

Debugging with the Intel® Parallel Studio XE Composer Edition Quickstart Guide

Intel® Parallel Studio XE 2015 Composer Edition for C++ Linux*, OS X*

Intel® Parallel Studio XE 2015 Composer Edition for Fortran Linux*, OS X*

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1 Introduction

This document provides an entry point to using the GNU* Project Debugger (GDB) for debugging applications natively on IA-32 or Intel® 64 Architecture systems and debugging applications remotely on Intel® Xeon Phi™ coprocessor systems (Linux* OS host only).

For new debugger features, hardware and software requirements, other prerequisites, and known issues, refer to your product's release notes.

Using the GNU* Project Debugger (GDB) 2

The GNU* Project Debugger (GDB) provided with the Intel® Parallel Studio XE Composer Edition is based on GDB with enhancements provided by Intel. It comes in different versions:

IA-32/Intel® 64 Architecture debugger:

Debug applications natively on IA-32 or Intel® 64 Architecture systems.

Intel® Xeon Phi™ coprocessor debugger (Linux* OS only):

Debug applications remotely on Intel® Xeon Phi™ coprocessor systems. The debugger runs on a host system and a debug agent (`gdbserver`) runs on the coprocessor.

There are two options:

- Use the command line version of the debugger. This only works for native Intel® Xeon Phi™ coprocessor applications.
- Use the Eclipse* IDE plugin. This works only for offload enabled Intel® Xeon Phi™ coprocessor applications. Native applications need to be debugged with the command line version.

NOTE
For any of the debugger versions mentioned above, always source the following script in the same environment where you use the debugger:

```
source <install-dir>/bin/debuggervars.[sh|csh]
```

Starting GDB for Native IA-32/Intel® 64 Architecture Applications

To debug applications natively on IA-32 or Intel® 64 Architecture systems, start GDB with the following command:

```
gdb-ia
```

The actual debugger usage is the same as for the GNU* Project Debugger. Extensions for IA-32/Intel® 64 Architecture are described in the debugger documentation.

Starting GDB for Intel® Xeon Phi™ Coprocessor Applications (Linux* OS Only)

Debugging applications for the Intel® Xeon Phi™ coprocessor is different to debugging local applications because of the difference of host and target:

The host is running the debugger GNU* GDB. This system can be the host containing the coprocessor cards or any other development host.

The target, here the coprocessor itself, executes a debug agent (`gdbserver`) to which the host connects to.

For more information on debugging on the Intel® Xeon Phi™ coprocessor, see also http://software.intel.com/en-us/articles/debugging-intel-xeon-phi-applications-on-linux-host.

You can either start the debugger from the command line or from Eclipse* IDE:

Starting the debugger from the command line

NOTE
Make sure to source the following script in the same environment where you use the debugger:

```
source <install-dir>/bin/debuggervars.[sh|csh]
```

1. Transfer the debug agent to the Intel® Xeon Phi™ coprocessor, such as:

```
$ scp <install-dir>/debugger/gdb/target/mic/bin/gdbserver mic0:/tmp
```

2. Start GDB on the host and connect to the target, such as:

```
$ gdb-mic
(gdb) target extended-remote | ssh mic0 /tmp/gdbserver --multi -
```

- To load and execute an application on the coprocessor, issue the following commands:

```
(gdb) file <path_on_host>/application
(gdb) set remote exec-file <path_on_target>/application
```

- To attach to a process already running on the coprocessor with PID `<pid>`, issue the following commands:

```
(gdb) file <path_on_host>/application
(gdb) attach <pid>
```

Starting the debugger from Eclipse* IDE

NOTE
Make sure to source the following script in the same environment where you start Eclipse* IDE:

```
source <install-dir>/bin/debuggervars.[sh|csh]
```

Currently, only offload enabled Intel® Xeon Phi™ applications can be debugged.

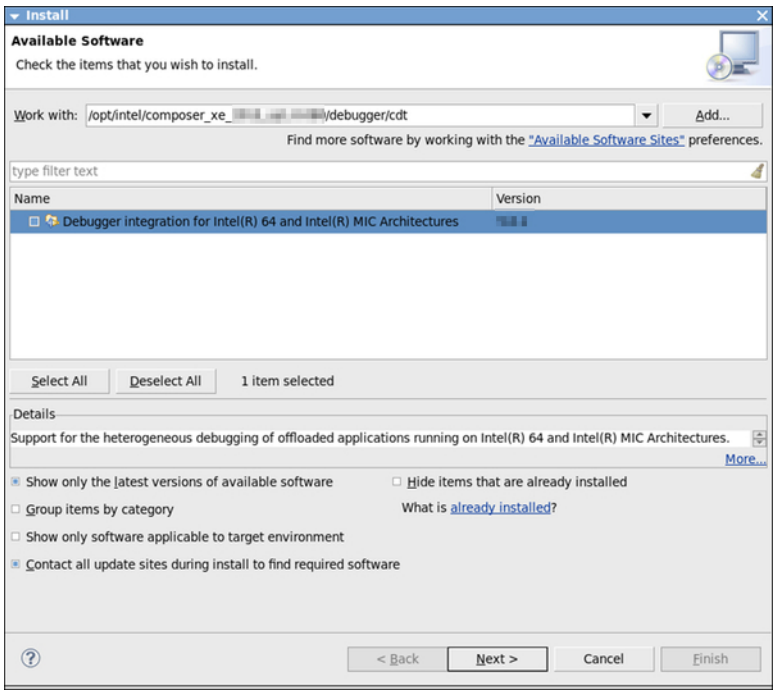
To install and start the GDB back-end for debugging Intel® Xeon Phi™ applications from Eclipse* IDE:

1. Set the following additional environment variables on your host system for Intel® Manycore Platform Software Stack (Intel® MPSS) 3.1 or higher:

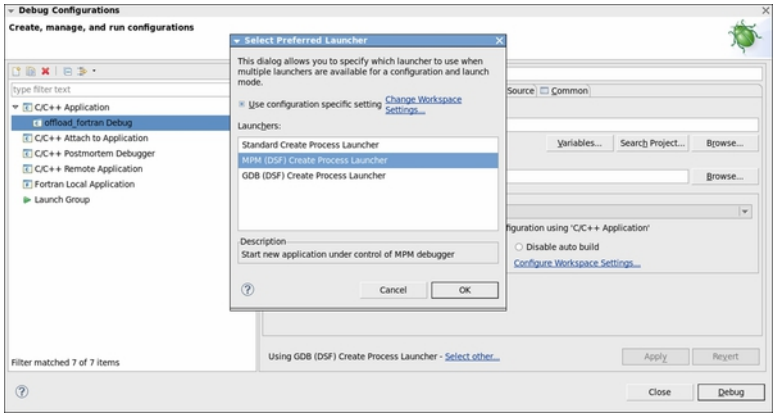
```
AMPLXE_COI_DEBUG_SUPPORT=TRUE

MYO_WATCHDOG_MONITOR=-1
```

2. Start Eclipse* IDE.
3. Click **Help** > **Install New Software...**.
4. Click the **Add...** button.
5. Click the **Local...** button and select the directory `<install-dir>/debugger/cdt/`.
6. Uncheck **Group items by category** (checked by default).
7. Check the plugin **Debugger Integration for Intel® 64 and Intel® MIC Architectures**.



8. Complete the installation of the plugin. There might be a warning about unsigned content. This can be ignored.
9. Restart Eclipse* IDE
10. Select **Run** > **Debug Configurations** and create a new debug configuration.
11. For **Using Standard Create Process Launcher**, click **Select other...** and select **MPM (DSF) Create Process Launcher**.



Configuring Eclipse* for Debugging Fortran Applications with GDB

NOTE
Make sure to source the following script in the same environment where you start Eclipse* IDE:

```
source <install-dir>/bin/debuggervars.[sh|csh]
```

1. Start Eclipse* IDE.

2. Click **Help** > **Install New Software**
3. From the **Work with:** dropdown menu select the appropriate Eclipse* version.
   For example, `Kepler -http://download.eclipse.org/releases/kepler"`.
4. Expand **Programming Languages** and check the checkboxes for
   - **Fortran Development Tools (Photran)**
   - **Linux Intel(R) Fortran Compiler Support**
5. Complete the installation of these two plugins.
6. For every Fortran project:
   a. Click **Run** > **Debug Configurations ...**
   b. Select **C/C++ Application** and click **New_configuration**.
   c. Enter the configuration for the respective Fortran project.
   d. Go to the **Debugger** tab.
   e. Check the checkbox **Stop on startup at:** and enter `main__`
   f. Close the **Debug Configurations** dialog box

Eclipse* is now configured to debug Fortran Applications with GDB.

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