

Summary of GDB commands for x86-64 Systems

Command	Effect
Starting:	
gdb	
gdb <file>	
Running and stopping	
quit	Exit gdb
run	Run program
run 1 2 3	Run program with command-line arguments 1 2 3
kill	Stop the program
quit	Exit gdb
Ctrl-d	Exit gdb
Note: Ctrl-C does not exit from gdb, but halts the current gdb command	
Breakpoints	
break sum	Set breakpoint at the entry to function sum
break *0x80483c3	Set breakpoint at address 0x80483c3
delete 1	Delete breakpoint 1
disable 1	Disable the breakpoint 1 (gdb numbers each breakpoint you create)
enable 1	Enable breakpoint 1
delete	Delete all breakpoints
clear sum	Clear any breakpoints at the entry to function sum
Execution	
stepi	Execute one instruction
stepi 4	Execute four instructions
nexti	Like stepi, but proceed through function calls without stopping
step	Execute one C statement
continue	Resume execution until the next breakpoint
until 3	Continue executing until program hits breakpoint 3
finish	Resume execution until current function returns
call sum(1, 2)	Call sum(1,2) and print return value
Examining code	
disas	Disassemble current function
disas sum	Disassemble function sum
disas 0x80483b7	Disassemble function around 0x80483b7
disas 0x80483b7 0x80483c7	Disassemble code within specified address range
print /x \$rip	Print program counter in hex
print /d \$rip	Print program counter in decimal
print /t \$rip	Print program counter in binary
Examining data	
print /d \$rax	Print contents of %rax in decimal
print /x \$rax	Print contents of %rax in hex
print /t \$rax	Print contents of %rax in binary
print /d (int)\$rax	Print contents of %rax in decimal after sign-extending lower 32-bits.
You need this to print 32-bit, negative numbers stored in the lower 32 bits of %rax. For example, if the lower 32-bits of %rax store 0xffffffff, you will see	

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(gdb) print $rax
$1 = 4294967295
(gdb) print (int)$rax
$2 = -1
(gdb)

print 0x100          Print decimal representation of 0x100
print /x 555         Print hex representation of 555
print /x ($rsp+8)     Print (contents of %rsp) + 8 in hex
print *(int *) 0xbffff890 Print integer at address 0xbffff890
print *(int *) ($rsp+8) Print integer at address %rsp + 8
print (char *) 0xbffff890 Examine a string stored at 0xbffff890

x/w 0xbffff890       Examine (4-byte) word starting at address
                      0xbffff890
x/w $rsp              Examine (4-byte) word starting at address in $rsp
x/wd $rsp             Examine (4-byte) word starting at address in $rsp.
                      Print in decimal
x/2w $rsp            Examine two (4-byte) words starting at address
                      in $rsp
x/2wd $rsp           Examine two (4-byte) words starting at address
                      in $rsp. Print in decimal
x/g $rsp             Examine (8-byte) word starting at address in $rsp.
x/gd $rsp            Examine (8-byte) word starting at address in $rsp.
                      Print in decimal
x/a $rsp             Examine address in $rsp. Print as offset from
                      previous global symbol.
x/s 0xbffff890       Examine a string stored at 0xbffff890
x/20b sum            Examine first 20 opcode bytes of function sum
x/10i sum            Examine first 10 instructions of function sum

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(Note: the format string for the 'x' command has the general form
 x/[NUM][SIZE][FORMAT] where

NUM = number of objects to display
 SIZE = size of each object (b=byte, h=half-word, w=word,
 g=giant (quad-word))
 FORMAT = how to display each object (d=decimal, x=hex, o=octal, etc.)

If you don't specify SIZE or FORMAT, either a default value, or the last
 value you specified in a previous 'print' or 'x' command is used.

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Useful information

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backtrace             Print the current address and stack backtrace
where                 Print the current address and stack backtrace

info program          Print current status of the program)
info functions        Print functions in program
info stack            Print backtrace of the stack)
info frame            Print information about the current stack frame
info registers        Print registers and their contents
info breakpoints      Print status of user-settable breakpoints

display /FMT EXPR     Print expression EXPR using format FMT
                      every time GDB stops
undisplay             Turn off display mode
help                  Get information about gdb

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