

Clouds and the Earth's Radiant Energy System (CERES)

Data Management System

CATALYST Test Plan Version 1

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Document Revision Record

The Document Revision Record contains information pertaining to approved document changes. The table lists the date the Software Configuration Change Request (SCCR) was approved, the Version Number, the SCCR number, a short description of the revision, and the revised sections. The document authors are listed on the cover. The Head of the CERES Data Management Team approves or disapproves the requested changes based on recommendations of the Configuration Control Board.

Document Revision Record

SCCR Approval Date	Version Number	SCCR Number	Description of Revision	Section(s) Affected
09/25/12	V1	931	<ul style="list-style-type: none"> • New document. • Formatting issues were fixed and long hyphens were replaced with short hyphens for easier testing. (12/11/2012) 	All All

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1.0 Introduction

CERES is a key component of EOS and NPP. The first CERES instrument (PFM) flew on TRMM, four instruments are currently operating on the EOS Terra (FM1 and FM2) and Aqua (FM3 and FM4) platforms, and NPP (FM5) platform. CERES measures radiances in three broadband channels: a shortwave channel (0.3 - 5 μm), a total channel (0.3 - 200 μm), and an infrared window channel (8 - 12 μm). The last data processed from the PFM instrument aboard TRMM was March 2000; no additional data are expected. Until June 2005, one instrument on each EOS platform operated in a fixed azimuth scanning mode and the other operated in a rotating azimuth scanning mode; now all are typically operating in the fixed azimuth scanning mode. The NPP platform carries the FM5 instrument, which operates in the fixed azimuth scanning mode though it has the capability to operate in a rotating azimuth scanning mode.

CERES climate data records involve an unprecedented level of data fusion: CERES measurements are combined with imager data (e.g., MODIS on Terra and Aqua, VIIRS on NPP), 4-D weather assimilation data, microwave sea-ice observations, and measurements from five geostationary satellites to produce climate-quality radiative fluxes at the top-of-atmosphere, within the atmosphere and at the surface, together with the associated cloud and aerosol properties.

The CERES project management and implementation responsibility is at NASA Langley. The CERES Science Team is responsible for the instrument design and the derivation and validation of the scientific algorithms used to produce the data products distributed to the atmospheric sciences community. The CERES DMT is responsible for the development and maintenance of the software that implements the science team's algorithms in the production environment to produce CERES data products. The Langley ASDC is responsible for the production environment, data ingest, and the processing, archival, and distribution of the CERES data products.

1.1 Document Overview

This document, [CATALYST Test Plan](#), is part of the CATALYST delivery package provided to the Langley Distributed Active Archive Center (DAAC). It provides procedures for installing and testing the CATALYST software. A list of acronyms and abbreviations is provided in [Appendix A](#), a directory structure diagram is contained in [Appendix B](#) and a description of the software and data files is contained in [Appendix C](#).

This document is organized as follows:

- Section [1.0](#) - Introduction
- Section [2.0](#) - Software Installation Procedures
- Section [3.0](#) - Test and Evaluation Procedures
- Section [4.0](#) - CATALYST File Promotion into Production
- [Appendix A](#) - Acronyms and Abbreviations
- [Appendix B](#) - Directory Structure Diagram
- [Appendix C](#) - File Description Tables

1.2 CATALYST Overview

The CATALYST service contains no PGEs. Rather it is a framework for coordinating the execution of CERES PGEs in the ASDC production environment. This initial release provides the bare minimum capability for the PR Web Application to authenticate users using the *AMI-P* LDAP service.

1.2.1 Perl Library Modules

CATALYST is written primarily in Perl. Many of the routines required by CATALYST are located in CERES's *Perl_Lib*. The **\$PERL5LIB** environment variable must be defined before attempting to run the CATALYST server. **\$PERL5LIB** can be set using **\$CERESENV**.

1.2.2 Architecture/Location Dependent Code

There is only one location that CATALYST is to be installed: the *AMI-P X86_64* cluster head node. This requirement exists because CATALYST must be able to communicate both internally, within the *AMI-P* cluster for job coordination, and externally to the PR Web Application, CATALYST Operator's Console, and sub-programs built using the CATALYST XML-RPC API for operator interaction and control.

2.0 Software Installation Procedures

This section describes how to install the CATALYST software in preparation for making the necessary test runs at the Langley DAAC. The installation procedures include instructions for uncompressing and untarring the delivered tar files, properly defining environmental variables, and compiling the code to create the CATALYST library files.

2.1 Installation

1. The scripts and makefiles in the CATALYST delivery package expect the CERES environment variable, **\$CERESENV**, to point to a file which sets the following environment variables:

CERESHOME - Top directory for CERES software
CERESLIB - Top directory for CERESlib software (this location will be different for the different CERESlib versions)
PERL5LIB - Directory containing CERES Perl module

2. In the installation instructions below, use the following definition for the TAG variable, which is included in the file name of the delivery files.

TAG = R{R#}-{SCCR#}

where R# = CERES Software Release Number
 SCCR# = SCCR Number for the CATALYST Delivery

Ex: **TAG = R2-050**
 for CERES Software Release 2 and GGEO SCCR #050

3. Follow the steps below to install the CATALYST software.

```
source $CERESENV (x86_64 version)
mv CATALYST_src_{TAG}.tar.gz $CERESHOME
cd $CERESHOME
tar xf CATALYST_src{TAG}.tar.gz
```

2.2 Compilation

Complete the following steps to compile the CATALYST source code.

On AMI-P head node with X86_64 arch:

Compile the X86_64 CATALYST version.

```
cd $CERESHOME/catalyst/lib
make
```

Notes:

- Report any and all compilations to CATALYST developers when encountered.

3.0 Test and Evaluation Procedures

This section provides instructions for compiling and executing the CATALYST test suite. (See Section 2.1 for an explanation of the CERESENV environment variable.)

The test suite will be executed once on the *AMI-P* head node, which CATALYST has been installed. In each case, the CATALYST test scripts will print messages to the screen for each problem discovered during execution. If no problems are encountered, then the script will yield a success message to the tester. If problems are encountered in any of the tests, immediately contact one of the CATALYST analysts.

3.1 Executing the *AMI-P* X86_64 (ab01) CATALYST Test Suite

1. **Starting server:** Change directory CATALYST directory and initialize the server.

```
source $CERESENV
cd $CERESHOME/catalyst/bin
source catalyst_env.csh
./catalyst_server.pl -daemonize
```

2. **Testing login to server:** The server is now running as a daemon. That is, it is running independently of your shell and therefore remains running after you have logged out. Now, the server can be tested.

```
cd $CERESHOME/catalyst/bin
source catalyst_env.csh
cd $CERESHOME/catalyst/test_suites
./test_login.pl
```

The “test_login.pl” application will prompt you for your *AMI* username and password. Upon entering them you should see that the following actions have been performed:

1. Logged into server and received a token.
 2. Verify the server acknowledges your token as being valid.
 3. Logged out of the server.
 4. Verify that the server no longer acknowledges your token as being valid.
 5. Verify that a falsified token is not accepted by the server.
3. **Terminating the server:** After step 2 has been sufficiently tested, you can now kill the server. Since no persistent data is being stored in the server, the server may be forcibly killed by the process owner. Note the backtick (`) characters:

```
cd $CERESHOME/catalyst/bin
cat catalyst.pid | xargs kill && rm catalyst.pid
```

The server is now terminated.

4.0 CATALYST File Promotion into Production

After CATALYST testing is complete, the following subdirectories and all their contents should be promoted to the production directories:

1. **\$CERESHOME/catalyst**

Appendix A Acronyms and Abbreviations

API	Application Programming Interface
ASDC	Atmospheric Science Data Center
CATALYST	CERES AuTomAteD job Loading SYSTem
CERES	Clouds and the Earth's Radiant Energy System
CERESlib	CERES library
DAAC	Distributed Active Archive Center
LDAP	Lightweight Directory Access Protocol
NASA	National Aeronautics and Space Administration
Perl_Lib	CERES's Perl module library
PR	Processing Request
TRMM	Tropical Rainfall Measuring Mission
XML-RPC	Extensible Markup Language – Remote Procedure Call

Appendix B CATALYST Directory Structure Diagram

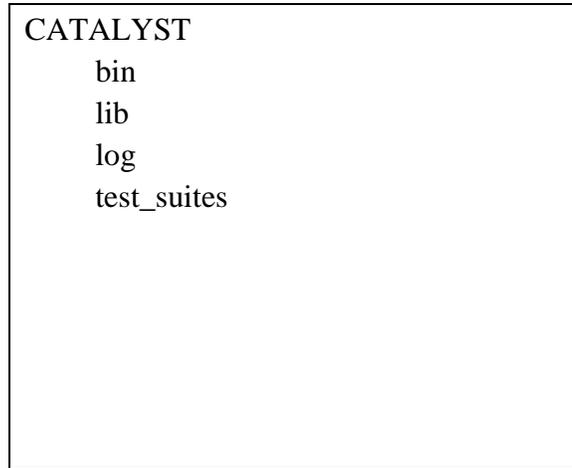


Figure B-1. CATALYST Directory Structure

Appendix C File Description Table

C.1 Executable Scripts

Table C-1. \$CATALYST/bin directory

File Name	Format	Description
catalyst_server.pl	ASCII	Executes the catalyst process. Add "-daemonize" to detach (background) the process.