Return-to-libc Lab

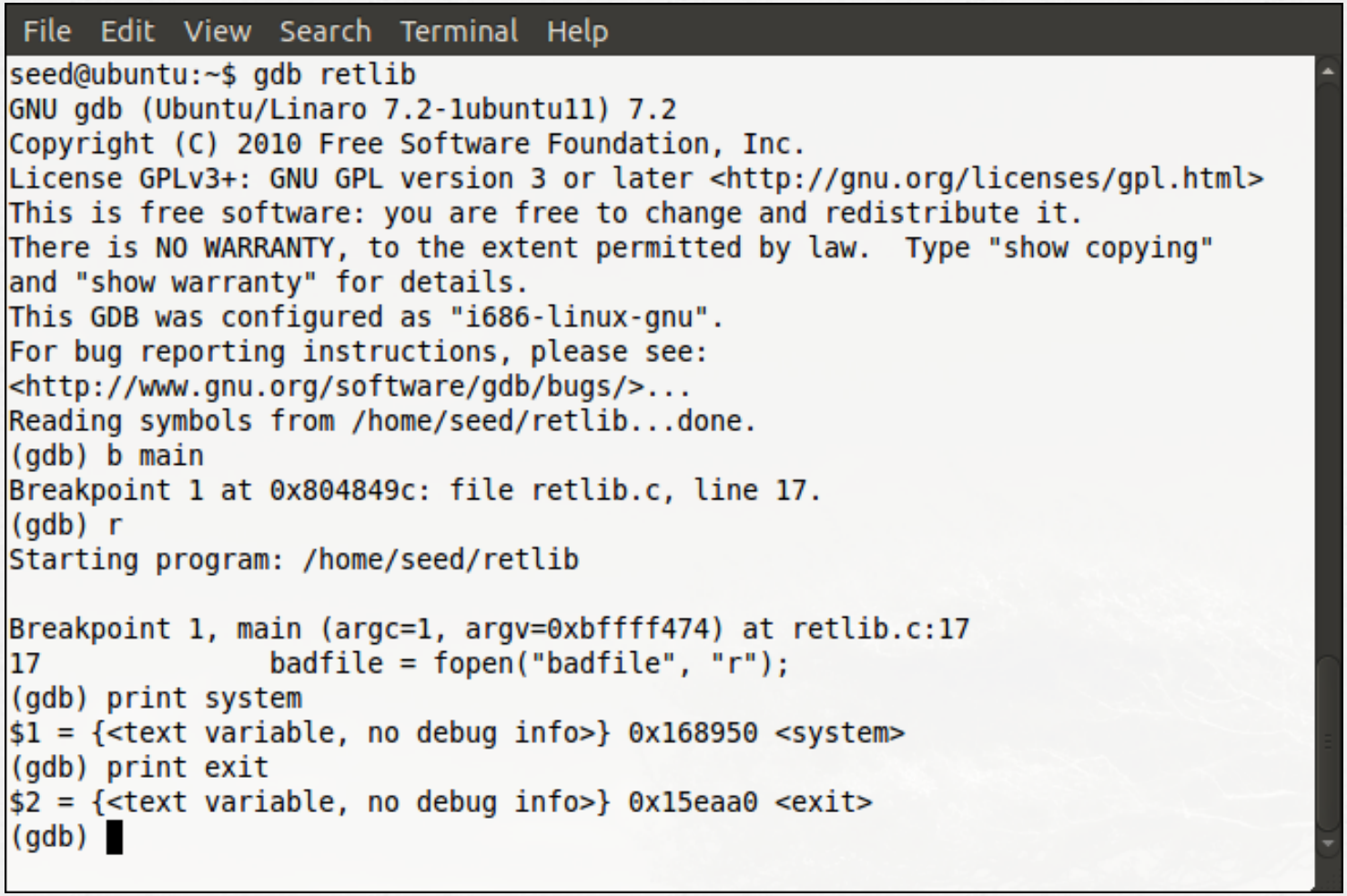
Computer Security

Basic approach

- Use exploit.c and exploit1.c to exploit a return-to-libc vulnerability in the application
- Observations from buffer-overflow-lab:
  - gcc looks like it adds two 32-bit fields just before the variable declarations begin
  - Buffer is 24 bytes away instead of 16 bytes away

gdb for libc function addresses

- Use gdb to get addresses of libc functions
  - Libc function addresses are the same for all programs


File Edit View Search Terminal Help
seed@ubuntu:~$ gdb retlib
GNU gdb (Ubuntu/Linaro 7.2-1ubuntu11) 7.2
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This is free software: you are free to change and redistribute it.
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and "show warranty" for details.
This GDB was configured as "i686-linux-gnu".
For bug reporting instructions, please see:
<http://www.gnu.org/software/gdb/bugs/>...
Reading symbols from /home/seed/retlib...done.
(gdb) b main
Breakpoint 1 at 0x804849c: file retlib.c, line 17.
(gdb) r
Starting program: /home/seed/retlib
Breakpoint 1, main (argc=1, argv=0xbffff474) at retlib.c:17
17 badfile = fopen("badfile", "r");
(gdb) print system
$1 = {<text variable, no debug info>} 0x168950 <system>
(gdb) print exit
$2 = {<text variable, no debug info>} 0x15eaa0 <exit>
(gdb)

Tasks

- Task 1
  - Store the string “/bin/sh” in memory and get it’s address
  - VERIFY that it exists at this address. You can use the following code:

Code to get the address of /bin/sh

```
#include <stdlib.h>

void main() {
 char *shell = getenv("MYSHELL");
 if (shell) {
   printf("%x\n", (unsigned int)shell);
 }
 else
   printf("Environment variable not
      set\n");
}
```

Code to verify the address of /bin/sh

```
#include <stdlib.h>

void main() {
  // Address of MYSHELL from
  // previous program
  char *shell = 0xaddress;
  printf("%s\n", shell);
}
```

Tasks

- Task 1
  - Store the string “/bin/sh” in memory and get it’s address
  - VERIFY that it exists at this address. You can use the following code:
  - “/bin/sh” may exist at an offset that’s slightly above what you get from the sample code given in the lab description
  - Recall the stack layout and where return addresses lie. Also figure out where the parameter addresses need to go.

Tasks

- Task 2
  - Find address of setuid() and use this address for the previous attack.
- Task 3
  - Disable address randomization and repeat