

# CERES Software Bulletin 12-01

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## Testing Toolkit 5.2.18v1 (*P6* and *x86*) and Upgrades to the Compilers on Both *P6* and *x86* blades

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### 1.0 Introduction

This document has been created to provide the subsystems with a definition of the required tests to support the pending upgrades to the *AMI* systems. These include an upgrade of the existing Toolkit 5.2.16v1 to Toolkit 5.2.18v1, upgrades to the existing GCC compilers (4.2.2) on both the *P6* and *x86* platforms along with an upgrade to the IBM XLF compiler on the *P6* platforms, and an Operating System upgrade of the Suse Linux Enterprise Server (SLES) to version 11 on both the *x86* and *P6* platforms. Since SLES 11 is already installed on the *AMI-P* production system, compiler upgrade testing will only be performed under the SLES 11 environment.

NOTE: *magneto* will not be upgraded, so PGEs do not need to be tested on that platform.

Per the Data Management Lead, CERES will upgrade to use of Toolkit 5.2.18v1. This upgrade is designed to prevent significant version changes between upgrades. Lessons learned from the previous upgrade between TK 5.2.7v1 to TK 5.2.12v1 identified a need to maintain a reasonably current version the Toolkit. During that upgrade, we experienced significant difficulties due to large variations between the versions. Toolkit TK 5.2.18v1 fixes issues that we have had to manually patch in the previous version (TK 5.2.16v1) and provides a fix to the celestial body in the field-of-view algorithm provided by Toolkit.

The GCC 4.2.2 compiler is no longer supported and CERES will therefore upgrade to use a new suite of GCC compilers for Ada, C, C++ and F90 on the *x86* platforms and C and C++ on the *P6* platforms. Additionally, the IBM XLF compiler on the *P6* platform will be upgraded from version 11 to version 13.

In order to ensure that the upgrades are working correctly and that any issues that are found can be traced back to one specific upgrade, the testing will be done in stages with the following set of tests cases:

Testing Toolkit 5.2.18v1 in the current environment

Testing SLES 11, GCC 4.5.3 and XLF 13 compilers, and Toolkit 5.2.18v1 on the *P6*

Testing SLES 11, GCC 4.5.3 compilers, and Toolkit 5.2.18v1 on the *x86*

~~NOTE: This bulletin will be updated to include the required testing for the SLES upgrade when the test blades have been properly configured for subsystem testing.~~

The following sections provide the information to allow each subsystem to test all PGEs along with any frequently used validation/analysis software that will be used after the upgrades. Each subsystem should report the results of their PGE testing to the DMT Toolkit and Compiler POC (Nelson Hillyer, thomas.n.hillyer@nasa.gov). Results from your validation/analysis software testing should be reported in your CPOB subsystem report(s).

## 2.0 Testing Toolkit 5.2.18v1 in the Current Environment

The latest version (TK 5.2.18v1) of the SDP Toolkit has been released. This set of tests is the first step in the process to test the system upgrades (Toolkit, compilers and operating system). DMT PGE testing will determine the compatibility of Toolkit within the current environment, in order to discover any issues that may be related to the Toolkit upgrades alone. Each subsystem should run the following set of tests for every PGE delivered (or being delivered) to *AMI-P* and any analysis software that will be run on *AMI* after the upgrade. The first priority is to test PGEs that will be run in production on *AMI-P*. The Toolkit testing should be completed by June 1, 2012.

Each subsystem will need to produce expected output data products using the existing Toolkit 5.2.16v1 before you begin the following test cases:

### Required Test Cases for each *AMI-P* PGE – P6:

- 1) New Toolkit 5.2.18v1 libraries *using the existing executables*
  - a. Source the new CERESlib environment for the new Toolkit  
**/SCF2/CERES/lib/testing/p6-xf/ceres-env.csh**
  - b. Run existing executables for each PGE – *do not recompile*.
  - c. Compare the output from these test cases with output created using the existing  
**/SCF2/CERES/lib/p6-xf/ceres-env.csh** and TK 5.2.16v1.
  - d. Record results.
  
- 2) New Toolkit 5.2.18v1 *with recompilation*
  - a. Source the new CERESlib environment for the new Toolkit  
**/SCF2/CERES/lib/testing/p6-xf/ceres-env.csh**
  - b. Recompile each subsystem PGE.
  - c. Run each PGE.
  - d. Compare the output from these test cases with output created using the existing  
**/SCF2/CERES/lib/p6-xf/ceres-env.csh** and TK 5.2.16v1.
  - e. Record results.

Report your results to the DMT Toolkit and Compiler POC.

### Required Test Cases for each *AMI-P* PGE – x86:

- 1) New Toolkit 5.2.18v1 libraries *using the existing executables*
  - a. Source the new CERESlib environment for the new Toolkit  
**/SCF2/CERES/lib/testing/x86-gnu/ceres-env.csh**

- b. Run existing executables for each PGE – *do not recompile*.
  - c. Compare the output from these test cases with output created using the existing `/SCF2/CERES/lib/x86-gnu/ceres-env.csh` and TK 5.2.16v1.
  - d. Record results.
- 2) New Toolkit 5.2.18v1 *with recompilation*
- a. Source the new CERESlib environment for the new Toolkit  
`/SCF2/CERES/lib/testing/x86-gnu/ceres-env.csh`
  - b. Recompile each subsystem PGE.
  - c. Run each PGE.
  - d. Compare the output from these test cases with output created using the existing `/SCF2/CERES/lib/x86-gnu/ceres-env.csh` and TK 5.2.16v1.
  - e. Record results.

Report your results to the DMT Toolkit and Compiler POC.

### 3.0 Testing SLES 11, new GCC 4.5.3 and XLF 13 compilers and Toolkit 5.2.18v1 on the P6

~~NOTE: The production version of the compiler upgrades are not yet available, so you do not need to perform this set of tests until you are informed that the compilers are ready for testing.~~

This suite of tests is designed to identify possible issues related to the Operating System and GCC and XLF upgrades on the P6 platform and should be run **after** the tests described in Section 2.0 above. PGEs delivered on the AMI-P production system have already been tested using SLES 11, and this test suite will therefore exclude testing with the new compilers and the older version of SLES 10. CERESlib has been built using the new compiler and SLES 10 to debug specific problems if they arise. Each subsystem should run the following set of tests for each PGE delivered (or planned delivery) to AMI-P and any analysis software that will be run on AMI after the upgrades. The Toolkit testing should be completed by June 15, 2012.

Before testing, create all expected output data products using the existing Toolkit 5.2.18v1 and the existing compilers (P6) before executing the following test cases:

#### Required Test Cases for each AMI-P PGE – P6:

- 1) New GCC 4.5.3 and XLF 13 libraries *using the existing executables*
  - a. Log into bc114 from any AMI host (e.g., clouds-b-blue)
  - b. Source the new CERESlib environment for the new Toolkit  
`/SCF2/CERES/lib/testing/p6-xlf-gcc45/ceres-env.csh`
  - c. Run existing executables for each PGE – *do not recompile*. The following queue can be used for UGE: `scf-sles11.q@bc113`. The AMI Job Submission Scripts (AJSS) will handle this automatically for PGEs using these scripts.

- d. Compare the output from these test cases with output created using `/SCF2/CERES/lib/testing/p6-xf/ceres-env.csh` and TK 5.2.18v1.
  - e. Record results.
- 2) New GCC 4.5.3 and XLF 13 *with recompilation*
- a. Log into bc114 from any *AMI* host (e.g., clouds-b-blue)
  - b. Source the new CERESlib environment for the new Toolkit `/SCF2/CERES/lib/testing/p6-xf-gcc45/ceres-env.csh`
  - c. Recompile each subsystem PGE.
  - d. Run each PGE. The following queue can be used for UGE: `scf-sles11.q@bc113`. The AJSS will handle this automatically for PGEs using these scripts.
  - e. Compare the output from these test cases with output created using `/SCF2/CERES/lib/testing/p6-xf/ceres-env.csh` and TK 5.2.18v1.
  - f. Record results.

Report your results to the DMT Toolkit and Compiler POC.

#### 4.0 Testing SLES 11, new GCC 4.5.3 compilers and Toolkit 5.2.18v1 on the *x86*

~~NOTE: The production version of the compiler upgrades are not yet available, so you do not need to perform this set of tests until you are informed that the compilers are ready for testing.~~

This suite of tests is designed to identify possible issues related to the Operating System and GCC and XLF upgrades on the *x86* platform and should be run **after** the tests described in Section 2.0 above. PGEs delivered on the *AMI-P* production system have already been tested using SLES 11, and this test suite will therefore exclude testing with the new compilers and the older version of SLES 10. CERESlib has been built using the new compiler and SLES 10 to debug specific problems if they arise. Each subsystem should run the following set of tests for each PGE delivered (or planned delivery) to *AMI-P* and any analysis software that will be run on *AMI* after the upgrades. The Toolkit testing should be completed by June 29, 2012.

Created expected output products using the existing Toolkit 5.2.18v1 and the existing compilers (*x86*) before executing the following test cases:

##### Required Test Cases for each *AMI-P* PGE – *x86*:

- 1) New GCC 4.5.3 libraries *using existing executables*
  - a. Log into ac09 from any *AMI* host (e.g., clouds-b-blue)
  - b. Source the new CERESlib environment for the new Toolkit `/SCF2/CERES/lib/testing/x86-gnu-gcc45/ceres-env.csh`
  - c. Run existing executables for each PGE – *do not recompile*. The following queue can be used for UGE: `scf-sles11.q@ac09.cluster.net`. The AJSS will handle this automatically for PGEs using these scripts.

- d. Compare the output from these test cases with output created using **/SCF2/CERES/lib/testing/x86-gnu/ceres-env.csh** and TK 5.2.18v1.
  - e. Record your results.
- 2) New GCC 4.5.3 with *recompilation*
- a. Log into ac09 from any *AMI* host (e.g., clouds-b-blue)
  - b. Source the new CERESlib environment for the new Toolkit **/SCF2/CERES/lib/testing/x86-gnu-gcc45/ceres-env.csh**
  - c. Recompile each of your subsystem PGEs.
  - d. Run each of your PGEs. The following queue can be used for UGE: scf-sles11.q@ac09.cluster.net. The AJSS will handle this automatically for PGEs using these scripts.
  - e. Compare the output from these test cases with output created using **/SCF2/CERES/lib/testing/x86-gnu/ceres-env.csh** and TK 5.2.18v1.
  - f. Record results.

Report your results to the DMT Toolkit and Compiler POC.

## Document Revision Record

The Document Revision Record contains information pertaining to approved document changes. The table lists the Version Number, the date of the last revision, a short description of the revision, and the revised sections. The document authors are listed on the first page.

Document Revision Record

<b>Version Number</b>	<b>Date</b>	<b>Description of Revision</b>	<b>Section(s) Affected</b>
V1	05/21/2012	<ul style="list-style-type: none"><li>• Initial version of the bulletin.</li></ul>	All
V2	06/22/2012	<ul style="list-style-type: none"><li>• Modified document to third-person voice.</li><li>• Updated to reflect current status.</li><li>• Struck through and added red color to note.</li></ul>	All Sec. 3.0 Sec. 1.0