

June 2009 Programming Environments Release Announcement

The following product/versions are officially released:

Release Date	Product/Version	
=====	=====	
06/18/09	CCE	7.1.0
	intel-prgenv	1.0.0
	intelsup	11.0.074
	xt-asyncpe	3.0
	xt-libsci	10.3.6
	MPT	3.3.0
	libfast_mv	1.0.4
	PETSc	3.0.0.3
	CADE	4.2 (Cray Application Developer's Environment)

These products are available for download from both CRInform and CrayPort at:

http://wwwcst.mw.cray.com/cgi-bin/crinform/cringate/order_software
<http://crayport-int.us.cray.com/Pages/OrderCraySoftware-Int.aspx>

Productivity statement:

CCE 7.1.0:

The CCE 7.1.0 release enhances productivity by providing support for C++ and OpenMP 3.0 features, giving users access to C++ language support and the most recent OpenMP standard. OpenMP 3.0 includes support for nested parallelism and OpenMP 'tasks', which can be used to take advantage of increasing numbers of cores within a node.

New optimizations in this release increase productivity by improving performance of the compiler generated code. Optimizations in this release include automatic multithreading, significant performance improvements for complex data operations, and improved performance of UPC collective routines and memory copy functions.

intel-prgenv 1.0.0 and intelsup 11.0.074:

Support of the Intel compilers improve programmer productivity by providing another option for compiling applications.

Brief descriptions of individual releases:

More details for each release are provided below.

- * CCE 7.1.0
Feature release of the Cray Compiling Environment with support for C++, OpenMP 3.0 and license manager.
- * intel-prgenv 1.0.0 *** NEW! ***

- intelsup 11.0.074 *** NEW! ***
Module file support for the Intel Compiler.
- * xt-asyncpe 3.0
Bug fix and support in the compiler driver scripts for the Intel compiler. No catamount support, CLE CNL only.
- * xt-libsci 10.3.6
Bug fixes.
- * MPT 3.3.0
Bug Fixes and improved MPI-IO by default.
- * libfast_mv 1.0.4
Bug fixes and minor features.
- * PETSc 3.0.0.3
Bug fixes and Istanbul support.
- * CADE 4.2 (Cray Application Developer's Environment)
Update to xt-asyncpe, xt-libsci, MPT, libfast_mv, PETSc and the addition of intel-prgenv and intelsup.

Operating System Dependencies:

These products were tested on Cray XT systems running the UNICOS/lc 2.0 CNL, CLE 2.1 CNL and CLE 2.2 operating systems.

Detailed descriptions

Cray Compiling Environment 7.1.0 (CCE 7.1.0)

Feature information and overview:

See the Cray Compiling Environment 7.1 Release Overview and Installation Guide (S-5212-71) for a more complete list of enhancements.

Features in this release

The following features are provided in CCE 7.1.0:

- 1) C++ support
- 2) Initial support of Auto threading
- 3) OpenMP 3.0 Support:
Limitations
 - C++ random access iterator loops marked for work sharing may not get work shared.
 - Tasks switching is not implemented.
- 4) Performance tuning
- 5) FLEXnet License manager

Bugs fixed in the CCE 7.1.0 release:

- 747420 flush() can be linked by CCE, but the executable aborts with "Segmentation fault"
- 746338 Totalview does not seem to appreciate CCE
- 750361 Error in the text for explain ftn-878

750007 getting ftn-1295 when compiling 3 source with dependencies
746954 OpenMP scales w/ PGI, but not w/ PathScale or GNU compiles

Dependencies:

The CCE 7.1.0 release is supported on Cray XT systems running the UNICOS/lc 2.0 CNL and CLE 2.1 CNL or later operating systems.

CCE 7.1.0 requires that gcc/4.1.2 be installed. This does not need to be the default GNU environment.

The following product versions are the minimum versions required to be used with CCE 7.1.0 compilers on XT systems:

acml/4.1.0a (4.2.0 or later is preferred)
cray-prgenv-1.0.1
MPT 3.1.0.6 (3.2.0 is preferred)
CrayPat 4.4.0 or later
libsci 10.3.1.6 (10.3.4 or later is preferred)
xt-asyncpe 2.5 (3.0 or later is preferred)

Installation instructions:

To install the PrgEnv-cray, CCE, programming environment, copy the rpms and execute these commands:

```
env CRAY_INSTALL_DEFAULT=1 rpm -ivh --oldpackage cce-7.1.0-133.x86_64.rpm  
env CRAY_INSTALL_DEFAULT=1 rpm -ivh --oldpackage cray-prgenv-1.0.1-  
3.x86_64.rpm
```

A FLEXnet License Key for CCE 7.1.0 will be provided separately and will include some additional installation and set up instructions. Contact orderdsk@cray.com to request a license key.

After installation, users will swap in the PrgEnv-cray environment just as you would for PathScale or gnu. You will also use the same ftn and cc scripts to invoke the compiler. Also, you will load module xtpe-barcelona to create a barcelona executable, xtpe-shanghai to create a shanghai executable or xtpe-istanbul to create an istanbul executable.

```
Log on  
$ module swap PrgEnv-pgi PrgEnv-cray  
$ module load xtpe-barcelona  
$ ftn test.f
```

intel-prgenv 1.0.0 and intelsup 11.0.074

Purpose:

The intel-prgenv and intelsup packages provide the module files to support compiling with the Intel compiler.

Dependencies:

The intel-prgenv 1.0.0 and intelsup 11.0.074 releases are supported on Cray XT systems running the UNICOS/lc 2.0 CNL and CLE 2.1 CNL or later operating systems.

You must get the Intel compiler suite Version 11.0.074 (C/C++ and FTN) and install it in the default location. The module file is set up for version 11.0.074 only. Other versions may work if the intelsup module file is modified appropriately. The Intel C/C++ only installation is not supported because the Intel Fortran run time libraries are required by Cray XT libraries (libsci, for example) when using the Intel compiler.

These products are also required:

```
xt-asyncpe 3.0 or later
Libsci      10.3.6 or later
MPT         3.2.0 or later
hdf5-netcdf 1.3 or later
```

libfast_mv is not recommended for use with the Intel compiler as it does not improve performance.

PETSc does not support the Intel compiler at this time. This will be supported in a future release.

Installation Instructions:

```
export CRAY_INSTALL_DEFAULT=1
rpm -ihv intel-prgenv-1.0.0-1.x86_64.rpm
rpm -ihv xt-intelsup-11.0.074-4.x86_64.rpm
unset CRAY_INSTALL_DEFAULT
```

xt-asyncpe 3.0

Purpose:

This package includes updated versions of the cc, CC and FT man pages. Add support for Intel compilers.

Bugs fixed:

```
747940 Link option problem with libsci for quadcore
750566 Istanbul Specific PETSc Library isn't picked with xtpe-istanbul
750488 fortran module path incorrectly set by crayftn for petsc and cce
750507 .cray_rpm_release file needs to be added to products
750426 intel compiled libraries get many "unsatisfied" errors
750687 Move PE driver manpages to xt-asyncpe
```

Dependencies:

The xt-asyncpe 3.0 release is supported on Cray XT systems running the UNICOS/lc 2.0 CNL and CLE 2.1 CNL or later operating systems.

Installation Instructions:

To install the xt-asyncpe 3.0 update, copy the rpms and execute these commands:

```
export CRAY_INSTALL_DEFAULT=1
rpm -ivh --oldpackage xt-asyncpe-3.0-13.i386.rpm
unset CRAY_INSTALL_DEFAULT
```

xt-libsci 10.3.6

Purpose:

xt-libsci 10.3.6 release contains a set of libraries built with the Intel compiler for linking with Intel compiler built applications.

Bugs fixed with libsci 10.3.6:

- 749172 missing intro_fftw2 and intro_fftw3 man pages
- 750113 CALL to SORGTR yields Seg Fault for N=3 with input of zeros - regression
- 750114 IN Cray xt-libsci proposed 10.3.5 SLAMCH ('Overflow threshold') = Infinity is BAD
- 750406 dgetrf isn't in Cray's libsci

Dependencies:

The xt-libsci 10.3.6 release is supported on Cray XT systems running the UNICOS/lc 2.0 CNL and CLE 2.1 CNL or later operating systems.

xt-asyncpe 2.5 or later

Installation Instructions:

To install the xt-libsci 10.3.6 update, copy the rpms and execute these commands:

```
export CRAY_INSTALL_DEFAULT=1
rpm -ivh xt-libsci-10.3.6-1.x86_64.rpm
unset CRAY_INSTALL_DEFAULT
```

MPT 3.3.0

Purpose:

The MPT 3.3.0 release has changed a couple of MPI-IO default optimizations. It now has "MPICH_MPIO_CB_ALIGN" set to 2 by default, sets the "cb_nodes" hint to the number of stripes by default, and though the default for the "romio_cb_write" hint is still "automatic", collective buffering now is always done in "automatic" mode for collective I/O calls. These changes were made because internal testing has shown the new algorithm performed better.

The reason that these new default settings and the new algorithm work well is that for each stripe all the physical I/O writes are done by one and only one PE, and this can greatly reduce both the number of physical writes and the amount of Lustre "extent lock" contention. In addition, the default values for "data sieving" were changed from "automatic" to "disable" since data sieving rarely helps for large XT applications. We are encouraging users with applications that do a significant amount of I/O to consider using MPI-IO collective calls if not already doing so. Please see the following paper on MPI-IO collective buffering: "Optimizing MPI-IO for Applications on Cray XT

Systems". It is available from the new Pubs "Knowledge Base" web page: <http://docs.cray.com/kbase/> The "MPICH_MPIIO_HINTS" and "MPICH_MPIIO_CB_ALIGN" sections of the "mpi" man page also give more details.

Bugs fixed in MPT 3.3.0:

750632 MPICH2 test io/resized.c gets incorrect output when data sieving is disabled
750708 MPICH2 test romio_io/large_array.c gets errors when MPIIO_CB_ALIGN==2
749960 PTL_ME_INUSE errors when setting MPICH_PTL_EAGER_LONG=1
750652 MPI_File_create_errhandler doesn't create a viable error handler that is called when a file error occurs.
749870 Increase matchbits to verify 14 bits of contextID
748342 current context id limit is too high

Differences between MPT 3.2.0 and MPT 3.3.0:

MPT 3.3.0 limits the maximum number of communicators in use at any one time to 4096. This is due to the available space in the matchbits. Since MPT collective optimizations create two additional communicators per user-communicator, this results in a user application being able to create approximately 1360 simultaneous communicators.

Disabling collective optimizations by setting MPICH_COLL_OPT_OFF=1, allows an application to create up to 4096 simultaneous communicators. See Bug 748342 for more details.

Dependencies:

The MPT 3.3.0 release is supported on Cray XT systems running the UNICOS/lc 2.0 CNL and CLE 2.1 CNL or later operating systems.

xt-asyncpe 2.5 or later

Installation Instructions:

To install the xt-mpt 3.3.0 update, copy the rpms and execute these commands:

```
export CRAY_INSTALL_DEFAULT=1
rpm -ivh --nodeps cray-mpt-3.3.0-0_1.0000.7404.0.x86_64.rpm
unset CRAY_INSTALL_DEFAULT
```

libfast_mv 1.0.4

Purpose:

The following functions were added. For more detail, see the intro_fast_mv and cos man pages.

frda_log	Array version of 64 bit base-e logarithm
vrda_log	Array version of 64 bit base-e logarithm
frsa_logf	Array version of 32 bit base-e logarithm

vrsa_logf Array version of 32 bit base-e logarithm
__vrd4_log Four element version of 64 bit base-e logarithm
fastcos Scalar 64 bit cosine
fastsin Scalar 64 bit sine
fastsincos Scalar 64 bit sine and cosine.

Loops involving log() may speed up when compiled with PathScale using the -LNO:vintr=2 and -O3 options.

Loops involving both sin() and cos() may speed up when compiled with PGI. The sin() and cos() arguments must be identical.

Some functions were optimized for AMD Barcelona processors.

Bugs fixed in libfast_mv 1.0.4:

747122 S3D code needs a fast_mv array logarithm
750853 libfast modulefile needs clean up
750289 libfast modulefile causes cce to fail

Dependencies:

The libfast_mv 1.0.4 release is supported on Cray XT systems running the UNICOS/lc 2.0 CNL and CLE 2.1 CNL or later operating systems.

Installation Instructions:

```
export CRAY_INSTALL_DEFAULT=1
rpm -ivh --oldpackage libfast_mv-1.0.4-2.x86_64.rpm
unset CRAY_INSTALL_DEFAULT
```

PETSc 3.0.0.3

Purpose:

Bug fixes and Istanbul support.

Bug fixes:

750236 Need to add MANPATH for intro_petsc man page
750566 Istanbul Specific PETSc Library isn't picked with xtpe-istanbul
750053 FIXED compile fails when /opt/petsc/3.0.0.1/.... is included
750111 include/finclude/petsc.h with PathScale compile gets 'Unknown compiler directive...error'

Dependencies:

The PETSc 3.0.0.3 release is supported on Cray XT systems running the UNICOS/lc 2.0 CNL and CLE 2.1 CNL or later operating systems.

xt-asyncpe 3.0

Installation Instructions:

```
export CRAY_INSTALL_DEFAULT=1
```

```
rpm -ivh --oldpackage petsc-3.0.0.3-3.x86_64.rpm
unset CRAY_INSTALL_DEFAULT
```

CADE 4.2

Purpose:

CADE is a collection of the latest basic programming environment for Cray XT systems. CADE does not include licensed products (CCE, PGI, Performance tools and etc). This package plus the licensed products (compilers, performance tools and debuggers) will update your system to the latest Programming Environment.

```
acml-4.2.0-1.x86_64.rpm
cray-gcc-mpfr-2.3.1-20.x86_64.rpm
cray-mpt-3.3.0-0_1.0000.7404.0.x86_64.rpm
fftw-2.1.5.1-1.x86_64.rpm
fftw-3.2.1-1.x86_64.rpm
hdf5_netcdf-1.3-0.x86_64.rpm
intel-prgenv-1.0.0-1.x86_64.rpm
java-jdk1.6.0_13-3.x86_64.rpm
lgdb-1.1-3.x86_64.rpm
libfast_mv-1.0.4-2.x86_64.rpm
petsc-3.0.0.3-3.x86_64.rpm
xt-asyncpe-3.0-13.i386.rpm
xt-gcc-4.1.2-10.x86_64.rpm
xt-gcc-4.2.4-5.x86_64.rpm
xt-gcc-4.3.3-2.x86_64.rpm
xt-intelsup-11.0.074-4.x86_64.rpm
xt-libsci-10.3.6-1.x86_64.rpm
xt-pathscalesup-3.2-2.x86_64.rpm
```

Installation Instructions:

To install the CADE 4.2, please see the README file in the CADE package.

Bugs closed lists online:

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Complete lists of bugs closed can be found at:

```
CCE 7.1.0: ftp://ftp.cray.com/pub/pe/download/FIXED\_IN\_cce\_710
xt-asyncpe 3.0: ftp://ftp.cray.com/pub/pe/download/FIXED\_IN\_xt-asyncpe\_30
xt-libsci 10.3.6: ftp://ftp.cray.com/pub/pe/download/FIXED\_IN\_xt-libsci\_1036
mpt: ftp://ftp.cray.com/pub/pe/download/FIXED\_IN\_mpt\_330
fast_mv 1.0.4: ftp://ftp.cray.com/pub/pe/download/FIXED\_IN\_fast\_mv\_104
xt-petsc 3.0.0.3: ftp://ftp.cray.com/pub/pe/download/FIXED\_IN\_petsc\_3003
```