Eclipse IDE for Blue Waters, demos:

- Eclipse Kepler release
  - Cray Loopmark
  - OpenACC support
- Nvidia Nsight for C/CUDA
Eclipse kepler release

• Eclipse downloads are available for Linux, Mac and Windows platforms

• www.eclipse.org
  • Downloads
    • Developer builds
      • Eclipse for Parallel Application Developers
        • Select your OS and architecture (32 or 64 bit)
Synchronized projects with loopmark and Openacc

- Eclipse supports client-server development via synchronized projects
  - Create a new *synchronized project*
    - Makefile project (empty)
    - Setup filters if the project contains large files because `/usr/bin/git` doesn’t handle large files well
    - Fix remote include paths if desired
  - Confused? Look at eclipse help—search box.
Eclipse help: searching for Cray

Recognizing Compiler Errors: Cray, PGI, and Open64

- Configuring Error Parsers
- Recognizing Cray, Compiler Optimization/Logmark Information

When you build a C/C++ or Fortran application, the output from the compiler (including any error messages) is displayed in the Console view. However, CDT/Phorun can ‘recognize’ the error and warning messages from many popular compilers, placing the problem description in the Problems view and marking the corresponding line in the source file with an icon.

CDT does not, by default, recognize error or warning messages from the Cray, PGI, or Open64 C/C++ compilers. However, this is possible when PTP is installed.

Configuring Error Parsers

To recognize errors and warnings from the Cray, PGI, or Open64 C/C++ compilers:

1. In the Project Explorer view, right-click on a C/C++ or Fortran project.
2. In the context menu, select Properties. This will open the Project Properties dialog.
3. In the tree on the left, navigate to C/C++ Build > Settings.
4. In the right side of the dialog, select the Error Parsers tab. Note that the list includes these entries:
   - CDT Cray C/C++ Error Parser
   - CDT PGI C/C++ Error Parser
   - CDT Open64 C/C++ Error Parser
5. Select the error parsers corresponding to all of the C/C++ and Fortran compilers you use, or might use in the future, to compile the project.
6. Click the OK button to close the Project Properties dialog.
Working with modules (Blue Waters and Xsede)

- Project
  - Properties
    - c/c++ build (also for fortran)
      - Environment management
Cdt editor tips

• Function calls
  • Hover over a function or subroutine to see definition
  • Select it to see occurrences
  • Right-click for more options like call hierarchy
• For line numbering, right click near the left edge of the edit window
• Tab indent (un-indent) code sections
Driving makefile: clean and build

- Project menu
  - Clean
  - Build
- Hammer time (build)
- There are often multiple methods of doing the same thing in eclipse: it’s the unix of IDEs
Cray loopmark demo

- Cray c and fortran compilers can annotate source code with compiler optimization information
- Both compilers can also emit optimization messages to stderr
  - Drop –g as it inhibits optimization
  - c/c++
    - -h msgs [ negmsgs will report unoptimized code ]
  - Fortran
    - -O msgs
Optimization report info

- Problems view
  - Info
  - Defaults to 100 items
  - view menu -> configure contents (to increase)
C optimization report view
Fortran optimization report view
OpenACC artifacts

- Search for OpenACC in eclipse help
OpenACC c code
Questions before moving on to Nsight?
Nvidia Nsight cuda development IDE

- Based on eclipse, but customized for CUDA
  - Handles kernels
  - A slightly simplified version of eclipse
  - Contains no parallel tools components (yet )
- Mac and Linux versions
- Windows Nsight is for visual studio – no demo today
Nsight demo - run remote or install?

- Demo: Running locally from jyc or bw
  - Module load cudatoolkit ; nsight
- You can install your own version by downloading cuda5
- My linux laptop has a copy from bw obtained using Globus Online
Nsight customizations when running local
Nsight on bw or jyc
Nsight features

• Hover over kernel invocation, bring up definition
• Understands .cu file extension
• Can build code with nvcc
• Cudasamples/ (from Nvidia) contains ready-to-build Nsight projects of most of the sample codes used in Nvidia documentation and tutorials
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Recognizing Compiler Errors: Cray, PGI, and Open64

Configuring Error Parsers

1. In the Project Explorer view, right-click a Cray, PGI, or Open64 project.
2. In the context menu, select Properties. The tab opens the Project Properties dialog.
3. Click the Build tab under Build & Run Settings. A list of Build and Run Settings will open.
4. Right-click a selected compiler and select Error Parsers from the context menu. A list of Error Parsers will open.
5. Select the error parser corresponding to the Cray, PGI, or Open64 compiler you use, or right-click to create a new one.
6. Click OK to close the Project Properties dialog.
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