High Performance Computing

GDB: The GNU Debugger

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Running a program

You start the debugger by the command gdb PROGRAM, which drops you into the debugging shell.

Enter the command run (or r) to start running the program. This will run the program until it exits or the debugger encounters an interrupt (typically the program is about to crash).

You can quite the debugger by the command quit (or q).

The text user interface

To start the text user interface (TUI) use the command tui enable. To disable it tui disable.

Inside of the TUI you have access to several windows. Initially the command (cmd) and the source (src) window are displayed.

You navigate inside of the focused window with arrow keys, page up, and page down.

Focus can be changed by the commands focus cmd and focus src.

The call stack

The command info stack displays the call stack, an ordered list of which function was called by which.

To go up and down in the call stack, you can use the commands up and down. Note that the stack is printed in reverse order. For example, the command up goes down in the printed list.

To go several steps provide the number of steps as an argument, for example up 4.

Printing variables

To print the value of a variable use the command print (or p) and then the variable name or expression.

For example, to print the 5-th element of an array a you write p a[4].

The variable must be in current scope, taking into account the position in the call stack.

Stepping through code

To proceed to the next line of code in the current file use the command next (or n).

To proceed to the next line of code executed use the command step (or n).

To finish the execution of a function use the command finish .

Breakpoints

Breakpoints are positions in the code where execution will be interrupted.

To add a breakpoints use the command break FILE:LINE (or b instead of break). The file and the colon can be omitted if the line number refers to the currently active file (in the source window).

You can also insert a breakpoint for a function by break FUNCTION.

Conversely you remove breakpoints via clear FILE:LINE or clear FUNCTION

To list all breakpoints use the command info breakpoints.

To delete all breakpoints use the command delete breakpoints.

Listing

A file must be activated to add a breakpoint to it. If this has not yet happened, use the command list FILE:1 to list it.

More general, use the command list FUNCTION to list the code for a function.