Return**.
 - The *mode* is the ECS mode in which you are operating. This mode should be **TS1 or another mode assigned beforehand to operate in**.
 - 6 At the UNIX prompt on the AIT Sun, type `EcDpAtMgrStart <mode> &`
 - This invokes the **SSIT Manager GUI** which should be displayed.
 - The checklist displayed within the GUI will be the default.
 - This sets environment variables and other settings needed for running the SSIT Manager.
-

11.2.2.2 Set Up of a Checklist for the SSIT Manager

The SSIT Manager offers the capability of maintaining user-defined checklist of SSI&T activities. The checklist is presented in the main window of the SSIT Manager. A default checklist is displayed unless a new checklist is specifically created. This procedure explains how to set up a customized checklist.

Detailed procedures for tasks performed by the SSI&T operator are provided in the sections that follow.

Creating a User-Defined Checklist for the SSIT Manager:

- 1 a From the SSIT Manager, click on the **T**ools menu, then choose **P**roduct Examination, then **E**OSView.

- The EOSView GUI will be displayed.
- 1 b** Alternately, if EOSView isn't available from the SSIT Manager GUI, invoke EOSView from the command-line.
- Go to the proper area by typing **cd /usr/ecs/TS1/CUSTOM/eosview**
 <RETURN>
- Start EOSView by typing **EOSView** <RETURN>
- 2** In the GUI labeled **EOSView - EOSView Main Window**, click on the **F**ile menu and select **O**pen.
- The **F**ilter GUI will be displayed.
- 3** In the subwindow labeled **F**ilter, enter full path name and file name wildcard template. For example, enter */home/MyDirectory/MySubdirectory/**.
- The */home/MyDirectory/MySubdirectory/** represents the location to the directory containing the HDF-EOS files to examine.
 - The asterisk (*) is a wildcard template that represents all files in that directory; other wildcard templates can narrow the search further, *e.g.* ***.hdf**.
 - Use the **D**irectories field to further select the correct directory.
 - Files found matching the wildcard template in the chosen directory will be displayed in **F**iles subwindow.
- 4** In the **F**iles subwindow, click on the file name of the HDF-EOS file to examine. Then click on the **O**K button.
- A GUI labeled **EOSView - MyOutputFile.hdf** will be displayed where *MyOutputFile.hdf* is the file name of the file chosen in step 3.
 - Be patient - this GUI may take some time to appear, particularly for large files.
 - Once displayed, a list of HDF objects will appear in the main window. If nothing is listed, it means that no HDF objects were found within the file.
- 5** In the GUI labeled **EOSView - MyOutputFile.hdf**, click on an object listed for which metadata is to be inspected.
- The object selected will be highlighted.
 - Do not double click on object since this will cause a **D**imension GUI to be displayed instead.
- 6** In the GUI labeled **EOSView - MyOutputFile.hdf**, click on the **A**tttributes menu and select **G**lobal.
- A GUI labeled **EOSView - Text Display** will be displayed.
 - The global metadata associated with the object selected (in step 5) will be displayed in a scrollable field.
 - If instead, the message "Contains no Global Attributes" appears, then the selected object contains no global metadata.
- 7** Repeat steps 5 and 6 for each HDF object within the selected HDF-EOS file for which metadata is to be examined.
- 8** In the GUI labeled **EOSView - MyOutputFile.hdf**, click on the **F**ile menu and select **C**lose.

- The **EOSView - MyOutputFile.hdf** GUI will disappear.
 - Be patient - this GUI may take some time to disappear, particularly for large files.
- 9 In the GUI labeled **EOSView - EOSView Main Window**, click on the **File** menu and select **Exit**.
- The **EOSView - EOSView Main Window** GUI will disappear.

11.2.3 SSIT Manager Tools

There are several tools that are accessible through the SSIT Manager GUI. After selecting the TOOLS menu option of the menu bar, a set of options is available. See Figure 11.2.3-1, which indicates the use of the Tool menu item.

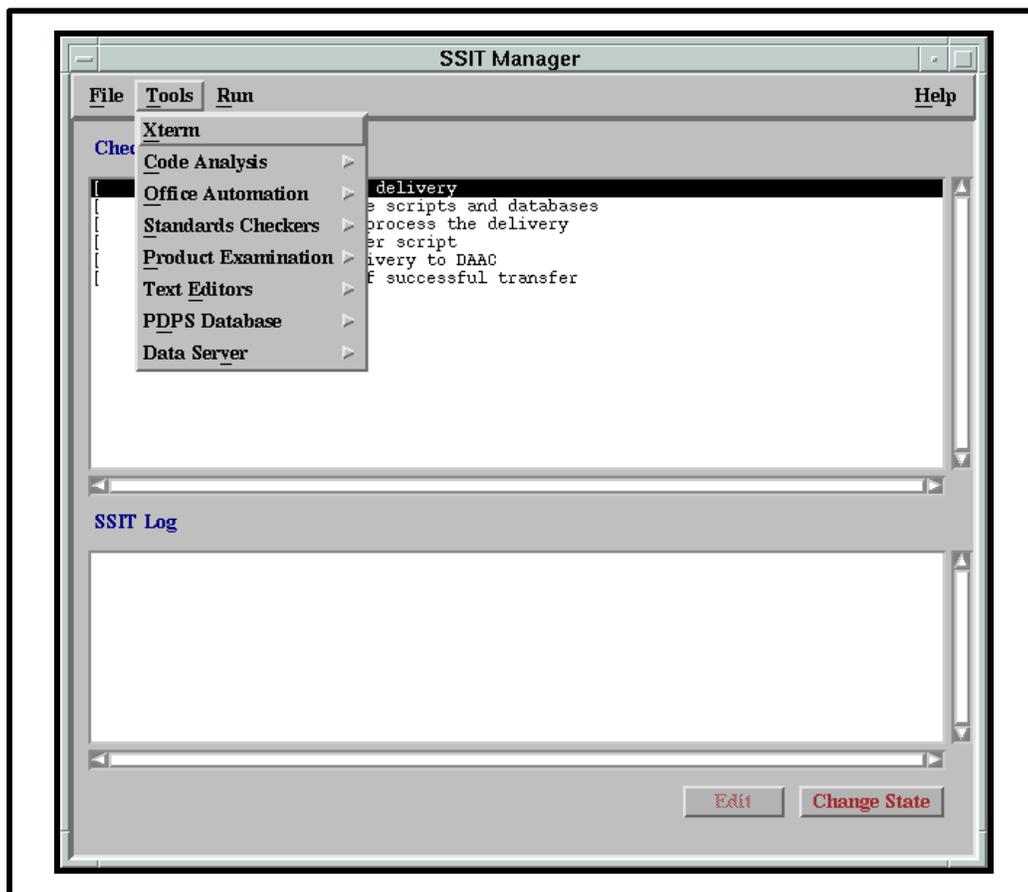


Figure 11.2.3-1. SSIT Manager Window - Tools Menu

11.2.4 Using the SSIT Manager:

The following is a list of tools, and or assumptions:

1. The SSIT Manager is running.
 2. The source file(s) are available, accessible, and have read permissions.
 3. The below listed formatted text (ASCII) files containing the list of prohibited functions exist in the directory stored in the environment variable DPATMGR_DAT:
 4. prohibitedFunctionsAda.txt
 5. prohibitedFunctions.C++.txt
 6. prohibitedFunctions.C.txt
 7. prohibitedFunctions.F77.txt
 8. prohibitedFunctions.F90.txt
 9. If the source code files to be checked are in a VOB in ClearCase, a view has been set before the SSIT Manager was started.
-

11.3 Delivered Algorithm Package (DAP) - Acquiring, Unpacking, Subscription

The Delivered Algorithm Package (DAP) is the vehicle by which the PGE, source code, supporting files, documentation, etc. are delivered to a DAAC for SSI&T. Typically, the DAP is a compressed TAR file with a file name of form *string.tar.Z* . After initial processing, the DAP is broken apart into its components and those components will be subsequently processed and used based on their intended function.

The delivery mechanism for DAPs can be electronic (e.g. via UNIX ftp) or physical media (4 mm or 8 mm digital audio tapes).

11.3.1 Acquiring the Delivered Algorithm Package (DAP)

The following procedures are used by the SSIT team to acquire DAPs.

11.3.1.1 Acquiring the DAP via FTP

FTP is another method that the SSIT team uses in order to receive the science software. The following example demonstrates the FTP of the tar file from a remote machine.

Acquiring the DAP via FTP

-
- 1 Log into one of the AIT Sun workstations by typing: **username** then press the **Enter** key.
 - 2 Enter the **password** then press the **Enter** key.
If you access the workstation through a remote login (rlogin), you must enter **xhost <remote_workstation_name>** then press the **Enter** key.
 - 3 At a UNIX prompt, type **cd DeliveryPathname**, then press the **Enter** key.
 - The **DeliveryPathname** is the full path name to the directory that has been set aside for ftp pull of DAPs from the Instrument Team. For example, **cd /home/user** where **user** is the user's login directory, then press the **Enter** key.
 - If the DAP is to be copied into a subdirectory, change to this subdirectory.
 - 4 At a UNIX prompt, type **ftp machineIPAddress**, then press the **Enter** key.
The **machineIPAddress** is the IP address or fully qualified domain name of the remote SCF machine. For example, **ftp 192.116.53.2**, then press the **Enter** key.
Or for example, **ftp aitag2sun.gsfc.ecs.nasa.gov**, then press the **Enter** key. The remote machine will likely display some messages and then prompt for a login name.
An ftp session is established.
 - 5 At the ftp prompt on the remote machine, enter user login name, then press the **Enter** key.
The remote machine will typically respond with **331 Password required for username:**
 - 6 At the ftp prompt on the remote machine, enter user password, then press the **Enter** key.
 - The remote machine will typically respond with **230 User username logged in** and display the **ftp>** prompt for further ftp commands.
 - 7 At the ftp prompt on the remote machine, type **cd DAPpathname** then press the **Enter** key.
 - The **DAPpathname** is the full path name to the directory on the remote machine containing the DAP to retrieve. For example, **cd /home/mac**, then press the **Enter** key. The directory location should be known.
 - 8 At the ftp prompt on the remote machine, type **binary**, then press the **Enter** key.
 - The **binary** command causes subsequent file transfers to be in binary mode, preserving the integrity of the file to retrieve without interpretation (as would be done in ASCII mode).
 - The system will typically respond with the message **200 Type set to I** indicating that binary mode has been set.
 - 9 At the ftp prompt on the remote machine, type **get DAPfilename**, then press the **Enter** key.
 - The **DAPfilename** is the file name of the DAP to retrieve.
 - • For example, type **get TestPGE.tar**, then press the **Enter** key.
 - The user may need to type **dir** then press **Enter** to display a listing of the files in the current directory. The system will likely display several lines of

messages once the transfer has completed. For large files, this may take a long time (minutes to hours depending upon the size of the DAP and the bandwidth of the connection).

- 10 At the ftp prompt on the remote machine, repeat step 9 or type **quit**, then press the **Enter** key.
 - Typing **quit** and pressing **Enter** closes the ftp connection with the remote machine.
 - Retrieve other DAP files by repeating step 9. The DAPs retrieved will reside in *DeliveryPathname* on the local machine.
- 11 At the UNIX prompt type **cp /home/mac/TestPGE.tar**, then press the **Enter** key.
 - This step will copy the DAP tar file into their working directory.

11.3.1.2 Acquiring the DAP from the Archive after Ingest

The **insert** service is used to put the DAP into the Data Server after it is ingested. Once the DAP is in the Data Server, the **acquire** service is used to retrieve it.

DAP is acquired from Data Server and placed in the specified directory. Note there will be 2 files, the DAP itself (a big tar file) and the metadata associated with the DAP. The metadata may be helpful in the creating the SSAP.

When a DAP is inserted into the Data Server by Ingest, an email is sent to all users who subscribe to that event (Section 11.3.2).

11.3.1.3 Performing a DAP Acquire Using SSIT Manager

Generally, the preferred approach to accomplishing a DAP **acquire** will be through the use of the SSIT Manager GUI.

Detailed procedures for tasks performed by the SSI&T operator are provided in the sections that follow.

Assumptions:

1. The following servers/services are up and operational:
Data Server, Subscription Server, Storage management
2. The following must have occurred between those Servers/Services:
Ingest must have ingested DAP and Inserted it into the Data Server.
Subscription Server must have gotten notification from the Data Server of the Insert. Subscription Server must send email to the SSIT operator notifying him/her of DAP Insertion and giving him (in the email) the UR of the DAP.
3. The SSIT Manager is available
4. The X Window **DISPLAY** environment variable is pointing to your screen

DAP Acquire Procedures:

- 1 If not already on an AIT Sun, log onto one from your current machine.

- 2 Bring up the SSIT Manager GUI. At the UNIX prompt, type **mgr** (if alias has been established)
- 3 After a short while, the SSIT Manager GUI will appear. From the SSIT Manager top menu bar, select **Tools -> Data Server -> Acquire DAP**
See figure 11.2.3-1. If the SSIT Manager GUI is used to initiate the DAP processing, Step 4 can be skipped.
- 4 Alternately, one can initiate the DPA processing sequence from the command line. To do this
 - Type **source /usr/ecs/TS1/CUSTOM/bin/DPS/.buildrc <RETURN>**
Note: This step only needs to be done once per login
 - Type **/usr/ecs/TS1/CUSTOM/bin/DPS/DpAtStageAlgorithmPackage.sh <RETURN>**

- 5 The user will be prompted with:

** DAP Staging Tool **
Configuration filename? (enter for default: DpAtAA.CFG)

To respond, type **<RETURN>**

- 6 The user will be prompted with:

ECS Mode of operations? (enter for default: OPS)

To respond, type **TS1 <RETURN>**

- 7 The user will be prompted with:

Name of email message file (including path)?

To respond, type the required file name plus the path, e.g.,
/home/diascone/emessage01.asc <RETURN>

The user will be prompted with:

Directory to receive staged file?

To respond, type the required directory, e.g.,
/home/diascone/staged <RETURN>

11.3.2 Unpacking a DAP

Once a DAP has been acquired via electronic means or physical media, it typically needs to be unpacked before its contents are accessible for SSI&T. Several mechanisms are available under standard UNIX for packing and unpacking files to and from a file archive, the most common being UNIX *tar*. Another fairly typical utility is *gzip* and its companion, *gunzip*.

The file name extension is usually an indication of the packing utility used and DAP files should use this convention. DAP files that have been packed using the UNIX *tar* utility will usually have *.tar* as a file name extension indicating a tar file. If the DAP has been further compressed using the UNIX *compress* utility, the file name extension is typically *.tar.Z* indicating a compressed tar file. For DAP files packed with the *gzip* utility, the *.zip* file name extension is generally used.

When unpacking is performed on a DAP, the contents of the packed file are moved from the tar archive to local disk. If the DAP tar file contains directories as well as files, these directories will be created in the same structure as in the tar file. This structure typically reflects the directory structure from which the tar file was created in the first place at the SCF. Once a tar file has been unpacked, the original tar file will still exist unaltered.

Unpacking a DAP

- 1 Log into one of the AIT Sun workstations by typing: **username** then press the **Enter** key.
- 2 Enter the **password** then press the **Enter** key.
If you access the workstation through a remote login (rlogin), you must enter **xhost <remote_workstation_name>** then press the **Enter** key.
- 3 At a UNIX prompt, type **cd UnpackPathname**, then press the **Enter** key.
The **UnpackPathname** is the path name of the directory that has been set aside for unpacking of DAPs.
This directory now contains the DAP tar file. For example, **cd /home/user**, where **user** is the user's login directory, then press the **Enter** key.
- 4 If the tar file is compressed, at a UNIX prompt, type **uncompress PackedDAP.Z**, then press the **Enter** key.
The **PackedDAP.Z** is the file name of the compressed DAP file.
The file name extension of **.Z** is a convention indicating UNIX compressed files.
The **uncompress** utility expects this file name extension by default. A resulting error may indicate that the DAP file was not compressed or that another compression utility was used. If the file name extension was **.Z**, the uncompressed version will have the same file name but without the **.Z**, for example **PackedDAP**.
The tar file for the SSI&T Training will not be compressed.
- 5 At the UNIX prompt, type **tar xvf PackedDAP**, then press the **Enter** key.
The **PackedDAP** is the file name of the uncompressed DAP file.

The tar archive will be unpacked in the current directory. If the archive contained directories and subdirectories, these will be created by the tar utility and populated by the files that belong.

11.4 Science Software Configuration Management

The CM Administrator and System Administrator are key players in the SSI&T process. The CM Administrator receives the science software from the Science Data Specialist, places these files into a directory and request that the System Administrator place the files under configuration control by using the ClearCase tool. The science software is then tested by the SSI&T team and once the science software has successfully been tested, and upon direction from the CCB, the files are distributed to the Production Planner for placement on production server.

The CM and System Administrator need a good understanding of the ClearCase tool. ClearCase will be used to create a view, create a new directory, import files into the temporary subdirectories, and check-in and check-out files.

11.4.1 ClearCase Overview

All data managed under ClearCase are stored in Versioned Object Bases (VOBs), which are the “public” storage areas and Views, which are the “private storage areas. VOBs are data structures that can only be created by the CM administrator using the mkvob (“make vob”) command. A VOBs is mounted as a file system and when viewed through a view, it appears as a standard UNIX directory tree structure. This file system, accessed through its mount point, has a version-control dimension which contains file elements and versions of file elements. Once reviewed, the System Administrator will place these files under configuration control. In order to accomplish this task, a view must be created in ClearCase. A view is necessary in order to make visible and accessible files and directories that have been checked in to a VOB.

Data that are under configuration management in ClearCase are said to be “checked in”. In order to alter a checked-in data element (e.g. a file) to make a newer version of it, the data element must first be “checked out”. Once the change has been made to the checked-out version, it is checked in again. The VOB will then contain both versions of the data element and either can be retrieved at a later date.

In general, executable binary files, object files, and data files should not be checked into ClearCase. Binary and object files are not stored efficiently in ClearCase; data files for software may be extremely large and a VOB is typically not sized for this.

Files that should be checked into ClearCase include source code, scripts, makefiles, assorted build and run scripts, documentation and other ASCII files.

A Versioned Object Base is defined by the following characteristics:

A mountable file system which stores version-controlled data, such as source files, binary files, object libraries, WYSIWYG documents, spreadsheets and anything which can be stored in the UNIX file system.

Can be mounted on some or all workstations

Several VOBs may exist on a machine or on different machines on a network.

When mounted as a file system of type MFS, a VOB can be accessed with standard UNIX and ClearCase tools.

The ClearCase file system is transparent.

Created by the CM administrator

A VOB is comprised of:

Storage area for versioned files, derived objects and cleartext files.

Database (live, shadow and log file).

11.4.2 Creating a View in ClearCase

In order to make files and directories that are in a ClearCase VOB visible and accessible a ClearCase view must be set. A ClearCase view need only be created once. Once created, the view can be set at the beginning of each user session. Multiple views for a single user may be created.

In order for the SSI&T tools under the SSIT Manager to have access to the ClearCase VOB, the ClearCase view must be set before the SSIT Manager is run.

A view is defined by the following characteristics:

A working context for an individual developer or closely coordinated group.

Can be used to access any VOB or multiple VOBs.

Selects versions of VOB directories and files to display.

Allows developer to work without interfering with other developers.

Not a set of files but a way of seeing shared elements.

Each user may have multiple views for new development, bug fixing or porting activities.

A view is comprised of:

View storage area (typically in a local machine) - private storage for checked-out files, derived objects and private files.

Configuration Specification - set of rules which determine the version of a file the view will see.

View-tag - Name given to the view (ex. `angies_view`), view-tags are registered in `/urs/adm/atria/view_tags`.

Objects stored in a view:

Checked-out versions of file elements.

Unshared derived objects.

The ClearCase procedures can either be run from the UNIX command line or from the File Browser Screen. The SSI&T Training will only cover the UNIX command line procedures. The corresponding GUI procedures are included in the Training Material for future reference.

The following procedure not only will create a view, but will also allow creation of a subdirectory where new science software files may be stored.

Assumptions:

1. ClearCase is available.
2. A Versioned Object Base (VOB) has been created

11.4.2.1 Creating a View in ClearCase Using Command Lines

- 1 Log into one of the AIT Sun workstations by typing: **username** then press the **Enter** key.
- 2 Enter the **password** then press the **Enter** key.
- 3 At a UNIX prompt type **cleartool lsview**, then press the **Enter** key.
 - The **lsview** command displays the pathname to the storage location of the views.
- 4 At a UNIX prompt type **cleartool mkview -tag *ViewName* *ViewPath/ViewName.vws***, then press the **Enter** key.

The ***ViewPath*** is the full path to the directory where views are stored.

The ***ViewName*** is the user selected name for the view. The file name for the view must end in “.vws”.

For future reference, the corresponding ClearCase GUI procedures are included in the following section.

11.4.2.2 Creating a View in ClearCase using the File Browser Screen

Selecting a view listed in the View Tag Browser screen brings up the File Browser, or main screen, shown in Figure 11.4.2-1.

Displays the directory name of the current VOB, just below the toolbar.

Displays the content of the directory in the space below the directory's name.

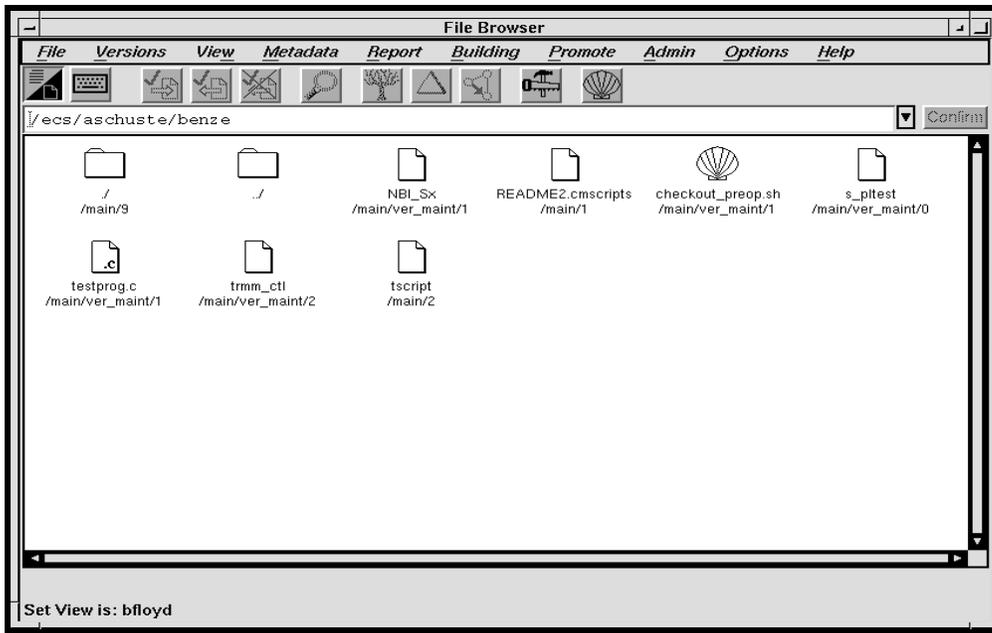


Figure 11.4.2-1 ClearCase File Browser Screen (Main Screen)

Procedures

- 1 The user should log into one of the AIT Sun workstations by typing: **username** then press the **Enter** key.
Cursor moves to the **Password** field.
- 2 Type the **password** then press the **Enter** key.
- 3 Invoke ClearCase by typing **xclearcase &** on the UNIX command line then press the **Enter** key.
The ClearCase **Transcript** screen is displayed as the View Tag Browser loads.
The ClearCase **View Tag Browser** screen is displayed listing available views.
- 4 To create a view for checking in the software change package, select a known View and press the **Enter** key.
The File Browser window is displayed.
- 5 Select **File**→**Execute**→**Single Command**.
The String Browser window is displayed.
The prompt Enter shell command to run is displayed.
- 6 Invoke the make view command by typing **mkview [filename]** on the UNIX command line and press the **Enter** key.
The **tempdisp** window appears.
The **View [filename] Created Successfully** and the **Cache Updated for View [filename]** prompts are displayed.
- 7 Close the **tempdisp** window by clicking on the window and press the **Enter** key.
 - The **tempdisp** window closes.
- 8 Select **View** →**List** from the menu.
 - The **View Tag Browser** is displayed.
- 9 Find the new view by scrolling through the list until the new view is observed.

11.4.3 Setting a View in ClearCase

In order to make files and directories that are in a ClearCase VOB visible and accessible, a ClearCase view must be set. Only one view can be set (active) at a time.

11.4.3.1 Setting a View in ClearCase Using Command Lines

- 1 Log into one of the AIT Sun workstations by typing: **username** then press the **Enter** key.
- 2 Enter the **password** then press the **Enter** key.
- 3 At a UNIX prompt type **cleartool setview *ViewName*** where *ViewName* is the user's view created in the previous section, then press the **Enter** key.

11.4.3.2 Setting a View Using the File Browser Screen in ClearCase

- 1 Log into one of the AIT Sun workstations by typing: **username** then press the **Enter** key.
Cursor moves to the **Password** field.
- 2 Type the **password** then press the **Enter** key.
- 3 Invoke ClearCase by typing **xclearcase &** on the UNIX command line then press the **Enter** key.
The ClearCase **Transcript** screen is displayed as the View Tag Browser loads.
The ClearCase **View Tag Browser** screen is displayed listing available views.
- 4 To set a view, select a known View and press the **Enter** key.
The File Browser window is displayed.
- 5 Select **File→Execute→Single Command**.
The String Browser window is displayed.
The prompt **Enter** shell command to run is displayed.
- 6 Invoke the set view command by typing **setview *ViewName*** on the UNIX command line and press the **Enter** key.
ViewName is the name of the view to set.

11.4.4 Creating a New Directory

In cases where a new directory needs to be created and placed in ClearCase, the user will activate ClearCase and create a new directory. This type of procedure is necessary only if a new directory is required.

The following is a list of tools, and or assumptions:

1. A VOB has been created at the UNIX directory.
2. A view has been created.

11.4.4.1 Creating a New Directory in ClearCase Using Command Lines

- 1 Log into one of the AIT Sun workstations by typing: **username** then press the **Enter** key.
- 2 Enter the **password** then press the **Enter** key.
- 3 At a UNIX prompt type **cleartool setview *ViewName***, then press the **Enter** key.
The *ViewName* is the user's view.
- 4 At a UNIX prompt type **cleartool lsvo**, then press the **Enter** key.
This command lists all the VOBs and allows the identification of the SSI&T VOB.
- 5 At a UNIX prompt type **cd *pathname***, then press the **Enter** key.
The *pathname* is the full path name of the parent directory in the VOB in which the new directory is to be added.
- 6 At a UNIX prompt type **cleartool checkout -nc .** then press the **Enter** key.
This command checks out the current directory. Note the dot for the directory.
The **-nc** is a keyword used when no comments are to be made for this action.
- 7 At a UNIX prompt type **cleartool mkdir -nc *dirname***, then press the **Enter** key.
The *dirname* is the name of the new directory being created.
- 8 At a UNIX prompt type **cleartool checkin -nc *dirname***, then press the **Enter** key.
This command checks in the new directory named *dirname*.
- 9 At a UNIX prompt type **cleartool checkin -nc .** then press the **Enter** key.
This command checks in the current directory.

11.4.4.2 Entering a New Directory Using the File Screen Browser into ClearCase

- 1 Log into one of the AIT Sun workstations by typing: **username** then press the **Enter** key.
Cursor moves to the **Password** field.
- 2 Type the **password** then press the **Enter** key.
- 3 Invoke ClearCase by typing **xclearcase &** on the UNIX command line then press the **Enter** key.
 - The ClearCase **Transcript** screen is displayed as the View Tag Browser loads.
 - The ClearCase **View Tag Browser** screen is displayed listing available views.
- 4 Select **File→Execute→Single Command**.
The String Browser window is displayed.
The prompt **Enter shell command to run** is displayed.

- 5 Invoke the make directory element by typing **mkdir [filename]** on the UNIX command line and press the **Enter** key.
 - 6 Invoke the make element command by typing **mkelem [directory name]** on the UNIX command line and press the **Enter** key.
 - 7 Type into the directory input box of the **File Browser** the name of the directory in the VOB to be checked out, press the **Enter** key, then follow the menu path **Version→Checkout→Reserved: no comment**.
 - In order to add new files to ClearCase, the directory in which the files are to be added must be checked out first.
 - ClearCase forces the checkout onto a maintenance branch to isolate the maintenance activity.
 - If someone else has already checked out the directory, permission to check out the directory is denied. A separate shell window is displayed.
 - 8 Cancel the checkout of the element if it is decided that no changes are to be made by typing into the directory input box of the **File Browser** the name of the directory to be checked in, press the **Enter** key, then follow the menu path **Version→Uncheckout→Unreserved: no comment**,
 - 9 On the **File Browser** screen, follow the menu path **File→Exit**.
The ClearCase Graphical User Interface session is closed.
-

11.4.5 Importing files into ClearCase

Once the user has created a directory to place the science software files, ClearCase can be used to place a single file or multiple files in a UNIX directory structure under CM.

The following is a list of tools, and or assumptions:

1. A VOB and subdirectory are created to hold these files.
2. No object files or executables exist in the source code directory.
3. The PGE was received with a directory structure that contains various types of files.
4. These files will be entered into ClearCase and will maintain the same directory structure as the delivery structure.

11.4.5.1 Importing a Single File into ClearCase

Procedure:

- 1 Log into one of the AIT Sun workstations by typing: **username** then press the **Enter** key.
Cursor moves to the **Password** field.
- 2 Type the **password** then press the **Enter** key.
- 3 At a UNIX prompt, type **cleartool setview ViewName**, press **Enter**
The **ViewName** is the name of the ClearCase View.

- 4** At the UNIX prompt, type **cd *pathname***, then press the **Enter** key.
The *pathname* is the full path name of the subdirectory in the VOB into which the file is to be checked in.
If the desired directory cannot be seen, it could mean that the view has not been set or the properties of the view do not allow the directory to be seen; check with the CM Administrator.
 - 5** At a UNIX prompt, type **cp *pathname/filename* .**, press **Enter** (note the space and then “dot” at the end of the command).
The *pathname* is the full path name to the directory where the file to be checked in exists and *filename* is the file name of the file to be checked in.
This command copies a file over into the VOB area in preparation for checking it in.
 - 6** At the UNIX prompt, type **cleartool checkout -nc .**, press **Enter** (note the space and then “dot” at the end of the command).
This command checks out the current directory (represented by the “dot”) from ClearCase.
Adding a new file (or element) to a directory represents a modification of the directory. Hence, the directory must be checked out before a file can be checked in.
 - 7** At a UNIX prompt, type **cleartool mkelem -nc *filename***, then press the **Enter** key.
The *filename* is the name of the file that was copied over in step 5 and is the file that will be checked into ClearCase.
This command creates a ClearCase element from the file in preparation for checking it in.
The **-nc** flag means “no comment”; it suppresses ClearCase from prompting for a comment to be associated with the make element step.
 - 8** At the UNIX prompt, type **cleartool checkin -nc *filename***, then press the **Enter** key.
The *filename* is the name of the file to be checked into ClearCase.
This command performs the check in of the file.
The **-nc** flag means “no comment”; it suppresses ClearCase from prompting for a comment to be associated with the checkin step.
 - 9** At the UNIX prompt, type **cleartool checkin -nc .**, press **Enter** (note the space and then “dot” at the end of the command).
This command checks in the current directory (represented by the “dot”) into ClearCase.
The adding of an element (here, a file) represents a modification to the directory and hence, the new version of the directory must be checked back in.
The **-nc** flag means “no comment”; it suppresses ClearCase from prompting for a comment to be associated with the checkin step.
-

11.4.5.2 Importing Multiple Files into ClearCase

The DAP for the synthetic PGE contains only one source code module and a minimal number of other files. A real PGE will generally contain many source files, header files, and multiple other types of files stored in a standard type of directory structure which is retained when the PGE is packed into the tar file. The script provided by ClearCase is used for the purpose of making another load script to enter all of the DAP files along with the directory structure at one time. The final step of running the load script can only be performed by the DAAC Administrator.

The following procedure explains how to place the entire contents of a UNIX directory structure under ClearCase. A UNIX directory structure refers to all the files and subdirectories under some top-level directory.

This procedure is geared toward science software deliveries. In such cases, science software is delivered in the form of a UNIX *tar* files. A *tar* file has been unpacked (*untarred*) and the contents are to be placed under ClearCase configuration management.

Detailed procedures for tasks performed by the SSI&T operator are provided in the sections that follow.

The following is a list of tools, and or assumptions:

1. A VOB and subdirectory are created to hold these files.
2. A ClearCase view is **not** required to perform this procedure.

Importing Multiple Files Into ClearCase

- 1** At a UNIX prompt, type **cd *ParentPathname***, then press the **Enter** key
The *ParentPathname* is the path name of the directory that *contains* the directory structure to be brought into ClearCase. This is *not* the VOB.
- 2** At the UNIX prompt, type **clearcvt_unix -r *DirName***, then press the **Enter** key.
The *DirName* is the name of the directory in which it and everything below it is to be brought into ClearCase.
A conversion script will be then be created. The -r causes all subdirectories to be recursively included in the script created.
- 3** Contact the VOB Administrator and request that the utility script *cvt_script* be run on the script created in step 2.
The VOB Administrator is the only one who can run the *cvt_script* because it modifies the VOB.
- 4** At this time the user logs out from this workstation. The VOB Administrator completes the procedure.
The remaining steps are accomplished by the VOB Administrator.
- 5** The VOB Administrator logs into the AIT Sun workstation by typing **username** then press the **Enter** key.
Cursor moves to the **Password** field.

- 6 Type the **password** then press the **Enter** key.
- 7 Invoke ClearCase by typing **xcclearcase &** on the UNIX command line then press the **Enter** key.

The ClearCase **Transcript** screen is displayed as the View Tag Browser loads.
The ClearCase **View Tag Browser** screen is displayed listing available views.
- 8 To create a view for checking in the software change package, select a known View and press the **Enter** key. If you are using an existing view, select the desired existing view and proceed to step 14.

The File Browser window is displayed.
- 9 Select **File→Execute→Single Command**.

The String Browser window is displayed.
The prompt Enter shell command to run is displayed.
- 10 Invoke the make view command by typing **mkview [filename]** on the UNIX command line and press the **Enter** key.

The **tempdisp** window appears.
The **View [filename] Created Successfully** and the **Cache Updated for View [filename]** prompts are displayed.
- 11 Close the **tempdisp** window by clicking on the window and press the **Enter** key.

The **tempdisp** window closes.
- 12 Select the VOB where the software change package is to be imported then press the **Enter** key.
- 13 To create a subdirectory for the software change package in that VOB, which is a modification to the parent directory (for the VOB) the parent directory must be checked out by following the menu path **Version→Checkout→Reserved: no comment**.

In order to add new files to ClearCase, the directory in which the files are to be added must be checked out first.
ClearCase forces the checkout onto a maintenance branch to isolate the maintenance activity.
If someone else has already checked out the directory, permission to check out the directory is denied.
A separate shell window is displayed.
- 14 Start a shell process in a separate window by clicking on the shell icon button of the **File Browser** toolbar.

A separate shell window is displayed.
- 15 To run the script, type **cvt_script** then press the **Enter** key.

The VOB Administrator is the only person who can run the **cvt_script** because it modifies the VOB.

- 16 To check in the new directory, type into the directory input box of the **File Browser** screen: **path** [where **path** is the full path identification for the new directory (**directoryname**)], then press the **Enter** key. Then select **Versions**→**Checkin** from the menu.
 - 17 To check in the parent directory (for the VOB), type into the directory input box of the **File Browser** screen: **VOBpath** (where **VOBpath** is the full path identification for the parent directory), then press the **Enter** key. Then select **Versions**→**Checkin** from the menu.
 - 18 On the **File Browser** screen, follow menu path **File**→**Exit**.
The ClearCase Graphical User Interface session is closed.
-

11.4.6 Checking Out a File From ClearCase

If a configured file requires modification, then the file needs to be checked out of the configured directory and placed in a user directory. This will allow the file(s) to be modified.

The following is a list of tools, and or assumptions:

1. The file or directory must be an element created in ClearCase.
2. The view should be configured to ensure the correct version of the file or directory is seen.

Checking Out an Element/File from the Command Line

- 1 Log into one of the AIT Sun workstations by typing: **username** then press the **Enter** key.
 - 2 Enter the **password** then press the **Enter** key.
 - 3 At a UNIX prompt type **cleartool setview *ViewName***, then press the **Enter** key. The ***ViewName*** is the name if the user's view.
 - 4 At a UNIX prompt type **cleartool checkout -nc *element*** then press the **Enter** key.
 - The ***element*** is the name of the file or directory that is to be checked out.
 - The **-nc** flag means “no comment” which will suppress the ClearCase prompting for a comment to be associated with the check out step.
-

Checking Out an Element/File from the File Screen Browser

- 1 Log into one of the AIT Sun workstations by typing: **username** then press the **Enter** key.
Cursor moves to the **Password** field.

- 2 Type the **password** then press the **Enter** key.
 - 3 Invoke ClearCase GUI by typing **xclearcase &** on the UNIX command line then press the **Enter** key.
The ClearCase **Transcript** screen is displayed as the View Tag Browser loads.
The ClearCase **View Tag Browser** screen is displayed listing available views.
 - 4 To check out the directory where the controlled files were place, type into the directory input box of the **File Browser** screen: **path** [where **path** is the full path identification for the directory (**directoryname**)], then press the **Enter** key. Then select **Versions**→**Checkout** from the menu.
 - 5 Select **File**→**Execute**→**Single Command**.
The String Browser window is displayed.
The prompt **Enter shell command to run** is displayed.
 - 6 To determine editing privileges, type **ls -l**, then press the **Enter** key.
A prompt displaying read/write/execute privileges will be displayed. There will be three groupings:
 - **User Group Others**
 - **r=read, w=write, x=execute**
 - 7 If you have editing/execute privileges, you can revise the contents of the file with any text editor.
 - 8 To checkin a controlled file, select **Versions**→**Checkin** from the menu.
The file/directory will be checked in to ClearCase and the version will be updated.
-

11.4.7 Checking a Modified Element into ClearCase

This procedure explains how to check in a modified element to ClearCase. An element refers to a directory or file in ClearCase, that is, under configuration management. Modifications made to a file or directory cannot be saved in ClearCase unless the file or directory had been checked out first.

The following is a list of tools, and or assumptions:

1. A VOB exists and is mounted at a known UNIX directory.
2. A ClearCase view exists for the SSI&T operator.
3. The element or file has been checked out and modified.
4. The modified file is now in the user's directory on the VOB from which it was checked out.

11.4.7.1 Checking a Modified Element/File into ClearCase

- 1 Log into one of the AIT Sun workstations by typing: **username** then press the **Enter** key.
Cursor moves to the **Password** field.
- 2 Type the **password** then press the **Enter** key.
- 3 At a UNIX prompt, type **cleartool setview ViewName**, then press the **Enter** key.

The *ViewName* is the name of the user's view.

- 4 At the UNIX prompt, type **cleartool checkin -nc *filename***, then press the **Enter** key.

The *filename* is the name of the file (full path name allowed) that is to be checked out (and later modified).

The **-nc** flag means "no comment"; it suppresses ClearCase from prompting for a comment to be associated with the check out step.

This command checks in the current directory.

- 5 This step is optional; it is performed when ClearCase does not accept a checkin because the element was not modified. In this case, the check out must be canceled. At a UNIX prompt, type **cleartool uncheckout -nc *filename***, then press the **Enter** key.

The *filename* is the name of the file or directory (full path name allowed) checked out.

This command cancels the check out of an element/file.

11.5 Standards Checking of Science Software

The purpose of standards checking is to verify that the source files of the science software are compliant with the ESDIS Data Production Software Computing Facility (SCF) Standards and Guidelines document.

11.5.1 Checking FORTRAN 77 ESDIS Standards Compliance

The ESDIS Data Production Software Computing Facility (SCF) Standards and Guidelines document requires all FORTRAN 77 code to be compliant with the ANSI FORTRAN 77. The COTS used for this task is FORCHECK.

The following is a list of tools, and or assumptions:

Assumptions:

1. The FORTRAN 77 science software source code is available, accessible, and has read permissions for the user.
2. SSIT Manager is available for use.

FORCHECK is available only on the AIT Suns.

To check for ESDIS standards compliance in FORTRAN 77 code, execute the procedure steps that follow:

- 1 If not already on an AIT Sun, log into one from your machine.

- If necessary, before logging onto AIT Sun, use the xhost command to allow X Window reception.
 - Once logged onto proper Sun, remember to set the DISPLAY environmental variable to point to your X Window screen.
- 2 If required, at the UNIX prompt on the AIT Sun, type **cleartool setview *ViewName***, press **Return**.
- The *ViewName* is the name of a view allowing the FORTRAN 77 source files to be accessible.
 - This step is only necessary if any of the FORTRAN 77 source files are in ClearCase (in the VOB under configuration management).
- 3 If your general environment setup does not include transparent access to the SSIT Manager GUI, then you need to set that up. One way to do it is as follows:
- Set up an alias, manually or from shell script, to set up preliminary environment. At UNIX prompt, type **alias do_buildrc “source /usr/ecs/TS1/CUSTOM/bin/DPS/.buildrc”**
 - Set up an alias, manually or through shell script, to invoke SSIT Manager. At UNIX prompt, type **alias do_ssit_man “/usr/ecs/TS1/CUSTOM/bin/DPS/EcDpAtMgr ConfigFile /usr/ecs/TS1/CUSTOM/cfg/EcDpAtMG.CFG ecs_mode TS1& “**
- 4 Set up the preliminary environment (do_buildrc). This only needs to be done once per session. Then, run SSIT Manager (do_ssit_man).
- Type **do_buildrc**
 - Type **do_ssit_man**
- 5 Once the SSIT Manager comes up, the following steps need to be taken to invoke FORCHECK
- From the top menu bar, select **Tools**.
 - From the Tools menu, select **Standards Checkers**.
 - From the Standards Checkers menu, select **FORCHECK**.
 - See Figure 11.8.5-2. for a screen snapshot of this step.
- 6 A separate FORCHECK window will now open.
- The user will be prompted for input. The first prompt will be *global option(s) and list file?*
 - The second prompt will be *local option(s) and file(s)?*
 - The second prompt will be repeated until there is a blank line and carriage return.
 - In order to understand what the proper responses should be, the user is encouraged to find hardcopy documentation for FORCHECK or to use the UNIX man facility and type *man forchk* .

- 7 At the UNIX prompt on the AIT Sun, type **vi *FORCHECKoutput***, press **Return**.
- The *FORCHECKoutput* is the file name for the output file produced in step 6.
 - The *FORCHECKoutput* file will contain any warnings, errors, and other messages from FORCHECK. A summary will be at the bottom of the file.
 - Any text editor may be used for this procedure step.
- 8 At the UNIX prompt on the AIT Sun, type **vi *ListFile***, press **Return**.
- The *ListFile* is the file name for the list file specified at the FORCHECK prompt.
 - The *ListFile* file will contain FORCHECK messages similar to the *FORCHECKoutput* file embedded in the source code listing.
- Any text editor may be used for this procedure step.
-

11.5.2 Checking for ESDIS Standards Compliance in Fortran 90

This procedure describes how to use the Fortran 90 compiler flags on the SPR SGI machines to check science software written in Fortran 90 for ESDIS standards compliance.

Unlike with FORTRAN 77, no COTS tool is used to check Fortran 90 science software. Instead, this procedure describes how to use the compiler to perform the checking (ESDIS standards for Fortran 90 are ANSI). Since the Fortran 90 compiler is used, the checking for standards compliance can be naturally tied in with building the science software (since this procedure will produce object files suitable for linking). However, in this procedure, the building of the software (compiling *and* linking) is deferred to a later procedure.

Detailed procedures for tasks performed by the SSI&T operator are provided in the sections that follow.

Assumptions:

1. The Fortran 90 science software source code is available, accessible, and has read permissions for the user.
2. Required Status Message Facility (SMF) files have been compiled.
3. The C shell (or a derivative) is the current command shell.
4. The Fortran 90 compiler is available on the SPR SGI.

To check for ESDIS standards compliance in Fortran 90 code, execute the procedure steps that follow:

- 1 From the SSIT Manager, click on the **Tools** menu, then choose **Xterm**. Then telnet to the SPR SGI.
 - Alternatively, in any currently available xterm window, spawn a new session: type **xterm &**, press **Return**. Then telnet to the SPR SGI.

- 2 At the UNIX prompt on the SPR SGI, set up the proper environment for the compiler to be used by typing `source ToolkitPathname /bin/sgiXX/pgs-dev-env.csh` .
 - *ToolkitPathname* is the home directory of the desired SDP Toolkit version .
 - The directory *sgiXX* should be replaced with **sgi32** or **sgi64** as appropriate for the specific compiler desired.
 - For example, on the mini-DAAC platform ÓlasherÓ, type `source /data3/ecs/TS1/CUSTOM/daac_toolkit_f90/TOOLKIT/bin/sgi64/pgs-dev-env.csh` . This will set up the various environment parameters, such as PGSHOME, to enable the 64 bit version of the FORTRAN 90 compiler to be run.
- 3 If required, at the UNIX prompt on the SPR SGI, type `cleartool setview ViewName`, press **Return**.
 - The *ViewName* is the name of a view allowing the Fortran 90 source files to be accessible.
 - This step is only necessary if any of the Fortran 90 source files are in ClearCase (in the VOB under configuration management).
- 4 At the UNIX prompt on the SPR SGI, type `cd SrcPathname`, press **Return**.
 - The *SrcPathname* is the full path name to the location of the Fortran 90 source files to be checked.
 - The *SrcPathname* will be in the ClearCase VOB is the Fortran 90 source files are checked into ClearCase.
- 5 At the UNIX prompt on the SPR SGI, type `f90 -c -ansi [-$PGSINC] [-$HDFINC] [[-IOtherIncFiles]....] SourceFiles >& ReportFile`, press **Return**.
 - The terms in square brackets (*[]*) are used to optionally specify locations of include and module (.mod) files. The *\$PGSINC* already contains the SDP Toolkit include directory and *\$HDFINC* already contains the HDF include directory. The **OtherIncFiles** represents one or more additional include or module directories.
 - The *SourceFiles* is a list (space delimited) of Fortran 90 source files or a wildcard template (*e.g.* *.f90).
 - The >& is a C shell construct that causes standard error (where the output from the Fortran 90 compiler normally emerges) to be redirected to a file.
 - The *ReportFile* is the file name under which to save the results of the compile process.
 - The **-c** flag causes only compilation (no linking).
 - The **-ansi** flag enables ANSI checking.
 - Apply the terms in square brackets only as necessary. Do not include the brackets in the actual command. See example below.
 - Do not use the **-I** option for include or module files that are in the standard directories or in the current directory.
 - The makefile for the science software may contain the names of additional include files needed by the software.

- For example, type **f90 -c -I\$PGSINC -I\$HDFINC -I/ecs/modis/pge5/include/ *.f90 >& pge10.report**, press **Return**.
- 6 At the UNIX prompt on the SPR SGI, type **vi ReportFile**, press **Return**.
- The **ReportFile** is the file name for the compilation results as produced in step 5.
 - Any text editor may be used for this procedure step.
-

11.5.3 Checking for ESDIS Standards Compliance in C

This procedure describes how to use the C compiler flags on the SPR SGI machines to check science software written in C for ESDIS standards compliance.

Unlike with FORTRAN 77, no COTS tool is used to check C science software. Instead, this procedure describes how to use the compiler to perform the checking (ESDIS standards for C are essentially ANSI). Since the C compiler is used, the checking for standards compliance can be naturally tied in with building the science software (since this procedure will produce object files suitable for linking). However, in this procedure, the building of the software (compiling *and* linking) is deferred to a later procedure.

Detailed procedures for tasks performed by the SSI&T operator are provided in the sections that follow.

Assumptions:

1. The C science software source code is available, accessible, and has read permissions for the user.
2. Required Status Message Facility (SMF) files have been compiled.
3. The C shell (or a derivative) is the current command shell.
 - The C compiler is available on the SPR SGI.

To check for ESDIS standards compliance in C code, execute the procedure steps that follow:

- 1 From the SSIT Manager, click on the **T**ools menu, then choose **X**term. Then telnet to the SPR SGI.
 - Alternatively, in any currently available xterm window, spawn a new session: type **xterm &**, press **Return**. Then telnet to the SPR SGI.
- 2 At the UNIX prompt on the SPR SGI, type **setenv PGSHOME ToolkitPathname**, press **Return**. Then type, source **\$PGSHOME/bin/sgiX/pgs-dev-env.csh**, press **Return**.
 - The **ToolkitPathname** is the home directory of the desired SDP Toolkit version.
 - The **sgiX** refers to the appropriate processor. For example, type **source \$PGSHOME/bin/sgi/pgs-dev-env.csh**, press **Return**.
- 3 If required, at the UNIX prompt on the SPR SGI, type **cleartool setview ViewName**, press **Return**.

- The *ViewName* is the name of a view allowing the C source files to be accessible.
 - This step is only necessary if any of the C source files are in ClearCase (in the VOB under configuration management).
- 4 At the UNIX prompt on the SPR SGI, type **cd *SrcPathname***, press **Return**.
- The *SrcPathname* is the full path name to the location of the C source files to be checked.
 - The *SrcPathname* will be in the ClearCase VOB if the C source files are checked into ClearCase.
- 5 At the UNIX prompt on the SPR SGI, type **cc -c -ansi [-I\$PGSINC] [-I\$HDFINC] [[-IOtherIncFiles]...] *SourceFiles* >& *ReportFile***, press **Return**.
- The terms in square brackets (*[]*) are used to optionally specify locations of include and module (.mod) files. The *\$PGSINC* already contains the SDP Toolkit include directory and *\$HDFINC* already contains the HDF include directory. The *OtherIncFiles* represents one or more additional include directories.
 - The *SourceFiles* is a list (space delimited) of C source files or a wildcard template (e.g. *.c).
 - The >& is a C shell construct that causes standard error (where the output from the C compiler normally emerges) to be redirected to a file.
 - The *ReportFile* is the file name under which to save the results of the compile process.
 - The **-c** flag causes only compilation (no linking).
 - The **-ansi** flag enables ANSI checking.
 - Apply the terms in square brackets only as necessary. Do not include the brackets in the actual command. See example below.
 - Do not use the **-I** option for include files that are in the standard directories (e.g. /usr/include) or in the current directory.
 - The makefile for the science software may contain the names of additional include files needed by the software.
 - For example, type **cc -c -ansi-I\$PGSINC -I\$HDFINC -I/ecs/modis/pge5/include/ *.c >& pge10.report**, press **Return**.
- 6 At the UNIX prompt on the SPR SGI, type **vi *ReportFile***, press **Return**.
- The *ReportFile* is the file name for the compilation results as produced in step 5.
 - Any text editor may be used for this procedure step.
-

11.5.4 Checking for ESDIS Standards Compliance in Ada

This procedure describes how to use Ada compilers on the SPR SGI machines to check science software written in Ada for ESDIS standards compliance.

Unlike with FORTRAN 77, Fortran 90, or C, Ada compilers are subjected to a validation process by the DoD Ada Committee. Thus, any code that compiles successfully by a validated compiler is, by definition, fully ANSI compliant. Since the Ada compiler is used, the checking for standards compliance can be naturally tied in with building the science software (since this procedure will produce object files suitable for linking). However, in this procedure, the building of the software (compiling *and* linking) is deferred to a later procedure.

11.5.4.1 Checking for ESDIS Standards Compliance in Ada: Verdix COTS

This procedure describes compiling Ada software using the COTS Verdix Ada Development System (VADS) which provides a complete environment for building (and developing) Ada software. See the *gcc* compiler in compiling Ada code.

Detailed procedures for tasks performed by the SSI&T operator are provided in the sections that follow.

Assumptions:

1. The Ada science software source code is available, accessible, and has read permissions for the user.
2. The C shell (or a derivative) is the current command shell.
 - The Ada compiler is available on the SPR SGI.

To check for ESDIS standards compliance in Ada code, execute the procedure steps that follow:

- 1** From the SSIT Manager, click on the **T**ools menu, then choose **X**term. Then telnet to the SPR SGI.
 - Alternatively, in any currently available xterm window, spawn a new session: type **xterm &**, press **Return**. Then telnet to the SPR SGI.
- 2** If required, at the UNIX prompt on the SPR SGI, type **cleartool setview ViewName**, press **Return**.
 - The **ViewName** is the name of a view allowing the Ada source files to be accessible.
 - This step is only necessary if any of the Ada source files are in ClearCase (in the VOB under configuration management).
- 3** At the UNIX prompt on the SPR SGI, type **setenv SGI_ABI -32**, press **Return**.
 - This command sets the environment variable **SGI_ABI** for 32-bit mode compilation.
- 4** At the UNIX prompt on the SPR SGI, type **cd SrcPathname**, press **Return**.
 - The **SrcPathname** is the full path name to the location of the Ada source files to be checked.
 - The **SrcPathname** will be in the ClearCase VOB if the Ada source files are checked into ClearCase.
- 5** At the UNIX prompt on the SPR SGI, type **a.mklib**, press **Return**.

- This command creates a VADS library directory. All Ada compilation must occur in a VADS Ada library.
- 6 At the UNIX prompt on the SPR SGI, type **a.make -v -f *SourceFiles* >& *ReportFile***, press **Return**.
- The ***SourceFiles*** is a list (space delimited) of Ada source files or a wildcard template (*e.g.* *.ada).
 - The **>&** is a C shell construct that causes standard error (where the output from the Ada compiler normally emerges) to be redirected to a file.
 - The ***ReportFile*** is the file name under which to save the results of the compile process.
 - The **-v** flag enables verbose output.
 - The **-f** flag indicates that what immediately follows are the source files. The order of the flags is therefore important.
- 7 At the UNIX prompt on the AIT Sun, type **vi *ReportFile***, press **Return**.
- The ***ReportFile*** is the file name for the compilation results as produced in step 6.
 - Any text editor may be used for this procedure step.
-

11.5.4.2 Checking for ESDIS Standards Compliance in Ada: GNU *gcc* Compiler

This procedure describes compiling Ada software using the GNU C compiler, *gcc*.

Detailed procedures for tasks performed by the SSI&T operator are provided in the sections that follow.

Assumptions:

1. The Ada science software source code is available, accessible, and has read permissions for the user.
2. The C shell (or a derivative) is the current command shell.

The GNU *gcc* compiler is available on the SPR SGI.

To check for ESDIS standards compliance in Ada code, execute the procedure steps that follow:

- 1 From the SSIT Manager, click on the **T**ools menu, then choose **X**term. Then telnet to the SPR SGI.
 - Alternatively, in any currently available xterm window, spawn a new session: type **xterm &**, press **Return**. Then telnet to the SPR SGI.
 - It is recommended that this procedure begin within a new command shell on the SPR SGI.
- 2 If required, at the UNIX prompt on the SPR SGI, type **cleartool setview ViewName**, press **Return**.
 - The **ViewName** is the name of a view allowing the Ada source files to be accessible.
 - This step is only necessary if any of the Ada source files are in ClearCase (in the VOB under configuration management).
- 3 At the UNIX prompt on the SPR SGI, type **setenv SGI_ABI -32**, press **Return**.
 - This command sets the environment variable **SGI_ABI** for 32-bit mode compilation.
- 4 At the UNIX prompt on the SPR SGI, type **cd SrcPathname**, press **Return**.
 - The **SrcPathname** is the full path name to the location of the Ada source files to be checked.
 - The **SrcPathname** will be in the ClearCase VOB if the Ada source files are checked into ClearCase.
- 5 At the UNIX prompt on the SPR SGI, type **gcc -c -gnat83 SourceFiles >& ReportFile**, press **Return**.
 - The **SourceFiles** is a list (space delimited) of Ada source files or a wildcard template (e.g. *.ada).
 - The **>&** is a C shell construct that causes standard error (where the output from the *gcc* compiler normally emerges) to be redirected to a file.
 - The **ReportFile** is the file name under which to save the results of the compile process.
 - The **-c** flag causes only compilation (no linking).
 - The **-gnat83** enables compilation of Ada using the 1983 Ada Standard. Note that without this flag, the compiler would assume the 1995 Ada proposed Standard.
- 6 At the UNIX prompt on the SPR SGI, type **vi ReportFile**, press **Return**.
 - The **ReportFile** is the file name for the compilation results as produced in step 5.
 - Any text editor may be used for this procedure step

11.5.5 Prohibited Function Checker

The use of certain functions in the PGE is prohibited. The Prohibited Function Checker (Figure 11.5.4-1) is used to check C, FORTRAN 77, FORTRAN 90, and Ada language

source files for the occurrence of functions that are prohibited in the ECS DAAC production environment.

11.5.5.1 Checking for Prohibited Functions: Command-Line Version

This procedure describes using the command-line version of the Prohibited Function Checker to check science software for the prohibited functions.

Detailed procedures for tasks performed by the SSI&T operator are provided in the sections that follow.

Assumptions:

1. The source files to be checked are available, accessible, and have read permissions for the operator.
2. Source files to be checked are Ada, C, FORTRAN 77, Fortran 90, C shell, Korn shell, Bourne shell, or Perl and have recognizable file name extensions.

To check for prohibited functions in delivered source files, execute the procedure steps that follow:

- 1 If required, at the UNIX prompt on an AIT Sun, type **cleartool setview *ViewName***, press **Return**.
 - The *ViewName* is the name of a view allowing the source files to be accessible.
 - This step is only necessary if any of the source files are in ClearCase (in the VOB under configuration management).
- 2 At the UNIX prompt on the AIT Sun, type **cd *SrcPathname***, press **Return**.
 - The *SrcPathname* is the full path name to the location of the source files to be checked.
 - The *SrcPathname* will be in the ClearCase VOB if the source files are checked into ClearCase.
 - The *SrcPathname* can contain other directories that contain source files and/or more directories. The Prohibited Function Checker will search out all source files in subdirectories recursively.
- 3 At the UNIX prompt on the AIT Sun, type ***/data3/ecs/TS1/CUSTOM/bin/DPS/EcDpAtMgrBadFunc ConfigFile /data3/ecs/TS1/CUSTOM/cfg/EcDpAtBA.CFG FilesOrDirectories > ResultsFile***, press **Return**.
 - The *FilesOrDirectories* is a list of source file names or directory names of directories containing source files.
 - The *ResultsFile* is the file name for the results that are output.
 - For example, type ***/data3/ecs/TS1/CUSTOM/bin/DPS/EcDpAtMgrBadFunc ConfigFile /data3/ecs/TS1/CUSTOM/cfg/EcDpAtBA.CFG main.c utils/ > myOutput***, press **Return**. Here, *main.c* is a source file and *utils/* is a directory that contains other source files.

- 4 At the UNIX prompt on the AIT Sun, type **vi *ResultsFile***, press **Return**.
- The ***ResultsFile*** is the file name for the output results as produced in step 3.
 - Any text editor may be used for this procedure step.
-

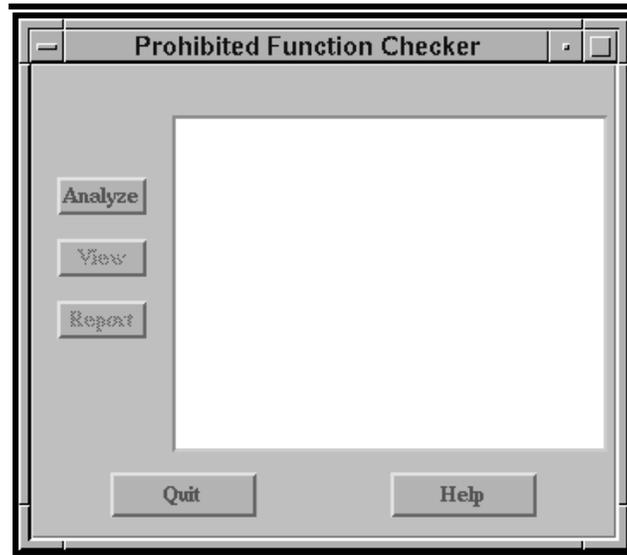


Figure 11.5.5-1. Prohibited Function Checker

Prohibited Function Checker GUI

- 1** From the SSIT Manager, select **T**ools → **S**tandards Checkers → **P**rohibited **F**unction **C**hecker from the menu.
The Prohibited Function Checker GUI will be displayed.
 - 2** In the Prohibited Function Checker GUI, click on the **A**nalyze button.
The File Selector GUI will be displayed.
 - 3** Within the **D**irectories subwindow, double click on the desired directory.
Repeat this step until the directory with the source files to be checked are displayed in the **F**iles subwindow.
 - 4** Within the **F**iles subwindow, click on the source files to be checked. Each file clicked on will be highlighted.
To choose groups of contiguous files, hold down the left mouse button and drag the mouse.
To choose non-contiguous files, hold down the Control key while clicking on file names.
 - 5** In the File Selector GUI, click on the **O**K button.
The File Selector GUI will disappear.
The files selected in step 5 will be displayed in the Prohibited Function Checker GUI window as they are being checked.
 - 6** In the Prohibited Function Checker GUI, click on the **R**eport button.
The **R**eport GUI will be displayed.
For each file, a list of prohibited functions found will be displayed.
 - 7** Optionally, click on the **P**rint button or the **S**ave button.
Choose **S**ave to save the results to a file; choose **P**rint to have the results printed on the default printer.
Choosing **S**ave will bring up a GUI labeled **S**ave **T**o **F**ile. Specify the directory and file name in which to save the results file.
 - 8** Optionally, in the Prohibited Function Checker GUI, highlight one of the source files listed. Then click on **V**iew.
The **S**ource **C**ode GUI will be displayed.
Occurrences of prohibited functions found in that source file will be highlighted.
Click on the **N**ext button to bring into the window successive occurrences of prohibited functions (the **N**ext button does not bring in the next source file).
Click on the **D**one button to close the **S**ource **C**ode GUI. Other source files may be examined similarly, one at a time.
 - 9** In the Prohibited Function Checker GUI, click on the **Q**uit button.
The Prohibited Function Checker GUI will disappear.
This ends the session.
-



Figure 11.5.5-2. Invoking the Prohibited Function Checker

11.5.6 Checking Process Control Files

The next task to accomplish is to check that the PCFs are syntactically correct and contain all necessary information for PGEs to run within the ECS DAAC production environment. Only one PCF can be associated with a PGE. The following procedure describes how to check PCFs for valid syntax and format, both using the GUI and the command line interface.

11.5.6.1 Checking Process Control Files GUI

The following is a list of tools, and or assumptions:

1. The SSIT Manager is running.
2. The Process Control File(s) are available, accessible, and have read permissions.

If the source code files to be checked are in a VOB in ClearCase, a view has been set before the SSIT Manager was started.

Checking Process Control Files GUI

- 1 From the SSIT Manager, select **Tools** → **Standards Checkers** → **Process Control File Checker** from the menu, see figure 11.5.6-1.

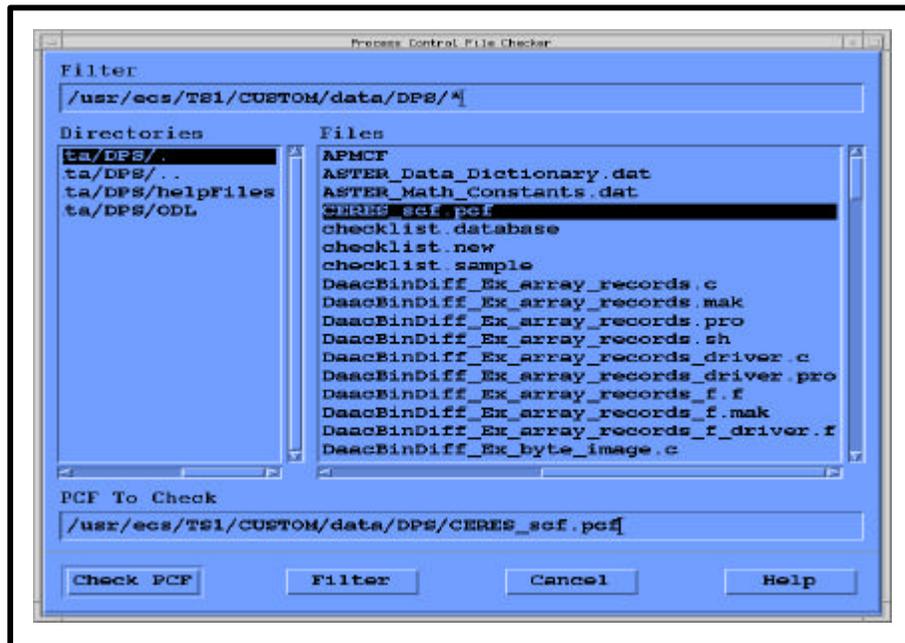


Figure 11.5.6-1. Process Control File Checker GUI

- The Process Control File Checker GUI will be displayed.
- 2 In the **Directories** subwindow, double click on the desired directory.
Repeat this step until the directory with the PCF(s) to be checked are displayed in the Files window.
Use the **Filter** subwindow to limit which files are displayed.
 - 3 Within the **Files** subwindow, click on the PCF to be checked.
The file clicked on will be highlighted.
Only one PCF can be checked at a time.
 - 4 Click on the **Check PCF** button.
A GUI labeled **PCF Checker Results** will be displayed.
Results will be displayed in this window.
 - 5 Optionally, click on the **Save** button or on the **Print** button.
Choose **Save** to save the results to a file; choose **Print** to have the results printed on the default printer.
Choosing **Save** will bring up a GUI labeled **Save To File**. Specify the directory and file name in which to save the results file.
Choosing **Print** and then clicking on the **OK** button will send the results to the default printer.
 - 6 Click on the **Check Another** button or on the **Quit** button.
Choosing **Check Another** allows another PCF to be checked. Repeat steps 2 through 5.
Choosing **Quit** causes the Process Control File Checker GUI to disappear and ends the session.
-

11.5.6.2 Checking Process Control Files: Command-Line Version

This procedure describes using the command-line version of the Process Control File Checker to check process control files delivered with the science software.

Detailed procedures for tasks performed by the SSI&T operator are provided in the sections that follow.

Assumptions:

1. The PCF files to be checked are available, accessible, and have read permissions for the operator.
2. You will need the command **pccheck.sh**. One way to see if this is available is to type **which pcccheck.sh**, press **Return**. If a path is displayed, then the directory is in your path. On the mini-DAAC Sun platform **calahans**, the pathname for the command is `/ecs/formal/TOOLKIT/bin/sun5/pccheck.sh`. In this case, you will have to set a ClearCase view to access that area.

To check Process Control Files, execute the procedure steps that follow:

- 1 If required, at the UNIX prompt on an AIT Sun, type **cleartool setview *ViewName***, press **Return**.
 - The *ViewName* is the name of a view allowing the Process Control File(s) to be accessible.
 - This step is only necessary if any of the Process Control Files are in ClearCase (in the VOB under configuration management).
 - 2 At the UNIX prompt on AIT Sun, type **cd *PCFpathname***, press **Return**.
 - The *PCFpathname* is the full path name to the location of the Process Control File(s) to be checked.
 - The *PCFpathname* will be in the ClearCase VOB if the Process Control Files are checked into ClearCase.
 - 3 At the UNIX prompt on an AIT Sun, type **/ecs/formal/TOOLKIT/bin/sun5/pccheck.sh -i *PCFfilename* > *ResultsFile***, press **Return**.
 - The *PCFfilename* is the full path name (directory and file name) to the Process Control File to check.
 - The *ResultsFile* is the file name for the results that are output.
 - The PCF Checker is also available on the SPR SGI machines. The easiest way to access it is to set a SDP Toolkit environment (any will do for purposes here, see Section 9.2) and type **\$PGSBIN/pccheck.sh -i *PCFfilename* > *ResultsFile***, press **Return**.
 - 4 At the UNIX prompt on the SPR SGI, type **vi *ResultsFile***, press **Return**.
 - The *ResultsFile* is the file name for the output results as produced in step 4.
 - Any text editor may be used for this procedure step.
-

11.5.7 Extracting Prologs

The Project standards and guidelines are contained in the latest version of the document *Data Production Software and Science Computing Facility (SCF) Standards and Guidelines* (423-16-01). This ESDIS document mandates that science software delivered to the DAACs to be integrated into the ECS contain prologs in the source files. Prologs are internal documentation containing information about the software. The details are specified in the ESDIS document. Prologs must be at the top of every function, subroutine, procedure, or program module.

This procedure describes using the Prolog Extractor to extract prologs into a file. Note that the prolog extractor only extract the prologs it finds. It does not check the contents of prologs.

The following is a list of tools, and or assumptions:

1. The SSIT Manager is running.
2. Prologs are assumed to be delimited by particular delimiters depending on the language type. Delimiters are listed in the table below:

Prolog Delimiters

Language	Type	Delimiter
FORTRAN 77	source	!F77
Fortran 90	source	!F90
C	source	!C
Ada	source	!Ada
FORTRAN 77	include	!F77-INC
Fortran 90	include	!F90-INC
C	include	!C-INC
Any Language	any	!PROLOG
All Languages	The end delimiter is always !END	

The Prolog Extractor recognizes the language type of the file by its file name extension. The table below lists assumed file name extensions:

File Name Extensions

File Type	File Name Extensions
FORTRAN 77	f, f77, ftn, for, F, F77, FTN, FOR
Fortran 90	f90, F90, f, F
FORTRAN 77/Fortran 90 include	inc, INC
C	c
C/C++ header	h
Ada	a, ada

11.5.7.1 Extracting Prologs

The Prolog Extractor can be started from the UNIX prompt. To do this, at the UNIX prompt on the AIT Sun, type `/data3/ecs/TS1/CUSTOM/bin/DPS/EcDpAtMgrPrologs`, press **Return**

or

-
- 1 From the SSIT Manager, select the **T**ools → **S**tandards Checkers → **P**rolog **E**xtractor from the menu.
An xterm will be displayed on the AIT Sun.
Select the default ConfigFile. The output goes to a file called Prologs.txt in the directory from which the SSIT Manager was started.
The Prologs.txt file can be viewed by changing directories to the SSIT Manager directory and invoking a text editor. The file may also be sent to a printer.
 - 2 At the **Files(S)? (-h help)** prompt, type in the file names and/or directory names containing the files.
Separate items with spaces.
The contents of the directory will be search recursively for files with valid file name extensions.
Use `./` to indicate current directory.
The time needed for the Prolog Extractor could be very long for large numbers of files and directories.
When extraction is complete, the message **Output written to file: ./prologs.txt** will be displayed.
 - 3 At the program prompt **Hit Enter for another, "q <Enter>" to quit:**, press **Enter** to repeat process with another set of source files or type **q** and press **Enter** to quit.
 - The xterm will disappear.
 - 4 At a UNIX prompt on the AIT Sun, type **vi prologs.txt**, then press the **Enter** key.
The extracted prologs file, named **prologs.txt**, will be brought into the editor.
The default location of the **prologs.txt** file is the directory from which the SSIT Manager was invoked.
 - 5 Once the extracted prologs file has been examined, exit the editor.
-

```
SOURCE CODE PROLOG EXTRACTOR
Configuration filename? (enter for default: ../../cfg/EcDpAtPrologs.CFG)
ECS mode? (enter for default: OPS)
TS1
File(s)? (enter -h for help)
/home/dps/ssit/*.c
Warning: Could not open message catalog "oodce.cat"
[Warning:
Invalid Resource Catalog directory path or no catalog installed
Applications can run with or without Resource Catalog
FYI : Values of ECS_HOME env variable and RC Directory path:/usr/ecs/ecsmode/CU
STOM/data/DPS/ResourceCatalogs
]

EcDpAtPrologs: Process Framework: ConfigFile ../../cfg/EcDpAtPrologs.CFG  ecs_m
ode ecsmode

Output written to file: /usr/ecs//TS1/CUSTOM/logs/prologs.txt
Hit return for another, 'q <return>' to quit:
□
```

Figure 11.5.7-1. Prolog Extractor Sample Run.

11.6 Compiling and Linking Science Software

Science software to the DAACs is in the form of source files. In order to be run and tested within the ECS, this science software has to be compiled and linked to form the binary executables that run within the PGEs. Science software is developed at independent Science Computing Facilities (SCFs) using the SDP Toolkit. The SDP Toolkit allows science software to be developed for ECS at independent SCFs. Once delivered to the DAACs for SSI&T, science software needs to be compiled and linked to one of the SDP Toolkit versions resident at the DAAC. The (PCFs) Process Control Files provide the interface between the science software and the production system in the ECS. Since the process control files delivered to the DAACs for SSI&T were created and used at the SCFs, the path names in the PCF will need to be checked and revised to work at the DAACs.

To save time for the SSI&T Training Lesson, the compile and link with the SCF Version of the Toolkit will be omitted. The procedures are included in the student guide for future reference.

The next step is to set up a DAAC version SDP Toolkit environment, compile the PGE, and link to the DAAC Toolkit. This procedure will be performed at the SSI&T Training.

The procedure steps for the two processes are the same except for the set up for the Toolkit environment and link with the corresponding Toolkit library.

11.6.1 Updating the Process Control File

Detailed procedures for tasks performed by the SSI&T operator are provided in the sections that follow.

Assumptions:

1. A PCF for the PGE has been delivered and is available, accessible, and has read permissions.

To update the PCF, execute the procedure steps that follow:

- 1 From the SSIT Manager, click on the **T**ools menu, then choose **X**term. Then telnet to the SGI.
 - Alternatively, in any currently available xterm window, spawn a new session: type **xterm &**, press **Return**. Then telnet to the SGI.
- 2 If required, at the UNIX prompt on the SGI, type **cleartool setview *ViewName***, press **Return**.
 - The ***ViewName*** is the name of a view allowing the PCF to be accessible.
 - This step is only necessary if the PCF is in ClearCase (in the VOB under configuration management).
- 3 At the UNIX prompt on the Sun or on the SGI, type **cd *PCFpathname***, press **Return**.
 - The ***PCFpathname*** is the full path name to the location of the PCF. This location will be in the ClearCase VOB if the PCF is under configuration management.
- 4 At the UNIX prompt on the Sun or on the SGI, type **cleartool checkout -nc *PCFfilename***, press **Return**.
 - The ***PCFfilename*** is the file name of the PCF that is to be checked out (and later modified). The **-nc** flag means “no comment”; it suppresses ClearCase from prompting for a comment to be associated with the check out step.
- 5 Run the Process Control File Checker on the delivered PCF.
 - This will verify that the delivered PCF is correct before editing.
- 6 At a UNIX prompt on the Sun, type **vi *PCFfilename***, press **Return**.
 - The ***PCFfilename*** is the file name of the PCF to update.
 - Any text editor may be used such as *emacs*. For example, **emacs *AST02.pcf***, press **Return**.
- 7 In the file, make changes to the default directories specified in each section of the PCF. All path names specified in the PCF must exist on the SGI.
 - Each section begins with a line consisting of a ? in the first column followed by a label:
? PRODUCT INPUT FILES
? PRODUCT OUTPUT FILES

```

? SUPPORT INPUT FILES
? SUPPORT OUTPUT FILES
? INTERMEDIATE INPUT
? INTERMEDIATE OUTPUT
? TEMPORARY I/O

```

- Each of the above section heading lines will then be followed (not necessarily immediately; there may be comment lines) by a line that begins with a ! in the first column. These lines specify the default path names for each section.
 - If the line reads:
! ~/runtime
leave it unchanged. The tilde (~) is a symbol that represents \$PGSHOME.
 - If another path name is listed instead, it will probably need to be changed to a path name that exists at the DAAC on the SGI. When specifying a path name, use an absolute path name, not a relative path name.

- 8** In the file, look for science software specific entries in each section and make changes to the path names (field 3) as necessary. All path names specified in the PCF must exist on the SGI.
- The science software specific entries will have logical IDs (first field) *outside* of the range 10,000 to 10,999.
 - Where necessary, replace the path names in the third field of each entry with the path names appropriate to the DAAC environment.
 - Do not alter file entries that are used by the SDP Toolkit itself. These have logical IDs *in* the range 10,000 to 10,999.
 - For example, if the following entry was found in the PCF:
100 | A.granule | /MODIS/run/input | | | 1
change /MODIS/run/input to the appropriate path name in the DAAC where the file A.granule is stored.
 - When specifying a path name, use an absolute path name, not a relative path name.
 - Do not include the file name with the path name. The file name belongs in field 2 by itself.
- 9** In the file, verify that the SUPPORT OUTPUT FILES section contains an entry to the shared memory pointer file.
- Look for the entry:
10111 | ShmMem | ~/runtime | | | 1
The third field may be blank; this will work too.
 - If this entry is not within this section, add it.
- 10** Once changes have been made to the PCF, save the changes and exit the editor.
- The specifics depend upon which editor is being used. If using *vi*, the command sequence to enter is **:wq**, press **Return**.
 - For other editors, refer to that editor's documentation.
- 11** Again, run the Process Control File Checker on the PCF.

- 12** If the PCF had been checked out of ClearCase, at the UNIX prompt on the SGI, type **cleartool checkin -nc *PCFfilename***, press **Return**.
- The *PCFfilename* is the file name of the modified PCF. The **-nc** flag means “no comment”; it suppresses ClearCase from prompting for a comment to be associated with the check in step.
-

11.6.2 Setting up a SDP Toolkit Environment

The purpose of the SDP Toolkit is to allow science software to be developed for ECS at independent SCFs and to provide:

An interface to the ECS system, including PDPS and CSMS and information management.

A method for Science software to be portable to different platforms at the DAAC.

A method to reduce redundant coding at the SCF.

Value added functionality for science software development.

The SDP Toolkit is divided into two groups of tools:

11.6.2.1 Mandatory Tools

Error and Status Message Facility (SMF) - provides general error handling, status log messaging, and interface to CSMS services.

Process Control Tools - provides the primary interface to the PDPS. Allows access to physical filenames and file attributes and retrieval of user defined parameters.

Generic Input/Output - provides the means to open and close support, temporary and intermediate duration files.

Memory Allocation Tools - simple wrappers on native C functions which track memory usage in the SDPS, and shared memory tools which enable the sharing of memory among executables within a PGE.

11.6.2.2 Optional Tools

Ancillary Data Access - provides access to NMC data and Digital Elevation (DEM) data.

Celestial Body Position - locates the sun, moon and the planets.

Coordinate System Conversion - coordinate conversions between celestial reference.

Constant and Unit Conversion - physical constants and unit conversions.

IMSL - mathematical and statistical support.

In the description of the Toolkit routines, descriptive information is presented in the following format:

TOOL TITLE

NAME:	Procedure or routine name
SYNOPSIS:	C: C language call
FORTRAN:	FORTRAN77 or Fortran90 language call
DESCRIPTION:	Cursory description of routine usage
INPUTS:	List and description of data files and parameters input to the routine

- OUTPUTS:** List and description of data files and parameters output from the routine
- ENTERS:** List of returned parameters indicating success, failure, etc.
- EXAMPLES:** Example usage of routine
- NOTES:** Detailed information about usage and assumptions
- REQUIREMENTS:** Requirements from PGS Toolkit Specification, Oct. 93 which the routine satisfies

The science software delivered to the DAACs is expected to work with either the SCF SDP Toolkit or the DAAC SDP Toolkit which are both installed each DAAC. During the pre-SSI&T initial testing, the SCF Toolkit should be used.

There are several versions of the SCF/DAAC SDP Toolkit installed on the SGI Power Challenges at the DAACs for the Release 4 system. The toolkit versions at the DAACs differ according to:

Object Type - The operating system on the SGI Power Challenges on Release 4 is IRIX 6.2, a 64-bit operating system. To be backward compatible, the SGI operating system will allow new 64-bit and 32-bit objects to be built as well as the older 32-bit machines. Each of these object types are designated by placing a cc flag on the command line to enable a particular mode with the SGI C compiler.

New 64-bit: cc flag = -64

New 32-bit: cc flag = -n32

Old 32-bit: cc flag = -32

Library Type - The SDP Toolkit uses different libraries depending upon whether FORTRAN 77 or FORTRAN 90 source code is being linked. If C source code is to be linked, then either language version of the library will work.

The following Table summarizes the available SDP Toolkits used by the SGI science processors.

Table 11.6.2-1. SDP Toolkits used by the SGI science processors.

SDP Version	Language Type	Library Object Type	\$PGSHOME	\$PGSBIN
SCF	FORTRAN 77 or C	Old 32-bit mode	\$CUSTOM_HOME/bin/ scf_toolkit_f77/TOOLKIT/	\$CUSTOM_HOME/bin/ scf_toolkit_f77/TOOLKIT/ bin/sgi/
SCF	Fortran 90 or C	Old 32-bit mode	\$CUSTOM_HOME/bin/ scf_toolkit_f90/TOOLKIT/	\$CUSTOM_HOME/bin/ scf_toolkit_f90/TOOLKIT/ bin/sgi/
SCF	FORTRAN 77 or C	New 32-bit mode	\$CUSTOM_HOME/bin/ scf_toolkit_f77/TOOLKIT/	\$CUSTOM_HOME/bin/ scf_toolkit_f77/TOOLKIT/ bin/sgi32/
SCF	Fortran 90 or C	New 32-bit mode	\$CUSTOM_HOME/bin/ scf_toolkit_f90/TOOLKIT/	\$CUSTOM_HOME/bin/ scf_toolkit_f90/TOOLKIT/ bin/sgi32/
SCF	FORTRAN 77 or C	64-bit mode	\$CUSTOM_HOME/bin/ scf_toolkit_f77/TOOLKIT/	\$CUSTOM_HOME/bin/ scf_toolkit_f77/TOOLKIT/ bin/sgi64/
SCF	Fortran 90 or C	64-bit mode	\$CUSTOM_HOME/bin/ scf_toolkit_f90/TOOLKIT/	\$CUSTOM_HOME/bin/ scf_toolkit_f90/TOOLKIT/ bin/sgi64/
DAAC	FORTRAN 77 or C	Old 32-bit mode	\$CUSTOM_HOME/bin/ daac_toolkit_f77/TOOLKIT/	\$CUSTOM_HOME/bin/ daac_toolkit_f77/TOOLKIT/ bin/sgi/
DAAC	Fortran 90 or C	Old 32-bit mode	\$CUSTOM_HOME/bin/ daac_toolkit_f90/TOOLKIT/	\$CUSTOM_HOME/bin/ daac_toolkit_f90/TOOLKIT/ bin/sgi/
DAAC	FORTRAN 77 or C	New 32-bit mode	\$CUSTOM_HOME/bin/ daac_toolkit_f77/TOOLKIT/	\$CUSTOM_HOME/bin/ daac_toolkit_f77/TOOLKIT/ bin/sgi32/
DAAC	Fortran 90 or C	New 32-bit mode	\$CUSTOM_HOME/bin/ daac_toolkit_f90/TOOLKIT/	\$CUSTOM_HOME/bin/ daac_toolkit_f90/TOOLKIT/ bin/sgi32/
DAAC	FORTRAN 77 or C	64-bit mode	\$CUSTOM_HOME/bin/ daac_toolkit_f77/TOOLKIT/	\$CUSTOM_HOME/bin/ daac_toolkit_f77/TOOLKIT/ bin/sgi64/
DAAC	Fortran 90 or C	64-bit mode	\$CUSTOM_HOME/bin/ daac_toolkit_f90/TOOLKIT/	\$CUSTOM_HOME/bin/ daac_toolkit_f90/TOOLKIT/ bin/sgi64/

11.6.2.3 Setting Up the SDP Toolkit Environment

Detailed procedures for tasks performed by the SSI&T operator are provided in the sections that follow.

Assumptions:

1. The C shell (or a derivative) is the current command shell.

To check set up a SDP Toolkit environment, execute the procedure steps that follow:

-
- 1 At the UNIX prompt on the SGI, type **setenv PGSHOME *ToolkitPathname***, press **Return**.
 - The *ToolkitPathname* is the home directory of the particular SDP Toolkit version being used. Refer to Table 11.6.2-1. Note that the setting of PGSHOME shown in this table may differ in your local DAAC.
 - Korn shell users, type **PGSHOME=*ToolkitPathname*; export PGSHOME**, press **Return**.
 - 2 At the UNIX prompt on the SGI, type **source \$PGSHOME/bin/*sgiX*/pgs-dev-env.csh**, press **Return**.
 - The *sgiX* is one of: **sgi** for 32-bit version of the Toolkit or **sgi64** for 64-bit version of the Toolkit. Refer to the last column of Table 11.6.2-1. for path names to the file to source.
 - Korn shell users, type **.\$PGSHOME/bin/*sgiX*/pgs-dev-env.ksh**, press **Return** (note the “dot” and then space at the beginning of this command).
 - 3 This step is optional. Edit the file \$HOME/.cshrc and add the line **alias *aliasname* ‘setenv PGSHOME *ToolkitPathname*; source \$PGSHOME/bin/*sgiX*/pgs-dev-env.csh; echo “*textmessage*” ‘**.
 - The *aliasname* is the name of the alias. For example, to set up an environment for the DAAC version of the Toolkit for FORTRAN 77 (or C), you might use **DAACf77** as an *aliasname*.
 - The *ToolkitPathname* is the home directory of the particular SDP Toolkit version being used. Refer to Table 11.6.2-1. Note that the setting of PGSHOME shown in this table may differ in your local DAAC.
 - The *sgiX* is one of: **sgi** for 32-bit version of the Toolkit or **sgi64** for 64-bit version of the Toolkit.
 - The *textmessage* is a message that will be echoed to the screen signifying that a new Toolkit environment has been set up. It must be enclosed within double quotes (“”). An example may be, **“DAAC F77 Toolkit environment is now set.”**
 - A complete example (it should be all on one line in the .cshrc file):

```
alias DAACf77 ‘setenv PGSHOME
    /$CUSTOM_HOME/bin/daac_toolkit_f77/TOOLKIT;
    source $PGSHOME/bin/sgi/pgs-dev-env.csh; echo
    “DAAC F77 Toolkit environment is now set” ‘
```
 - Other aliases for other versions of the Toolkit can be set up similarly.
-

11.6.2.4 An example of Compile procedures used to produce a PGE.exe :

1 Setup for PGE07:

```
/home/emcleod/MODIS/STORE/PGE07/MOD_PR10/source
rm MOD_PR10.exe
rm *.o
setenv PGSHOME /usr/ecs/OPS/CUSTOM/daac_toolkit_f77/TOOLKIT
source $PGSHOME/bin/sgi32/pgs-dev-env.csh
source
/home/emcleod/MODIS/STORE/PGE07/MOD_PR10/source/MODIS_setup.csh.pge07
alias
n32_f77
env
make -f MOD_PR10.mk &
ls -l *exe
setenv PGS_PC_INFO_FILE
/home/emcleod/MODIS/STORE/PGE07/MOD_PR10/source/MOD_PR10.pcf
ls
MOD_PR10.exe &
confirm execution when done by looking at file : vi
MOD_PR10_ClopyL1BmetaToSnow.c
see if job is running: ps -u emcleod "time updating for MOD_PR10"
lasher{emcleod}88: ps -u emcleod
  PID TTY   TIME CMD
  267 ?    3:13 biod
 25825 pts/11 0:01 csh
 21994 pts/10 0:01 csh
 23215 pts/16 0:00 csh
 26242 pts/10 0:07 MOD_PR10.
 26089 pts/11 0:01 xedit
 26318 pts/10 0:00 ps
lasher{emcleod}105: pwd
/tmp_mnt/home/emcleod/MODIS/STORE/PGE07/MOD_PR10/source
lasher{emcleod}106: ls
MODIS_setup.csh.pge07      MOD_PR10_CopyL1BmetaToSnow.c
MODIS_setup_OPS           MOD_PR10_CopyL1BmetaToSnow.o
MOD_PR10.exe              MOD_PR10_MakeMeta.c
MOD_PR10.h                MOD_PR10_MakeMeta.o
MOD_PR10.mcf              MOD_PR10_Process_Cloud.c
MOD_PR10.mk               MOD_PR10_Process_Cloud.o
MOD_PR10.pcf              MOD_PR10_Process_GEO.c
MOD_PR10_AAmain.c         MOD_PR10_Process_GEO.o
MOD_PR10_AAmain.o         MOD_PR10_Process_L1B.c
MOD_PR10_Compute_Snow.c   MOD_PR10_Process_L1B.o
MOD_PR10_Compute_Snow.o   MOD_PR10_Process_SnowFile.c
```

```
MOD_PR10_CopyGEOmetaToSnow.c MOD_PR10_Process_SnowFile.o
MOD_PR10_CopyGEOmetaToSnow.o compile_smf.csh
lasher{emcleod}107:
```

11.6.2.5 Example of a PGE Executables Tar File Insertion Script

This example was produced in Drop 4 and is provided for review only. Go to the section Placing the Science Software Executable (SSEP) on the Data Server which includes the Insertion of a PGE Tar file..

```
Configuration filename? (enter for default:
../cfg/EcDpAtInsertExeTarFile.CFG)
ECS Mode of operations? (enter for default: OPS)
Name of PGE? (enter for default: PGE07)
Science software version of PGE? (enter for default: 2)
Staged filename to insert (including FULL path)? (enter for default:
/home/emcleod/SSEP/PGE07.tar)
Associated ASCII metadata filename to insert (including FULL path)? (enter for
default /home/emcleod/SSEP/PGE07.tar.met)
Top level shell filename within tar file? (enter for default: PGE07.csh)
PGE07.csh
Warning: Could not open message catalog "oodce.cat"
/usr/ecs//OPS/CUSTOM/bin/DPS/EcDpAtInsertExeTarFile: Process Framework:
ConfigFile ../cfg/EcDpAtInsertExeTarFile.CFG ecs_mode OPS
Performing INSERT.....
Retrieved from IOS for ESDT = PGEEXE the DSS UR =
UR:15:DsShSciServerUR:13:[MDC:DSSDSR
Trying to make a request to [MDC:DSSDSRV]
Trying to make a request to [MDC:DSSDSRV]
Insert to Data Server and PDPS database update successful for:
  PGE name = 'PGE07'
  Ssw version = '2'
  ESDT = 'PGEEXE'
  ESDT Version = "001"
  staged file = '/home/emcleod/SSEP/PGE07.tar'
  metadata file = '/home/emcleod/SSEP/PGE07.tar.met'
  Top level shell name = 'PGE07.csh'
Inserted at UR:
'UR:10:DsShESDTUR:UR:15:DsShSciServerUR:13:[MDC:DSSDSRV]:14:LM:PGEEEX
E:94'
Hit return to run again, 'q <return>' to quit:
```

11.6.3 Compiling Status Message Facility (SMF) Files

Status Message Facility (SMF) files are used by the SDP Toolkit to facilitate a status and error message handling mechanism for use in the science software and to provide a means to send log files, informational messages, and output data files to DAAC personnel or to remote users.

Science software making use of the SMF need particular header (include) files when being built and also need particular runtime message files when being run. Both the header and message files are produced by running a SMF “compiler” on a message text file. These message text files should be part of the science software delivery to the DAAC. They typically have a .t file name extension.

This procedure describes how to compile the SMF message text files to produce both the necessary include files and the necessary runtime message files.

Detailed procedures for tasks performed by the SSI&T operator are provided in the sections that follow.

Assumptions:

1. The C shell (or a derivative) is the current command shell.

To check compile status message facility (SMF) files, execute the procedure steps that follow:

- 1 From the SSIT Manager, click on the **T**ools menu, then choose **X**term. Then telnet to the SGI.
 - Alternatively, in any currently available xterm window, spawn a new session: type **xterm &**, press **Return**. Then telnet to the SGI.
 - It is recommended that this procedure begin within a new command shell on the SGI.
- 2 If required, at the UNIX prompt on the SGI, type **cleartool setview *ViewName***, press **Return**.
 - The ***ViewName*** is the name of a view allowing the SMF files to be accessible.
 - This step is only necessary if any of the SMF files are in ClearCase (in the VOB under configuration management).
- 3 At the UNIX prompt on the SGI, type **setenv PGSHOME *ToolkitPathname***, press **Return**. Then type, source **\$PGSHOME/bin/*sgiX*/pgs-dev-env.csh**, press **Return**.
 - The ***ToolkitPathname*** is the home directory of the desired SDP Toolkit version.
 - The ***sgiX*** refers to the appropriate processor. For example, type **source \$PGSHOME/bin/*sgi*/pgs-dev-env.csh**, press **Return**.
- 4 At the UNIX prompt on the SGI, type **cd *pathname***, press **Return**.
 - The ***pathname*** is the full path name to the directory containing the SMF text files.
 - The SMF text files will typically have .t file name extensions.

- 5 At the UNIX prompt on the SGI, type **smfcompile -f *textfile.t* -lang** , press **Return**.
- The **-lang** is a flag that indicates for what language to compile. This flag can be one of **-c** to produce C header files, **-f77** to produce FORTRAN 77 include files, and **-ada** to produce Ada include files. The default is for C include files. For example, type **smfcompile -f77 PGS_MODIS_39123.t**, press **Return**.
 - The ***textfile*** is the file name of the SMF text file delivered with the science software.
 - The SMF text files will typically have .t file name extensions.
 - File names for SMF text files usually have the “seed” value used by the file as part of its file name (*e.g.* PGS_MODIS_39123.t where 39123 is the seed number).
 - Only one such SMF text file can be compiled at a time; wildcards cannot be used.
 - The SMF compiler may be run with the additional flags **-r** and **-i** as in, **smfcompile -f *textfile.t* -r -i**. The **-r** automatically places the runtime message file in the directory given by the environment variable PGSMSG. The **-i** automatically places the include file in the directory given by the environment variable PGSINC. For example, type **smfcompile -ada -r -i -f PGS_MODIS_39123.t**, press **Return**. Note that the **-f** flag must always be immediately followed by the name of the text file.
- 6 If necessary, at the UNIX prompt on the SGI, type **mv *IncludeFilename* \$PGSINC**, press **Return**. Then, type **mv *RuntimeFilename* \$PGSMSG**, press **Return**.
- This step is only required if either the **-r** or the **-i** flag were not used in step 5.
 - The ***IncludeFilename*** is the name of the include file created in step 5.
 - The ***RuntimeFilename*** is the name of the runtime message file created in step 5.
 - For example, type **mv PGS_MODIS_39123.h \$PGSINC**, press **Return**. And then type, **mv PGS_MODIS_39123 \$PGSMSG**, press **Return**.
-

11.6.4 Building Science Software with the SCF Version of the SDP Toolkit

In order to be tested at the DAAC, science software must be compiled and linked to produce binary executables. These binary executables are then packaged into one or more shell scripts as defined by the science software developer (Instrument Team). These science software packages are the Product Generation Executives (PGEs) delivered to the DAACs during SSI&T. PGEs are the smallest schedulable unit of science software in the ECS.

Building science software into PGEs should be done in accordance with supplied documentation. Such documentation should describe the process in detail. In general, science software deliveries will come with make files or other build scripts to automate the build process.

In general, science software will be built, run, and tested with the SCF version of the SDP Toolkit to ensure that the software has been successfully ported to the DAAC. Once this test has been completed successfully, the science software will be re-built, rerun, and re-tested with the DAAC version of the SDP Toolkit. Only with the DAAC Toolkit can the PGE be run within the ECS.

This procedure describes some general principals that may or may not be applicable to a particular science software delivery for building a PGE with the SCF version of the SDP Toolkit. See Section for Building a PGE with the DAAC version of the SDP Toolkit.

Building Science Software with the SCF Version of the SDP Toolkit - Activity Detailed procedures for tasks performed by the SSI&T operator are provided in the sections that follow.

Assumptions:

1. The C shell (or a derivative) is the current command shell.

To build science software with the SCF version of the SDP Toolkit, be aware of the “typical” procedure steps that follow:

- 1 Read all instructional material supplied with the science software delivery. Such material should be the primary source of information on how to build the science software.
 - Read the *Systems Description* document and the *Operations Manual*. Both of these or their equivalent should be in the delivery.
 - Typically, there will be “readme” files accompanying each PGE in the directory structure, perhaps in a doc directory.
 - Text files (ASCII) may be viewed with the UNIX command, *more* or with the *vi* editor.
 - PostScript documents may be viewed with *ghostview*, which is accessible via the SSIT Manager.
 - PDF formatted documents may be viewed with *acroread*, the Acrobat Reader, also accessible via the SSIT Manager.
 - Documents in Microsoft Word and related formats may be viewed through the Microsoft Windows™ 3.1 emulator. The MS Windows emulator may be accessed from the SSIT Manager.
- 2 From the SSIT Manager, click on the **T**ools menu, then choose **X**term. Then telnet to the SGI.
 - Alternatively, in any currently available xterm window, spawn a new session: type **xterm &**, press **Return**. Then telnet to the SGI.
 - It is recommended that this procedure begin within a new command shell on the SGI.

- 3 At the UNIX prompt on the SGI, type **setenv *PGSHOME ToolkitPathname***, press **Return**. Then type, source ***\$PGSHOME/bin/sgiX/pgs-dev-env.csh***, press **Return**.
 - The *ToolkitPathname* is the home directory of the desired SDP Toolkit version, in this case, an SCF version.
 - The *sgiX* refers to the appropriate processor. For example, type **source *\$PGSHOME/bin/sgi/pgs-dev-env.csh***, press **Return**.
- 4 If make files are in ClearCase, at the UNIX prompt on the SGI, type **cleartool setview *ViewName***, press **Return**. Then, **cd *pathname***, press **Return**. And **cleartool checkout -nc *makefile***, press **Return**.
 - The *ViewName* is the name of a view allowing the make files to be accessible.
 - The *pathname* is the full path name of the directory (in the VOB) where the make file has been checked in.
 - The *makefile* is the name of the make file to examine and possibly modify.
 - This step is only necessary if any of the make files (or build scripts) are in ClearCase (in the VOB under configuration management).
- 5 Examine and alter (if necessary) any make files using any text editor (*vi*, *emacs*).
 - There may be several make files for a particular PGE.
 - Verify that compiler, compiler flag settings, and other environment variable settings are appropriate.
 - The Toolkit set up (from step 3) will set many environment variables which can be used in the make files. To see the current environment variable settings, at the UNIX prompt on the SGI, type **env**, press **Return**.
- 6 Compile any required status message facility (SMF) files and place the header file(s) in the proper directory for building.
- 7 Verify that the directory structure for the PGE source files matches the directory structure expected by the make files or build scripts.
 - Deliveries may come with install scripts that place files into various directories according to some predefined structure.
- 8 If necessary, at the UNIX prompt on the SGI, type **cleartool checkout -nc *filename***, press **Return**.
 - The *filename* is the file name of the executable, object file, or make file to be checked out of ClearCase. The **-nc** flag means “no comment”; it suppresses ClearCase from prompting for a comment to be associated with the check out step.
 - Note that checking in executable or object files is *not* recommended in the first place.
- 9 Build the software in accordance with instructions delivered.
 - Science software deliveries may come with a single, top-level script to do the entire build or the build process could involve a series of steps, each of which should be described fully in the delivered documentation.
 - Choose the most appropriate optimization/debugger flag. During testing, the **"-g"** is often used. This results in larger and slower executables, but

assists in debugging. For production, the "-O" flag may be used to optimize execution time. Variants of the "-g" and "-O" flags may be incompatible.

- 10** If necessary, at the UNIX prompt on the SGI, type **cleartool checkin *filename* -nc**, press **Return**.
- The *filename* is the file name of the executable, object file, or make file to be checked into ClearCase. The **-nc** flag means “no comment”; it suppresses ClearCase from prompting for a comment to be associated with the check in step.
 - Note that checking in executable or object files is *not* recommended.
-

11.6.5 Building Science Software with the DAAC Version of the SDP Toolkit

In general, science software will be built, run, and tested with the SCF version of the SDP Toolkit to ensure that the software has been successfully ported to the DAAC. Once this test has been completed successfully, the science software will be re-built, rerun, and re-tested with the DAAC version of the SDP Toolkit. Only with the DAAC Toolkit can the PGE be run within the ECS.

This procedure describes some general principals that may or may not be applicable to a particular science software delivery for building a PGE with the DAAC version of the SDP Toolkit.

Building Science Software with the DAAC Version of the SDP Toolkit - Activity Detailed procedures for tasks performed by the SSI&T operator are provided in the sections that follow.

Assumptions:

1. The C shell (or a derivative) is the current command shell.

To build science software with the DAAC version of the SDP Toolkit, be aware of the “typical” procedure steps that follow:

- 1** Read all instructional material supplied with the science software delivery. Such material should be the primary source of information on how to build the science software.
 - Read the *Systems Description* document and the *Operations Manual*. Both of these or their equivalent should be in the delivery.
 - Typically, there will be “readme” files accompanying each PGE in the directory structure, perhaps in a doc directory.
 - Text files (ASCII) may be viewed with the UNIX command, *more* or with the *vi* editor.
 - PostScript documents may be viewed with *ghostview*, which is accessible via the SSIT Manager.

- PDF formatted documents may be viewed with *acroread*, the Acrobat Reader, also accessible via the SSIT Manager.
 - Documents in Microsoft Word and related formats may be viewed through the Microsoft Windows™ 3.1 emulator. The MS Windows emulator may be accessed from the SSIT Manager.
- 2 From the SSIT Manager, click on the **T**ools menu, then choose **x**term. Then telnet to the SGI.
- Alternatively, in any currently available xterm window, spawn a new session: type **xterm &**, press **Return**. Then telnet to the SGI.
 - It is recommended that this procedure begin within a new command shell on the SGI.
- 3 At the UNIX prompt on the SGI, type **setenv PGSHOME ToolkitPathname**, press **Return**. Then type, source **\$PGSHOME/bin/sgiX/pgs-dev-env.csh**, press **Return**.
- The *ToolkitPathname* is the home directory of the desired SDP Toolkit version, in this case, a DAAC version.
 - The *sgiX* refers to the appropriate processor. For example, type **source \$PGSHOME/bin/sgi/pgs-dev-env.csh**, press **Return**.
- 4 If make files are in ClearCase, at the UNIX prompt on the SGI, type **cleartool setview ViewName**, press **Return**. Then, **cd pathname**, press **Return**. And **cleartool checkout -nc makefile**, press **Return**.
- The *ViewName* is the name of a view allowing the make files to be accessible.
 - The *pathname* is the full path name of the directory (in the VOB) where the make file has been checked in.
 - The *makefile* is the name of the make file to examine and possibly modify.
 - This step is only necessary if any of the make files (or build scripts) are in ClearCase (in the VOB under configuration management).
- 5 Examine and alter (if necessary) any make files using any text editor (*vi*, *emacs*). If the software had already been built and tested with the SCF version of the SDP Toolkit, this step may be unnecessary.
- There may be several make files for a particular PGE.
 - Verify that compiler, compiler flag settings, and other environment variable settings are appropriate.
 - The Toolkit set up (from step 3) will set many environment variables which can be used in the make files. To see the current environment variable settings, at the UNIX prompt on the SGI, type **env**, press **Return**.
- 6 Compile any required status message facility (SMF) files and place the header file(s) in the proper directory for building.
- 7 Verify that the directory structure for the PGE source files matches the directory structure expected by the make files or build scripts.
- Deliveries may come with install scripts that place files into various directories according to some predefined structure.

- 8 If necessary, at the UNIX prompt on the SGI, type **cleartool checkout -nc filename**, press **Return**.
- The *filename* is the file name of the executable, object file, or make file to be checked out of ClearCase. The **-nc** flag means “no comment”; it suppresses ClearCase from prompting for a comment to be associated with the check out step.
 - Note that checking in executable or object files is *not* recommended in the first place.
- 9 Build the software in accordance with instructions delivered.
- Science software deliveries may come with a single, top-level script to do the entire build or the build process could involve a series of steps, each of which should be described fully in the delivered documentation.
 - Choose the most appropriate optimization/debugger flag. During testing, the "-g" is often used. This results in larger and slower executables, but assists in debugging. For production, the "-O" flag may be used to optimize execution time. Variants of the "-g" and "-O" flags may be incompatible.
- 10 If necessary, at the UNIX prompt on the SGI, type **cleartool checkin filename -nc**, press **Return**.
- The *filename* is the file name of the executable, object file, or make file to be checked into ClearCase. The **-nc** flag means “no comment”; it suppresses ClearCase from prompting for a comment to be associated with the check in step.
 - Note that checking in executable or object files is *not* recommended.
-

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11.7 Running a PGE in a Simulated SCF Environment

Science software delivered to the DAACs for SSI&T was developed and tested at individual SCFs using the SCF version of the SDP Toolkit. Before linking the software with the DAAC version of the Toolkit and integrating it with the ECS, it is prudent to first link the software to the SCF version of the Toolkit and run it as it was run at the SCF. This type of testing can reveal problems associated with the process of porting the software to another platform whose architecture may be quite different from the one on which the software was developed.

A simulated SCF environment means that the software is built using the SCF version of the Toolkit and is run from the UNIX command line. The Planning and Data Processing System (PDPS) and the Data Server are not involved.

The procedures which follow describe how to run the science software in a simulated SCF environment.

11.7.1 Setting Up the Environment for Running the PGE

Running a PGE that has been built with the SCF version of the SDP Toolkit requires some environment set up as it does at the SCF. This procedure describes how to set up a simulated SCF environment.

Detailed procedures for tasks performed by the SSI&T operator are provided in the sections that follow.

Assumptions:

1. The Process Control File (PCF) exists and has been tailored for the DAAC environment.
2. The C shell or a derivative (*e.g.* T shell) is the current user shell.

To set up an environment for running the PGE, execute the procedure steps that follow:

- 1 From the SSIT Manager, click on the **T**ools menu, then choose **x**term. Then telnet to the SPR SGI.
 - Alternatively, in any currently available xterm window, spawn a new session: type **xterm &**, press **Return**. Then telnet to the SPR SGI.
 - It is recommended that this procedure begin within a new command shell on the SPR SGI.
- 2 At the UNIX prompt on the SPR SGI, type **setenv PGSHOME ToolkitPathname**, press **Return**. Then type, source **\$PGSHOME/bin/sgiX/pgs-dev-env.csh**, press **Return**.
 - The **ToolkitPathname** is the home directory of the desired SDP Toolkit version, in this case, an SCF version.
 - The **sgiX** refers to the appropriate processor (see Section 9.2 ?). For example, type **source \$PGSHOME/bin/sgi/pgs-dev-env.csh**, press **Return**.

- At the UNIX prompt on the SPR SGI, type **setenv PGS_PC_INFO_FILE *PCFpathname/PCFfilename***, press **Return**.
- The *PCFpathname* is the full path name to the location of the Process Control File (PCF) to be associated with this PGE.
 - The *PCFfilename* is the file name of the PCF.
 - For example, **setenv PGS_PC_INFO_FILE /disk2/PGE32/PCF/PGE32.pcf**, press **Return**.
- 3 Optionally, at the UNIX prompt on the SPR SGI, type **rm *LogPathname/LogFilename***, press **Return**.
- The *LogPathname* is the full path name to the location of the PGE log files for this PGE.
 - The *LogFilename* is the file name of the PGE log file to remove from a previous run of the same PGE. PGE log files can be Status, User, or Report.
 - The *LogFilename* may use wildcard characters to remove all of the log files at the same time.
 - This step is optional. If log files from a previous run of the same PGE are not removed, they will be appended with the information from the current run.
 - The environment will then be set up. Continue on the next Section.
- 4 If necessary, set any other shell environment variables needed by the PGE by sourcing the appropriate scripts or setting them on the command line.
- For example, for a PGE requiring IMSL, at the UNIX prompt on the SPR SGI, type **source /usr/ecs/TS1/COTS/imsl/vni/ipt/bin/iptsetup.cs**, press **Return**
 - For some PGEs, the environment variables to be set will be specified in the documentation or the files to source will be supplied in the delivery. Refer to documentation included in the delivery.
-

11.7.2 Running and Profiling the PGE

Profiling a PGE refers to the process of gathering information about the runtime behavior of a PGE. The information includes the wall clock time, user time and system time devoted to the PGE; the amount of memory used; the number of page faults; and the number of input and output blocks.

The Planning and Data Processing System (PDPS) database must be populated with the above information when the PGE is registered with the PDPS during the integration phase of SSI&T. This information may be delivered with the PGE or it may need to be determined at the DAAC during SSI&T. This procedure addresses the latter need.

Note that profiling, as used here, does not involve altering the binary executable to produce instrumented code.

Detailed procedures for tasks performed by the SSI&T operator are provided in the sections that follow.

Assumptions:

1. The PGE has been built successfully with the SCF version of the SDP Toolkit .
2. The required SMF runtime message files have been produced and placed in the correct locations.
3. The Process Control File (PCF) exists and has been tailored for the DAAC environment.
4. The required environment for running the PGE has been set up.
5. The required input files are available and accessible.
6. The C shell or a derivative (*e.g.* T shell) is the current user shell.

To run and profile the PGE, execute the procedure steps that follow:

- 1 At the UNIX prompt on the SPR SGI in the window containing the set up environment, type **cd *PGEbinPathname***, press **Return**.
 - The *PGEbinPathname* is the full path name of the directory containing the built PGE binary executable. For example, **cd /disk3/PGE32/bin/**, press **Return**.
- 2 At the UNIX prompt on the SPR SGI, type **/usr/ecs/<mode>/CUSTOM/bin/DPS/EcDpPrRusage *PGE* >& *ResultsOut***, press **Return**.
 - The *PGE* is the name given to the PGE binary executable.
 - The *ResultsOut* is the file name in which to capture the profiling results as well as any messages from standard output (stdout) and standard error (stderr) that may be produced by the running PGE. Note that PGEs should *not* write to stdout or stderr.
 - The **EcDpPrRusage** is the profiling program that outputs information about the runtime behavior of the PGE.
 - Depending upon the PGE, it may take some time before the UNIX prompt returns.
- 3 At the UNIX prompt on the SPR SGI, type **echo \$status**, press **Return**.
 - The **\$status** is an environment variable that stores the exit status of the previous program run, in this case, the PGE.
 - A status of zero indicates success; a status of non-zero indicates an error of some kind.
 - The meaning of a non-zero exit status should be documented and included with the DAPs.
 - This command must be run *immediately* after the **EcDpPrRusage** command.
- 4 At the UNIX prompt on the SPR SGI, type **vi *ResultsOut***, press **Return**.
 - The *ResultsOut* is the file name under which the profiling output was saved. Other output of the PGE may also be in this file.

- The **EcDpPrRusage** results may then be recorded and used when the PGE is registered in the PDPS.
- Any text editor/viewer may be used.

Sample of an Rusage File produced:

```
lasher{emcleod}6: more Profile.out
# source .cshrc
# cd TEST/MOD*
# ls
# /usr/ecs/OPS/CUSTOM/bin/DPS/EcDpPrRusage MOD_PR10.exe >
  Profile.out

lasher{emcleod}9: more profile.out

# Resource Usage Information

COMMAND=MOD_PR10.exe

EXIT_STATUS=0

ELAPSED_TIME=233.583145

USER_TIME=10.046158

SYSTEM_TIME=7.555547

MAXIMUM_RESIDENT_SET_SIZE=4080

AVERAGE_SHARED_TEXT_SIZE=0

AVERAGE_UNSHARED_DATA_SIZE=0

AVERAGE_UNSHARED_STACK_SIZE=0

PAGE_RECLAIMS=151

PAGE_FAULTS=0

SWAPS=0

BLOCK_INPUT_OPERATIONS=2

BLOCK_OUTPUT_OPERATIONS=2710

MESSAGES_SENT=0

MESSAGES_RECEIVED=0

SIGNALS_RECEIVED=0

VOLUNTARY_CONTEXT_SWITCHES=1095

INVOLUNTARY_CONTEXT_SWITCHES=2

lasher{emcleod}10:
```

11.8 File Comparison and Data Visualization

The purpose of File Comparison is to verify that the output files produced at the DAAC are identical (within tolerances) to the test output files delivered with the DAPs. A successful comparison is a strong indication that the porting of the science software from the development facility at the SCF to the operational facility at the DAAC has not introduced any errors.

A number of file comparison tools are available during SSI&T via the SSIT Manager GUI or they can be invoked from the UNIX command line. Two tools are available for comparing HDF or HDF-EOS files, one tool for comparing ASCII files, and another tool for assisting in comparing binary files.

11.8.1 Using the GUI HDF File Comparison GUI

The following is a list of tools, and or assumptions:

1. The SSIT Manager is running.
2. Two HDF or HDF-EOS files exist with similar structures.
3. The Instrument Team has delivered test output files.
4. If either of the two HDF/HDF-EOS files is in the ClearCase VOB, a ClearCase view was set before the SSIT Manager was started.

Comparing Two HDF or HDF-EOS Files Using the HDF File Comparison GUI

- 1 From the SSIT Manager, select **T**ools→**P**roduct Examination → **H**DF from the menu.
The HDF File Comparison GUI window will be displayed.
- 2 In the HDF File Comparison Tool GUI, click on the **File 1** button.
 - Read the Systems Description document and the Operations Manual. Both of these or their equivalent should be in the delivery.

11.8.2 Using the hdiff HDF File Comparison Tool

The hdiff File Comparison Tool is a text-oriented tool run from the command line. It allows comparison of two HDF or HDF-EOS files

The following is a list of tools, and or assumptions:

1. The SSIT Manager is running.
2. Two HDF or HDF-EOS files exist with similar structures.
3. The instrument Team has delivered test output files.
4. If either of the two HDF/HDF-EOS files is in the ClearCase VOB, a ClearCase view was set before the SSIT Manager was started.

Comparing two HDF or HDF-EOS Files Using the hdiff File Comparison Tool

- 1 From the SSIT Manager, select **T**ools→**P**roduct Examination → **F**ile Comparison → **H**DF from the menu.
The HDF File Comparison Tool window will be displayed.
 - An xterm window running *hdiff* will be displayed.
 - 2 In the xterm window at the prompt **Options? (-h for help)**, type in any desired options then press the **Enter** key.
 - To see the list of available options, type **-h** then press the **Enter** key. to the prompt.
 - 3 In xterm window at the prompt **1st file to compare?**, type *filename1*, then press the **Enter** key.
 - The *filename1* is the file name of the first of two HDF or HDF-EOS files to be compared.
 - If *filename1* is not in the current directory (the directory from which the SSIT Manage was run), include the full path name with the file name.
 - 4 In xterm window at the prompt **2nd file to compare?**, type *filename2*, then press the **Enter** key.
 - The *filename2* is the file name of the second of two HDF or HDF-EOS files to be compared. Select another students' file.
 - If *filename2* is not in the current directory (the directory from which the SSIT Manage was run), include the full path name with the file name. The two files will be compared and the output will be displayed in the xterm window.
-

11.8.3 Using the ASCII File Comparison Tool

Most output files (products) from PGEs run in the DAAC will be in HDF-EOS format. A small minority may be in ASCII (text) format. The ASCII File Comparison Tool is a front-end to *xdiff* UNIX X Window tool for comparing two ASCII files.

Detailed procedures for tasks performed by the SSI&T operator are provided in the sections that follow.

The following is a list of tools, and or assumptions:

1. The SSIT Manager is running.
2. Two ASCII files exist and have read permissions.
3. The instrument Team has delivered test output files.
4. If either of the two ASCII files are in the ClearCase VOB, a ClearCase view was set before the SSIT Manager was started.

Comparing Two ASCII Files

- 1 From the SSIT Manager, select **T**ools→**P**roduct Examination → **F**ile **C**omparison → **A**SCII from the menu.
An xterm window running *xdiff* will be displayed.
 - 2 In xterm window at the prompt **1st file to compare?**, type *filename1*, then press the **Enter** key. Select a descriptor or mcf file in the directory with the PGE.
The *filename1* is the file name of the first of two ASCII files to be compared.
If *filename1* is not in the current directory (the directory from which the SSIT Manage was run), include the full path name with the file name.
 - 3 In xterm window at the prompt **2nd file to compare?**, type *filename2*, then press the **Enter** key.
The *filename2* is the file name of the second of two ASCII files to be compared.
Select another student's corresponding file.
If *filename2* is not in the current directory (the directory from which the SSIT Manager was run), include the full path name with the file name.
A window labeled **xdiff** will be displayed.
 - 4 In the window labeled **xdiff**, view the differences between the two files displayed.
File *filename1* will be displayed on the left side of the window. File *filename2* will be displayed on the right.
Only sections of file in which there are differences will be displayed. A “bang” character (!) at the beginning of a line indicates that a difference was found.
For further help on *xdiff*, type **man xdiff**, in an xterm window then press the **Enter** key.
Close the display window by using the pull down menu from the X window in the upper left corner.
 - 5 In the xterm window at the prompt **Hit Enter for another diff, 'q <Enter>' to quit.**, type **q** press **Enter** to quit or just press **Enter** to perform another comparison.
-

11.8.4 Using the Binary File Difference Assistant

Most output files (products) from PGEs run in the DAAC will be in HDF-EOS format. A small minority may be in some binary format. The Binary File Difference Assistant aids the user in constructing code that allows comparison of binary output files. Since there is an unwieldy number of possibilities for binary file formats, this tool cannot compare two binary files without some custom code written at the DAAC, hence, the “Assistant” in the name. The Binary File Difference Assistant aids the user by generating a makefile, a driver module, and a template comparison module in C, FORTRAN 77 or IDL (Interactive Data Language). The user then edits these templates to read the particular binary format in question according to a SCF-supplied format specification.

The binary file comparison will not be performed during the SSIT training lesson.

The following is a list of tools, and or assumptions:

1. The SSIT Manager is running.
2. Two Binary files exist and have read permissions.
3. The instrument Team has delivered test output files.
4. If either of the two Binary files are in the ClearCase VOB, a ClearCase view was set before the SSIT Manager was started.

Comparing two Binary Files

- 1 From the SSIT Manager, select **T**ools→**P**roduct Examination → **F**ile **C**omparison → **B**inary from the menu.
The Binary File Difference Assistant tool GUI will be displayed.
- 2 In the Binary File Difference Assistant tool GUI, click on one of the languages listed under the **Select Language** label. The choices are C, FORTRAN, or IDL. The choice of language depends largely on preference. It does not necessarily have to be the language that was used to create the files being compared.
- 3 Optionally, click on either the **Image** button or the **Structure** button located under the label **Compare Function**.
Clicking on the **Image** button will display a code example for comparing binary files containing images.
Clicking on the **Structure** button will display a code example for comparing binary files containing structures or records.
The displayed listing well documented and should be read.
The language of the code will depend on the language selection made in step 2.
- 4 Optionally, click on either the **Image** button or the **Structure** button located under the label **Driver**.
Clicking on the **Image** button will display a code example for a driver invoking the compare function for binary files containing images.
Clicking on the **Structure** button will display a code example for a driver invoking the compare function for binary files containing structures or records.
The displayed listing well documented and should be read.
The language of the code will depend on the language selection made in step 2.
- 5 Optionally, click on either the **Help** button.
A Help window will be displayed.
To end help, click on the **Dismiss** button.
The Help window may remain displayed while using the Binary File Difference Assistant.
- 6 Once familiar with the code examples (steps 3 and 4), click on the **Copy** button.
 - A window labeled **Enter Unique ID** will be displayed.
 - In the field labeled **Enter unique file identifier:**, type *fileID*, click on the **OK** button.
 - The *fileID* will be used in the file names of the files copied over. These files will be:
C:

DaacBinDiff_ <i>fileID</i> .c	Compare function
DaacBinDiff_ <i>fileID</i> _driver.c	Driver
DaacBinDiff_ <i>fileID</i> .mak	Makefile

FORTRAN:

DaacBinDiff_ <i>fileID</i> .f	Compare function
DaacBinDiff_ <i>fileID</i> _driver.f	Driver
DaacBinDiff_ <i>fileID</i> .mak	Makefile

IDL:

DaacBinDiff_ <i>fileID</i> .pro	Compare function
DaacBinDiff_ <i>fileID</i> _driver.pro	Driver
DaacBinDiff_ <i>fileID</i> .sh	Shell script with here document

- The files will be copied into the directory from which the SSIT Manager is being run.

- 8 Using any desired text editor, customize the files for the job at hand. Then build the executable using the customized makefile provided (for C and FORTRAN). Then run the program to perform the binary file comparison.
-

11.8.5 Data Visualization

In order to view the success of science software in producing scientifically valid data sets, the data needs to be displayed in forms that convey the most information. Data visualization enables this to be done.

There are two visualization tools provided to the DAAC: EOSView and Interactive Data Language (IDL). These tools are both accessible via the SSIT Manager. EOSView is user friendly GUI for creating two-dimensional displays from HDF-EOS objects(Grid, Swath) as well as the standard HDF objects (SDS, Vdata, Image, Text). It has additional features such as thumbnail-panning, colorization, zooming, plotting, and animation. Only some aspects of data visualization will be addressed in this training material. For further information, see the related references.

IDL is a COTS display and analysis tool widely applied in the scientific community, It is used to create two-dimensional, three dimensional (volumetric), and surface/terrain displays from binary, ASCII, and many other formats in addition to HDF.

Only a limited number of file types will be available during SSIT training.

11.8.5.1 Data Visualization with EOSView

11.8.5.1.1 Viewing Product Metadata with the EOSView Tool

This procedure describes how to use the EOSView tool to inspect the metadata in the HDF-EOS output file from a PGE. To view product metadata with the EOSView tool, execute the procedure steps that follow:

Viewing Product Metadata ** The SSIT Manager does not support Data Visualization at the time of Drop 4.***** A backup example is as follows for EOSView:**

Log into an Algorithm and Test Tools (AITTL) environment using using a machine so configured. At the mini-daac this machine is **calahans**

- 1 Telnet into **calahans**.
- 2 **logon using your own ID and Password**
- 3 **cd /usr/ecs/TS1/CUSTOM/eosview.**
- 4 **Select EOSView, The EOSView GUI will be displayed.**
- 5 **Use the select buttons to guide you toward the view desired**

The following is a list of tools, and or assumptions:

1. The SSIT Manager is running.
2. The output file is HDF-EOS and has been created and populated with metadata using the SDP Toolkit metadata tools.

Viewing Product Metadata

- 1 From the SSIT Manager, select **T**ools→**P**roduct Examination → **E**OSView from the menu.
 - The EOSView GUI will be displayed.
- 2 In the GUI labeled **EOSView - EOSView Main Window**, click on the **F**ile menu and select **O**pen. The **F**ilter GUI will be displayed.
 - In the subwindow labeled **F**ilter, select the appropriate directory and file to open.
- 3 A GUI labeled **EOSView - MyOutputFile.hdf** will be displayed where *MyOutputFile.hdf* is the file name of the file chosen in step 2. Once displayed, a list of HDF objects will appear in the main window. If nothing is listed, it means that no HDF objects were found within the file.
- 4 In the GUI labeled **EOSView - MyOutputFile.hdf**, click on an object listed for which metadata is to be inspected. The object selected will be highlighted.
 - Do not double click on object since this will cause a **D**imension GUI to be displayed instead.

- 5 The global metadata associated with the object selected will be displayed in a scrollable field by clicking on the **Attributes** menu and selecting **Global** in the GUI labeled **EOSView - MyOutputFile.hdf**.
 - If instead, the message “Contains no Global Attributes” appears, then the selected object contains no global metadata.
 - 6 Repeat steps 4 and 5 for each HDF object within the selected HDF-EOS file for which metadata is to be examined.
 - 7 In the GUI labeled **EOSView - MyOutputFile.hdf**, click on the **File** menu and select **Close** to close the **EOSView - MyOutputFile.hdf** GUI.
 - 8 In the GUI labeled **EOSView - EOSView Main Window**, click on the **File** menu and select **Exit** to exit **EOSView - EOSView Main Window** GUI.
-

11.8.5.1.2 Viewing HDF Image Objects

This procedure describes how to use the EOSView tool to view science Images in the HDF-EOS output file from a PGE.

The following is a list of tools, and or assumptions:

1. The SSIT Manager is running.
2. The output file is HDF-EOS and has been created and populated with metadata using the SDP Toolkit metadata tools.
3. At least one object is an HDF image (RIS8, RIS24, *i.e.* Browse data).

Viewing HDF Image Objects

- 1 From the SSIT Manager, select **T**ools→**P**roduct Examination → **E**OSView from the menu.
The EOSView GUI will be displayed.
- 2 In the GUI labeled **EOSView - MyOutputFile.hdf**, double click on an Image object listed for which data is to be inspected.
A GUI labeled **EOSView - Image Display Window - MyImageObject** will be displayed where *MyImageObject* is the name of the object selected.
- 3 Optional colorization. In the GUI labeled **EOSView - Image Display Window - MyImageObject**, click on the **P**alette menu, then select one of the palettes listed: **Default**, **Greyscale**, **Antarctica**, **Rainbow**, or **World Colors**.
This selection may be repeated until the desired palette is chosen.
- 4 Optional zooming. In the GUI labeled **EOSView - Image Display Window - MyImageObject**, click on the **Z**ooming menu, then select and then select one of the resampling methods listed: **Bilinear Interpolation** or **Nearest Neighbor**.
Then click on the **Z**oom In or **Z**oom Out buttons to apply the method.
- 5 Optional panning while zooming. In the GUI labeled **EOSView - Image Display Window - MyImageObject**, click on the **O**ptions menu, then select **P**an **W**indow, a thumbnail representation of the entire Image will be displayed in the

subwindow labeled **Pan Window**. The portion of the zoomed Image shown in the main window will be the portion indicated by the hollow rectangle on the thumbnail image. Use the mouse left button to click and drag the rectangle to a new location on the thumbnail image.

The panning option may be repeated as desired.

6 To end the session with colorization, zooming, or panning, in the GUI labeled **EOSView - Image Display Window - *MyImageObject***, click on the **File** menu and select **Close**.

7 Optional animation. In the GUI labeled **EOSView - *MyOutputFile.hdf***, click on the **Options** menu, then select **Animated images**.

A GUI labeled **EOSView - Image Animation Window - *MyOutputFile.hdf*** will be displayed.

Optionally, click on the **Options** menu select **Mode** to select how the animation is to be run. Choose **Stop at end, Continuous run, or Bounce**.

To end animation session, click on the **File** → **Close**.

11.8.5.1.3 Viewing HDF-EOS Grid Objects

This procedure describes how to use the EOSView tool to view science data in the HDF-EOS output file that are in HDF-EOS Grid format. These are generally the science data and not browse images.

The following is a list of tools, and or assumptions:

1. The SSIT Manager is running.
2. The output file is HDF-EOS and has been created and populated with metadata using the SDP Toolkit metadata tools.
3. At least one object is an HDF-EOS Grid.

Viewing HDF-EOS Grid Objects

- 1** From the SSIT Manager, select **T**ools→**P**roduct Examination → **E**OSView from the menu.
The EOSView GUI will be displayed.
- 2** In the GUI labeled **EOSView - *MyOutputFile.hdf***, double click on an Grid object listed for which data is to be inspected. A GUI labeled **EOSView - Grid Select** will be displayed.
Information on **Grid Information, Projection Information, Dimensions, Attributes** for the selected object can be displayed by clicking on the appropriate checkboxes.
- 3** In the GUI labeled **EOSView - Grid Select**, click on the **Data Fields** checkbox and then click on the **OK** button. Then double click on one of the data fields listed.

- A GUI labeled **EOSView - Grid - *GridObjectName* - Start/Stride/Edge** will be displayed where *GridObjectName* will be replaced by the name of the Grid object selected in step 1.
- 4 To display the data in the form of a table of values, in the GUI labeled **EOSView - Grid - *GridObjectName* - Start/Stride/Edge**, click on the checkboxes for both **YDim** and **XDim** and then click on the **OK** button.
 - A GUI labeled ***MyDataField*** will be displayed where *MyDataField* will be replaced by the name of the data field selected in step 2.
 - 5 To display the data field in image form, in the GUI labeled ***MyDataField***, click on the **File** menu and then select **Make Image**. A GUI labeled **EOSView - Swath/Grid Image** will appear,
 - 6 Optional colorization, zooming, panning while zooming can be used to obtain your desired output.
 - 7 To end the session with displaying Grid object, in the GUI labeled **EOSView - Swath/Grid**, click on the **File** menu and select **Close**. The **EOSView - Swath/Grid** GUI will disappear.
-

11.8.5.1.4 Viewing HDF-EOS Swath Objects

This procedure describes how to use the EOSView tool to view science data in the HDF-EOS output file that are in HDF-EOS Swath format. These are generally the science data and not browse images.

The following is a list of tools, and or assumptions:

1. The SSIT Manager is running.
2. The output file is HDF-EOS and has been created and populated with metadata using the SDP Toolkit metadata tools.
3. At least one object is an HDF-EOS Swath.

Viewing HDF-EOS Swath Objects

- 1 From the SSIT Manager, select **Tools**→**Product Examination** → **EOSView** from the menu.
The EOSView GUI will be displayed.
- 2 In the GUI labeled **EOSView - *MyOutputFile.hdf***, double click on a Swath object listed for which data is to be inspected.
A GUI labeled **EOSView - Swath Select** will be displayed.
Information on **Dimensions, Geolocation Mappings, Indexed Mappings, Geolocation Fields, Attributes** for the selected Swath Object can be displayed by clicking on the corresponding checkboxes.
- 3 In the GUI labeled **EOSView - Swath Select**, click on the **Data Fields** checkbox and then click on the **OK** button. Then double click on one of the data fields listed.

- A GUI labeled **EOSView - Swath - SwathObjectName - Start/Stride/Edge** will be displayed where *SwathObjectName* will be replaced by the name of the Swath object selected in step 1.
- 4 To display the data in the form of a table of values, in the GUI labeled **EOSView - Swath - SwathObjectName - Start/Stride/Edge**, click on the checkboxes for both **ScanLineTra** and **PixelsXtrac** and then click on the **OK** button.
 - 5 To display the data field in image form, in the GUI labeled *MyDataField*, click on the **F**ile menu and then select **Make Image**.
A GUI labeled **EOSView - Swath/Grid Image** will appear.
 - 6 Optional colorization, zooming, panning while zooming features can be used in the GUI labeled **EOSView - Swath/Grid Image** to obtain your desired image.
 - 7 To end the session with displaying Swath object, in the GUI labeled **EOSView - Swath/Grid**, click on the **F**ile → **C**lose.
-

11.8.5.1.5 Viewing HDF SDS Objects

This procedure describes how to use the EOSView tool to view science data in the HDF-EOS output file that are in HDF SDS (standard HDF science data set) format. To view an HDF SDS object with the EOSView tool, execute the procedure steps that follow:

The following is a list of tools, and or assumptions:

1. The SSIT Manager is running.
2. The output file is HDF-EOS and has been created and populated with metadata using the SDP Toolkit metadata tools.
3. At least one object is an HDF-SDS.

Viewing HDF SDS Objects

- 1 From the SSIT Manager, select **T**ools→**P**roduct Examination → **E**OSView from the menu.
The EOSView GUI will be displayed.
- 2 In the GUI labeled **EOSView - MyOutputFile.hdf**, double click on a SDS object listed for which data is to be inspected.
A GUI labeled **EOSView - Multi-Dimension SDS** will be displayed.
A number of checkboxes will be displayed, one for each of the dimensions in the selected SDS (there will be at least two, an X and a Y).
- 3 In the GUI labeled **EOSView - Multi-Dimension SDS**, click on two of the dimension checkboxes and then click on the **T**able button. Then double click on one of the data fields listed.
A GUI labeled *MySDS* will be displayed where *MySDS* will be replaced by the name of the SDS object selected in step 1.

- 4 To display the data field in image form, in the GUI labeled *MySDS*, click on the **File** menu and then select **Make Image**.
A GUI labeled EOSView - Image Display Window - *MySDS* will appear,
 - 5 Optional colorization, zooming, panning while zooming can be used to obtain your desired output.
 - 6 To end the session with displaying Swath object, in the GUI labeled **EOSView - Image Display Window - MySDS**, select **File** → **Close** from the menu.
 - The **EOSView - Image Display Window - MySDS** GUI will disappear.
-

11.8.5.2 Data Visualization with the IDL Tool

11.8.5.2.1 Viewing Product Data with the IDL Tool

The following procedures describe how to use the IDL (Interactive Data Language) COTS tool to inspect the data in the output file from a PGE. These procedures are geared toward binary and ASCII formats, but can be extended to other formats supported by IDL including HDF, NetCDF, and PGE. Consult the IDL references for details on these other formats.

The major activities addresses here include creating an image display, saving an image display, creating a plot display, and saving a plot display.

The following is a list of tools, and or assumptions:

1. The SSIT Manager is running.
2. The output file is binary, ASCII, or one of the other IDL supported data formats.
3. IDL has been properly installed and is accessible to the user.

Viewing Product Data with the IDL Tool

- 1 From the SSIT Manager, select **T**ools→**P**roduct Examination → **I**DL from the menu.
An xterm (on the AIT Sun) will be displayed within which the IDL command interpreter will be run.
 - 2 Select the procedure depending upon the activity to perform.
 - 3 To end the IDL session, close any display windows remaining, then at the IDL prompt type **quit**, then press the **Enter** key.
The IDL session will be closed.
-

11.8.5.2.2 Creating an Image Display Using IDL

The following procedure describes how to use the IDL Tool to create an image display.

The following is a list of tools, and or assumptions:

1. The SSIT Manager is running.
2. The PGE output file to be examined is of an IDL-supported type/format (if in doubt, consult the IDL Reference Guide)
3. IDL has been properly installed and is accessible to the user.
4. For binary files, data is assumed to be 8-bit characters

Creating an Image Display Using the IDL Tool - Binary Data

- 1 From the SSIT Manager, select **T**ools→**P**roduct Examination → **I**DL from the menu.
An xterm (on the AIT Sun) will be displayed within which the IDL command interpreter will be run.
 - 2 At the IDL prompt, type **OPENR,1,'MyBinaryFilename'**, press the **Enter** key.
The **MyBinaryFilename** is the full path name and file name of the binary data file of known dimensions to read in.
The single quotes (') must be included around the path/file name.
The **1** is the logical unit number.
 - 3 At the IDL prompt, type **MyImage=BYTARR(dim1, dim2)**, press the **Enter** key.
The **MyImage** is the name to be given to the image once created.
The **dim1** and **dim2** are the dimensions of the input data.
 - 4 At the IDL prompt, type **READU,1,MyImage**, press the **Enter** key.
 - 5 At the IDL prompt, type **TV,MyImage**, press the **Enter** key.
The image, **MyImage**, should then be displayed.
 - 6 At the IDL prompt, type **LOADCT,3**, press the **Enter** key.
This command loads color table number 3. Other color tables are available
 - 7 At the IDL prompt, type **CLOSE,1**, press the **Enter** key.
This closes logical unit 1.
Always close logical units or an error will result the next time an access is attempted.
-

Creating an Image Display Using the IDL Tool - ASCII Data

- 1 From the SSIT Manager, select **T**ools→**P**roduct Examination → **I**DL from the menu.
An xterm (on the AIT Sun) will be displayed within which the IDL command interpreter will be run.
- 2 At the IDL prompt, type **OPENR,1,'MyASCIIfilename'**, then press the **Enter** key.

The **MyASCIIfilename** is the full path name and file name of the ASCII data file of known dimensions to read in.

The single quotes (‘) must be included around the path/file name.

The **1** is the logical unit number.

- 3 At the IDL prompt, type ***MyImage=BYTARR(dim1,dim2)***, then press the **Enter** key.

The ***MyImage*** is the name to be given to the image once created.

The ***dim1*** and ***dim2*** are the dimensions of the input data.

- 4 At the IDL prompt, type ***READF,1,MyImage***, then press the **Enter** key.

- 5 At the IDL prompt, type ***TV,MyImage***, then press the **Enter** key.

The image, **MyImage**, is displayed.

- 6 At the IDL prompt, type ***LOADCT,3***, then press the **Enter** key.

This command loads color table number 3. Other color tables are available; refer to the IDL Reference Guide for more details.

- 7 At the IDL prompt, type ***CLOSE,1***, then press the **Enter** key.

This closes logical unit 1.

Always close logical units or an error will result the next time an access is attempted.

Creating an Image Display Using the IDL Tool - PGM Data:

- 1 From the SSIT Manager, select **Tools**→**Product Examination** → **IDL** from the menu.

An xterm (on the AIT Sun) will be displayed within which the IDL command interpreter will be run.

- 2 At the IDL prompt, type ***READ_PPM,"MyPGMfilename",MyImage,r,g,b***, then press the **Enter** key.

The **MyPGMfilename** is the full path name and file name of the PGM formatted data file.

The double quotes (“) must be included around the path/file name.

The **MyImage** is the name to be given to the image created.

- 3 At the IDL prompt, type ***TVLCT,r,g,b***, then press the **Enter** key.

Note that r,g,b color table syntax is used for most formatted file types in IDL.

- 4 At the IDL prompt, type ***TV,MyImage***, then press the **Enter** key.

The image, **MyImage**, should then be displayed.

11.8.5.2.3 Saving an Image Display Using IDL

The next procedure describes how to save an image display (once created) to either a data file or a graphic file.

The following is a list of tools, and or assumptions:

1. The SSIT Manager is running, IDL is running
2. The PGE output file to be examined is of an IDL-supported type/format (if in doubt, consult the IDL Reference Guide)
3. For binary files, data is assumed to be 8-bit characters
4. The image display is to be saved in a binary (8-bit) or ASCII (comma-delimited characters) format.

Save an image display using IDL - Binary Data

- 1 From the SSIT Manager, select **T**ools→**P**roduct Examination → **I**DL from the menu.
An xterm (on the AIT Sun) will be displayed within which the IDL command interpreter will be run.
 - 2 At the IDL prompt, type **OPENW,1,('MyBinaryFilename.bin')**, then press the **Enter** key.
The **MyBinaryFilename.bin** is the full path name and file name of the binary data file to write out.
The single quotes (') must be included around the path/file name.
The **1** is the logical unit number.
 - 3 At the IDL prompt, type **WRITEU,1,MyImage**, then press the **Enter** key.
The **MyImage** is the name of the image to save.
 - 4 At the IDL prompt, type **CLOSE,1**, then press the **Enter** key.
This closes logical unit 1.
Always close logical units or an error will result the next time an access is attempted.
-

Save an image display using IDL - ASCII Data

- 1 From the SSIT Manager, select **T**ools→**P**roduct Examination → **I**DL from the menu.
An xterm (on the AIT Sun) will be displayed within which the IDL command interpreter will be run.
 - 2 At the IDL prompt, type **OPENW,1,('MyASCIIfilename.asc')**, then press the **Enter** key.
The **MyASCIIfilename.asc** is the full path name and file name of the binary data file to write out.
The single quotes (') must be included around the path/file name.
The **1** is the logical unit number.
 - 3 At the IDL prompt, type **PRINTF,1,MyImage**, then press the **Enter** key.
The **MyImage** is the name of the image to save.
 - 4 At the IDL prompt, type **CLOSE,1**, then press the **Enter** key.
This closes logical unit 1.
Always close logical units or an error will result the next time an access is attempted.
-

Save an image display using JPEG Data

- 1 At the IDL prompt, type `WRITE_JPEG,"MyJPEGfilename.jpg",MyImage`, press **Return**.
 - The *MyJPEGfilename.jpg* is the full path name and file name of the JPEG data file to write out.

Creating a Plot Display Using IDL

The procedures for creating a plot display are clearly described in the IDL manuals; some exceptions are clarified below.

Setting axis limits for a plot:

- 1 At the IDL prompt, type `SURFACE,MyPlot,AX=70,AZ=70,xrange=[0,20],yrange=[0,20]zrange=[0,30]`, and press **Return**.
 - The *MyPlot* is the IDL session variable (to which you have assigned some math function, program output, image, etc.).
 - *AX* sets the displayed rotation about the X axis.
 - *AZ* sets the displayed rotation about the Z axis.
 - The values of *xrange* set the displayed portion of the X axis.
 - The values of *yrange* set the displayed portion of the Y axis.
 - The values of *zrange* set the displayed portion of the Z axis.
 - The plot will then be displayed to the screen.

Setting axis titles for a plot:

- 1 At the IDL prompt, type `SURFACE,MyPlot,AX=70,AZ=70,xtitle='this is X',ytitle='this is Y',ztitle='this is Z'`, and press **Return**.
 - The *MyPlot* is the IDL session variable (to which you have assigned some math function, program output, image, etc.).
 - The value of *xtitle* sets the displayed title of the X axis.
 - The value of *ytitle* sets the displayed title of the Y axis.
 - The value of *ztitle* sets the displayed title of the Z axis.
 - The plot will then be displayed to the screen.

Saving a Plot Display Using IDL

Saving a displayed plot to a permanent file:

- 1 At the IDL prompt, type `MyPlotDisplay=SURFACE,MyPlot,AX=80,AZ=20`, and press **Return**.
 - The *MyPlotDisplay* is session name for the displayed plot of *MyPlot*.
 - The *MyPlot* is the IDL session variable (to which you have assigned some math function, program output, image, etc.).
- 2 At the IDL prompt, type `SAVE,MyPlotDisplay,4,'MyPlotOutput.ps'`, press **Return**.

- The *MyPlotDisplay* is the session name of the plot display .
- The *MyPlotOutput.ps* is the desired name for the saved file.
- The SAVE option number 4 sets the output file type to PostScript (ps). There are other options, of course (consult the IDL manuals).

11.8.5.2.4 Raster Mapping Fundamentals

This procedure describes how to use the IDL Tool to perform basic raster mapping functions. These are spatial functions involving map projections, but do not include surface modeling (also called “2.5D”) or two-dimensional spectral functions.

The following is a list of tools, and or assumptions:

1. The SSIT Manager is running.
2. IDL is running

Raster Mapping - Global Data Set Image

- 1 From the SSIT Manager, select **T**ools→**P**roduct Examination → **I**DL from the menu.
An xterm (on the AIT Sun) will be displayed within which the IDL command interpreter will be run.
- 2 At the IDL prompt, type *TV,MyImage*, then press the **Enter** key.
The *MyImage* is the image name of the global image data set.
The image, *MyImage*, should then be displayed.
- 3 At the IDL prompt, type *MAP_SET,/ORTHOGRAPHIC*, then press the **Enter** key.
IDL also supports other map projections. Refer to IDL Reference Guide.
- 4 At the IDL prompt, type
MyNewImage=MAP_IMAGE(MyImage,startx,starty,/BILIN), then press the **Enter** key.
The *MyNewImage* is the name to assign to the resulting image.
The *MyImage* is the name of the original global image data set.
- 5 At the IDL prompt, type *TV,MyNewImage,startx,starty*, then press the **Enter** key.
The image *MyNewImage* should then be displayed.
- 6 Optional overlay Lat/Long. At the IDL prompt, type *MAP_GRID*, then press the **Enter** key.
This overlays Lat/Long graticule onto *MyNewImage*.
- 7 Optional overlay world coastlines. At the IDL prompt, type *MAP_CONTINENTS*, press the **Enter** key.
This overlays world coastlines onto *MyNewImage*.

For a sub-global data set image, one having geocentric-LLR coordinates defined for subintervals of longitude and latitude (e.g. from -88 to -77 degrees East Longitude and 23 to 32 degrees North Latitude).

The following is a list of tools, and or assumptions:

1. The SSIT Manager is running.
2. IDL is running

Raster Mapping - Sub-Global Data Set Image

- 1 From the SSIT Manager, select **T**ools→**P**roduct Examination → **I**DL from the menu.
An xterm (on the AIT Sun) will be displayed within which the IDL command interpreter will be run.
- 2 At the IDL prompt, type *TV,MyImage*, then press the **Enter** key.
The *MyImage* is the image name of the sub-global image data set.
The image, *MyImage*, should then be displayed.
- 3 At the IDL prompt, type *MAP_SET,/MERCATOR,LIMIT=[lat1,lon1,lat2,lon2]*, then press the **Enter** key.
The *lat1*, *lon1*, *lat2*, and *lon2* specify the latitude and longitude intervals of the sub-global image data set.
- 4 At the IDL prompt, type *MyNewImage=MAP_IMAGE(MyImage,startx,starty,/BILIN.LATMIN=lat1,LATMAX=lat2,LONMIN=lon1,LONMAX=lon2)*, then press the **Enter** key.
The *MyNewImage* is the name to assign to the resulting image.
The *MyImage* is the name of the original global image data set.
The *lat1*, *lon1*, *lat2*, and *lon2* specify the latitude and longitude intervals of the sub-global image data set.
- 5 At the IDL prompt, type *TV,MyNewImage,startx,starty*, then press the **Enter** key.
The image *MyNewImage* should then be displayed.
- 6 Optional overlay Lat/Long. At the IDL prompt, type *MAP_GRID*, then press the **Enter** key.
This overlays Lat/Long graticule onto *MyNewImage*.
- 7 Optional overlay world coastlines. At the IDL prompt, type *MAP_CONTINENTS*, then press the **Enter** key.
This overlays world coastlines onto *MyNewImage*.

11.9 Science Software Integration and Test (SSI&T) Release RELEASE 4.

The process of SSI&T or integration of EOS Instrument Science Software into the ECS has been developed and refined over three iterations of ECS. IR1, the Pre-Release B Testbed and Release RELEASE 4. The latter will be the at-launch system supporting EOS-AM1 instruments. Although every attempt has been made to keep integration procedures for science software consistent through succeeding releases, basis architectural differences have led to significant variances. This section describes the architecture of the last iterations of ECS.

11.9.1 RELEASE 4 Architecture: Overview

The Release RELEASE 4 architecture can be grouped into the following four categories:

- Data storage and management is provided by the Data Server Subsystem (DSS), with the functions needed to archive science data, search for and retrieve archived data, manage the archives, and stage data resources needed as input to science software or resulting as output from their execution. The Data Server Subsystem provides access to earth science data in an integrated fashion through an Application Programming Interface that is common to all layers.
- Information search and data retrieval is provided by the science user interface functions in the Client Subsystem (CLS), by information search support functions in the Data Management Subsystem (DMS), and by capabilities in the Interoperability Subsystem (IOS) which assist users in locating services and data.
- Data processing is provided by the Data Processing Subsystem (DPS) for the science software; and by capabilities for long and short term planning of science data processing, as well as by management of the production environment provided by the Planning Subsystem (PLS). Routine data processing and re-processing will occur in accordance with the established production plans. In addition ECS will provide “on-demand processing”, where higher level products are produced only when there is explicit demand for their creation.
- Data ingest is provided by the Ingest Subsystem (INS), which interfaces with external applications and provides data staging capabilities and storage for an approximately 1-year buffer of Level 0 data (so that reprocessing can be serviced from local storage). The number of external interfaces which ECS will have is potentially very large, and the interfaces can serve very diverse functions, such as high-volume ingest of level 0 data and low-volume ingest of data from field campaigns.

Table 11.9.3-1 provides procedural differences: Testbed to RELEASE 4.

11.9.1.1 ECS Subsystems

The following sub-sections provide brief overviews for each of these subsystems. More detailed discussions of their design breakdown can be found in 305-CD-020-002.

11.9.1.2 Client Subsystem (CLS)

The Client provides users with an interface through which they can access ECS services and data. It also gives science software access to the ECS services, as well as direct access to ECS data. Access is provided through graphic user interface (GUI) application tools for displaying the various kinds of ECS data (e.g., images, documents, tables), and libraries representing the client APIs to ECS services. The client subsystem follows an object oriented design. The design is built around a core set of 'root' objects from which all other software will inherit its behavior.

11.9.1.3 Interoperability Subsystem (IOS)

The Interoperability subsystem provides an advertising service. It maintains a database of information about the services and data offered by ECS, and provides interfaces for searching this database and for browsing through related information items. For example, ESDTs are made visible through the advertising service. The Client Subsystem provides the user interface which enables access to the IOS.

11.9.1.4 Data Management Subsystem (DMS)

The Data Management subsystem provides three main functions:

- Provide end-users with a consolidated logical view of a distributed set of data repositories.
- Allow end-users to obtain descriptions for the data offered by these repositories. This also includes descriptions of attributes about the data and the valid values for those attributes.
- Provide data search and access gateways between ECS and external information systems.

11.9.1.5 Data Server Subsystem (DSS)

The Data Server subsystem provides the management, cataloging, access, physical storage, distribution functions for the ECS earth science data repositories, consisting of science data and their documentation. The Data Server provides interfaces for other ECS subsystems which require access to data server services. The Data Server Subsystem consists of the following principal design components:

- Database Management System - The Data Server subsystem will use database technology to manage its catalog of earth science data, and for the persistence of its system administrative and operational data.

- Document Management System - Web server and database technology are used to implement a document management system to provide storage and information retrieval for guide documents, science software documentation, and ECS earth science related documents.
- Data Type Libraries - The Data Server will use custom dynamic linked libraries (DLLs) to provide an extensible means of implementing the variety of ECS earth science data types and services, and will provide a consistent interface for use by other ECS subsystems requiring access to those services and data.
- File Storage Management System - This component provides archival and staging storage for data.
- Distribution System - The Data Server provides the capabilities needed to distribute bulk data via electronic file transfer or physical media.

11.9.1.6 Ingest Subsystem (INS)

This subsystem deals with the initial reception of all data received at an EOSDIS facility and triggers subsequent archiving and processing of the data. The ingest subsystem is organized into a collection of software components (e.g., ingest management software, translation tools, media handling software) from which those required in a specific situation can be readily configured. The resultant configuration is called an ingest client. Ingest clients can operate on a continuous basis to serve a routine external interface; or they may exist only for the duration of a specific ad-hoc ingest task. The ingest subsystem also standardizes on a number of possible application protocols for negotiating an ingest operation, either in response to an external notification, or by polling known data locations for requests and data.

11.9.1.7 Data Processing Subsystem (DPS)

The main components of the data processing subsystem - the science algorithms or Product Generation Executives (PGEs) - will be provided by the science teams. The data processing subsystem provides the necessary hardware resources, as well as a software environment for queuing, dispatching and managing the execution of these algorithms. The processing environment will be highly distributed and will consist of heterogeneous computing platforms. The AutoSys COTS tool is used as the scheduling engine. The tool is designed to manage production in a distributed UNIX environment. The DPS also interacts with the DSS to cause the staging and de-staging of data resources in synchronization with processing requirements.

11.9.1.8 Planning Subsystem (PLS)

The Planning Subsystem provides the functions needed to plan routine data processing, schedule on-demand processing, and dispatch and manage processing requests. The subsystem provides access to the data production schedules at each site, and provides

management functions for handling deviations from the schedule to operations and science users. The Planning subsystem provides several functions to account for:

- a processing environment which eventually will be highly distributed and consist of heterogeneous computing platforms
- existence of inter-site and external data dependencies
- dynamic nature of the data and processing requirements of science algorithms
- need for high availability
- providing a resource scheduling function which can accommodate hardware technology upgrades
- support for on-demand processing (as an alternative to predominantly routine processing)
- ability to provide longer-term (e.g., monthly) processing predictions as well as short term
(e.g., daily) planning and scheduling

11.9.1.9 Communications Subsystem (CSS)

The CSS helps manage the operation of distributed objects in ECS, by providing a communications environment. The environment allows software objects to communicate with each other reliably, synchronously as well as asynchronously, via interfaces that make the location of a software object and the specifics of the communications mechanisms transparent to the application.

In addition, CSS provides the infra-structural services for the distributed object environment. They are based on the Distributed Computing Environment (DCE) from the Open Software Foundation (OSF). DCE includes a number of basic services needed to develop distributed applications, such as remote procedure calls (rpc), distributed file services (DFS), directory and naming services, security services, and time services.

Finally, CSS provides a set of common facilities, which include legacy communications services required within the ECS infrastructure and at the external interfaces for file transfer, electronic mail, bulletin board and remote terminal support. The Object Services support all ECS applications with inter-process communication and specialized infra-structural services such as security, directory, time, asynchronous message passing, event logging, lifecycle service, transaction processing and World Wide Web (WWW) service.

11.9.1.10 Management Subsystem (MSS)

The Management Subsystem (MSS) provides enterprise management (network and system management) for all ECS resources: commercial hardware (including computers, peripherals, and network routing devices), commercial software, and custom applications.

With few exceptions, the management services will be fully decentralized, such that no single point of failure exists.

MSS provides two levels of an ECS management view: the local (site/DAAC specific) view, provided by Local System Management (LSM), and the enterprise view, provided by the Enterprise Monitoring and Coordination (EMC) at the SMC. Enterprise management relies on the collection of information about the managed resources, and the ability to send notifications to those resources. For network devices, computing platforms, and some commercial of the shelf software, MSS relies on software called “agents” which are usually located on the same device/platform and interact with the device’s or platform’s control and application software, or the commercial software product. However, a large portion of the ECS applications software is custom developed, and some of this software - the science software - is externally supplied. For these components, MSS provides a set of interfaces via which these components can provide information to MSS (e.g., about events which are of interest to system management such as the receipt of a user request or the detection of a software failure). These interfaces also allow applications to accept commands from MSS, provided to MSS from M&O consoles (e.g., an instruction to shut down a particular component). Applications which do not interact with MSS directly will be monitored by software which acts as their “proxies”. For example, the Data Processing Subsystem (DPS) acts as the proxy for the science software it executes. DPS notifies MSS of events such as the dispatching or completion of a PGE, or its abnormal termination.

MSS uses HP OpenView as the centerpiece of its system management solution. The information collected via the MSS interfaces from the various ECS resources is consolidated into an event history database, some on a near real-time basis, some on a regular polling basis (every 15-to 30 minutes) as well as on demand, when necessitated by an operator inquiry. The database is managed by Sybase, and Sybase query and report writing capabilities will be used to extract regular and ad-hoc reports from it. Extracts and summaries of this information will be further consolidated on a system wide basis by forwarding it to the SMC (also on a regular basis).

MSS provides fault and performance management and other general system management functions such as security management (providing administration of identifications, passwords, and profiles); configuration management for ECS software, hardware, and documents; Billing and Accounting; report generation; trending; request tracking; and mode management (operational, test, simulation, etc.).

11.9.1.11 Internetworking Subsystem (ISS)

The ISS provides local area networking (LAN) services at ECS installations to interconnect and transport data among ECS resources. The ISS includes all components associated with LAN services including routing, switching, and cabling as well as network interface units and communications protocols within ECS resources.

The ISS also provides access services to link the ECS LAN services to Government-furnished wide-area networks (WANs), point-to-point links and institutional network

services. Examples include the NASA Science Internet (NSI), Program Support Communications Network (PSCN), and various campus networks “adjoining” ECS installations.

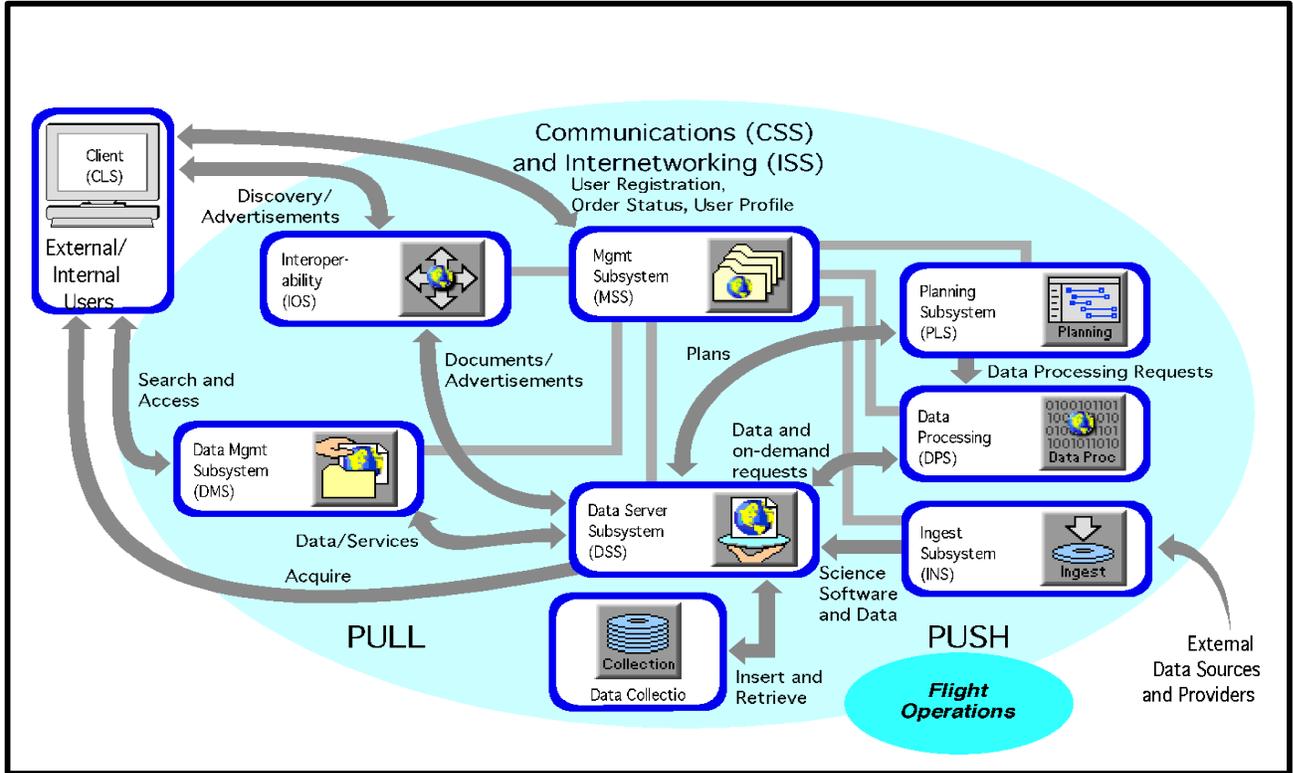


Figure 11.9.1-1. ECS Communications /Internetworking Subsystems

11.9.2 Implications for SSI&T Functions.

Table 11.9.3-1 . List the major Functions that will be encountered by SSI&T staff. These architectural functions characterize the RELEASE 4 systems. The major functions are due to the presence of Ingest and Data Server Subsystems in RELEASE 4.

Function		Release RELEASE 4
System Operation		All servers must run and communicate with each other; bring up manually, or use ECS Assist tool.
Ingest Ancillary Data		Ingest GUI, ESDTs must be

Granules		visible to ADV server.
ESDT Insert		Use Ingest
ESDT Verification		verify through ADV
DAP, SSAP Insert		Use Ingest
PDPS Database Population		More attributes, production rules
PGE Operation		When all data is available; DPR activated. No automatic reprocessing Complex chaining through production rules.
File Access		verify presence through ADV; ftp from SDSRV; access to multiple sites
Multi-file Granule Support		Files inserted together, accessed as a single granule.
Subscription Management		Subscription Manager

Table 11.9.3.1. Major SSI&T Functions within VERSION 2.0

11.10 Using ECS Assistant to View ECS Science Data Server Database

ESDTs and their granules stored in the archive are managed using an ECS Science Data server database. ECS Assistant provides an easy way to review the records stored in this database by using the ECS Assistant DB Viewer. There are two main windows in the DB Viewer. The first is called Collections and is used to display ESDT information included in the Collection database table. Information listed in this table includes ESDT short names, times last updated, types, etc. If an ESDT is added to the Science Data Server, its record will be shown in this window. The other window is called Granules and is used to display information included in the Granule database table. If a granule is inserted for an ESDT, the granule information will be listed in this window if its ESDT is highlighted in the Collection window. In addition to these two main windows, this DB Viewer GUI can also show ESDT database validation rules, Product Specific Attributes, (PSA) information, and summary information about the database reviewed.

Detailed procedures for tasks performed by the SSI&T operator are provided in the sections that follow.

Assumptions:

1. The ECS Assistant has been properly installed.
2. The ECS Subsystem Manager is running.
3. The environment variables for using the database have been set correctly.

11.10.1 Starting ECS monitor GUI:

- 1 Invoke the ECS Assistant GUI.
 - The ECS Assistant GUI will be launched.
- 2 At the ECS Assistant GUI, select ESDT Manager GUI by clicking the ESDT Manager.
 - The ESDT manager GUI will appear.
- 3 At the ECS ESDT Manager GUI, select the DB Viewer by clicking the **DB Viewer** button.
 - The Database Login GUI will appear as shown in Figure 11.10-1.
 - Fill in the fields to point to the specific database for the mode used.
 - Click Login to open the DB Viewer.
 - The DB Viewer GUI will appear as shown in Figure 11.-10-2
 - ESDTs are listed in the Collections window.

DB user: \$DSQUERY:

Password: \$SYBASE:

Database name:

Fill in the three fields above, or fill in the Mode below and press Use to obtain the database info from the mode's configuration file. Then press Login. If you started with the mode as a command line argument, everything should be filled in and you can just press Login. If the values for \$SYBASE and \$DSQUERY are not right, you will need to set them in your environment and restart.

Mode:

Figure 11.10-1. Database Login GUI

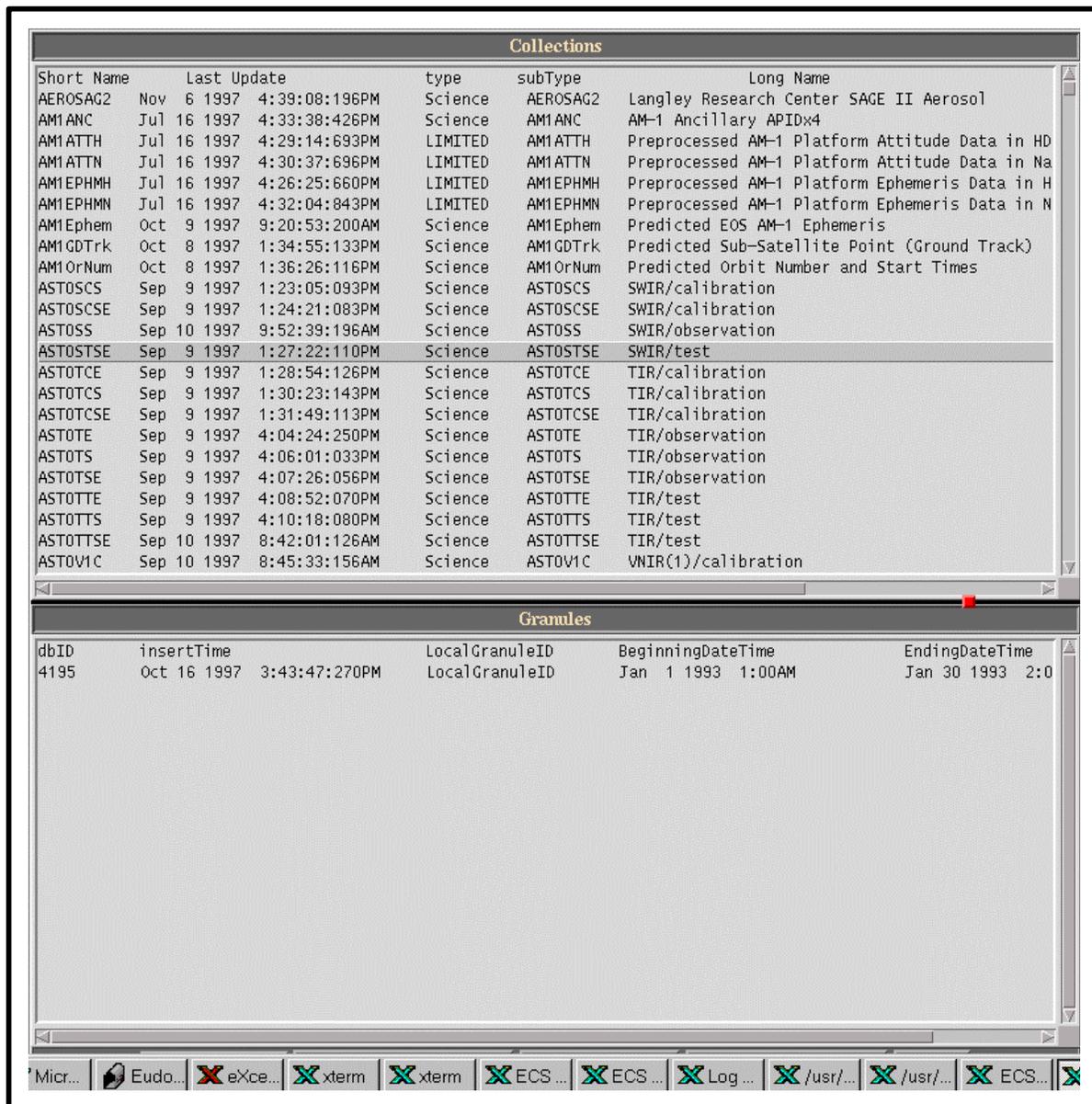


Figure 11.10-2. DB Viewer GUI

- 4 To view the inserted granules for a selected ESDT, first select an ESDT by clicking its short name in the Collections window.
 - The selected ESDT is highlighted.
 - Granule information for that ESDT, if there is any, will be listed in the Granules window.
- 5 To exit, click the **EXIT** button. This will end the DB Viewer GUI.

11.10.2 Using ECS Assistant to View Database

Detailed procedures for tasks performed by the SSI&T operator are provided in the sections that follow.

Assumptions:

1. The ECS Assistant has been properly installed.
2. The ECS Subsystem Manager is running.

To routinely start up the ECS monitor GUI, execute the procedure steps that follow:

- 1** At the ECS **Subsystem Manager** GUI, select a mode by **clicking** a mode in the mode list.
 - The mode should be the one to be used for SSI&T.
 - Once the mode is selected, the color of the subsystem name list is changed.
- 2** Select a subsystem by **clicking** the radio button next to the subsystem name under the subsystem component window.
 - The selected subsystem radio button will be highlighted.
 - The components corresponding to that the subsystem will be displayed in the component window.
- 3** Select a component by **clicking** a component name under the component window.
 - All the servers for that selected component will be displayed in the server window.
- 4** **Click** the **monitor** button from the common tasks.
 - This will invoke the Server Monitor GUI window as shown in Figure 11.10-3.
 - The status “UP/DOWN” indicates whether the server is running.
- 5** To see which host each server running on, click the **cdsping all servers...** button.
 - This will invoke the **cdsping GUI** as indicated in Figure 11.10.4.
 - The host name for each running server is listed
- 6** Both **Server monitor GUI** and **cdsping GUI** can be updated by clicking the **update** button in the GUI.

This will cause the list to update to the current status.
- 7** To monitor other servers, repeat steps 1-6.
- 8** To exit, click the EXIT button. This will end the monitor GUI.

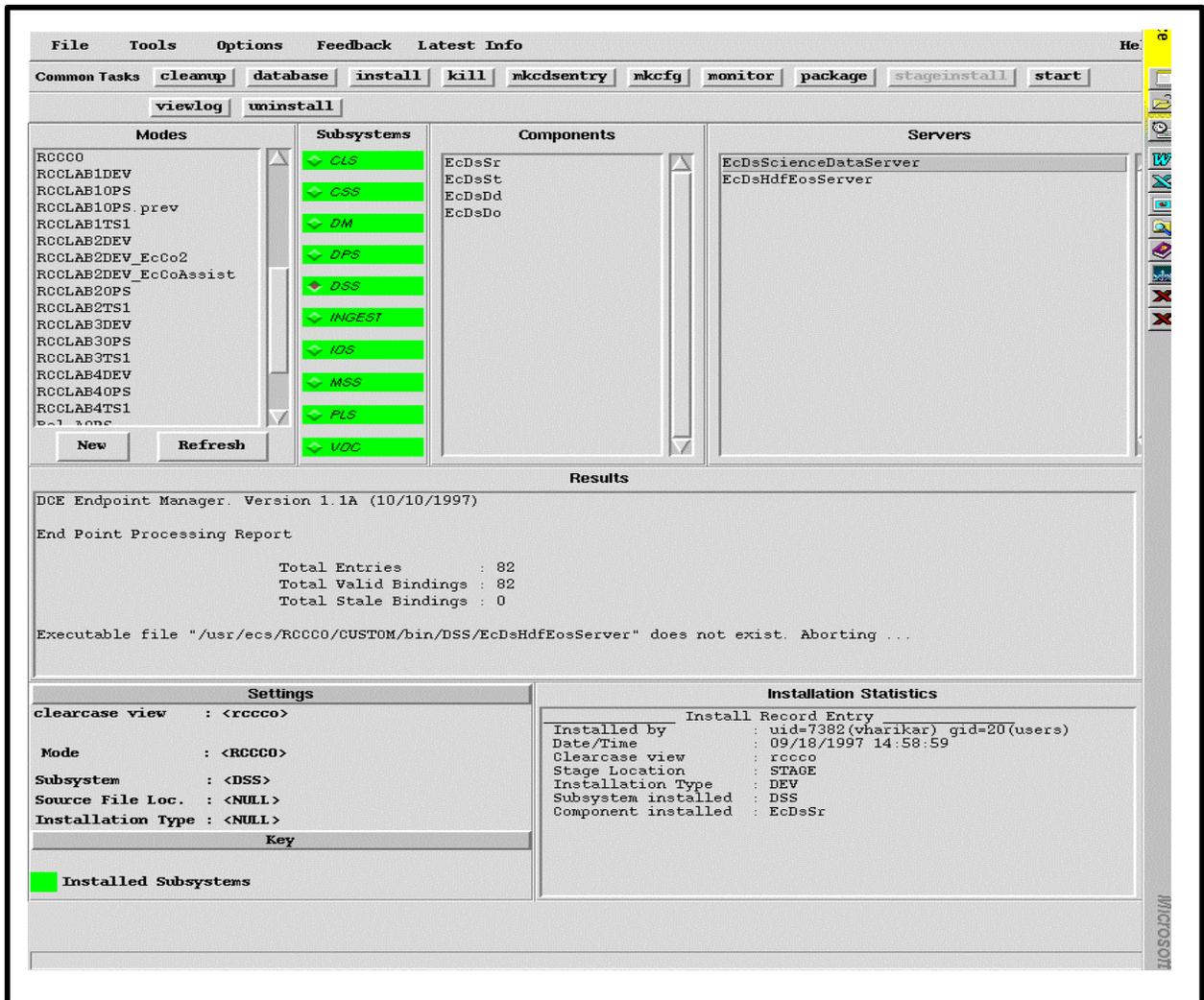


Figure 11.10-3 Server Monitor GUI

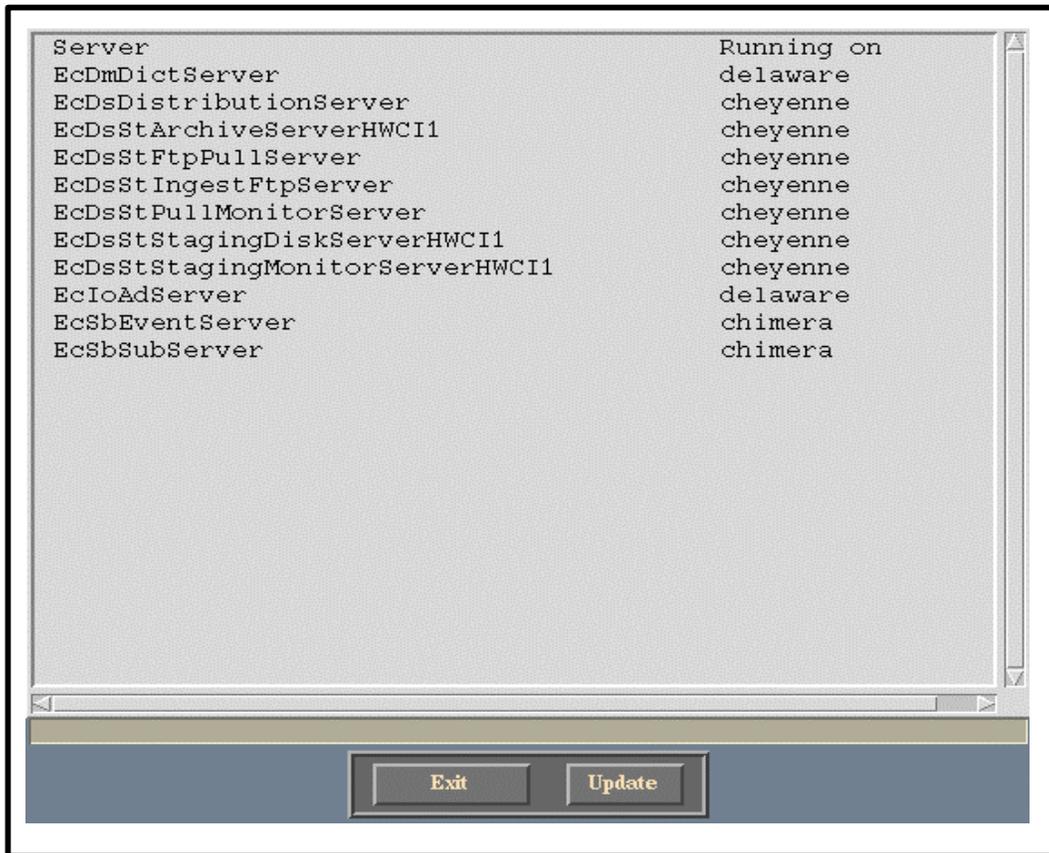


Figure 11.10-4. cdsping GUI

11.10.3 Using Browser to View ECS Science PDPS/IOS Database

Connect to the **SDSRV** database with login information as follows:

Server Name: **journey_srvr**

User Name: **sdsrvApp**

Password: **welcome**

The Browser lets you view all the tables in the **SDSRV** database with the mode you have selected.

The following tables are useful to track down the problems in insert ***.met**:

- 1 DsDeDictionaryAttribute
- 2 DsMdAdditionalAttributes
- 3 DsMdCollections
- 4 DsMdGranules

11.11 Installing ESDTs and Inserting Granules on the Science Data Server

11.11.1 Required Servers for Installing ESDT's

The following servers need to be started and running before installing ESDTs (with GDAAC machine names as examples):

- **Science Data Server (g0acs03)**
 - **Storage Management Servers (g0icg01, g0drg01, g0dps02)**
 - **Data Distribution Servers (g0dps02)**
 - **Subscription Server (g0ins01)**
 - **Advertising Server (g0ins02)**
 - **Data Dictionary Server (g0ins02)**
-

11.11.2. Installing/Removing (ESDT/DLL) using the Science Data Server Operator GUI

Before the ECS can process data, an Earth Science Data Type must be installed into the system via the Science Data Server (SDSRV). The ESDT allows the system to recognize a particular data type and also provides services for accessing the data in the form of a Dynamic Link Library (DLL). The following procedures give step-by-step instructions on configuring the ESDT and installing the ESDT using the Science Data Server GUI., see Figure 11.11.1. Science Dataserver Operator GUI.

Installing a single Earth Science Data Type (ESDT) or Dynamic Link Library (DLL)

- 1 Copy the ESDT descriptor file and ESDT/DLL file from the source directory to the directory under the current mode of operations, The ESDT descriptor files are installed in the specified mode.

DLL's located : /usr/ecs/<mode>/CUSTOM/lib/ESS

ESDT Descriptors Located: /usr/ecs/<mode>/CUSTOM/data/ESS

- 2 Ensure that the following servers are currently executing: **Advertising Service** on the appropriate ADSHW HWCI server machine, **Data Dictionary Service** on the appropriate DMGHW HWCI server machine, **Science Data Server** on the appropriate ACMHW HWCI server machine and the **Subscription Service** that operates on the appropriate CSS server machine.

- 3 Start the **SDSRV GUI** by entering the following at the UNIX prompt on the SDSRV GUI workstation:
 - a) telnet to (SDSRV) **texas** [e.g.]
 - b) login: **cmops**
password: **opsu\$er**
 - c) Login to DCE (dce_login <name> <Password>), setenv DISPLAY:0.0
 - d) **cd /usr/ecs/<mode>/CUSTOM/utilities/EcDsSdSrvGuiStart <mode>**
 - 4 On the main screen select the **Data Types** tab. A list of the ESDTs that have already been installed on the SDSRV will be displayed.
 - 5 Click the **Add** button below to bring up the **Add Data Type** window.
 - 6 **Descriptor Filename:** enter path to where the ESDT/DLL is located, including the full ESDT descriptor. **Archive ID:** field. **Note:** The descriptor filename and DLL Filename will require the complete directory path name as part of the file name which is the same directory as was specified in step 1 above. (**isolate the particular Data Type from the larger List, by using a unique sequence of letters or numbers at the end of the full path to better identify the Data Types ie; /*__***). To specify specific directories, the **File..** button to the right of the Descriptor Filename and DLL Filename data entry fields will bring up a standard file selection GUI for this purpose. Also note that the **Archive ID** field will be constructed using the DSS Storage Management Staging Server UR that is found in the Science Data Server configuration file. The Science Data Server Configuration file is located in:
/usr/ecs/<mode>/CUSTOM/cfg/EcDsScienceDataServer.CFG.
Example: If the **DSSSTMGSTAGEINGSERVERUR** field was set to **DRP1_OPS** then the **Archive ID** fields would be set to **DRP1_OPS**.
 - 7 Click the **Ok** button, this will cause the **Add Data Type** window to initiate installation of the ESDT/DLL into the Science Data Server.
 - 8 The Science Data Server GUI will respond in a short time with a window stating that **MM/DD/YY HH/MM Finished adding ESDT's**. Also, the ESDT will appear alphabetically on the **Science Data Server - Data Types** list under the **Data Types** tab.
-

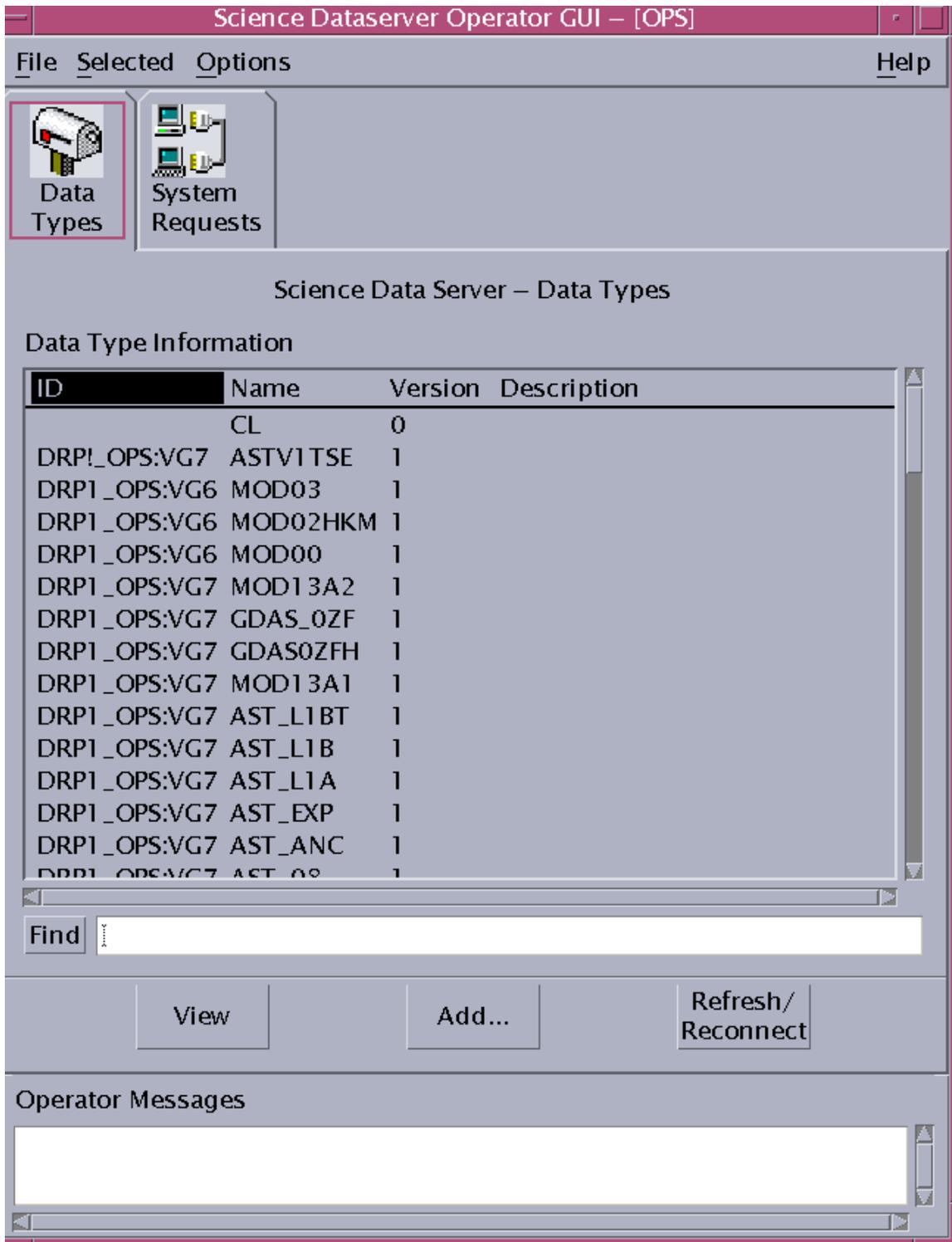


Figure 11.11.1. Science Dataserver Operator GUI.

11.11.3 Granule Insert into Science Data Server

The Science Data Server subsystem includes a utility that will allow users to manually insert a data granule into the ECS. The tool will prompt the user for key inputs for The Science Data Server subsystem includes a utility that will allow users to manually insert a data granule into the ECS. The tool will prompt the user for key inputs for inserting the granule. The following procedures describe this process.

- 1 Ensure that the **Science Data Server** subsystem is currently executing on the appropriate ACMHW HWCI server machine. Tested on **texas**.
 - 2 Start the Science Data Server test utility by entering the following at the UNIX prompt on the SDSRV workstation:
setenv MODE TS1
cd /usr/ecs/<mode>/CUSTOM/bin/DSS/
source ../ ../utilities/EcCoEnvCsh
/usr/ecs/<mode>/CUSTOM/bin/DSS/dttest6 ConfigFile
/usr/ecs/<mode>/CUSTOM/cfg/EcDsScienceDataServerClient.CFG
ecs_mode <mode>
 - 3 The following selection menu is displayed:
 1. **INSERT granule**
 2. **INSERT granule with browse file**
 3. **ACQUIRE granule with date**
 4. **ACQUIRE granule with a UR**
 5. **DELETE granule**
 6. **Exit****Please make selection=>**
Choose option **1** to perform the search and acquire.
 - 4 The program indicates that the search process will take place first by displaying the message "**Executing insert**". The user is prompted to enter the datatype of the data that will be inserted. For example:
Enter data type=> **AST_L1BT**
 - 5 The program will then prompt the user for the full path name of the data file. For example:
Enter datafile name (full path)=>/**tmp/:SC:AST_L1BT:1391:1.EOSHDF**
 - 6 The program will then prompt the user for the full path name of the metadata file. For example: Enter data metafile name(full path)=>/**tmp/AST_L1BT.MCF**
 - 7 The program will then give status on the success of the insert. The following messages should appear on the successful insert:
Insert science data only...
Trying to make a request to {:DSSDSRV} Success.
 - 8 The user should hit return at this prompt and the program will redisplay the first menu that was given in step 3. The user can then choose option 6 to exit.
-

11.11.4 Acquire a Granule from Science Data Server

The Science Data Server subsystem includes a utility that will allow users to manually search and retrieve (acquire) a data granule from the ECS. The tool will prompt the user for key inputs for acquiring the granule. The following procedures describe this process.

Acquiring a Granule from the Science Data Server

- 1 Ensure that the **Science Data Server** subsystem is currently executing on the appropriate ACMHW HWCI server machine. Tested on **texas**.
- 2 Start the Science Data Server test utility by entering the following at the UNIX prompt on the SDSRV workstation:
setenv MODE TS1
cd /usr/ecs/<mode>/CUSTOM/bin/DSS/
source ../ ./utilities/EcCoEnvCsh
/usr/ecs/<mode>/CUSTOM/bin/DSS/dttest6 ConfigFile
/usr/ecs/<mode>/CUSTOM/cfg/EcDsScienceDataServerClient.CFG
ecs_mode <mode>
- 3 The following selection menu is displayed:
 1. **INSERT granule**
 2. **INSERT granule with browse file**
 3. **ACQUIRE granule with date**
 4. **ACQUIRE granule with a UR**
 5. **DELETE granule**
 6. **Exit****Please make selection=>**
Choose option **3** to perform the search and acquire.
- 4 The program indicates that the search process will take place first by displaying the message “**Executing search** “. The user is prompted to enter a hostname. Enter the hostname of the machine on which the Science Data Server process is executing:
Enter hostname=> **dss2**
- 5 The user is prompted to enter a data type. Enter the ESDT short name of the type of data that is to be acquired. An example:
Enter data type=> **AST_L1BT**
- 6 The user is prompted to enter a start and end date. These dates indicate a range over which the user would like to search the database for data of the given type. The start and end dates will narrow the search to those data granules that were collected within that time range. Times are given in the format **mm/dd/yy**. For example:
Enter starting date(mm/dd/yy)=> **07/04/97**
Enter end date(mm/dd/yy)=> **07/05/97**
- 7 After the start and end dates are entered the utility will make a request of the Science Data Server and the following message will be displayed:

Trying to make a request to [:DSSDSRV]

A table of data granules will be displayed to the user if any were found within the given time range. For example, if the user had requested to display all of the data granules for the ESDT **AST_L1BT** within a certain time range, the following table would be displayed:

```

UR   Type   Create Date   Size
--  -----  -
AST_L1BT SC:AST_L1BT:1390
AST_L1BT SC:AST_L1BT:1391
AST_L1BT SC:AST_L1BT:1322
AST_L1BT SC:AST_L1BT:1289
AST_L1BT SC:AST_L1BT:1299

```

The table displays the data type (AST_L1BT) and UR (i.e., SC:AST_L1BT:1390) for each granule found.

In addition to the table, a list of the granules with a corresponding numerical index will be displayed with a prompt to the user to enter the index of the granule that they wish to acquire. An example of the indexed list follows:

NOW ENTERING ACQUIRE

There is(are)5 in the collection

Index = 0 AST_L1BT SC:AST_L1BT:1390 Index = 1 AST_L1BT

SC:AST_L1BT:1391 Index = 2 AST_L1BT SC:AST_L1BT:1322 Index = 3

AST_L1BT SC:AST_L1BT:1289 Index = 4 AST_L1BT SC:AST_L1BT:1299

Please enter the index of the associated UR

- 8** At this time the user should enter the numerical index of the granule that they wish to acquire and hit enter.
- 9** The SDSRV utility will prompt the user for a media type, the type of media on which the data will be retrieved:

Valid Media Types:

FtpPull

FtpPush

8MM

4MM

CDROM

9TRK

Enter media type (case sensitive)=>

The user should enter one of the values of the valid media types. If the user entered FtpPush, the user will expect the data to be ftp'd to a given directory.

- 10** After the user has entered the Media type, the utility will prompt the user for the media format. The media format should be entered as "FILEFORMAT"

Enter mediaformat=> FILEFORMAT

- 11** After the user has entered the Media format, the utility will prompt the user for the user profile id. This entry can be any alphanumeric character.

Enter userProfID => a

- 12** After the user has entered the user profile id, the utility will prompt the user for a user id and associated password. The user id/password will be used for authorization to perform the ftp of the data file from the archive area to the user-

specified directory. The password field will not be echoed to the screen. The following is only an example. The user should use a valid user id/password within the current environment.

Enter username=> **sdsrv**

Enter password=>

- 13** The next entry that the user must enter is the host id of the machine to which they want the data ftp'd. Enter a valid host name as follows:

Enter host=> **dss2**

- 14** After the host id, the user must enter the fully qualified destination directory to which the file will be ftp'd:

Enter destination=> **/tmp**

- 15** After the destination directory has been entered, the utility will give the following message:

Trying to make a request to [:DSSDSRV]

If the acquire operation is successful, the utility will give the following message:

Acquire successful.

Please <CR> to continue.

- 16** The user should hit return at this prompt and the program will redisplay the first menu that was given in step 3. The user can then choose option 5 to exit.
-

11.11.5 Add ESDTs through the ECS Assistant GUI

Execute the procedure steps that follow:

- 1** Launch the ECS Assistant GUI.
 - The GUI will display three selection buttons, one of which is **ESDT Manager**.
- 2** Click the **ESDT Manager** button to open the ESDT Manager GUI. The ESDT Manager GUI will be invoked.
- 3** Select a mode by clicking the drop down list in the **Mode** window.
 - All the modes are listed in the **Mode** window.
 - Select a mode by clicking its name in the mode list.
- 4** Input a DLL path where the shared object files are located by typing a full path name in the **DLL Path** window. (i.e.; **"/usr/ecs/OPS/CUSTOM/lib/ESS"**), **ESDT Descriptor Path:** (i.e.; **"/usr/ecs/OPS/CUSTOM/data/ESS"**).
- 5** Select a subdirectory for the instrument team by clicking the corresponding abbreviation.
 - The descriptor files installed for that instrument will be listed.

- 6 Select descriptor files to be added to the archive by clicking the descriptor names in the list.
 - The selected descriptor files are highlighted.
 - 7 Move the selected files to the **Selected Files** window by clicking the “==>” button.
 - The short names for the selected descriptor files are listed in the Selected Files window.
 - 8 To add the selected files into the archive, click the **Add** button.
 - The ESDTs are added to the archive.
 - 9 To exit, select **Exit** in the **File** pull-down menu.
This will terminate the ESDT Manager GUI.
-

11.11.6 Using ECS Assistant to Manage ESDTs

With the ECS Assistant Tool, ESDTs can be added to and removed from the Science Data Server database by means of a GUI. These operations will be described in the following sections.

11.11.6.1 Installing ESDTs/DLL's to the Storage Area

In the ECS system, ESDTs are used to define data granules. Prior to executing a PGE, the relevant ESDT descriptor files and their DLL codes must be installed into the system through the science data server. ECS Assistant provides an easy-to-use GUI to perform these activities. If the installation is successful, the science data server, advertising server, subscription server, Management subsystem (MSS) and the new ESDT implementation library (DLLs) will all be updated.

ESDT's, (both components; descriptor and corresponding DLL files) to be installed must exist and have been verified for syntax, valids, and other metadata attributes correctness.

Detailed procedures for tasks performed by the SSI&T operator are provided in the sections that follow.

Assumptions:

1. The ECS Assistant is up with the necessary servers listening.
2. The ECS Assistant GUI is running with **ESDT Manager** selected.
3. Proper ClearCase view has been set.
4. The ESDT descriptor files are installed in the specified mode.

DLL's located : /usr/ecs/<mode>/CUSTOM/lib/ESS

ESDT Descriptors Located: /usr/ecs/<mode>/CUSTOM/data/ESS

11.11.6.2 Adding ESDTs through the ECS Assistant GUI:

- 1 Launch the ECS Assistant GUI.
 - The GUI will display three selection buttons, one of which is **ESDT Manager**.
- 2 Click the **ESDT Manager** button to open the ESDT Manager GUI.
- 3 Select a mode by clicking the drop down list in the **Mode** window.
 - All the modes are listed in the **Mode** window.
 - Select a mode by clicking its name in the mode list.
- 4 Input a DLL path where the shared object files are located by typing a full path name in the **DLL Path** window. (i.e.; **“/usr/ecs/OPS/CUSTOM/lib/ESS”**)
- 5 Select a subdirectory for the instrument team by clicking the corresponding abbreviation.
 - The descriptor files installed for that instrument will be listed.
- 6 Select descriptor files to be added to the archive by clicking the descriptor names in the list.

The selected descriptor files are highlighted.

- 7 Move the selected files to the **Selected Files** window by clicking the “==>” button.
 - The short names for the selected descriptor files are listed in the Selected Files window.
 - 8 To add the selected files into the archive, click the **Add** button.
 - The ESDTs are added to the archive.
 - 9 To exit, select **Exit** in the **File** pull-down menu.
This will terminate the ESDT Manager GUI.
-

11.11.6.3 Validating Successful ESDT Installation

Criteria for success:

The **SDSRV** will display an Event ID to the fact that a new ESDT has been installed successfully.

The following servers will also need to have acknowledged a successful ESDT Event ID before additional work can be done: **ADSRV, DDICT, & SBSRV**

11.11.6.4 Removing ESDTs with ECS Assistant

If an ESDT is installed incorrectly or a new version of it becomes available, the installed ESDT will need to be removed from the archive, so that the new ESDT can be added. As with addition of ESDTs, their removal can also be accomplished with the ECS Assistant. Doing so performs the following actions:

- The selected ESDT is removed from DsSrConfiguration.acfg file
- The selected ESDT is removed from the database table
- The event file for the selected ESDT is removed
- The destination descriptor and DLL files for the selected ESDT are removed.

Detailed procedures for tasks performed by the SSI&T operator are provided in the sections that follow.

Assumptions:

1. The ECS Assistant has been properly installed.
2. The ECS Assistant GUI is running.
3. ESDTs are not stored under ClearCase.
4. The ESDT descriptor files are installed in the specified mode.

11.11.6.5 Removing ESDTs from Archive Area using ECS Assistant GUI:

- 1 Open the ECS Assistant GUI - The GUI will display three selection buttons, one of which is **ESDT Manager**.
- 2 At the ECS Assistant GUI, click the **ESDT Manager** button to open the ESDT Manager GUI.
 - The ESDT Manager GUI will be invoked as shown in Figure 11.11-1
- 3 Select a mode by clicking the drop down list in the Mode window.
 - All the modes are listed in the Mode window.
 - Select a mode by clicking its name in the mode list.
- 4 Input a DLL path where the shared object files are located by typing a full path name in the DLL Path window.
- 5 Select a subdirectory where the ESDTs are staged by clicking a subdirectory name (as indicated by the instrument team abbreviation).

- The descriptor files stored in that directory are listed.
- 6 Select descriptor files to be removed from the archive by clicking their names in the list.
 - The selected descriptor files are highlighted.
 - 7 Move the selected files to the Selected Files window by clicking the “==>” button.
 - The short name for the selected descriptor files are listed in the Selected Files window.
 - 8 To remove the selected ESDTs from the archive, click the **Remove** button.
 - The ESDTs are removed from the archive.
 - The necessary cleanups are performed.
 - 9 To exit, click the **EXIT** in the **File** pull down menu.
 - This will end the ESDT Manager GUI.

11.11.6.6 Removing ESDTs using the Command Line:

Procedures:

- 1 **telnet** to (SDSRV) **texas** [e.g.]
- 2 login: **cmts1**, password: **ecsuser**
- 3 *Login to DCE (dce_login <name> <Password>), setenv DISPLAY:0.0*
- 4 **cd dbr**
- 5 **source dx.csh**
- %dbr**

First delete ESDT's from the Advertisement Subsystem:

- 6 **rlogin incagold -l cmts1**
- 7 *Login to DCE (dce_login <name> <Password>), setenv DISPLAY:0.0*
- 8 **rlogin incagold -l ios**
- 9 *Login to DCE (dce_login <name> <Password>), setenv DISPLAY:0.0*
- 10 **cd /usr/ecs/OPS/CUSTOM/utilities**
- 11 **setenv MODE OPS**
- 12 **source EcCoEnvCsh**
- 13 **cd /usr/ecs/OPS/CUSTOM/bin/IOS**
ContributionDriver OPS
awhitele
awhitele
 3
 2
- 14 **your_short_name_here**
 - y

Success is when the "<" prompt returns

To make sure the advertisements are deleted from the database

- 15 **incagold% isql -Uios_role -Pwelcome -Sincagold_srvr**

- [If not OPS mode]
- 1> use IoAdAdvService_MODE
[where MODE is your mode, e.g. TS1]
- [if OPS mode]
 - 1> use IoAdAdvService
 - 2> go
 - 1> select * from IoAdAdvMaster where title like
"%your_short_name_here%"
 - 2> go

Result should be no rows returned.

If you do get rows returned, the delete from advertisement did not work.

Then delete ESDT

```

16  rlogin [texas] -l cmts1, pw: ecsu$er
17  Login to DCE (dce_login <name> <Password>), setenv DISPLAY .....:0.0
18  cd /usr/ecs/OPS/CUSTOM/utilities
19  EcDsSrRmesdt OPS your_short_name_here

```

Success is no error msgs

Kill servers -- AFTER WARNING EVERYONE WORKING IN YOUR MODE!

```

20  Using ECS Assistant : # kill Sdsrv & HdfEosSrv & AdSrvr

```

```

#This will clean up DCE 's. Using ECS Assistant : # Restart servers! Sdsrv & HdfEosSrv
& AdSrvr

```

- # start Sdsrv & HdfEosSrv on [texas]
 - # start SubSrvr on [incagold]
- # (cleanup done automatically)
- sdsrv.startup OPS
 - ios-dm-mss.startup OPS

Now reinstall the ESDT on SDSRV



11.12 Production Rules

11.12.1 Purpose and Scope

This section describes the production rules supported by the Release B CDR design. It is intended to explain the implementation of these production rules in ECS and to document the information required for each rule. This section does not cover the exact design and implementation of these production rules in the PDPS system. That information may be found in the PDPS design documents, primarily in the Planning Subsystem document 305-CD-026-002, Release B SDPS Planning Subsystem Design Specification for the ECS Project.

. While this section does address the syntax and operational procedures for specifying production rules, it does provide detailed information about what data is required for each rule and how that data will be used

11.12.2 Overview of Production Rules

11.12.2.1 Data Processing in ECS

Before discussing production rules, it is important to have a basic understanding of how the Earth Observing System Data and Information System (EOSDIS) Core System (ECS) conducts its data processing. ECS provides facilities for running product generation executives (PGEs) to produce science data products. The support for this function primarily resides in three subsystems: the Data Processing Subsystem (DPS) which actually executes the PGEs, the Planning Subsystem (PLS) which plans the execution of PGEs to efficiently utilize the local computing resources and the Data Server Subsystem (DSS) which provides PGEs with input data and archives output data. The design and implementation of the DPS and the PLS are carried out by the ECS organization known as the Planning and Data Processing System (PDPS).

Data Processing Subsystem (DPS) - The DPS provides the environment under which PGEs are run. It works with the SDP toolkit to interface with the science software. The DPS coordinates the acquisition of input data (staging) and the archiving of output data (de-staging) with the DSS.

The DPS also ensures that there are adequate resources (disk space, RAM, etc.) available before a PGE begins execution. The DPS uses the AutoSys COTS product to implement the PLS production plan.

Planning Subsystem (PLS) - The PLS generally manages the ECS data processing activities and provides the main interface between the DPS and the rest of ECS. The PLS plans the execution of PGEs to provide efficient use of computing resources. The PLS receives Production Requests (PRs) either from a software tool (Production Request Editor) or, for on-demand production requests (OPRs), from the DSS or DPS (see Error Handling). The PLS breaks up PRs into data processing requests (DPRs), which are individual runs of a PGE. It maintains information about input data for specific DPRs and passes that information to the DPS. It queries the DSS for data which meets required

criteria and provides the universal references (URs) of that data to the DPS for acquisition.

Data Server Subsystem (DSS) - The DSS provides input data to the DPS and archives output data from the DPS. It responds to queries from the PLS and provides the PLS notification of the arrival of input data for all subscriptions the PLS has placed with it. The DSS also submits On-Demand

Production Requests (OPRs) to the PLS.

These three subsystems form the core of the ECS data processing services. Since it has responsibility for managing these activities, most of the information about production rules will be maintained by the PLS.

11.12.2.2 General Definition of Production Rules

Simply stated, production rules are the instructions about how a particular PGE is to be run. These instructions specify a wide range of information such as the input and output data types, the frequency of execution, activation conditions and error handling instructions. This section focuses on the other types of production rules such as alternate inputs to be used or conditional PGE activations. These and other production rules are defined in the following sections.

Production rules in the ECS system will be tied to PGEs. This means that each PGE will use one or more production rules. The production rules will be initially entered by the Instrument Team with further modifications if necessary when a PGE undergoes Science Software Integration and Test (SSI&T) at the DAAC. Where applicable, default parameter values will be entered at that time. Many of these defaults can be overridden in the production environment when a Production Request is entered.

11.12.3 Production Rule Definitions

Introduction

This section presents a basic definition and examples of each of the production rules currently supported by the Release B CDR design. The production rules are divided into three categories:

- Input Data Specification
- Conditional Activation
- Error Handling

.Input Data Specification rules specify how the inputs for a particular run of a PGE are identified. Conditional Activation rules stipulate the conditions of when a particular PGE is to be run. Error Handling rules specify automatic actions to be taken when a PGE fails. Each sub-section is titled with the name of the production rule being discussed.

It is hoped that providing a common nomenclature will facilitate any future discussions between ITs and ECS about production rules. After each rule there is a list of the information required to implement that rule in the production environment (i.e. post-launch, at the DAACs). This information will initially be provided at SSI&T time. In the operational environment many of the values can be set when a Production Request is entered. Most production rule sections also include a simple diagram to help illustrate the concept being presented.

11.12.3.1 Input Data Specification

These production rules generally stipulate how inputs for a particular run of a PGE (a DPR) are identified/selected/created. Most PGEs have at least one input and one output. The most basic information about these inputs and outputs is the Earth Science Data Type (ESDT). It is assumed in the examples in this chapter that the ESDT is specified for all data sets which are used or produced by a PGE.

11.12.3.2 Basic Temporal

The most basic type of production rule specifies, for each input ESDT, the temporal range of that ESDT required by the PGE.

For example, the run of a PGE which produces a particular 2.5 minute MODIS Level 1B data granule requires as input the specific 2.5 minute Level 1A granule which is ontemporaneous with the Level 1B granule to be produced.

Another example would be the production of a CERES Level 1A granule from the Level 0 data. CERES L1A granules cover 24 hours and require the PLS to identify and the DPS to stage all of the Level 0 data files that cover a particular 24 hour period. This sort of simple temporal specification is basic to the system and will be used by every PGE.

Inputs required to implement the Basic Temporal rule

For each PGE which uses this rule, the following data must be provided for each ESDT (input or output): Time period - Length of time of ESDT (e.g. 12 hours, 1 week or one year).

Boundary - Date/time to start counting periods

Both of the above parameters are specified at SSI&T time.

11.12.3.2.1 Example use of the Basic Temporal Rule

Suppose there is a PGE which creates a daily (24 hour) data set and those data sets should correspond with calendar days. In that case Time Period = 24 hours and Boundary = 1/1/98 00:00 (this could be any date). When a Production Request is entered, the Planning Subsystem will scan backwards from the start time of the PR until it finds the start of a period. It then produces DPRs for each period of time covered by the PR. Figure 3-1 illustrates how this would work. Given the period and boundary defined above, two PRs are entered, the first for the time between 6/3/99 12:00 - 6/7/99 6:00 while the second specifies 6/7/99 18:00 - 6/16/99 12:00. When the first PR (#1) is entered, the Planning Subsystem determines that the start time of the PR is not the start time of a period. It then scans backwards, finding the start time of the period to be 6/3/99 00:00 and creates a DPR (1.1) to process that period. It then continues producing DPRs (1.2, 1.3, 1.4 and 1.5) until it reaches the end of the period which contains the end time of the PR. When the second PR (#2) is entered, the same process takes place. Note that since the end time of PR #1 and the start time of PR #2 fall in the same period, duplicate DPRs (1.5 and 2.1) are created. This sort of duplication is checked for by the Planning Subsystem and the second DPR is not run.

Boundary (1/1/98 00:00)
= Period (24 Hrs)
PR #1 PR #2
DPR 1.1
DPR 1.2
DPR 1.3
DPR 1.4
DPR 1.5 = DPR 2.1
DPR 2.2
DPR 2.3
DPR 2.10
DPR 2.9
6/1/99 6/23/99

Table 11.12.3.2-1. Basic Temporal

11.12.3.3 Alternate Inputs

This is a fairly simple rule, although there are several options which give it great flexibility and power. There are cases where, for one of its input data sets, a PGE can use any one of several inputs. For example, a particular PGE might require model wind data as an input and would be capable of accepting wind data from a DAO model, an NCEP model or, as a last resort, could use climatology. Variants of this rule allow the alternate input to be optional or allow alternates to be grouped so that more than one of the alternates may be needed (i.e. use any M of N ESDTs in the group).

11.12.3.4 Inputs required to implement the Alternate Inputs rule

ESDT of Primary Alternate - This is the data set ID for the most desirable alternative.
 Timer for Primary Alternate - Amount of time to wait before attempting to use second alternate. Number Needed - Number of the alternate data sets (from this group of alternatives) required by the PGE. Usually 1, but can be more. If set to 0, this set of alternates is optional (i.e. the PGE can run without any of the alternates) ESDT of Second Alternate -

Data set ID for Second Alternate

Timer for second Alternate - Amount of time to wait before attempting to use third alternate.. (include any number of alternates, no practical limit).

ESDT of Last Alternate - Data set ID for Last Alternate.

Timer for Last Alternate - Note that this timer is used only if Number Needed = 0, which indicates that this set of alternates is optional. In that case, if this timer expires, the DPR will be executed even if none of the alternates is available. If however, Number Needed > 0, then this timer is not used; the DPR will be held indefinitely, waiting for one of the alternates to become available.

11.12.3.4.1 Example use of the Alternate Inputs Rule:

Let's assume that a PGE has two required input data sets and a third data set which can be any one of three alternates. Of the three alternates, the first two choices are almost equivalent, while the last choice is less desirable. In this case we designate the Primary Alternate (first choice) and set a timer for 1 hour. The second choice is designated with a timer set for 4 hours. This situation is shown in Table 11.12.3.4-1. What will happen is that, after the two required inputs are available, an attempt is made to acquire the first choice. If that choice is unavailable, the Planning Subsystem holds the DPR and starts the first timer (1 hour). If the first choice becomes available in that hour, the DPR is started immediately. If the first timer expires and the first alternate is still unavailable, an attempt is made to use the second choice. If the second choice is unavailable, the second timer (4 hours) is started. If the first or second alternates become available at any time during that 4 hours, the DPR is started immediately. However, if the second timer expires (a total of 5 hours after the two required inputs are available), an attempt is made to use the third choice. Unless this set of alternates is optional, most PGEs are expected to have a last alternate which is always available (e.g. climatology). If not, the DPR is held indefinitely waiting for one of the alternates to become available.

Required Dataset 1
Primary Alternate
Second Alternate
DPR
< or > First Choice –Timer set to 1 hour.
Wait 1 hour after required data sets are available before trying to use second alternate.
Second Choice –Timer set to 4 hours.
Wait 4 hours after this choice was first tried before attempting to use third alternate.
Output Dataset
Third Alternate < or > Third (in this case, last) choice. Attempt to use if primary and secondary alternates are unavailable 5 hours after required datasets are available.

Required Dataset 2

Table 11.12.3.4-1. Alternate Inputs

11.12.3.5 Tiling

In this case a PGE is set up to run for a series of pre-defined, rectangular areas (tiles). The tile definitions need to be entered into the PDPS database so that the proper input data granules can be identified. The implementation of this rule calls for the PGE developers to create tile definition files which would have descriptions of each tile. The Planning subsystem would then use those definitions to query the Data Server for input data granules for each tile. Tiles are grouped together into clusters which are likely to share common input granules. This is done for efficiency of operations.

11.12.3.5.1 Inputs required to implement the Tiling rule:

The primary input for the tiling rule is a tile definition file. This file will contain one entry for every tile which will include: Tile ID - Unique identifier used to refer to the tile
Lat./Lon. of tile corners -

Four coupled pairs of coordinates which bound the tile. Cluster ID - ID of cluster in which tile falls.

Tile 1 Input Data
Tile 2 Input Data
Tile 3 Input Data
Tiles 4-6
Tiles 7 and 8
DPR-1
DPR-2
DPR-3
Output granule for tile 1
Output granule for tile 2
Output granule for tile 3
Tiles 4-8 are processed in the same manner as tiles 1-3.
8 Tiles clustered together since they are likely to have overlapping inputs
Original
Swath
Data

Table 11.12.3.6-1. Tiling

11.12.3.5.2 Example use of the Tiling Rule

A tile definition file is part of the package delivered with the PGE for SSI&T. In the production environment, a PR is entered to run the PGE on all the tiles. A DPR is generated for each tile. These DPRs are grouped by Cluster ID so that, since they will share some of their inputs, these DPRs will be run on the same machine which will minimize the the staging and copying of those inputs amongst the various production machines. The PLS will use the tile definitions to query the DSS to identify all input data

granules covering a tile. It is likely that many of these input granules will have data outside as well as inside each tile. The URs for these input granules and the specific tile definition are then passed to the DPS as part of each DPR. Each DPR will then run, the DPS will acquire the inputs from the DSS and the PGE will run and, using only the data in the tile, create an output data granule for its tile.

11.12.3.6 Data Server Proxy (Subsetting/Subsampling)

There are cases where a PGE would like to use Data Server services on its input data sets prior to running the PGE. In these cases the Planning and Data Processing subsystems simply act as proxies for the PGE by calling those Data Server services. The services provided here are totally dependent what services the DSS offers for each specific product. Instrument teams wishing to use specific services on specific products should coordinate with the Data Server Subsystem to ensure those services will be available.

11.12.3.6.1 Inputs required to implement the Data Server Proxy rule

Each PGE which uses this rule will be need to identify:

Input ESDT - ID of data set upon which Data Server services will be performed.

Service Requested - Data server service ID
 Interface Parameters - Parameters specific to the service being requested. For example, a spatial subset request would specify the geographic extent while a temporal subset request would specify the time period requested.

Subset of Original Dataset
DPR Output Data Granule
DPR Output Data Granule Subsample of Original Dataset
Spatial Subsetting Subsampling

Table 11.12.3.7-1. Subsetting & Subsampling

11.12.3.6.2 Example use of the Data Server Proxy Rule

Assume a PGE with an input data set which covers the entire globe and is gridded at a .1 o by .1 o resolution. During the post-launch, PGE shakedown phase, the science software developer might want to generate a 1 o by 1 o resolution product for a quick look at the output data. Rather than have the PGE do its own averaging/subsampling, Data Server subsampling services could be invoked so that the PGE only has to run on 1/100th the amount of the original data. In this case a second PGE profile would be created at SSI&T which would include the service request and track the different runtime characteristics (e.g. CPU time, disk storage for input/outputs, RAM usage, etc.)

11.12.3.7 Level 0 to Level 1A

This is a special case of the simple temporal range rule and is of interest only to certain Level 1A PGE developers. The issue is what rules PDPS uses to determine what Level 0 data files are required to produce a particular Level 1A granule. In many cases (such as CERES), this is handled by the Basic Temporal rule rather than the method described here. This rule is intended to handle orbit-based Level 1A granules. Level 0 'granules' received by EDOS will be not have any discernible relationship with the spacecraft orbit.

The Level 0 'granules' have not even been fully defined for some instruments flying on other platforms. In these cases, the Planning Subsystem will access a crude orbit model (really just a lookup table) to determine the start/stop times of a given orbit. It will then use those start/stop times (after adding a small cushion to ensure complete coverage of an orbit) to query the data server for the Level 0 data covering the orbit. The response to that query is given to the Data Processing Subsystem which acquires the data. The PGE then uses SDP Toolkit calls to determine the exact extent of the orbit. A similar process will be used for instruments having orbit-based Level 1A granules but which will be flying on platforms other than AM-1. In the case of SeaWinds, flying on the ADEOS II platform, a temporal offset may have to be used if the orbit model is based on equator crossing rather than on pole crossing as the SeaWinds want for their Level 1A granules.

Time

Time
Level 0 Data
Orbit-based
Level 1A Granules
Using temporal definitions of orbits, the PLS identifies and the DPS stages the appropriate Level 0 Data for each orbit-based Level 1A granules

Table 11.12.3.7-1. Level 0 to Level 1A

11.12.3.8 Conditional Activation:

Most PGEs have well defined times and conditions when they are to be executed. The most common activation condition is the availability of all input data sets. Similarly, the frequency of execution is usually well defined (e.g. run once for every granule or run monthly averages once a month). However, some PGEs might have additional/different constraints on when they get run. This section addresses those cases.

11.12.3.9 Intermittent Execution

A PGE can be set up to run on every Nth instance of input data. For example, a QA PGE that is run on a daily product may only need to be run every fifth day to provide a spot check. Note that this does not refer to the common case of only running a weekly averaging PGEs once each week, which would be handled by the Basic Temporal rule and the time ranges specified for the input and output ESDTs. Rather this is a special case where a PGE can be run every day (or hour, week, etc.), but, for whatever reason, it is only desired to be run every Nth day.

11.12.3.9.1 Inputs required to implement the Intermittent Execution rule

This rule is implemented by using two parameters:

Number to Skip - Number of DPRs to be skipped (not executed)

Number to Keep - After skipping the specified number of DPRs, how many are to be kept.

This number will usually be one, but could be any number. The use of these parameters will allow a pattern of execution to be established. This pattern is not maintained between PRs.

PR #2

PR #1
DPR
1.1
DPR
1.2
DPR
1.3
DPR
1.4
DPR
2.1
DPR
2.2
DPR
2.3
DPR
2.4
DPR
2.5
DPR
1.2
DPR
1.3
DPR
2.3
DPR
2.2
DPR
2.5
PRs #1 and #2 are entered at different times.
PR #1 generates 4 DPRs and PR #2 Generates 5.
Only 5 of the 9 are 'kept' and actually run.
Number Skipped = 1
Number Kept = 2
Created Run
Separate PRs,
pattern is restarted for PR#2

Table 11.12.3.9-1. Intermittent Execution

11.12.3.9.2 Example use of the Intermittent Execution Rule

Using the above example of a QA PGE to be run every fifth day, let's assume a Production Request is entered which covers the period from 6/1 - 6/30. As part of the PR values are

entered for number skipped (4) and number kept (1). The PR would be expanded into 30 daily DPRs, of which, four out of every five would be discarded, leaving one DPR every fifth day.

11.12.3.10 Metadata-based Conditional Activation

It is possible to determine if a given DPR should be run, based on the metadata of one or more of its input data sets. For example, a PGE could be set up so that a QA flag must be set to an acceptable level/state within the metadata of an input data set or the PGE should not be run. This production rule will work for both core and product-specific metadata. Note that this is different than data-based conditional activation, which will not be supported in Release B. If that sort of conditional activation is desired, the IT will need to define a product-specific metadata field which will be filled by the PGE producing that data.

11.12.3.10.1 Inputs required to implement the Metadata-based Conditional Activation rule

This rule is implemented by using a series of statements for each ESDT to be checked. These statements take the basic form of:

Metadata field Operand Value. These statements would be 'AND'ed together so that if any of the checks fail, the DPR will not be run. These statements would be entered in at SSI&T time, however, the values could be changed when a Production Request is entered.

Input 1
QAFlag=7
DayNight='DAY'
Clouds=20%
Input 2
QAFlag=4
Input 1
QAFlag=9
DayNight='DAY'
Clouds=70%
Input 2
QAFlag=8
Input 1
QAFlag=7
DayNight='DAY'
Clouds=30%
Input 2
QAFlag=7
DPR 1
DPR 2
DPR 3
Metadata Checks:
Input 1:

QAFlag > 5
DayNight = 'Day'
Cloud < 40%
Input 2:
QAFlag > 6
DPR 1 is NOT run since Input 2 failed the QAFlag check.
DPR 2 is NOT run since Input 1 failed the cloud cover check.
DPR 3 IS run since Inputs 1 and 2 met all metadata conditions

.Table 11.12.3.10-1. Metadata-based Conditional Activation

11.12.3.10.2 Example use of the Metadata-based Conditional Activation Rule

Assume there is a PGE which uses multiple ESDTs as inputs. Two of the inputs (Input 1 and Input 2) need to have their metadata checked prior to the PGE being executed. Input 1 needs to have a certain quality, less than a certain percentage of clouds and be daytime data while Input 2 just needs to be of a certain quality. Table 11.12.3.4-1, illustrates this situation and shows three DPRs created for different instances of Inputs 1 and 2 and the disposition of those DPRs based on the metadata of the inputs. As stated earlier, if it was decided that the cloud cover rule was too strict, the value used for comparison could be changed when Production Requests are entered. If, however, a new check were needed for some other metadata field, this change would have to be done through SSI&T.

11.12.3.10.3 Mode-based Conditional Activation

In this case, the mode a given instrument is in will determine which PGE is run. For example an instrument might go into a calibration mode which requires that a special calibration PGE is run. Actually, this is just a specialized case of the metadata-based conditional activation. The added functionality here is that at SSI&T time PGEs can be grouped into PGE collections. In such cases, the instrument mode would determine which PGE in the collection is run. This mechanism is used primarily to improve the accuracy of plans generated by the PLS .

11.12.3.11 Error Handling

Error handling is a little different from the other two categories of production rules. This is because it is mostly an operational procedure which occurs in response to an (hopefully) anomalous event. The key mechanism for implementing error handling will be PGE exit codes. Release A PDPS is currently working to define PGE exit codes and determine how best to associate actions with exit codes. (Establishing Science Software Exit Conditions for the Production Environment, 420-WP-006-001) is in preparation. The key enhancement to error handling by Release B is the reuse of the on-demand processing mechanism to automate the response to a specific error code. In this case, when a PGE undergoes SSI&T, On-Demand Production Requests (OPRs) are then associated with various PGE exit codes.

11.12.3.11.1 Inputs required to implement the Automated Error Handling

At SSI&T time, for every exit condition which will need another PGE to be run, the following information will need to be entered:

Exit Code - PGE exit code which triggers action
Message - Message to be displayed to operation console
OPR - On-Demand Production Request to be executed. The OPR will have the same timeframe as the original DPR so if the DPR were run on data from 6/20/99 12:00-13:00, then the OPR would be given the same timeframe before being passed to PLS.

11.12.3.11.2 Example use of Automated Error Handling

It is difficult for a short example to capture the full error handling options of the ECS production system. The following example simply gives a flavor for what is possible with regard to automatically submitting OPRs based on a PGEs exit code. While a certain PGE (PGE1) is undergoing SSI&T it is set up so that if PGE1 has an exit code of 6, it should be re-run in debug mode. If it has an exit code of 12 (can only happen from debug mode), then a second PGE (PGE2) should be run. At a later date, in the operational environment, a DPR for PGE1 is running and terminates with exit code 6. An OPR is generated for PGE1 which includes the runtime flag used to send it into debug mode. A message is displayed on the operator's console informing them of this event. The OPR is run and it finishes with an exit code of 12. Now another OPR is created, this one for PGE2. A different message is displayed on the operator's console.

11.12.4 Combinations of Production Rules

11.12.4.1 Introduction

One of the most powerful features of production rules is the ability to combine multiple rules. This gives the science software developers greater flexibility and control over the production of their data. This section is intended to illustrate how some of the production rules can be used together. It is not intended to be exhaustive, but rather to give a sampling of the more common combinations. Most combinations are quite easy to understand and the implications of these combinations are quite clear. However, while theoretically any and all of the production rules can be combined, some combinations will make little sense. For instance, combining tiling with intermittent execution will only produce DPRs for some tiles and it will not be easy for the science software developer to determine those tiles in advance. Conversely, intermittent execution works quite well with the basic temporal rule and behaves in an easily predictable manner. While the software can handle complex combinations, in practice these combinations might have results which are not especially intuitive. For example, while combining alternate inputs with metadata based activation, tiling and intermittent execution would seem quite reasonable to the Planning Subsystem software, it would be difficult for a human to determine the results in advance. However, if intermittent execution is removed from the above combination, the remaining combination might be a perfectly valid production recipe. The following sections provide a few examples of how production rules may be combined.

11.12.4.2 Basic Temporal

The Basic Temporal rule is fundamental to the production system. All Production Requests will have a temporal component. Consequently, all of the other production rules are being combined with the Basic Temporal rule.

11.12.4.3 Alternate Inputs and Metadata-Based Conditional Activation

It is possible to combine these two rules so that the metadata of the inputs determines which alternate is used. For example, suppose there is a PGE which, along with its required inputs, can use one of two alternates, but the primary alternate must have a certain level of QA set in its metadata. If the primary data set becomes available, its metadata is checked and, if it fails the check, an attempt is made to use the second alternate.

11.12.4.4 Alternate Inputs and Data Server Proxy

This combination is quite straightforward. After the input data sets are determined via the Alternate Inputs rule, the Data Server Proxy service is invoked.

11.12.4.5 Alternate Inputs and Tiling

In this combination determining which data granules fall within a tile is a completely separate activity from determining which alternate is most should be used. In this case the tile definition could be used to acquire the data sets which had been chosen as part of the alternate input process.

11.12.4.6 Intermittent Execution

While it was mentioned above that all PGEs use the Basic Temporal rule, it is worth emphasizing that point in the case of Intermittent Execution. This rule is somewhat unique since it doesn't create DPRs, it removes them. By definition this rule needs to be used in combination with another rule.

11.12.4.7 Changes to rules

The following changes have occurred in the listing and organization of the rules documented by this section:

- The Release A Basic Temporal rule has been added.
- The current Alternate Inputs rule is the consolidation of Optional Inputs, Alternate Inputs - Hierarchical Preference and Alternate Inputs - No Preference. Subsetting and Subsampling have been combined and renamed Data Server Proxy- Alternate Inputs - Temporal/Spatial Tradeoff has been left out. This is because the PDPS team is still determining the best manner to implement this rule. There are several reasons for this including the lack of an IT provided algorithm, the nature of which could impact the design and implementation. Depending on what variables the algorithm uses, this rule might actually be a variant of the Data Server Proxy rule, or it might require the algorithm(s) to be integrated into PLS code.

11.12.5 Production Rules Technical Information Sources

- 1 ECS Baseline Information System :
 - 2 PDPS Home Page: <http://dmsserver.gsfc.nasa.gov/ecsdev/relb/pdps/index.html>
<http://pete.hitc.com/baseline/> -choose drop4, you will find latest patch documentation and much more.
 - 2 EOS Instrument Team Science Software (PGE's):
<http://ecsinfo.hitc.com/iteams/Science/science.html>. Production Rules White Paper and much more.
 - 3 MODIS - Science Data Processing software Release 4 System Description, SDST-104 dated August 25, 1998.
 - 4 Test Scenarios for selected Production Rules can be viewed by accessing the SCF at: [/home/dheroux/DPS/TESTBED/MISR/SSIT/V2/ODL/Scenarios](http://home/dheroux/DPS/TESTBED/MISR/SSIT/V2/ODL/Scenarios)
-

11.12.6 Production_Rules_Syntax

The Production Rules Syntax are presented as part of the Powerpoint Slides that accompany this document.

Production Rules identified thus far are listed as follows:

Basic Temporal, Advanced Temporal, Period Specification, Alternate Inputs, Optional Inputs, Metadata-based Activation, Metadata-Based Query -Static, Metadata-based Query - Dynamic, Orbit-Based Activation, Orbit Path, Runtime Parameter, Multi-File Granules, Multi-Granule ESDT's, Spatial Query, Minimum Number of Granules, Land Tiling, Tiling with Metadata-based Query, Optional DPRs, Ocean Data Day, Most Recent Granule, Alternates based on Minimum number of Granules, Zonal Tiling, Tile Clustering and Smart_Start_of_Year.

11.12.7 Production Requests

11.12.7.1 Science Software and Production Requests

Science software is one of the keys to production planning and processing:

- Performs the actual data processing to create desired products.
- Is developed at Science Computing Facilities (SCFs) external to ECS.
- Is embodied in Product Generation Executives (PGEs) when the software is integrated into the ECS production processing environment.
 - PGEs are science software code (e.g., executable programs or shell scripts) that contain the instructions for processing data to create the desired products.

The production request (PR) is another key to production planning and processing. The Production Planner defines ECS science data processing in terms of PRs.

- A PR is an order for data to be produced by the Data Processing Subsystem.
- A single PR may specify several jobs (using the same PGE) that are to be run over a period of time or a single job producing a single set of data.
- PRs may apply to the processing of new data (standard PRs or standing orders) or 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.
 - The 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.

The Planning Subsystem performs the following functions:

- 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 SDP processing function, including PGE-related information.
- Checks the availability of the data required for the DPR, either from the data server (if the data have been previously ingested) or from internal predictions (if the data are expected to arrive in the future).
- Determines what data will be included in the DPR output so the system can make predictions concerning the availability of data for subsequent PGEs.

Figure 11.12.7.1-1 shows the relationships among the PGEs, PRs, and DPRs as they are accessed through the Production Request Editor GUI.

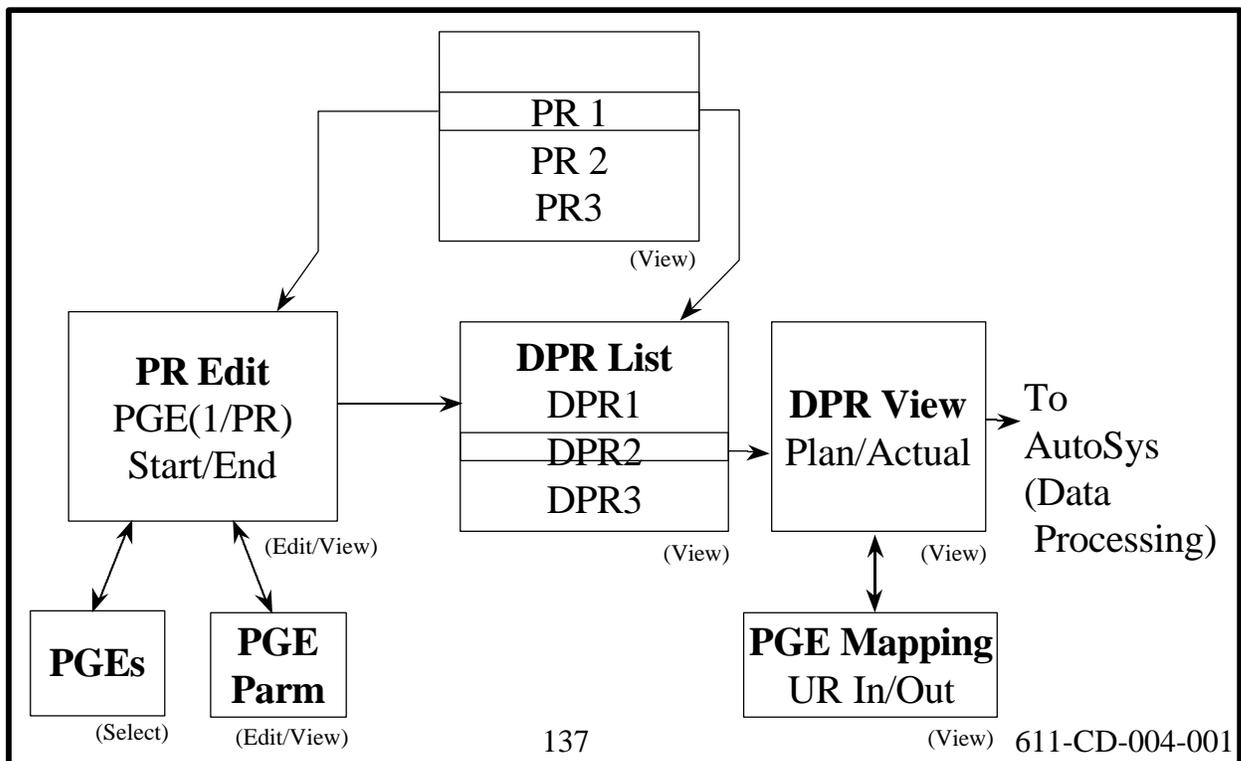


Figure 11.12.7.1-1. Production Request Editor Flow

11.12.7.2 Types of Processing

ECS either accommodates or will accommodate the following three general types of data processing:

- Routine Processing
- Reprocessing
- Ad-Hoc Reprocessing
- On-Demand Processing

Routine processing is pre-defined software production processing that is periodic and keyed to data arrival. For example, every day a Production Planner includes in the daily schedule a DPR for generating a particular Level 1A product from the most recent Level 0 data from the applicable satellite instrument.

Reprocessing typically involves using a new, improved PGE to process data that had previously been processed with an older version of the PGE. In such cases reprocessing would be a large-scale operation, especially if several years worth of data were to be reprocessed. Consequently, the Production Planner is likely to schedule reprocessing in manageable quantities so the processing resources can accommodate routine and on-demand processing in addition to the reprocessing.

In addition, ad-hoc reprocessing could be necessary at any time. For example, if a product fails a quality assurance (QA) check, the same PGE could be run again on the same data set in the hope of creating an acceptable product. Similarly, if processing of a PGE fails for some reason, it might be possible to rerun the PGE and hopefully achieve a successful outcome.

On-demand processing is ad-hoc processing initiated by either the Planning Subsystem or an end-user (as opposed to the Production Planner). For example, a researcher using data from the Advanced Spaceborne Thermal Emission and Reflection Radiometer (ASTER) instrument on the Terra satellite may need a particular Level 2 product that has not yet been generated. The ASTER researcher would submit an on-demand request to have the product generated from a Level 1B product stored in the archive.

In the future such on-demand processing requests (OPRs) will be entered from a Client Subsystem tool, passed through the Distributed Information Manager (Data Management Subsystem) and the Data Server to the Planning Subsystem. Currently there is a work-around to the automated process which requires the requester to contact DAAC personnel to make the request. So far ASTER researchers are the only identified external users of automated on-demand processing.

Another future feature is automated cross-DAAC planning. It is a process that will be undertaken when products produced at one DAAC require inputs being produced at another DAAC. The predicted production time of remote input products will be used in creating local production plans. The primary mechanism for cross-DAAC planning will be the use of Predicted Data Availability Schedules (PDAS), created when a plan is created. A DAAC's PDAS will be made available to remote DAACs via the Data Server.

11.12.8 Production Rules used in Planning PGE Processing

11.12.8.1 Production Rules Defining the PGE

Production rules are the instructions about how a particular PGE is to be run. The instructions specify a wide range of information such as the input and output data types, the frequency of execution, activation conditions and error handling instructions.

A single PGE may use one or more sets of production rules, known as PGE profiles, since it may be desirable to run the same PGE with different input data sets, or activation conditions. The production rules are entered when a PGE undergoes Science Software Integration and Test (SSI&T) at the DAAC. Where applicable, default parameter values are entered at that time. The initially selected runtime parameters, metadata check parameters, tile IDs, and many of the default parameters can be overridden in the production environment when a Production Request is entered.

Production rules define the PGE to the Planning and Data Processing Subsystems (PDPS).

The following types of conditions can be specified for each PGE:

- The time period for which the PGE will run.
 - A PGE can run every hour, every day, or for every orbit of a satellite. The frequency of how often a PGE runs must be defined to PDPS so that it knows when to plan and execute the PGE. A definition of a satellite's orbit could be included if the PGE were to be executed for some number of satellite passes.
- PGE Inputs.
 - A PGE can have any number of inputs. The types of the inputs and how frequently they are available helps determine on what basis the PGE is scheduled.
 - Most inputs to a PGE are retrieved based on time; the specified inputs are retrieved from the Data Server Subsystem for the time which the PGE is defined to execute. Production Rules allow other conditions to be added to the mix, such as checks or queries against the metadata of the input granules, or the lists of inputs as alternates (for when a primary input is not available) or optionals (for inputs without which the PGE can still run successfully). If inputs are defined as alternate or optional, the number of inputs staged for the execution of the PGE may vary from one run to the next.
- PGE Outputs.
 - A PGE can have any number of outputs. The characteristics of the outputs can have effects on any downstream PGEs that use them as

inputs. For example, it is possible for an output to be defined as optional, in which case it may or may not even be produced. (When an output is not generated, it cannot be used as input for a downstream PGE.)

- **Runtime Parameter Values.**
 - A PGE can have any number of runtime parameters, which are values that are placed in the process control file (PCF) under specified logical IDs before the PGE executes. The PGE treats them as constants and normally they are set either during SSI&T or when the Production Request is entered.
 - For some production rules (such as Orbital Processing) there is specific information that can be placed in a runtime parameter if so desired by the PGE.
- **Geographic Tiles.**
 - A PGE can define a geographic location for which it will process data. Tiles are defined through production rules, and change the staging of inputs from time-based, to a combination of time- and geographically-based. Data are retrieved based on their location on the Earth with respect to the tile that it is currently being processed.

Some (but not all) production rules can work with other production rules.

11.12.8.2 Production rules are often used for the selection of dynamic inputs.

- **Dynamic inputs** can be either internal or external.
 - **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.
 - The Metadata Query Production Rule is the only production rule that works for choosing static inputs.

PGE profiles allow a PGE to be defined to PDPS multiple times, each with a different set of inputs, outputs, or even scheduling information. Each PGE's definition is made up of its name, its version and its profile number. Different PGE name/version pairs define different PGEs to PDPS. The addition of the profile allows for multiple definitions of a PGE name/version pair. There can be up to 99 profiles for each PGE.

11.12.8.3 Syntax of Production Rules

Production rules are defined in the following two ways:

- Through science metadata that is entered in various types of files during the SSI&T process.
- By entering parameter values when a Production Request is created to schedule the PGE.

During SSI&T, production rules are defined in files written in Object Description Language (ODL) in a parameter equals value format. There are three general 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.
 - Tile Definition ODL Files.

When a Production Request is created to schedule a PGE, it is necessary to enter certain information that is essential to implementing the production rules that affect the particular PGE. The information may concern the date and time-range

11.12.8.4 PGE Science Metadata ODL Files

The PGE science metadata ODL file defines a PGE (or at least the current plan for its operation) to PDPS. It specifies everything from the PGE name and version, to the period for the PGE (how often it runs), all inputs and outputs, any runtime parameters and any exit messages or dependencies. A template version of the PGE science metadata ODL file is created by the **SSIT Create ODL Template** program from a PCF from the PGE.

11.12.8.5 ESDT Science Metadata ODL Files

The ESDT science metadata ODL file defines a PGE input or output to PDPS. Each input and output of a PGE must have a corresponding ESDT science metadata ODL file defined. It describes everything that PDPS needs to know about the subject input or output file, from its name and version, to its period (how often data is collected), to where it is used and archived. Note that many PGEs can use the same input or output type, and thus can share the same ESDT science metadata ODL file.

Unlike the PGE science metadata ODL file, there is no tool for automatically generating a template ESDT science metadata ODL file. A template version exists under the data directory called `ESDT_ODL.template`. The template must be copied to a file that follows the naming convention *ESDTShortName#ESDTVVersionID.odl*.

11.12.8.6 Production Rule-Specific Science Metadata ODL Files

The production rule-specific science metadata ODL files provide specific information to PDPS about production rules used by a PGE. They are needed only when the PGE is subject to one of the following conditions:

- Is executed on the basis of a satellite orbit.
- Needs to know the orbital path of a satellite.
- Requires data based on geographic tiling of the Earth.

Since not every PGE is based on orbits or tiles, not all PGEs require these files. The comments in the PGE_ODL.template describe when setting a specific parameter means that a production rule-specific science metadata ODL file needs to be created.

The production rule-specific science metadata ODL files are broken into three types, which are defined as follows:

- Orbit ODL File.
 - Defines the orbital period of the satellite from which the PGE's input data is created.
 - Defines when a given orbit starts, how long it lasts, and the number of the orbit.
 - PDPS uses the information in the orbit ODL file to extrapolate future orbits and is able to plan PGEs that are required to run every so many orbits of the satellite.
- Pathmap ODL File.
 - Defines the mapping between the cyclic 0-233 orbits that the satellite makes with the actual path number that the PGE requires.
 - PDPS computes the path number from the orbit number (specified in the orbit ODL file) by incrementing it until it reaches the 233 maximum, then resetting it to zero.
 - Many instruments expect the path number to be a fixed swath on the Earth, so it is not just incremented for each satellite pass.
 - The pathmap ODL file creates a mapping from the sequential path numbers to the path numbers expected by the PGEs.
- Tile ODL File.
 - Defines the coordinates of the tiles used by some instruments to specify geographic locations on the Earth.
 - The tile definitions are used by PDPS to schedule the PGE (one execution per tile) and to acquire the necessary data (using the geographic coordinates to acquire data for the tile being processed only).

Unlike the PGE science metadata ODL file, there is no tool to automatically generate a template production rule-specific science metadata ODL file. Because the files themselves tend to be small, this is not usually a problem. A template version of each kind of production rule-specific science metadata ODL file (e.g., ORBIT_ODL.template, TILE_ODL.template) exists in the /usr/ecs/<MODE>/CUSTOM/data directory on the AIT Workstation. The templates must be copied, named properly, and edited in order to create the appropriate production rule-specific science metadata ODL file.

11.12.8.7 Release 5 Production Rules

The following statements provide some simplified descriptions of production rules that are scheduled to be made available in Release 5:

- **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 Input** - PGE is run with different inputs based on the availability of various alternate input data sets.
- **Optional Input** - PGE is run with specified optional inputs if available; otherwise, PGE is run without them.
- **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).
- **Intermittent Activation** - Every n^{th} DPR is activated; all other DPRs are skipped.
- **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.
- **Data Day** - Input data selection is based on Data Day.
- **Spatial Query** - Input granule selection is based on the spatial coverage of another input (i.e., the key input).
- **Tiling** - Input data is chosen on the basis of Instrument Team-defined tiles (geographic areas).
- **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.

11.12.8.8 Basic Temporal Production Rule

The Basic Temporal Production Rule defines the timeframe for the PGE along with its input and output data. PGEs subject to the Basic Temporal Production Rule generally have the following characteristics in common:

- 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.

The 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.

- 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 timeframe for which the PGE is run.
- 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 timeframe for which the PGE is run.

The fundamental elements used to define the Basic Temporal Production Rule are “period:

- **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.
- **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.

Both the PGE itself and the input data have a boundary and period associated with them. That is how PDPS determines 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.

Boundary offset is an addition to the Basic Temporal Production Rule that allows a PGE or data to start on an offset from a given boundary. For example, if a PGE would normally run every day but not start until two or three hours into the day (e.g., beginning at 3:00 a.m. instead of midnight), a boundary offset can be used to add three hours to the “start of day” boundary. This would mean the PGE would run on data that occurred three hours after the boundary.

Data with offset times refers to data where the start time is a few minutes off of the start time that PDPS expects. For example: if data is defined to PDPS as follows:

```
BOUNDARY = "START_OF_HOUR"  
PERIOD   = "HOURS=1"
```

but the data actually starts at 1:05 and ends at 2:05, the data is said to have **offset times**. There is a flag in the production rule syntax that tells PDPS to shift granule time specifications to match the granules in the archive.

The **end-of-month anomaly** is an addition to the Basic Temporal Production Rule that allows a PGE or data to cover a specific number of days within a month. The month is broken into thirds. The first third is composed of the first 10 days of the month. The second third consists of days 11 through 20. And the last third varies in length depending on the total number of days in the month (i.e., for November it would have 10 days; for December it would have 11 days). A specific **boundary** and **period** allow a PGE or its data to be scheduled into thirds of a month.

Figure 5 provides an illustration of the Basic Temporal Production Rule. The PGE has a boundary of “start of day” and a period of one hour, so it 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, one for 12:00-1:00, one for 1:00-2:00, one for 2:00-3:00, and one for 3:00-4:00.

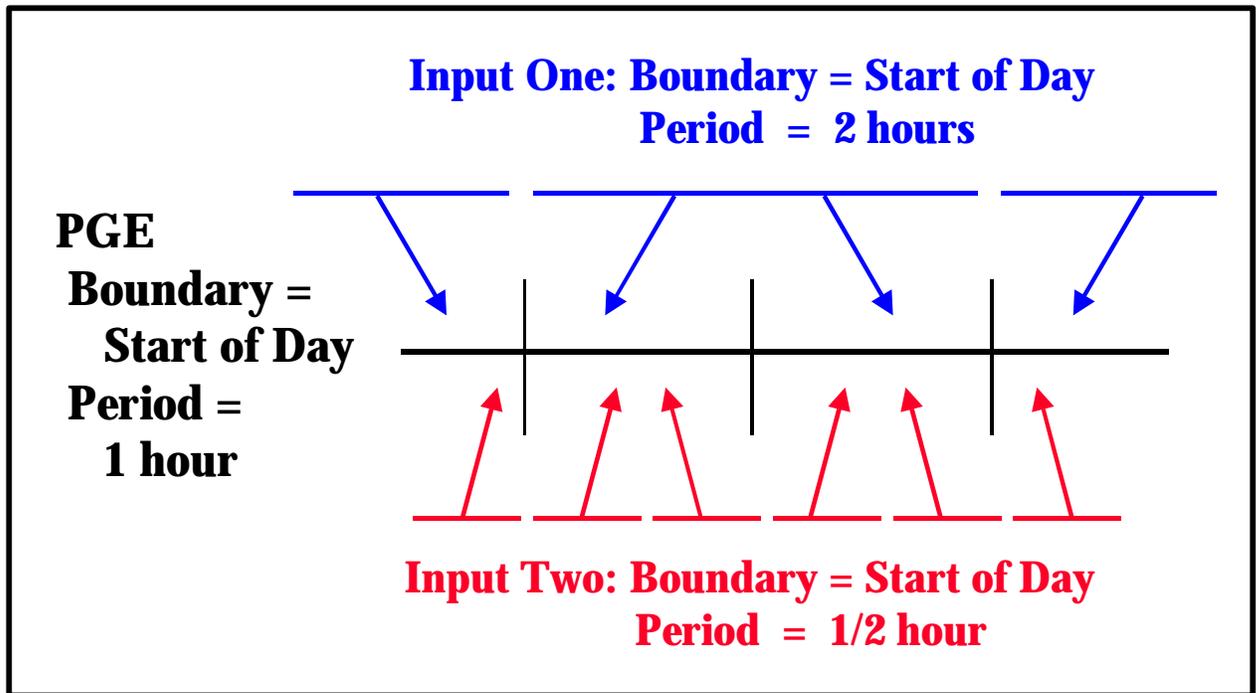


Figure 11.12.8.8-1. Example of the Basic Temporal Production Rule

In the example (Figure 11.12.8.8-1), Input One has a boundary of “start of day” and a period of two hours, so when PDPS plans for its availability, it expects a granule every two hours beginning at midnight. Consequently, each granule of Input One is associated with two DPRs for the PGE, because the PGE encompasses only one hour of the two-hour granule's period.

Input Two has a boundary of “start of day” and a period of ½ hour, so when PDPS plans for its availability, it expects a granule every ½ hour beginning at midnight. As a result two granules of Input Two are associated with each DPR for the PGE, because the PGE encompasses an hour of the ½-hour granule's Period. Thus, every DPR of the PGE will wait for two granules of Input Two to arrive before it can be processed.

11.12.8.9 PGE Science Metadata ODL File Parameters

The following parameters must be set properly in the applicable PGE science metadata ODL file in order to implement the Basic Temporal Production Rule:

- SCHEDULE_TYPE.
- PROCESSING_PERIOD.
- PROCESSING_BOUNDARY.

The SCHEDULE_TYPE parameter specifies the type of scheduling that will be done for the PGE. The following values are applicable to the Basic Temporal Production Rule:

- "Time"

- The PGE is scheduled on the basis of the specified boundary/period and the availability of data for that boundary/period.
- "Snapshot"
 - The PGE is scheduled for a single date/time.
 - Note that PROCESSING_PERIOD and PROCESSING_BOUNDARY are **not** needed when "Snapshot" is specified.

Other values for SCHEDULE_TYPE apply to other production rules, such as the following values:

- "Data"
 - The PGE is scheduled on the basis of the availability of data produced by other PGEs.
- "Tile"
 - The PGE is scheduled based on the definition of geographic tiles.
- "Orbit"
 - PGE scheduling is based on the orbit of the spacecraft.

The PROCESSING_PERIOD parameter describes the length of time for which the PGE executes. Data will be acquired (barring any combination of Production Rules) for the specified period and output data will be planned for the given period. It is of the format "<Period Type>=<Length of Period>". Note that "length of period" can be specified as a positive integer only. The following values are acceptable "period type" entries for the Basic Temporal Production Rule:

- "YEARS"
 - PGE processes data applicable to a given year or years.
 - "YEARS" might be specified for a PGE that computes a yearly average.
 - For example, PROCESSING_PERIOD = "YEARS=1" relates to a PGE that processes one year's worth of data.
- "MONTHS"
 - PGE processes data applicable to a particular month or several months.
 - "MONTHS" is most likely to be used for some kind of averaging PGE.
 - For example, PROCESSING_PERIOD = "MONTHS=2" relates to a PGE that processes two months' worth of data at a time.
- "THIRDS"
 - PGE processes data applicable to some number of thirds of the month.
 - For example, PROCESSING_PERIOD = "THIRDS=1" relates to a PGE that processes data applicable to 1/3 of the month.
- "WEEKS"
 - PGE processes data applicable to some number of weeks.

- For example, PROCESSING_PERIOD = "WEEKS=2" relates to a PGE that processes two weeks' worth of data every time it runs.
- "DAYS"
 - PGE processes data applicable to some number of days.
 - For example, PROCESSING_PERIOD = "DAYS=5" relates to a PGE that processes five days' worth of data.
- "HOURS"
 - PGE processes data applicable to some number of hours.
 - For example, PROCESSING_PERIOD = "HOURS=4" relates to a PGE that processes four hours' worth of data when it is executed.
- "MINS"
 - PGE processes data applicable to some number of minutes.
 - For example, PROCESSING_PERIOD = "MINS=5" relates to a PGE that processes five minutes' worth of data.
- "SECS"
 - PGE processes data applicable to some number of seconds.
 - For example, PROCESSING_PERIOD = "SECS=2" relates to a PGE that runs on two seconds' worth of data.

There are other types of values for PROCESSING_PERIOD but they apply to other production rules (as described in the applicable sections of the lesson).

The PROCESSING_BOUNDARY parameter specifies the boundary (starting point in time) of the PGE. It tells when each instance of the PGE should start. Note that the PROCESSING_BOUNDARY and PROCESSING_PERIOD are used in conjunction to schedule the PGE.

The following PROCESSING_BOUNDARY values are used for implementing the Basic Temporal Production Rule:

- "START_OF_HOUR" – PGE processes data for each hourly interval.
- "START_OF_6HOUR" - PGE processes data for every 6-hour interval.
- "START_OF_DAY" - PGE processes data for every daily interval.
- "START_OF_WEEK" - PGE processes data for every weekly interval.
- "START_OF_ONE_THIRD_MONTH" - PGE processes data for every 1/3 of a month.
- "START_OF_MONTH" - PGE processes data for every monthly interval.
- "START_OF_YEAR" - PGE processes data for every yearly interval.
- "START_DATE=DD/MM/YYYY" - PGE processes data for the specified date only.

There are other values for PROCESSING_BOUNDARY that apply to other production rules (as described in the applicable sections of the lesson).

11.12.8.10 Handling Data with Offset Times

When the `ALIGN_DPR_TIME_WITH_INPUT_TIME` flag is set to "Y" (i.e., `ALIGN_DPR_TIME_WITH_INPUT_TIME = "Y"`) PDPS shifts the expected times for input data to the actual times found in the archive. If the flag is NOT set, data with offset times can cause problems when generating Production Requests.

11.12.8.11 ESDT Science Metadata ODL File Parameters

The following parameters must be set properly in the applicable ESDT science metadata ODL file in order to implement the Basic Temporal Production Rule:

- `DYNAMIC_FLAG`.
- `PERIOD`.
- `BOUNDARY`.

The `DYNAMIC_FLAG` describes the type of data that is defined in the ESDT science metadata ODL file. It specifies to PDPS what kind of data the PGE requires as input or produces as output. It can have any of the following four possible values, all of which are valid for Basic Temporal data:

- "S"
 - Static Data.
 - Data do not change at regular intervals.
 - The same granule can be used as input for many runs of the PGE.
 - Calibration files are a good example of static data.
- "I"
 - Dynamic Internal.
 - Data are produced by a PGE running at the local DAAC.
 - All output products are either “dynamic internal” or “interim” kinds of data.
- "E"
 - Dynamic External.
 - Data are produced by an external source (not a PGE running at the local DAAC).
 - EDOS data is a primary example.
 - Dynamic external can be set for PGE inputs only.
- "T"
 - Interim/Intermediate.
 - Data are stored only temporarily by the Data Server Subsystem.

The `PERIOD` parameter specifies the length of time covered by the data. Data are expected to be either ingested or produced for the length of the `PROCESSING_PERIOD` described in PGE science metadata ODL files. However, the `PERIOD` of the data does

not have to match the PROCESSING_PERIOD defined for the PGE. PDPS plans for data where the ESDT period is less or more than the processing period of the PGE that uses it. For example, if the PGE PROCESSING_PERIOD = "HOURS=1" and the input data PERIOD = "MINS=5", then PDPS plans to acquire twelve granules of the input data to cover the PROCESSING_PERIOD.

The following "period type" values are used for implementing the Basic Temporal Production Rule:

- "YEARS"
 - Data span a year or years.
 - "YEARS" might be selected for a yearly average output product.
 - For example, PERIOD = "YEARS=1" specifies data that cover a period of a year.
- "MONTHS"
 - Data span a month or several months.
 - "MONTHS" is most likely used for some kind of averaging output product.
 - For example, PERIOD = "MONTHS=2" specifies data that cover a period of two months.
- "THIRDS"
 - Data span some number of thirds of a month.
 - For example, PERIOD = "THIRDS=1" specifies data that cover a period of 1/3 month.
- "WEEKS"
 - Data span some number of weeks.
 - For example, PERIOD = "WEEKS=2" specifies data that cover a period of two weeks.
- "DAYS"
 - Data span some number of days.
 - For example, PERIOD = "DAYS=5" specifies data that cover a period of five days.
- "HOURS"
 - Data span some number of hours.
 - For example, PERIOD = "HOURS=4" specifies data that cover a period of four hours.
- "MINS"
 - Data span some number of minutes.

- For example, PERIOD = "MINS=5" specifies data that cover a period of five minutes.
- "SECS"
 - Data span some number of seconds.
 - For example, PERIOD = "SECS=2" specifies data that cover a period of two seconds.
- "ORBITS"
 - Data span some number of orbits of the spacecraft.
 - For example, PERIOD = "ORBITS=1" specifies data that cover one orbit.
 - A PGE can be time-scheduled (using the Basic Temporal Production Rule) but use orbit-based data.

The BOUNDARY parameter is the starting point in time of the data granule. It tells when each data granule should start. Note that the BOUNDARY and PERIOD are used in conjunction to determine the starting and ending time for the granules.

The following values for BOUNDARY apply to the Basic Temporal Production Rule:

- "START_OF_HOUR"
 - Data granules start every hour.
- "START_OF_6HOUR"
 - Data granules start every six hours.
- "START_OF_DAY"
 - Data granules start every day.
- "START_OF_WEEK"
 - Data granules start every week.
- "START_OF_ONE_THIRD_MONTH"
 - Data granules start every 1/3 of a month.
- "START_OF_MONTH"
 - Data granules start every month.
- "START_OF_YEAR"
 - Data granules start every year.
- "START_OF_ORBIT"
 - Data granules start every orbit.

11.12.8.12 Advanced Temporal Production Rule

The 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. It provides an offset mechanism, specifying 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.
- 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).

The Advanced Temporal Production Rule 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. The offsets are specified as either negative or positive numbers to indicate whether the time period of the input data is before or after that of the DPR (a particular run of a PGE).

- **Begin Period Offset** is an amount of time (in seconds) that is specified with respect to the DPR start time. A negative beginning offset requests data that was collected before the DPR start time. A positive beginning offset requests data with a collection time after the start time of the DPR.
- **End Period Offset** is an amount of time (in seconds) that is specified with respect to the DPR end time. A negative ending offset requests data that ended collection before the DPR end time was reached. A positive ending offset requests data that ended collection after the end time of the DPR boundaries.

Note that the beginning and ending offsets are not absolute cut-offs for data. Overlapping granules (granules that start or end outside of the offsets) will be staged as inputs to the DPR.

Figure 11.12.8.12-1 provides an illustration of the Advanced Temporal Production Rule. The PGE shown in the example processes data for every one-hour interval. However, Input One comes in at two-hour intervals and Input Two is produced every 1/2 hour. Both the Begin Period Offset and End Period Offset for Input One are -7200 seconds (minus two hours). Consequently, every DPR will stage the "previous" Input One. This could be used to get the "previous" or "next" granule of an input.

The Begin Period Offset for Input Two is zero, meaning that it will match the Start Time of the DPR. The End Period Offset is +1800 seconds (plus 1/2 hour). Therefore, all

Input Two granules will be staged that fall within the time period of the DPR plus 1/2 hour. The effect is to acquire all Input Two granules within the time period of the DPR, 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.

The same types of parameter settings that apply to the Basic Temporal Production Rule apply to the Advanced Temporal Production Rule. In addition, there are some parameters in the PGE science metadata ODL file that apply specifically to the Advanced Temporal Production Rule. However, the values applicable to the Basic Temporal Production Rule must be set before the Advanced Temporal Production Rule syntax is added.

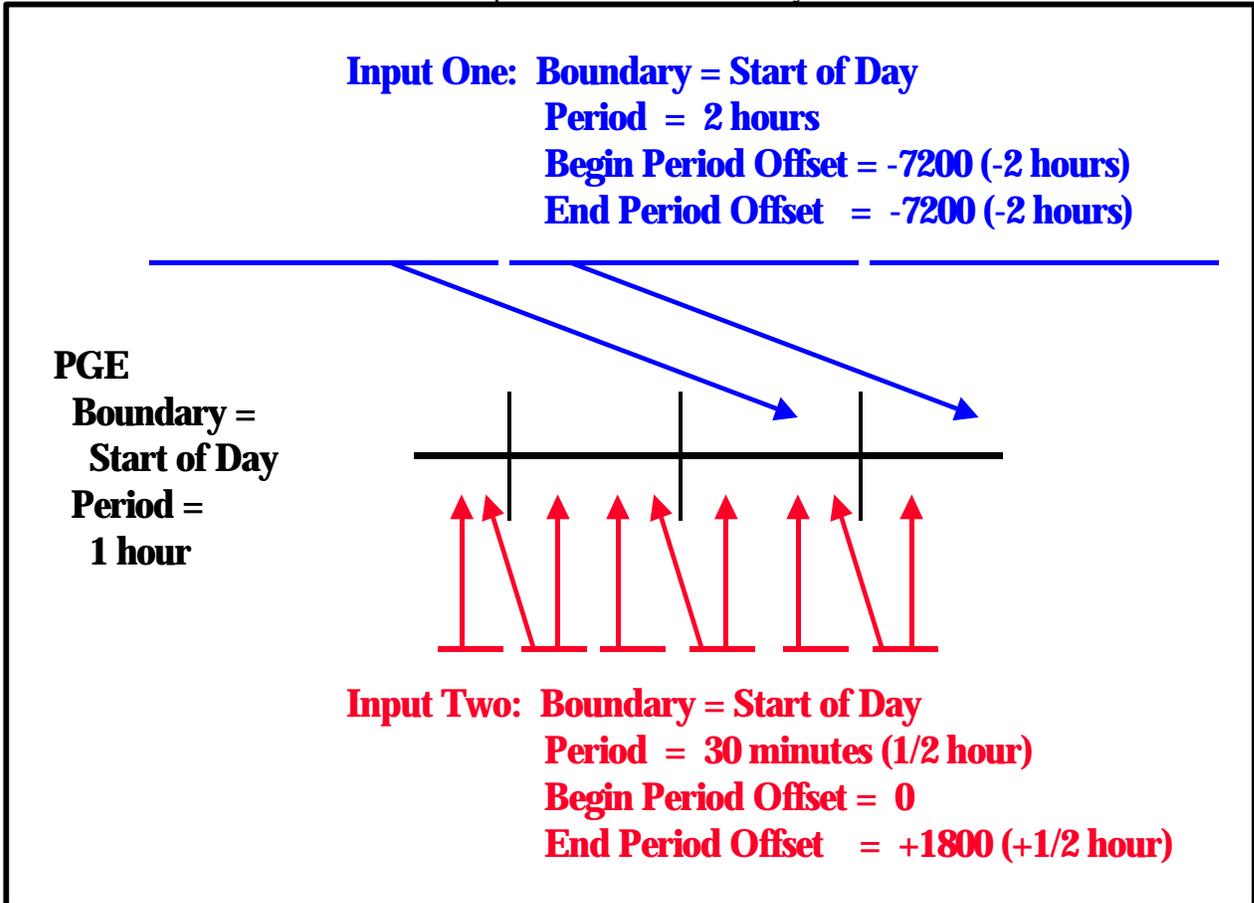


Figure 11.12.8.12-1. Example of the Advanced Temporal Production Rule

11.12.8.13 PGE Science Metadata ODL File Parameters

During the SSI&T process the PGE science metadata ODL file is generated from the PCF delivered with the science algorithm. A PCF_ENTRY object is generated for each file entry in the PCF. In order to implement the Advanced Temporal Production Rule the PCF_ENTRY object for each type of input file to which the rule applies uses the following syntax:

```

OBJECT = PCF_ENTRY
.
.
.
BEGIN_PERIOD_OFFSET =
END_PERIOD_OFFSET =
.
.
.
END_OBJECT = PCF_ENTRY

```

Accordingly, the following parameters must be set properly in order to implement the Advanced Temporal Production Rule:

- BEGIN_PERIOD_OFFSET.
- END_PERIOD_OFFSET.

BEGIN_PERIOD_OFFSET is the offset added to or subtracted from the Data Start Time of the DPR. The value assigned to BEGIN_PERIOD_OFFSET can be either a positive or negative value, specified in seconds. If the value is positive, it is added to the Data Collection Start Time (looking for the input forward in time). If the value is negative, it is subtracted from the Data Collection Start Time (looking backward in time). For example, BEGIN_PERIOD_OFFSET = -3600 requests data that was collected one hour (3600 seconds) before the DPR start time.

END_PERIOD_OFFSET is the offset added to or subtracted from the Data Collection End Time of the DPR. The value assigned to END_PERIOD_OFFSET can be either a positive or negative value, specified in seconds. If the value is positive, it is added to the Data Collection End Time (looking for the input forward in time). If the value is negative, it is subtracted from the Data Collection End Time (looking backward in time). For example, END_PERIOD_OFFSET = +2700 requests data that was collected 45 minutes (2700 seconds) after the DPR end time.

The BEGIN_PERIOD_OFFSET and END_PERIOD_OFFSET parameters can be specified for any input PCF_ENTRY in the PGE science metadata ODL file. If not specified, the parameters are set to zero (0) and the Advanced Temporal Production Rule does not apply to the PGE.

11.12.8.14 Alternate Input and Optional Input Production Rules

The Alternate Input and Optional Input Production Rules are very similar and use much the same processing in PDPS. Both rules allow a PGE to select various inputs based on timers and priority lists. The major difference is that Alternate Inputs requires that one of alternates on the list be used, whereas Optional Inputs allows successful execution of the PGE if no optional input on the list is available.

The Alternate Input Production Rule allows for a PGE to evaluate a list of inputs in priority order and be scheduled and executed with the best priority input that could be found. In essence, a PGE using Alternate Inputs is saying "I would like to run with Input A, but if it's not available, I am willing to run with Input B." A timer can be used to

specify how long to wait for a given alternate choice before proceeding with a choice of lesser priority. The PGE is not executed until one of the alternate choices has been found.

- Example:
 - A 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 (as a last resort) climatology.
 - The PGE would use the Alternate Input Production Rule to list each input in priority order, giving a timer value for how long to wait before trying the next input.
 - If the DAO data are most desirable, DAO would be listed as first choice or "primary" data.
 - NCEP would be the second choice.
 - Climatology would be the last choice.
 - If a timer value is specified for DAO data, the PGE will wait for that timer to expire before running with either NCEP data or climatology.
 - If a timer had been placed on the NCEP input, the PGE would wait before running with the climatology data.

The Optional Input Production Rule allows for a PGE to list inputs that are desired but not required for it to execute. The inputs are ranked as previously stated and timers are set to wait before choosing a lower-priority type of input. However, if none of the inputs on the list becomes available, the PGE starts because the alternatives are classified as "optional." In essence the PGE is saying "I would like to run with Input A, but if its not available, I can run (and produce reasonable output) without it."

- 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.

Figure 11.12.8.14-1 provides an illustration of the Alternate Input Production Rule. The PGE in the illustration has two inputs that are "required" so they must be available for the PGE to be run. It also has one input that is "alternate." The alternate input can be one of three choices, the first choice is the **primary**, then there are second and third choices. After the pair of required inputs has become available, the alternate inputs are evaluated as follows:

- If the primary alternate is available, it is used as input and the PGE is scheduled for execution.

- There is a 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 and the PGE is scheduled for execution.

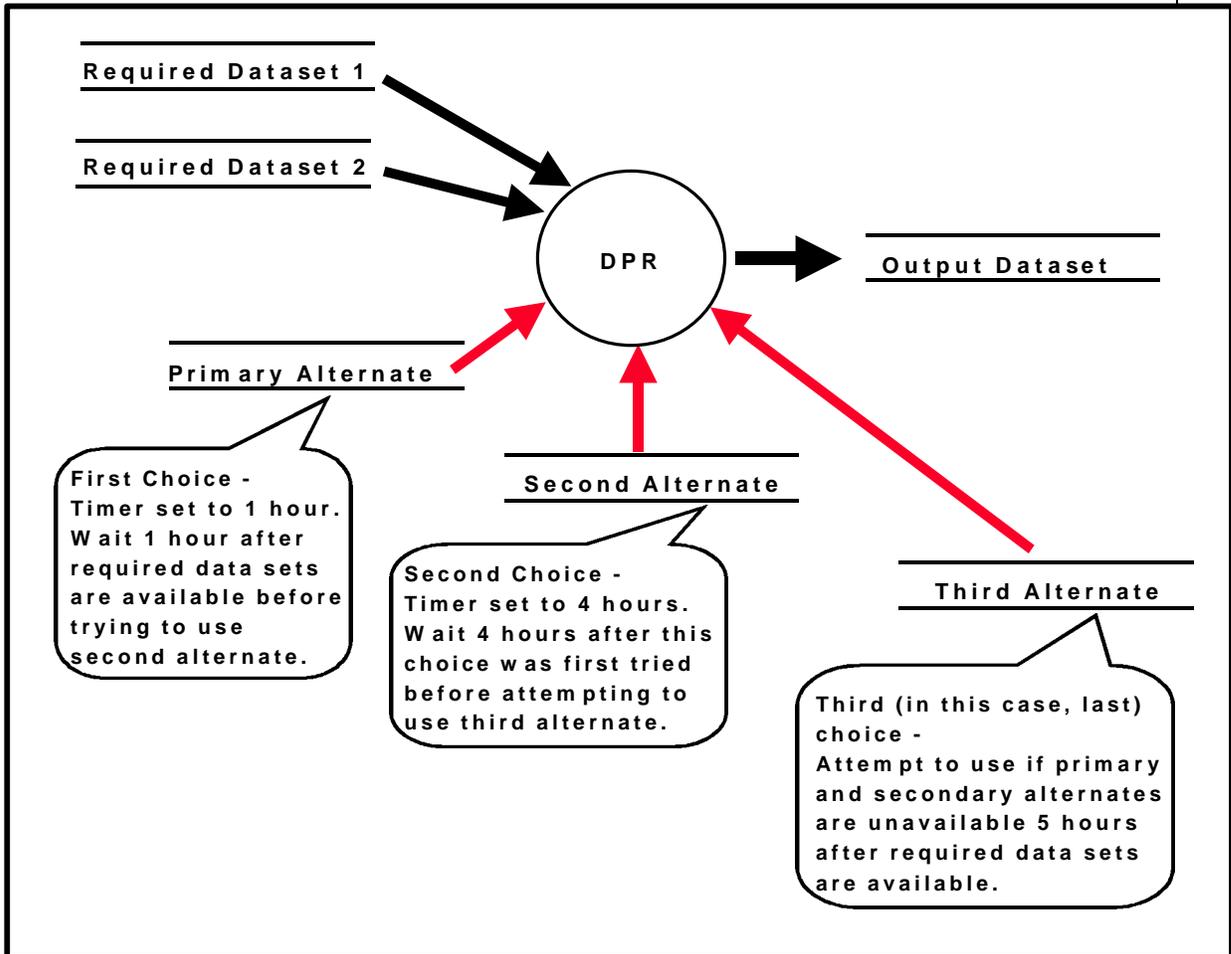


Figure 11.12.8.14-1. Example of the Alternate Input Production Rule

- 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 and the PGE is scheduled for execution.
- 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 will not start processing until one of the alternates becomes available. 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.

The Alternate Input and Optional Input Production Rules are additions to settings/syntax put into the ODL files for other production rules. Inputs deemed “optional” or “alternate” can be searched for and acquired by other production rules (e.g., Basic Temporal or Metadata Checks/Query). The syntax for the rules used to search for the inputs have to be filled out in addition to the syntax required to make the input an alternate or optional input.

11.12.8.15 PGE Science Metadata ODL File Parameters

The following parameter must be set properly in the applicable PGE science metadata ODL file in order to implement the Alternate Input or Optional Input Production Rule:

- INPUT_TYPE.

In addition, one of the following two ODL objects is used within a PCF_ENTRY to define either the Alternate Input Production Rule or the Optional Input Production Rule:

- ALTERNATE_INPUT object.
- OPTIONAL_INPUT object.

INPUT_TYPE is a type of data defined by a PCF_ENTRY object (i.e., between OBJECT = PCF_ENTRY and END_OBJECT = PCF_ENTRY). It can have one of four possible values, only three of which are used to define an alternate or optional inputs:

- "Required"
 - A required input.
 - The data must be available or the PGE does not execute.
 - It is the "normal" value for the parameter (i.e., INPUT_TYPE = “Required”); consequently, the input is neither an alternate input nor an optional input.
- "Primary"
 - The primary alternate input.
 - The data is the first choice in a list of alternates.
- "Alternate"
 - An alternate input (except the primary alternate) in a list of alternates.
 - The data is not the first choice in a list of alternates; it is a subsequent choice if the primary (or a higher-priority alternate) is not available.
- "Optional"
 - An optional input.
 - Availability of the data will be checked and if a timer has been specified, execution of the PGE will wait.

- The PGE can be executed without the data if it is not available.

Although the Alternate Input and Optional Input Production Rules are similar, there are two different ODL objects used to define them within a PCF_ENTRY; i.e., the ALTERNATE_INPUT object and the OPTIONAL_INPUT object.

The ALTERNATE_INPUT object has the following syntax:

```

OBJECT = PCF_ENTRY
.
.
.
.
OBJECT = ALTERNATE_INPUT
.
.
.
END_OBJECT = ALTERNATE_INPUT
END_OBJECT = PCF_ENTRY

```

The ALTERNATE_INPUT ODL object surrounds an Alternate Input definition. An OBJECT/END_OBJECT pair separates the parameters defining the Alternate Input from the rest of the parameters defining the PCF_ENTRY. The following parameters define an ALTERNATE_INPUT object:

- CLASS.
- CATEGORY.
- ORDER.
- RUNTIME_PARM_ID.
- TIMER.
- WAITFOR.
- TEMPORAL [not implemented].

CLASS is a simple counter used to differentiate the different ALTERNATE_INPUT objects within the file. Since each ALTERNATE_INPUT object resides within a different PCF_ENTRY object, the CLASS for an ALTERNATE_INPUT object can always be 1. CATEGORY is the name of the list of alternates to which the ALTERNATE_INPUT belongs. The PDPS uses CATEGORY to associate different alternates within a list. CATEGORY can be set to any string value of 20 characters or less (e.g., CATEGORY = "Snow Ice"). Alternates that are part of the same list should have matching CATEGORY values.

ORDER is the numerical place that the particular alternate holds in the list of alternates. The first choice or Primary Alternate (with the INPUT_TYPE = "Primary") should have ORDER = 1.

RUNTIME_PARM_ID specifies the Logical ID (in the PCF) for which the PGE will find the Logical ID of the alternate chosen. Since all alternates must be contained within different PCF_ENTRY objects, they all must have different Logical IDs (but all alternates within the same CATEGORY should have the same value of RUNTIME_PARM_ID).

The RUNTIME_PARM_ID parameter specifies the Logical ID of a runtime parameter

that the PGE may read to find out which alternate was chosen for the particular execution of the PGE.

The TIMER parameter specifies how long to wait for the particular alternate before checking for the next alternate in the list. The parameter value is expressed in the format "<Period Type>=<Length of Period>". Note that "Length of Period" can be specified as a positive integer only. The Alternate Input Production Rule accepts the following "Period Type" values:

- "WEEKS"
 - PDPS should wait for some number of weeks before searching for the next alternate in the list.
 - For example, TIMER = "WEEKS=2" would make PDPS wait two weeks before checking for the next alternate input.
- "DAYS"
 - PDPS should wait for some number of days before searching for the next alternate in the list.
 - For example, TIMER = "DAYS=5" would make PDPS wait five days before checking for the next alternate input.
- "HOURS"
 - PDPS should wait for some number of hours before searching for the next alternate in the list.
 - For example, TIMER = "HOURS=4" would make PDPS wait four hours before checking for the next alternate input.
- "MINS"
 - PDPS should wait for some number of minutes before searching for the next alternate in the list.
 - For example, TIMER = "MINS=5" would make PDPS wait five minutes before checking for the next alternate input.
- "SECS"
 - PDPS should wait for some number of seconds before searching for the next alternate in the list.
 - For example, TIMER = "SECS=2" would make PDPS wait two seconds before checking for the next alternate input.

The WAITFOR parameter specifies whether or not the PGE can be run without the alternate input. Setting WAITFOR = "N" means that the PGE can run without the input if it cannot be found. In a list of alternate inputs, this would have meaning for the last choice only. If WAITFOR = "Y", the PGE is not executed (even after the last alternate timer expires) until one of the alternates in the list can be found.

The TEMPORAL parameter is an unimplemented feature that would allow for searching for alternates from the same time period but a different date. It is currently stored in the PDPS database but is not used.

The OPTIONAL_INPUT object has the following syntax:

```

OBJECT = PCF_ENTRY
.
.
.
.
OBJECT = OPTIONAL_INPUT
.
.
.
END_OBJECT = OPTIONAL_INPUT
END_OBJECT = PCF_ENTRY

```

The OPTIONAL_INPUT ODL object surrounds an Optional Input definition. An OBJECT/END_OBJECT pair separates the parameters defining the Optional Input from the rest of the parameters defining the PCF_ENTRY. The following parameters define an OPTIONAL_INPUT object:

- CLASS.
- CATEGORY.
- ORDER.
- RUNTIME_PARM_ID.
- TIMER.
- TEMPORAL [not implemented].

The parameters that apply to the Optional Input Production Rule are defined in the same way that the corresponding parameters are defined for the Alternate Input Production Rule. However, note that the Optional Input Production Rule has no WAITFOR parameter. It is irrelevant; in fact, the very essence of the Optional Input Production Rule depends on not “waiting for” the last option but going ahead with the execution of the PGE without the unavailable optional input(s).

Table 11.12.8.5-1. Extract of PGE Metadata ODL File Template Showing Alternate Inputs

>OBJECT = PCF_ENTRY	
> CLASS = 16	
> LOGICAL_ID = 1500	
> PCF_FILE_TYPE = 1	
> DATA_TYPE_NAME = "MOD10L2G"	[MODIS Level 2G Snow Cover]
> DATA_TYPE_VERSION = "1"	[ESDT versioning in release B.0]
> DATA_TYPE_REQUIREMENT = 1	
> SCIENCE_GROUP = ""	

Table 11.12.8.5-1. Extract of PGE Metadata ODL File Template Showing Alternate Inputs

```

> OBJECT = FILETYPE
>   CLASS = 1
>   FILETYPE_NAME = "Single File Granule"
> END_OBJECT = FILETYPE
> INPUT_TYPE = "Primary"
> NUMBER_NEEDED = 1
> OBJECT = ALTERNATE_INPUT
>   CLASS = 1
>   CATEGORY = "Snow Ice"           [User defined]
>   ORDER = 1                       [This data type is sought first]
>   RUNTIME_PARM_ID = 1509          [Run-time parameter holds LID of alternate]
>   TIMER = "HOURS=6"
>   WAITFOR = "N"                   [Force time-out on wait]
>   TEMPORAL = "N"                  [Use most currently produced]
> END_OBJECT = ALTERNATE_INPUT
>END_OBJECT = PCF_ENTRY
>
>OBJECT = PCF_ENTRY
>   CLASS = 17
>   LOGICAL_ID = 1501
>   PCF_FILE_TYPE = 1
>   DATA_TYPE_NAME = "MOD10A1"     [MODIS Level 3 Daily Gridded Snow Cover data set]
>   DATA_TYPE_VERSION = "1"
>   DATA_TYPE_REQUIREMENT = 1
>   SCIENCE_GROUP = ""
> OBJECT = FILETYPE
>   CLASS = 2
>   FILETYPE_NAME = "Single File Granule"
> END_OBJECT = FILETYPE
> INPUT_TYPE = "Alternate"
> OBJECT = ALTERNATE_INPUT
>   CLASS = 2
>   CATEGORY = "Snow Ice"           [User defined]
>   ORDER = 2                       [This data type is sought last]
>   RUNTIME_PARM_ID = 1509          [Run-time parameter holds LID of alternate]
>   TIMER = "HOURS=6"              [Wait 6 additional hours]
>   WAITFOR = "N"
>   TEMPORAL = "N"
> END_OBJECT = ALTERNATE_INPUT
>END_OBJECT = PCF_ENTRY

```

Table 11.12.8.5-1. Extract of PGE Metadata ODL File Template Showing Alternate Inputs

```

>
>OBJECT = PCF_ENTRY
> CLASS = 18
> LOGICAL_ID = 1502
> PCF_FILE_TYPE = 1
> DATA_TYPE_NAME = "MIANTASC"    [MISR Terrestrial Atmosphere and Surface
Climatology]
> DATA_TYPE_VERSION = "1"
> DATA_TYPE_REQUIREMENT = 1
> SCIENCE_GROUP = ""
> OBJECT = FILETYPE
>   CLASS = 3
>   FILETYPE_NAME = "Single File Granule"
> END_OBJECT = FILETYPE
> INPUT_TYPE = "Alternate"
> OBJECT = ALTERNATE_INPUT
>   CLASS = 3
>   CATEGORY = "Snow Ice"          [User defined]
>   ORDER = 3                      [This data type is sought last]
>   RUNTIME_PARM_ID = 1509         [Run-time parameter holds LID of alternate]
>   TIMER = ""                    [Don't wait for this one]
>   WAITFOR = "Y"                 [Start anyway]
>   TEMPORAL = "N"
> END_OBJECT = ALTERNATE_INPUT
>END_OBJECT = PCF_ENTRY

```

Minimum/Maximum Number of Granules Production Rule

The 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.

For example, a 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.
- Therefore, ...
 - Minimum Number of Granules = 1.
 - Maximum Number of Granules = 2.

The Minimum/Maximum Number of Granules Production Rule is different from most production rules because it works for both input and output granules. It allows the PGE to request of a range of inputs (i.e., 1-10 granules), so that it runs with as few as one granule but with as many as ten granules. If a PGE needs at least three granules of a particular input, the minimum number of granules is defined as three and the 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. In such cases the PGE can produce none of the particular type of output and still be considered to have executed successfully. 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.

Figure 8 provides an illustration of the Minimum/Maximum Number of Granules Production Rule. In the example the PGE processes data related to a one-hour period and takes in both Input 1 and Input 2. Since 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, so there are four Input 2 granules for every PGE run.

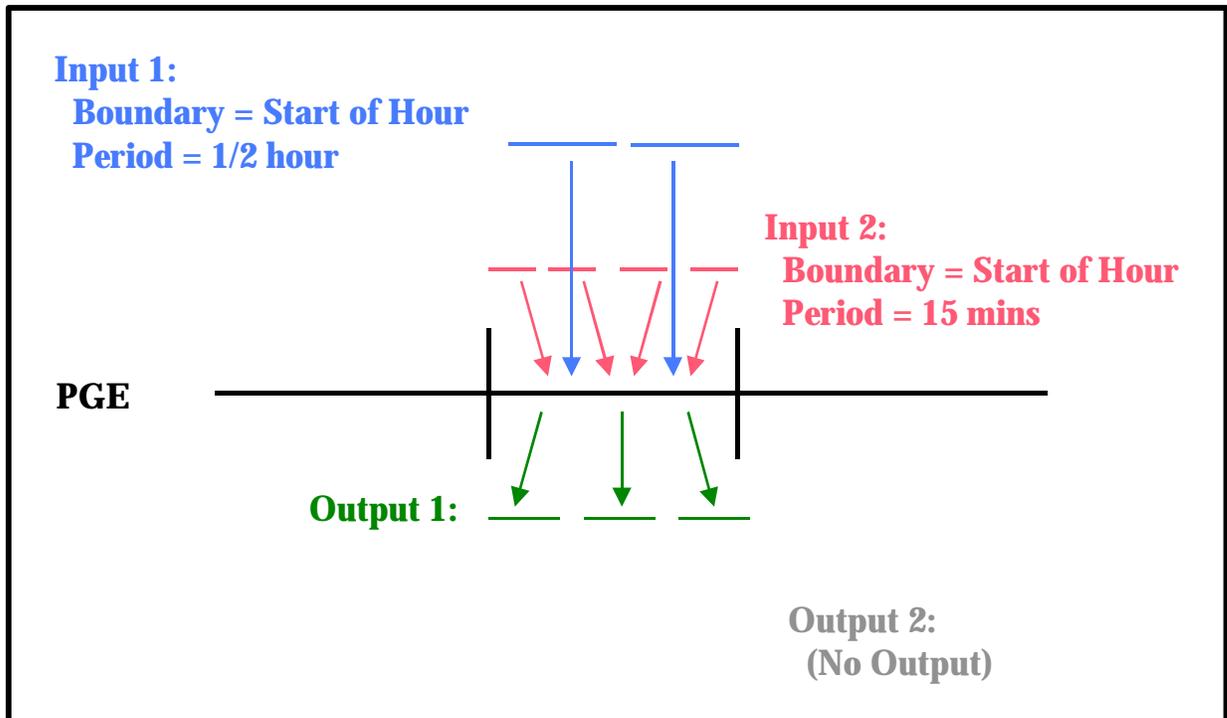


Figure 11.12.8.15-1. Example of the Minimum/Maximum Number of Granules Production Rule

The PGE produces three Output 1 granules for each run. In this case it does not produce any Output 2 granules.

Minimum and maximum values can affect each input and output as follows:

- Input 1:
 - If Minimum Granules is set to anything equal to or less than two for Input 1, the PGE is scheduled and executed.
 - If Minimum Granules is set to three, the PGE is not scheduled because 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 scheduled and executed.
 - If Maximum Granules is set to one, the PGE is not scheduled because there are too many Input 1 granules (the number exceeds the maximum that the PGE can process).

- Input 2:
 - If the Minimum Granules is set to anything equal to or less than four for Input 2, the PGE is scheduled and executed.
 - If Minimum Granules is set to five, the PGE is not scheduled because 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 scheduled and executed.
 - If Maximum Granules is set to three, the PGE is not scheduled because there are too many Input 2 granules (the number exceeds the maximum that the PGE can process).
- Output 1:
 - If Minimum Granules is set to anything equal to or less than three for Output 1, the PGE is scheduled and executes successfully.
 - If Minimum Granules is set to four, the PGE is marked as failed because it did not produce the expected number of output granules.
 - If Maximum Granules is set to anything equal to or greater than three for Output 1, the PGE is scheduled and executes successfully.
 - If Maximum Granules is set to two, the PGE is marked as failed because it produced too many output granules.
- Output 2:
 - If Minimum Granules is set to anything other than zero, the PGE is marked as failed because it 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, the PGE is scheduled and executes successfully.

The Minimum/Maximum Granules Production Rules are additions to settings/syntax put into the ODL files for other production rules. All Production Rules have a Minimum and Maximum Granule setting for both inputs and outputs, even though both values may be set to one (1).

11.12.8.16 PGE Science Metadata ODL File Parameters

The PGE science metadata ODL file syntax for implementing the Minimum/Maximum Production Rule for **input** data includes the following types of entries:

```

OBJECT = PCF_ENTRY
.
PCF_FILE_TYPE =
.
.
MIN_GRANULES_REQUIRED =

```

```
MAX_GRANULES_REQUIRED =
```

```
.  
. .  
. .
```

```
END_OBJECT = PCF_ENTRY
```

Accordingly, the following parameters must be set properly in order to implement the Minimum/Maximum Production Rule:

- PCF_FILE_TYPE.
- MIN_GRANULES_REQUIRED.
- MAX_GRANULES_REQUIRED.

The PCF_FILE_TYPE parameter is defined by integers in the range of 1 to 8 (inclusive). The integers are codes for the following types of files:

- 1 - product input files.
- 2 - product output files.
- 3 - support input files.
- 4 - support output files.
- 5 - user defined runtime parameters.
- 6 - interim/intermediate input files.
- 7 - interim/intermediate output files.
- 8 - temporary input/output.

For inputs (any PCF_ENTRY with a PCF_FILE_TYPE equal to 1, 3 or 6) the following pair of values must be set for each PCF_ENTRY:

- MIN_GRANULES_REQUIRED
 - Minimum number of granules required for the input.
 - A value of zero (MIN_GRANULES_REQUIRED = 0) would mean that the PGE could execute if no granules for that particular input could be found (in effect, the input is an **optional input**).
 - A value of three (for example) would mean that the PGE must have at least three granules of the input before the PGE can be executed.
- MAX_GRANULES_REQUIRED
 - Maximum number of granules for the input that the PGE is able to successfully process.
 - A value of four (for example) would mean that the PGE would process at most four granules for the input.
 - If MAX_GRANULES_REQUIRED = 4 and more than four granules are found for the given input, the PGE is not executed.

The PGE science metadata ODL file syntax for implementing the Minimum/Maximum Production Rule for **output** data includes the following types of entries:

```
OBJECT = PCF_ENTRY
```

```
.
```

```
PCF_FILE_TYPE =
```

```

.
.
MIN_GRANULE_YIELD =
MAX_GRANULE_YIELD =
.
.
.
END_OBJECT = PCF_ENTRY

```

For outputs (any PCF_ENTRY with a PCF_FILE_TYPE equal to 2, 4 or 7) the following pair of values must be set for each PCF_ENTRY.

- **MIN_GRANULE_YIELD**
 - Minimum number of granules that the PGE produces for the output.
 - A value of zero (MIN_GRANULE_YIELD = 0) means that the PGE produces no granules for the output (the output is an **optional output**).
 - A value of three (for example) means that the PGE produces at least three granules of the output during a successful execution.
- **MAX_GRANULE_YIELD**
 - Maximum number of granules that the PGE produces for this output.
 - A value of four (for example) means that at most the PGE produces four granules for the output.
 - Note that sizing of disk space is based on this number, so making it too small could cause problems on the science processor disks.

11.12.8.17 Optional DPRs Production Rule

The 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**. The 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.

The Optional DPRs Production Rule 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.
 - Routine data makes it possible for the Basic Temporal Production Rule to schedule PGEs based on their input data.
- **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).

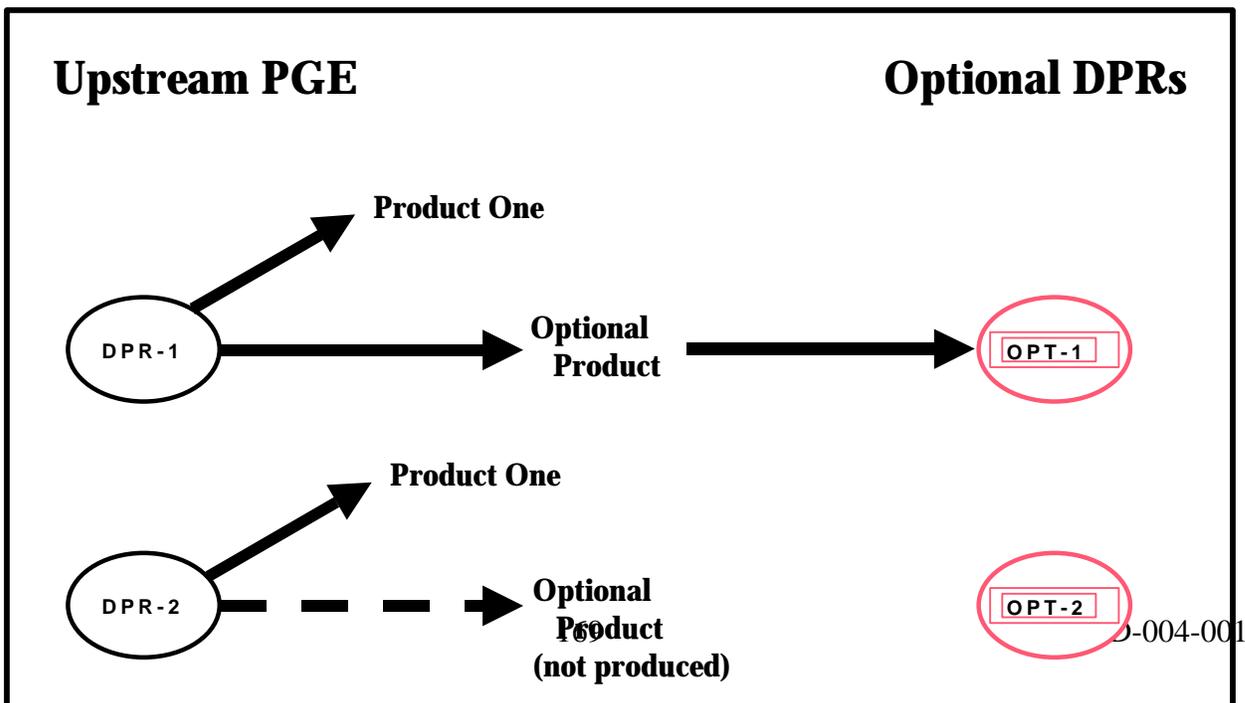
An Optional DPR has as its **key input** a non-routine data type. There are two sets of circumstances that lead to the scheduling of Optional DPRs:

- 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).

An example of the first condition starts with a MODIS PGE that 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. The second MODIS PGE is scheduled to run after every instance of the first MODIS PGE; however, 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.

The second condition is illustrated by ASTER routine processing, which makes use of the Optional DPRs Production Rule to schedule and execute ASTER PGEs for new data that have been archived. (Note that the DAAC ingests and archives ASTER production data from tapes supplied by the ASTER Ground Data System on a frequent but not entirely predictable basis.) When the Production Planner creates a Production Request for an ASTER PGE, it is necessary to specify the **insertion time** range (i.e., the time period when the desired data were archived) as opposed to the **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 time period specified in the Production Request.

An illustration of the Optional DPRs production rule is presented in Figure 11.12.8.17-1. In the figure there are two DPRs (i.e., DPR-1 and DPR-2) for the upstream PGE and two DPRs (i.e., OPT-1 and OPT-2) for the PGE subject to the Optional DPRs Production Rule. The "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. However, OPT-2 is not executed because DPR-2 (on which OPT-2 depends) does not produce the optional output.

Figure 11.12.8.17-1 . Example of the Optional DPRs Production Rule

The Optional DPRs Production Rule is set up during the SSI&T process. It uses many of the same parameter settings as the Basic Temporal Production Rule so the values specified in the Basic Temporal Production Rule (or other production rules) are set first, then the Optional DPRs Production Rule syntax is added.

11.12.8.18 PGE Science Metadata ODL File Parameters

The following two types of PGE science metadata ODL file entries must be made in order to set up the Optional DPRs Production Rule:

- SCHEDULE_TYPE.
- KEY_INPUT.

The SCHEDULE_TYPE parameter is set as follows:

- SCHEDULE_TYPE = “Data”
 - This demonstrates the appropriateness of the term “Data-Scheduled
 - Other schedule types include Time, Tile, Orbit, and Snapshot.

The key input is designated by including the following parameter in the PCF_ENTRY for whichever input is to be the key input:

- KEY_INPUT = “Y”
 - Assigning a value of “Y” to the KEY_INPUT parameter identifies the data as a key input and it is subsequently treated as such.
 - Either assigning a value of “N” to the KEY_INPUT parameter or leaving out the parameter entirely identifies the non-key input data.
 - Only one key input is allowed per PGE profile.

The Production Planner’s role in the implementation of the Optional DPRs Production Rule was described in the MODIS and ASTER examples previously described and varies with the kind of key input:

- Optional output of an upstream PGE (MODIS example).
 - Production Planner creates Production Requests for the PGE subject to the Optional DPRs Production Rule and specifies the same date/time range as for the upstream PGE.
 - Some of the DPRs generated as a result of the Production Request will never run due to lack of input data.
- Ingested on an irregular time schedule (ASTER example).
 - Production Planner specifies the data **insertion time** range when creating Production Requests.

- All DPRs generated as a result of the Production Requests should be capable of running.

11.12.8.19 Intermittent Activation Production Rule

The conditions for executing most PGEs are well defined. The most common activation condition is the availability of all input data sets. Similarly, the frequency of execution is usually well defined (e.g., run once for every granule or run monthly averages once a month). However, some PGEs have additional or different constraints on when they are run.

A PGE can be set up to run on every n^{th} instance of input data. For example, a QA PGE that is run on a daily product may need to be run only every fifth day to provide a spot check. Note that this does **not** refer to the common case of running a weekly averaging PGE only once each week, which would be handled by the Basic Temporal Production Rule and the time ranges specified for the input and output ESDTs. Rather, this is a special case where a PGE **can** be run every day (or hour, week, etc.), but for some reason (such as a QA check) it is desired to run the PGE only every n^{th} day.

To implement the Intermittent Activation Production Rule the Production Planner supplies the following information (via the Production Request Editor) when creating a production request:

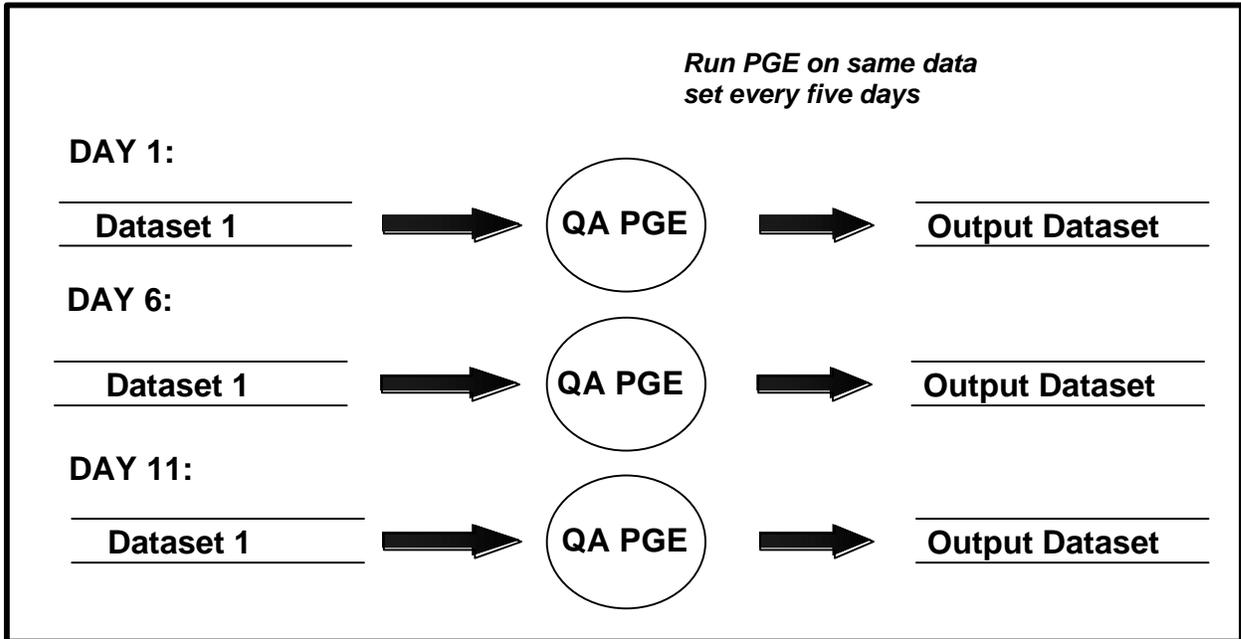
- **Number to Skip**
 - Number of DPRs to be skipped (not executed).
 - Entered in the **Skip** field on the Production Request Editor.
- **Number to Keep**
 - After skipping the specified number of DPRs, how many are to be kept?
 - Entered in the **Keep** field on the Production Request Editor.
 - The number to keep is usually one but could be any number.
- **Skip First**
 - Button on the Production Request Editor.
 - Selected to skip the first DPR.
 - Not selected if the first DPR is to be run.

The Planning Subsystem uses the preceding information to establish a pattern of execution. The pattern is effective for the single PR in which the “number to skip” and the “number to keep” are specified; it is not maintained between PRs.

The following example of the Intermittent Activation Production Rule is shown in Figure 10:

- The Production Planner prepares a production request for a 14-day period, generating 14 DPRs.
- The 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.
- Consequently, the following results are obtained:
 - First DPR runs.



- Four DPRs (second through fifth) are skipped.

Figure 11.12.8.19-1. Example of the Intermittent Activation Production Rule

- Sixth DPR runs.
- Four DPRs (seventh through tenth) are skipped.
- Eleventh DPR runs.
- Remaining three DPRs (twelfth through fourteenth) are skipped.

11.12.8.20 Metadata Checks and Metadata Query Production Rules

The Metadata Checks and Metadata Query Production Rules are similar in definition and use. Both production rules allow the PGE to specify granule-level metadata values that define whether the PGE can accept one (or more) of its inputs. The rules differ only in the results of metadata search performed.

- 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 value(s) allowed by the PGE.
- 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 metadata value(s) desired by the PGE.
 - Only the granules that match the time frame of the PGE plus the granule-level metadata value(s) specified by the PGE are staged for the PGE to use as input.
 - If no granules are found matching the conditions and the input is not optional, the PGE is not executed.
- 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.
- 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").

The 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. The Metadata Check or Query is added information that further refines what granules are sought by the PGE.

Multi-Granule ESDTs are a special case of the Metadata Query Production Rule. Multi-Granule ESDTs are used for PGE inputs or outputs when more than one granule of the same ESDT exists for the same temporal range (time period). The Multi-Granule ESDT mechanism employs a metadata parameter to differentiate between the "equal in time" granules. A metadata parameter is selected that is unique across granules for the same time period and that is used by PDPS to keep track of which granule is which when the granules are produced. Later, if only one of a pair of granules for a particular time period is needed as input to the PGE, the Metadata Query is used to ensure that PDPS schedules the correct granule as input.

The **Data Day Production Rule** is actually an addition to the Metadata Query Production Rule involving runtime parameter values. There is a pair of settings (Start Data Day and End Data Day) that allow a PGE to perform a Metadata Query for the start of the Data Day and the end of the Data Day. A separate section of this lesson is devoted to the Data Day Production Rule.

Using runtime parameter values is a capability of the Metadata Query and Metadata Checks Production Rules. Rather than use a hard-coded value for the check or query, a value computed from one of the other production rules can be used.

Figure 11 illustrates the Metadata Checks and Metadata Query Production Rules. If no Metadata Check or Query were applicable, the PGE shown in the figure would use three granules of input (i.e., Granules A through C). However, let us assume that the metadata value to be checked/queried is %CloudCover. Each granule has a different value for %CloudCover.

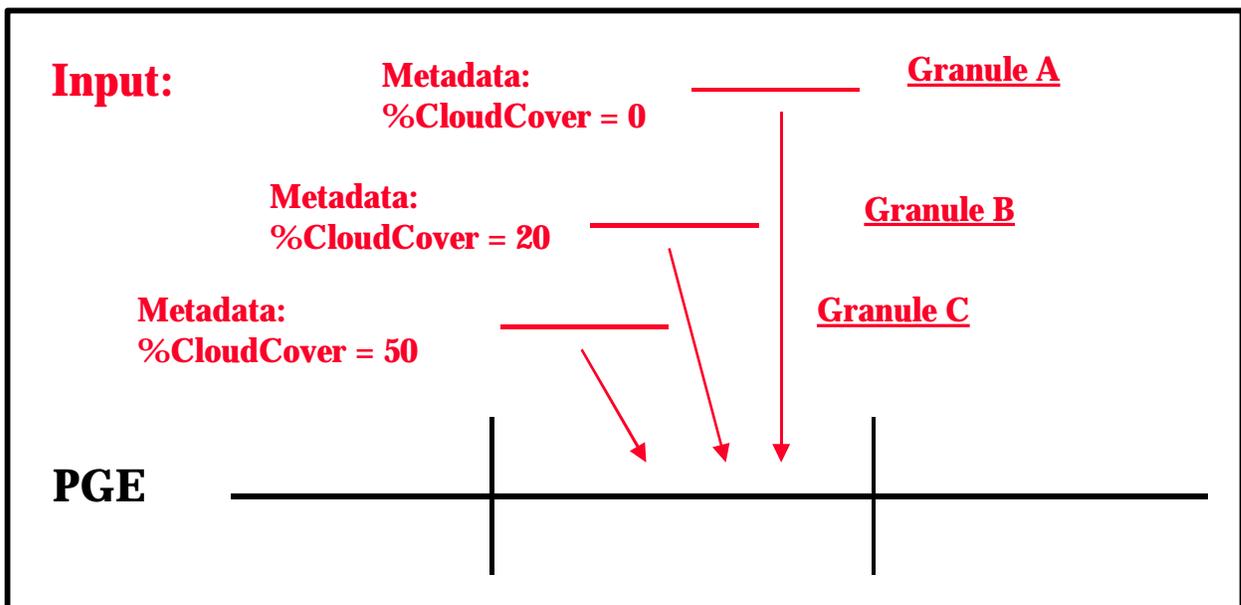


Figure 11.12.8.20-1. Example of the Metadata Checks and Query Production Rules

The following results demonstrate the differences between the Metadata Checks and Metadata Query Production Rules, especially with respect to the number of inputs that the PGE receives when different values are specified:

- Metadata Check of %CloudCover < 80:
 - In this case all three granules are acquired and the PGE is scheduled and executed.
- Metadata Query of %CloudCover < 80:
 - All three granules are acquired and the PGE is scheduled and executed.
- Metadata Check of %CloudCover = 50:
 - The 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 scheduled and executed.
- Metadata Check of %CloudCover < 50:
 - The PGE is not scheduled because only two of the three granules (Granule A and B) meet the criterion.
- Metadata Query of %CloudCover < 50:
 - Granules A and B are found and if the PGE's Min/Max Granules parameters are set to allow two granules, the granules are acquired and the PGE is scheduled and executed.
- Metadata Check of %CloudCover <= 50:
 - The PGE is scheduled and executed because all three granules meet the criterion.
- Metadata Query of %CloudCover <= 50:
 - All three granules are found and acquired and the PGE is scheduled and executed.
- Metadata Check of %CloudCover = 20:
 - The 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 scheduled and executed.
- Metadata Check of %CloudCover < 20:

- The 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 scheduled and executed.
- Metadata Check of %CloudCover = 10:
 - The PGE is not scheduled because none of the three granules meets the criterion.
- Metadata Query of %CloudCover = 10:
 - The PGE is not scheduled because no granules are returned from the query (unless Minimum Granules is set to 0).

Note that there can be more than one Metadata Check or Metadata Query on a given input. In the preceding example, a Metadata Check on %CloudCover can be combined with a Metadata Query on another parameter to further limit the input.

The Metadata Checks and Metadata Query Production Rules are additions to settings/syntax put into the ODL files for other production rules. The addition of a Metadata Check or a Metadata Query to an input means that other production rules used to evaluate that input will be applied in combination with the Metadata Check or Metadata Query.

11.12.8.21 PGE Science Metadata ODL File Parameters

Although the Metadata Checks and Metadata Query Production Rules are similar, there are two different ODL objects used to define them within a PCF_ENTRY in the PGE science metadata ODL file; i.e., the METADATA_CHECKS object and the METADATA_QUERY object.

The METADATA_CHECKS object has the following syntax:

```

OBJECT = PCF_ENTRY
.
.
.
.
.
OBJECT = METADATA_CHECKS
.
.
.
END_OBJECT = METADATA_CHECKS
END_OBJECT = PCF_ENTRY

```

The METADATA_QUERY object has the same syntax except “METADATA_QUERY” replaces “METADATA_CHECKS” in every instance.

Most of the following parameters must be set in the PGE science metadata ODL file within the METADATA_CHECKS or METADATA_QUERY ODL object (as

applicable) in order to implement either the Metadata Checks or Metadata Query Production Rule:

- CLASS.
- PARM_NAME.
- OPERATOR.
- VALUE.
- DATABASE_QUERY.
- KEY_PARAMETER_NAME (optional).
- KEY_PARAMETER_VALUE (optional).

CLASS is a simple counter used to differentiate the different Metadata Checks or Metadata Query objects within the file. Since each Metadata Checks or Metadata Query object resides within a different PCF_ENTRY object, the CLASS for an METADATA_CHECKS or METADATA_QUERY object can always be 1 (e.g., CLASS = 1).

PARM_NAME is the name of the metadata parameter on which the check or query is to be performed. The value specified for PARM_NAME (e.g., PARM_NAME = "%CloudCover") must be part of the granule-level metadata of the ESDT. In addition, it must match the parameter name specified in the ESDT science metadata ODL file.

OPERATOR is the operator (e.g., OPERATOR = "==") on which the check/query is to be performed. The following values are valid for OPERATOR:

- ">"
 - Value in metadata must be greater than.
- "<"
 - Value in metadata must be less than.
- ">="
- Value in metadata must be greater than or equal to.
- "<="
- Value in metadata must be less than or equal to.
- "=="
- Value in metadata must be equal to.
- "!="
- Value in metadata must be **not** equal to.

VALUE is the value (e.g., VALUE = 50) against which the metadata parameter (defined by PARM_NAME) is compared (using the operator specified by the OPERATOR parameter). The value for the VALUE parameter should be the type of data (e.g., integer, string) as defined in the ESDT ODL metadata for the parameter.

DATABASE_QUERY indicates whether the value for the Metadata Check or Query should be retrieved from the PDPS database rather than through the use of the VALUE parameter. Specifying DATABASE_QUERY permits **runtime parameter values** to be used for Metadata Query or Metadata Checks. The following values are valid for the DATABASE_QUERY parameter:

- "NONE"

- Use the value in the VALUE parameter; no value from the PDPS database is used.
- "PATH NUMBER"
 - Use the Path Number (0-233) of the orbit for which the PGE is scheduled.
- "ORBIT NUMBER"
 - Use the Orbit Number of the orbit for which the PGE is scheduled.
- "TILE ID"
 - Use the Tile ID of the current Data Processing Request.
- "START DATA DAY"
 - Use the Start Data Day for the current Data Processing Request.
- "END DATA DAY"
 - Use the End Data Day for the current Data Processing Request.

KEY_PARAMETER_NAME is an optional parameter that is used to specify the container within a multi-container metadata group (i.e., the MeasuredParameters metadata group in most ESDTs). The KEY_PARAMETER_NAME (e.g., KEY_PARAMETER_NAME = "ParameterName" for metadata checks or queries within the MeasuredParameters group) in conjunction with the KEY_PARAMETER_VALUE allows PDPS to determine which container within the multi-container group is to be the object of the check or query. KEY_PARAMETER_NAME is **not** used for product-specific attributes.

KEY_PARAMETER_VALUE is an optional parameter that is used to specify the **value** (e.g., KEY_PARAMETER_VALUE = "LandCoverage") for the container within a multi-container metadata group (i.e. the MeasuredParameters metadata group in most ESDTs). The KEY_PARAMETER_VALUE in both the PGE science metadata ODL file and ESDT science metadata ODL file must match.

Multi-Granule ESDTs are created by adding the following parameter to the PCF_ENTRY in the PGE science metadata ODL file:

- DISTINCT_VALUE.

The DISTINCT_VALUE must be set to the value of the metadata parameter that is used to differentiate granules within the Multi-Granule ESDT. In addition, the input or output defined by the PCF entry must have a corresponding DISTINCT_PARAMETER entry in the ESDT science metadata ODL file.

11.12.8.22 ESDT Science Metadata ODL File Parameters

The METADATA_DEFINITION ODL object surrounds the definition for Metadata Checks or Metadata Query information within the ESDT science metadata ODL file. An OBJECT/END_OBJECT pair is needed to separate the parameters defining the Metadata Definition from the rest of the parameters defining the ESDT with the following syntax:

```
OBJECT = METADATA_DEFINITION
.
.
.
END_OBJECT = METADATA_DEFINITION
```

A METADATA_DEFINITION object can match multiple Metadata Checks or Metadata Query objects in various PGE science metadata ODL files. There is no difference between the two production rules with respect to the parameters that need to be set in the ESDT science metadata ODL file. Most of the following parameters must be set:

- CLASS.
- PARM_NAME.
- CONTAINER_NAME.
- TYPE.
- KEY_PARAMETER_NAME (optional).
- KEY_PARAMETER_VALUE (optional).

CLASS is a simple counter used to differentiate the different Metadata Definition objects within the file. Each Metadata Definition object within the file must have a **different** CLASS value.

PARM_NAME is the name of the Metadata parameter on which the check or query will be performed. The value specified for PARM_NAME must be part of the granule-level metadata of the ESDT. It must also match the parameter name specified in the PGE science metadata ODL file(s).

CONTAINER_NAME is the name of the Metadata Group within which the metadata parameter defined by PARM_NAME is contained. For product-specific attributes CONTAINER_NAME is set to the string "AdditionalAttributes" (i.e., CONTAINER_NAME = "AdditionalAttributes").

TYPE indicates the type of data within the metadata parameter. The following values are valid for TYPE:

- "INT"
 - Integer data.

- "FLOAT"
 - Floating point data.
- "STR"
 - String or character data.
 - Note that dates and times are considered string data.

KEY_PARAMETER_NAME is an optional parameter that is used to specify the container within a multi-container metadata group (i.e., the MeasuredParameters metadata group in most ESDTs). The KEY_PARAMETER_NAME allows PDPS to determine which container within the multi-container group is to be the object of the check or query. KEY_PARAMETER_VALUE is an optional parameter that is used to specify the value for the container within a multi-container metadata group (i.e., the MeasuredParameters metadata group in most ESDTs). The KEY_PARAMETER_VALUE in both the ESDT science metadata ODL file and PGE science metadata ODL file must match.

The ESDT science metadata ODL file for an input specifying Multi-Granule ESDTs needs to have the following parameter added:

- DISTINCT_PARAMETER.

The DISTINCT_PARAMETER must be set to the name of the metadata parameter that is used to differentiate granules within the Multi-Granule ESDT. A corresponding METADATA_DEFINITION must be created to help PDPS find the specified metadata parameter when querying the Science Data Server.

11.12.8.23 Data Day Production Rule

The Data Day Production Rule is an addition to the Metadata Query Production Rule involving runtime parameter values. The Data Day Production Rule uses a query to the PDPS database for the time period for the DPR and a Metadata Query for data matching the Data Day. The Data Day is defined as a day within twelve hours of the current day. There is a pair of settings (Start Data Day and End Data Day) that provide parameters for the Metadata Query.

The Start Data Day and End Data Day values are calculated by subtracting twelve hours from the starting day for which the PGE is executing and adding twelve hours onto the ending day for which the PGE is running.

- Data Day for a PGE is running on data from 07/04 00:00:00 to 07/05 00:00:00 is defined as follows:
 - START_DATA_DAY = 07/03 12:00:00
 - END_DATA_DAY = 07/06 12:00:00.

11.12.8.24 Spatial Query Production Rule

The Spatial Query Production Rule allows a PGE to select input(s) based on the spatial coverage of another input (called the **key input**). The PDPS queries the Science Data Server for the spatial coverage of the key input, then uses it in acquiring any subsequent inputs that the PGE has requested that have the same spatial coverage.

- 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.

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.

For Release 5B Spatial Pad will be added 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.

Figure 11.12.8.24-1 is an illustration of the Spatial Query Production Rule. The figure shows a PGE that has two input types, one of which 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. The spatial coordinates of the granule are retrieved and all inputs of the second ESDT are checked for overlap with the key input’s coordinates.

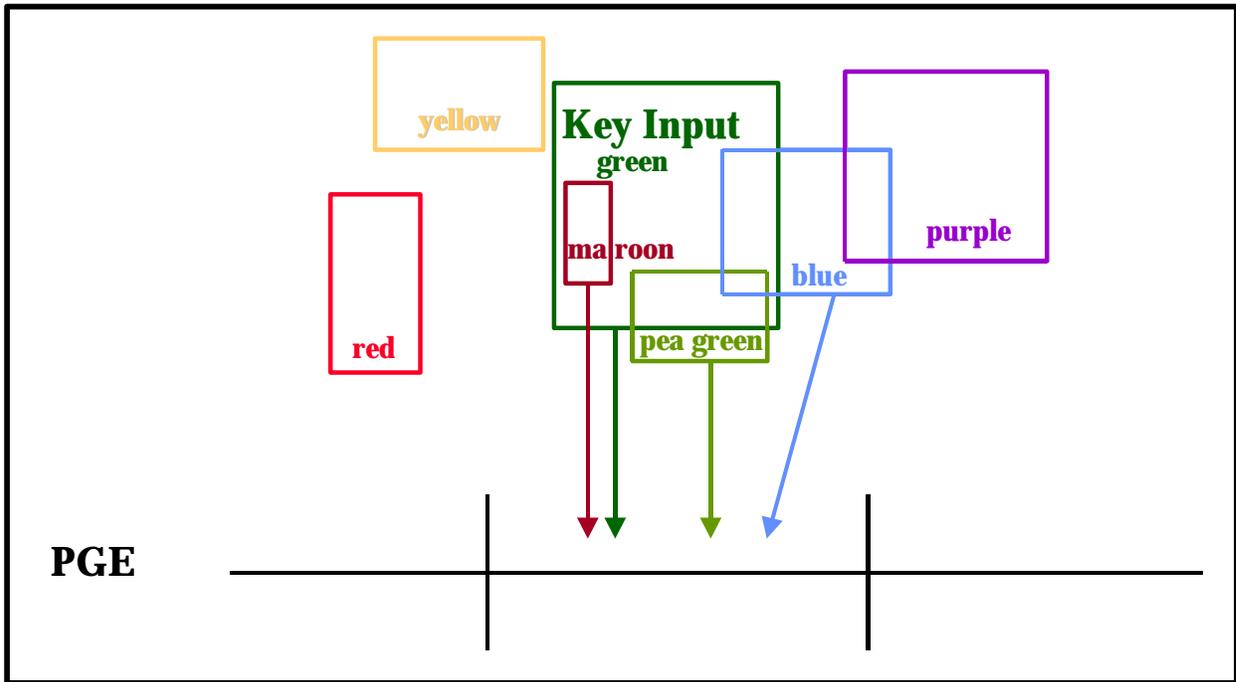


Figure 11.12.8.24-1. Example of the Spatial Query Production Rule

Assuming that all granules relate to the same time period, the granules are evaluated as follows:

- The “yellow” granule is not retrieved as an input because its spatial coordinates do not overlap with those of the key input.
- The “red” granule is not retrieved as an input because its spatial coordinates do not overlap with those of the key input.
- The “blue” granule is retrieved as an input because its spatial coordinates overlap with those of the key input. Part of its spatial constraint is within the constraint of the key input.
- The “maroon” granule is retrieved as an input because its spatial coordinates overlap with those of the key input. The spatial constraint of this granule is completely within the constraint of the key input.
- The “pea green” granule is retrieved as an input because its spatial coordinates overlap with those of the key input. Part of its spatial constraint overlaps with that of the key input.
- The “purple” granule is not retrieved as an input because its spatial coordinates do not overlap with those of the key input. It does not matter that it overlaps with another input that is accepted (i.e., the “blue” granule).

The Spatial Query Production rule is somewhat of an addition to other production rules. As such, it needs the same parameter settings as the Basic Temporal Production Rule. The values specified in the Basic Temporal Production Rule (or other production rules) are set first, then the Spatial Query Production Rule syntax is added.

11.12.8.25 PGE Science Metadata ODL File Parameters

In order to implement the Spatial Query Production Rule the following two parameters must be defined in the applicable PCF_ENTRY (each input is defined by a separate PCF_ENTRY in the PGE science metadata ODL file):

- KEY_INPUT.
- QUERY_TYPE.

The entries are made in the following format:

```
OBJECT = PCF_ENTRY
.
.
.
QUERY_TYPE = "Spatial"
KEY_INPUT = "Y"
.
.
.
END_OBJECT = PCF_ENTRY
```

QUERY_TYPE indicates what type of query is to be done to acquire the input defined by the PCF_ENTRY object. Valid values are as follows:

- "Temporal" - Input is acquired based on time.
 - The Basic Temporal and/or the Advanced Temporal Production Rules is/are used to get the input.
 - "Temporal" is the value that is assumed if the parameter is left out of the PCF_ENTRY object.
- "Spatial" - Input is acquired based on spatial coordinates (as well as time).
 - An input must be designated the key input to be used in determining the spatial constraints of the search.
 - "Spatial" is the value specified for each input that uses the Spatial Query Production Rule.
- "Tile" - Input is acquired by the spatial definition of a tile.
 - Refer to the Tiling Production Rule for additional information.

- "Already Created Tile" - Input is acquired based on the tile ID of an already created tile.
 - Refer to the Tiling Production Rule for additional information.

The KEY_INPUT is the input on which the spatial queries for other inputs will be based. When a KEY_INPUT parameter is assigned a value of "Y" the corresponding input is designated a key input and is treated as such. A value of "N" or leaving out the parameter entirely specifies a non-key input. Only one (1) key input is allowed per PGE Profile.

11.12.8.26 Tiling Production Rule

The Tiling Production Rule allows a PGE to run over a series of specific geographic locations called "tiles". The tiles are defined before the PGE is scheduled, specifying the longitude and latitude of four points that outline each tile. When the PGE is scheduled, it is scheduled for an entire day, and data is queried based on both a timeframe and the geographic location specified. Each run of the PGE for that day is for a specific tile, and only data that overlap or fit within the geographical coordinates of the tile are staged for the PGE.

- Example:
 - A MODIS PGE is designed to run on data for a specific geographic location every day.
 - The location is expressed as a polygon defined by latitude and longitude coordinates.
 - The MODIS PGE is scheduled every day, and data are retrieved that match the time period (the day for which the PGE is being executed) and some part of it falls within the geographic constraints of the tile.
 - The PGE runs and produces data that define information about the particular tile.

Period and **boundary** are used to specify the timing of input data and provide indications of how often the PGE should be executed. But at least some of the input data are retrieved on the basis of the coordinates defined for the tile on which the PGE is executing. In fact there are really two kinds of tiling:

- The PGE takes in data based on geographic shapes (tiles) and produces an output or outputs for the specified geographical coverage.
- The PGE takes in an already tiled product as input.
 - This form of tiling is more like a Metadata Query using a runtime parameter value to acquire the correct tiled data.

There are some possible future enhancements to the Tiling Production Rule but they have not been scheduled yet:

- **Zonal Tiling** supports tiles that cover a band around the Earth between two given latitudes.
- **Tile Clustering** involves grouping tiles that cover nearby geographic locations together so that data that span the tiles may be staged only once.
 - Intended to improve the performance of Tiling.
 - Also provides for the ability to prioritize one group of tiles over others (so specific geographic outputs are produced before other geographic outputs).

Runtime parameters can be set to the ID of the tile being processed. Since PDPS schedules a Tiling PGE to run once per tile, it can pass the identifier of the tile to the PGE. The identifier can be placed under a specified runtime parameter in the PCF, or it can be used in a Metadata Query for a PGE that would use already tiled data as input.

Figure 13 provides an example of the Tiling Production Rule. The PGE runs once per defined tile. So for every tile in the Tile Scheme a Data Processing Request is created to run using data that match the geographic extent of the tile. The PDPS sends the coordinates of the tiles (e.g., Tiles 1 through 3 in Figure 11.12.8.27-1) to the Science Data Server when requesting data and acquires only the granules that fall fully or partially within the defined tile.

The PGE itself must be set up to handle the fact that the entire area of the tile may not be covered by available data. In addition, because PDPS does not keep track of tiles once they have been produced, the PGE must set the metadata of the output products so a downstream Tiling PGE can acquire the correct granules for a given tile. The PDPS matches up the granules needed for a downstream PGE via a query to the Data Server Subsystem.

11.12.8.27 Tiling Based on Already Tiled Data

As previously stated, the second form of Tiling concerns PGEs based on tiles that have already been created by other PGEs. Tiling based on already tiled data is really a combination of the Metadata Query Production Rule and the Tiling Production Rule. The latter is used in running the PGE(s) once per tile, just like any other Tiling PGE. The Metadata Query Production Rule is used in acquiring the previously tiled data by querying the Science Data Server for metadata that match the tile ID that is currently being executed. The query depends on the “runtime parameters” function of Tiling to provide the tile ID relevant to the PGE that is currently being executed.

The Tiling Production Rule is based (at least for the PGE science metadata ODL file) on the same fields used for the Basic Temporal Production Rule. A PGE that performs Tiling still needs a **boundary** and **period** and other such parameters. The difference is that values specified for some of the fields provide Tiling information. Furthermore, Tiling requires that a tile scheme be identified in the PGE science metadata ODL file. The tile scheme is defined in a tile science metadata ODL file.

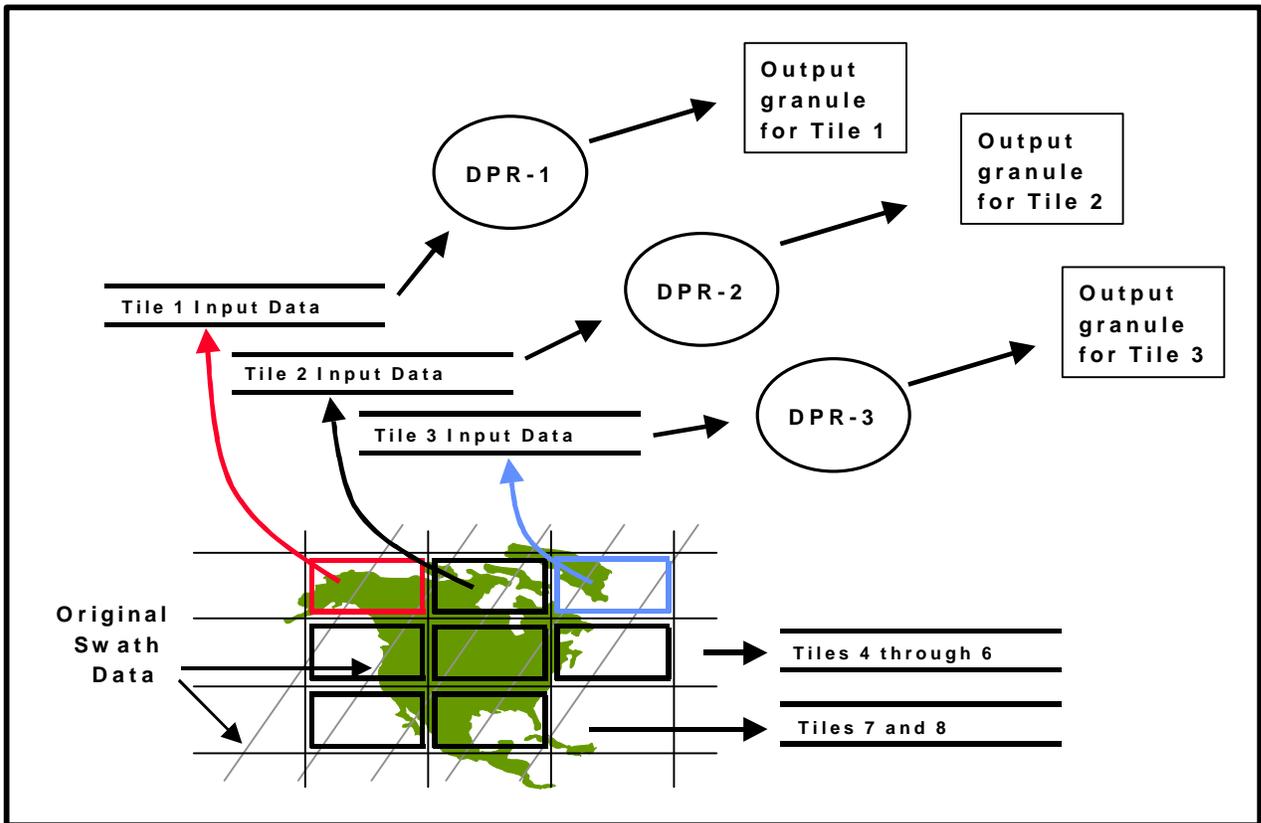


Figure 11.12.8.27-1. Example of the Tiling Production Rule

PGE Science Metadata ODL File Parameters

The following parameters must be set in the PGE science metadata ODL file in order to implement the Tiling Production Rule:

- SCHEDULE_TYPE.
- TILE_SCHEME_NAME.

In addition, the following parameter is used within a PCF_ENTRY when defining the Tiling Production Rule:

- QUERY_TYPE.

The SCHEDULE_TYPE parameter defines the type of scheduling that will be done for the PGE. Values for the Tiling Production Rule are:

- "Tiling"
 - Tile-Scheduled.
 - The PGE is scheduled based on the specified PROCESSING_PERIOD and PROCESSING_BOUNDARY, but a DPR is created for each defined tile.

The TILE_SCHEME_NAME parameter is the name of the Tile Scheme to be used by PDPS when scheduling and executing PGEs for each defined tile. There must be a tile ODL file that matches the specified scheme name.

The QUERY_TYPE parameter specifies the type of query to be performed on the input defined by the PCF_ENTRY Object. It uses the following syntax:

```
OBJECT = PCF_ENTRY
.
.
.
QUERY_TYPE =
.
END_OBJECT = PCF_ENTRY
```

For Tiling PGEs there are two possible values for QUERY_TYPE:

- "Tile"
 - The data for the input are acquired on the basis of the spatial constraints of the current tile.
 - Used for a PGE that takes in raw data and produces one or more tiles of data.
- "Already Created Tile"
 - The input is a tiled output of another Tiling PGE.
 - Used for a PGE that takes input from one or more other Tiling PGEs.
 - A Metadata Query must be added to this PCF_ENTRY in order for the correct tiled input to be acquired.

11.12.8.28 Tile Science Metadata ODL File Parameters

The following parameter must be set in the Tile science metadata ODL file in order to implement the Tiling Production Rule:

- TILE_SCHEME_NAME.

In addition, the following ODL objects are used within a PCF_ENTRY to define the Tiling Production Rule:

- TILE object.
- TILE_COORDINATE object.

The TILE_SCHEME_NAME parameter identifies the tile scheme for which the tile information is being specified. Values are limited by the following constraints:

- The string specified can be no more than 20 characters.
- The string specified should match the string specified for TILE_SCHEME in the PGE science metadata ODL file.

The TILE object is an ODL object that surrounds each tile definition. An OBJECT/END_OBJECT pair (as shown in the example that follows) is needed for each tile that is going to be expressly defined:

```
OBJECT = TILE
.
.
.
```

```
END_OBJECT = TILE
```

The following parameters are set in the TILE object in order to implement the Tiling Production Rule:

- CLASS.
- TILE_ID.
- TILE_DESCRIPTION.

CLASS is a simple counter used to differentiate the different TILE objects within the file. Each TILE object needs to have a different CLASS value.

TILE_ID is the tile identifier for the tile being defined. The TILE_ID must be an integer (e.g., TILE_ID = 12) and must be greater than zero but less than the maximum integer. If a Tile ID is defined in other tile schemes, it must have the same coordinates and description.

TILE_DESCRIPTION is a string of characters (255 characters maximum) that describes what the tile is for, such as its geographic location or area that it covers (e.g., TILE_DESCRIPTION = "Upper North America").

The TILE_COORDINATE object is an ODL object that defines a coordinate (latitude and longitude) for a tile. An OBJECT/END_OBJECT pair is needed for each coordinate that is defined. Each tile must have four TILE_COORDINATE objects defined. (Currently only four-sided polygons are allowed; however, a possible future enhancement would provide for polygons with more than four points.) Coordinate objects must follow a clockwise sequence so that if lines were drawn between the points in the order they are given the desired shape would be drawn.

Coordinate objects conform to the following format:

```
OBJECT = TILE
.
.
.
OBJECT = TILE_COORDINATE
CLASS =
LATITUDE =
LONGITUDE =
END_OBJECT = TILE_COORDINATE
.
.
.
END_OBJECT = TILE
```

The following parameters are set in the TILE_COORDINATE object in order to implement the Tiling Production Rule:

- CLASS.
- LATITUDE.
- LONGITUDE.

The CLASS parameter (e.g., CLASS = 1) is an object counter that is used only to distinguish objects. The value assigned to CLASS must be an integer greater than zero and must be unique in the file for the particular type of object.

The LATITUDE parameter (e.g., LATITUDE = 12.15) describes the latitude component of the tile coordinate. There is one LATITUDE entry per TILE_COORDINATE object. The LONGITUDE parameter (e.g., LONGITUDE = -43.22) describes the longitude component of the tile coordinate. There is one LONGITUDE entry per TILE_COORDINATE object.

11.12.8.29 Closest Granule Production Rule

The Closest Granule Production Rule allows a PGE to request the nearest input granule from the Data Processing Request time. The PDPS requests a search forward or backward for a specified period of time until it finds a granule that matches the request. However, there is a limit to the number of queries that are performed. The number of queries and the period length of the query are specified during SSI&T.

- 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.

The Closest Granule Production Rule supersedes the Most Recent Granule Production Rule. The latter allowed the search for inputs to go backward in time from the start of the DPR. The Closest Granule Production Rule allows the search for input granules to go either backward or forward in time, increasing the flexibility of the rule. The Closest Granule Production Rule has all of the ability of Most Recent Granule, plus the ability to search forward in time for input data.

The Closest Granule Production Rule uses two values to determine the period of the query. The two values are concerned with the direction of the query and the number of queries allowed.

- Offset.
 - Tells the PDPS software the query duration.
 - The sign (+ or -) indicates whether the query goes forward (positive) or backward (negative) in time.
- Retries.
 - Tells the PDPS software how many time periods (as defined by the offset) to search (either forward or backward) in time for matching granule.

The 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 against the Science Data Server for the period defined by the offset. Again, 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.

Figure 11.12.8.29-1 illustrates the Closest Granule Production Rule. In the example, the PGE has a boundary of “start of day” and a period of one hour, so it is scheduled to run for one hour’s worth of input data. The input has a period of one hour, and can come in at any hour of the day. Consequently, the PGE requests one granule of input.

The PGE has defined the Closest Granule Production rule with a –6-hour period of the query, meaning that it queries back in time in six-hour intervals. The number of retries is two. The PDPS performs a query for the input based on the time period of the DPR. Not finding any matching data, it 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, so a second Closest Granule query is performed, this one six hours before the last Closest Granule query. The second query results in the discovery of two matching granules. The PDPS selects the granule that is later in time and schedules the PGE to use it as input.

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.

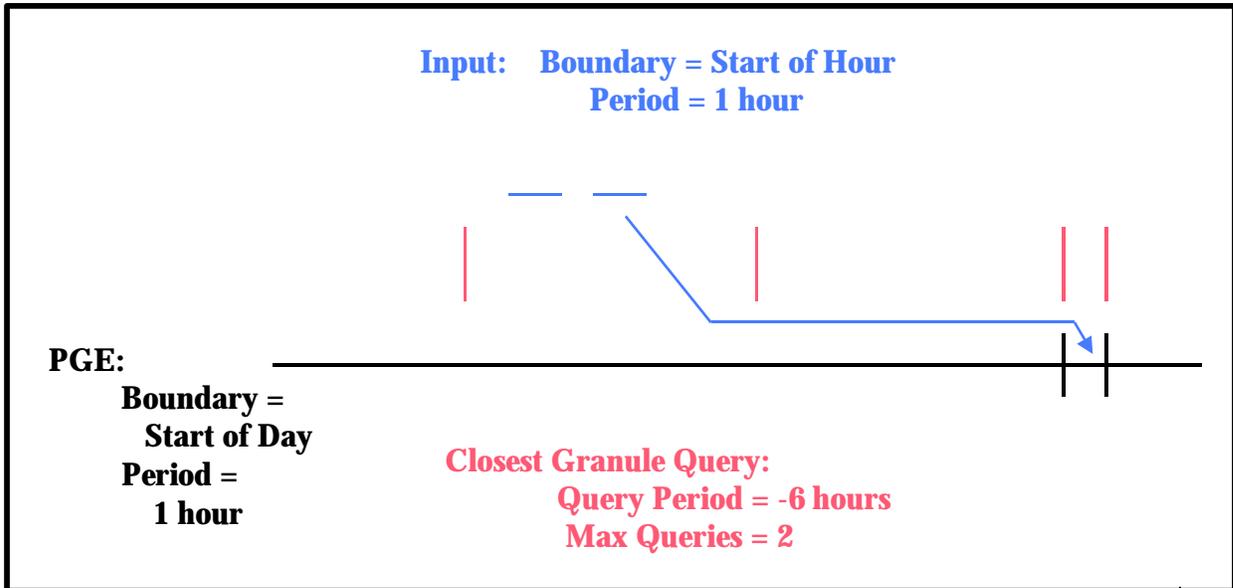


Figure 11.12.8.29-1. Example of Closest Granule Production Rule

The Closest Granule Production Rule needs the same parameter settings as the Basic Temporal Production Rule. The values needed for the Basic Temporal Production Rule must be set before the Closest Granule Production Rule syntax is added.

11.12.8.30 PGE Science Metadata ODL File Parameters

In addition to the parameter settings for the Basic Temporal Production Rule, the following parameters must be set within the appropriate PCF_ENTRY in the PGE science metadata ODL file in order to implement the Closest Granule Production Rule:

- CLOSEST_QUERY_OFFSET.
- CLOSEST_QUERY_RETRIES.

CLOSEST_QUERY_OFFSET is the offset added to or subtracted from the Data Start Time of the DPR and uses as the query for the requested input data type. The specified value has the format "<Period Type>=<Length of Period>" (e.g., CLOSEST_QUERY_OFFSET = "HOURS=6"). The following "Period Type" values are used in implementing the Closest Granule rule:

- "WEEKS"
 - Offset is some number of weeks.
 - For example, "WEEKS=2" would be a 14-day offset.
- "DAYS"
 - Offset is some number of days.
 - For example, "DAYS=5" would be a 120-hour offset.
- "HOURS"
 - Offset is some number of hours.

- For example, "HOURS=4" would be a 240-minute offset.
- "MINS"
 - Offset is some number of minutes.
 - For example, "MINS=5" would be a 300-second offset.
- "SECS"
 - Offset is some number of seconds.

CLOSEST_QUERY_RETRIES is the maximum number of Closest Granule queries before the DPR fails due to insufficient input data. The specified value is an integer value that is limited only by the maximum size of an integer on the executing hardware.

Note that the longer the offset value or the greater the number of retries, the more time that each query requires due to search time at the Science Data Server and processing time of any granules returned. The combination of a large offset with a large number of retries, can (if no data granules are found) consume a lot of time while failing to generate a DPR.

11.12.8.31 Orbital Processing Production Rule

The Orbital Processing Production Rule is similar to the Basic Temporal Production Rule in that both define the time period for the inputs and outputs of the PGE. The difference is that the Orbital Processing Production Rule uses the orbit of the spacecraft to determine that time period. A PGE that processes data related to every orbit of a satellite uses data related to a time period that is computed from the orbit of that satellite.

- Example:
 - A PGE processes Level 0 data related to each orbit of the AM-1 satellite.
 - The AM-1 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.

The Orbital Processing Production Rule uses the “period” and “boundary” concept just like the Basic Temporal Production Rule. The difference is that for Orbital Processing, the 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 provided during the SSI&T process. The information (stored 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.

Orbital path is the path of the satellite over the Earth. It is a number from 0-233 that indicates the region of the Earth covered by a particular orbit. Note that 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 list of orbital parameters can be placed under runtime parameters:

- Orbit Number.
 - The number of the orbit (starting from zero) and continually increasing.
- Orbital Path Number.
 - The number of the path that maps to the orbit number.
 - The orbital path number is the 0-233 orbital path traversed by the satellite.
- Orbit Number within the Day.
 - The number of the orbit within the given day.
 - It includes any orbit that starts within the given day.
 - This is a **Release 5B** capability.
- Granule Number within the Orbit.
 - The number of the granule within a given orbit.
 - It includes any granule that starts within the given orbit.
 - This is a **Release 5B** capability.

Figure 11.12.8.31-1 provides an illustration of the Orbital Processing Production Rule. The PGE in the diagram 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 time period relevant to the DPR.

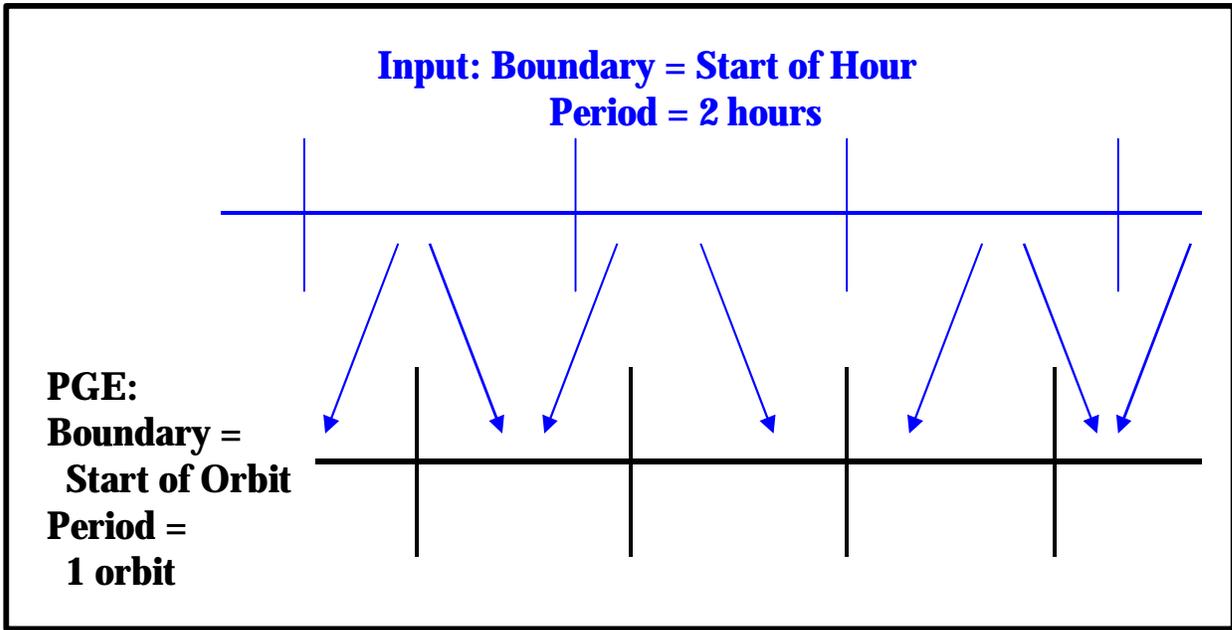


Figure 11.12.8.31-1. Example of the Orbital Processing Production Rule

In the example shown in Figure 11.12.8.31-1 the length of an orbit is less than the period of the two-hour input, so sometimes a single granule may cover the input time range of a PGE execution and at other times two granules are required. The production rule would work equally well if the data were of a shorter period (e.g., 1/2 hour) than the orbit of a satellite (e.g., 90 minutes). In such a case three granules would be staged for every execution of the PGE.

The Orbital Processing Production Rule is based (at least for the PGE science metadata ODL file) on the same fields used for the Basic Temporal Production Rule. However, the values specified for the parameters provide orbit information rather than time-period information.

11.12.8.32 PGE Science Metadata ODL File Parameters

The following parameters must be set in the PGE science metadata ODL file in order to implement the Orbital Processing Production Rule:

- PLATFORM.
- SCHEDULE_TYPE.
- PROCESSING_PERIOD.
- PROCESSING_BOUNDARY.

The PLATFORM parameter is the name of the platform (satellite) for which the PGE is processing data. Information concerning the orbits of a satellite are stored in the PDPS database. Values that can be assigned to the parameter are subject to the following constraints:

- The string specified can have no more than 25 characters.

- The string specified should match the string specified in the orbit science metadata ODL file. If no matching file is found, an error is reported during SSI&T.

The SCHEDULE_TYPE parameter describes the type of scheduling that is required for the PGE. "Orbit" is the value used for Orbital Processing. As a result, the PGE is scheduled based on the start time and period of the satellite's orbit. Note that PROCESSING_PERIOD and PROCESSING_BOUNDARY must be set correspondingly.

The PROCESSING_PERIOD is the time interval for the data that the PGE processes. Assuming no combination of production rules that would affect the period, data are acquired for the specified PROCESSING_PERIOD and output data are planned for the given period. The value assigned to PROCESSING_PERIOD is of the format "<Period Type>=<Length of Period>". The "Period Type" applicable to the Orbital Processing Production Rule is "ORBITS". For example, "ORBITS=1" would be applied to a PGE that processes data related to one orbit's worth of data.

The PROCESSING_BOUNDARY is the boundary (starting point in time) of the PGE. It specifies when each instance of the PGE should start. Note that the PROCESSING_BOUNDARY and PROCESSING_PERIOD are used in conjunction when scheduling the PGE. Consequently, "START_OF_ORBIT" is the acceptable PROCESSING_BOUNDARY for the Orbital Processing Production Rule. It indicates that the PGE processes data related to each satellite orbit. It must be used in conjunction with a PROCESSING_PERIOD that specifies a "Period Type" of "ORBITS".

11.12.8.33 Orbit Science Metadata ODL File Parameters

The following parameter must be set in the orbit science metadata ODL file in order to implement the Orbital Processing Production Rule:

- PLATFORM.

In addition, the following ODL object is used in defining orbits for the Orbital Processing Production Rule:

- ORBIT_MODEL object.

The value assigned to the PLATFORM parameter in the orbit science metadata ODL file must be exactly the same as that specified for the same parameter in the PGE science metadata ODL file.

The ORBIT_MODEL object is an ODL object that surrounds each orbit definition. An OBJECT/END_OBJECT pair (as shown in the example that follows) is needed for each orbit that is to be expressly defined: PDPS extrapolates or interpolates orbits that are not specifically defined within the file.

```
OBJECT = ORBIT_MODEL
CLASS = 1
ORBIT_NUMBER = 1000
ORBIT_PATH_NUMBER = 68
ORBIT_PERIOD = "MINS=98"
ORBIT_START = "09/21/1999 14:50:00"
END_OBJECT = ORBIT_MODEL
```

The following parameters are set in the ORBIT_MODEL object in order to implement the Orbital Processing Production Rule:

- CLASS.
- ORBIT_NUMBER.
- ORBIT_PATH_NUMBER.
- ORBIT_PERIOD.
- ORBIT_START.

CLASS is a simple counter used to differentiate the different ORBIT_MODEL objects within the file. Each ORBIT_MODEL object needs to have a different CLASS value. ORBIT_NUMBER is simply the number of the orbit being specified. Each orbit of the satellite has a sequential number associated with it. This is the integer value of the orbit number for the orbit being defined in the ORBIT_MODEL object.

ORBIT_PATH_NUMBER is value of the path for the specified orbit. The orbital path is a number from 0-233 that repeats every 16 days. This is the integer value of the orbital path number for the orbit being defined in the ORBIT_MODEL object.

ORBIT_PERIOD is the length of time it takes for the satellite to complete one orbit. The value assigned to ORBIT_PERIOD has the format "<Period Type>=<Length of Period>" (e.g., "MINS=98"). Note that the "Length of Period" is specified as a positive integer only.

Period Type values for the orbit model science metadata OFL file are:

- "WEEKS"
 - Orbit spans some number of weeks.
 - For example, "WEEKS=2" would be an orbit that takes two weeks to complete.
- "DAYS"
 - Orbit spans some number of days.
 - For example, "DAYS=5" would be an orbit that takes five days to complete.
- "HOURS"
 - Orbit spans some number of hours.
 - For example, "HOURS=4" would be an orbit that takes four hours to complete.
- "MINS"
 - Orbit spans some number of minutes.
 - For example, "MINS=85" would be an orbit that takes eighty-five minutes to complete.
- "SECS"
 - Orbit spans some number of seconds.
 - For example, "SECS=7200" would be an orbit that takes 7200 seconds (two hours) to complete.

ORBIT_START is the start date and time for the orbit defined by the particular ORBIT_MODEL object. Its format is either "MMM DD YYYY HH:MM:SS" or "MM/DD/YYYY HH:MM:SS".

11.12.8.34 Production Planning Considerations

During normal operations it is expected that the Production Planner will not have to add PRs to the PDPS database very frequently. The frequency of this activity is, to some extent, determined by the SCF responsible for the science software.

- The PR is a template request to generate a particular data product and results in a production run of the associated SCF-provided PGE.
 - PR specifies a range (temporal, orbit, or tile) over which the data products are to be produced or the PGEs are to be scheduled.
 - 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, resulting in several hundred jobs being planned and run as the input data become available.
 - Early in a mission the SCF may prefer to request processing for a short time period only (e.g., a week or less).
 - At that time the SCF is gaining an understanding of the on-orbit behavior of the instrument, the resulting data, and the interaction of the science processing software with real data.
 - SCF reviews the quality of the products and notifies the Production Planner of the need for any changes to the PR (e.g., discontinue the PR, change time ranges, or modify input parameters).
 - 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.
 - DAAC operations may have operational reasons for wanting to issue processing requests for a more limited time period.
- The 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. The production planning tools are intended to be flexible enough in their design to support the particular planning and scheduling cycles of the operations organization at each DAAC.

Before planning production the Production Planner must coordinate with the Resource Planner to resolve all resource allocation issues. The Resource Planner notifies the Production Planner of the resources available for use in processing. Furthermore, the Production Planner may well have direct access to the Resource Plan.

The Production Planner prepares monthly and weekly production plans. In addition, the Production Planner develops a daily production schedule from the most current weekly plan. However, the first step in the planning process is creating production requests using the Production Request Editor.

11.12.8.35 DPREP Considerations

DPREP (data preprocessing) is a set of three PGEs that are supplied by ECS, unlike most PGEs, which are provided by the Science Computing Facilities that ECS supports.

DPREP consists of the following three PGEs:

- EcDpPrAm1EdosEphAttDPREP_PGE (Step 1).
- EcDpPrAm1FddAttitudeDPREP_PGE (Step 2).
- EcDpPrAm1FddEphemerisDPREP_PGE (Step 3).

The PGEs run separately and in a particular sequence.

Two files describe the PGEs and how to run them:

- “DPREP_README”
- “HowtoRunDPREP”

The files are installed on the science processor hosts (e.g., e0spg01, g0spg01, l0spg01, n0spg03) in the /usr/ecs/*MODE*/CUSTOM/data/DPS directory.

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.

There are two profiles for DPREP PGEs:

- Profile 1 runs routinely at the DAACs using previous DPREP output in addition to new Terra ancillary (e.g., AM1ANC) data.
- Profile 2 (the boot-up procedure) takes in the Terra ancillary data only and is run under two sets of conditions:
 - First run of DPREP (because there is no previous output) to initialize DPREP processing.
 - Following any long period of time during which EDOS L0 ancillary data are unavailable. (Short gaps in the ephemeris data are filled by EcDpPrAm1EdosEphemerisRepair, one of the executables in the EcDpPrAm1EdosEphAttDPREP_PGE.)

In order to run Profile 2 successfully following a long period of data unavailability, DPREP must be told where to resume orbit counting. The initial orbit number in the Step 1 process control file (PCF), must be set to the orbit number corresponding to the timestamp at which data availability resumes.

Until an automated process can be implemented, whenever there is a telemetry drop-out, a member of the DAAC science support team takes the following actions:

- Calls the Flight Operations Team (FOT).
- Asks for the on-line engineer.
- Requests the orbit number that coincides with the start time of the first L0 ancillary data set that follows the data drop-out.
- Sets the orbit number in the Step 1 PCF.

Then Profile 2 can be run successfully. Afterward, routine operations can be resumed using Profile 1 PGEs.

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11.13 PGE Registration and Test Data Preparation

The integration of science software with ECS requires that information about the Product Generation Executives (PGEs) be made known to the PDPS in its database. In addition, the PGEs themselves and the test files that they use (both input and output) need to be placed on the Data Server. These steps must be accomplished before the science software can be run and tested within the ECS.

The following procedures describe how to register a new PGE with ECS. This involves updating the PDPS database with information needed to plan, schedule, and run the PGE. The first step in the PGE registration process is to determine which ESDTs are needed for the PGE. You must Verify that an ESDT metadata ODL file exists for each ESDT or generate an ODL file. The next step in the process is to create a PGE metadata ODL file using the delivered PCF. Finally, additional operational information (resource requirements and runtime statistics) must be input into the PDPS database. This is the last step in the PGE registration process. The order in which these procedures are done is important and should be done as indicated. Please reference Appendix C. for Examples of PGE and ESDT ODL Files for Each Instrument Team.

11.13.1 PGE ODL Preparation

. This section describes how to prepare PGE ODL files. It is assumed that the SSIT Manager is running .

- 1 From the SSIT Manager, click on the **T**ools menu, then choose **P**DPs Database and then **P**CF ODL Template.
 - An xterm with title “SSIT: Science Metadata ODL Template Creation” will be displayed.
- 2 At the program prompt **C**onfiguration Filename (enter for default: `../cfp/EcDpAtCreatODLTemplate.CFG`)?
 - Press **E**nter for the default configuration file
- 3 At the program prompt **E**CS mode of operations?, type *mode*, press **R**eturn or just press **R**eturn if the default shown is correct.
 - The *mode* refers to the database used and will typically be **O**PS or **T**S1.
- 4 At the program prompt **P**rocess Control file name (PCF to generate template from)?, type *PCFpathname/PCFfilename*, press **R**eturn.
 - The *PCFpathname* is the full path name to the location of the PCF. If not specified, the directory from which the SSIT Manager was run will be assumed.
 - The *PCFfilename* is the file name of the PCF.
- 5 At the program prompt **P**GE name (max 10 characters)?, type *PGEname*, press **R**eturn.
 - The *PGEname* is the name of the PGE that will be registered.

- 6 At the program prompt **PGE version (max 5 characters)?**, type *PGEversion*, press **Return** or just press **Return** if the default shown is correct.
- The *PGEversion* is the version of the PGE that will be registered.
- 7 At the prompt **PGE Profile ID (0 for Null, max 99)?**, type 1 or any valid profile ID.
- After a brief time, the message “Successfully created ODL template file” should be displayed if the task was successful.
 - The program will output a file with the filename **PGE_PGEname#PGEversion#ProfileID.tpl**.
 - For example, if the PGE name was **PGE35**, and the version and profile ID were both **1** this output file will be named **PGE_PGE35#001#01.tpl**.
- 8 At the program prompt **Hit return to run again, 'q <return>' to quit.**, press **Return** to repeat process with another PCF or type **q** and press **Return** to quit.
- The xterm will disappear.
- 9 At a UNIX prompt on an AIT Sun, type **cd SSITrunPathname**, press **Return**.
- The *SSITrunPathname* is the full path to the directory from which the SSIT Manager was run, for example /usr/ecs/TS1/CUSTOM/bin/DPS. This will be the directory where the file **PGE_PGEname#PGEversion#ProfileID.tpl** will reside.
- 10 At a UNIX prompt on the AIT Sun, type **cp PGE_PGEname#PGEversion#ProfileID.tpl PGE_PGEname#PGEversion#ProfileID.odl**, press **Return**.
- The **PGE_PGEname#PGEversion#ProfileID.tpl** is the file name of the ODL template file created in step 7.
 - The **PGE_PGEname#PGEversion#ProfileID.odl** is the file name of a copy which can be safely edited. This file name convention must be used.
- 11 At a UNIX prompt on the AIT Sun, type **mv PGE_PGEname#PGEversion#ProfileID.odl /usr/ecs/<mode>/CUSTOM/data/DPS/ODL**
- This will place the ODL file in the directory where the executable that populates the PDPS database will read from. **PGE_PGEname#PGEversion#ProfileID.odl** is the file name of the copy created in step 10.
- 12 At a UNIX prompt on the AIT Sun, change the directory to the one in step above and type **vi PGE_PGEname#PGEversion#ProfileID.odl**, press **Return**.
- The **PGE_PGEname#PGEversion#ProfileID.odl** is the file name of the copy created in step 10.
 - Any text editor may be used such as *emacs*. For example, **emacs PGE_PGE35#001#01.odl**, press **Return**.
- 13 In the file, add required metadata to the ODL template.
- For an explanation of what metadata is required, see file /usr/ecs/<mode>/CUSTOM/data/DPS/PGE_ODL.template.
 - Note that the ShortNames typed into this file must each have a corresponding PDPS ESDT metadata ODL file (sec. 11.13.2).

- All objects corresponding to output ESDTs will automatically have the SCIENCE_GROUP and YIELD set during the generation of PGE ODL.
 - All objects corresponding to output ESDTs will have an attribute “ASSOCIATED_MCF_ID. Place here the Logical Unit Number (LUN) listed in the PCF for the associated MCF listing.
 - All objects corresponding to static input ESDTs must have the SCIENCE_GROUP set. Objects corresponding to *dynamic* input ESDTs should NOT have the SCIENCE_GROUP set.
 - See Appendix E for an example of PCF and corresponding PGE ODL files.
- 14** Save the changes made to the ODL template file and exit the editor.
- The specifics depend upon which editor is being used. If using *vi*, the command sequence to enter is **:wq**, press **Return**.
 - For other editors, refer to that editor’s documentation.
 - If you make a mistake entering any values, press **Return** here; your previous enteries are restored as defaults and you won’t have to retype them.
 - A comment should be received: “**Update of PDPS/SSIT database with PDPS SCIENCE METADATA SUCCESSFUL**”
-

11.13.2 ESDT ODL Preparation

Assumption:

The PGE ODL file has been created and edited for the required PGE.

Follow the steps below to prepare ESDT ODL files for each ESDT required by the PGE.

- 1** Determine ShortName for required ESDTs corresponding to a Logical Unit Number (LUN) in the PGE ODL file.
- 2** At a UNIX prompt on an AIT Sun, type **ls /usr/ecs/<mode>/CUSTOM/data/DPS/ODL/ESDT_*ShortName*#*Version*.odl**, press **Return**.
 - The **ESDT_*ShortName*#*Version*.odl** is the file name of the ESDT ODL file you are looking for where *ShortName* is the ESDT’s ShortName and *Version* is the ESDT version. If a file for the desired ESDT is listed, then it has already been prepared and this procedure can be exited now.
 - For example, if the desired ESDT has the ShortName MOD03 and version 001, type **ls /usr/ecs/TS1/S/CUSTOM/data/DPS/ODL/ESDT_MOD03#001.odl**, press **Return**.
 - If the desired file is *not* listed, continue on to step 3.
- 3** At a UNIX prompt on the AIT Sun, type **cd *WorkingPathname***, press **Return**.

- The *WorkingPathname* is the full path name to a working directory for which the user has write permissions.
 - For example, **cd /home/jdoe/working/**, press **Return**.
- 4 At a UNIX prompt on the AIT Sun, type
**cp /usr/ecs/<mode>/CUSTOM/data/DPS/ESDT_ODL.template
ESDT_ShortName#Version.odl**, press **Return**.
- For <mode> enter the mode you are working in, for example **OPS** or **TS1**.
 - The **ESDT_ShortName#Version.odl** is the file name of the ESDT ODL file to be created.
 - This command copies a template ESDT ODL file to the ESDT ODL file to be created. The template is well commented.
 - For example, type **cp
/usr/ecs/<mode>/CUSTOM/data/DPS/ESDT_ODL.template
ESDT_MOD03#001.odl**, press **Return**.
 - The **ESDT_ShortName#Version.odl** file naming convention *must* be observed.
- 5 At a UNIX prompt on the AIT Sun, type **vi ESDT_ShortName#Version.odl**, press **Return**.
- The **ESDT_ShortName#Version.odl** represents the file name of the ESDT ODL template file created in step 4.
 - Any text editor may be used such as *emacs*. For example, **emacs
ESDT_MOD03#001.odl**, press **Return**.
- 6 In the file, add required metadata to the ODL template.
- Use the internal documentation contained in the ODL file (from the original template) to aid in populating with metadata.
 - Note that the ShortName specified within the file must match the ShortName of the file name itself.
 - In addition, the ShortNames used in the PDPS PGE metadata ODL file must match the ShortNames in these files.
- 7 Save the changes made to the ESDT metadata ODL file and exit the editor.
- The specifics depend upon which editor is being used. If using *vi*, the command sequence to enter is **:wq**, press **Return**.
 - For other editors, refer to that editor's documentation.
- 8 Next type **mv ESDT_ShortName#Version.odl
/usr/ecs/<mode>/CUSTOM/data/DPS/ODL**.
- This will place the just created ESDT ODL file in the directory where PDPS will read it from.
- 9 Repeat steps 1 through 8 for each ESDT required by a particular PGE. When all ESDT metadata ODL files have been completed, continue on to next section.
-

11.13.3 Update PDPS/SSIT Database with PGE Science Metadata

In order to update the PDPS Database with PGE metadata, the ESDT metadata ODL files must first be prepared for each ESDT required by the PGE. This section describes how to perform the next step, running the SSIT Science Update program.

Assumptions:

1. The SSIT Manager is running.
2. The directory used for containing the PDPS PGE metadata ODL files. Nominally, this is `/usr/ecs/<mode>/CUSTOM/data/DPS/ODL`.

Updating the PDPS Database with PGE Metadata

The following is a list of tools, procedures and or assumptions:

The directory used for containing the PDPS ESDT metadata ODL files can be accessed by the following commands:

- 1 telnet to (AITTL/DPS) **calahans** or a machine that matches the SSIT Manager host.
- 2 login: **cmts1**, password: **ecsuser**
- 3 *Login to DCE (dce_login <name> <Password>), setenv... :0.0*
- 4 The directory used for containing the PDPS ESDT metadata ODL files. is `/usr/ecs/<mode>/CUSTOM/data/DPS/ODL`
- 5 From the SSIT Manager, click on the **T**ools menu, then choose **PDPS Database** and then **SSIT Science Metadata Update**.
 - An xterm with title “SSIT: Science Metadata Database Update” will be displayed.
- 6 At the program prompt **Configuration Filename (enter for default: `../cfp/EcDpAtRegisterPGE.CFG`)?**
 - Press **Return**.
- 7 At the program prompt **ECS mode of operation?**, type *mode*, press **Return** or just press **Return** if the default shown is correct.
 - The *mode* refers to the database used and will typically be **OPS** or **TS1**.
- 8 At the program prompt **PGE name (max 10 characters)?**, type *PGEname*, press **Return**.
 - The *PGEname* is the name of the PGE that will be registered. This name must match the PGE name specified.
- 9 At the program prompt **PGE version (max 5 characters1)?**, type *PGEversion*, press **Return** or just press **Return** if the default shown is correct.
 - The *PGEversion* is the version of the PGE that will be registered. This version must match the PGE version specified.

- 10** At the program prompt **PGE Profile ID (0-99, 0 means null)?** Type in a valid profile ID and press **Return**, or if already listed just press **Return**.
- The PDPS database will then be updated with the information contained in the file **PGE_PGEname#PGEversion#ProfileID.odl**
- 11** At the program prompt **Hit return to run again, q <return> to quit:**, press **Return** to update the PDPS database with another PGE ODL metadata file or type **q** and press **Return** to quit.
- If you make a mistake entering any values, press **Return** here; your previous entries are restored as defaults and you won't have to retype them.
 - NOTE: If you make mistakes while editing the PGE and ESDT ODL files, you can run the ODL checker (Tools → PDPS Database → Check ODL) via the SSIT manager to locate any errors.
- ODL files must have been created to define the PGE to PDPS. Examples of the ODL files are under the data directory: PGE_ODL.template, ESDT_ODL.template, ORBIT_ODL.template, TILE_ODL.template and PATHMAP_ODL. A tool can be run to generate a template ODL file for the PGE from the SSIT Manager via Tools->PDPS Database->PCF Odl Template script. This then has to be populated with all information that can not be garnered from the PCF. The CheckOdl tool from the SSIT Manager via Tools->PDPS Database->Check ODL can be used to flag any errors in ODL before trying to put it in the database.

Sample of ESDT.odl files being established in ECS

```
home/emcleod/MODIS/STORE/PGE07
calahans{emcleod}10: ls
ESDT_MD10L2#001.odl  MOD_PR10          pge_cfg
ESDT_MD35L2#001.odl  MOD_PR10.mk        scf_cfg
ESDT_MOD02H#001.odl  PGE07.mk          script
ESDT_MOD03#001.odl  doc
calahans{emcleod}11: cp ESDT_MD10L2#001.odl ESDT_MD35L2#001.odl
ESDT_MOD02H#001.odl ESDT_MOD03#001.odl
/usr/ecs/OPS/CUSTOM/data/DPS/ODL/
```

Alternative Tool for SSIT Metadata Update:

Source the buildrc file for the mode in which you are working (*source .buildrc*).
 /usr/ecs/<MODE>/CUSTOM/utilities, Note that this only has to be done once per login. Then (*cd /usr/ecs/<MODE>/CUSTOM/bin/DPS*)
 (The tool can also be executed by being in the /usr/ecs/<MODE>/CUSTOM/bin/DPS and executing **EcDpAtDefinePGE..**)

Shell script prompts user for information.

- 1** Enter in the location of the configuration file (*././cfg/EcDpAtRegisterPGE.CFG*).
- 2** Filename Enter the MODE of operation (<MODE>).

- 3 Enter name of PGE (it must match what is in the PGE ODL file).
- 4 Enter the version of the PGE (it must match what is in the PGE ODL file).
- 5 Enter the Profile ID (it must match what is in the PGE ODL file). Note that the ODL file for the PGE must have the of: PGE_<PGE NAME>#<PGE VERSION>#<PROFILE ID>.
 - Each ODL file is displayed as it is processed. A good status message should be displayed as a result. Information about the PGE (inputs and outputs, Production Rules, etc) should be entered in the Database.

11.13.3.1 Examples of PGE and ESDT ODL Files for Each Instrument Team

This section is taken from the latest **Green Book 162-TD-001-005** and are listed in Appendix C. Depicted are examples of ODL files in SSI&T activities. Then, examples of specific ODL files are listed by instrument (ASTER, MISR or MODIS).

Template ODL Files

There are three Template ODL files listed therein. The specific or tailored ODL files listed were derived from these templates by appropriate editing and filling-in of values. The three ODL Template files listed reside, on the AIT Sun host, at `/usr/ecs/<mode>/CUSTOM/data/DPS` . They are

PGE_ODL.template

ESDT_ODL.template

ORBIT_ODL.template

Example of a successful PDPS Science Metadata Update:

PDPS/SSIT SCIENCE Metadata Database Update **

Configuration filename? (enter for default: ../../cfg/EcDpAtRegisterPGE.CFG)

ECS Mode of operations? (enter for default: OPS)

OPS

PGE name (max 10 characters)?

PGE07

PGE version (max 5 characters)?

001

PGE Profile ID (0-99, 0 means null)? (enter for default: 1)

1

Warning: Could not open message catalog "oodce.cat"

EcDpAtRegisterPGE: Process Framework: ConfigFile

../../cfg/EcDpAtRegisterPGE.CFG ecs_mode OPS

' PGE profile id = '1' ...

Do you wish to overwrite the previous PGE PGE07((y)es or (n)o):

y

FILES PROCESSED

: PGE SCIENCE ODL file = /usr/ecs//OPS/CUSTOM/data/DPS/ODL/PGE_PGE07#0#001.odl

ESDT SCIENCE ODL file = /usr/ecs//OPS/CUSTOM/data/DPS/ODL/ESDT_MOD02H#001.odl

ESDT SCIENCE ODL file = /usr/ecs//OPS/CUSTOM/data/DPS/ODL/ESDT_MD35L2#001.odl

```
ESDT SCIENCE ODL file = /usr/ecs//OPS/CUSTOM/data/DPS/ODL/ESDT_MOD03#001.odl
ESDT SCIENCE ODL file = /usr/ecs//OPS/CUSTOM/data/DPS/ODL/ESDT_MD10L2#001.odl
***** Update of PDPS/SSIT database with PDPS SCIENCE metadata SUCCESSFUL *****
Hit return to run again, 'q <return>' to quit:
```

11.13.4 Operational Metadata

The SSIT version of the PDPS database is initialized and updated with SSIT Operational Metadata so that the Planning and Processing Subsystem can schedule and run PGEs. Here, PDPS Operational Metadata refers to PGE information which is supplied to the DAAC/SSIT Operator and may change frequently.

The operator enters this data directly into the SSIT Operational Metadata Update GUI. The program then writes the data directly to the SSIT version of the PDPS database.

Before running the SSIT Operational Metadata Update from the SSIT Manager, you must first update the PDPS with SSIT Science Metadata. In addition, to get initial PGE Performance data which will be entered into the GUI, you need to run the profiling utility, EcDpPrRusage on the PGE or have the information on profiling provided. See section 11.13.2.

Detailed procedures for tasks performed by the SSI&T operator are provided in the sections that follow.

Assumptions:

1. The required UNIX environment variables have been set.
2. The Science metadata has been updated to the PDPS database for this PGE.

To update the SSIT version of the PDPS database with operational metadata, execute the steps that follow:

- 1** From the SSIT Manager, click on the **T**ools menu, then choose **P**DPs Database and then **S**SI **O**pnl Metadata Update.
 - The PDPS/SSIT Database Update GUI will be displayed.
- 2** Click on the radio button labeled **NEW PGE** in the lower left quadrant.
 - The PGE that you are working on should appear in the subwindow labeled **PGE Names** along with its version number in the subwindow labeled **PGE Versions**.
- 3** In the subwindow labeled **PGE Names**, click on a PGE name. Then in the subwindow labeled **PGE Versions**, click on the PGE version for that PGE. Then click on the button labeled **EDIT**.
 - The PGE name and version will be highlighted when you click on them.
 - The page tabs **PROFILE**, **RUNTIME**, and **ESDT** will change from gray (indicating disabled) to black (indicating enabled).
 - To see the contents of PGE Metadata, click on the button labeled **DISPLAY** and then click on the button labeled **DONE**.

- If the PGE name and/or version does not appear in the lists, it means that updating of PDPS database with PGE metadata was not successful.
- 4 Click on the **PROFILE** page tab.
- The Profile page will be displayed.
- 5 In the fields under the label **Performance Statistics**, enter the information specified.
- In the field labeled **Wall clock time**, enter the amount of wall clock time it takes for one execution of the PGE, in seconds. The tab **PROFILE** will change from black (indicating enabled) to red (indicating database needs to be updated by APPLY button).
 - In the field labeled **CPU time (user)**, enter the so-called *user* time of the PGE, in seconds. This value should come from profiling the PGE .
 - In the field labeled **Max memory used**, enter the maximum amount of memory used by the PGE, in megabytes (MB). This value should come from profiling the PGE .
 - In the fields labeled **Block input ops** and **Block output ops**, enter the integer number of block inputs and block outputs, respectively. These values should come from profiling the PGE .
 - In the field labeled **Swaps**, enter the integer number of page swaps from the PGE. This value should come from profiling the PGE .
 - In the field labeled **Page faults**, enter the integer number of page faults from the PGE. This value should come from profiling the PGE .
- 6 In the fields under the label **Resource Requirements**, enter the information specified.
- In the field labeled **DISK SPACE used for PGE run**, enter the maximum amount of disk used by the PGE during execution, in megabytes (MB). Space should be allowed for the executable(s), input files, output files, ancillary files, static files, MCFs, and the PCF. (This number should also be in the PGE metadata ODL file; yes, there is duplication here.)
 - Click on the radio button labeled **Proc. String** (if not already clicked on).
 - A list of processing strings should appear in the scrollable window to the left of the two radio buttons **Proc. String** and **Computer Name**. Nominally, only one item should be listed and should be highlighted.
 - In the field labeled **Number of CPUs**, the number 1 should appear.
- 7 Once the fields on the **PROFILE** page have been completed, click on the **APPLY** button.
- This will update the PDPS database with the information just entered. The tab **PROFILE** will change from red (indicating database needs to be updated) to black (indicating enabled).
 - An information box will be displayed; click on **Ok**.
 - To start over, click on the **RESET** button. This will clear all fields.
- 8 Click on the **File** menu and select **Exit**.
- This will end the session with PDPS/SSIT Database Update and the GUI will disappear.

11.13.5 SSIT Operational Metadata Update GUI

The SSIT version of the PDPS database is initialized and updated with SSIT Operational Metadata so that the Planning and Processing Subsystem can schedule and run PGEs. Here, PDPS Operational Metadata refers to PGE information which is supplied to the DAAC/SSIT Operator and may change frequently.

The operator enters this data directly into the SSIT Operational Metadata Update GUI (Figure 11.13.5-1). The program then writes the data directly to the SSIT version of the PDPS database. The SSIT Operational Metadata Update GUI is used to view or update the following operational parameters for a particular PGE:

- Performance parameters for the PGEs.
- Resource parameters for the PGEs.
- PGE user-defined static parameter.
- View the PGE science metadata file.

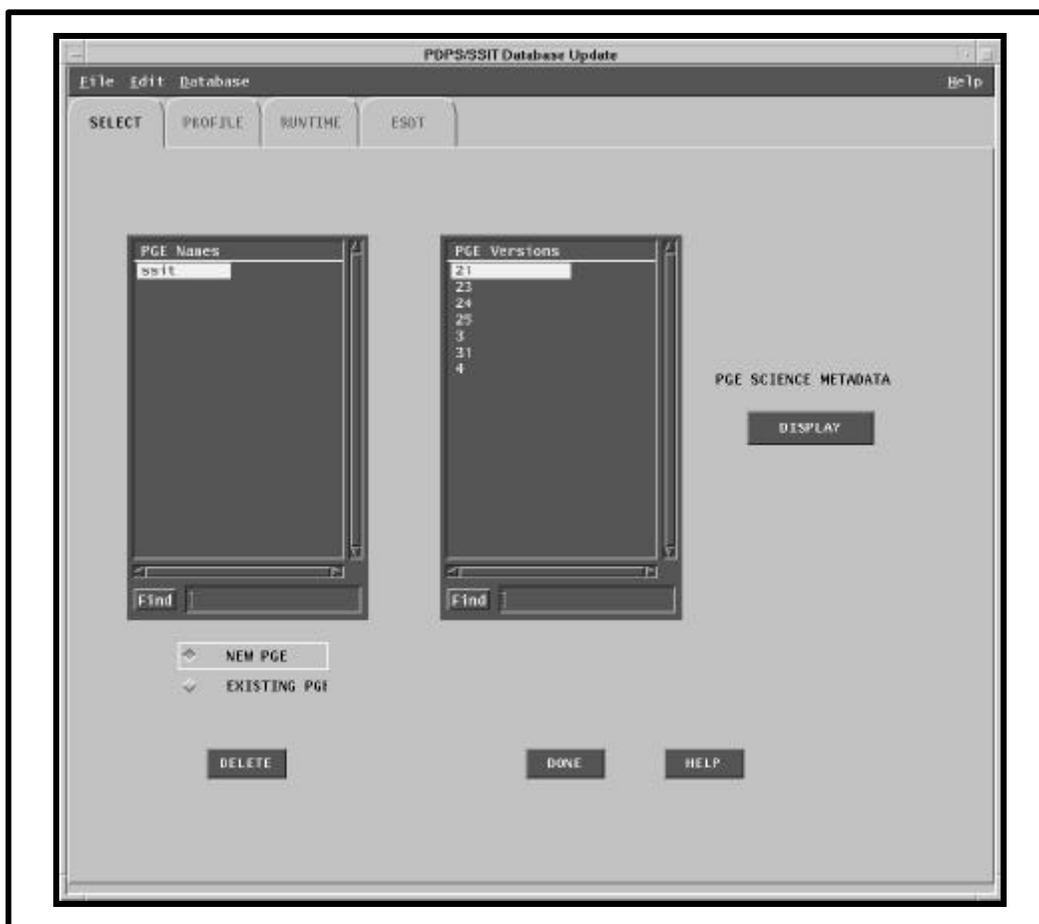


Figure 11.13.5-1. SSIT Database Operational Metadata Update GUI – SELECT view

11.13.6 Test Data Preparation and Insertion of Data Granules

This section describes how to prepare test data for use by registered PGEs. When PGEs are first delivered to the DAAC and registered within the PDPS, they will typically be run in isolation. That is, they will be run without any PGE dependencies. For this testing to be possible, test input data granules required by the PGE need to be pre-Inserted to the Data Server.

Data granules can be *dynamic* or *static*. Dynamic data granules are those whose temporal locality differs for each instance of the granule. Examples of dynamic granules are Level 0, Level 1, and Level 2 data sets. Static data granules are those whose temporal locality is static over long periods of time. Examples of static granules are calibration files which may only change with a new version of a PGE. For any granule to be Inserted to the Data Server, a Target MCF is needed (also known as an ASCII metadata ODL file or a .met file).

In the actual production environment, a Target MCF is produced by the PGE during execution. Thus, the data granule can be Inserted. In isolation testing of a PGE, however,

the inputs needed by it will not have been Inserted by a previous PGE in the chain. This Insertion must be done manually. The next two sections describes how to use the Source MCF for a dynamic data granule to create a Target MCF. and then describes how to do the Insert. In this way, a dynamic data granule can be Inserted to the Data Server as if a PGE had produced it.

11.13.6.1 Generating a Metadata Configuration File (Source MCF)

Detailed procedures for tasks performed by the SSI&T operator are provided in the sections that follow.

Assumptions:

1. The SSIT Manager is running.
2. ESDT's are installed onto the **Science Data Server**.

To Generate the Metadata Configuration File (Source MCF) for the input and output ESDT's, execute the steps that follow.

- 1 From the SSIT Manager, click on the **T**ools menu, then choose **D**ata **S**erver and then **G**et **M**CF.
 - An xterm in which EcDpAtGetMCFis running will be displayed as SSIT: Acquire MCF..
 - Alternatively, the same tool can be invoked by typing at a UNIX prompt on an AIT Sun **EcDpAtGetMCF.sh**, press **Return**.
- 2 At the program prompt **C**onfiguration **F**ilename (default *defaultConfigFile*)?
 - Type in **../.. /cfg/ defaultConfigFile** and press **Return**.
 - The *defaultConfigFile* will be replaced by the full path name and file name of the default configuration file. The file name will be **EcDpAtGetMCF.CFG** where *daac* will be replaced by one of {GSFC, EDC, LARC, NSIDC}.
- 3 At the program prompt **E**CS mode of operation (enter for default: *defaultMode*)?, type *mode*, press **Return** or just press **Return** if the default shown is correct.
 - The *mode* refers to the database used and will typically be **TS1**.
- 4 At the program prompt **E**SDT Short Name?, type *ESDT ShortName*, press **Return**.
 - The *ESDTShortName* is the name of the ESDT that the EcDpAtGetMCF tool will use to generate the MCF.
- 5 At the program prompt **E**SDT Version?, type *ESDTversion*, press **Return** or just press **Return** if the default shown is correct.
 - The *ESDTversion* is the version of the ESDT.
- 6 At the program prompt **D**irectory to receive MCF (must be full path)?, type *MCFpathname*, press **Return**.

- The *MCFpathname* is the full path name to the location where the source MCF will be placed. For example, /home/jdoe/ssit.
- 7 To the final prompt **Hit return to run again, 'q <return> to quit:**, press **Return** to generate another Source MCF or type **q** and press **Return** to quit.
- If you make a mistake entering any values, press **Return** here; your previous entries are restored as defaults and you won't have to retype them.

Example of a successful installation of a Source MCF:

Configuration filename? (enter for default: ../../cfg/EcDpAtGetMCF.CFG)

ECS Mode of operations?

OPS

ESDT Short Name?

MOD03EM

ESDT Version?

0

Directory to receive MCF? (must be full path)

/home/emcleod/MCF/

Warning: Could not open message catalog "oodce.cat"

EcDpAtGetMCF: Process Framework: ConfigFile ../../cfg/EcDpAtGetMCF.CFG

ecs_mode

OPS

incomplete group entries in the configfile,using default G1

Request for MCF successful for:

ESDT name = 'MOD03EM'

ESDT version = '0'

directory = '/home/emcleod/MCF/'

Hit return to run again, 'q <return>' to quit:

11.13.7 Creating a Target MCF (.met) for a Dynamic/Static Granule

A Target MCF file for a corresponding data granule can be created based on the information provided in the Source MCF file and the involved science software package (PGE).

In standalone or isolation testing of a PGE, the inputs needed by it will not have been inserted by a previous PGE in the chain. This insertion must be done manually. A Target MCF file for a corresponding data granule is required to run a standalone PGE. This way a dynamic data granule can be inserted to the Science Data Server as if a PGE had produced it.

Creating a Metadata ODL File for a Static Granule

- 1 At the UNIX prompt on the AIT Sun, type `cd WorkingPathname`, then press the Enter key. Example: `cd /usr/ecs/{MODE}/CUSTOM/data/DPS/ODL/`
The *WorkingPathname* is the full path name of the working directory containing the template metadata ODL file.
 - 2 At the UNIX prompt on the AIT Sun, type `cp StaticODLmet.tpl filename.met`, then press the **Enter** key.
The *StaticODLmet.tpl* is the file name of the template Target MCF.
The *filename.met* is the file name of the Target MCF for this static file. The file name extension must be `.met`.
This command will copy the template Target MCF to *filename.met*. For example, type `cp StaticODLmet.tpl CER11T.mcf.met`, then press the **Enter** key.
 - 3 At a UNIX prompt on the AIT Sun, type `vi filename.met`, then press the **Enter** key.
This command invokes the *vi* editor and reads in the Target MCF created above.
 - 4 Edit the Target MCF with the specific information for the static data granule to be inserted. The following guidelines should be followed when editing on the template MCF:
The value for the ShortName object should be filled out with proper instrument name.
The value for the Version ID object should be filled out with the proper version number.
In the **INFORMATIONCONTENTCONTAINER** object enter the following:
 - The value for the **PARAMETERNAME** object of the class “1” should be filled out with the name of static data file.
 - The value for the **PARAMETERVALUE** object of the class “2” should be filled out based on the following guideline:
 - If the data granule is a coefficient file, a “C” followed by a numerical number *n* (*n*=1,2,...) will be used. Here *n* stands for the number of the coefficient file.
 - If the data granule is a MCF file, a “M” followed by a numerical number *n* (*n*=1,2,...) will be used. Here *n* stands for the number of the MCF file.
 - 5 Save the changes made to the Target MCF (*filename.met*) and exit the editor.
The specifics depend upon which editor is being used. If using *vi*, the command sequence to enter is `:wq`, then press the **Enter** key.
-

11.13.8 Inserting Static Data Granules into the Data Server

Inserting a Static Data File:

The following Servers/Services must be up and operational:

Science Data Server, Storage Management.

The following must have occurred between those Servers/Services:

The ESDT of the static file must have been installed at the Data Server.

What the user must do before trying SSIT functionality:

Create a metadata file for the static file to insert. To do this, an MCF (See “Getting an MCF in this section”) must be gotten from the Data Server for the ESDT of the file to insert. Mandatory fields are filled into the MCF, creating a metadata file.

If the tool is NOT run from the SSIT Manager then go to the executables directory (**cd /usr/ecs/<MODE>/CUSTOM/utilities**)

Source the buildrc file for the mode in which you are working (source .buildrc). Note that this only has to be done once per login.

If the tool is NOT run from the SSIT Manager then go to the executables directory (**cd /usr/ecs/<MODE>/CUSTOM/bin/DPS**)

From the **SSIT Manager** choose **Tools** menu and then **Data Server** submenu. Choose **Insert Static File**.

The tool can also be executed by being in the **/usr/ecs/<MODE>/CUSTOM/bin/DPS** and executing **EcDpAtInsertStatic**

Shell script prompts user for information.

- 1 Enter in the location of the DpAtInsertStaticFile configuration file (**././cfg/EcDpAtInsertStaticFile.CFG**).
- 2 Enter the MODE of operation (<MODE>). At the program prompt **mode (default ops)?**, or press **Enter** to take default.
- 3 Enter the short name of the ESDT (for the static file). This value is in the pdps database under the PIDataTypeMaster table and must be in the PGE ODL file.
At the program prompt **ESDT name?** type *ESDTShortName*, then press the **Enter** key. For example type: **MOD02LUT**.
- 4 Enter the version of the ESDT for the static file. This value is also in the pdps database under the PIDataTypeMaster table and must be in the PGE ODL file.
At the program prompt **PGE version (default 1)?**, type *PGEVersion*, then press the **Enter** key.
The *PGEVersion* must match exactly the PGE version entered into the PDPS for this PGE.
- 5 Enter the science group for this static (this will be from the ODL created during Populating the PGE information in the Database).
At the program prompt **Science group for Static file(one of{C,L,D,O} followed by a 3 digit number)?**, type *ScienceGroupID*, then press the **Enter** key.

The *ScienceGroupID* is an identifier used to define the file type as a coefficient file, a lookup table file, or a MCF. It distinguishes static granules of different types which share the same ESDT. For instance, for a coefficient file, use **C n** , where number n could be 0, 1, 2...; this number n needs to be matched with the number n in the PGE_PGEName#Version.odl file. For an MCF. For example, type **C001**, press **Return**.

- The Science Group ID must match what was edited into the PGE metadata ODL file for that PCF entry.
- 6 At the program prompt **Is there more than one data file for this Static (Y = Yes, N = No)? (enter for default: N)**. If there is only one data file, press **Return** and go to next step. If there are more than one data files, type **Y**, press **Return** and go to step 10.
- 7 At the program prompt **Single Static Filename to Insert (including FULL path)?**, type *pathname/GranuleFileName*, press **Return**
- The *pathname/GranuleFileName* is the full path name and file name of the static data granule to be Inserted. For example, type **/home/MODIS/PGE10/MOD_PR28/coeff/emissivity.dat**, press **Return**.
- 8 At the program prompt **Associated ASCII Metadata Filename to Insert (including FULL path)**. Type *pathname/GranuleFileName.met*?, press **Return**.
- The *pathname/GranuleFileName.met* is the full path name and file name of the .met file for the associated static data granule to be Inserted. For example, type **/home/MODIS/PGE10/MOD_PR28/MOD28LUT.met** press **Return**.
- 9 At the program prompt **Directory where all data files and .met file exist (FULL path)?** Type *pathname* press **Return**.
- where *pathname* is the full path of the directory where all data files and .met file exist.
 - Note for a multiframe granule, the data files and .met file should be placed in the same working directory.
- 10 At the program prompt **Name of MFG file (enter to end list)?** Type in the *GranuleFileName*, one at a time and press **Return**. To end the list press **Return**.
- where *GranuleFileName* is the names of the multiframe granules.
- 11 At the program prompt **Associated ASCII Metadata Filename to Insert?** Type *GranuleFileName.met*, press **Return**.
- where *GranuleFileName.met* is the name of one .met file that is used with all data granules in the even of a multiframe granule.
 - The dynamic data granule will be Inserted to the Data Server. For reference, the Data Server Universal Reference (UR) will be printed on the screen.
- 12 At the program prompt **Hit return to run again, 'q <return>' to quit:** type **q** and press **Return** to quit or just press **Return** to insert additional dynamic granules.
- If continuing, repeat steps 2 through 9.
-

11.13.9 Inserting Dynamic Data Granules to the Science Data Server

In order for dynamic data files to be used both during the SSI&T and in production, this file must exist in the Data Server and be accessible by the local machine. A program called the Insert Test Dynamic File can be used for Inserting a dynamic data granule into the Data Server.

Detailed procedures for tasks performed by the SSI&T operator are provided in the sections that follow.

Assumptions:

1. The ESDT's have been installed on the Data Server.
2. The Target MCF for this data granule has been created for the Insert.

To Insert a dynamic granule to the Data Server, execute the following steps:

- 1 From the SSIT Manager, click on the **T**ools menu, then choose **D**ata **S**erver and then **I**nsert **T**est **D**ynamic.
 - An xterm with title "SSIT: PGE Test Dynamic Input File Insertion" will be displayed.
- 2 At the program prompt **C**onfiguration filename? (enter for default: **../.cfg/EcDpAtInsertTestFile.CFG**), press **R**eturn.
- 3 At the program prompt **E**C**S** Mode of operations?
 - Type in the **<mode>** you are working in. For example, **TS1** or **OPS**. Press **R**eturn.
- 4 At the program prompt **E**SDT short name for the file(s) to insert? type **ESDTShortName**, press **R**eturn
 - The **ESDTShortName** is the ShortName of the ESDT descriptor file corresponding to this granule to be Inserted. For example, type **MOD021KM** press **R**eturn.
- 5 At the program prompt **E**SDT Version for the file(s) to insert? Type in the ESDT version and press **R**eturn.
- 6 At the program prompt **I**s there more than one data file to this Dynamic Granule (**Y** = Yes, **N** = No)? (enter for default: **N**)? If there are no multifiles for this ESDT, press **R**eturn and go to step 7. If there are more than one file for this granule go to step 9.
- 7 At the program prompt **S**ingle Filename to Insert? (including **F**ULL path) type **pathname/GranuleFilename**, press
 - The **pathname/GranuleFileName** is the full path name and file name of the data granule to be Inserted. For example, type **/home/MODIS/PGE10/MOD021KM.A1996217.0014.002.hdf**, press **R**eturn.
- 8 At the program prompt **A**ssociated **A**SCII Metadata Filename to Insert (including **F**ULL path) , Type **pathname/GranuleFileName.met** and press **R**eturn.

- *pathname* is full name of the path and *GranuleFileName.met* is the name of the associated .met file. For example, **/home/MODIS/PGE10/MOD021KM.met**
 - The dynamic data granule will be Inserted to the Data Server. For reference, the Data Server Universal Reference (UR) will be printed on the screen.
- 9** At the program prompt **Directory where all data files and .met file exist (FULL path)?** Type *pathname* press **Return**.
- where *pathname* is the full path of the directory where all data files and .met file exist. Note for a multifile granule, the data files and .met file should be placed in the same working directory.
- 10** At the program prompt **Name of MFG file (enter to end list)?** Type in the *GranuleFileName*, one at a time and press **Return**. To end the list press **Return**.
- where *GranuleFileName* is the names of the multifile granules.
- 11** At the program prompt **Associated ASCII Metadata Filename to Insert?** Type *GranuleFileName.met*, press **Return**.
- where *GranuleFileName.met* is the name of one .met file that is used with all data granules in the even of a multifile granule.
- The dynamic data granule will be Inserted to the Data Server. For reference, the Data Server Universal Reference (UR) will be printed on the screen.
- 12** At the program prompt **Hit return to run again, 'q <return>' to quit:** type **q** and press **Return** to quit or just press **Return** to insert additional dynamic granules.
- If continuing, repeat steps 2 through 8.
-

Example of a successful insertion of a Dynamic Input Data Granule into the Data Servers:

```

PGE Test Dynamic Input File Insertion **
Configuration filename? (enter for default:
../.. /cfg/EcDpAtInsertTestFile.CFG)
ECS Mode of operations? (enter for default: OPS)
OPS
ESDT name
MOD02H
ESDT Version (enter for default: 1)
0
Staged Filename to Insert? (including FULL path)
/home/emcleod/MCF/MOD02HKM.A1997217.1730.002.hdf
Associated ASCII Metadata Filename to Insert? (including FULL path)
/home/emcleod/MCF/MOD02H.met
Warning: Could not open message catalog "oodce.cat"
EcDpAtInsertTestFile: Process Framework: ConfigFile
../.. /cfg/EcDpAtInsertTestFile.CFG ecs_mode OPS

```

incomplete group entries in the configfile,using default G1

Trying to make a request to [MDC:DSSDSRV]

incomplete group entries in the configfile, using default

Trying to make a request to [MDC:DSSDSRV]

incomplete group entries in the configfile, using default

Insert to Data Server successful:

ESDT Version = '0'

staged file = '/home/emcleod/MCF/MOD02HKM.A1997217.1730.002.hdf'

metadata file = '/home/emcleod/MCF/MOD02H.met'

Inserted at UR:

'UR:10:DsShESDTUR:UR:15:DsShSciServerUR:13:[MDC:DSSDSRV]:16:SC:MOD02H:1757'

Hit return to run again, 'q <return>' to quit:

11.13.10 Science Server Archive Package (SSAP)

The SSAP is used to provide a record of the science software, documentation, and other related files stored at the DAAC. The SSIT SSAP GUI provides a method for grouping required data about a PGE.

The SSAP is not to be confused with the Delivered Algorithm Package (DAP) received from the SCF. Much of what is in the DAP will make it into the SSAP. The key difference is that SSAP data is prepared after initial testing of the science software and will include data that reflects site integration as well as fixes required for performance at the DAAC.

The SSAP is made up of 2 different data types. The first data type is the Algorithm Package which contains metadata (name of the PGE, name of the instrument, date accepted, etc...) about the SSAP. The second data type is the source code, documentation, and test data which will be stored as a SSAP, with its own metadata in addition to the files. SSAP components such a source code will be tared to retain the directory structure.

The executables and static files are stored separately from the SSAP and will have their own data types (ESDTs).

The following is a list of tools, and or assumptions:

1. The SSIT Manager is running.
2. The PGE has been successfully built with the SCF and DAAC version of the Toolkit.

11.13.10.1 Creating an SSAP

The following Servers/Services must be up and operational:

Science Data Server, Storage Management.

The following must have occurred between those Servers/Services:

NONE.

What the user must do before trying SSIT functionality:

- 1** From the SSIT Manager choose **Tools** menu and then **Data Server** submenu. Choose **SSAP Editor**.
The GUI starts. Note that it will first query Data Server for a list of SSAPs that have previously been created. This list will appear in the window at the center (if any SSAPs already exist). Current SSAP field will be blank, and only Refresh and Create buttons will be active. All three tabs (Main, Files, and Metadata) will be active.
The SSAP GUI will be displayed.
- 2** Click on the **Create** to create a new SSAP.
 - The **Create SSAP** window appears. If no OK button is visible, resize the window such that the OK button is visible.
- 3** Enter the name of the SSAP in the first field . Enter SSAP version in the second field. Note that version has a limit of 20 characters.
- 4** Click OK and the window disappears
On the main GUI, the SSAP created (what was entered in the step above) will appear. Current SSAP is now set to that value. All buttons are now active.
- 5** To set up the SSAP components, click on the **File List** tab.
 - The File List Tab displays files in the local directory to the left and files in the selected SSAP component to the right. On the bottom left is a directory listing and a method to move through the directory tree on the local machine. Delete and Reset buttons—both active – are to the right.
- 6** To select a file in the left column, click on the **File Type** button, highlight a file (or files) and click on the **Add** arrow button to add the files..
The files selected to be added will be displayed in the right column.
To change directories (and thus add files from other directories to the SSAP component), click on the listing in the window on the bottom left of the GUI. The “..” is to go up one directory level. A single click with move to the directory chosen and change the display to show the directories under the new current directory. Note that the list of files in the upper left window changes to show the files within the current directory.
- 7** To add metadata for the new SSAP, select the **Metadata** tab.
The Metadata window will be displayed.
The Metadata Tab displays the metadata for the new SSAP. Only the Name and Version will be filled in automatically. The rest of the fields will have default information. While the SSAP can be submitted with the default information, it is wise to fill in valid values. To change a value:
- 8** To change the default information, click on the **Edit Assoc Collections** button.

- The **Edit Associated Collections** window displays a list of associated collections and fields for the entry of new ShortNames and Versions.
- 9** Enter a ShortName, and version (of the ESDT that has been installed in the Data Server) - must be eight or fewer characters. Note that the Data Server will verify if the Shortname exists.
 - 10** Enter the version (of the installed ESDT).
Then select the **OK** button. Select **Done** to close the window.
 - 11** To save the updated metadata, click **Save** on the **Metadata** tab.
 - 12** To get back to the **Main** tab, select the **Main** tab button.
 - 13** To submit the new SSAP to the Data Server, select the **Submit** button.
When the SSAP has been submitted, the **SSAP Successfully inserted to the Data Server** prompt will appear.
-

11.12.10.2 Updating an SSAP

The following Servers/Services must be up and operational:

Data Server, Storage Management.

The following must have occurred between those Servers/Services:

An SSAP must have already been inserted to the Data Server.

What the user must do before trying SSIT functionality:

The SSAP Editor has been used to insert an SSAP to the Data Server.

What must be done via SSIT tools:

If SSAP Editor is not running, use the directions from the first 2 paragraphs of (Creating an SSAP) to bring up the SSAP GUI. Note that the added SSAP should appear in the window of the Main tab.

If the SSAP Editor is already running, the added SSAP should appear in the window of the Main tab.

- 1** Click on added SSAP in the main display.
- 2** Click on the Metadata tab to update the SSAP.
The Metadata Tab displays the metadata for the SSAP. All fields will be set to the values entered when the SSAP was created, and the Algorithm Name field will be grayed out (because it may not be updated). If you want to create a new SSAP from the an existing one, go back to the Main tab and hit the Create With button.
- 3** Click on the Algorithm Version field (currently called Algorithm Description) and enter a new version (different from what is in the field when the tab is clicked).
- 4** Update any other fields that you wish to change. You can even add a new Associated Collection by clicking on the Assoc Collection button and following the steps described in Creating an SSAP.
- 5** Before you leave the Metadata tab, click Save to save the updated metadata.
- 6** Click on the File List tab to set up new SSAP components.
The File List Tab displays files in the local directory to the left and files in the selected SSAP component to the right. On the bottom left is a directory listing and a method to move through the directory tree on the local machine. Delete and Reset buttons—both active—are to the right.
- 7** Click on the File Type button to select the additional SSAP component to manipulate.
Choose one of the menu items.
Select a file (or files) from the left window to add to the component.
Click the Add Arrow button to add the files. They will appear in the right window because they are now part of that SSAP Component.
Click Main to get back to the Main tab.

On the Main tab:

Click Submit to send the new SSAP to Data Server. When finished, a message should pop up that says “SSAP Successfully inserted to the Data Server”.

11.13.11 PGE Checkout

The following Servers/Services must be up and operational:

NONE.

The following must have occurred between those Servers/Services:

NONE.

What the user must do before trying SSIT functionality:

In normal SSIT (at the DAACs) the DAP would be untared, and the source code recompiled and tested.

What must be done via SSIT tools:

Since SSIT is just a calibration of various tools, there is no specific order for which they must be run. All tools can be started from the SSIT Manager and can be executed on their own.

For SparcWorks (for code analysis and debugging), choose Tools menu and then Code Analysis submenu. See SparcWorks manuals for SparcWorks operation.

For various office tools, choose Tools menu and the Office Automation submenu. Choose from MS Windows (a simulator to allow the user to run Windows programs), Ghostview (a viewer), Netscape (for web access), Acrobat (for document viewing), and DDTS (for problem reporting).

For Standards checkers, choose Tools and then the Standards Checkers submenu.

FORCHECK is a COTS Fortran language checking program.

The Prohibited Function Checker will examine source code for functions that are not permitted. On Prohibited Function Gui, choose Analyze to select files to examine. Hit the Ok button once selections are made and a message at the top of the Gui will indicate if prohibited functions have been found. If prohibited functions HAVE been found, use the View button to view the source code with the prohibited call. The Help button gives further information on how to work the Gui.

The Process Control File Checker examines selected PCFs and highlights any errors. The Process Control File Gui allows the user to work through the directory structure on the local machine and select PCFs to be checked. Click the Check PCF button to check a selected PCF. Again, the Help button provides more information.

11.13.12 Placing the Science Software Executable (SSEP) on the Data Server

In order to be able to run a PGE within the ECS system, the EXE TAR file has to be inserted to the Science Data Server. This tar file consists of all files needed to run a PGE, except for input data files. This includes the executables, any scripts, and the SDP Toolkit message files.

Assembling a Science Software Executable Package (SSEP)

This section describes how to assemble a Science Software executables Package (SSEP) and create a corresponding Target MCF. A SSEP is a UNIX tar file which contains PGE executables and SDP Toolkit message files.

In order to Insert a PGEEEXE tar file into the Science Data Server, a corresponding Target MCF (.met) must be generated before insertion. Such an ASCII metadata ODL file can be obtained by editing an existing template ODL file with the information of the specific PGE. The following procedures describe how to assemble a PGEEEXE tar file and create an ASCII metadata ODL file.

Detailed procedures for tasks performed by the SSI&T operator are provided in the sections that follow.

Assumptions:

1. PGE executables and message files required by this PGE are available to make a SSEP.

To create an SSEP, execute the steps that follow:

- 1 At the UNIX prompt on an AIT Sun, type **mkdir *SSEPpathname***, press **Return**.
 - The *SSEPpathname* is the full path name of a *new* directory which will contain all the files to be placed into the SSEP as well as the SSEP itself.
 - It is recommended that *SSEPpathame* be named with a convention that indicates the PGE for which a SSEP will be created. For example, type **mkdir PGE35.ssep**, press **Return**.
- 2 At the UNIX prompt on the AIT Sun, type **cd *SSEPpathname***, press **Return**.
 - The *SSEPpathname* is the directory name of the new directory created in step 1.
- 3 At the UNIX prompt on the AIT Sun, type **cp *pathname/file1 pathname/file2 ... pathname/filen .***, press **Return** (note the “dot” and then space at the end of the command).
 - The *pathname/file1, pathname/file2,...pathname/filen* represents a list of path names and file names (delimited by spaces) to copy into the current directory, *SSEPpathame* (the “dot” represents the current directory and must be last in the command).

- The value for the PARAMETERNAME object of the class “4” should be filled out with the Platform Version. For
 - The value for the PARAMETERNAME object of the class “5” should be filled out with the date to perform the Insertion. For example: “970319”.
 - The value for the PARAMETERNAME object of the class “6” should be filled out with the time to perform the Insertion. For example: “14:45:00”.
- 7 Save the changes made to the SSEP’s Target MCF (*filename.met*) and exit the editor.
- The specifics depend upon which editor is being used. If using *vi*, the command sequence to enter is **:wq**, press **Return**.

For other editors, refer to that editor’s documentation

- 1 At the UNIX prompt on the AIT Sun, type **mkdir SSEPpathname** then press the **Enter** key. For example, type **mkdir MOD35.ssep**, press **Enter**.
The *SSEPpathname* is the full path name of a *new* directory which will contain all the files to be placed into the SSEP as well as the SSEP itself.
- 2 At the UNIX prompt on the AIT Sun, type **cd SSEPpathname**, then press the **Enter** key.
The *SSEPpathname* is the directory name of the new directory created in step 1.
- 3 At the UNIX prompt on the AIT Sun, type **cp pathname/file1 pathname/file2 ... pathname/filen .**, then press **Enter** (note the space then the “dot” at the end of the command).
The *pathname* is the location of the files. The *file1, file2, ... filen* represents a list of file names (delimited by spaces) to copy into the current directory, *SSEPpathame* (the “dot” represents the current directory and must be last in the command). For example, type **cd /data/MODIS/pge/MOD35.pge /data/MODIS/mcf/MOD35.mcf /data/MODIS/MOD_13453 .**, press **Enter**. (note the space then the “dot” at the end of the command).
For the synthetic PGE, only the executable needs to be copied.
- 4 At the UNIX prompt on the AIT Sun, type **tar cvf SSEPfilename.tar ***, then press the **Enter** key.
The *SSEPfilename.tar* is the file name for the SSEP tar file.
The file name extension *.tar* is recommended but not required.
The asterisk (*) is a file name wildcard that represents all files in the current directory which will place all files in the SSEP tar file.
Once created, the contents of the SSEP tar file can be viewed by typing **tar tvf SSEPfilename.tar**, then press the **Enter** key.
- 5 At the UNIX prompt on the AIT Sun, type **cp filename.met.tpl filename.met**, then press the **Enter** key.
The *filename.met.tpl* is the file name of the Target MCF for this SSEP.

For the synthetic PGE, the **met** file has already been renamed and modified for use by the student when the file was unpacked.

- 6 At the UNIX prompt on the AIT Sun, type **vi filename.met**, then press the **Enter** key.

The **filename.met.tpl** is the Target MCF for this SSEP.

- 7 Edit the **filename.met** with the specific information for the SSEP to be inserted.

The value for the **VERSIONID** object should be filled out with the proper PGE version.

In the **INFORMATIONCONTENTCONTAINER** object enter the following:

The value for the **PARAMETERNAME** object of the **class “1”** should be filled out with the PGE name. The synthetic PGE should be “userid”.

The value for the **PARAMETERNAME** object of the **class “2”** should be filled out with the PGE Science Software Version.

The value for the **PARAMETERNAME** object of the **class “3”** should be filled out with the Platform Name.

The value for the **PARAMETERNAME** object of the **class “4”** should be filled out with the Platform Version.

The value for the **PARAMETERNAME** object of the **class “5”** should be filled out with the date to perform the Insertion.

The value for the **PARAMETERNAME** object of the **class “6”** should be filled out with the time to perform the Insertion.

- 8 Save the changes made to the SSEP’s Target MCF (**filename.met**) and exit the editor.

The specifics depend upon which editor is being used. If using *vi*, the command sequence to enter is **:wq**, then press the **Enter** key.

11.13.12.2 Inserting a Science Software Executable Package onto the Data Server

. Science software, like any other data that are managed in the ECS, must be placed on the Science Data Server. A program called the Insert EXE TAR Tool can be used for Inserting a Science Software Executable Package into the Data Server.

Detailed procedures for tasks performed by the SSI&T operator are provided in the sections that follow.

Assumptions:

1. The ESDT called PGEEEXE has been installed on the Science Data Server.
2. A Target MCF (.met) for this PGEEEXE tar file has been created for the Insert.

3. The PGEEEXE tar file has been created .\
4. The following Servers/Services must be up an operational:
Science Data Server, Storage Management.

To Insert the SSEP to the Science Data Server, execute the steps that follow:

- 1 From the SSIT Manager, click on the **T**ools menu, then choose **Data Server** and then **Insert EXE TAR**.
 - An xterm with title “SSIT: PGE Executable Tar File Insertion” will be displayed.
- 2 At the program prompt **Configuration filename? (enter for default: *./../EcDpAtInsertExeTarFile.CFG*)**, press **Return**.
- 3 At the program prompt **ECS mode of operations?**, Type *<mode>* press **Return**.
 - *<mode>* can either be **OPS** or **TS1**.
- 4 At the program prompt **Name of PGE?**, type *PGENAME*, press **Return**.
 - The *PGENAME* is the name of the PGE for which this static granule is being Inserted. For example, type **PGE01**, press **Return**.
 - The *PGENAME* must match exactly the PGE name entered into the PDPS for this PGE.
- 5 At the program prompt **Science software version of PGE?**, type *SSWversion*, press **Return**.
 - The *SSWversion* is the version of the science software which is being Inserted in this SSEP. Press **Return** to accept the default or enter in a version and press **Return**.
- 6 At the program prompt **Staged filename to insert (including Full path)?**, type *pathname/SSEPFileName*, press **Return**
 - The *pathname/SSEPFileName* is the full path name and file name of the SSEP tar file to be Inserted. For example, type **/data/MOD35/ssep/PGE35_1.tar**, press **Return**.
 - The SSEP tar file must not be compressed (*e.g.* with UNIX compress or gzip).
- 7 At the program prompt **Associated ASCII metadata filename to insert (including Full Path)?** *pathname/SSEPFileName.met*?, press **Return**.
 - The default is the file name of the granule to insert with the .met file name extension. If the default is not correct, then the file name of this file must be entered.
- 8 At the program prompt **Top level shell filename within tar file?**, type *ExecFileName*, press **Return**.
 - The *ExecFileName* is the file name of the top level executable or script within the SSEP tar file. It should be the same as was entered into the PDPS/SSIT Database Update GUI.
 - The SSEP will be Inserted to the Science Data Server.

- 9 At the program prompt **Hit return to run again, 'q <return>' to quit:** type **q** and press **Return** to quit or just press **Return** to insert additional dynamic granules.
- If continuing, repeat steps 3 through 8.
-

Example of a successful insertion of a SSEP EXE TAR:

PGE Executable Tar File Insertion Script

Configuration filename? (enter for default:.././cfg/EcDpAtInsertExeTarFile.CFG)

ECS Mode of operations? (enter for default: OPS)

OPS

Name of PGE? (enter for default: PGE07)

PGE07

Science software version of PGE? (enter for default: 0)

0

Staged filename to insert (including FULL path)? (enter for default:

/home/emcleod/SSEP/MODPGE07.tar)

Associated ASCII metadata filename to insert (including FULL path)? (enter for default: **/home/emcleod/SSEP/MOD_PR10.tar.met)**

Top level shell filename within tar file? (enter for default:

/home/emcleod/SSEP/MOD_PR10.exe)

MOD_PR10.exe (note: this entry is done a second time) Note: If you get **core dump**, execute using "dbx command: type in: **dbx filename .exe**. This will help isolate error message that caused core dump.

Warning: Could not open message catalog "oodce.cat"

EcDpAtInsertExeTarFile: Process Framework: ConfigFile

.././cfg/EcDpAtInsertExeTarFile.CFG ecs_mode OPS

Performing INSERT.....

incomplete group entries in the configfile,using default G1

Trying to make a request to [MDC:DSSDSRV]

incomplete group entries in the configfile, using default

Trying to make a request to [MDC:DSSDSRV]

incomplete group entries in the configfile, using default

Insert to Data Server and PDPS database update successful for:

PGE name = 'PGE07'

```
Ssw version = '0'  
ESDT = 'PGEEEXE'  
ESDT Version = '0'  
staged file = '/home/emcleod/SSEP/MODPGE07.tar'  
metadata file = '/home/emcleod/SSEP/MOD_PR10.tar.met'  
Top level shell name = 'MOD_PR10.exe'
```

Inserted at UR:

```
'UR:10:DsShESDTUR:UR:15:DsShSciServerUR:13:[MDC:DSSDSRV]:14:LM:PGEEEXE:1787'
```

Hit return to run again, 'q <return>' to quit:

11.14 PGE Planning Processing and Product Retrieval

11.14.1 Using the Production Request Editor

When standalone tests (Run from the command line) have completed successfully and information about the PGE has been entered into the PDPS Database (through PGE registration), the PGE is ready to be run through the automated ECS PDPS environment.

To process Science data, a Production Request (PR) must be submitted to the ECS system. The Production Request Editor GUI accomplishes this function. Only one PR may be submitted at a time. A single PR is exploded by the PDPS into one or more jobs called Data Processing Requests (DPRs). The number of DPRs that are created for a single PR is determined by the number needed to cover the requested time interval, orbital extent and tile schema. Some PRs may only require one DPR.

11.14.2 Invoking the Production Request

Currently, the Production Request Editor is invoked from a command line script. In the future, this will be done by clicking on the icon for the PR Editor on the ECS Desktop. Once the Production Request Editor is invoked, it brings up a screen with five tabs at the top for selection (as shown in Figure 11.14.2-1). The first tab is labeled "Planning". Selection of this tab displays a list of four capabilities available for the PR Editor by selecting the other tabs at the top of the primary GUI screen: PR Edit, PR List, DPR View, and DPR List.

******* Please be advised: Only one user per mode can be executing a DPR at a time. If more than one occurs the system will cancel the remaining DPR's. Problem discovered when chained PGE's failed to kickoff. *******

Detailed procedures for tasks performed by the SSI&T operator are provided in the sections that follow.

Assumptions:

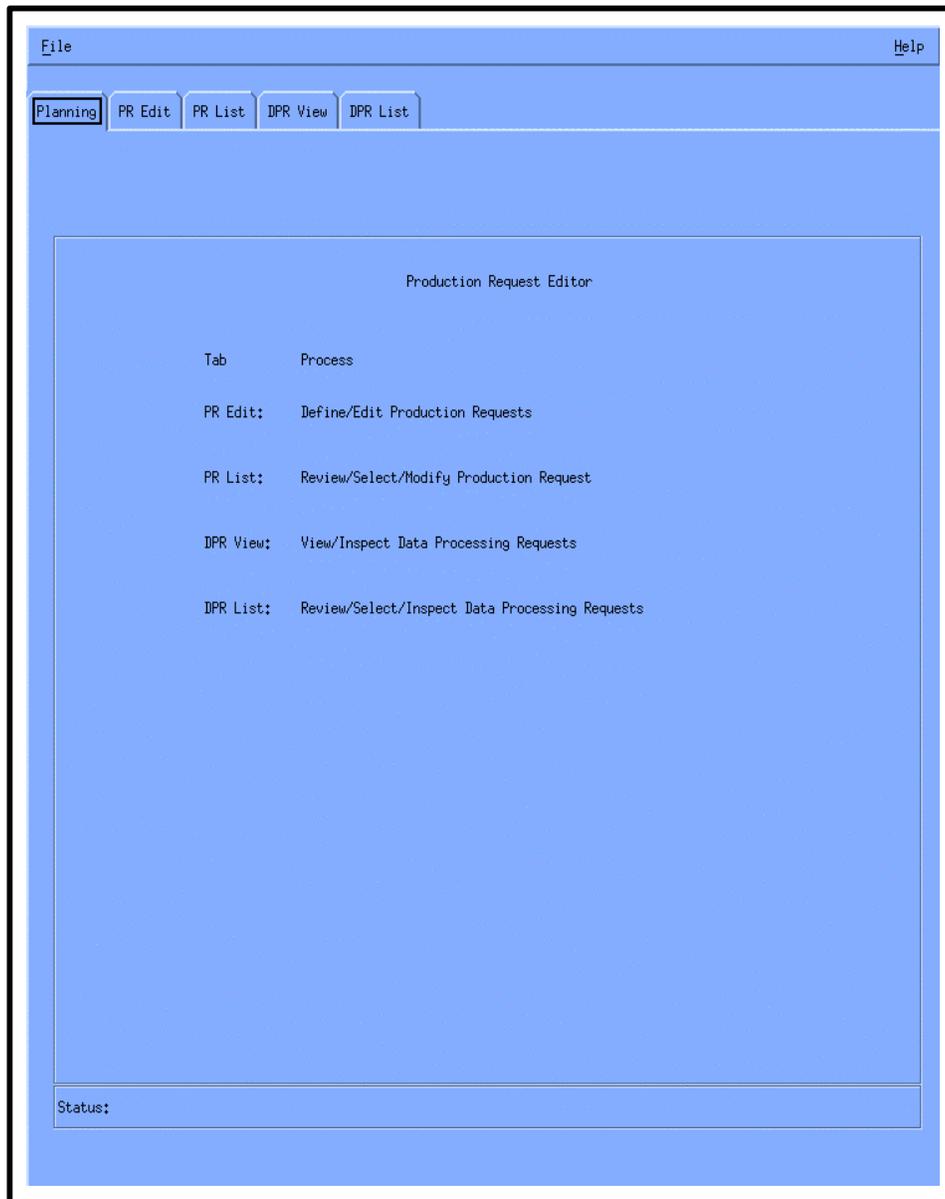
1. The PGE has been registered in the PDPS Database.

2. The PGE has been successfully compiled and linked with the DAAC version of the SDP Toolkit.
3. The required servers are up and running.

To invoke the Production Request Editor GUI, execute the procedure steps that follow:

- 1 In any currently available xterm window, spawn a new session: type **xterm &**, press **Return**. Then telnet to the PLS host.
 - It is recommended that this procedure begin within a new command shell on a PLS Host.
 - Set the DISPLAY environment variable. At the UNIX prompt on the PLS host (e.g. **odyssey**), type **setenv DISPLAY *terminal_id***, press **Return**.
- 2 Set the DCE environment variable. At the UNIX prompt on the PLS host (e.g. **odyssey**), type **dce_login *DCE_user_name* *DCE_password***, press **Return**.
- 3 Set the UNIX environment variable. At the UNIX prompt on the PLS host, change to the directory where the scripts are located (e.g. **cd /usr/ecs/TS1/CUSTOM/utilities**), then
 - Type **setenv MODE *mode*** (e.g. TS1).
 - Type **source *environment_setup_file*** (e.g. EcCoEnvCsh for C shell users).
- 4 At the UNIX prompt on the PLS host (e.g. **odyssey**), under the directory where the scripts are located (e.g. **cd /usr/ecs/TS1/CUSTOM/utilities**), type **EcPIPRE_IFStart *mode* *application_id* &**, then press **Return**.
 - The *mode* is the operations mode (e.g. TS1).
 - The *application_id* is a numerical number (e.g. 1).
 - For example, type **EcPIPRE_IFStart TS1 1 &**, press **Return**.
 - Various messages from the Production Request Editor may appear in this window as it is running. For this reason, avoid using this window for other tasks until the Production Request Editor has terminated.
- 5 In the Production Request Editor, click on one of the tabs PR Edit, PR List, DPR View, or DPR List corresponding to desired task.
 - To define a new Production Request or edit a Production Request, click on PR Edit. Proceed to Section Defining a New Production Request.
 - To review or list a Production Request, click on PR List.
 - To view or inspect a Data Processing Request, click on View.
 - To review or inspect a Data Processing Request, click on List.
- 6 When tasks are completed in the Production Request Editor GUI, click on the **File** menu, then choose **Exit**.
 - The Production Request Editor will disappear.

- Refer to Section (Troubleshooting and General Investigation) if fail to



bring up the Production Request Editor GUI.

Figure 11.14.3-1. Production Request Editor Introductory GUI

11.14.3 Defining a New Production Request

A Production Request (PR) is a request for data production of granules between a start date/time and an end date/time. A PR will explode into one or more Data Processing Requests (DPR) depending upon the time interval involved. Each DPR corresponds to the execution of a PGE. Therefore, a PR results in the execution of a PGE one or more times. Only one PGE is involved in a single Production Request.

Detailed procedures for tasks performed by the SSI&T operator are provided in the sections that follow.

Assumptions:

1. The user has selected the **PR Edit** tab from the Production Request Editor .
2. The PGE involved in the Production Request has been registered in the PDPS database.

On workstation **x0pls##**, at the UNIX prompt in a terminal window, type as in step 1 below your user id and password.

NOTE: The **x** in the workstation name will be a letter designating your site:

g = GSFC, **m** = SMC, **l** = LaRC, **e** = EDC, **n** = NSIDC, **o** = ORNL, **a** = ASF, **j** = JPL; the **##** will be an identifying two-digit number (e.g., **g0pls02** indicates a Planning Subsystem (PLS) workstation at GSFC).

If you access the workstation through a remote login (rlogin), you must enter **xhost <remote_workstation_name>** prior to the rlogin, and enter **setenv DISPLAY <local_workstation IP address>:0.0** after the rlogin, before entering the command. The **<ipaddress>** is the ip address of **x0pls##**, and **xterm** is required when entering this command on a Sun terminal.

To define a new Production Request, execute the procedure steps that follow:

- 1 From the Production Request Editor GUI, click on the **PR Edit** tab.
 - The PR Edit page will be displayed as shown in **Figure. 11.14.3-2**.
- 2 In the field labeled **PR Name:**, enter **New** or verify that **New** is already entered as the default.
- 3 The PGE for the Production Request must be selected from a list. To do this, click on the **PGE...** button.
 - A GUI labeled **PGE Selection** will be displayed within which registered PGEs will be listed. The appropriate PGE can then be selected by clicking on it and then on the **OK** button.
 - The selected PGE will then be used to populate **Satellite Name, Instrument Name, PGE Name, and PGE Version** fields of the main GUI.
- 4 In the field labeled **Priority:**, enter *priority*.
 - The *priority* is the priority to be assigned to this Production Request in the range 0 through 99 with 0 being the highest priority and 99 the lowest. For example, enter **40**.
- 5 In the Production Request Editor GUI, a **Duration** option is selected automatically based on the PGE registered into the PDPS. Two options are provided:
 - **UTC Time** for time range.

- **Orbit** for orbit number range.
- 6 In the Production Request Editor GUI, enter *StartDate* and *StartTime* in fields labeled **Begin**, respectively.
 - The *StartDate* and *StartTime* are the start date and time of the Production Request and should be entered in the mm/dd/yy and hh:mm:ss formats.
 - 7 In the case of UTC Time duration, enter *EndDate* and *EndTime* in fields labeled **End**, respectively.
 - The *Enddate* and *EndTime* are the end date and time of the Production Request and should be entered in the mm/dd/yy and hh:mm:ss formats.
 - 8 In the case of Orbit duration, enter *StartOrbit* and *EndOrbit* in fields labeled **From** and **To**, respectively.
 - The *StartOrbit* and *EndOrbit* are the orbit range of the Production Request.
 - 9 Optionally, enter *Comment* in field labeled **Comment:**.
 - This comment will be displayed whenever this Production Request is brought up and viewed.
 - 10 When Production Request is complete, click on **File** menu and select **Save As....**
 - A GUI labeled **File Selection** will be displayed.
 - In the field labeled **Selection**, enter a user-defined name to be assigned to the Production Request. Then click on the **OK** button. A message box will be displayed stating “Production Request Explosion into DPRs ok, *n* DPRs Generated”, where *n* will be the number of DPRs (e.g. a 2-hr PR time will generate 24 DPRs for the 5-min processing period). Click on the **Ok** button. A second message box stating “Write to Database of Production **Ok**.”
- Note that you will not be allowed to enter a PR name that already exists. PR names that already exist will be displayed in the main window. The Production Request will then be saved under the name specified.
- Refer to Section (Troubleshooting and General Investigation) if fail to generate the DPRs.
- 11 When tasks are completed with the Production Request Editor GUI, click on the **File** menu, then choose **Exit**.
 - The Production Request Editor GUI will disappear.
-

File Edit Help

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

Production Request Identification

PR Name: Origination Date:

PR Type: Originator:

Priority:

Request Definition

Satellite Name:

Instrument Name:

PGE Name:

PGE Version:

Profile Id:

Duration UTC Time Orbit

Begin / / - : :

End / / - : :

Tile Id

From

To

Intermittent DPR Skip Keep SkipFirst

Comment:

Status:

Figure 11.14.3-2. Production Request Editor GUI(Planning)

11.14.3 Processing

Once a candidate plan has been activated, each of the DPRs will result in subscriptions to the Data Server for the data needed. A request will go to the Data Server asking for notification when the required input data arrives.

Planning knows what data to request from the Data Server because the PDPS database stores this information as determined by the ESDT for each PGE. When the Data Server receives new data, it routinely checks to see if there are any outstanding subscriptions. If there are subscriptions, Planning will be notified. Once the input data required by a DPR becomes available, the DPR can be queued for processing.

Staging - The Data Processing Subsystem requests that the required input data, PGE (binary executables and shell scripts) and SDP Toolkit files be placed on a disk set aside for processing.

Process Control File (PCF) - establishes a linkage between logical Ids that the science software uses and the physical files that exist on the staging disk.

After the PGE has completed, the DPS will deallocate resources.

A Production History file will be created and will contain information concerning the conditions that the data products were generated by the PGE.

11.14.3.1 Viewing Production Requests

A Production Request (PR) is a request for data production of granules between a start date/time and an end date/time. A PR will explode into one or more Data Processing Requests (DPR) depending upon the time interval involved. Each DPR corresponds to the execution of a PGE. Therefore, a PR results in the execution of a PGE one or more times. Only one PGE is involved in a single Production Request.

This procedure describes how to view PRs that have already been defined . It assumes that the **PR List** tab has been selected from the Production Request Editor.

The information listed for each PR is:

- PR Name - The name assigned to the Production Request when it was defined.
- PGE ID - The name of the PGE involved in the PR.
- Priority - The priority (0 - 99) of the PR assigned when it was defined.
- Start - The start date and time of the PR.
- End - The end date and time of the PR.
- Comment - Any comment that was entered when the PR was defined.

Detailed procedures for tasks performed by the SSI&T operator are provided in the sections that follow.

Assumptions:

1. The user has selected the **PR List** tab from the Production Request Editor.
- 1** From the Production Request Editor GUI, click on the **PR List** tab.

- The PR List page will be displayed as shown in **Figure. 11.14.3-3**.
- 2 View the listed PRs. Optionally, find a PR by entering a search string in the field next to the **Find** button and then clicking on the **Find** button.
 - 3 To modify a PR listed, click on the PR in the list and from the **File** menu select **Save As...**
 - In the **File Selection** GUI, replace the current PR name shown in the **Selection** field with a new PR name. Then click on the **OK** button.
 - When modifying an existing PR, it must be saved under a new PR name.
 - Next, click on the **PR Edit** tab. The PR Edit page will be displayed with fields populated from the existing PR name, but having the new PR name chosen above.
 - See Section on using the PR Edit page and saving any changes made

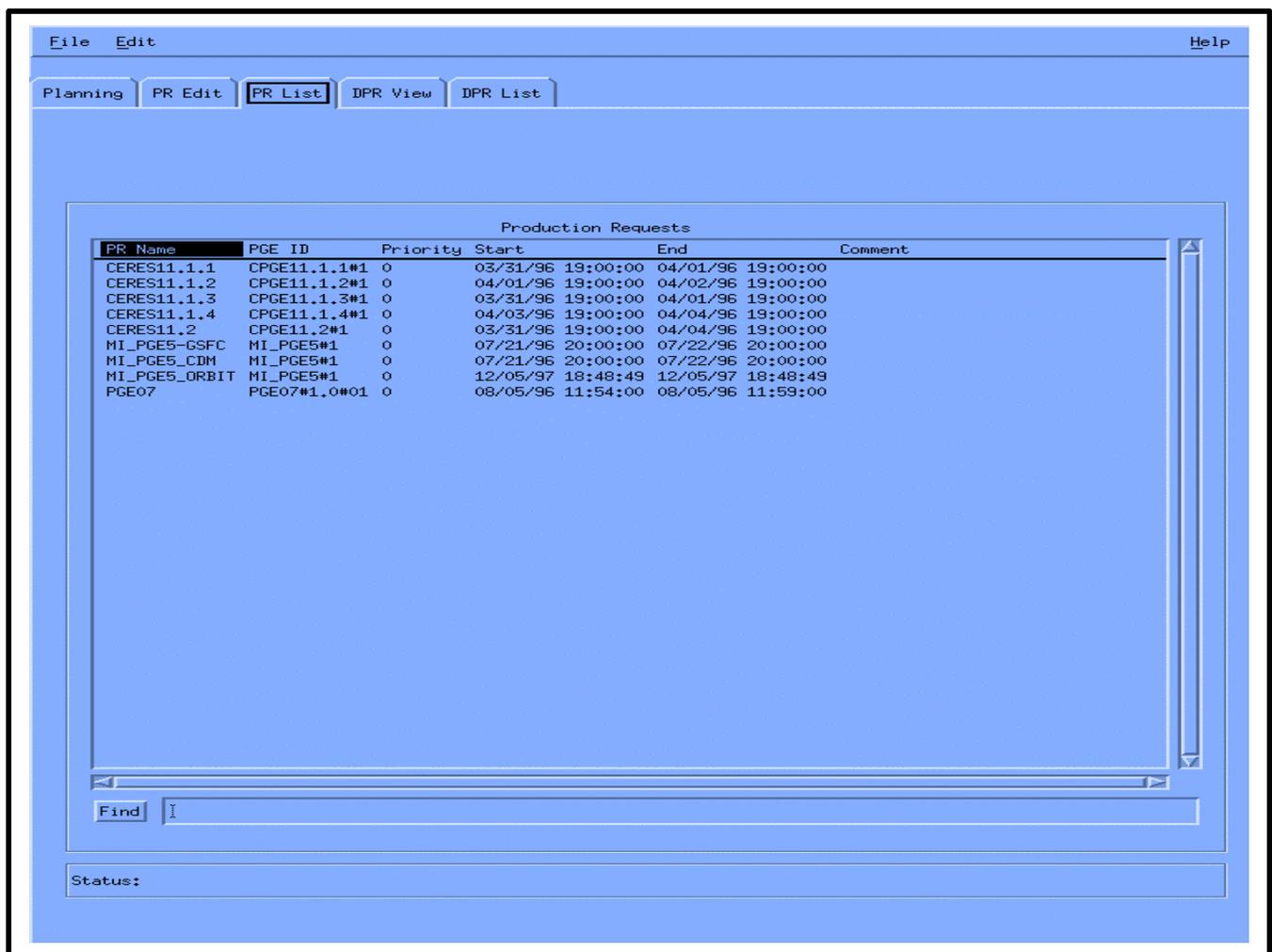


Figure 11.14.3-3. PR List GUI.

11.14.3.2 Viewing Data Processing Requests

Clicking on the DPR View GUI tab displays a list of all DPRs for all PRs entered into the system.

Detailed procedures for tasks performed by the SSI&T operator are provided in the sections that follow.

1 From the PR Editor GUI, click on **DPR View** tab. The following information will be displayed:

- Data Processing Request Identification.
- PGE ID and its parameters.
- Request Data and Status.

11.14.3.3 Listing Data Processing Requests

Selection of one PR on the PR List by highlighting it and then clicking on the DPR List tab, brings up a detailed display of all DPRs associated with the selected PR. These may be examined in order to develop production plans and schedule jobs.

Detailed procedures for tasks performed by the SSI&T operator are provided in the sections that follow.

1 From the PR Editor GUI, click on **DPR List** tab. The following information is displayed:

- DPR Id.
- PGE Id.
- PR Name.
- Data Start Time.
- Data Stop Time.

11.14.4 Using the Production Planning Workbench

The Production Planner uses the Production Planning Workbench to create new production plans and display a planning timeline.

11.14.4.1 Using the Planning Workbench to Run a PGE

Once a PGE has been fully registered, its test data files have been inserted to the Science Data Server, and a single Data Processing Request (DPR) has been generated, the Planning Workbench can be used to plan for one execution run of a single PGE.

Detailed procedures for tasks performed by the SSI&T operator are provided in the sections that follow.

Assumptions:

1. The required UNIX environment variables have been set properly.
2. The required servers of the ECS System are up and running.

3. A DPR has been generated successfully.
- 1 **Telnet to (PDPS) odyssey** or from the **SSIT Manager**, click on the **Tools** menu, then choose **xterm**. Then telnet to a PLN Host.
 - Alternatively, in any currently available xterm window, spawn a new session: type **xterm &**, press **Return**. Then telnet to the PLN Host.
 - It is recommended that this procedure begin within a new command shell on a PLN Host.
 - 2 login: **cmts1**
password: **ecsuser**
 - 3 *Login to DCE (dce_login awhitele awhitele), setenv DISPLAY:0.0*
 - Change the working directory to the location where the script for starting the Autosys is stored. (e.g. **cd /usr/ecs/<mode>/CUSTOM/utilities**).
 - Type: **source EcCoEnvCsh**
 - 4 At the UNIX prompt on an PLN Host, Type **EcPIAllStart <mode> <application_id>**, press **Return**.
 - The *mode* is one of modes used in the ECS system. e.g. TS1.
 - The *application_id* is a numerical number. e.g. 1.
 - For example: **EcPIAllStart TS1 1, Return**.
 - A Planning Workbench GUI will be appeared as shown in **Figure 11.14.4-1**.
 - 5 In the Planning Workbench GUI, go to the subwindow labeled **Unscheduled** and click on a Production Request name.
 - The Production Request name is the name under which the PR was saved.
 - The PR name entry will be highlighted.
 - 6 In the Planning Workbench GUI, click on the button next to the label **Schedule** (the button has an inverted triangle on it).
 - The PR highlighted in step 3 will appear in the subwindow labeled **Scheduled**.
 - 7 In the Planning Workbench GUI, click on the **Activate** button
 - A small GUI labeled **Plan Activation** will be displayed.
 - 8 In the Plan Activation GUI, set the time in the time field forward to allow ample time for the PGE to run. Then click on the **Ok** button.
 - All that is necessary is for there to be sufficient time for the PGE run. There is no penalty for allowing *too* much time.
 - The Production Request thus planned will be submitted to processing and its progress can be monitored with AutoSys.
 - 10 When tasks are completed with the Planning Workbench GUI, click on the **File** menu, then choose **Exit**.
 - The Planning Workbench GUI will disappear.

Important Note : The creation of Production Requests and Plans requires close coordination among all who are using the same mode in SSIT. Otherwise, the submittal of a Plan may prevent a waiting DPR from starting. In particular, when submitting a new Plan in a mode being shared with others, one should:

1. Ask everyone else if they have a DPR awaiting data as part of a chain.
 2. Check the PDPS database table PIDataProcessingRequest for any DPRs that are in state CQ_HOLD and include these in the new Production Request and Plan.
 3. Also, include any DPRs (except those marked SUCCESS) upon which the given DPR depends in the new Production Request and Plan.
-

11.14.4.2 Creating and Activating a Production Plan

The Production Planner creates a plan for production data processing at the DAAC by selecting specific PRs whose DPRs are to be run. The planning tool provides a forecast of the start and completion times of the jobs based upon historical experience in running these PGEs. Through the planning tool, when the generated plan is “activated,” the information included in the plan is transferred to the Data Processing subsystem and loaded into the Platinum AutoSys tool where production processing is managed.

The Production Planner creates the plan by selecting PRs from two lists of PRs, i.e., the list of available “Unscheduled” PRs and the list of “Scheduled” PRs. Using arrow buttons, the Production Planner moves the PRs between lists until the “Scheduled” list contains the desired set of PRs that define the new plan. Only one user can use the **Planning Work Bench** at a time. It is recommended for SSI&T that only one person do the planning for the group.

Before creating a new production plan the Production Planner must have available the following information:

- Name of the plan.
- Comments (if any).
- PRs to be included in the new production plan.

- 1 Log into one of the pln sun workstations by typing: **username** then press the **Enter** key.
- 2 Enter the **password** then press the **Enter** key.
If you access the workstation through a remote login (**rlogin**), you must enter **xhost <remote_workstation_name>** then press the **Enter** key.
Once you have entered **xhost <remote_workstation_name>**, but prior to the remote login, enter **setenv DISPLAY <local workstation IP address>:0.0** where the local workstation IP address represents the IP address you where you are located.

You may need to setup the terminal so that the remote host is displayed on your screen (Sun machine). This is done by clicking on the **Application Manager** icon (the file drawer located at the bottom of the screen), followed by the **Desktop Tools** icon, followed by the **Terminal Console** icon, then typing **xhost+**.

3 At a UNIX prompt type `cd` to the directory where the scripts are located. (e.g. `/usr/ecs/TS1/CUSTOM/utilities`).

4 At a UNIX prompt type `setenv DISPLAY hostname:0.0`

5 At a UNIX prompt on the PLN host (e.g. odyssey), type `EcPIPE_IFStart mode 3 a`

Planning Workbench GUI is displayed (Figure 11.14.4-1)

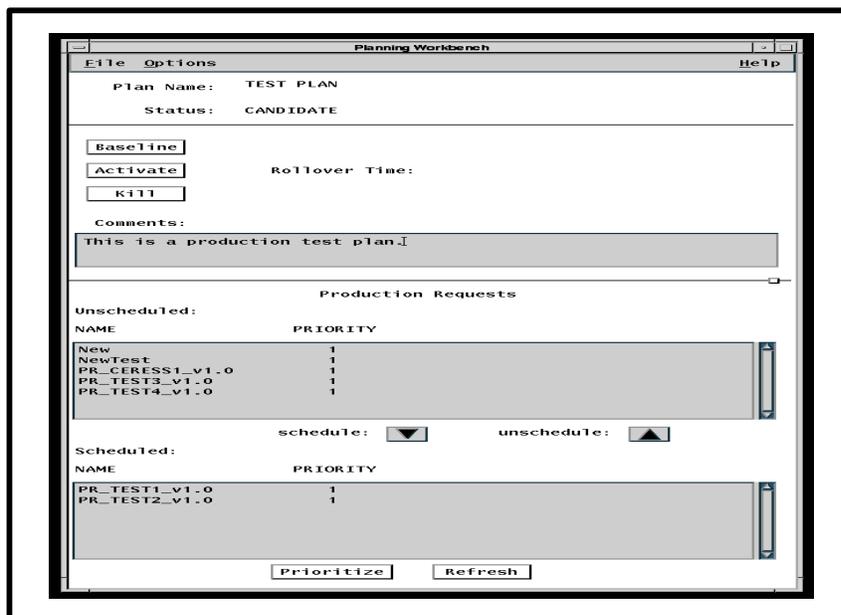


Figure 11.14.4-1. Planning Workbench GUI

Data concerning the currently active production plan are displayed.

If you want to “kill” (deactivate) the currently active production plan without activating a replacement, click on the **Kill** button.

Whenever you activate a plan (by clicking on the **Activate** button), you automatically “kill” the currently active plan.

6 Select **File** → **New** from the pull-down menu.

The “New” window appears.

7 Type a name for the new plan, then press the **Tab** key on the keyboard.

The **Planning Workbench** GUI is displayed.

The **Plan Name** is displayed.

The **Status** displayed is **Candidate**.

8 Type the desired date (in **MM/DD/YY** format), then press the **Tab** key on the keyboard to advance to the next field.

- 9 Type the desired time (in *hh:mm* format), then press the **Tab** key on the keyboard.
The **Rollover Time** is displayed.
- 10 Type any relevant comments (up to 255 characters) in the **Comments** field.
- 11 Move PRs between the **Unscheduled** and **Scheduled** lists as necessary by selecting (highlighting) the PR to be moved by clicking on the PR in the list from which it is to be moved then clicking on the up or down arrow button (as applicable) to move the PR to the other list.
Highlighted PR disappears from one list and appears on the other.
The unscheduled and scheduled PR lists are scrollable.
- 12 When the **Scheduled** list accurately reflects the PRs to be scheduled in the production plan, select **File** → **Save** (or **File** → **Save As**) from the pull-down menu to save the new production plan.
The new production plan is saved.
- 13 If the new plan is to be activated immediately, click on the **Activate** button to activate the new plan.
The currently active plan is killed (deactivated) and the new plan is activated.
 - The **Production Planning Timeline** GUI is displayed.
- 14 If the new production plan is to be used as a baseline plan, click on the **Baseline** button.
The “New” window appears.
The plan is recorded as well as the time of baselining so that it can be used in comparing future processing results with planned objectives.
- 15 If the production plan being displayed is active and should be deactivated, click on the **Kill** button.
The “New” window appears.
The plan is deactivated without activating another plan.

The progress of one or more PGEs running within the PDPS may be monitored. The COTS tool used for this purpose is AutoSys® by Atria Software. Each Data Processing Request results in seven AutoSys jobs that are boxed together. An AutoSys job name follows the template:

PGName#Suffix

where *PGName* is replaced by the name of the PGE, and *Suffix* is a character indicating the job phase of the DPR

For example, for a scheduled PGE named MOPITT4, the AutoSys jobs making up that DPR would be:

MOPITT4#A
 MOPITT4#S
 MOPITT4#P
 MOPITT4#E
 MOPITT4#p
 MOPITT4#I
 MOPITT4#D

Detailed procedures for tasks performed by the SSI&T operator are provided in the sections that follow.

Assumptions:

1. The required servers of the ECS System are up and running.
2. A DPR has been scheduled successfully.

To monitor production, execute the procedure steps that follow:

- 1 In any currently available xterm window, spawn a new session: type **xterm &**, press **Return**. Then telnet to the DPS host.
 - It is recommended that this procedure begin within a new command shell on a DPS Host.
 - Set the DISPLAY environment variable. At the UNIX prompt on the DPS host (e.g. illiad), type **setenv DISPLAY terminal_id**, press **Return**.
- 2 Set the DCE environment variable. At the UNIX prompt on the DPS host (e.g. illiad), type **dce_login DCE_user_name DCE_password**, press **Return**.
- 3 Set the UNIX environment variable. At the UNIX prompt on the DPS host, change to the directory where the scripts are located (e.g. **cd /usr/ecs/TS1/CUSTOM/utilities**), then
 - Type **setenv MODE mode** (e.g. TS1).
 - Type **source environment_setup_file** (e.g., **EcCoEnvCsh** for C shell users).
- 4 At the UNIX prompt on the DPS Host, under the directory where the scripts are located (e.g. **cd /usr/ecs/TS1/CUSTOM/utilities**), type **EcDpPrAutosysStart mode application_id &**, then press **Return**.
 - The **mode** is one of modes used in the ECS system (e.g., TS1).
 - The **application_id** is a numerical number (e.g., 1).
 - For example: **EcDpPrAutosysStart TS1 1, Return**.
 - A GUI labeled **AutoSys** will be displayed.
 - This GUI will contain eight buttons for invoking various tools available under AutoSys.
- 5 In the AutoSys GUI, click on the **Ops Console** button.
 - A GUI labeled **AutoSys Job Activity Console** GUI will be displayed.
 - The main subwindow of this GUI will contain a dynamically updated list of AutoSys jobs (seven jobs make up one DPR) currently scheduled.
 - To disable dynamic updating of the main subwindow (which may be distracting), click on the **View** menu, then choose **Select Jobs**. A GUI labeled **Job Selection** will be displayed. Under the label **Select by Name**, click on the square labeled **All jobs**, then click on the **OK** button.
 - DPRs will be listed in the column labeled **Job Name** and their statuses (e.g. SUCCESS) will be listed in the column labeled **Status**.
 - To view job status information for a particular DPR, click on a DPR. Below the main subwindow, available job status information will be displayed.
 - To view the existing event report, under the label **Reports**, click on the middle diamond labeled **Event**. The current event status for the selected

DPR will be displayed in the subwindow labeled **Event Report**. Alternatively, the summary report for the selected DPR will be displayed by clicking on the middle diamond labeled **Summary**.

- To view the job definition, under the label **Show**, click on the **Job Definition** tab. A GUI labeled **Job Definition** will be displayed. The selected DPR is shown in **Job Name**. To kill the DPR, click on the **Delete** tab. (**Warning: Be very careful to avoid deleting wrong DPR!**)
 - Exit the **AutoSys Job Activity Console** by clicking on the **Exit** button.
- 6 In the AutoSys GUI, click on the **JobScape** button.
- A GUI labeled **JobScape** will be displayed.
 - The main subwindow of this GUI will contain a dynamically updated list of AutoSys jobs (seven jobs make up one DPR) currently scheduled. The colors indicate the job statuses for DPRs and their jobs at present.
 - There are eleven job statuses: **ACTIVATED, STARTING, RUNNING, SUCCESS, FAILURE, TERMINATED, RESTART, QUE_WANT, ON_ICE, OFF_HOLD, and INACTIVE**. The color chart is on the left of GUI.
 - To view job status information for a particular DPR (or job) in detail, click on a DPR (or job), then click on the **Job Console** button. A GUI labeled **Job Console** will be displayed. The information shown here is similar to that shown in **Ops Console** as mentioned above.
 - To change the status of a job for a particular DPR, click on a job under that DPR, then press the right button of the mouse. Choose one of the functions in the lower part of the menu. For example, to hold a job, choose **On Hold**, then click the **Yes** button.
 - **Suggestion:** For a scheduled DPR, hold all jobs for that DPR except the first one (Allocation). After the first job runs successfully, release the next job (Staging) by choosing **Off Hold**. Repeat until all jobs are done. Therefore, if a job fails, it can be fixed and rerun without interfering with the others.
 - To exit the **JobScape**, click on the **File** menu, then choose **Exit**.
- 7 In the AutoSys GUI, click on the **TimeScape** button.
- A GUI labeled **TimeScape** GUI will be displayed.
 - The main subwindow labeled **Job Name** of this GUI will contain a dynamically updated list of AutoSys jobs (seven per DPR) currently scheduled.
 - To disable dynamic updating of AutoSys jobs (which may be distracting), click on the **Freeze Frame** button.
 - The color of each job indicates its status according to the legend on the left side of the GUI.
 - The time line is shown on the right side of the GUI with time marked at the top. A red vertical line (dashed) indicates the current time.
 - Exit the **TimeScape** GUI by clicking on the **File** menu and selecting **Exit**.
- 8 To quit AutoSys, in the AutoSys GUI, click on the **Exit** button.
- The AutoSys GUI will disappear.
 - Refer to Section (Troubleshooting and General Investigation) if any job fails on AutoSys.
-

On workstation **x0pls##**, at the UNIX prompt in a terminal window, enter steps as in step 1 below.

NOTE: The **x** in the workstation name will be a letter designating your site:

g = GSFC, **m** = SMC, **l** = LaRC, **e** = EDC, **n** = NSIDC, **o** = ORNL, **a** = ASF, **j** = JPL; the **##** will be an identifying two-digit number (e.g., **g0pls01** indicates a Planning and Data Processing subsystem(PLS) workstation at GSFC).

If you access the workstation through a remote login (rlogin), you must enter **xhost <remote_workstation_name>** prior to the rlogin, and enter **setenv DISPLAY <local_workstation IP address>:0.0** after the rlogin, before entering the command. The **<ipaddress>** is the ip address of **x0pls##**, and **xterm** is required when entering this command on a Sun terminal.

11.14.5 Monitoring Production in PDPS Subsystem

Example of monitoring production using above procedures:

- 1 **telnet to (PDPS) taltos** or from the SSIT Manager, click on the **T**ools menu, then choose **X**term. Then telnet to a PLN Host.
- 2 login: **cmts1**, password: **ecsu\$er**
- 3 *Login to DCE (dce_login awhitele awhitele), setenv DISPLAY:0.0*
 - Change the working directory to the location where the script for starting the Autosys is stored. (e.g. **cd /usr/ecs/<mode>/CUSTOM/utilities**).
 - **setenv MODE <MODE>**
 - **source EcCoEnvCsh**
- 4 At the UNIX prompt on the PLN Host, type: **EcDpPrAutosysStart <MODE> <Autosys Instance>**, example: **TS1 1, &**, press **Return**.
 - A GUI labeled **AutoSys** will be displayed.
 - This GUI will contain eight buttons for invoking various tools available under AutoSys.
- 5 In the AutoSys GUI, click on the **Ops Console** button.
 - The AutoSys GUI will be displayed.
- 6 Select the desired display and view the contents.
 - Selections include:
 - Autosys Job Activity Ops Console
 - HostScope
 - TimeScope
 - JobScope
 - The main subwindow of this GUI will contain a dynamically updated list of AutoSys jobs (seven jobs make up one DPR) currently scheduled.
 - To disable dynamic updating of the main subwindow (which may be distracting), click on **Freeze Frame** in the small subwindow labeled **Show**.

- DPRs will be listed in the column labeled **Job Name** and their statuses (SUCCESS, FAILURE, TERMINATED) will be listed in the column labeled **Status**.
- To view job status information for a particular DPR, click on a DPR. Below the main subwindow, available job status information will be displayed.
- To view the existing event report, under the label **Reports**, click on the middle diamond labeled **Event**. The current event status for the selected DPR will be displayed in the subwindow labeled **Event Report**.
- Exit the **AutoSys Job Activity Console** by clicking on the **Exit** button.

Suggestion: For a scheduled DPR, hold all jobs for that DPR except the first one (Allocation). After the first job runs successfully, release the next job (Staging) by choosing Off Hold. Repeat until all jobs are done. Therefore, if a job fails, it can be fixed and rerun without interfering with the others.

This is especially important for the Postprocessing job. If the PGE fails and the Postprocessing job is not **On Hold**, the DPR will have to be deleted and a new one created. This happens because PDPS will have deleted all references to the output granules in the PDPS database

- 7 In the AutoSys GUI, click on the **TimeScope** button.
 - A GUI labeled **TimeScope** GUI will be displayed.
 - The main subwindow labeled **Job Name** of this GUI will contain a dynamically updated list of AutoSys jobs (seven per DPR) currently scheduled.
 - To disable dynamic updating of AutoSys jobs (which may be distracting), click on the **Freeze Frame** button.
 - The color of each job indicates its status according to the legend on the left side of the GUI.
 - The time line is shown on the right side of the GUI with time marked at the top. A red vertical line (dashed) indicates the current time.
 - Exit the **TimeScope** GUI by clicking on the **File** menu and selecting **Exit**.
 - 8 To quit AutoSys, in the AutoSys GUI, click on the **Exit** button.
 - The AutoSys GUI will disappear.
 - 9 Use the “**tail -f em.log**” to create a permanent record of a log file if debugging is necessary. Note: the xx.log file has to be created first: “**vi em.log**”
 - 10 To look at the Data Base type: **setenv MODE <MODE>, cd utilities source EcCoEnvCsh, cd dbr, dbrowser-syb <MODE> 2 &**
 - 11 Scripts to restart the servers and subsystems are located in: **/home/cmts1/restart/drop4/**
-

11.14.6 Using the Q/A Monitor

The Q/A Monitor allows the output products produced during a PGE run to be accessed and examined. Input test data granules and Production History files can be retrieved in the

same manner. The Q/A Monitor retrieves output products based on the collection name (*i.e.* the ESDT) and time of Insertion to the Science Data Server.

Detailed procedures for tasks performed by the SSI&T operator are provided in the sections that follow. The Q/A Monitor is discussed in more detail in Section 15.

Assumptions:

1. The required UNIX environment variables have been set properly.
2. The desired output products have been successfully Inserted to the Science Data Server.

To use the Q/A Monitor, execute the procedure steps that follow:

- 1** **telnet to (PDPS) taltos** or from the SSIT Manager, click on the **T**ools menu, then choose **x**term. Then telnet to a PLN Host.
 - Alternatively, in any currently available xterm window, spawn a new session: type **xterm &**, press **Return**. Then telnet to the PLN Host.
 - Set the DISPLAY environment variable: **setenv DISPLAY terminal_id**, press **Return**.
 - Type **setenv <mode>** (e.g., **TS1**).
 - Type **source environment_setup_file** (e.g., **EcCoEnvCsh** for C shell users).
- 2** login: **cmts1**, password: **ecsu\$er**
- 3** *Login to DCE (dce_login awhitele awhitele), setenv DISPLAY:0.0*
 - Change the working directory to the location where the script for starting the Autosys is stored. (e.g. **cd /usr/ecs/<mode>/CUSTOM/utilities**).
- 4** At the UNIX prompt on the PLN Host, type: **EcDpPrQaMonitorGUIStart <MODE> <Q/A Monitor Instance>**, example: **TS1 1, &**, press **Return**.
 - The *mode* is the operations mode.
 - The Q/A Monitor GUI will be displayed.
 - Various messages from the Q/A Monitor will appear in this window as it is running.
- 5** In the Q/A Monitor subwindow labeled **Data Types**, select an ESDT from the list presented and click on it.
 - Use the scroll bars if necessary to locate desired ESDT.
 - Optionally, use the **Find** field and button to locate an ESDT.
- 6** In the Q/A Monitor, under the label **Data Granule Insert Date (mm/dd/yy)**, set the date range within which the search for granules of the ESDT selected will be conducted.
 - The date range can be made arbitrarily large to select all granules of a particular collection (ESDT).
 - The dates refer to date of granule Insert to the Science Data Server.
- 7** In the Q/A Monitor, click on the **Query** button.
 - The results of the query will be displayed in the bottom window, labeled **Data Granules**.
 - All granules having the ESDT selected in step 3 and having Insert times within the date range specified in step 4 will be listed in this window.

- 8 In the Q/A Monitor subwindow labeled **Data Granules**, click on one of the data granules listed to be examined.
 - The data granule selected will be highlighted.
 - 9 To retrieve the data granule's Production History file, click on the **Retrieve Prod History** button.
 - The Production History (PH) tar file corresponding to the selected data granule will be retrieved from the Science Data Server and placed on the local machine (a PLN Host) in the directory /var/tmp.
 - The PH can then be moved or copied manually from the /var/tmp directory to a user working directory for examination.
 - Only the PH file is retrieved with the **Retrieve Prod History** button.
 - If only the PH is desired, exit this procedure. To retrieve the data granule itself, continue on to step 8.
 - 10 To retrieve the data granule, click on the **Retrieve Data Granule** button and note its file name (listed in the entry for the granule; you may have to scroll over to the right to see it).
 - The data granule selected will be retrieved from the Science Data Server and placed on the local machine (a PLS Host) in the directory /var/tmp.
 - A granule of any format (binary, ASCII, HDF, HDF-EOS) may be retrieved in this manner. Only HDF and HDF-EOS granules, however, may be further visualized using EOSView as described in the next steps.
 - 11 To examine the data granule, click on the **Visualize data** tab.
 - The **Visualize data** page will be displayed.

 - 12 In the main subwindow on the **Visualize data** page, locate the file name of the granule retrieved in step 8 and click on it.
 - The item selected will be highlighted and will appear in the **Selection** subwindow below.
 - 13 Click on the **Visualize** button.
 - This action will invoke **EOSView** with the granule selected.
 - The granule must be HDF or HDF-EOS format.
 - 14 When tasks are completed with the Q/A Monitor GUI, click on the **File** menu, then choose **Exit**.
-

11.15 Postprocessing and General Investigation

An important part of SSI&T is verifying that the output files produced at the DAAC are identical (within particular tolerances) to the test output files delivered with the DAPs. A successful comparison is a strong indication that the porting of the science software from the development facility at the SCF to the operational facility at the DAAC has not introduced any errors.

A number of file comparison tools are available during SSI&T via the SSIT Manager GUI or they can be invoked from the UNIX command line. Two tools are available for

comparing HDF or HDF-EOS files, one tool for comparing ASCII files, and another tool for assisting in comparing binary files.

It is assumed that the Instrument Team has delivered test output files (produced at their SCF) with which to perform the comparison.

11.15.1 Examining PGE Log Files

Three log files are produced by PGEs during runtime: the Status log, User Log, and the Report log. These log files are written by the SDP Toolkit and by the science software using the Toolkit's Status Message Facility (SMF). The location of these log files is specified in the Process Control File (PCF). When the PGE is built and run with the SCF version of the SDP Toolkit, the location and file names of the log files can be set as desired. When the PGE is built with the DAAC version of the SDP Toolkit and run within the PDPS, the location and file names of the log files is set by the system in the instantiated PCF.

The Status log file captures all error and status information. The User log file captures a subset of messages which are more informational. The Report log file captures arbitrary message strings sent by the PGE.

The section aforementioned describes how to examine log files produced by PGEs that have been built with the SCF version of the SDP Toolkit and run from the command line.

The section aforementioned describes how to examine log files (within the Production History) produced by PGEs that have been built with the DAAC version of the SDP Toolkit and run within the PDPS.

11.15.1.1 Log Files From PGEs Run Outside of the PDPS

When the PGE is run outside of the PDPS, the PCF specifies the location and file names of the log files produced. This procedure describes how to locate that information from the PCF and use it to examine the log files.

Detailed procedures for tasks performed by the SSI&T operator are provided in the sections that follow.

Assumptions:

1. The PGE has been successfully built with the SCF version of the SDP Toolkit.
 2. The PGE's PCF has been updated properly for the DAAC environment .
- 1 At the UNIX prompt on an AIT Sun or on the SPR SGI, type **cd *PCFpathname***, press **Return**.
 - The ***PCFpathname*** is the full path name to the location of the PCF used by the PGE for which log files are to be examined.
 - 2 At the UNIX prompt on the AIT Sun or on the SPR SGI, type **vi *PCFfilename***, press **Return**.
 - The ***PCFfilename*** is the file name of the PCF used by the PGE for which log files are to be examined.
 - This brings up the file named ***PCFfilename*** in the *vi* editor.

- Any text editor may be used such as *emacs*. For example, **emacs MOD35.pcf**, press **Return**.
- 3** In the editor, search for logical IDs (beginning in the first column) **10100**, **10101**, and **10102**. These are the PCF entries for the LogStatus, LogReport, and LogUser respectively. For each, note the file names in field 2 and the path names in field 3. Then quit the editor.
- If field 3 is blank, then the location is given by the default location specified in a line above the entries beginning with the “!” character.
- 4** At the UNIX prompt on the SPR SGI, type **vi *StatusLogPathname/filename***, press **Return**.
- The *StatusLogPathname/filename* is the full path name and file name of the Status log file noted in step 3 associated with PCF logical ID 10100. When finished, quit the editor.
 - Note any error or warning messages in file.
 - Any text editor may be used such as *emacs*. For example, **emacs /PGE/MOD35/LogStatus**, press **Return**.
- 5** At the UNIX prompt on the SPR SGI, type **vi *UserLogPathname/filename***, press **Return**.
- The *UserLogPathname/filename* is the full path name and file name of the Status log file noted in step 3 associated with PCF logical ID 10101. When finished, quit the editor.
 - Note any error or warning messages in file.
 - Any text editor may be used such as *emacs*. For example, **emacs /PGE/MOD35/LogUser**, press **Return**.
- 6** At the UNIX prompt on the SPR SGI, type **vi *ReportLogPathname/filename***, press **Return**.
- The *ReportLogPathname/filename* is the full path name and file name of the Status log file noted in step 3 associated with PCF logical ID 10102. When finished, quit the editor.
 - Note any anomalous messages in file.
 - Any text editor may be used such as *emacs*. For example, **emacs /PGE/MOD35/LogReport**, press **Return**.

11.15.1.2 Production History Log Files From PGEs Run Within the PDPS

The Production History (PH) is created during PGE execution within the PDPS and then Inserted into the Data Server upon PGE completion. The PH is a UNIX tar file that includes the PGE log files.

Detailed procedures for tasks performed by the SSI&T operator are provided in the sections that follow.

Assumptions:

1. The PDPS archive configuration area is properly set up.

2. The environment variable `DataServer` contains the full path name to the archive. This is typically `/imf/archive/` or `/imf_data/archive/` and varies at each DAAC.
- 1 At the UNIX prompt on the SPR SGI, type `cd $DataServer/PH`, press **Return**.
 - The `$DataServer` is an environment variable containing the full path name of the Data Server archive and `PH` is a subdirectory under `$DataServer` containing the Production History tar files.
 - For example, type `cd $DataServer/PH`, press **Return**.
 - 2 At the UNIX prompt on the AIT Sun or on the SPR SGI, type `ls -al`, press **Return**.
 - A list of the current contents will be displayed. These will be Production History tar files.
 - The file names of PH files are named `PGName#versionMMDDYYhhmm_runtime.tar_UR` where `PGName` is replaced by the PGE name, `version` is replaced by the PGE version, `MMDDYY` is replaced by the Insert date in the month-day-year format, `hhmm` is replaced by the Insert time in the hours-minutes format, and `UR` is replaced by the Universal Reference. For example, the PH file name for Release 4.1 of a SAGE III PGE named `sage_1t` Inserted on December 14, 1999 at 2:00pm could be:
`sage_1t#2.11214991400_runtime.tar_YAAa005Li_19991214135815`.
 - Look for the PH of interest.
 - 3 At a UNIX prompt on the AIT Sun or on the SPR SGI, type `cp PHtarFilename WorkingPathname`, press **Return**.
 - The `PHtarFilename` is the file name of the Production History tar file.
 - The `WorkingPathname` is the full path name to some working directory in which the Production History tar file is to be placed and examined.
 - 4 At the UNIX prompt on the AIT Sun or on the SPR SGI, type `cd WorkingPathname`, press **Return**.
 - The `WorkingPathname` is the full path name to the working directory specified in step 3.
 - 5 At the UNIX prompt on the AIT Sun or on the SPR SGI, type `tar xvf PHtarFilename`, press **Return**.
 - The `PHtarFilename` is the file name of the Production History tar file in the working directory.
 - This command will untar the Production History tar file, extracting its component files into the current directory.
 - 6 At the UNIX prompt on the AIT Sun or on the SPR SGI, type `vi StatusLogFilename`, press **Return**.
 - The `StatusLogFilename` is the file name of the Status log file within the PH. When finished, quit the editor.
 - Note any error or warning messages in file.
 - Any text editor may be used such as `emacs`. For example, `emacs LogStatus`, press **Return**.

- 7 At the UNIX prompt on the AIT Sun or on the SPR SGI, type **vi** *UserLogFilename*, press **Return**.
- The *UserLogFilename* is the file name of the User log file within the PH. When finished, quit the editor.
 - Note any error or warning messages in file.
 - Any text editor may be used such as *emacs*. For example, **emacs LogUser**, press **Return**.
- 8 At the UNIX prompt on the AIT Sun or on the SPR SGI, type **vi** *ReportLogFilename*, press **Return**.
- The *ReportLogFilename* is the file name of the Report log file within the PH. When finished, quit the editor.
 - Note any error or warning messages in file.
 - Any text editor may be used such as *emacs*. For example, **emacs LogReport**, press **Return**.

11.15.1.3 History Log Files From Failed PGEs Run Within the PDPS

The History Log(HL) is created during PGE execution within the PDPS and then Inserted into the Data Server upon failure of the PGE. The HL is a UNIX file that includes the PGE log files, the PCF and PH.

Detailed procedures for tasks performed by the SSI&T operator are provided in the sections that follow.

Assumptions:

1. The PDPS archive configuration area is properly set up.
 2. The environment variable `DataServer` contains the full path name to the archive.
- 1 At the UNIX prompt on the SPR SGI, type **cd \$DataServer/FAILPGE**, press **Return**.
- The `$DataServer` is an environment variable containing the full path name of the IMF Data Server archive and **FAILPGE** is a subdirectory under `$DataServer` containing the History Log files.
 - For example, type **cd \$DataServer/FAILPGE**, press **Return**.
- 2 At the UNIX prompt on the SPR SGI, type **ls -al**, press **Return**.
- A list of the current contents will be displayed. These will be History Log files.
 - The file names of HL files are named *PGENAME#versionMMDDYYhhmm_runtime.tar_UR* where *PGENAME* is replaced by the PGE name, *version* is replaced by the PGE version, *MMDDYY* is replaced by the Insert date in the month-day-year format, *hhmm* is replaced by the Insert time in the hours-minutes format, and *UR* is replaced by the Universal Reference. For example, the HL file name for Release 4.1 of a SAGE III PGE named `sage_1t` Inserted on December 14,

1999 at 2:00pm could be:
sage_1t#2.11214991400_runtime.tar_YAAa005Li_19991214135815.

- Look for the HL of interest.
- 3** At a UNIX prompt on the SPR SGI, type **cp *HLFilename WorkingPathname***, press **Return**.
- The *HLFilename* is the file name of the History Log file.
 - The *WorkingPathname* is the full path name to some working directory in which the History Log file is to be placed and examined.
- 4** At the UNIX prompt on the SPR SGI, type **cd *WorkingPathname***, press **Return**.
- The *WorkingPathname* is the full path name to the working directory specified in step 3.
- 5** At the UNIX prompt on the SPR SGI, type **vi *HLFilename***, press **Return**.
- The *HLFilename* is the file name of the History Log. When finished, quit the editor.
 - Note any error or warning messages in file.
 - Any text editor may be used such as *emacs*. For example, **emacs *HLFilename***, press **Return**.

11.15.2 The Production History

The Production History (PH) is a UNIX tar file that is produced and archived for every run of a PGE in the PDPS. Each PH can be uniquely retrieved from the Data Server.

PH files are located in the \$DataServer/PH directory and have the following naming convention:

PGName#versionMMDDYYhhmm_runtime.tar_UR

where *PGName* is replaced by the PGE name, *version* is replaced by the PGE version, *MMDDYY* is replaced by the Insert date in the month-day-year format, *hhmm* is replaced by the Insert time in the hours-minutes format, and *UR* is replaced by the Universal Reference.

For example, a PH file name for Release 4.1 of a SAGE III PGE named sage_1t Inserted on December 14, 1999 at 2:00pm would be:

sage_1t#2.11214991400_runtime.tar_YAAa005Li_19991214135815.

Detailed procedures for tasks performed by the SSI&T operator are provided in the sections that follow.

Assumptions:

1. The PDPS archive configuration area is properly set up.
 2. The environment variable DataServer contains the full path name to the archive.
- 1** At the UNIX prompt on an AIT Sun or on the SPR SGI, type **cd \$DataServer/PH**, press **Return**.

- The **\$DataServer** is an environment variable containing the full path name of the IMF Data Server archive and **PH** is a subdirectory under **\$DataServer** containing the Production History tar files.
 - For example, type **cd \$DataServer/PH**, press **Return**.
- 2 At the UNIX prompt on the AIT Sun or on the SPR SGI, type **ls -al**, press **Return**.
- A list of the current contents will be displayed. These will be Production History tar files.
 - The file names of PH files are named *PGName#versionMMDDYYhhmm_runtime.tar_UR* where *PGName* is replaced by the PGE name, *version* is replaced by the PGE version, *MMDDYY* is replaced by the Insert date in the month-day-year format, *hhmm* is replaced by the Insert time in the hours-minutes format, and *UR* is replaced by the Universal Reference. For example, the PH file name for Release 4.1 of a SAGE III PGE named sage_1t Inserted on December 14, 1999 at 2:00pm could be:
sage_1t#2.11214991400_runtime.tar_YAAa005Li_19991214135815.
 - Look for the PH of interest.
- 3 At a UNIX prompt on the AIT Sun or on the SPR SGI, type **cp PHtarFilename WorkingPathname**, press **Return**.
- The **PHtarFilename** is the file name of the Production History tar file.
 - The **WorkingPathname** is the full path name to some working directory in which the Production History tar file is to be placed and examined.
- 4 At the UNIX prompt on the AIT Sun or on the SPR SGI, type **cd WorkingPathname**, press **Return**.
- The **WorkingPathname** is the full path name to the working directory specified in step 3.
- 5 At the UNIX prompt on the AIT Sun or on the SPR SGI, type **tar xvf PHtarFilename**, press **Return**.
- The **PHtarFilename** is the file name of the Production History tar file in the working directory.
 - This command will untar the Production History tar file, extracting its component files into the current directory.
- 6 At the UNIX prompt on the AIT Sun or on the SPR SGI, type **vi PHcomponentFile**, press **Return**.
- The **PHcomponentFile** is the file name of one of the PH component files. The component files are:
 - *PGName#versionMMDDYYhhmm.Log* - Contains the DPR ID, the actual command used to run the PGE, resource usage information, the PGE exit status, and files used by the PGE.
 - *PGName#versionMMDDYYhhmm.Pcf* - The actual instantiated PCF used when running the PGE.

- *PGENAME#versionMMDDYYhhmm.ProdLog* - Contains the DPR ID, the PGE ID, and resource usage information (same as in the .Log file).
- *PGENAME#versionMMDDYYhhmm.Profile* - Contains the environment variables defined during the execution of the PGE including the contents of the PATH environment variable.
- *PGENAME#versionMMDDYYhhmm.TkReport* - The Report log file, same as is produced when run outside of the PDPS.
- *PGENAME#versionMMDDYYhhmm.TkStatus* - The Status log file, same as is produced when run outside of the PDPS.
- *PGENAME#versionMMDDYYhhmm.TkUser* - The User log file, same as is produced when run outside of the PDPS.
- *ESDTmmddyHHMM.met* - All target MCFs for all Inserts on behalf of the PGE. The *ESDT* is the ESDT ShortName into which the file was Inserted, *mmddy* is the month, day, and year of the Insert and *HHMM* is the time of the Insert.

11.16 Examining PDPS-Related Scripts and Message Files

This section describes how users may access files, in addition to the PGE-produced log files, which are created during the execution of a DPR job and which may hold information useful in tracing processing problems.

Some of these files are written by default to directory paths that can only be accessed on either the SGI processor machine or one of the Sun workstations. More detailed descriptions of these files and the conditions under which they are generated will be supplied in future Green Book versions.

11.16.1 Examining AutoSys JIL Scripts

JILxxxxxxxx is the Job Information Language (JIL) script that defines the DPR job to **AutoSys** and which must be submitted to the **AutoSys** Database before a DPR job can be run. The name of the file created is system-generated and begins with the characters 'JIL' followed by nine characters (e.g. JILAAa0066c).

Sample file content:

```
insert_job: 5251_823122483_1
job_type: command
command: /usr/ecs/{mode}/CUSTOM/data/bin/sgi/EcDpAtExecutionMain
5251_823122483_1
machine: sprlsgigsfc
std_out_file: /home/cboettch/mockpge_msfc/out/dpat_std.out
std_err_file: /home/cboettch/mockpge_msfc/out/dpat_std.err
profile: /usr/ecs/<MODE>/CUSTOM/data/bin/sgi/EcDpAtRunProfile.sh
```

To examine JILxxxxxxxx scripts on the AIT Sun, execute the procedure steps that follow:

- 1 At the UNIX prompt on an AIT Sun, type **cd *JILscriptPathname***, press **Return**.
 - The *JILscriptPathname* is the full path name to the location of the JILxxxxxxx scripts to be examined.
- 2 At the UNIX prompt on the AIT Sun, type **vi *JILscriptFilename***, press **Return**.
 - The *JILscriptFilename* is the file name of the JILxxxxxxx script to be examined.
 - This brings up the file named *JILscriptFilename* in the *vi* editor.
 - Any text editor may be used such as *emacs*. For example, **emacs *JILscriptFilename***, press **Return**.

11.16.2 Examining Application Log Files (ALOG)

Most of the custom code used during SSI&T routinely produce log files. For example, the SSIT Manager produces a log file named **EcDpAtMgr.log** and the tool used to Insert SSEPs to the Data Server (**EcDpAtInsertExeTarFile.sh**) produces a log file named **EcDpAtInsertExeTarFile.log**. These files are placed in the directory in which the tool was executed. If the **SSIT Manager** is run from the user's home directory, then the log files for each of the associated tools will be found in the user's home directory. Log files are produced at the first invocation of the tools, even if no messages are written to them. During subsequent use of the tools, the associated log files will be appended.

Log files are generally named according to the convention:

ApplicationName.log

where *ApplicationName* is replaced with the name of the tool's executable binary. For tools that are shell scripts (*e.g.* .sh files), the shell name is left out of the log file name. For example, the tool **EcDpAtInsertStaticFile.sh** produces a log file named **EcDpAtInsertStaticFile.log** and not **EcDpAtInsertStaticFile.sh.log**.

Where an **SSIT Manager** application has been run using login **cmts1**, pw: **ecsu\$er** with **dce_login**, the log files will be found using path: **/usr/ecs/{MODE}/CUSTOM/logs/**.

DCE failures have been encountered when installing **ESDT's**, **MCF's** and **.met files**. The term bounce the servers has been widely used in conjunction with the effort to re-install or delete files. **Bounce** means to **shut down a server** and then **bring them back up** to rid the servers of unwanted or old bindings. The nature of what needs to be done is outlined as follows:

- 1 Install or Delete **ESDT's** - the **SDSRV** and **ADSRV** need to be bounced after installation or removal of **ESDT's** to allow for a refresh of the **DCE** cell management.
 - 2 For **PGE.....odl**, **MCF's** and **.met files**, bouncing the servers **SDSRV** and **ADSRV** need to be done after installation and reinstallation.
 - 3 This can be done by logging into **ECS Assistant** for each server. The login should be with generic ID: **cmts1** and PW: **ecsu\$er**, and **dce_login awhitele awhitele**.
-

11.17 DPREP

11.17.1 Introduction

This section contains information to run DPREP.

- DPREP is made up of three PGE's each run separately. The PGE's are titled Step 1 DPREP, Step 2 DPREP and Step 3 DPREP.
- The input files come from INGEST. These files are depicted in two of the three step DPREP process in **Figure 11.17.1-1**. DPREP Step 3 will be available with Drop 5A.
- The output files generated from each of the DPREP PGE's contains Ancillary Attitude, and Ephemeris data that becomes new inputs to Instrument PGE's. These Instrument PGE's will then process its satellite data with similar time span files created by DPREP.
- The DPREP registration process for each of the three PGE's creates in the Science Data Server Archive a subscription for each of the DPREP PGE's. PGE execution then takes place in the PDPS.
- The SSI&T effort for DPREP PGE's is similar in effort to what would be required to register any other PGE.

11.17.2 SSI&T Activity for DPREP

The Level Zero datasets are received in 2 hour chunks. The file processes in Figure 11.17.1-1 depicts the minimal time span allowable for a DPREP run. In a normal operation of DPREP, a twenty four hour time span would be prepared for. This would require additional 2 hour chunks and thus additional files of data would need to be registered. Before the registration process can take place a number of files will have to be updated to process a block of data for a particular time period. Therefore, DPREP input files will have to be identified and various templates for the SSI&T process will require annotation.

The sections that follow have been highlighted with notations as to what SSI&T process applies in the preparation of each template and the function required to register each section. With a particular function identified, other portions of this manual can be referred to for more detailed procedures to be used to carry out the full SSI&T process.

Whenever new input files are introduced or updated executables are re-introduced it is wise to set up the PGE to run from the Command Line. This will determine if what has been introduced will run error free. After a successful Command Line run it is advisable then to complete the SSI&T effort to run from the PDPS. Command Line Runs include the use of the PCF to run from in the Science Data Server. PDPS runs include ESDT's and ODL files to generate internal PCF's.

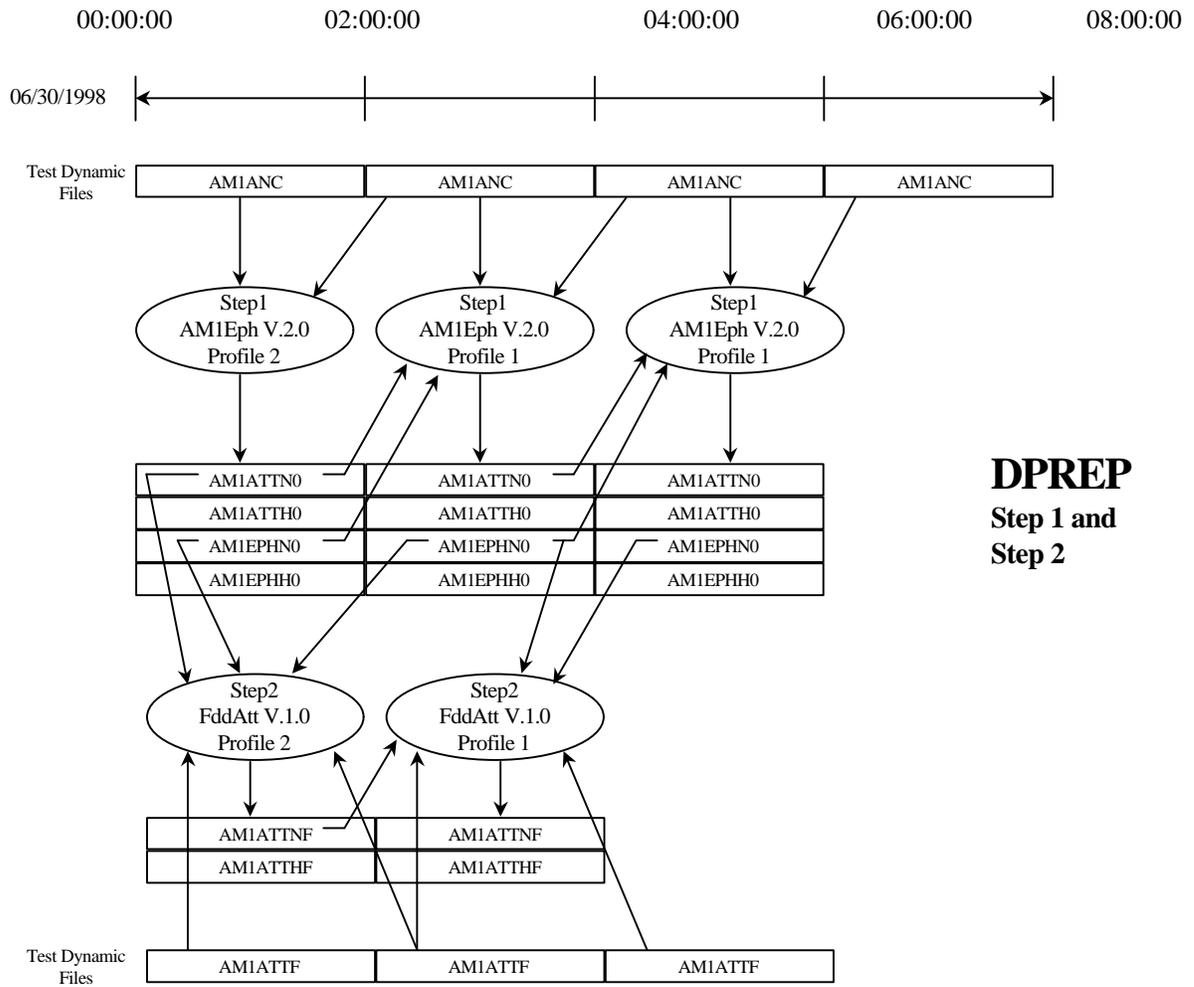


Figure 11.17.1-1. DPREP File Processes

11.17.3 DPREP Processes and Procedures

Processes and procedures are provided in the following files on an SGI machine used to support SSI&T:

DPREP README and HowToRunDPREP files located at
:usr/ecs/OPS/CUSTOM/data/DPS/

DPREP binary located: :usr/ecs/OPS/CUSTOM/bin/DPS/

The following files are taken from an SSI&T SGI machine using the /data/DPS/ thread for referencing DPREP files in this section.

```
:  
/data3/ecs/OPS/CUSTOM/data/DPS  
lasher{emcleod}21: ls -lrt  
total 13568  
-rwxr-xr-x 1 cmops cmops 449920 Jul 16 1998  
P0420004AAAAAAAAAAAAAAAAA96182015958001  
-rwxr-xr-x 1 cmops cmops 376 Jul 16 1998  
P0420004AAAAAAAAAAAAAAAAA96182015958000  
-rwxr-xr-x 1 cmops cmops 93408 Jul 16 1998  
EOS_AM1_Ephemeris_FDF.eph  
-rwxr-xr-x 1 cmops cmops 451104 Jul 16 1998  
EOS_AM1_Ephemeris_EDOS.eph  
-rwxr-xr-x 1 cmops cmops 449920 Jul 16 1998  
P0420004AAAAAAAAAAAAAAAAA96182035958001  
-rwxr-xr-x 1 cmops cmops 376 Jul 16 1998  
P0420004AAAAAAAAAAAAAAAAA96182035958000  
-rwxr-xr-x 1 cmops cmops 93152 Jul 16 1998 EOSAM1_1998-01-13.eph  
-rwxr-xr-x 1 cmops cmops 93184 Jul 16 1998 EOSAM1_1998-01-14.eph  
-rwxr-xr-x 1 cmops cmops 92672 Jul 16 1998 EOSAM1_1998-01-13.att  
-rwxr-xr-x 1 cmops cmops 29430 Jul 16 1998 DpPrPreProcess.pcf  
-rwxr-xr-x 1 cmops cmops 15058 Jul 16 1998 DpPrEphReplacer.pcf  
-rwxr-xr-x 1 cmops cmops 13840 Feb 8 15:21 PGS_101  
-rwxr-xr-x 1 cmops cmops 6207 Feb 8 15:21 HowToRunDPREP  
-rwxr-xr-x 1 cmops cmops 2834 Feb 8 15:21 HowToCreateDprepTarFile  
-rwxr-xr-x 1 cmops cmops 384 Feb 8 15:21 EDOS_LEVEL_ZERO_00.curr  
-rwxr-xr-x 1 cmops cmops 449344 Feb 8 15:21 EDOS_LEVEL_ZERO_01.curr  
-rwxr-xr-x 1 cmops cmops 384 Feb 8 15:21 EDOS_LEVEL_ZERO_00.next  
-rwxr-xr-x 1 cmops cmops 449984 Feb 8 15:21  
EDOS_LEVEL_ZERO_01.next_2  
-rwxr-xr-x 1 cmops cmops 449984 Feb 8 15:21  
EDOS_LEVEL_ZERO_01.next_1  
-rwxr-xr-x 1 cmops cmops 449280 Feb 8 15:21 EDOS_LEVEL_ZERO_01.next  
-rwxr-xr-x 1 cmops cmops 384 Feb 8 15:21  
EDOS_LEVEL_ZERO_00.next_2  
-rwxr-xr-x 1 cmops cmops 384 Feb 8 15:21
```

```

EDOS_LEVEL_ZERO_00.next_1
-rwxr-xr-x 1 cmops cmops 384 Feb 8 15:21
EDOS_LEVEL_ZERO_00.next.step3
-rwxr-xr-x 1 cmops cmops 449984 Feb 8 15:21
EDOS_LEVEL_ZERO_01.next.step3
-rwxr-xr-x 1 cmops cmops 225280 Feb 8 15:21
AM1_DEFINITIVE_ATT.fdd.next_1
-rwxr-xr-x 1 cmops cmops 225280 Feb 8 15:21
AM1_DEFINITIVE_ATT.fdd.next
-rwxr-xr-x 1 cmops cmops 225280 Feb 8 15:21
AM1_DEFINITIVE_ATT.fdd.curr
-rwxr-xr-x 1 cmops cmops 5909 Feb 8 15:21 FDDAttitude.tar.met
-rwxr-xr-x 1 cmops cmops 14000 Feb 8 15:21 AM1_REPAIR_EPH.fdd
-rwxr-xr-x 1 cmops cmops 1681 Feb 8 15:21
AM1_DEFINITIVE_ATT.fdd.next_1.met
-rwxr-xr-x 1 cmops cmops 1681 Feb 8 15:21
AM1_DEFINITIVE_ATT.fdd.next.met
-rwxr-xr-x 1 cmops cmops 1681 Feb 8 15:21
AM1_DEFINITIVE_ATT.fdd.curr.met
-rwxr-xr-x 1 cmops cmops 1654 Feb 8 15:21 AM1ANC.next_2.met
-rwxr-xr-x 1 cmops cmops 1654 Feb 8 15:21 AM1ANC.next_1.met
-rwxr-xr-x 1 cmops cmops 1654 Feb 8 15:21 AM1ANC.next.met
-rwxr-xr-x 1 cmops cmops 1654 Feb 8 15:21 AM1ANC.curr.met
-rwxr-xr-x 1 cmops cmops 26819 Feb 8 15:21
EcDpPrAm1FddEphemerisDPREP_PGEDPREP.Step3.PCF.curr
-rwxr-xr-x 1 cmops cmops 28627 Feb 8 15:21
EcDpPrAm1FddAttitudeDPREP_PGE.Step2.PCF.next
-rwxr-xr-x 1 cmops cmops 29026 Feb 8 15:21
EcDpPrAm1FddAttitudeDPREP_PGE.Step2.PCF.curr
-rwxr-xr-x 1 cmops cmops 30520 Feb 8 15:21
EcDpPrAm1EdosAncillary.Steps1ab.PCF.next_1
-rwxr-xr-x 1 cmops cmops 30553 Feb 8 15:21
EcDpPrAm1EdosAncillary.Steps1ab.PCF.next
-rwxr-xr-x 1 cmops cmops 30485 Feb 8 15:21
EcDpPrAm1EdosAncillary.Steps1ab.PCF.curr
-rwxr-xr-x 1 cmops cmops 5909 Feb 8 15:21
AM1_Ancillary_DPREP.tar.met
-rwxr-xr-x 1 cmops cmops 26819 Feb 8 15:21
EcDpPrAm1FddEphemerisDPREP_PGEDPREP.Step3.PCF.next
-rwxr-xr-x 1 cmops cmops 5816 Feb 8 15:21 DPREP_README

```

11.17.3.1 DPREP consists of three PGE's each run separately.

- 1 The first step is a **ksh** script called **EcDpPrAm1EdosEphAttDPREP_PGE**, which serves as a driver for three executables:

EcDpPrAm1EdosAncillary

EcDpPrAm1EdosEphemerisRepair
EcDpPrAm1ToolkitHdf

- 2 The second step is **EcDpPrAm1FddAttitudeDPREP_PGE**.
- 3 The third step is **EcDpPrAm1FddEphemerisDPREP_PGE**.

STEP ONE

EcDpPrAm1EdosAncillary reads in AM-1 L0 (EDOS) Ancillary Dataset (logical id 1000, ESDT AM1ANC). It also reads another set of AM-1 L0 (EDOS) Ancillary Dataset (logical id 1010, ESDT AM1ANC). The second set of L0 data is required to insure that incomplete orbits in the first data set get complete orbit metadata records. The only data that will be extracted from the second data set is the descending node time and longitude.

EcDpPrAm1EdosAncillary also reads in ephemeris and attitude data (toolkit native format) under logical ids 1500 (ESDT AM1EPHN0) and 1502 (ESDT AM1ATTN0). These would be the last ephemeris/attitude data sets generated from a previous run of this PGE.

EcDpPrAm1EdosEphemerisRepair

If EcDpPrAm1EdosAncillary signals a short gap was detected then EcDpPrAm1EdosEphemerisRepair reads the scratchfile created by EcDpPrAm1EdosAncillary and performs the gap fill and writes a gap filled native format ephemeris file. If no short gap is signaled then the scratch file is simply renamed to the native format ephemeris file.

EcDpPrAm1ToolkitHdf

This process takes the native format ephemeris file and produces a corresponding HDF file and a metadata file.

This PGE produces reformatted attitude and ephemeris data sets. The attitude data sets are produced using logical ids 1001 (ESDT AM1ATTN0) and 1100 (ESDT AM1ATTH0). The ephemeris data sets are produced using logical ids 1151 (ESDT AM1EPHN0) and 1152 (ESDT AM1EPHH0). The corresponding MCFs are accessed using logical ids 1400 (ESDT AM1EPHH0), 1401 (ESDT AM1ATTH0), 1402 (ESDT AM1EPHN0) and 1403 (ESDT AM1ATTN0).

The PGE produces an ASCII report file under logical id 2000

EcDpPrAm1EdosAncillary.Steps1ab.PCF.curr is a sample pcf used by this PGE. This pcf has directory locations and file names which may not be valid in all environments. Be careful before directly using this pcf. A sample set of input files for this PGE are

1000 EDOS_LEVEL_ZERO_00.curr
1000 EDOS_LEVEL_ZERO_01.curr
1010 EDOS_LEVEL_ZERO_00.next
1010 EDOS_LEVEL_ZERO_01.next

and a copy of each of these files is provided. The files in this group do contain small data gaps which will cause EcDpPrAm1EdosEphemerisRepair to be run.

The remaining pcfs for Step 1 DPREP:

EcDpPrAm1EdosAncillary.Steps1ab.PCF.next
EcDpPrAm1EdosAncillary.Steps1ab.PCF.next_1

will move through the sequence of the Level Zero files provided.

example; EDOS_LEVEL_ZERO_00.next is treated as current and

EDOS_LEVEL_ZERO_00.next_1 is treated as next etc...These pcfs can be utilized at the testers discretion and are not necessary for the running of steps 2 and 3. The input files indicated in

EcDpPrAm1EdosAncillary.Steps1ab.PCF.next_1 contain no gaps so testers shouldn't be concerned that EcDpPrAm1EdosEphemerisRepair is not invoked when using this pcf.

Note:

The Level Zero datasets are received in 2 hour chunks but processing can't be performed on the most recently available 2 hour chunk. Step 1 processing needs to look forward in the time stream in order to complete orbit metadata processing.

STEP TWO

EcDpPrAm1FddAttitudeDPREP_PGE reads in the current FDD Attitude Dataset under logical ID 1000 and the next FDD Attitude Dataset under logical ID 1010. It also reads in the attitude data set it produced with it's last run under logical ID 1502. The output of this process is a native format attitude file (logical ID 1001) and an HDF format attitude file (logical ID 1100). A .met file is also produced for each.

EcDpPrAm1FddAttitudeDPREP_PGE.Step2.PCF.curr is a sample pcf used by this PGE. This pcf has directory locations and file names which may not be valid in all environments. Be careful before directly using this pcf. A sample set of input files for this PGE are

1000 AM1_DEFINITIVE_ATT.fdd.curr

1010 AM1_DEFINITIVE_ATT.fdd.next

(IMPORTANT: These files contain incorrect data and were delivered only as a placeholder.

EcDpPrAm1FddAttitudeDPREP_PGE will not run with these files as input. When valid FDD Definitive Attitude files become available they should be moved to these filenames and

EcDpPrAm1FddAttitudeDPREP_PGE should run successfully.)

and a copy of each of these files is provided.

Note: Step 2 processing must follow 2 hours behind step 1 processing.

STEP THREE

If step1 finds too many missing data points in the ephemeris data it signals that a definitive ephemeris file is needed from FDD which EcDpPrReplaceEphemeris will use to replace the ephemeris dataset that was generated from the Level Zero data.

EcDpPrReplaceEphemeris reads in the definitive Ephemeris dataset received from FDD (logical ID 1000) and the EOS_AM1 Ephemeris data (logical id 1001) in toolkit native format.

It produces Replacement ephemeris datasets (logical id 1101, ESDT AM1EPHH0) and (logical id 1100, ESDT AM1EPHN0). The corresponding MCFs are accessed using logical ids 1400 (ESDT AM1EPHH0) & 1402 (ESDT AM1EPHN0)

EcDpPrAm1FddEphemerisDPREP_PGE.Step3.PCF.curr is a sample pcf used by this PGE.

This pcf has directory locations and file names which may not be valid in all environments. Be careful before directly using this pcf. A sample FDD input file for this PGE is

1000 AM1_REPAIR_EPH.fdd

and a copy of this file is provided.

Toolkit Initialization Settings

SGI Application Binary Interface New 32

Disk Space Used for PGE Run 50.000 MB

Shared Memory ON

Use Test Files if SM Fails ON

Use Log Files ON

Continue if Logging Fails OFF

11.17.4 HowToRunDPREP

DPREP is made up of 3 PGEs that are named:

Step1 DPREP, Step2 DPREP, Step3 DPREP.

Step1 DPREP is what used to be called **Am1Ancillary DPREP**.

Step2 DPREP is the **FDD Attitude DPREP**.

Step3 DPREP is a **combination of FDD Ephemeris and the replacer DPREPs**.

Note: Each PGE will use both the **Science Metadata update tool** and the **Operational Metadata Update tool** to incorporate the specific parameters listed in each of the direction sections below.

11.17.4.1 Step1 DPREP directions

There are 2 profiles for DPREP. Profile 1 takes in previous DPREP output and is expected to be run most of the time at the DAACs. Profile 2 takes in only the AM1 Ancillary data and will be run only for the first run of DPREP (because there is no previous output). Both profiles should be registered and executed.

PGENAME : AM1Eph

PGEVERSION : 2.0

PROFILE : 1

TopLevelShellName : EcDpPrAm1EdosEphAttDPREP_PGE

PGENAME : AM1Eph

PGEVERSION : 2.0

PROFILE : 2

TopLevelShellName : EcDpPrAm1EdosEphAttDPREP_PGE (same executable, only insert it once)

PGE Tar file location :

\$ECS_HOME/<MODE>/CUSTOM/data/DPS/AM1_Ancillary_DPREP.tar

PGE Met file location :

\$ECS_HOME/<MODE>/CUSTOM/data/DPS/AM1_Ancillary_DPREP.tar.met

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The PGE tar file contains the executables: EcDpPrAm1EdosEphAttDPREP_PGE, EcDpPrAm1EdosAncillary, EcDpPrAm1EdosEphemerisRepair, EcDpPrAm1ToolkitHdf.and the toolkit message file PGS_101

This PGE has no static data. This means Insert Static from SSIT can be skipped for this PGE.

However, there are 4 dynamic granules (2 files each) that this PGE needs as input. These 4 granules can be inserted from SSIT **Insert Test Dynamic Tool**

Granule 1:

ESDT Short Name : AM1ANC

Version : 001

Multi File granule : Y

Directory : \$ECS_HOME/<MODE>/CUSTOM/data/DPS

File Names : EDOS_LEVEL_ZERO_00.curr, EDOS_LEVEL_ZERO_01.curr

Met file : AM1ANC.curr.met

Granule 2:

ESDT Short Name : AM1ANC
Version : 001
Multi File granule : Y
Directory : \$ECS_HOME/<MODE>/CUSTOM/data/DPS
File Names : EDOS_LEVEL_ZERO_00.next, EDOS_LEVEL_ZERO_01.next
Met file : AM1ANC.next.met

Granule 3:

ESDT Short Name : AM1ANC
Version : 001
Multi File granule : Y
Directory : \$ECS_HOME/<MODE>/CUSTOM/data/DPS
File Names : EDOS_LEVEL_ZERO_00.next_1, EDOS_LEVEL_ZERO_01.next_1
Met file : AM1ANC.next_1.met

Granule 4:

ESDT Short Name : AM1ANC
Version : 001
Multi File granule : Y
Directory : \$ECS_HOME/<MODE>/CUSTOM/data/DPS
File Names : EDOS_LEVEL_ZERO_00.next_2, EDOS_LEVEL_ZERO_01.next_2
Met file : AM1ANC.next_2.met

3 PRs need to be created, two for Profile 1 and one for Profile 2. Create the PR for Profile 2 first (it runs on earlier data) and then create the PR for Profile 1.

The time frame for Production request editor for Profile 2 is 1998 June 30 00:00:00 to 1998 June 30 02:00:00

The time frame for Production request editor for Profile 1 is 1998 June 30 02:00:00 to 1998 June 30 04:00:00

The time frame for Production request editor for the second Profile 1 is 1998 June 30 04:00:00 to 1998 June 30 06:00:00

11.17.4.2 Step2 DPREP directions:

Step 2 DPREP can run ONLY after all three PRs for Step 1 DPREP have completed

There are 2 profiles for Step 2 DPREP. Profile 1 takes in previous Step 2 DPREP output and is expected to be run most of the time at the DAACs. Profile 2 takes in only the Fdd Att data and will be run only for the first run of DPREP (because there is no previous output). Both profiles should be registered and executed.

PGENAME : FddAtt
PGEVERSION : 1.0
PROFILE : 1

TopLevelShellName : EcDpPrAm1FddAttitudeDPREP_PGE

PGENAME : FddAtt

PGEVERSION : 1.0

PROFILE : 2

TopLevelShellName : EcDpPrAm1FddAttitudeDPREP_PGE (same executable, only insert it once)

PGE Tar file location : \$ECS_HOME/<MODE>/CUSTOM/data/DPS/FDDAttitude.tar

PGE Met file location : \$ECS_HOME/<MODE>/CUSTOM/data/DPS/FDDAttitude.tar.met

Science Software Version: 1.0

The PGE tar file contains the executable EcDpPrAm1FddAttitudeDPREP_PGE and the toolkit message file PGS_101

This PGE has no static data. This means Insert Static from SSIT can be skipped for this PGE. However, there are 3 dynamic granules that this PGE needs as input. These 3 granules can be inserted from SSIT insert test dynamic tool

Granule 1:

ESDT Short Name : AM1ATTF

Version : 001

Multi File granule : N

File Name :

\$ECS_HOME/<MODE>/CUSTOM/data/DPS/AM1_DEFINITIVE_ATT.fdd.curr

Met file :

\$ECS_HOME/<MODE>/CUSTOM/data/DPS/AM1_DEFINITIVE_ATT.fdd.curr.met

Granule 2:

ESDT Short Name : AM1ATTF

Version : 001

Multi File granule : N

File Name :

\$ECS_HOME/<MODE>/CUSTOM/data/DPS/AM1_DEFINITIVE_ATT.fdd.next

Met file :

\$ECS_HOME/<MODE>/CUSTOM/data/DPS/AM1_DEFINITIVE_ATT.fdd.next.met

Granule 3:

ESDT Short Name : AM1ATTF

Version : 001

Multi File granule : N

File Name :

\$ECS_HOME/<MODE>/CUSTOM/data/DPS/AM1_DEFINITIVE_ATT.fdd.next_1

Met file :

\$ECS_HOME/<MODE>/CUSTOM/data/DPS/AM1_DEFINITIVE_ATT.fdd.next_1.met

2 PRs need to be created, one for Profile 1 and one for Profile 2. Create the PR for Profile 2 first (it runs on earlier data) and then create the PR for Profile 1.

The time frame for Production request editor for Profile 2 is 1998 June 30 02:00:00 to 1998 June 30 04:00:00

The time frame for Production request editor for Profile 1 is 1998 June 30 04:00:00 to 1998 June 30 06:00:00

Note: The Data files and tar files are delivered only to the Science Data Server and cannot be directly accessed by SSIT. In order to insert these files they must be moved to the SSIT server manually.

11.17.4.3 DPREP Step1 profile1 PCF

PRODUCT INPUT FILES

#####

(Initial Construction Record:)

1000|P0420004AAAAAAAAAAAAAAAAA98300080000000.PDS|/net/raven/dss_amass/testdata/instrument_data/AM1/EDOS_HK_ANC/EDOSL0_ANC_PDS_0002||<A) insert UR here>||2

(Current 2 hour Data File)

1000|P0420004AAAAAAAAAAAAAAAAA98300080000001.PDS|/net/raven/dss_amass/testdata/instrument_data/AM1/EDOS_HK_ANC/EDOSL0_ANC_PDS_0002||<B) insert UR here>||1

:

(Future 2 hour Construction Record)

1010|P0420004AAAAAAAAAAAAAAAAA98300100000000.PDS|/net/raven/dss_amass/testdata/instrument_data/AM1/EDOS_HK_ANC/EDOSL0_ANC_PDS_0002||<C) insert UR here>||2

(Future 2 hour Data File)

1010|P0420004AAAAAAAAAAAAAAAAA98300100000001.PDS|/net/raven/dss_amass/testdata/instrument_data/AM1/EDOS_HK_ANC/EDOSL0_ANC_PDS_0002||<D) insert UR here>||1

The last ephemeris/attitude data sets generated. (Found in PGE template)

Ephemeris (Toolkit native format) (Previous Time Range)

1500|EOS_AM1_Ephemeris.21206.step1b.eph|/home/cmts1/DPREP/demooutput||<E) insert UR here>||1

Attitude (Toolkit native format)

1502|EOS_AM1_Attitude.21206.step1.att|/home/cmts1/DPREP/demooutput||<F) insert UR here>||1

:

? PRODUCT OUTPUT FILES

#####

(Current Time Range)

```

# -----
# Toolkit attitude datasets (output of EcDpPrAm1EdosAncillary).
# -----
1001|EOS_AM1_Attitude.21208.step1.att/home/cmts1/DPREP/demooutput|||1
1100|EOS_AM1_Attitude.21208.step1.hdf/home/cmts1/DPREP/demooutput|||1
# -----
# Toolkit ephemeris datasets (output of EcDpPrAm1EdosAncillary).
# -----
1102|EOS_AM1_Ephemeris.21208.hdf/home/cmts1/DPREP/demooutput|||1
# -----
# Gap-filled HDF ephemeris dataset (output of EcDpPrAm1EphemerisGapFill).
# -----
1151|EOS_AM1_Ephemeris.21208.step1b.eph/home/cmts1/DPREP/demooutput|||1
# -----
# Gap-filled Toolkit ephemeris dataset (output of
# EcDpPrAm1FormatNativeEphemeris).
# -----
1152|EOS_AM1_Ephemeris.21208.step1b.hdf/home/cmts1/DPREP/demooutput|||1
:
SUPPORT OUTPUT FILES
#####
10100|LogStatus/home/cmts1/DPREP/logs|||1
10101|LogReport/home/cmts1/DPREP/logs|||1
10102|LogUser/home/cmts1/DPREP/logs|||1
10103|TmpStatus|||1
10104|TmpReport|||1
10105|TmpUser|||1
10110|MailFile|||1
:
? USER DEFINED RUNTIME PARAMETERS
#####
999|No Previous Data Set; 1=true, 0=false.|0      (Profile 1 set to 0, Profile 2 set to 1)
# -----
# Toolkit version for which this PCF was intended.
# DO NOT REMOVE THIS VERSION ENTRY!
# -----
10220|Toolkit version string|DAAC B.0 TK5.2.4   (Caution: May need to change to higher
level Toolkit)
END

```

11.17.4.4 DPREP Step1 profile2 PCF (Profile 2 is start up PCF)

PRODUCT INPUT FILES

```

#####
1000|P0420004AAAAAAAAAAAAAAAAA98300060000000.PDS/net/raven/dss_amass/testdata/instrument_data/AM1/EDOS_HK_ANC/EDOSL0_ANC_PDS_0002||<A) insert UR here>||2

```

```

1000|P0420004AAAAAAAAAAAAAAAAA98300060000001.PDS|/net/raven/dss_amaass/testdata/instrument_data/AM1/EDOS_HK_ANC/EDOSL0_ANC_PDS_0002||<B) insert UR here>||1
1010|P0420004AAAAAAAAAAAAAAAAA98300080000000.PDS|/net/raven/dss_amaass/testdata/instrument_data/AM1/EDOS_HK_ANC/EDOSL0_ANC_PDS_0002||<C) insert UR here>||2
1010|P0420004AAAAAAAAAAAAAAAAA98300080000001.PDS|/net/raven/dss_amaass/testdata/instrument_data/AM1/EDOS_HK_ANC/EDOSL0_ANC_PDS_0002||<D) insert UR here>||1
# -----
# The last ephemeris/attitude data sets generated.
# -----
# Ephemeris (Toolkit native format)
#1500|EOS_AM1_Ephemeris.prev.eph|.||<E) insert UR here>||1
# Attitude (Toolkit native format)
#1502|EOS_AM1_Attitude.21206.step1.att|/home/cmts1/DPREP/output||<F) insert UR here>||1
:
? PRODUCT OUTPUT FILES
#####
# -----
# Toolkit attitude datasets (output of EcDpPrAm1EdosAncillary).
# -----
1001|EOS_AM1_Attitude.21206.step1.att|/home/cmts1/DPREP/demooutput|||1
1100|EOS_AM1_Attitude.21206.step1.hdf|/home/cmts1/DPREP/demooutput|||1
# -----
# Toolkit ephemeris datasets (output of EcDpPrAm1EdosAncillary).
# -----
1102|EOS_AM1_Ephemeris.21206.hdf|/home/cmts1/DPREP/demooutput|||1
# -----
# Gap-filled HDF ephemeris dataset (output of EcDpPrAm1EphemerisGapFill).
# -----
1151|EOS_AM1_Ephemeris.21206.step1b.eph|/home/cmts1/DPREP/demooutput|||1
# -----
# Gap-filled Toolkit ephemeris dataset (output of EcDpPrAm1FormatNativeEphemeris).
# -----
1152|EOS_AM1_Ephemeris.21206.step1b.hdf|/home/cmts1/DPREP/demooutput|||1
? SUPPORT OUTPUT FILES
#####
10100|LogStatus|/home/cmts1/DPREP/logs|||1
10101|LogReport|/home/cmts1/DPREP/logs|||1
10102|LogUser|/home/cmts1/DPREP/logs|||1
10103|TmpStatus|||1
10104|TmpReport|||1
10105|TmpUser|||1
10110|MailFile|||1
:
? USER DEFINED RUNTIME PARAMETERS
#####

```

```
999|No Previous Data Set; 1=true, 0=false.|1
# -----
# Toolkit version for which this PCF was intended.
# DO NOT REMOVE THIS VERSION ENTRY!
# -----
10220|Toolkit version string|DAAC B.0 TK5.2.4
? END
```

11.17.4.5 DPREP Step2 profile1 PCF

PRODUCT INPUT FILES

```
#####
1000|AM1_DEFATT_080000_212_1997_01.FDD|/home/cmts1/DPREP/am1defatt|<A) insert
UR here>||1
:
1010|AM1_DEFATT_100000_212_1997_01.FDD|/home/cmts1/DPREP/am1defatt|<B) insert
UR here>||1
# -----
# The last ephemeris/attitude data sets generated.
# -----
# Attitude (Toolkit native format)
1502|EOS_AM1_Attitude.21206.step2.att|/home/cmts1/DPREP/demooutput|<C) insert UR
here>||1
:
#1400|AM1EPHMH.mcf|.||||1
1401|AM1ATTHF.MCF|/home/cmts1/DPREP/mcf||||1
#1402|AM1EPHMN.mcf|.||||1
1403|AM1ATTNF.MCF|/home/cmts1/DPREP/mcf||||1
10250|MCF||||1
10252|GetAttr.temp||||1
10254|MCFWrite.temp||||1
:
10501|EOS_AM1_Ephemeris.21208.step1b.eph|/home/cmts1/DPREP/demooutput||||2
10501|EOS_AM1_Ephemeris.21210.step1b.eph|/home/cmts1/DPREP/demooutput||||1
10502|INSERT_ATTITUDE_FILES_HERE||||1
:
? PRODUCT OUTPUT FILES
#####
:1001|EOS_AM1_Attitude.21208.step2.att|/home/cmts1/DPREP/demooutput||||1
1100|EOS_AM1_Attitude.21208.step2.hdf|/home/cmts1/DPREP/demooutput||||1
:
? USER DEFINED RUNTIME PARAMETERS
#####
:
999|First Mission Data Set; 1=true, 0=false.|0
:10220|Toolkit version string|DAAC B.0 TK5.2.4
:END
```

11.17.4.6 DREP Step2 profile2 PCF

PRODUCT INPUT FILES

```
#####
1000|AM1_DEFATT_060000_212_1997_01.FDD|/home/cmts1/DPREP/am1defatt|<A) insert
UR here>||1
```

```

:
1010|AM1_DEFATT_080000_212_1997_01.FDD|/home/cmts1/DPREP/am1defatt|<B) insert
UR here>||1
# -----
# The last ephemeris/attitude data sets generated.
# -----
# Attitude (Toolkit native format)
1502|EOS_AM1_Attitude.21206.step1.att|/home/cmts1/DPREP/demooutput|<C) insert UR
here>||1
:
1400|AM1EPHMH.mcf|.||||1
1401|AM1ATTHF.MCF|/home/cmts1/DPREP/mcf||||1
1402|AM1EPHMN.mcf|.||||1
1403|AM1ATTNF.MCF|/home/cmts1/DPREP/mcf||||1
10250|MCF||||1
10252|GetAttr.temp||||1
10254|MCFWrite.temp||||1
:
10501|EOS_AM1_Ephemeris.21206.step1b.eph|/home/cmts1/DPREP/demooutput||||2
10501|EOS_AM1_Ephemeris.21208.step1b.eph|/home/cmts1/DPREP/demooutput||||1
10502|INSERT_ATTITUDE_FILES_HERE||||1
:
? PRODUCT OUTPUT FILES
#####
1001|EOS_AM1_Attitude.21206.step2.att|/home/cmts1/DPREP/demooutput||||1
1100|EOS_AM1_Attitude.21206.step2.hdf|/home/cmts1/DPREP/demooutput||||1
:
? USER DEFINED RUNTIME PARAMETERS
#####
:999|First Mission Data Set; 1=true, 0=false.|1
:
10220|Toolkit version string|DAAC B.0 TK5.2.4
:
? END

```

11.17.4.7 Setups for DPREP

```

set path = ( /usr/ecs/TS1/CUSTOM/TOOLKIT/toolkit/bin/sgi_daac_f90 $path )
setenv PGS_PC_INFO_FILE /home/cmts1/DPREP/pcf/Step1DP21206.PCF
setenv PGSMMSG /home/cmts1/DPREP/msg
setenv PGSHOME /usr/ecs/TS1/CUSTOM/toolkit
setenv PGS_PC_INFO_FILE /home/cmts1/DPREP/pcf/Step1DP21208.PCF
setenv PGSMMSG /home/cmts1/DPREP/msg
setenv PGSHOME /usr/ecs/TS1/CUSTOM/toolkit
setenv PGS_PC_INFO_FILE /home/cmts1/DPREP/pcf/Step1DP21210.PCF
setenv PGSMMSG /home/cmts1/DPREP/msg

```

```
setenv PGSHOME /usr/ecs/TS1/CUSTOM/toolkit
setenv PGS_PC_INFO_FILE /home/cmts1/DPREP/pcf/Step2DP21206.PCF
setenv PGSMSG /home/cmts1/DPREP/msg
setenv PGSHOME /usr/ecs/TS1/CUSTOM/toolkit
setenv PGS_PC_INFO_FILE /home/cmts1/DPREP/pcf/Step2DP21208.PCF
* setenv PGSMSG /home/cmts1/DPREP/msg
* setenv PGSHOME /usr/ecs/TS1/CUSTOM/toolkit
```

Note: The **setenv** parameters are used for the **Command Line PGE** test. Only the (*) are used for **PDPS PGE** runs.

11.18. Learn more about SSI & T

11.18.1 References:

http://m0mss01.ecs.nasa.gov/smc/dc_master.html

` URL for ECS Project Training Material Volume 16: SSI&T December 1997:

MISR Science Data Processing Software Test Plan, Volume 2, Detailed Procedures and Facilities Version 2.0, Part 1 (PGE 1) June 1998.

<http://dmserver.gsfc.nasa.gov/relbit/relbit.htm>

SV DOC

REPOSITORY

Home

Drop Build Plans

Acceptance Test Plan

System Verification Test Plan

Access Database

Release B Testdata

Site Install and Checkout Test

End To End Test Procedures

Goddard DAAC M&O Status

VATC Status Page

ECS TEST

PAGES

Advertising Service (VATC)
User Registration Tool
(VATC)
V0 Web Client (VATC TS2)
V0 Web Client (DAAC
MODE TS2)
V0 Web Client (DAAC
MODE TS1)
V0 Web Client (DAAC
MODE OPS)

ECS TOOLS

EP7
RTM
CCR
EDHS
DDTS
Network Status Page
ECS Newsroom Server
Configuration Management
Release B Integration
ECS Telephone & Email Dir

ISO 9001

Business Manual Tab
Job Description Tab
Organization Charts Tab
Process Directives Tab
Training Tab
Miscellaneous Tab
Frequently Asked questions

EDHS

Raytheon Company

ESDT Basics - <http://dmserver.gsfc.nasa.gov/esdt/EsdtSection1/index.html>

GDAAC Directory for SSI&T:<http://gsfcsrvr8.gsfcmo.ecs.nasa.gov/SSIT/>

The ESDT Process (updated for drop 4) by Karl W. Cox, 22 December 1997

DCE Cell Manager Common User Tasks provided by IDG, February 6, 1998

-
- Tools and Techniques for Diagnosing Potential DCE Problems

MODIS - Science Data Processing Software Release 4 System Description

SDST-104, May 19, 1998

ECSINFO: <http://ecsinfo.hitc.com/iteams/Science/science.html>

PDPS howto are located on the EDF machines at: **/home/PDPS/docs/**

PDPS Web Page: <http://dmserver.gsfc.nasa.gov/ecsdev/relb/pdps/index.html>

For Troubleshooting or use the following EDF machines:

PDPS Troubleshooting Techniques are located on the EDF machines at :
/home/PDPS/troubleshooting/

DPREP README files located at **:/usr/ecs/TS1/CUSTOM/data/DPS/**

DPREP binary located: **:/usr/ecs/TS1/CUSTOM/bin/DPS/**

11.18.2 Server Node Names Convention:

The naming convention is as follows:

Machine names are defined to be equivalent to the network hostname of the machine. Network hostnames are limited to eight characters. On ECS we are now formatting these hostnames as `svcimnni`

Wheres : Site

g – GSFC

e – EDC

l – LaRC

n – NSIDC

a – ASF

j – JPL

m -- Mini-DAAC

t – VATC

v : Version

0 -- Release 4 At-Launch COTS design

1 -- Stood for B.1 COTS design; OBE, but still used in VATC

s -- Used for special SSI&T machines set up at GSFC and EDC

ci : Hardware Configuration Item

- sp -- Science Processing (SPRHW)
- ai -- Algorithm Integration and Test (AITHW)
- aq -- Algorithm Quality Assurance (AQAHW)
- pl -- Planning (PLNHW)
- ms -- Management Subsystem (MSSHW)
- cs -- Communications Subsystem (CSSHW)
- in -- Interface (INTHW)
- dm -- Data Management (DMGHW)
- dr -- Data Repository (DRPHW)
- ac -- Access Control Management (ACMHW)
- ic -- Ingest Client (ICLHW)
- wk -- Working Storage (WKSHW)
- di -- Distribution (DIPHW)
- as -- ASTER (ASTHW) [Occurs only at EDC]
- te -- Test Equipment

m : Manufacturer

- s -- Sun
- g -- SGI
- h -- HP
- x -- X Terminal
- p -- PC

nn : One-up number (01, 02, et cetera -- should be unique for the CI)

i : Interface type

- <null> -- Production network
- u -- User network
- h -- HiPPI

Note that the machine name leaves off the last letter (the interface); hence, we generally refer to machines as "g0spg01", vice "g0spg01h". A machine may have multiple interfaces -- production, user, and HiPPI. So a single machine may show

up in network documentation multiple times (g0spg01, g0spg01h, g0spg01u).

11.18.3 A Handy Alias file to use while conducting SSI&T:

lasher{emcleod}51: **alias**

+ pushd

- popd

More more !* |grep -v "Msg: Caught dce error: No more bindings (dce / rpc)"
|grep -v "MsgLink :0 meaningfulname :EcAgManager::Recovery" |grep -v "MsgLink
:0 meaningfulname :DsShSRequestRealSetStateSettingState" |grep -v "Command 1/1
execution complete"

cdstagebin cd /ecs/formal/STAGE/DSS/bin/sun5.5

dbg debugger -bg NavajoWhite -fn 12x24 !* &

db /home/jzhuang/bin/dbbrowser-syb &

disp setenv DISPLAY !*

mgr DpAtMgr ConfigFile /usr/ecs/TS1/CUSTOM/cfg/DpAtMG.CFG ecs_mode TS1&

ops cd /usr/ecs/OPS/CUSTOM

ts1 cd /usr/ecs/TS1/CUSTOM

xslq_autosys isql -Uautosys -Pautosys -Staltos_svr

xsq1_css isql -Ucss_role -Pwelcome -Ssahara_svr

xsq1_dss isql -UdsrvApp -Pwelcome -Sjourney_sq222_svr

xsq1_ios isql -Uios_role -Pwelcome -Sincagold_svr

xsq1_pdps isql -UpdpsUsers -Pwelcome -Sodyyssey_svr

alias for browser

Note: On mini daac, dbbrowser has to originate from workstation ODYSSEY to execute alias db_pdps to reach PDPS DB on ILLIAD.

alias db_dss '/home/opscm/dbr/dbbrowser-syb -UdsrvApp -Pwelcome -Sjourney_sq222_svr &'

alias db_ios '/home/opscm/dbr/dbbrowser-syb -Uios_role -Pwelcome -Sincagold_svr &'

alias db_css '/home/opscm/dbr/dbbrowser-syb -Ucss_role -Pwelcome -Ssahara_svr &'

alias db_autosys '/home/opscm/dbr/dbbrowser-syb -Uautosys -Pautosys -Staltos_svr &'

alias db_pdps '/home/opscm/dbr/dbbrowser-syb -UpdpsUsers -Pwelcome -Silliad_svr &'

alias db_ing '/home/opscm/dbr/dbbrowser-syb -UEcInPolling -P3nWK0fG1 -Shuckfinn_svr &'

alias db_stmgt '/home/opscm/dbr/dbbrowser-syb -UEcDsStFtpDisServer -PS71Oq4y3 -
Shuckfinn_svr &'

ls -laF look at root and .cshrc, .alias

11.18.4 HOWTO_SSI HELPFUL NOTES

Xterm format to bring up xterm windows for servers all at once

This list of xterm identifiers should be assigned a file name and placed into your home directory. Then invoke the file name when you want to create the entire list of xterms.

Example of filename: - xterm_pls

```
xterm -sb -sl 10000 -fg green -bg black -name "Resource Editor" &
xterm -sb -sl 10000 -fg green -bg black -name "Resource Model" &
xterm -sb -sl 10000 -fg green -bg black -name "Production Request Editor" &
xterm -sb -sl 10000 -fg green -bg black -name "Planning Workbench" &
xterm -sb -sl 10000 -fg green -bg black -name "Database" &
xterm -sb -sl 10000 -fg green -bg black -name "Planning Timeline" &
xterm -sb -sl 10000 -fg green -bg black -name "Logs" &
xterm -sb -sl 10000 -fg green -bg black -name "ECS Assist" &
xterm -sb -sl 10000 -fg green -bg black -name "g0sps06" &
xterm -sb -sl 10000 -fg green -bg black -name "g0ais01" &
xterm -sb -sl 10000 -fg green -bg black -name "g0spg01" &
xterm -sb -sl 10000 -fg green -bg black -name "g0drg01" &
xterm -sb -sl 10000 -fg green -bg black -name "g0pls02" &
# setenv ECS_HOME /usr/ecs
# setenv MODE TS2
```

11.18.4.1 howto_start_and_kill_servers_drop4

```
*****
```

Start servers

```
*****
```

```
% rlogin <any_machine> -l cmops
# To start ALL servers:
/home/cmops/restart/Drop4/Ec.mgr start all TS1
# Substitute subsystem name for "all" to do for a single subsystem
# Valid subsystem names
# EcDm
# EcDp
# EcDsDist
# EcDsSr
# EcDsSt
# EcDsStIn
# EcIn
# EcIo
# EcMsAc
# EcPl
# EcSb
```

```
*****
```

Kill servers -- AFTER WARNING EVERYONE WORKING IN YOUR MODE!

```
*****
```

```
% rlogin <any_machine> -l cmops
# To kill ALL servers:
/home/cmops/restart/Drop4/Ec.mgr stop all TS1
# Substitute subsystem name for "all" to do for a single subsystem
EcDm
```

EcDp
EcDsDist
EcDsSr
EcDsSt
EcDsStIn
EcIn
EcIo
EcMsAc
EcPl
EcSb

11.18.4.2 howto_install_esdt_drop4pL

INSTALLING ESDTs:

```
mini-daac% rlogin texas -l cmops
# passwd opsu$er
#####
# Make sure IOS and SDSRV are up
#####
# Use either ECS Assist on texas *and* incagold,
# Alternatively, use ps:
texas:> ps -ef | grep EcDsScienceDataServer | grep ConfigFile
  sdsrv 24410  1 0 10:17:57 pts/3  0:33
/usr/ecs//OPS/CUSTOM/bin/DSS/EcDsScienceDataServer ConfigFile /usr/ecs//OPS/CUS
incagold:> ps -ef | grep EcIoAdServer
  ios 5864  1 0 10:17:07 pts/0  0:28
/usr/ecs//OPS/CUSTOM/bin/IOS/EcIoAdServer ConfigFile /usr/ecs//OPS/CUSTOM/cfg/E
# If either is not present, that server is down.
# You must arrange to have it up before continuing the install
#####
# If you have ever installed this ESDT before,
# you must first delete its advertisement
#####
See howto_remove_esdt
#####
# Install ESDT on texas
#####
setenv MODE OPS
source /usr/ecs/${MODE}/CUSTOM/utilities/EcCoEnvCsh
# First make sure correct descriptor is in the right directory
texas:> cd /usr/ecs/${MODE}/CUSTOM/data/ESS
texas:> ls -l *<shortname>*
# Substitute your ShortName for <shortname>
# You should see 1 file ending in .desc
# Run GUI to add ESDT
cd /usr/ecs/${MODE}/CUSTOM/utilities
```

EcDsSdSrvGuiStart \$MODE

Click Add, then type in:

Name: <shortname>

Version: 1

Click first File..., then edit Filter so it gets your ESDTs:

(for example, if your ESDTs all contain the string "CER")

/usr/ecs/OPS/CUSTOM/data/ESS/*CER*

Select your ESDT from the list, click OK

Click second File..., then edit Filter so it gets your ESDTs:

(for example, if your ESDTs all contain the string "CER")

/usr/ecs/OPS/CUSTOM/lib/ESS/*CER*

Select your ESDT from the list, click OK

Type in:

Archive ID: DRP1_OPS

Click OK

ESDT begins to install

If you get a "Failure to Add Datatype" message,

go to SDSRV logs and examine them

cd /usr/ecs/OPS/CUSTOM/logs

vi EcDsScienceDataServer.ALOG

vi EcDsScienceDataServerDebug.log

Go to end of log file

:\$

Now look for your ShortName, then read error messages if any

Make sure you are looking at recent error messages by comparing

to the current time

#####

Check that ESDT is in SDSRV database

#####

Invoke ISQL to look at database

texas% isql -UsdsvApp -Pwelcome -Sjourney_sqs222_srvr

Get correct Dsrv database

1> use relbdss

2> go

See your ShortName

1> select ShortName from DsMdCollections where ShortName="<shortname>"

Substitute your ShortName for <shortname>

2> go

Your ShortName should appear on the screen

#####

Check that ESDT was advertised

#####

Open URL <http://incagold:4900> with netscape

Click "Search All"

```

# Enter ShortName in "Search for" box
# Click "Service entry" box
# Click "Search" button at bottom of page
# You should see a list of items, all for your ShortName
# Make sure Insert Service is one of them, so you can do Inserts
# Alternatively, run a script to see all the services
mini-daac% rlogin incagold -l ios
# passwd Mak!thpn
cd /home/ios/scripts
listESDT.csh <shortname>
# passwd welcome
# You should see a bunch of lines with your ShortName in them

```

11.18.4.3 howto_do bulk install of ESDT's

Below is a script you can modify to install several ESDTs at once. I tested up installation of up to 8 ESDTs at once in 4PX/TS1, and it worked. (Haven't tried to Insert any granules yet though ;-)

Success for each ESDT install occurs when you see the message
 /usr/ecs/TS1/CUSTOM/data/ESS/DsESDTMiMISL0CF.001.desc added successfully.
 scroll by on your screen.

Note that you will also see a message

Details:

```

-UnnamedPL[]
/usr/ecs/TS1/CUSTOM/utilities/EcDsSrAdesdt[144]: 11668 Bus Error(coredump)
-- just ignore this ;-)
```

Suggest you start a "script" session to save all the screen output before you start, so you'll know which ESDTs successfully installed.

```
#!/bin/sh -f
```

```
#
```

```
# Install MPGE1 ESDTs not yet installed for MPGE7
```

```
#
```

```
# Usage:
```

```
# install_mpge1_esdts.sh <mode>
```

```
#
```

```
# To use with other ESDTs:
```

```
# Change PFX to your instrument prefix, e.g., "Mo" for MODIS
```

```
# Change the ESDT list "for ESDT in" to your own list
```

```
if [ ! "$1" ]; then
```

```
    echo Usage: $0 \<mode>
```

```
    exit
```

```
fi
```

```
m=$1
```

```
if [ "$m" != "OPS" -a "$m" != "TS1" -a "$m" != "TS2" -a "$m" != "TS3" ]; then
```

```

    echo Mode must be one of {OPS,TS1,TS2,TS3}
    exit
fi
EXE=/usr/ecs/${m}/CUSTOM/utilities/EcDsSrAdesdt
VOLUME_GROUP=VG5

PFX=Mi
V=001

# for ESDT in MIRCCT MIANCSSC MIANPP MIRFOI MIANCARP MISL0AA MISL0AF
MISL0AN
MISL0BA MISL0BF MISL0CA MISL0CF MISL0DA MISL0DF
for ESDT in MIANRCCH MIL1A MI1B2T MI1B2E MIRCCM MISQA MI1B1
do
    $EXE $m $VOLUME_GROUP NULL NULL DsESDT${PFX}${ESDT}.${V}.desc
done

```

11.18.4.4 howto_remove_esdt_drop4pX

First delete advertisement

```

rlogin
incagold -l opscm
rlogin incagold -l cmts1
setenv MODE TS1
cd /usr/ecs/${MODE}/CUSTOM/utilities
source EcCoEnvCsh
cd /usr/ecs/${MODE}/CUSTOM/bin/IOS
ContributionDriver $MODE
awhitele
awhitele
3
2
your_short_name_here
y
# Success is when the "<" prompt returns
# To make sure the advertisements are deleted from the database
incagold% isql -Uios_role -Pwelcome -Sincagold_srvr
[If not OPS mode]
1> use IoAdAdvService_MODE
[where MODE is your mode, e.g. OPS]
[if OPS mode]
1> use IoAdAdvService
2> go
1> select title from IoAdAdvMaster where title like "%your_short_name_here%"
2> go

```

Result should be no rows returned.
If you do get rows returned, the delete of the advertisement
did not work.

Clean up DDICT

```
rlogin incagold -l cmts1
setenv MODE TS1
cd /usr/ecs/${MODE}/CUSTOM/dbms/DMS
DmDbCleanCollection.csh <short_name> 1
```

****IMPORTANT****

CHANGE Database Name FOR THE MODE IN QUESTION

****IMPORTANT****

```
Enter Server Name (DSQUERY): incagold_svr
Enter Database Name: EcDmDictService_TS1
Enter User Name: dms_role
Enter password: welcome
```

incagold_svr

EcDmDictService_TS1

dms_role

welcome

EcCoEnvCsh appears to have wrong value of SYBASE

```
setenv SYBASE /tools/sybOCv11.1.0
```

Then delete ESDT from Data Server

```
rlogin texas -l cmts1
setenv MODE TS1
cd /usr/ecs/${MODE}/CUSTOM/utilities
EcDsSrRmesdt $MODE descriptor_FILENAME_here
e.g. descriptor_FILENAME_here is
DsESDTMiMISL0AA.001.desc
```

(NOTE: Do not put the directory in front of the filename in Drop 4PL)

Success is no error msgs

Kill servers -- AFTER WARNING EVERYONE WORKING IN YOUR MODE!

kill Sdsrv & HdfEosSrv & AdSrv

```
% rlogin <any_machine> -l opscm
```

```
cd /home/jzhuang/test/ShutDown
```

```
sdsrv.shutdown OPS
```

```
ios-dm-mss.shutdown OPS
```

Clean up DCE & Restart servers

```
# (Same login as last step)
# start Sdsrv & HdfEosSrv on texas
# start SubSrvr on incagold
# (cleanup done automatically)
```

Now reinstall the ESDT

texas

See howto_install_esdt.t

11.18.4.5 howto_delete_granules_frm_sdsrv_drop4pX

Delete granules from Sdsrv

```
rlogin texas -l cmops
```

To delete all granules for a given ESDT from the Data Server database:

```
# MAKE SURE YOU USE THE RIGHT MODE!
```

```
# else people may get mad at you
```

```
setenv DSQUERY journey_sq222_srvr
```

```
setenv DBNAME relbdss
```

```
setenv DBUSERNAME sdsrv_role
```

```
setenv DBPASSWD popcorn11
```

```
setenv MODE TS1
```

```
/usr/ecs/${MODE}/CUSTOM/dbms/DSS/DsDbCleanGranules your_short_name_here 1
```

Delete granules from Stmgt

Once you have done this, there is no way for the system to ever retrieve these granules from Stmgt again.

Therefore you can delete them from Stmgt:

```
rlogin raven -l cmops
```

```
cd /dss_amass/OPS
```

WARNING: BE VERY CAREFUL USING THIS COMMAND

If you type it incorrectly, you could delete **everyone's** granules!

```
rm *your_short_name_here*
```

Delete granules from Pdps

See howto_delete_single_file_granule_in_pdps

11.18.4.6 howto_ingest_4px

4PX/OPS

On raven,

```
tail -f EcDsStArchiveServerDebug.log
```

On huckfinn,

```
tail -f EcInPolling.EDOSDebug.log
```

```
tail -f EcInGranDebug.log
```

Login to huckfinn as cmops.

Polling directory is \$POLL = /usr/ecs/OPS/CUSTOM/icl/huckfinn/data/pollEDOS

Prepare data to Ingest in a directory, e.g.,

```
$ING = /SSIT/MISR/PGE1/2.01/L0
```

If necessary, determine correct filename for PDS from

Eric Chomko, & rename your L0 files, and create

the Ingest input files *.PDR and *.PDR.XFR .

For MISR AA camera these files are

```
huckfinn:/SSIT/MISR/PGE1/2.01/L0>lt *0420330AAAAAAAAAAAAAAAAA960071629590*
```

```
-rw-rw-rw- 1 cmts1 cmts1 258278400 Oct 7 16:50
```

```
P0420330AAAAAAAAAAAAAAAAA96007162959001.PDS
```

```
-rw-rw-rw- 1 cmts1 cmts1 384 Oct 7 17:51
```

```
P0420330AAAAAAAAAAAAAAAAA96007162959000.PDS
```

```
-rwxrwxr-x 1 fhuang users 975 Oct 7 18:06
```

```
X0420330AAAAAAAAAAAAAAAAA960071629590.PDR*
```

```
-rwxrwxr-x 1 fhuang users 39 Oct 7 18:06
```

```
X0420330AAAAAAAAAAAAAAAAA960071629590.PDR.XFR
```

For MISR DF camera these files are

```
calahans:/SSIT/MISR/PGE1/2.01/L0>lt *0420320*
```

```
-rw-rw-rw- 1 cmts1 cmts1 299059200 Oct 7 16:35
```

```
P0420320AAAAAAAAAAAAAAAAA96007162959001.PDS
```

```
-rwxrwxrw- 1 cmts1 cmts1 39 Oct 7 16:58
```

```
X0420320AAAAAAAAAAAAAAAAA960071629590.PDR.XFR*
```

```
-rwxrwxrw- 1 cmts1 cmts1 989 Oct 7 17:41
```

```
X0420320AAAAAAAAAAAAAAAAA960071629590.PDR*
```

```
-rw-rw-rw- 1 cmts1 cmts1 384 Oct 13 09:33
```

```
P0420320AAAAAAAAAAAAAAAAA96007162959000.PDS
```

Make sure the .PDR file contains the path pointing

to the L0 files *.PDS .

When ready to Ingest, copy the *.PDR and *.PDR.XFR files

to the \$POLL directory.

Ingest automatically picks up the files every 120 sec.

If need to Start servers:

```
cd /usr/ecs/OPS/CUSTOM/utilities
```

```
EcInStart OPS cold
```

```
grep "End of Start" $LOGS/EcInGranDebug.log
```

Also check ECS Monitor in EcsAssist: make sure EcInPolling.EDOS is UP.

11.18.4.7 howto_register_misr_pges

Copy over ODL

(MISR PGEs 7,1,8c)

```
setenv OTS1 /usr/ecs/TS1/CUSTOM/data/DPS/ODL
```

```
setenv OOPS /usr/ecs/OPS/CUSTOM/data/DPS/ODL
```

```
\cp -p $OTS1/ESDT_MI*.odl $OOPS
```

```
\cp -p $OTS1/ESDT_AM1*.odl $OOPS
```

```
\cp -p $OTS1/PGE_MPGE* $OOPS
```

```
\cp -p $OTS1/ORBIT_MISR.odl $OOPS
```

```
\cp -p $OTS1/PATHMAP_MISR.odl $OOPS
```

MPGE7

Install ESDTs

+++++

MISANCGM

MICNFG

MIANCAGP

AM1EPHN0

AM1ATTN0

MIB2GEOP

Scripts are in

/usr/ecs/TS1/CUSTOM/ssit/lasher/data/MISR/PGE7.FullSwath/pdps

Examples are for OPS mode

+++++

Register PGE

+++++

run_sci.sh OPS

EcDpAtOpDbGui ConfigFile /usr/ecs/OPS/CUSTOM/cfg/EcDpAtOpDbGui.CFG ecs_mode

OPS &

+++++

Insert static input

+++++

insert_stat_mpge7.sh OPS

+++++

Insert dynamic input

+++++

insert_stat_mpge7.sh OPS

+++++

Insert tar file

+++++

MPGE1

Install ESDTs

+++++

- MIRCCT
- MIANCSSC
- MIANPP
- MIRFOI
- MIANCARP
- MISL0AA
- MISL0AF
- MISL0AN
- MISL0BA
- MISL0BF
- MISL0CA
- MISL0CF
- MISL0DA
- MISL0DF
- MIANRCCH
- MIL1A
- MI1B2T
- MI1B2E
- MIRCCM
- MISQA
- MI1B1

Archive ID:

DRP1_OPS:VG4

Scripts are in

/usr/ecs/TS1/CUSTOM/ssit/lasher/data/MISR/PGE1/2.01/pdps

+++++

Register PGE

+++++

DefinePGE.sh OPS

EcDpAtOpDbGui ConfigFile /usr/ecs/OPS/CUSTOM/cfg/EcDpAtOpDbGui.CFG ecs_mode

OPS &

For copying over the OpDbGui stuff for all 9 PGEs:

update PIPgePerformance set

cpuTime=7561,pgeElapsedTime=3844,dprElapsedTime=3844,maxMemory=2905.5,runCpuTime=7561,runMaxMemory=2905.5,runPgeElapsed=3844,runDprElapsed=3844

where pgeId like "MPGE1%:"

update PIPgeMaster set pgeTestOperational=1 where pgeId like "MPGE1% "

+++++

Insert static input

```

+++++
insert_stat_mpge1.sh OPS
(current version does not Insert same granules used by PGE 7)
+++++
Insert dynamic input
+++++
Get Feng to Insert 9 L0 granules
ATT/EPH already Inserted for PGE 7
+++++
Insert tar file
+++++
#####
File MPGE4#2.0_checklist
#####
# Generated by opscm using EcDpAtMkcfg on Sun Jan 11, 1998 15:03:40
#####
# DpAtMgr log initialization file.
# parameter=value pairs:
# DATABASE=path and filename
# CHECKLIST=name of checklist
# ITEM=checklist_item_name

```

DATABASE=/home/toma/green/MPGE4#2.0#02

11.18.4.8 Sample CHECKLIST for: MPGE4#2.0#02

```

ITEM=Install ESDTs
ITEM=Unpack Delivered Algorithm Package
ITEM=Determine path to new 32-bit IMSL library
ITEM=Edit SCF environment variables; change to DAAC values
ITEM=Edit SCF PCF; change file paths to DAAC values
ITEM=Examine SCF PCF; ensure paths to leapsec, utcpole, planetary eph files OK
ITEM=Examine SCF PCF; ensure LID for udunits file is 10302, not 11001
ITEM=Examine SCF PCF; ensure all output file paths have write permission
ITEM=Run PGE from command line; check against expected results
ITEM=Do test Insert of command line output .met file to Data Server
ITEM=Determine mapping of PCF logical IDs to ESDT Short Names
ITEM=Create PGE PDPS metadata ODL file template
ITEM=Edit PGE PDPS metadata ODL file to add ESDT Short Names, other info
ITEM=Create ESDT PDPS metadata ODL files
ITEM=Register SCIENCE metadata in PDPS database
ITEM=Register OPERATIONAL metadata in PDPS database
ITEM=Create .met files for PGE input file Inserts to Data Server
ITEM=Insert static files to Data Server
ITEM=Edit MISR_PGE.sh; replace MISR_PGE_start.pl with PCS_main
ITEM=Create -profile- file

```

ITEM=Create tar file of PGE executables, scripts, message files
 ITEM=Insert tar file of PGE executables to Data Server
 ITEM=Insert test dynamic files to Data Server
 ITEM=Add UR of DataServer itself to PDPS database table with FixMcfGetScript
 ITEM=Edit Toolkit template PCF; Delete Toolkit ephemeris/attitude LIDs
 ITEM=Examine Toolkit template PCF; ensure path to planetary eph files OK
 ITEM=Examine Toolkit template PCF; ensure LID for udunits file 10302, not 11001
 ITEM=Create DPR with Production Request Editor
 ITEM=Create Plan and Kickoff PGE with Planning Workbench
 ITEM=Invoke AutoSys to monitor PGE execution
 ITEM=Place steps Execution (E) and Insert (I) steps On Hold in AutoSys
 ITEM=Before Execution: Change PCF paths to leapsec and utcpole to MISR versions
 ITEM=Before Execution: Ensure PCF output paths have write permission
 ITEM=Before Execution: Change MCF CLASS value for PSAs with Data_Location=MCF
 ITEM=Before Insert: Eliminate duplicate URs from InputPointer field in .met
 ITEM=Before Insert: Truncate EquatorCrossingTime to 15 characters in .met
 ITEM=Compare archived output file with expected test output

#####

11.18.4.9 howto_delete_misr_chain_granules_from_db

DELETING ALL MISR CHAIN GRANULES FROM PDPS DATABASE

Do this after deleting all DPRs.

These instructions are for deleting output granules:

references.

Ignore /* */ below

/*

```
select granuleId from PIDataGranule where dataTypeId like "MIB2GEOP%"
or dataTypeId like "MIANRCCH%"
or dataTypeId like "MIL1A%"
or dataTypeId like "MI1B2T%"
or dataTypeId like "MI1B2E%"
or dataTypeId like "MI1B1%"
or dataTypeId like "MIRCCM%"
or dataTypeId like "MISQA%"
or dataTypeId like "MIL2TCAL%"
```

*/

```
--select granuleId from DpPrGranuleLocation
```

/*

```
delete DpPrGranuleLocation
where granuleId like "MIB2GEOP%"
or granuleId like "MIANRCCH%"
or granuleId like "MIL1A%"
or granuleId like "MI1B2T%"
or granuleId like "MI1B2E%"
```

```

or granuleId like "MI1B1%"
or granuleId like "MIRCCM%"
or granuleId like "MISQA%"
or granuleId like "MIL2TCAL%"
*/
--select fileName from DpPrFile
/*
delete DpPrFile
where universalReference like "%MIB2GEOP%"
or universalReference like "%MIANRCCH%"
or universalReference like "%MIL1A%"
or universalReference like "%MI1B2T%"
or universalReference like "%MI1B2E%"
or universalReference like "%MI1B1%"
or universalReference like "%MIRCCM%"
or universalReference like "%MISQA%"
or universalReference like "%MIL2TCAL%"
*/
--select fileName from DpPrDiskAllocation
/*
delete DpPrDiskAllocation
where fileName like "%MIB2GEOP%"
or fileName like "%MIANRCCH%"
or fileName like "%MIL1A%"
or fileName like "%MI1B2T%"
or fileName like "%MI1B2E%"
or fileName like "%MI1B1%"
or fileName like "%MIRCCM%"
or fileName like "%MISQA%"
or fileName like "%MIL2TCAL%"
*/
/*
update PIRscDiskPartition
set diskUsage = (select sum(diskAllocationSize) from DpPrDiskAllocation)
*/
select * from PIRscDiskPartition

delete PIDataGranuleShort where dataTypeId like "MIB2GEOP%"
or dataTypeId like "MIANRCCH%"
or dataTypeId like "MIL1A%"
or dataTypeId like "MI1B2T%"
or dataTypeId like "MI1B2E%"
or dataTypeId like "MI1B1%"
or dataTypeId like "MIRCCM%"
or dataTypeId like "MISQA%"

```

or dataTypeId like "MIL2TCAL%"

11.18.4.10 howto_query_pdps_db_for_missing_urs

1> select a.granuleId, a.universalReference from PIDataGranuleShort a,

2> PIDprData b

3> where b.dprId like "%q4L%"

4> and a.granuleId = b.granuleId

5> and b.ioFlag = 0 and a.universalReference not like "UR%"

If anything is returned, it means this DPR has inputs that

do not have URs, which is a problem. 1> select a.granuleId, a.universalReference

from PIDataGranuleShort a,

2> PIDprData b

3> where b.dprId like "%q4L%"

4> and a.granuleId = b.granuleId

5> and b.ioFlag = 0 and a.universalReference not like "UR%"

If anything is returned, it means this DPR has inputs that

do not have URs, which is a problem.

#####

11.18.4.11 howto_run_in_pdps_drop4pX

rlogin odyssey -l cmts1

dce_login awhitele awhitele

setenv MODE TS1

cd /usr/ecs/\${MODE}/CUSTOM/utilities

source EcCoEnvCsh

setenv DISPLAY ncdso7:0.0

setenv DISPLAY ncdso32:0.0

setenv DISPLAY ncdso8:0.0

setenv DISPLAY ncdso30:0.0

setenv DISPLAY ncdp11:0.0

Enter a Production Request using PR Editor

script your_scriptname_here

EcPIPRE_IFStart \$MODE

Click PReDit tab

Select your PGE, click OK, wait 10-15 seconds

Enter start & stop time of your input data.

Click File menu, then Save As, type in a name to save your DPR.

After 15-30 seconds, a dialog box pops up.

If it says "1 DPR generated", you're in business!

If it says "0 DPRs generated", you're in trouble. Check the PReDitor logs.

Exit PR Editor.

If PR fails to explode

Check error messages on screen.

After making fixes, delete entries from PIDataGranuleShort
for your PGE.

For example

isql -UpdpsUsers -Pwelcome -Silliad_srvr

1> use pdps_TS1

2> go

Rerun PREditor.

Bring up Planning Workbench

cd /usr/ecs/TS1/CUSTOM/utilities

EcPIAllStart \$MODE 1

Wait 10-15 seconds for it to come up.

If you get a message like:

Process EcPISubMgr is already running in mode TS1 with PID ...

then check if someone else is running Planning Workbench.

(Only one copy may run at a time.)

If not, do

EcPISlayAll \$MODE

then retry EcPIStartAll.

Schedule a Production Request

Under FILE click NEW.

Type in a name for your Plan.

Click your PR in the Production Requests Unscheduled window.

Click Schedule.

Click Save in the dialog box.

Click Activate.

Check if job has started

isql_pdps

1> use pdps

2> go

1> select dprId,completionState from PIDataProcessingRequest

2> go

If your DPR is marked STARTED, th job has started.

If marked NULL, it has not.

If marked CQ_HOLD....check if your granules have a UR in the PDPS database.

1> select dataTypeId,universalReference from PIDataGranule where dataTypeId like "CER%"

2> select dataTypeId,universalReference from PIDataGranule where dataTypeId like "AM1%"

3> go

If all of your granules do not have UR of the form UR:10:DsShESDTUR...,

go to "Delete a DPR and start over" below.

Cleanup and bounce PDPS

See howto_start_and_kill_servers_drop4.txt, use "EcPI"

as argument

Delete a DPR and start over

Do this if (for example) there is no UR for your dynamic granules in PIDataGranule.

1> update PIDataProcessingRequest set completionState="NULL" where dprId="CPGE1#1#010613970000"

1> delete PIPans where planId like "CPGE1%"

Bring up Planning Workbench again

EcPIAllStart \$MODE 1

Click DPRList tab

Click Production Request arrow and selct your PR.

Click on your DPR in the big window.

Click the Edit menu, select Delete.

Click the PRList tab. Your PR should be gone.

Go back to "Enter a Production Request using PR Editor" above.

Run in AutoSys

Once you have a plan scheduled:

rlogin illiad -l cmts1

illiad:> /usr/ecs/TS1/CUSTOM/utilities/EcDpPrAutosysStart TS1 TAL

Click JobScape

Scroll to your PGE

Buttons end in this character:

A -- Allocate

S -- Stage

P -- Preprocess (create runtime PCF)

E -- Execute

p -- Postprocess
I -- Insert to Data Server
D -- Destage (Insert output to Dsrv)

Look for runtime files under
/usr/ecs/TS1/CUSTOM/pdps/lasher/data/DpPrRm/lasher_disk/<pgId>
If AutoSys turns red on Stage step:
look at file
/usr/ecs/RCCCO/CUSTOM/logs/<pgId....>

Restart in AutoSys

First clean out log files from /usr/ecs/RCCCO/CUSTOM/logs .
In JobScope, click on the step that failed (in red).
Click Job Console.
Click Force Start Job.
Step changes to green.
#####

11.18.4.12 howto_insert_dprrfile_entries_mpge1..

insert DpPrFile values
("MI1B2T#00101071996143741AssociatedSensorShortNameDA00000.met","lasher",
"UR:10:DsShESDTUR:UR:15:DsShSciServerUR:13:[MDC:DSSDSRV]:18:SC:MI1B2T.001:12
33",
"/usr/ecs/OPS/CUSTOM/pdps/lasher/data//DpPrRm/lasher_disk",
10,0.032658,0,0,0,0,"08/31/1998 19:00:00",1200)

insert DpPrFile values
("MI1B2T#00101071996143741AssociatedSensorShortNameDA00000","lasher",
"UR:10:DsShESDTUR:UR:15:DsShSciServerUR:13:[MDC:DSSDSRV]:18:SC:MI1B2T.001:12
33",
"/usr/ecs/OPS/CUSTOM/pdps/lasher/data//DpPrRm/lasher_disk",
10,516.909552,0,0,1,1,"08/31/1998 19:00:00",1201)

insert DpPrGranuleLocation
values("MI1B2T#00101071996143741AssociatedSensorShortNameDA0","lasher",2,NULL)

insert DpPrFile values
("MI1B2T#00101071996143741AssociatedSensorShortNameDA00000.met","lasher",
"UR:10:DsShESDTUR:UR:15:DsShSciServerUR:13:[MDC:DSSDSRV]:18:SC:MI1B2T.001:12
33",
"/usr/ecs/OPS/CUSTOM/pdps/lasher/data//DpPrRm/lasher_disk",
10,0.032658,0,0,0,0,"08/31/1998 19:00:00",1200)

```

insert DpPrFile values
("MI1B2T#00101071996143741AssociatedSensorShortNameDA00000","lasher",
"UR:10:DsShESDTUR:UR:15:DsShSciServerUR:13:[MDC:DSSDSRV]:18:SC:MI1B2T.001:12
33",
"/usr/ecs/OPS/CUSTOM/pdps/lasher/data//DpPrRm/lasher_disk",
10,516.909552,0,0,1,1,"08/31/1998 19:00:00",1201)

```

```

insert DpPrGranuleLocation
values("MI1B2T#00101071996143741AssociatedSensorShortNameDA0","lasher",2,NULL)
*****

```

11.18.4.13 howto_run_from_cmdline_in_runtime_dir_drop4pL

```

lasher
cd /usr/ecs/OPS/pdps/DpPrRm/lasher_disk/MPGE8C#2.0a/MPGE8C_lasher
csh% sh
./usr/ecs/OPS/CUSTOM/bin/DPS/auto.profile
.MPGE8C.Profile
grep PGS_PC_Shell.sh MPGE8C.Log
# Paste string after "COMMAND="
PGS_PC_Shell.sh
/usr/ecs/OPS/CUSTOM/pdps/lasher/data//DpPrRm/lasher_disk/MPGE8C#2.0a/PCS_main
1010
/usr/ecs/OPS/CUSTOM/pdps/lasher/data//DpPrRm/lasher_disk/MPGE8C#2.0a/MPGE8C_lasher/
MPGE8C.Pcf
50 -v -p
*****

```

11.18.4.14 howto_increase_stacksize_mpge8

Edy of MISR ssays that PGE 8C will coredump if the stacksize is not increased to "unlimited".

```

lasher:>limit
cputime      unlimited
filesize    unlimited
datasize     unlimited
stacksize    65536 kbytes
coredumpsize unlimited
memoryuse    1019024 kbytes
descriptors  200
vmemoryuse   unlimited
lasher:>limit stacksize unlimited
lasher:>limit
cputime      unlimited
filesize     unlimited

```

```
datasize    unlimited
stacksize   524288 kbytes
coredumpsize unlimited
memoryuse   1019024 kbytes
descriptors 200
vmemoryuse  unlimited
datasize    unlimited
```

11.18.4.15 howto_insert_test_metadata_only_in_sdsrv_drop4pL

```
rlogin texas
cd /usr/ecs/OPS/CUSTOM/utilities
setenv MODE OPS
source EcCoEnvCsh
/usr/ecs/OPS/CUSTOM/bin/DSS/insert_test ConfigFile
/usr/ecs/OPS/CUSTOM/cfg/EcDsScienceDataServerClient.CFG ecs_mode OPS
```

Respond to prompts:

```
your_short_name_here
1
your_metadata_filename_here
your_dummy_data_filename_here
y
```

NOTE: your_dummy_data_filename cannot be the same filename as

your_metadata_filename

[example for MISR]

Respond to prompts:

```
MISANCGM
/usr/ecs/OPS/CUSTOM/ssit/lasher/data/MISR/PGE1/2.0/ANC/
/usr/ecs/OPS/CUSTOM/ssit/lasher/data/MISR/PGE1/2.0/pdps/dum
y
```

If a UR is returned, test metadata Insert was successful, and metadata is valid.

If not, check the string beginning "--CmdResults[" for error messages.

Edit .met file and retry.

Other tests

MISL0CF

```
/usr/ecs/OPS/CUSTOM/ssit/lasher/data/MISR/PGE1/2.0/fullswath/STP_CF_NEW_NOMINAL/
L0SIM/MISL0CF.met
/usr/ecs/OPS/CUSTOM/ssit/lasher/data/MISR/PGE1/2.0/fullswath/STP_CF_NEW_NOMINAL/
L0SIM/L0sim.cf.new.nominal.00.EDS
```

n

```
/usr/ecs/OPS/CUSTOM/ssit/lasher/data/MISR/PGE1/2.0/pdps/dum
```

y

MIANPP

```
/usr/ecs/OPS/CUSTOM/ssit/lasher/data/MISR/PGE1/2.0/fullswath/STP_CF_NEW_NOMINAL/PP/cf.pp.met
```

```
/usr/ecs/OPS/CUSTOM/ssit/lasher/data/MISR/PGE1/2.0/fullswath/STP_CF_NEW_NOMINAL/PP/cf.pp.met.0
```

```
y  
MIRFOI
```

```
/usr/ecs/OPS/CUSTOM/ssit/lasher/data/MISR/PGE1/2.0/fullswath/STP_CF_NEW_NOMINAL/ROI/cf.roi.met
```

```
/usr/ecs/OPS/CUSTOM/ssit/lasher/data/MISR/PGE1/2.0/fullswath/STP_CF_NEW_NOMINAL/ROI/cf.roi.met.0
```

```
y  
MI1B1
```

```
/usr/ecs/OPS/CUSTOM/ssit/lasher/data/MISR/PGE1/2.0/pdps/met0/
```

```
/usr/ecs/OPS/CUSTOM/ssit/lasher/data/MISR/PGE1/2.0/pdps/met0/dum
```

```
y  
MI1B1
```

```
/usr/ecs/OPS/CUSTOM/ssit/lasher/data/MISR/PGE1/2.0/pdps/met/
```

```
/usr/ecs/OPS/CUSTOM/ssit/lasher/data/MISR/PGE1/2.0/pdps/met/dum
```

```
y
```

```
*****
```

11.18.4.16 howto_delete_granules_frm_sdsrv_drop4pL

```
*****
```

Delete granules from Sdsrv

```
*****
```

```
rlogin texas -l cmops
```

To delete all granules for a given ESDT from the Data Server database:

```
# MAKE SURE YOU USE THE RIGHT MODE!
```

```
# else people may get mad at you
```

```
setenv DSQUERY journey_sqs222_srvr
```

```
setenv DBNAME relbdss
```

```
setenv DBUSERNAME sdsrv_role
```

```
setenv DBPASSWD popcorn11
```

```
setenv MODE OPS
```

```
/usr/ecs/${MODE}/CUSTOM/dbms/DSS/DsDbCleanGranules your_short_name_here 1
```

```
*****
```

Delete granules from Stmgt

```
*****
```

Once you have done this, there is no way for the system to ever retrieve these granules from Stmgt again.

Therefore you can delete them from Stmgt:

```
rlogin raven -l cmops
```

```
cd /dss_amass/OPS
```

WARNING: BE VERY CAREFUL USING THIS COMMAND

If you type it incorrectly, you could delete *everyone's* granules!

```
rm *your_short_name_here*
```

Delete granules from Pdps

See [howto_delete_single_file_granule_in_pdps.txt](#)

11.18.4.17 howto_run_in_pdps_drop4pL

```
rlogin odyssey -l cmops
```

```
dce_login awhitele awhitele
```

```
setenv MODE OPS
```

```
cd /usr/ecs/${MODE}/CUSTOM/utilities
```

```
source EcCoEnvCsh
```

```
setenv DISPLAY ncdso7:0.0
```

```
setenv DISPLAY ncdso32:0.0
```

```
setenv DISPLAY ncdso8:0.0
```

```
setenv DISPLAY ncdso30:0.0
```

```
setenv DISPLAY ncdp11:0.0
```

Enter a Production Request using PR Editor

```
script your_scriptname_here
```

```
EcPIPE_IFStart $MODE
```

Click PREdit tab

Select your PGE, click OK, wait 10-15 seconds

Enter start & stop time of your input data.

Click File menu, then Save As, type in a name to save your DPR.

After 15-30 seconds, a dialog box pops up.

If it says "1 DPR generated", you're in business!

If it says "0 DPRs generated", you're in trouble. Check the PREditor logs.

Exit PR Editor.

If PR fails to explode

Check error messages on screen.

After making fixes, delete entries from PIDataGranuleShort

for your PGE.

For example

```
isql -UpdpsUsers -Pwelcome -Silliad_srvr
```

```
1> use pdps OPS
```

```
2> go
```

Rerun PREditor.

Bring up Planning Workbench

cd /usr/ecs/OPS/CUSTOM/utilities

EcPIAllStart \$MODE 1

Wait 10-15 seconds for it to come up.

If you get a message like

Process EcPISubMgr is already running in mode OPS with PID ...

then check if someone else is running Planning Workbench.

(Only one copy may run at a time.)

If not, do

EcPISlayAll \$MODE

then retry EcPIStartAll.

Schedule a Production Request

Under FILE click NEW.

Type in a name for your Plan.

Click your PR in the Production Requests Unscheduled window.

Click Schedule.

Click Save in the dialog box.

Click Activate.

Check if job has started

isql_pdps

1> use pdps

2> go

1> select dprId,completionState from PIDataProcessingRequest

2> go

If your DPR is marked STARTED, th job has started.

If marked NULL, it has not.

If marked CQ_HOLD...check if your granules have a UR in the PDPS database.

1> select dataTypeId,universalReference from PIDataGranule where dataTypeId like "CER%"

2> select dataTypeId,universalReference from PIDataGranule where dataTypeId like "AM1%"

3> go

If all of your granules do not have UR of the form UR:10:DsShESDTUR...,

go to "Delete a DPR and start over" below.

Cleanup and bounce PDPS

11.18.4.18 howto_start_and_kill_servers_drop4pL

use "EcPI" as argument

Delete a DPR and start over

Do this if (for example) there is no UR for your dynamic granules
in PIDataGranule.

1> update PIDataProcessingRequest set completionState="NULL" where
dprId="CPGE1#1#010613970000"

1> delete PIPans where planId like "CPGE1%"

Bring up Planning Workbench again

EcPIAllStart \$MODE 1

Click DPRList tab

Click Production Request arrow and select your PR.

Click on your DPR in the big window.

Click the Edit menu, select Delete.

Click the PRList tab. Your PR should be gone.

Go back to "Enter a Production Request using PR Editor" above.

Alternative way to delete a DPR:

/home/opscm/pdpsScript/EcPIResetDpr.sh \$MODE <dprId>

Now use PReDitor to delete PRs as above.

To delete a PGE from the database:

/home/opscm/pdpsScript/EcPIResetPge.sh \$MODE <pgeId>

Run in AutoSys

Once you have a plan scheduled:

rlogin illiad -l cmops

illiad:> /usr/ecs/OPS/CUSTOM/utilities/EcDpPrAutosysStart OPS TAL

Click JobScape

Scroll to your PGE

Buttons end in this character:

A -- Allocate

S -- Stage

P -- Preprocess (create runtime PCF)

E -- Execute

p -- Postprocess

I -- Insert to Data Server

D -- Destage (Insert output to Dsrv)

Look for runtime files under

/usr/ecs/OPS/CUSTOM/pdps/lasher/data/DpPrRm/lasher_disk/<pgeId>

If AutoSys turns red on Stage step:

look at file

/usr/ecs/RCCCO/CUSTOM/logs/<pgeId...>

Restart in AutoSys

First clean out log files from /usr/ecs/RCCCO/CUSTOM/logs .
In JobScape, click on the step that failed (in red).
Click Job Console.
Click Force Start Job.
Step changes to green.

11.18.4.19 Procedures to bring cdsbrowser up

```
telnet to msse5hp
#login in as yourself
login: rthamby
password: "yourpasswd"
cd /opt/dce/bin/
setenv DISPLAY
cdsbrowser &
#this would bring the cdsbrowser GUI
click on security
and dce login
login: awhitele
password: awhitele
next click on subsys icon,,,
then subsys/ecs
then subsys/ecs/server
now pick a server
*****
```

dbbrowser:

```
telnet to texas
login: cmops
password: opsu$er
cd dbr
source dx.csh
% dbr
*****
```

11.18.4.20 howto_insert static files

```
#####
# Make sure STMGT and SDSRV are up
#####
# Use either ECS Assist on texas *and* raven,
# Alternatively, use ps:
texas:> ps -ef | grep EcDsScienceDataServer
  sdsrv 24410  1 0 10:17:57 pts/3  0:33 /usr/ecs//OPS/CUSTOM/bin/DSS/
EcDsScienceDataServer ConfigFile /usr/ecs/OPS/CUSTOM/
```

```

raven:> ps -ef | grep Server | grep OPS | grep ConfigFile
stmgt 3786  1 0 Dec 30 ?   10:39 /usr/ecs/OPS/CUSTOM/bin/DSS/
EcDsStStagingDiskServer ConfigFile /usr/ecs/OPS/CUS
stmgt 3803  1 0 Dec 30 ?   10:31 /usr/ecs/OPS/CUSTOM/bin/DSS/
EcDsStStagingMonitorServer ConfigFile /usr/ecs/OPS/
stmgt 3770  1 0 Dec 30 ?   16:18 /usr/ecs/OPS/CUSTOM/bin/DSS/
EcDsStArchiveServer ConfigFile /usr/ecs/OPS/CUSTOM/
stmgt 3815  1 0 Dec 30 ?   10:59 /usr/ecs/OPS/CUSTOM/bin/DSS/
EcDsStFtpDisServer ConfigFile /usr/ecs/OPS/CUSTOM/
# If any of these are not present, that server is down.
# You must arrange to have it up before continuing the install
#####
# Setup SSIT environment, login to DCE
#####
mini-daac% rlogin calahans
calahans% source /usr/ecs/OPS/CUSTOM/utilities/.buildrc
calahans% dce_login
Enter Principal Name: awhitele
Enter Password: awhitele
#####

```

11.18.4.21 Insert all static files needed for CERES SS1

```

#####
calahans% cd /usr/ecs/TS1/CUSTOM/ssit/lasher/data/CERES/ecs/ss1/pdps
calahans% Ceres1StaticInsert.sh
#####
# Insert a single static file
*****

```

11.18.4.22 Insert Test Dynamic File (multi-file) using SSIT Manager

The Insert Test Dynamic File program inserts test dynamic input files to the Data Server, for use both during SSIT and in production. Dynamic Files are files which change at each instance of PGE processing; for example, Level 0 data files. (An example of a static file is a calibration file.) This tool performs a function that is normally done by Ingest. It allows the user to insert dynamic files to the Data Server for testing purposes. Normally, Ingest will take in such files and insert them as part of its normal processing.

Preconditions to running the Insert Test Dynamic File program Before this program is run, the following must have occurred: An ESDT for this data type must have been created in the Data Server. A PGE that uses the Dynamic File(s) ESDT must have been Registered to PDPS via the SSIT Science Metadata Update tool.

An ASCII Metadata File (.met) for this instance of the ESDT must have been created in the format expected by the Data Server for Insert.

Both the test dynamic data file(s) in question and its corresponding ASCII Metadata file must be accessible to the local machine.

The directory where the dynamic data file(s) and the ASCII Metadata File exist must be cross mounted to the Data Server machines.

Running the Insert Test Dynamic File program from the SSIT Manager

The Insert Test Dynamic File program is invoked from the SSIT Manager under the TOOLS menu item Data Server, sub-menu Insert Test.

The user prompts and explanations follow. Note that if there is a default value for an entry (in most cases this will only occur if you run the program more than once) it will appear at the end of the prompt line.

PGE Test Dynamic Input File Insertion

Configuration filename? (enter for default: ../../cfg/EcDpAtInsertTestFile.CFG)

In most cases hitting enter (for the default) is fine.

If not, enter the correct configuration filename including full path

ECS Mode of operations?

This is the mode (i.e. OPS, TS1) of operations.

In most cases this will be TS1

ESDT short name for the file(s) to Insert?

This is the ESDT short name (max 8 characters) for the data file(s).

ESDT Version for the file(s) to insert?

This is the ESDT version (an integer) for the data file(s).

Is there is more than one data file to this Dynamic Granule (Y = Yes, N = No)?

This indicates to the program if there is more than one file associated with the dynamic input.

Most dynamic inputs are a single data file and a corresponding ASCII Metadata File. Other dynamic inputs consist of more than one data file and a single ASCII Metadata file (there is always only 1 ASCII Metadata File).

If there is only one data file enter N (or just hit enter for the default).

For multiple data files enter Y

If it is NOT a Dynamic Multi-File Granule (there is a single data file) the following prompts will need to be answered

Single Filename to Insert (including FULL path)?

This is the name of the data file to insert to the Data Server.

Include the full path to the file so that it can be found by the tool

Associated ASCII Metadata Filename to Insert (including FULL path)?

<I>This is the name of the ASCII Metadata File (.met) associated with the data file.

Full path to the file must be included so that it can be found by the tool.

It can be created by using the Get MCF tool to get a Metadata Control File which specifies the fields and type of data that is required for the ASCII Metadata file

If it IS a Dynamic Multi-File Granule (more than 1 data file) the

following prompts will need to be answered

Directory where all data files and .met file exist (FULL path)?

This is the directory location where all the data files and the ASCII Metadata file are located.

For Multi-File Dynamics all files and Metadata must reside in the same directory

Name of MFG file (enter to end list)?

This is the name of one of the data files for a Dynamic Multi-File Granule.

Enter a file at the prompt and the prompt will then be repeated, allowing for the next file to be named. When all data files have been entered, just hit the enter key at the next prompt (thus entering nothing).

Associated ASCII Metadata Filename to Insert?

This is the name of the ASCII Metadata File (.met) associated with the data file.

No path is needed because it is assumed that the file resides in the directory specified above.

It can be created by using the `Get MCF` tool to get a Metadata Control File which specifies the fields and type of data that is required for the ASCII Metadata file

Any success or error messages will then be displayed followed by:

Hit Enter to run again, 'q <Enter>' to quit:

This allows the user to enter another Dynamic File (just hit enter) or quit the program (q).

Running the Insert Test Dynamic File program from the command line

There are two methods to run the program from the UNIX command line:

`EcDpAtInsertTest`

This is the same shell script that the SSIT Manager GUI kicks off and queries the user for all necessary data (as specified in the section above) for the program that will actually insert the test data file.

Or the program itself can be run directly as follows:

```
EcDpAtInsertTestFile ConfigFile EcDpAtInsertTestFile.CFG ecs_mode MODE SHORT_NAME  
VERSION {FILENAME METADATA_FILE} {DIRECTORY FILENAME ... FILENAME  
METADATA_FILE}
```

The arguments are described as follows:

`EcDpAtInsertTestFile` - name of the program. Substitute full path if running from a different location.

`ConfigFile` - delimiter that tells the program that the configuration file is the next item in the input list. Note that it must follow the program name.

`EcDpAtInsertTestFile.CFG` - name of the configuration file. Again, substitute full path if it is in another directory.

`ecs_mode` - delimiter that tells the program that the Mode is the next item in the input list. Note that it must follow the configuration file name.

`MODE` substitute the Mode of operations (i.e. TS1).

SHORT_NAME the ESDT short name for the file(s) to insert. Must already be installed at the Data Server.

VERSION version of the ESDT. An integer value.

{FILENAME METADATA_FILE- the pairing of inputs for a single file dynamic input.

FILENAME the name of the file (including Full path) to insert for single file dynamic granules.

METADATA_FILE- the name of the ASCII Metadata file (including Full path).

{DIRECTORY FILENAME ... FILENAME METADATA_FILE- the pairing of inputs for a multi-file dynamic granule.

DIRECTORY- the directory where all the files and the associated ASCII Metadata File is located.

FILENAME- the name of the file (assumed to be in the directory specified above) to insert for a multi-file dynamic granule. Repeat with as many filenames as needed to complete the granule.

Separate with spaces.

METADATA_FILE- the name of the ASCII Metadata file (assumed to be in the directory specified above).

After this program runs successfully, the specified file(s) have been stored at the Data Server and can be acquired by PDPS when executing PGEs. Also, any subscriptions made on the ESDT of the insert file(s) will trigger, and could (via Subscription Manager) cause PGE waiting on this data to start execution.

Problems?

If you get an error message like

Config file EcDpAtInserTestFile.CFG is unreadable

then the name or path of the Process Framework configuration file for this program is invalid.

Change the name and path of the .CFG file to point to a valid Process Framework configuration file.

If you get an error message like

Could not get DSS from Adv.

then there is a problem getting the location for the Data Server from Advertising (IOS). This is either because the Advertising server is down or the ESDT has not been properly installed. Check that the Advertising server is up and then verify the installation of the ESDT for the insert.

If you get an error message like

Submit to the Data Server failed

then it is likely that the you did not specify the full path for either the file or the metadata file, or the directory in which the files reside is not NFS mounted to the DSS machine. Try again with the full path name, or find a directory on the local machine that also appears on the DSS machine.

11.18.4.23 howto_insert_test_metadata_only_in_sdsrv_drop4/MISR

rlogin texas

/usr/ecs/TS1/CUSTOM/bin/DSS/insert_test ConfigFile

/usr/ecs/TS1/CUSTOM/cfg/EcDsScienceDataServerClient.CFG ecs_mode TS1

Respond to prompts:

your_short_name_here
your_metadata_filename_here
your_dummy_data_filename_here

y

NOTE: your_dummy_data_filename cannot be the same filename as
your_metadata_filename

[example for MISR]

Respond to prompts:

MISANCGM

/usr/ecs/TS1/CUSTOM/ssit/lasher/data/MISR/PGE1/2.0/ANC/
/usr/ecs/TS1/CUSTOM/ssit/lasher/data/MISR/PGE1/2.0/pdps/dum

y

If a UR is returned, test metadata Insert was successful, and metadata is
valid.

If not, check the string beginning "--CmdResults[" for error messages.

Edit .met file and retry.

Other tests

MISLOCF

/usr/ecs/TS1/CUSTOM/ssit/lasher/data/MISR/PGE1/2.0/fullswath/STP_CF_NEW_NOMINAL/L
0SIM/MISLOCF.met
/usr/ecs/TS1/CUSTOM/ssit/lasher/data/MISR/PGE1/2.0/fullswath/STP_CF_NEW_NOMINAL/L
0SIM/L0sim.cf.new.nominal.00.EDS

n

/usr/ecs/TS1/CUSTOM/ssit/lasher/data/MISR/PGE1/2.0/pdps/dum

y

MIANPP

/usr/ecs/TS1/CUSTOM/ssit/lasher/data/MISR/PGE1/2.0/fullswath/STP_CF_NEW_NOMINAL/P
P/cf.pp.met
/usr/ecs/TS1/CUSTOM/ssit/lasher/data/MISR/PGE1/2.0/fullswath/STP_CF_NEW_NOMINAL/P
P/cf.pp.met.0

y

MIRFOI

/usr/ecs/TS1/CUSTOM/ssit/lasher/data/MISR/PGE1/2.0/fullswath/STP_CF_NEW_NOMINAL/R
OI/cf.roi.met
/usr/ecs/TS1/CUSTOM/ssit/lasher/data/MISR/PGE1/2.0/fullswath/STP_CF_NEW_NOMINAL/R
OI/cf.roi.met.0

y

11.18.4.24 howto_insert test dynamic files

```
#####  
# Make sure STMGT and SDSRV are up  
#####  
# Use either ECS Assist on texas *and* raven,
```

```

# Alternatively, use ps:
texas:> ps -ef | grep EcDsScienceDataServerdsrv 24410 1 0 10:17:57 pts/3 0:33
/usr/ecs//TS1/CUSTOM/bin/DSS/EcDsScienceDataServer ConfigFile /usr/ecs//TS1/CUS
raven:> ps -ef | grep Server | grep ConfigFile
  stmgt 3786 1 0 Dec 30 ? 10:39 /usr/ecs/TS1/CUSTOM/bin/DSS/EcD
sStStagingDiskServer ConfigFile /usr/ecs/TS1/CUS
  stmgt 3803 1 0 Dec 30 ? 10:31 /usr/ecs/TS1/CUSTOM/bin/DSS/EcD
sStStagingMonitorServer ConfigFile /usr/ecs/TS1/
  stmgt 3770 1 0 Dec 30 ? 16:18 /usr/ecs/TS1/CUSTOM/bin/DSS/EcD
sStArchiveServer ConfigFile /usr/ecs/TS1/CUSTOM/
  stmgt 3815 1 0 Dec 30 ? 10:59 /usr/ecs/TS1/CUSTOM/bin/DSS/EcD
sStFtpDisServer ConfigFile /usr/ecs/TS1/CUSTOM/c
# If any of these are not present, that server is down.
# You must arrange to have it up before continuing the install
#####
# Setup SSIT environment, login to DCE
#####
mini-daac% rlogin calahans
calahans% source /usr/ecs/TS1/CUSTOM/bin/DPS/.buildrc
calahans% dce_login
Enter Principal Name: awhitele
Enter Password: awhitele
#####
# Insert the test file
#####
cd /usr/ecs/TS1/CUSTOM/ssit/lasher/data/CERES/ecs/ss1/pdps
# Bring up InsertStatic window -- leave it up until you
# are completely done inserting all static files --
*****

```

11.18.4.25 howto_insert_multifile_granules.scr

```

rlogin calahans -l sdsrv
dce_login
cd /home/mtheobal/tmp
source ld_path
Script started on Thu Jan 08 10:05:37 1998
sourcing /usr/ecs/TS1/CUSTOM/utilities/libpath.csh
/usr/ecs/TS1/CUSTOM/utilities/libpath.csh: No such file or directory
calahans{sdsrv}1: cd /home/mtheobal/tmp
calahans(sdsrv):/home/mtheobal/tmp<2>source ld_path
calahans(sdsrv):/home/mtheobal/tmp<3>subacquire ConfigFile
EcDsScienceDataServerClient.
CFG ecs_mode TS1
Warning: could not open message catalog "oodce.cat"
SDSRV cell is not in configfile, using local cell

```

```

Client G1 Path: ./subsys/ecs/TS1/EcDsScienceDataServerG1
1    Insert Data (w/multiple file)
2    Test Selective Acquirer
3    Test Subsetted Acquirer
4    Search for Granule
5    Exit
Please make selection=> 1
Executing insert .....
trying to connect to ./subsys/ecs/TS1/EcDsScienceDataServerG1
Enter data type=> ER00AF    ERDIAF
Enter data metafile name(full path)=>
/usr/ecs/TS1/CUSTOM/ssit/lasher/data/CERES/ecs/ss1/instrument/data/input/TRMM_G056_LZ
_1997-06-12T01-07-34Z_V01.DAT1.met
Enter number of datafile names=> 2
Inserting MetadataFile
[/usr/ecs/TS1/CUSTOM/ssit/lasher/data/CERES/ecs/ss1/instrument/data/input/TRMM_G056_LZ
_1997-06-12T01-07-34Z_V01.DAT1.met]
Enter datafile #1 name(full path)=>
/usr/ecs/TS1/CUSTOM/ssit/lasher/data
/CERES/ecs/ss1/instrument/data/input/TRMM_G056_LZ_1997-06-12T01-07-34Z_V01.DAT1
Inserting
DataFile #1
[/usr/ecs/TS1/CUSTOM/ssit/lasher/data/CERES/ecs/ss1/instr
ument/data/input/TRMM_G056_LZ_1997-06-12T01-07-34Z_V01.DAT1]
Enter datafile #2 name(full path)=>
/usr/ecs/TS1/CUSTOM/ssit/lasher/data
/CERES/ecs/ss1/instrument/data/input/TRMM_G056_LZ_1997-06-13T04-19-59Z_V01.DAT1
Inserting
DataFile #2
[/usr/ecs/TS1/CUSTOM/ssit/lasher/data/CERES/ecs/ss1/instr
ument/data/input/TRMM_G056_LZ_1997-06-13T04-19-59Z_V01.DAT1]
Insert science data only ...Success.
UR(UR:10:DsShESDTUR:UR:15:DsShSciServerUR:7:dssdsrv:20:Science:ERDIAF:1694)
1    Insert Data (w/multiple file)
2    Test Selective Acquirer
3    Test Subsetted Acquirer
    4    Search for Granule
    5    Exit

```

11.18.4.26 Insert Static File (multi_file) using SSIT Manager

The Insert Static File program inserts static input file(s) to the Data Server, for use both during SSIT and in production. Static Files are files which rarely change between

instances of PGE processing; for example, calibration files.

(An example of a dynamic file is a Level 0 data file.)

Preconditions to running the Insert Static File program

Before this program is run, the following must have occurred:

An ESDT for this data type must have been created in the Data Server.

A PGE that uses the Static File must have been Registered to PDPS via the [DpAtMgr_sciupdate.html](#) SSIT Science Metadata Update tool.

An ASCII Metadata File (.met) for this ESDT must have been created, in the format expected by the Data Server for Insert.

Both the static data file(s) in question and its corresponding ASCII Metadata file must be accessible to the local machine.

The directory where the static data file(s) and the ASCII Metadata File exist must be cross mounted to the Data Server machines

Running the Insert Test Dynamic File program from the SSIT Manager

The Insert Static File program is invoked from the SSIT Manager under the TOOLS menu item Data Server, sub-menu Insert Static.

The user prompts and explanations follow. Note that if there is a default value for an entry (in most cases this will only occur if you run the program more than once) it will appear at the end of the prompt line.

PGE Static Input File Insertion Script

Configuration filename? (enter for default: ../cfg/EcDpAtInsertStaticFile.CFG)

In most cases hitting enter (for the default) is fine.

If not, enter the correct configuration filename including full path

ECS Mode of operations?

This is the mode (i.e. OPS, TS1) of operations.

In most cases this will be **TS1**.

ESDT short name for the file(s) to Insert?

This is the ESDT short name (max 8 characters) for the data file(s)

ESDT Version for the file(s) to insert?

This is the ESDT version (an integer) for the data file(s).

Science Group for Static file (one of {C, L, D, O} followed by a 3 digit number)?

This is the Science Group for this Static File(s).

It is defined in the [DpAtMgr_PGEMetadata.html](#) PGE Metadata ODL File for each PGE that uses this static file.

C = Coefficient File(s), L = Lookup Table/file(s), D = Database File(s), O = Other Files. Note that using the wrong letter for the file(s) (say L for a Coefficient File) will not result in an error.

Is there is more than one data file to this Static (Y = Yes, N = No)?

This indicates to the program if there is more than one file associated with the static input.

Most static inputs are a single data file and a corresponding ASCII Metadata File. Other static inputs consist of more than one data file and a single ASCII Metadata file (there is always only 1 ASCII Metadata File).

If there is only one data file enter N (or just hit enter for the default).

For multiple data files enter Y.

If it is NOT a Static Multi-File Granule (there is a single data file)

the following prompts will need to be answered:

Single Filename to Insert (including FULL path)?

This is the name of the data file to insert to the Data Server.

Include the full path to the file so that it can be found by the tool.

Associated ASCII Metadata Filename to Insert (including FULL path)?

This is the name of the ASCII Metadata File (.met) associated with the data file.

Full path to the file must be included so that it can be found by the tool.

It can be created by using the [Get MCF](#) tool to get a Metadata Control File which specifies the fields and type of data that is required for the ASCII Metadata file.

If it IS a Static Multi-File Granule (more than 1 data file) the following prompts will need to be answered

Directory where all data files and .met file exist (FULL path)?

This is the directory location where all the data files and the ASCII Metadata file are located.

For Multi-File Statics all files and Metadata must reside in the same directory.

Name of MFG file (enter to end list)?

This is the name of one of the data files for a Static Multi-File Granule.

Enter a file at the prompt and the prompt will then be repeated, allowing for the next file to be named. When all data files have been entered, just hit the enter key at the next prompt (thus entering nothing).

Associated ASCII Metadata Filename to Insert?

This is the name of the ASCII Metadata File (.met) associated with the data file.

No path is needed because it is assumed that the file resides in the directory specified above.

It can be created by using the [Get MCF](#) tool to get a Metadata Control File which specifies the fields and type of data that is required for the ASCII Metadata file

Any success or error messages will then be displayed followed by:

Hit Enter to run again, 'q <Enter>' to quit:

This allows the user to enter another Static File (just hit enter) or quit the program (q).

Running the Insert Test Dynamic File program from the command line

There are two methods to run the program from the UNIX command line:

EcDpAtInsertStatic

This is the same shell script that the SSIT Mgr GUI kicks off and queries the user for all necessary data (as specified in the section above) for the program that will actually insert the static file.

Or the program itself can be run directly as follows:

```
EcDpAtInsertStaticFile ConfigFile EcDpAtInsertStaticFile.CFG ecs_mode MODE
SHORT_NAME VERSION SCIENCE_GROUP {FILENAME METADATA_FILE}
{DIRECTORY FILENAME ... FILENAME METADATA_FILE}
```

The arguments are described as follows:

EcDpAtInsertStaticFile - name of the program. Substitute full path if running from a different location.

ConfigFile - delimiter that tells the program that the configuration file is the next item in the input list. Note that it must follow the program name.

EcDpAtInsertStaticFile.CFG - name of the configuration file. Again, substitute full path if it is in another directory.

ecs_mode - delimiter that tells the program that the Mode is the next item in the input list. Note that it must follow the configuration file name.

MODE- substitute the Mode of operations (i.e. TS1).

SHORT_NAME- the ESDT short name for the file(s) to insert. Must already be installed at the Data Server.

VERSION- version of the ESDT. An integer value.

SCIENCE_GROUP- the grouping that defines this input to PGEs that use it. It is one of {C, L, D, O} followed by a 3-digit number.

{FILENAME METADATA_FILE- the pairing of inputs for a single file static input.

FILENAME- the name of the file (including Full path) to insert for single file static granules.

METADATA_FILE - the name of the ascii Metadata file (including Full path).

{DIRECTORY FILENAME ... FILENAME METADATA_FILE}- the pairing of inputs for a multi-file static granule.

DIRECTORY- the directory where all the files and the associated ASCII Metadata File is located.

FILENAME- the name of the file (assumed to be in the directory specified above) to insert for a multi-file static granule. Repeat with as many filenames as needed to complete the granule. Separate with spaces.

METADATA_FILE - the name of the ASCII Metadata file (assumed to be in the directory specified above).

After this program runs successfully, the PDPS database has been updated with the Data Server Universal Reference (UR) of the file inserted.

This UR is read by the Planning and Processing systems at runtime. so that the file can be acquired and used as need during production.

Problems

If you get an error message like

“Config file EcDpAtInsertStaticFile.CFG is unreadable”,

then the name or path of the Process Framework configuration file for this program is invalid.

Change the name and path of the .CFG file to point to a valid Process Framework configuration file.

If you get an error message like “Could not get DSS from Adv.” then there is a problem getting the location for the Data Server from Advertising (IOS). This is either because the Advertising server is down or the ESDT has not been properly installed. Check that the Advertising server is up and then verify the installation of the ESDT for the insert.

If you get an error message like “Submit to the Data Server failed” then it is likely that the you did not specify the full path for either the file or the metadata file, or the directory in which the files reside is not NFS mounted to the DSS machine. Try again with the full path name, or find a directory on the local machine that also appears on the DSS machine.

11.18.4.27 howto_cleanup_dce_on_hp

```
rlogin mse5hp -l cmops
setenv DISPLAY mojave:0.0
/opt/dce/bin/cdsbrowser &
Login to DCE from Security menu, click DCE Login...
```

Acquire failure: DDIST

If the AutoSys Staging step fails, and you get message in the PDPS *.err file like

Data Distribution Submit failed

Then check the EcDsDistributionServer.ALOG on the DDIST machine (sorccess in the mini-DAAC).

If you see this message

```
Msg: Exception: <DsStResourceProviderProxy.C:245>
(DsStResourceProviderProxy.C:245)
DCE Rebinding Area Error Priority: 2 Time : 07/29/98 13:24:44
```

Then you need to cdsping all servers, e.g. using EcsAssist.

Cannot Acquire big files

Very large files cause a core dump in the StagingMonitorServer on the Stmgt machine, when Acquire is attempted by PDPS in AutoSys.

Workaround is to copy over the Drop 4P-Landsat executable for StagingMonitorServer.

You must also manually copy the files from the archive to the staging disk directory, e.g.

```
raven:> cp /dss_amass/TS1/SC:MIANPP.001:1282:1.HDF-EOS
/usr/ecs/TS1/CUSTOM/drp/raven/data/staging/user1
```

(Note that files in the user1 directory are blown away when the Stmgt servers are cold started -- so it is best to avoid cold starts if you have to do this workaround.)

At this writing the MIANPP granules (size 945 MB) are

the only ones causing this problem.

The file size limit which causes the core dump is not known; the largest size file Acquired so far without this problem is the MIANCAGP granule of 240 MB. NCR 16425 was written for this, and is fixed in 4P-Landsat.

If execution fails: Switched order of L0 files

If you see a bunch of error messages in the Toolkit LogStatus file that start with

```
PGS_IO_L0_FileVersionInfo():PGSIO_E_L0_MEM_ALLOC:11824
```

Error occurred during memory allocation

then the problem is that the L0 construction record file and the L0 data file are in the wrong order in the PCF.

This can happen if at Ingest the files were named incorrectly, since PDPS sorts them in alphabetical order before placing them in PCF.

To fix it at Ingest, make sure the files have consistent names.

To fix it in PDPS, flip the order of the files in the PCF, and also change the sequence numbers (last field in PCF entry) so that sequence number 2 appears first in the PCF.

If execution fails: Bad L0 construction record

If you see a bunch of error messages in the Toolkit LogStatus file that start with

```
PGS_IO_L0_FileVersionInfo():PGSIO_E_L0_BAD_FILEINFO:11830
```

corrupt construction record, invalid EDS start time

then the problem is that the construction record was not done correctly.

This may happen because the delivered construction record file delivered by MISR needs to be changed in order to go through Ingest.

Solution is to get the correct construction record file through Ingest, and rerun the Planning Workbench, or to copy over the correct file to the PDPS runtime directory and force start Execution.

POC: Feng Huang

Cleaning up PDPS tables

If the AutoSys job fails for some external reason such as DDIST or a Stmgt server problem, and one of those servers needs to be cold started, then you must delete

all relevant entries from the PDPS database table DpPrRpcID before continuing.
(See "Cleaning up PDPS database after DDIST cold restart" above.)

It is usually not necessary to also delete the entries in tables DpPrFile and DpPrGranuleLocation. The StageState flag in DpPrGranuleLocation is set to 1 if the Acquire failed, so PDPS knows about this.

It is particularly important that you not delete these tables arbitrarily if you are doing many DPRs at once (e.g., 9 cameras for PGE 1). This is because it will screw up the value of the numberOfUsage flag in DpPrFile, causing it to go to 0, which will cause Allocate and Insert to fail.

The only time you might need to delete from these two tables is if you had a problem with duplicate filenames or something similar.

Developer POC: Naga Hariharan

Cleanup servers

Double click ././subsys/ecs/OPS to fold them back, then click ././subsys/ecs/servers.

For each server D machine in the following list: (huckfinn),

Double click the D entry of the machine.

Double click each D entry under the machine.

If it has no sub-entries, skip to next one.

If it has S sub entries:

Select each OPS MODE server (marked O or S, doesn't matter).

(Select more than one using Shift-Click)

WARNING: DO NOT SELECT OTHER MODES -- PEOPLE WILL GET MAD AT YOU.

Click Right Mouse Button. Select Delet Entry. Click OK.

Do this until no more sub-entries for OPS on this machine.

(Exception: DO not try to delete MsSubAgent servers.

You will not have permission anyway.)

Cold Start Servers

By default, ECS Assist does a warm start on DDIST (and all servers).

This means it will try to recreate all the requests that happened before it crashed.

If you kill & restart using ECSAssist, check that it came up correctly by

```
sorccess:/usr/ecs/TS1/CUSTOM/logs> grep Monit EcDsDistributionServerDebug.log
Success means you will see the line
```

```
End of StartMonitoring
If you don't, there is trouble.
This often happens if the requests are old.
Do a cold start instead.
```

COLD START

```
To do a cold start, which cleans the database out of pending requests:
sorccess:/usr/ecs/TS1/CUSTOM/utilities> EcDsDistributionServerStart TS1
StartTemperature cold
Make sure it came up correctly as above.
```

11.18.4.28 howto_insert_MISR_multifile_granules

```
rlogin texas -l sdsrv
% cd /usr/ecs/TS1/CUSTOM/bin/DSS
% dsses
Respond to prompts:
[MDC:DSSDSRV]
2
MISCALAA
2
/home/dps/SSIT/MISR/PGE4/SSTEST1/TestIn/MISCALAA.met
/home/dps/SSIT/MISR/PGE4/SSTEST1/TestIn/E0420350AAAAAAAAAAAAAAAAA97350153021
200.EDS
/home/dps/SSIT/MISR/PGE4/SSTEST1/TestIn/E0420350AAAAAAAAAAAAAAAAA97350153021
201.EDS
<CR>
```

11.18.4.29 howto_insert_multifile_granules

```
rlogin calahans -l sdsrv
dce_login awhitele awhitele
cd /home/mtheobal/tmp
source ld_path
subacquire ConfigFile EcDsScienceDataServerClient.CFG ecs_mode TS1
[answer prompts for example as follows:]
1
CER00AF
/usr/ecs/TS1/CUSTOM/ssit/lasher/data/CERES/ecs/ss1/instrument/data/input/TRMM_G054_LZ
_1
997-06-12T00-00-02Z_V01.DAT1.met
2
/usr/ecs/TS1/CUSTOM/ssit/lasher/data/CERES/ecs/ss1/instrument/data/input/TRMM_G054_LZ
_1
997-06-12T00-00-02Z_V01.DAT1
```

```
/usr/ecs/TS1/CUSTOM/ssit/lasher/data/CERES/ecs/ss1/instrument/data/input/TRMM_G054_LZ
_1
```

```
997-06-13T00-00-03Z_V01.DAT1
```

```
[Success messages:]
```

```
Insert science data only ...
```

```
Success.
```

```
UR(UR:10:DsShESDTUR:UR:15:DsShSciServerUR:7:dssdsrv:20:Science:CER00AF:1826)
```

```
*****
```

11.18.4.30 howto_lookat_dss_granules

```
mini-daac% rlogin texas
```

```
# Data server database entry for this granule
```

```
texas% isql -UsdsrvApp -Pwelcome -Sjourney_sqz222_srvr
```

```
1> use relbdss_TS1
```

```
2> go
```

```
1> select * from DsMdGranules where ShortName="CER00AF"
```

```
2> go
```

```
# You will see as many entries as there are granules for this ESDT.
```

```
# Look for one close to the current time, since insert insertTime
```

```
# is one of the fields
```

```
1> select dbID,ShortName,insertTime from DsMdGranules where ShortName="CER00AF"
```

```
2> go
```

```
1> select
```

```
dbID,RangeBeginningDate,RangeBeginningTime,RangeEndingDate,RangeEndingTime fr
```

```
om DsMdGranules where ShortName="CER00AF"
```

```
2> Go
```

```
*****
```

11.18.4.31 howto_install_esdt/CER

```
(for example, if your ESDTs all contain the string "CER")
```

```
/usr/ecs/TS1/CUSTOM/data/ESS/*CER*
```

```
Select your ESDT from the list, click OK
```

```
Click second File..., then edit Filter so it gets your ESDTs:
```

```
(for example, if your ESDTs all contain the string "CER")
```

```
/usr/ecs/TS1/CUSTOM/lib/ESS/*CER*
```

```
Select your ESDT from the list, click OK
```

```
Type in:
```

```
Archive ID: DRP1_TS1
```

```
Click OK
```

```
ESDT begins to install
```

```
If you get a "Failure to Add Datatype" message,
```

```
go to SDSRV logs and examine them
```

```
cd /usr/ecs/OPS/CUSTOM/logs
```

```
vi EcDsScienceDataServer.ALOG
```

```
vi EcDsScienceDataServerDebug.log
```


P1. Change PERIOD, DURATION, BOUNDARY in AM1EPHMN and AM1ATTN ESDT ODL files

AM1EPHMN and AM1ATTN ESDT ODL files must change from PGE 4 to PGE 7, because PGE 4 test eph/att files are of length 1 day each, whereas PGE 7 tes eph/att file is only 1 orbit. This means there is a possible conflict if running both of these PGEs at once or more accurately, if both are registered in the PDPS database concurrently.

Correct values for PGE 7 are
PERIOD = "ORBITS=1"
DURATION = "ORBITS=1"
BOUNDARY = "START_OF_ORBIT"

These changes are already done in the supplied PGE 7 ODL files. Just don't use the ones from PGE 4.

End PDPS ODL files

Changes to PDPS database

none

Changes to Toolkit Template PCF used by PDPS

This is the file PDPS starts from in constructing the runtime PCF. It has been copied from the Toolkit; it does not reside in the Toolkit directory structure.

Its path is defined in PDPS config files on the DPS machine:

EcDpPrEM.CFG

EcDpPrGE.CFG

EcDpPrJobMgmt.CFG

These files reside in directory /usr/ecs/<mode>/CUSTOM/cfg .

For example, on taltos in mode TS1 in the miniDAAC,

DpPrEM_MASTER_PCF =

/usr/ecs//TS1/CUSTOM/data/DPS/template_PCF//PCF.relB0.template

The DAAC path will be different.

Some changes may be necessary to this file.

P2. Delete Toolkit ephemeris/attitude LIDs

If the PDPS template PCF contains the following lines, delete them:

10501|INSERT_EPHEMERIS_FILES_HERE||||1

10502|INSERT_ATTITUDE_FILES_HERE||||1

This is necessary because it causes confusion when a DPR is created. Too many entries appear in the runtime PCF.

P3. Fix LID for udunits file

11001|udunits.dat|~/database/common/CUC|||1
10302|udunits.dat|~/database/common/CUC|||1

Changes to Data Server MCF to be made after stopping execution

The MCF staged by Data Server as PGE input must be edited before Execution.
In the miniDAAC this file is located in directory
/usr/ecs/TS1/CUSTOM/pdps/lasher/data/DpPrRm/lasher_disk/MPGE7#2.0/MPGE7#_lasher
where MPGE7#2.0 is the SswId and MPGE7# is the DPR Id.
The DAAC location will be different.

P4. Change CLASS value of AssociatedPlatformInstrumentSensorContainer
attributes

A bug prevents values of attributes specified in the Data Server MCF from being
passed to the output .met file at runtime.

To fix this, edit MIB2GEOP#0.MCF .
For all of the attributes for OBJECT =
AssociatedPlatformInstrumentSensorContainer
with Data_Location = "MCF" (i.e., AssociatedPlatformShortName,
OperationMode, and AssociatedInstrumentShortName)
change the line
CLASS = "M"

to
CLASS = "1" .
NCR ECSed12896 has been written for this problem.

END Changes to Data Server MCF to be made after stopping execution

Changes to output .met file to be made after stopping Insert

The metadata file (".met") output from the PGE must be edited during
a PDPS run, by placing the Insert (I) step On Hold in Autosys.
When all the changes below have been made, Force Restart for this step
in Autosys.

P5. Delete Gring Polygon data

There are 2 problems with the Gring Polygon
a. Data Server rejects duplicate points
b. Data Server rejects data with range in longitude of more than 180 degrees
These issues are being worked internally by ECS.

NCR 14223 was written for this problem.
Workaround for now is to delete the entire
SPATIALDOMAINCONTAINER group which encloses
the Gring Polygon data.
Downstream MISR processing is not affected by this;
it only affects end users who want to retrieve the
data by doing spatial searches.

P6. Add missing ASSOCIATEDPLATFORMINSTRUMENTSENSORCONTAINER attributes

The PGE generates 9 ASSOCIATEDPLATFORMINSTRUMENTSENSORCONTAINER
objects,
each with a ASSOCIATEDSENSORSHORTNAME object.
However, Data Server requires that there be 3 other objects in
this Container.
The fix to the MCF file described in P4 above allows the
first of the 9 ASSOCIATEDPLATFORMINSTRUMENTSENSORCONTAINER objects
to correctly include the 3 other objects.
However, the other 8 still incorrectly do not include them.
Edit the .met file to add the following to each of the 8
ASSOCIATEDPLATFORMINSTRUMENTSENSORCONTAINERs, after
ASSOCIATEDSENSORSHORTNAME:

```
OBJECT          = ASSOCIATEDPLATFORMSHORTNAME
CLASS           = "2"
NUM_VAL        = 1
VALUE          = "AM-1"
END_OBJECT     = ASSOCIATEDPLATFORMSHORTNAME
OBJECT          = OPERATIONMODE
CLASS           = "2"
NUM_VAL        = 1
VALUE          = "Normal"
END_OBJECT     = OPERATIONMODE
OBJECT          = ASSOCIATEDINSTRUMENTSHORTNAME
CLASS           = "2"
NUM_VAL        = 1
VALUE          = "MISR"
END_OBJECT     = ASSOCIATEDINSTRUMENTSHORTNAME
```

Replace the CLASS value with the same value as ASSOCIATEDSENSORSHORTNAME
for that Container (2,3,...9).

When finished, you should have 9 identical
ASSOCIATEDPLATFORMINSTRUMENTSENSORCONTAINERs, except for different
values of ASSOCIATEDSENSORSHORTNAME and different CLASS values.
NCR ECSed12896 also applies for this problem.

P7. If MIB2GEOP granule still fails to Insert....

Check the Data Server log EcDsScienceDataServer.ALOG .

If you see a message

SybaseError<Attempt to insert duplicate key row
in object 'DsMdGranulePlatformXref'
with unique index 'PK_DSMDGRANULEPLATFORMXREF'

then you have not yet had a late fix installed.

The issue is a bug in Data Server which caused it to reject .met files that
contain more than 1 instance of object

ASSOCIATEDPLATFORMINSTRUMENTSENSORCONTAINER, with the same values for
one

or more of its attributes.

There are 9 such objects for the MIB2GEOP .met file,
each of which has a different value of ASSOCIATEDSENSORSHORTNAME,
but the same values for the other 3 attributes

ASSOCIATEDPLATFORMSHORTNAME
OPERATIONMODE
ASSOCIATEDINSTRUMENTSHORTNAME

It is the latter fact that causes the problem.

NCR 14212 was written for this problem.

The fix was verified as being part of the PDPS patch;
however, at this writing (20-May-98) it appears doubtful if
this fix actually made it in.

I wrote NCR 14978 for the missing fix.

End Changes to output .met file to be made after stopping Insert

+++++

End PDPS RUNS

+++++

Summary of Suggested Changes for MISR to Make to PGE 7 at JPL

Remove leading zeroes from SP_AM_PATH_NO values in metadata (see below).

GROUP = ADDITIONALATTRIBUTES
OBJECT = ADDITIONALATTRIBUTESCONTAINER
CLASS = "1"
OBJECT = ADDITIONALATTRIBUTENAME
CLASS = "1"
NUM_VAL = 1
VALUE = "SP_AM_PATH_NO"
END_OBJECT = ADDITIONALATTRIBUTENAME
GROUP = INFORMATIONCONTENT
CLASS = "1"
OBJECT = PARAMETERVALUE

```

        NUM_VAL      = 1
        CLASS        = "1"
/* 29-Apr-98 TWA Leading 0 causes error in PDPS/Dsrv */
/*      VALUE       = "027" */
        VALUE        = "27"
        END_OBJECT   = PARAMETERVALUE
        END_GROUP    = INFORMATIONCONTENT
        END_OBJECT   = ADDITIONALATTRIBUTESCONTAINER
        END_GROUP    = ADDITIONALATTRIBUTES
*****
End Changes to MISR PGE 7 Delivery
*****

```

11.18.4.33 howto_run_from_cmdline_in_runtime_dir

```

lasher
cd
/usr/ecs/TS1/CUSTOM/pdps/lasher/data/DpPrRm/lasher_disk/MISRISH#syn2/MISRIS0000_lasher
er
csh% sh
./usr/ecs/TS1/CUSTOM/bin/DPS/auto.profile
. MISRIS0000.Profile
grep PGS_PC_Shell MISRIS0000.Log
# Paste string after "COMMAND="
PGS_PC_Shell.sh
/usr/ecs//TS1/CUSTOM/pdps/lasher/data//DpPrRm/lasher_disk/MISRISH#syn2/synpge_sgi6n32
1111
/usr/ecs//TS1/CUSTOM/pdps/lasher/data//DpPrRm/lasher_disk/MISRISH#syn2/MISRIS0000_lasher/MISRIS0000.Pcf
50 -v -p
*****

```

11.18.34 howto_setup_orbits_and_pathmaps

ORBITS & PATHMAPS

The Path is a an orbit swath, defined for Landsat-7 ("WRS"), which MISR uses in its processing.

Because the earth rotates under it, the path the satellite traverses for its next orbit is not path 2, but path 17.

This mapping of orbit number to path number is found in the PATHMAP ODL file.

In that file ABSOLUTE_PATH is what we call orbit number here, and MAPPED_PATH is the path number.

Now, this mapping is fixed, and never changes.

What does change is the time each orbit starts.

This is because the orbit may drift and be subject to

maneuvers.

Periodically (say, every 2 weeks), the Flight Dynamics Facility (FDF) at GSFC issues a new Orbit Start Time, with corresponding Orbit Number.

When this happens, the PDPS ORBIT ODL must be updated, with a new ORBIT_MODEL object, containing the new ORBIT_START and corresponding ORBIT_NUMBER.

The new ORBIT_PATH_NUMBER is determined manually by the operator, using the lookup table in the PATHMAP ODL file.

1. Example (MISR PGE7 test data)

FDF issues a bulletin stating that imaginary platform MPGE7 orbit number 27 starts at 14:37:39Z 07-Jan-96.

SSIT operator receives the bulletin, looks up in the corresponding PATHMAP_WRS7.odl file to find that ABSOLUTE_PATH XX corresponds to MAPPED_PATH XX.
NEED TO FIX THIS

The SSIT operator then creates a new ORBIT_MODEL object in the ORBIT ODL file as follows:

```
OBJECT = ORBIT_MODEL
  CLASS = 2
  ORBIT_NUMBER = 27
  ORBIT_PERIOD = "SECS=5932"
  ORBIT_START = "01/07/1996 14:37:39Z"
  ORBIT_PATH_NUMBER = 90
END_OBJECT = ORBIT_MODEL
```

11.18.35 howto_register_pge

```
# First prepare PGE and ESDT ODL files
# Update database
xterm -sb -sl 256 -bg maroon -fg "papaya whip" -cr "papaya whip" -fn
"*1*s*type*b*r*140
*" -T 'SSIT: Science Metadata Database Update' -n 'Science Metadata Update' -e
/usr/ecs
//OPS/CUSTOM/bin/DPS/EcDpAtDefinePGE &
# Update performance info
/usr/ecs//OPS/CUSTOM/bin/DPS/EcDpAtOpDbGui ConfigFile
/usr/ecs//OPS/CUSTOM/cfg/EcDpAtOp
DbGui.CFG ecs_mode OPS &
*****
```

11.18.36 howto_register_dpr

```
#####
# Make sure STMGT and SDSRV are up
#####
```

```

# Use either ECS Assist on texas *and* raven,
# Alternatively, use ps:
texas:> ps -ef | grep EcDsScienceDataServer | grep TS1
  sdsrv 24410   1  0 10:17:57 pts/3   0:33
/usr/ecs//TS1/CUSTOM/bin/DSS/EcDsScience
DataServer ConfigFile /usr/ecs//TS1/CUS
raven:> ps -ef | grep Server | grep TS1 | grep ConfigFile
  stmgt 3786   1  0 Dec 30 ?    10:39
/usr/ecs/TS1/CUSTOM/bin/DSS/EcDsStStaging
DiskServer ConfigFile /usr/ecs/TS1/CUS
  stmgt 3803   1  0 Dec 30 ?    10:31
/usr/ecs/TS1/CUSTOM/bin/DSS/EcDsStStaging
MonitorServer ConfigFile /usr/ecs/TS1/
  stmgt 3770   1  0 Dec 30 ?    16:18
/usr/ecs/TS1/CUSTOM/bin/DSS/EcDsStArchive
Server ConfigFile /usr/ecs/TS1/CUSTOM/
  stmgt 3815   1  0 Dec 30 ?    10:59
/usr/ecs/TS1/CUSTOM/bin/DSS/EcDsStFtpDisS
erver ConfigFile /usr/ecs/TS1/CUSTOM/c
# If any of these are not present, that server is down.
# You must arrange to have it up before continuing
*****

```

Using Production Request Editor and Planning Workbench

```

PRE:
telnet odyssey, cmops, dce_login
ops, cd utilities,
then invoke EcplStartPRE_IF OPS 3 &
PWB: telnet odyssey, cmops, dce_login
ops, cd utilities, invoke EcPlSlayAll prior to using PWB.
    then invoke EcPlStartAll OPS 3 & or 2
    times used for plan activation: 01/01/1990 time 00:00:00
AutoSys- To Monitor DPS , telnet to: taltos_svr
#####

```

11.18.37 howto_Make a Production Request

```

#####
rlogin odyssey -l pls
dce_login
awhitele
cd /usr/ecs/TS1/CUSTOM/utilities

```

```

set path = ( /usr/bin )
source .buildrc
setenv DISPLAY mojave:0.0
# Make sure no one else is running PREDitor, then run it
/usr/ucb/ps -auxwww | grep -i pre | grep TS1
EcPIStartPRE_IF TS1 1
Click PREDit
Click PGE, select it, OK
Set time to input, e.g. (CPGE1)
06 12 1997 00 00 00
06 14 1997 00 00 00
*****

```

11.18.5 Additional SSI&T Howto_procedures and Production rules taken from

PDPS tests documented in the following files last updated 12/01/98:

```

SCF: cd /home/PDPS/docs - look through list of 'howto_s'
production_rules_wp.doc*
Drop3Scen2.txt
HowToCompileAndRunSyntheticPGE
HowToDealWithDPSDeadLocks
HowToFakeSubscriptionNotification
HowToInstallOnComanche
HowToStartAutosysAndViewJobStates
HowToActivateAPlan
HowToDeleteAndRecreateJobs
HowToSetUpPlanning
Tiling.txt
HowToRunProductionStrategyGUI
SpatialQuery.txt
HowToInsertMultiFileGranules
HowToStartDPS
ModisDataList
HowToUseSubscriptionServerDriverToSendSubscriptionNotification
HowToReactivateReplan
VerifiedList
HowToStartQaMonitor
HowToTestFaultRecovery
HowToTestGroundEventJobs
HowToCleanAutoSys
HowToInstall-General
HowToInsertData
MergeList
HowToEnterGroundEvents
HowToTestDynamicMetaDataQuery
HowToReacquireAGranule

```

ReacquireGranule.sql
HowToAdHocReprocessPRs
HowToTestDatabaseCleanupScript
HowToDoProfiling
HowToRunMulti-GranuleESDTsTest
HowToRunSSITAcquireTool#
HowToRunResourcePlanning
HowToCreateDprepTarFile*HowToRunBROWSETest~
HowToRunBROWSETest
HowToRunSpatial
mailfile
HowToRunDataDay-InterimFilesTest~
HowToTest
HowToInstallPlanning~
HowToRunDataDay-InterimFilesTest
HowToInstallPlanning
HowToRunSSIT
HowToRunOptionalDPRs~
EndToEnd
HowToRunASTER
HowToRunOptionalDPRs
HowToRunTiling~
HowToRunMostRecentGranule~
HowToRunMostRecentGranule
HowToRunTiling
HowToTestAlternateInput~
HowToTestAlternateInput
HowToRunASTER#
HowToRunModis
HowToRunMISRLIKE~
HowToRunModisPlus
HowToRunMISRLIKE
HowToRunASTERRoutine
HowToRunDPREP
HowToRunMostRecentGranule#

11.18.5 Technical Notice concerning Leap Second/DPREP

Notice of Change to Toolkit Ephemeris and
Attitude Interpolation

March 15, 1999

Effective with a late patch to Drop 4PY, the time interval over which the Toolkit will interpolate spacecraft ephemeris or attitude is reduced from 121 seconds to 60 seconds. (The normal interval between packets for AM1 is 1.024 seconds, except for FDD replacement ephemeris, which will use 1 second time intervals.)

Impact of this Change

For reasons explained below, the only impact on real data processing would be to avoid the possibility of a less-than-ideal interpolation.

The impact on I&T would be that test data should always be generated or obtained with packet interval 60 seconds or less. There are a few inputs for the Toolkit test drivers, which are not a deliverable, but are occasionally supplied to Toolkit users, which (to save file space) are set up to work with 120 second packets. These lie in the file "orbsim.in" (which is, as explained, a PDPS add-on which is unsupported software when it is provided to users). To conduct tests without new and annoying failures, if you use this input file for "orbsim", you should edit it to replace "120" by "60" or less, globally. Results will not change significantly from the expected test results.

Rationale for this Change

The SDP Toolkit uses an analytic, cubic polynomial method to interpolate ephemeris that is extremely fast, but which could generate undesirable and spurious variations if applied across too large a time interval, or to data that are not smooth.

DPREP, which will process all incoming ephemeris data, has a robust method for patching gaps up to 60 seconds, based on a least squares quartic fit, component by component, to position and velocity. Although this method is undesirably slow for repeated use within the Toolkit, it is ideal for DPREP, which runs only once on a data set. The existence of any gaps not repairable by DPREP (i.e. > 60 seconds) will trigger procedures to obtain replacement data files from FDD.

It is therefore unwise to allow the Toolkit to interpolate gaps which DPREP cannot fill, so it is being changed. The

same limit is set for attitude. We expect no gaps whatever in FDD attitude, and the attitude is not of much use without the ephemeris, so this change was made consistently.
