STARTING THE
DDT DEBUGGER
ON MIO, AUN, & MC2

(Mouse over to the left to see thumbnails of all of the slides)

ALLINEA DDT

Allinea DDT is a powerful, easy-to-use graphical debugger capable of debugging a wide variety of scenarios found in today's development environments. With Allinea DDT, it is possible to debug:

- Single process and multithreaded software
- OpenMP
- Parallel (MPI) software
- Heterogeneous software such as that written to use GPUs
- Hybrid codes mixing paradigms such as MPI + OpenMP, or MPI + CUDA
- Multi-process software of any form, including client-server applications

PURPOSE:

- Show you how to start the ddt debugger, specifically on Mio

- The procedure is the same on AuN and Mc2

- There is a link to the full documentation at the end of these slides

ASSUMPTIONS

- You "home" machine supports X-Windows applications

  - Most desktop Linux machines support X out of the box

  - On Mac - use Quartz

  - On Windows - use Cygwin/X

- We have an example "buggy" application

- We will show how to launch ddt and run until we get to the bug

- We will run from a Mac

- There is a Mac and Windows client that does not require X but that requires an additional install, however, in the long run it is a better option

CONNECTING TO MIO

- ddt is an X-Windows application

- You must use the -Y option on your ssh line to allow X-Windows applications.

- If you are login in thru another machine you must use the -Y option there also
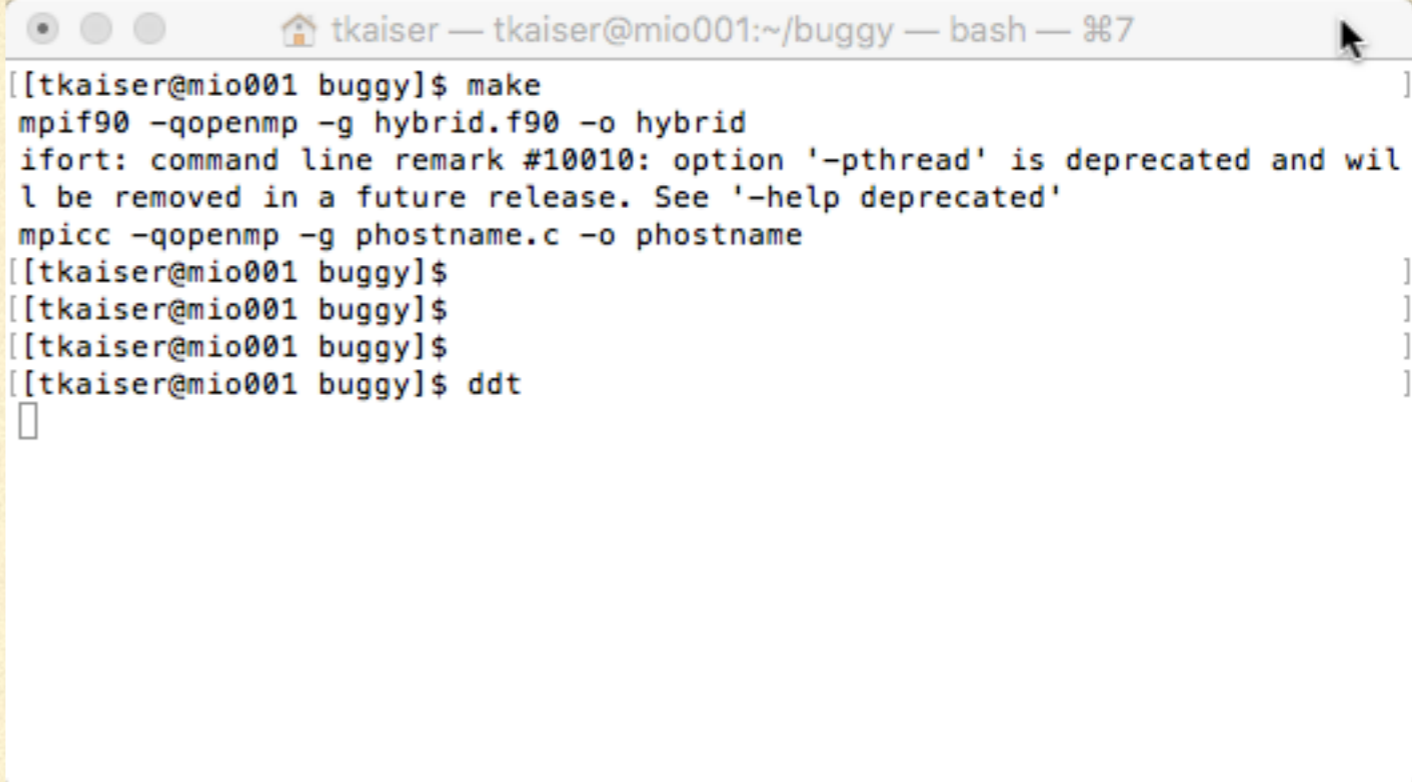
ssh -Y mio.mines.edu

SET UP…

- Reset your environment by doing an module purge and loading the modules you will need for the example

- The modules we use are:

  - PrgEnv/Debug/ddt

  - reset

- The "reset" module gives you a default compiler environment PrgEnv/Debug/ddt gives you the debugger

- Create a new directory, "buggy" , go there, and copy the example to the directory

```
osage:~ tkaiser$ ssh -Y mio
Last login: Tue Dec  8 14:36:15 2015 from osage.mines.edu
****************************
** For Mio questions email **
**     hpcinfo@mines.edu     **
****************************
[tkaiser@mio001 ~]$ module purge
[tkaiser@mio001 ~]$ module load PrgEnv/Debug/ddt
[tkaiser@mio001 ~]$ module load reset
[tkaiser@mio001 ~]$
[tkaiser@mio001 ~]$
[tkaiser@mio001 ~]$
[tkaiser@mio001 ~]$ mkdir buggy
[tkaiser@mio001 ~]$ cd buggy
[tkaiser@mio001 buggy]$ tar -xf /opt/utility/quickstart/debug.tar
[tkaiser@mio001 buggy]$ ls
batch.qtf  buggy.f90  command  hostfile  hybrid.f90  makefile  phostname.c  simple
[tkaiser@mio001 buggy]$
```

tkaiser — tkaiser@mio001:~/buggy — bash — ⌘7

BUILD AND STARTING DDT

- Build the example applications by entering make

- Note: You must use the -g option when you build a program to be able to debug it

- You can ignore the warning

- Launch ddt on the command line


```
tkaiser — tkaiser@mio001:~/buggy — bash — ⌘7
[[tkaiser@mio001 buggy]$ make
 mpif90 -qopenmp -g hybrid.f90 -o hybrid
 ifort: command line remark #10010: option '-pthread' is deprecated and wil
 l be removed in a future release. See '-help deprecated'
 mpicc -qopenmp -g phostname.c -o phostname
[[tkaiser@mio001 buggy]$
[[tkaiser@mio001 buggy]$
[[tkaiser@mio001 buggy]$
[[tkaiser@mio001 buggy]$ ddt
```
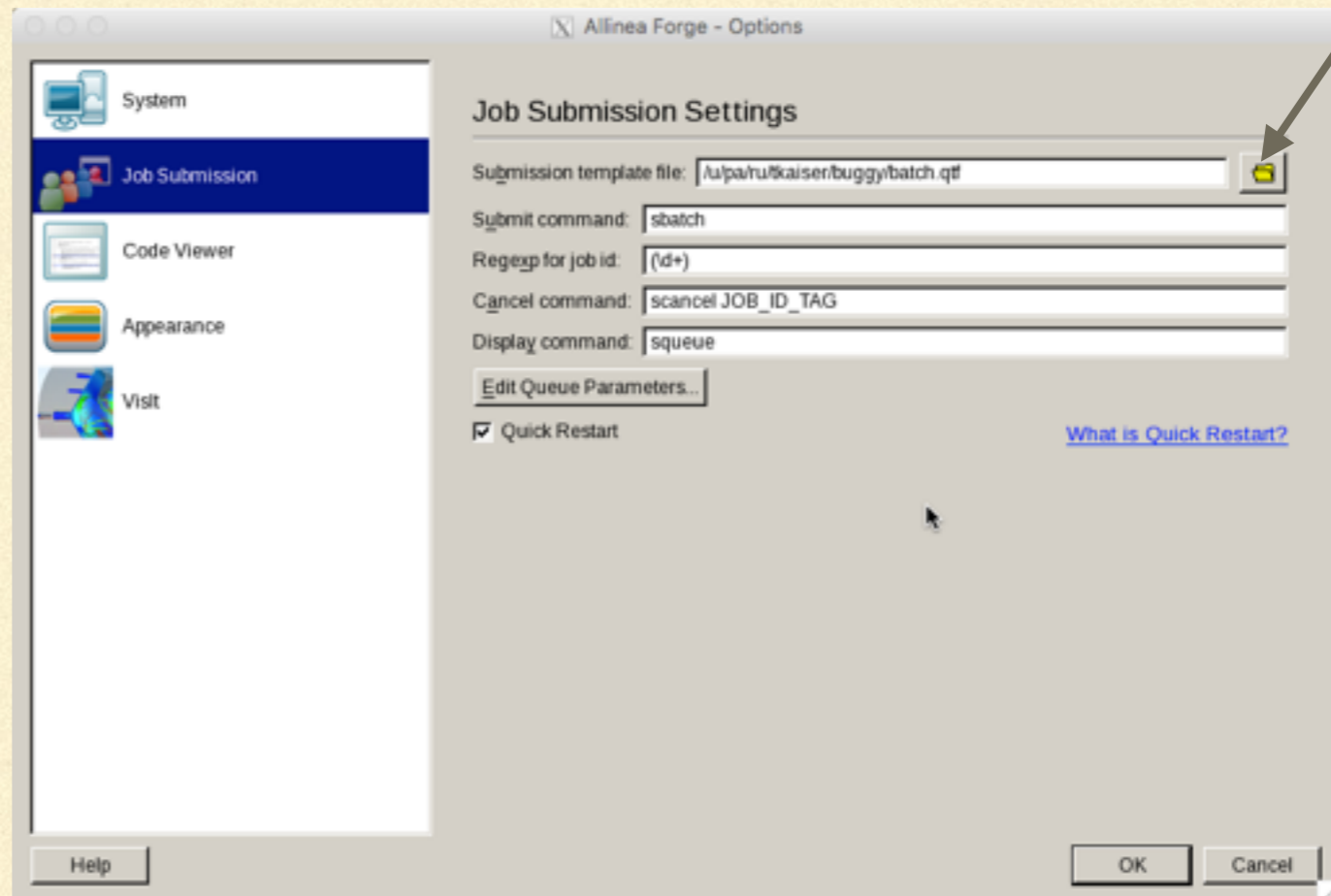
THE DDT MAIN WINDOW…

- This is the main ddt window

- In the ddt main window

  - Select File then Options

  - An Options window will come up

  - Select Job Submission
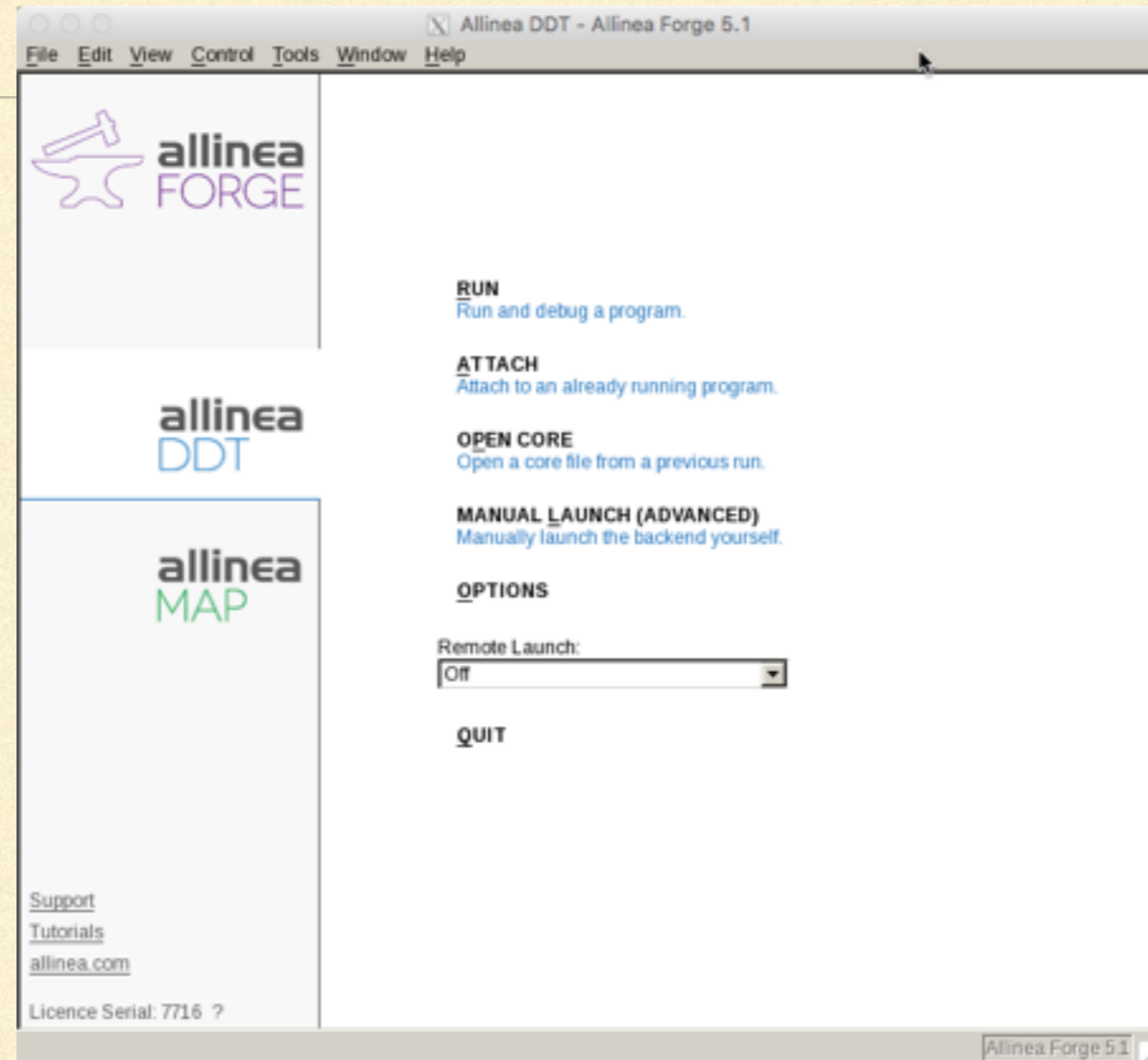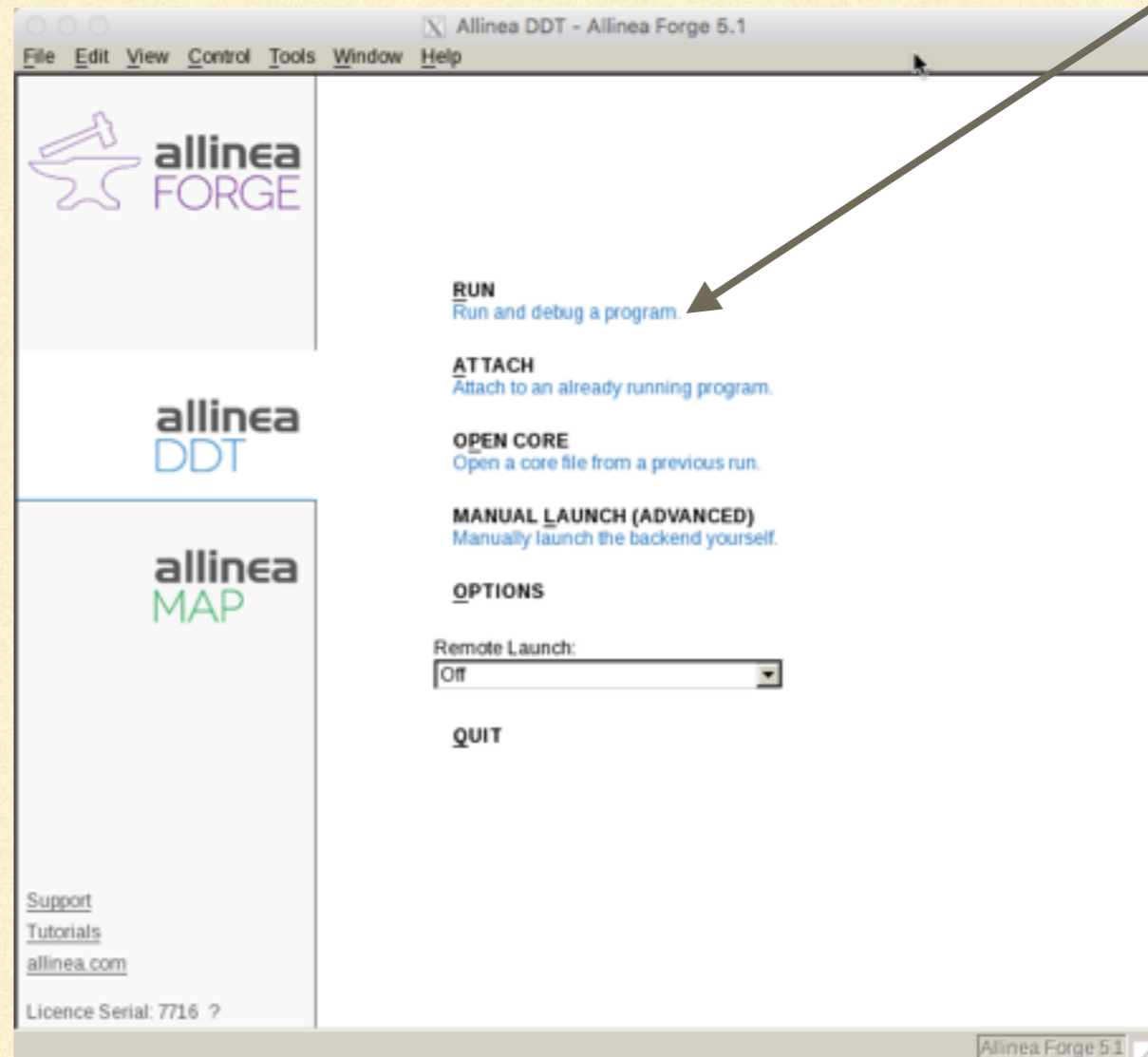
JOB SUBMISSIONS SETTINGS

Folder Icon

- Click on the "folder" icon and navigate to your "buggy" folder

- Select batch.qt

- Hit OK

- You will be back at the starting window
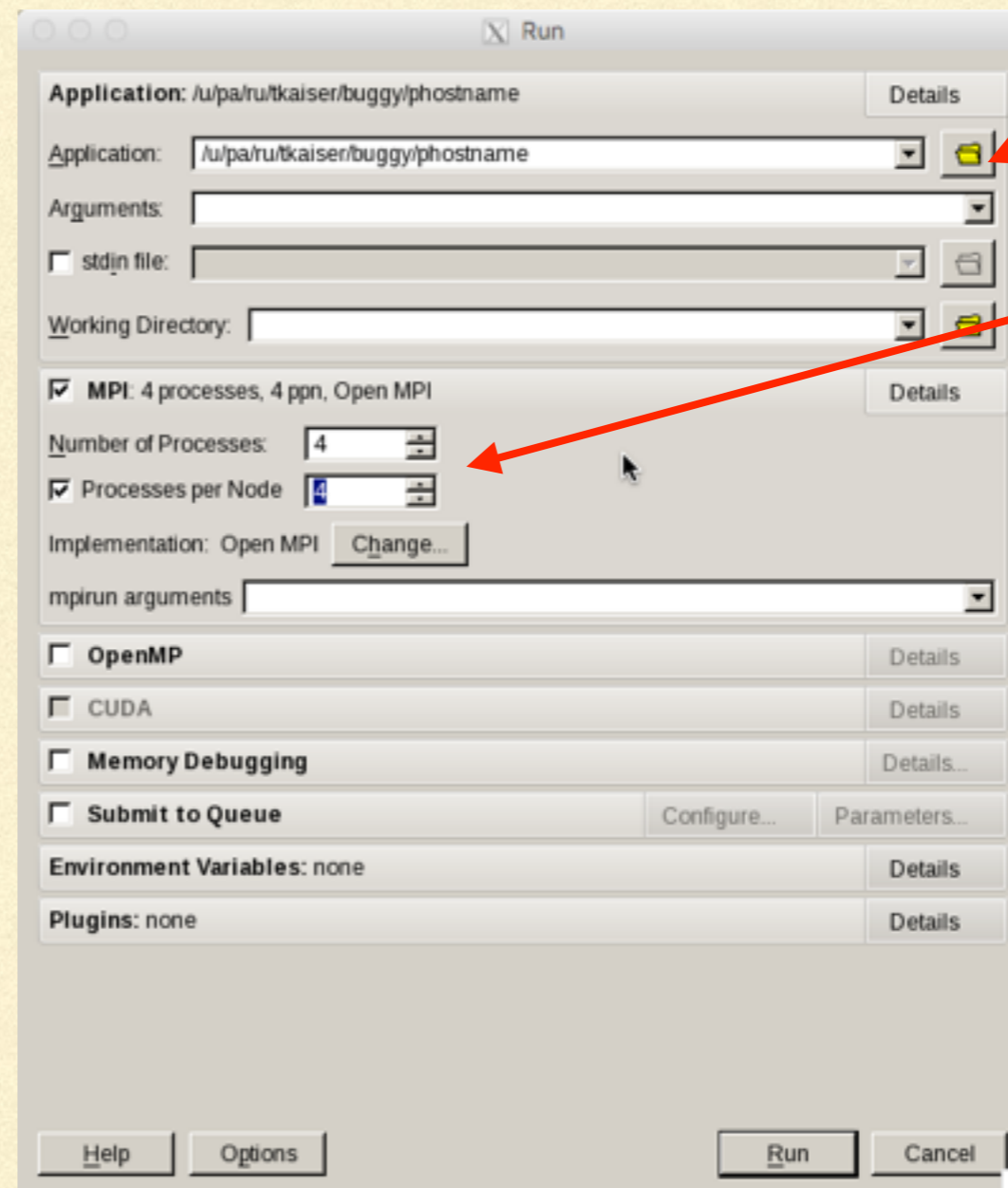
JOB SUBMISSIONS SETTINGS

Click Here

- In the starting window

  - Click on Run

  - This will bring up a window in which you can select the program you will run and the number of MPI tasks

APPLICATION AND MPI SETTINGS

Folder Icon

- Again select the folder icon and navigate to your "buggy" folder and select phostname

- Click next to MPI and then Processes per Node

- Enter 4 in each of the two boxes as shown. This will allow a run on 1 node with 4 MPI tasks.
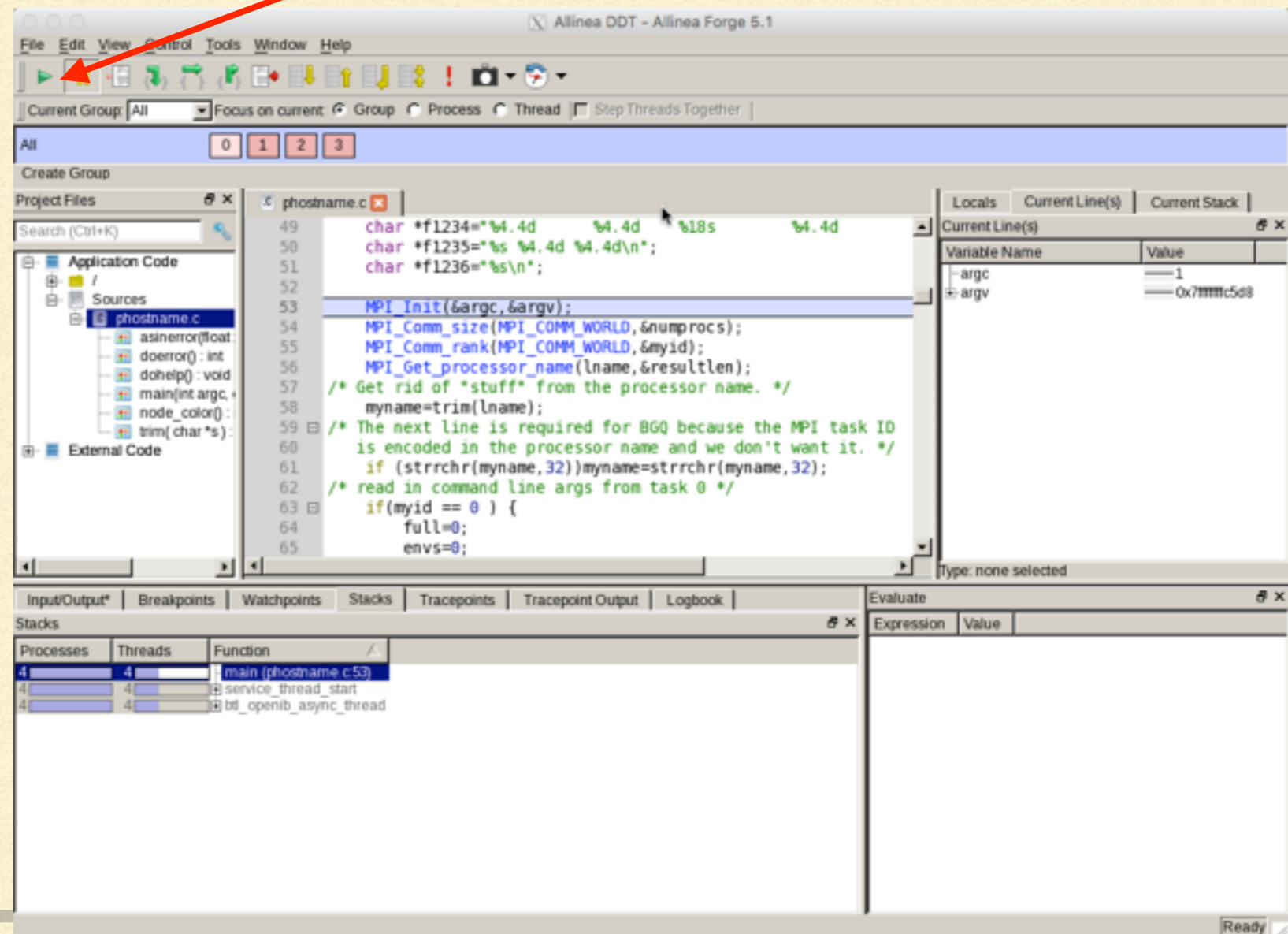
- Click Run

MPI run information

JOB SUBMISSIONS SETTINGS

- You will get a window that looks some thing like this with your source code in the middle.
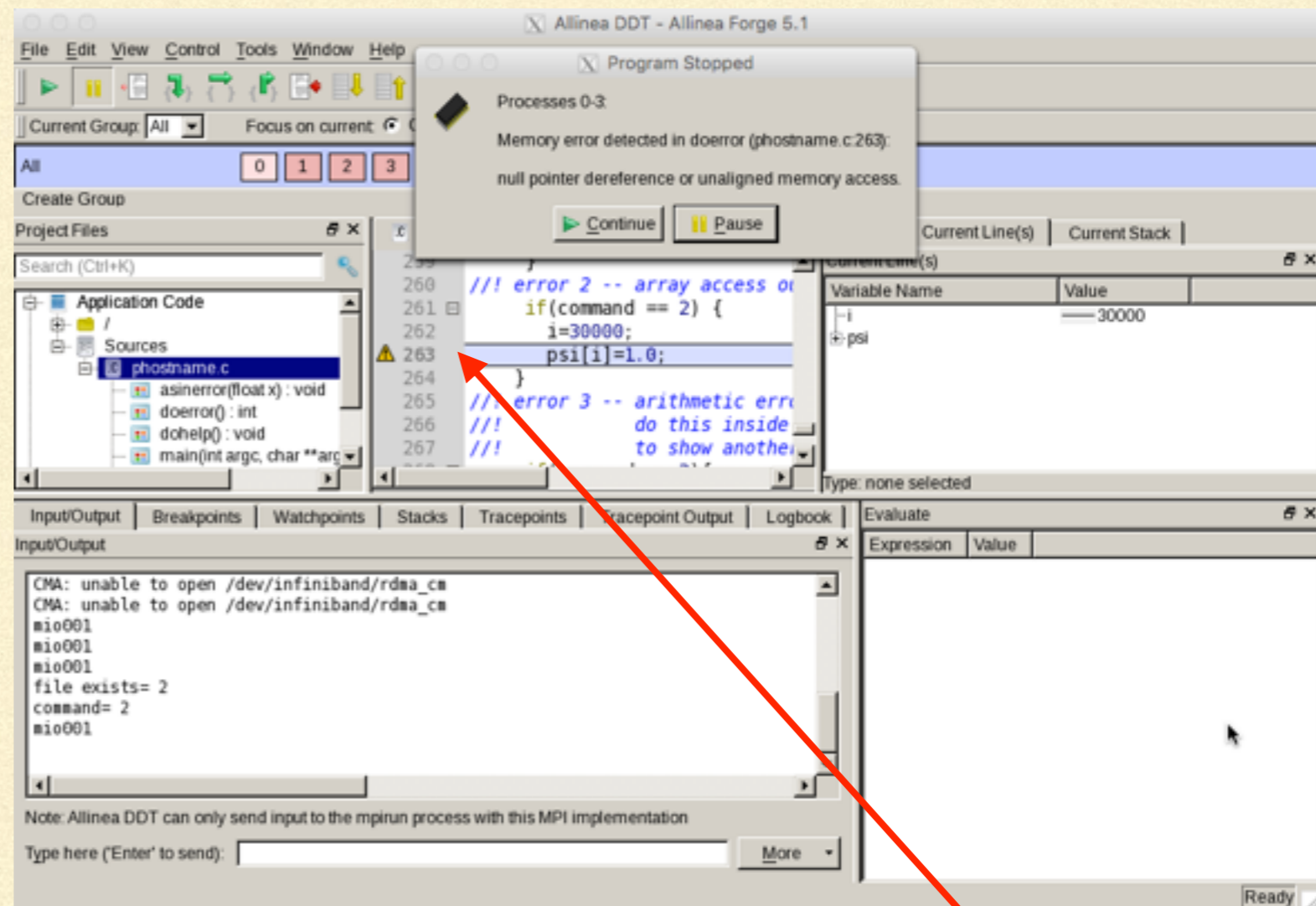
- Click on the Go arrow to start you program

Go arrow

JOB SUBMISSIONS SETTINGS

- After a few seconds you will see the Program Stopped window indicating that there was a problem

- Note the source window shows the line number where the problem occurred.

Here is the problem

MORE INFORMATION

- A movie of the ddt start-up process

  - http://geco.mines.edu/prototype/ddt/movie.html

- PDF of these slides

  - http://geco.mines.edu/prototype/ddt/ddt.pdf

- User guide

  - http://geco.mines.edu/prototype/ddt/userguid.pdf