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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 upcoming upgrades to the *AMI* systems. These upgrades include an upgrade of the existing Toolkit (TK 5.2.16v1) to the latest version (TK 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 upgrade of the SLES operating system to version 11 on both the *x86* and *P6* platforms. Since production platforms on *AMI-P* are already running SLES 11 and existing software is running in that environment now, compiler upgrade testing will only be preformed under SLES 11.

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

Jonathan would like us to upgrade to the latest version of the Toolkit, which is 5.2.18v1, so that we do not fall too far behind and experience issues, as when we upgraded from TK 5.2.7v1 to TK 5.2.12v1. 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 being supported so the ASDC has asked that we upgrade to a new suite of GCC compilers for Ada, C, C++ and F90 on the *x86* platforms and C and C++ on the *P6* platforms. It was determined that this was also a good time to upgrade the IBM XLF compiler on the *P6* platforms 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 each of their 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 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). We want to 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 is being asked to 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.

You will need 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 your 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 your 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 of your subsystem PGEs.
 - c. Run each of your PGEs.
 - 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 your results.

Report your results to Nelson Hillyer.

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 your 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 your 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 of your subsystem PGEs.
 - c. Run each of your PGEs.
 - 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 your results.

Report your results to Nelson Hillyer.

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.

The GCC 4.2.2 compilers are no longer being supported so the ASDC has asked that we upgrade to the new suite of GCC compilers (C and C++) on the P6 architecture. The IBM XLF compiler is also being upgraded to version 13. This set of tests should be run **after** you have run the testing from Section 2.0 above. This set of tests will be used to discover any issues that may be related to the operating system and compiler upgrades. Since delivered PGEs have already been tested using SLES 11, we are not testing the new compilers with SLES10. CERESlib does exist using the new compiler and SLES 10 if you need to check a problem. Each subsystem is being asked to 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 upgrades. The Toolkit testing should be completed by June 15, 2012.

You will want to ensure that you have created expected output data products using the existing Toolkit 5.2.18v1 and the existing compilers (P6) before you begin 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-xf-gcc45/ceres-env.csh`
 - c. Run your existing executables for each PGE – *do not recompile*. The following queue can be used for UGE: `scf-sles11.q@bc113`. If your PGEs use the AMI Job Submission Scripts, this will be handled automatically.

- 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 your 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 of your subsystem PGEs.
 - d. Run each of your PGEs. The following queue can be used for UGE: `scf-sles11.q@bc113`. If your PGEs use the *AMI* Job Submission Scripts, this will be handled automatically.
 - 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 your results.

Report your results to Nelson Hillyer.

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.

The GCC 4.2.2 compilers are no longer being supported; ASDC has asked that we upgrade to the new suite of GCC compilers (Ada, C, C++, and F90) on the *x86* architecture. This set of tests should be run **after** you have run the testing from Section 2.0 above. This set of tests will be used to discover any issues that may be related to the compiler upgrades alone. Since delivered PGEs have already been tested using SLES 11, we are not testing the new compilers with SLES10. CERESlib does exist using the new compiler and SLES 10 if you need to check a problem. Each subsystem is being asked to 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 upgrades. The Toolkit testing should be completed by June 29, 2012.

You will want to ensure that you have created expected output data products using the existing Toolkit 5.2.18v1 and the existing compilers (*x86*) before you begin 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 your existing executables for each PGE – *do not recompile*. The following queue can be used for UGE: `scf-sles11.q@ac09.cluster.net`. If your PGEs use the *AMI* Job Submission Scripts, this will be handled automatically.

- 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. If your PGEs use the *AMI* Job Submission Scripts, this will be handled automatically.
 - 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 your results.

Report your results to Nelson Hillyer.