

debugging/gdb/example_remote_debugging

GDB (The GNU Project Debugger)

Example: GDB - Remote debugging

On the target system

- Source code `division_by_zero.c++`:

```
#include <iostream>

int main(int argc, char *argv[]) {
    int a=1, b=0;
    std::cout << a/b << std::endl;
}
```

- Set up compiler environment

```
module add compiler/gnu
```

- Compile (add debug symbols)

```
c++ -ggdb -Wall division_by_zero.c++ -o division_by_zero
```

- Execute with GDB server (e.g. in batch job)

```
gdbserver *:8080 ./division_by_zero
```

```
Process ./division_by_zero created; pid = 94989
```

```
Listening on port 8080
```

On the login node

- Connect GDB with GDB server (e.g. from batch job)

```
gdb
```

```
(gdb) tui enable
```

```
(gdb) target remote ${NODE_NAME}:8080
```

```
Remote debugging using hkn0707:8080
```

```
Reading .../division_by_zero from remote target...
```

```

warning: File transfers from remote targets can be slow. Use "set sysroot" to access fi
Reading ../division_by_zero from remote target...
Reading symbols from target:../division_by_zero...done.
Reading /lib64/ld-linux-x86-64.so.2 from remote target...
Reading /lib64/ld-linux-x86-64.so.2 from remote target...
Reading symbols from target:/lib64/ld-linux-x86-64.so.2...Reading /lib64/ld-2.28.so.deb
Reading /lib64/.debug/ld-2.28.so.debug from remote target...
Missing separate debuginfo for target:/lib64/ld-linux-x86-64.so.2
Try: yum --enablerepo='*debug*' install /usr/lib/debug/.build-id/33/d30c20d175357a34970
(no debugging symbols found)...done.
0x0000155555327fa0 in _start () from target:/lib64/ld-linux-x86-64.so.2

(gdb) continue

Continuing.
Reading /opt/gcc/10/lib64/libstdc++.so.6 from remote target...
Reading /lib64/libm.so.6 from remote target...
Reading /opt/gcc/10/lib64/libgcc_s.so.1 from remote target...
Reading /lib64/libc.so.6 from remote target...
Reading /lib64/libm-2.28.so.debug from remote target...
Reading /lib64/.debug/libm-2.28.so.debug from remote target...
Missing separate debuginfo for target:/lib64/libm.so.6
Try: yum --enablerepo='*debug*' install /usr/lib/debug/.build-id/1d/b59e84916b99d6fd454
Reading /lib64/libc-2.28.so.debug from remote target...
Reading /lib64/.debug/libc-2.28.so.debug from remote target...
Missing separate debuginfo for target:/lib64/libc.so.6
Try: yum --enablerepo='*debug*' install /usr/lib/debug/.build-id/a9/1d7b51b23a64e86b82a

Program received signal SIGFPE, Arithmetic exception.
0x00000000004007a3 in main (argc=1, argv=0x7fffffffb2e8) at division_by_zero.c++:5
5          std::cout << a/b << std::endl;

```

Alternative: Graphical debugger on the client system

- Tunnel local TCP port to TCP port on compute node

```
ssh -L8080:${NODE_NAME}:8080 hk.scc.kit.edu
```
- Setup access to remote filesystem (for source code access)

```
mkdir                remote
sshfs hk.scc.kit.edu: remote
cd                   remote
```
- Or copy source code to local filesystem

```
scp hk.scc.kit.edu:division_by_zero.c++ .
```
- gdbgui - A browser-based frontend to gdb (gnu debugger)

- gdbgui releases
- Start graphical debugger `gdbgui`
- gdbgui configuration: Drop down menu: Connect to gdbserver: local-host:8080