GDB GNU debugger

CONCEPTS

Compile with -g (and -O0 for sane stepping), otherwise GDB shows no source lines or local variables.

Break break, watch
↓ run
Stopped frame, locals
↓ step / continue
Inspect print, x, info
↓ repeat
Resume next, finish, continue

Press Enter to repeat the last command, and use short forms: b, r, c, n, s, bt, p, i.

START AND ATTACH

gdb *<prog>*
Load a program

gdb --args *<prog> <args>*
Load a program with arguments

gdb -p *<pid>*
Attach to a running process

gdb *<prog> <core>*
Inspect a core dump

run [args]
Start the program

start
Run and stop at the start of main

set args *<args>*
Set arguments for later runs

attach *<pid>*
Attach from inside GDB

detach
Release the process and keep it running

quit
Leave GDB

BREAKPOINTS

break *<func>*
Break at a function

break *<file>*:*<line>*
Break at a line of a file

break *<line>*
Break at a line of the current file

BREAKPOINTS (cont.)

break *<loc>* **if** *<cond>*
Break only when the condition holds

tbreak *<loc>*
One-shot breakpoint, deleted after first stop

info breakpoints
List breakpoints and watchpoints

delete [*<n>***]**
Delete one breakpoint, or all

disable *<n>* **/ enable** *<n>*
Turn a breakpoint off / on

condition *<n> <expr>*
Set or change a breakpoint condition

ignore *<n> <count>*
Skip the next hits of a breakpoint

WATCHPOINTS

watch *<var>*
Stop when a value changes

watch -l *<expr>*
Watch the memory address, not the scope

rwatch *<var>*
Stop when a value is read

awatch *<var>*
Stop on read or write

RUN CONTROL

continue [*<n>***]**
Resume; optionally skip n-1 further hits here

next [*<n>***]**
Step over calls to the next line

step [*<n>***]**
Step into functions with debug info

finish
Run until the current function returns

Ctrl+C
Interrupt the running program

STACK

backtrace
Show the call stack

STACK (cont.)

backtrace full
Include local variables in each frame

thread apply all bt
Backtrace of every thread

frame *<n>*
Select a frame

up [*<n>***] / down [***<n>***]**
Move toward the caller / callee

info locals
Local variables of the frame

info args
Arguments of the frame

INSPECT DATA

print *<expr>*
Evaluate and show an expression

print/x *<expr>*
Print in hex (also d, o, t, c, a)

print *<arr>*@*<n>*
Show n elements from the first one

set var *<var>* **=** *<val>*
Change a variable

display *<expr>*
Show an expression at every stop

x/*<n><f><u>* *<addr>*
Examine memory

ptype *<expr-or-type>*
Show the full type definition

set print pretty on
Print structs one field per line

SOURCE AND SYMBOLS

list
Show source around the current line

info threads
List threads

TEXT UI

layout src
Source window above the command line

Ctrl+X A
Toggle the text UI on and off