

Intel® Cluster Studio XE 2013 Service Pack 1 (SP1) Release Notes

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Introduction

Intel® Cluster Studio XE 2013 SP1 for Linux* OS and Windows* OS accelerates parallel software development on cluster systems based on IA-32 and Intel® 64 architectures, as well as Intel® Many Integrated Core Architecture (Intel® MIC Architecture) on Linux* OS. For Intel® MIC Architecture, only Intel® Xeon Phi™ coprocessor (codename: Knights Corner) is supported.

Intel® Cluster Studio XE 2013 SP1 provides a software tools environment for **hybrid parallel programming** (message passing and threading). In terms of the Intel® Cluster Studio XE 2013 SP1 software for Windows* OS, consider references within this document to Microsoft* Windows* HPC Server 2008 OS and Microsoft* Windows* HPC Server 2008 R2 OS as interchangeable. The Microsoft Windows HPC Server 2008 and Microsoft Windows HPC Server 2008 R2 operating systems support only Intel® 64 architecture.

Intel® Cluster Studio XE 2013 SP1 supports hybrid parallel programming application development using Intel® MPI Library with optimized parallel libraries, performance analysis, and benchmarks. Intel® Cluster Studio XE 2013 SP1 saves software developers time and improves performance on distributed computing systems.

Intel® Cluster Studio XE 2013 SP1 for Linux OS and Windows* OS supports critical parts of the message-passing interface (MPI) application development process including:

- Compiler support through Intel® C++ Compiler XE 14.0 and Intel® Fortran Compiler XE 14.0. Intel® C++ Compiler XE 14.0 and Intel® Fortran Compiler XE 14.0 for Linux* OS provide support for Intel® Many Integrated Core Architecture (Intel® MIC Architecture).

- Intel® MPI Library 4.1 Update 1, which implements the Message Passing Interface 2.2 Standard (MPI-2.2). Intel MPI library enables multiple interconnect solutions with a single implementation. Intel® MPI Library 4.1 Update 1 for Linux* OS supports Intel® Many Integrated Core Architecture (Intel® MIC Architecture).
- Intel® Trace Analyzer and Collector 8.1 Update 3
 - o Intel® Trace Collector provides event-based tracing in cluster applications through an instrumentation library that ensures low overhead in execution. The trace information provides performance data, statistics, multi-threaded events, and automatic instrumentation of user binaries on Intel® 64, IA-32 and Intel® Many Integrated Core Architecture (Intel® MIC Architecture).
 - o Intel® Trace Analyzer provides visual analysis of application activities gathered by the Intel Trace Collector.
 - o A message checking component of the Intel Trace Collector provides a novel MPI correctness technology that detects errors with data types, buffers, communicators, point-to-point messages and collective operations, deadlocks, and data corruption.
- Application tuning with optimized mathematical library functions from Intel® Math Kernel Library (Intel® MKL) 11.1 that includes ScaLAPACK* solvers and Cluster DFTs (Discrete Fourier Transforms). Intel® MKL 11.1 for Linux* OS support Intel® Many Integrated Core Architecture (Intel® MIC Architecture).
- Intel® MPI Benchmarks 3.2.4 that makes it easy to gather performance information about a cluster system.

On completing the Intel® Cluster Studio XE 2013 SP1 installation process, locate the `Doc_Index.htm` file in the `doc` folder on the master node of the cluster. This file is a documentation map to navigate to various information resources of the Intel® Cluster Studio XE. See the [Installation Notes](#) section of these Release Notes for additional information about the exact location of `Doc_Index.htm` and its content.

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Product Contents

The table below lists the product components and related documentation.

Component	Version	Documentation
Intel® Advisor XE	2013 Update 4	documentation_advisor.htm
Intel® C++ Compiler XE	14.0	get_started_wc.htm for Windows* OS get_started_lc.htm for Linux* OS
Intel® Debugger (Linux* OS only)	13.0 Update 1	debugger_documentation.htm
Intel® Fortran Compiler XE	14.0	get_started_wf.htm for Windows* OS get_started_lf.htm for Linux* OS

Intel® Inspector XE	2013 Update 7	documentation_inspector.htm
Intel® Integrated Performance Primitives (Intel® IPP)	8.0 Update 1	ipp_documentation.htm
Intel® Math Kernel Library (Intel® MKL)	11.1	mkl_documentation.htm
Intel® MPI Benchmarks	3.2 Update 4	IMB_Users_Guide.htm Readme_Addendum_for_MIC_Architecture.txt (Linux* OS only)
Intel® MPI Library	4.1 Update 1	Doc_Index.html for Linux* OS and Doc_Index.htm for Windows* OS Release_Notes_Addendum_for_MIC_Architecture.txt (Linux* OS only)
Intel® Threading Building Blocks (Intel® TBB)	4.2	tbb_documentation.htm
Intel® Trace Analyzer and Collector	8.1 Update 3	ITA_Reference_Guide.htm ITC_Reference_Guide.htm Release_Notes_Addendum_for_MIC_Architecture.txt (Linux* OS only)
Intel® VTune™ Amplifier XE	2013 Update 12	documentation_amplifier.htm

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What's New

This section highlights important changes from the previous product version. For information on what is new in each component, please read the individual component release notes.

Changes since Intel® Cluster Studio XE 2013:

- Development of applications that offload work to an Intel® Xeon Phi™ coprocessor from a Windows* OS host is now supported.
- Intel® Cluster Studio XE web page provides an up-to-date list of frequently asked questions (FAQ) about the product. The FAQ document is now removed from the package.
- Product package now includes the Getting Started Guide describing product functionality for the current operating system. Documentation for other operating systems is published online at <http://software.intel.com/en-us/intel-software-technical-documentation>
- GNU* Project Debugger (GDB*) 7.5 (GPL licensed) is now included into the package
- All components updated to current versions:
 - Intel® C++ Compiler XE 14.0
 - Intel® Debugger 13.0 Update 1 (For Linux* OS only)
 - Intel® Fortran Compiler XE 14.0
 - Intel® Inspector XE 2013 Update 4
 - Intel® Integrated Performance Primitives 8.0 Update 1
 - Intel® MKL 11.1

- o Intel® MPI Benchmarks 3.2 Update 4
- o Intel® MPI Library 4.1 Update 1
- o Intel® Advisor XE 2013 Update 4
- o Intel® Threading Building Blocks 4.2
 - o Intel® Trace Analyzer and Collector 8.1 Update 3
 - o Intel® VTune™ Amplifier XE 2013 Update 12
 - o GNU* Project Debugger (GDB*) 7.5 (GPL licensed)
 - o Microsoft* Visual Studio* Shell for Intel® Visual Fortran **(For Windows* OS; installs only on the master node)**. Intel® Cluster Studio XE 2013 SP1 for Windows* OS provides Microsoft Visual Studio 2010 Shell. As a prerequisite, if you install the included Microsoft Visual Studio 2010 Shell, additional Microsoft software may be required to be installed prior to beginning the installation of the Intel® Cluster Studio XE 2013 SP1. **Microsoft .NET* 4.0 Framework is required for Microsoft* Visual Studio* 2010 Shell. If you do not have this framework installed already, you can download the installer from:**
<http://www.microsoft.com/en-us/download/details.aspx?id=17851>

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System Requirements

Processor Requirements

Systems based on IA-32 architecture:

A system based on the Intel® Pentium® 4 processor or higher

Intel® Core® i7 processor recommended

Systems based on Intel® 64 architecture:

Intel® Core™ processor family or higher

Intel® Xeon® 5500 processor series recommended

Note: It is assumed that the processors listed above are configured into homogeneous clusters. For Windows* OS, only processors based on the Intel® 64 architecture are supported.

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Disk Space Requirements

100 GB of disk space (minimum)

Note: During the installation process, the installer may need up to 12 GB of temporary disk storage to manage the intermediate installation files.

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Operating System Requirements

OS Distributions	IA-32	Intel® 64 Architecture
------------------	-------	------------------------

	Architecture	32-Bit Applications	64-Bit Applications
Intel® Cluster Ready ¹	N/A	N/A	S
Red Hat Enterprise Linux* 5.0	S	S	S
Red Hat Enterprise Linux* 6.0	S	S	S
SUSE Linux Enterprise Server* 11	S	S	S
Microsoft* Windows* HPC Server 2008	N/A	S	S
Microsoft* Windows* HPC Server 2008 R2	N/A	S	S

S = Supported

¹ Intel® Cluster Ready is an applications platform architecture standard for Linux* OS clusters. Please convey to your users the Linux* OS platform needed for your MPI application with:

This application has been verified to run correctly on Linux* OS clusters that conform to the Intel® Cluster Ready platform architecture. Each Intel® Cluster Ready system is shipped and tested with a diagnostic tool: Intel® Cluster Checker. Intel® Cluster Checker is used to validate operability and compliance, as well as overall system health. On an Intel® Cluster Ready system, start with these commands to easily view diagnostic logs:

```
$ . /opt/intel/clck/<version>/clckvars.sh
$ cluster-check --report
```

For more information on Intel® Cluster Ready and on the alliance of partner vendors, please visit <http://www.intel.com/go/cluster>.

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Memory Requirements

2 GB RAM (minimum)

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Intel® Professional Edition C++ Compiler and Intel® Fortran Compilers

For all of the Intel® architectures, the version number on the Intel compilers should be 11.1 or

higher.

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Adobe* Reader*

There are certain documents within the Intel® Cluster Studio XE that require Adobe Reader for viewing. You can download Adobe Reader onto your system from <http://get.adobe.com/reader/>.

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Installation Notes

For instructions on installing and uninstalling the Intel® Cluster Studio XE 2013 SP1 on Linux* OS and Windows* OS, see the Installation Guide.

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Documentation

The documentation index file Doc_Index.htm provides hyperlinks to the Intel® Cluster Studio XE documentation.

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Issues and Limitations

1. When trying to install the Intel® Cluster Studio or Intel® Cluster Studio XE product via the "*activate by using a license manager*" option, you may experience delays of up to 10 minutes. Do not immediately shut down the install in such cases but wait for the installer to complete. If you experience delays exponentially longer than this, contact Intel® Premier Support at <http://premier.intel.com>
2. There have been situations where during the installation process, /tmp has been filled up. We recommend that you have **at least 12 GB of free space** in /tmp when installing the Intel® Cluster Studio XE. Also, the installer script install.sh has the command-line options:

```
-t [FOLDER]
```

or

```
--tmp-dir [FOLDER]
```

where [FOLDER] is a directory path, which can direct the use of intermediate storage to another disk partition referenced by [FOLDER]. [FOLDER] should be a non-shared storage location on each node of the cluster. Note that [FOLDER] should also contain **at least 12 GB of free space**.

3. On Linux* OS, if any software component of the Intel® Cluster Studio XE is detected as

pre-installed on the head node, that software component will not be processed by the Intel Cluster Studio installer. There is a similar problem on Windows* OS in the 'Modify' mode. For Windows* OS, if some software component of the Intel® Cluster Studio XE is pre-installed on the head node using the Intel Cluster Studio installer, that software component will not be installed on the compute nodes of the cluster. For either Linux* OS or Windows* OS, if you already installed some of the software components only on the head node, and you want to install them on the other nodes using the Intel Cluster Studio installer, you need to uninstall such components from the head node manually before starting the installer.

4. For Linux* OS versions of the Intel® Cluster Studio XE, the Java* Runtime Environment is used by the Intel® Debugger graphical environment, which is a Java* application. On Linux* OS, the installer may display the following message with respect to the Java* Runtime Environment (JRE) during installation:

```
Step no: 4 of 6 | Installation configuration > Missing Optional Prerequisite
```

```
-----  
There is one or more optional unresolved issues. It is highly recommended to fix  
them all before you continue the installation. You can fix it without exiting  
the
```

installation and re-check. Or you can quit the installation, fix the issues, and run the installation again.

```
-----  
Missing optional prerequisite
```

```
-- No compatible Java* Runtime Environment (JRE) found
```

- ```

1. Skip missing optional prerequisites [default]
2. Show the detailed info about issue(s)
3. Re-check the prerequisites
```

- ```
h. Help  
b. Back to the previous menu  
q. Quit
```

```
-----  
Please type a selection or press "Enter" to accept default choice [1]:
```

You can resolve this issue by entering value 2 after the prompt message for the installation state shown above. This generates the following diagnostic information:

```
Step no: 4 of 6 | Installation configuration > Missing Optional Prerequisite
```

```
-----  
This system does not appear to have a Java* JRE version 5.0 (also referred to as  
1.5.0) installed. This may prevent operation of the Intel(R) Debugger GUI. For  
further details, please refer to the System Requirement section of the product  
Release Notes.
```

- ```

1. Finish with prerequisites and continue installation [default]
2. Back to Prerequisite summary dialog
```

- h. Help
- b. Back to the previous menu
- q. Quit

-----  
Please type a selection or press "Enter" to accept default choice [1]:

The generated instructions indicate that a version of the Java\* Runtime Environment is missing from your system. For the prompt message above, enter the character "q" to quit the installation process. Make sure that the Java\* Runtime Environment package is installed on your system. The directory path for the Java\* Runtime Environment might be:

/usr/java

If you cannot find the Java\* Runtime Environment library on your system, you can download the appropriate version of the Java\* Runtime Environment from <http://www.java.com/en/download/>

After the download completes, install the Java\* Runtime Environment on your system. You may need a system administrator to help you with the installation. The Java\* Runtime Environment is used by the Intel® Debugger graphical environment, which is a Java\* application.

Once you have a compatible Java\* Runtime Environment library on your system, set your PATH environment variable to include the directory path to the Java\* Runtime Environment library. The Bourne\* and Korn\* Shell syntax for setting the PATH environment variable might be as follows:

```
export PATH=/usr/java/jre1.5.0_22/bin:$PATH
```

For C Shell, the syntax for setting the PATH environment variable might be as follows:

```
setenv PATH /usr/java/jre1.5.0_22/bin:$PATH
```

After setting the PATH environment variable, repeat the installation process. The message regarding the missing Java\* Runtime Environment library will disappear.

5. You may encounter a symbolic links creation error on Linux\* OS when upgrading from Intel® Cluster Studio to Intel® Cluster Studio XE, with the following symptoms:

- a. No symbolic links are created in /opt/intel/icsxe/<version>/
- b. Lots of error messages are returned in case of the distributed install, such as:

```
ln: creating symbolic link `/root/icsxe/2013.0.028/mpi' to `/root/icsxe/
impi/4.1.0.008': No such file or directory
ln: creating symbolic link `/root/icsxe/2013.0.028/impi' to `/root/icsxe/
impi/4.1.0.008': No such file or directory
ln: creating symbolic link `/root/icsxe/2013.0.028/mpi' to `/root/icsxe/
impi/4.1.0.008': No such file or directory
ln: creating symbolic link `/root/icsxe/2013.0.028/impi' to `/root/icsxe/
```



```
impi/4.1.0.008': No such file or directory
```

The workaround is to put the Intel® Cluster Studio XE license into either `/opt/intel/licenses` or `${HOME}/intel/licenses` before starting the installation procedure described in the Linux\* OS installation guide.

6. If you use the C/C++ memory leak programming example described in the topic *Using Intel® Inspector XE* of the Intel® Cluster Studio XE 2013 SP1 Getting Started Guide and issue the Intel® MPI Library/Intel® Inspector XE command-line:

```
mpiexec -n 4 inspxe-cl -r inspectorxe_results -collect mi1 -- ./a.out
```

You may encounter a message of the following type:

```
Inspector reports 0 issues for all processes
```

Then try running the Intel® Inspector XE with the `mi2` collector as follows:

```
mpiexec -n 4 inspxe-cl -r inspectorxe_results -collect mi2 -- ./a.out
```

`mi1` is the Intel® Inspector XE collector that detects memory leaks. `mi2` is the Intel® Inspector XE collector that detects other memory problems.

7. If you use the Intel® MPI Library command `mpirun` with the Intel® Inspector XE as follows:

```
mpirun -f ./mpd.hosts -nolocal -ppn 1 -n 4 inspxe-cl -c ti2 -r r003_{mpirank} `pwd`/
inspxe_mpirank.exe inspxe-cl -c mi2 -r r000_{mpirank} `pwd`/inspxe_mpirank.exe
```

where the above command line is collecting two types of instrumentation data (`ti2` and `mi2`), and you encounter a run-time error that may look as follows:

```
... HYDU_create_process (./utils/launch/launch.c:94): execvp error on file r000_
{mpirank} (No such file or directory)
... HYDU_create_process (./utils/launch/launch.c:94): execvp error on file r000_
{mpirank} (No such file or directory)
... HYDU_create_process (./utils/launch/launch.c:94): execvp error on file r000_
{mpirank} (No such file or directory)
... HYDU_create_process (./utils/launch/launch.c:94): execvp error on file r000_
{mpirank} (No such file or directory)
```

In this case, you can use the `mpiexec` command in lieu of the `mpirun` command:

```
mpiexec -nolocal -ppn 1 -n 4 inspxe-cl -c ti2 -r /shared/cluster_common/
inspector_test/cluster/r003_{mpirank} `pwd`/inspxe_mpirank.exe inspxe-cl -c mi2 -
r r000_{mpirank} inspxe_mpirank.exe
```

where `/shared/cluster_common/inspector_test/cluster/r003_{mpirank}` is a shared path for collecting `ti2` instrumentation data.

Alternatively, you can create a Bourne\* Shell or C Shell script that contains instrumentation information that may look as follows:

```
inspxe-cl -c ti2 -r /shared/cluster_common/inspector_test/cluster/r003_{mpirank}
`pwd`/inspxe_mpirank.exe inspxe-cl -c mi2 -r r000_{mpirank} inspxe_mpirank.exe
```

Using Bourne\* Shell syntax, the script might be called `run.sh`, where it is used with the `mpirun` command in the following manner:

```
mpirun -ppn 1 -n 4 ./run.sh
```

You also need to remove the `-nolocal` command-line option because the `-f <hosts_file>` option was not specified, and therefore all processes are started locally.

8. Intel® Cluster Studio XE 2013 SP1 for Windows\* OS requires **the creation and use of symbolic links for installation of the Intel® software product components**. If you have a File Allocation Table (FAT32) file system deployed on your Windows\* OS platform, these symbolic links cannot be created and the integrity of the Intel® Cluster Studio XE installation is compromised.

9. Intel® Trace Analyzer and Collector 8.1 Update 3 - itcpin is not supported for Linux\* OS kernels version 3.x.

10. For Intel® MIC Architecture, Intel® MPI Library supports only Intel® Xeon Phi™ coprocessor (codename: Knights Corner).

This release of the Intel® MPI Library 4.1 for Linux\* OS does not support certain features for Intel® Xeon Phi™ coprocessor:

- o MPD process manager

Intel® MPI Library 4.1 for Linux\* OS supports multiple DAPL\* providers for communication between the host and the Intel® Xeon Phi™ coprocessor and between several Intel® Xeon Phi™ coprocessors inside one node.

Currently supported providers are DAPL over InfiniBand\* Architecture and DAPL over Intel® Symmetric Communication Interface (Intel® SCI). This feature requires using symbolic names in the host file.

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## Technical Support

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Your feedback is very important to us. To receive technical support for the tools provided in this product and technical information including FAQ's and product updates, you need to register for an Intel® Premier Support account at the [Intel® Registration Center](#).

**Note:** Registering for support varies for release product or pre-release products (alpha, beta, etc) - only released software products have support web pages at <http://software.intel.com/sites/support/>.

To register for an account, please visit the Intel® Registration Center website at <http://www.intel.com/software/products/registrationcenter/index.htm>. If you have forgotten your password, please email a request to: [quadsupport@mailbox.intel.com](mailto:quadsupport@mailbox.intel.com). Please do not email your technical issue to this email address.

The product support web site, located under the SUPPORT tab of the <http://www.intel.com/go/clustertools> product page, provides top technical issues, FAQs & Known Issues, [Documentation](#) and Training, and product errata. For more information, and to connect with the Intel HPC community, visit the Intel® Cluster Studio XE forums: <http://software.intel.com/en-us/forums/intel-clusters-and-hpc-technology>.

## Submitting Issues

To submit an issue via the Intel Premier Support website, please perform the following steps:

1. Ensure that Java\* and JavaScript\* are enabled in your browser.
2. Go to <https://premier.intel.com/>.
3. Type in your Login and Password. Both are case-sensitive.
4. Click the "Submit Issues" button in the left margin.
5. Read the Confidentiality Statement and click the "I Accept" button.
6. Click on the "Go" button next to the "Product" drop-down list.
7. Click on the "Submit Issue" link in the left navigation bar.
8. Choose "Development Environment (tools, SDV, EAP)" from the "Product Type" drop-down list.
9. If this is a software or license-related issue choose "Intel(R) Cluster Studio XE" from the "Product Name" drop-down list.
10. Enter your question and complete the fields in the web-page windows that follow to successfully submit the issue.

Follow these guidelines when forming your problem report or product suggestion:

1. Describe your difficulty or suggestion. For problem reports, please be as specific as possible (for example, including compiler and link command-line options), so that we may reproduce the problem. Please include a small test case if possible.
2. Describe your system configuration information. Be sure to include specific information that may be applicable to your setup: operating system, name and version number of the installed applications, and anything else that may be relevant to helping us address your concern.

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