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

Data Management System

Perl_Lib
Test Plan
Release 5
Version 4

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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 Release and 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	Release/ Version Number	SCCR Number	Description of Revision	Section(s) Affected
05/09/12	R5V1	892	• New document.	All
09/19/12	R5V2	932	• Updated compilation steps.	Sec. 2.2
			• Fixed name of environment variable.	Sec. 3.2
			• Added new sub-directories to diagram.	App. B
			• Formatting modifications were made for easier testing. (12/11/2012)	All
04/17/13	R5V3	964	• Updated compilation steps.	Sec. 2.2
			• Added new sub-directories to diagram.	App. B
08/12/13	R5V4	971	• Updated compilation steps to reflect modified Makefile.	Sec. 2.2

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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, <u>Perl_Lib Release 5 Test Plan</u>, is part of the Perl_Lib Library Release 5 delivery package provided to the Langley Distributed Active Archive Center (DAAC). It provides procedures for installing and testing the Perl_Lib Library software. A description 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:

1.2   Perl_Lib Overview

The Perl_Lib library contains no PGEs. Rather, it is a collection of routines and utilities used by multiple subsystems. Perl routines are contained within a collection of Perl modules. This collection consists of both in-house developed modules and some externally developed code. The externally developed code was obtained through CPAN.

1.2.1   Perl Library Modules

For implementation purposes, the Perl routines in Perl_Lib are divided amongst several Perl module files. The module files are themselves further divided into a hierarchical structure within the **$PERL5LIB** directory. This structure helps to organize related modules while conforming to Perl industry standards.

1.2.2   Architecture Dependent Code

There are two different architectures that Perl_Lib can be installed: the *AMI* X86_64 Linux and *AMI* PPC64 Linux platforms. Though the majority of the code in Perl_Lib is strictly interpreted, there are several libraries within it that must be compiled to generate native code. These types of libraries must be compiled on both target install architectures. The source and compiled code for these all reside within a single **$PERL5LIB** instance and are selected automatically by the makefiles at compile time and **$CERESENV** at runtime.

1.2.3   Perl_Lib Version Definition

The Perl_Lib version is defined by both the release number and release date of the latest change to the source code within the library. The format of the release number is given as XX.XX.XX and the release date as YYYYMMDD. The Perl_Lib version can be obtained by running **local_version.pl** within the **$PERL5LIB** directory. The current version of the Perl_Lib will be documented in the Delivery Memo.

2.0   Software Installation Procedures

This section describes how to install the Perl_Lib 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 Perl_Lib library files.

2.1   Installation

1. The scripts and makefiles in the Perl_Lib 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 Perl_Lib Delivery

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

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

    > **source $CERESENV (any version)**
    > **mv Perl_Lib_src_{TAG}.tar.gz $CERESHOME**
    > **cd $CERESHOME**
    > **tar xf Perl_Lib_src{TAG}.tar.gz**

2.2   Compilation

Complete the following steps to compile the Perl_Lib native source code.

On *AMI* with PPC64 arch:

1. Compile the PPC64 Perl_Lib version.

    > **source $CERESENV**
    > **cd $PERL5LIB**
    > **make clean**
    > **make**

On *AMI* with X86_64 arch:

2. Compile the X86_64 Perl_Lib version.

source $CERESENV
cd $PERL5LIB
make clean
make

Notes:
- When moving from one version of Perl_Lib to the other, do not simply change directory locations, but be sure that the appropriate start-up script has been sourced. Failure to do so may cause errors to occur.

3.0   Test and Evaluation Procedures

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

The test suite will be executed once for each platform which Perl_Lib has been installed. In each case, the Test_Perl_Lib script will print a warning message to the screen and pause processing for each problem discovered during execution. If no problems are encountered, then the script will complete without interruption until the end. If problems are encountered, then contact one of the Perl_Lib analysts.

3.1   Executing the *AMI* PPC64 Perl_Lib Test Suite

1. Change directory to **$PERL5LIB** and execute the test suite package.

       source $CERESENV
       cd $PERL5LIB/test_suites
       ./Test_Perl_Lib.pl

3.2   Executing the *AMI* X86_64 Perl_Lib Test Suite

1. Change directory to **$PERL5LIB** and execute the test suite package.

       source $CERESENV
       cd $PERL5LIB/test_suites
       ./Test_Perl_Lib.pl

4.0   Perl_Lib File Promotion into Production

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

1. **$PERL5LIB**

Appendix A
Acronyms and Abbreviations

CERES   Clouds and the Earth's Radiant Energy System

CERESlib   CERES library

CPAN   Comprehensive Perl Archive Network

DAAC   Distributed Active Archive Center

EOS   Earth Observing System

EOS-AM   EOS Morning Crossing Mission

EOS-PM   EOS Afternoon Crossing Mission

ERBE   Earth Radiation Budget Experiment

ERBS   Earth Radiation Budget Satellite

NASA   National Aeronautics and Space Administration

Perl_Lib   CERES's Perl module library

TRMM   Tropical Rainfall Measuring Mission

Appendix B
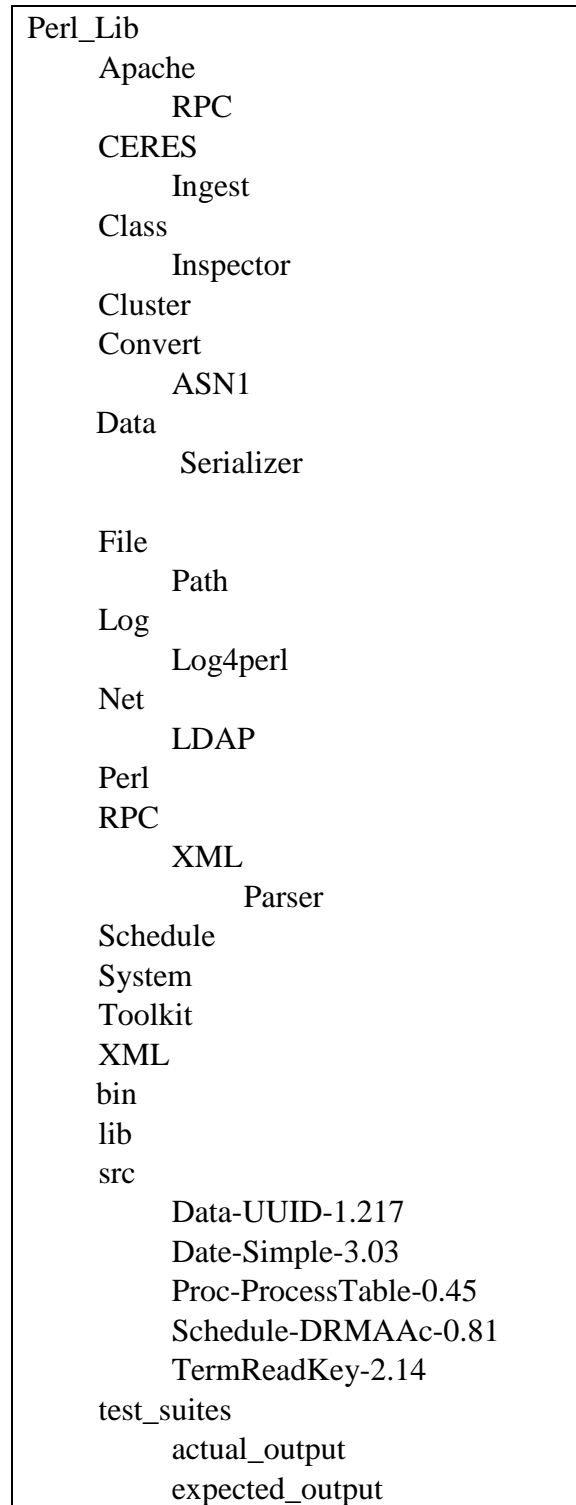**Perl_Lib Library Directory Structure Diagram**

```
Perl_Lib
      Apache
            RPC
      CERES
            Ingest
      Class
            Inspector
      Cluster
      Convert
            ASN1
      Data
            Serializer

      File
            Path
      Log
            Log4perl
      Net
            LDAP
      Perl
      RPC
            XML
                  Parser
      Schedule
      System
      Toolkit
      XML
      bin
      lib
      src
            Data-UUID-1.217
            Date-Simple-3.03
            Proc-ProcessTable-0.45
            Schedule-DRMAAc-0.81
            TermReadKey-2.14
      test_suites
            actual_output
            expected_output
```

Figure B-1. Perl_Lib Library Directory Structure

Appendix C
File Description Table

C.1 Executable Scripts

Table C-1. $PERL5LIB directory

File Name	Format	Description
local_version.pl	ASCII	Prints the Perl_Lib release number and date to the console.
make_method.pl	ASCII	Combines .code, .help, and .base files used by Perl_Lib's RPC::XML library.