CS241 #33 – Files #4

**Review:**

**> File permissions and directories**

For a directory what does the execute bit imply?

**> What am I describing and where is this useful?**

"Even though directory has rwx only the owner can rename or delete a subdirectory."

*I logged in therefore I am* , Descartes 1637

My process has a uid and euid.

If I run it under sudo which one has changed?

If I set the setuid bit which one has changed?

int main() { // who am i?

struct passwd \*pw;

pw = getpwuid(getuid());

printf("getuid: %d, Hello %s,\n",

getuid(), pw->pw\_name);

pw = getpwuid(geteuid());

printf("geteuid(): %d, You are effectively %s,\n",

geteuid(), pw->pw\_name);

printf("Opening file %s...\n", filename);

FILE\* f = fopen(filename,"r");

if( ! f ) quit("fopen failed");

if( stat(filename, &s) !=0 ) quit("stat failed");

size\_t size = s.st\_size;

char\* buffer = malloc(size);

size\_t bytesread = fread(buffer, 1, size, f);

fclose(f);

fwrite(buffer, 1, bytesread, stdout);

free(buffer);

}

An example bash script

#!/usr/bin/env bash

OTHERUSER=$1

if [[ "$OTHERUSER" == "" ]]; then

echo 'Specify username e.g. sshd '

exit 1

fi

sudo chown "$OTHERUSER" secret.txt

sudo chmod 400 secret.txt

sudo rm a.out 2>/dev/null

gcc hal.c -o myprogram

sudo chown "$OTHERUSER" myprogram

ls -al

How do I create directories and symlinks in code?

Which of the following will fail to create a directory or symbolic link?

1. int main() {
2. mkdir("dir1", 0700);
3. mkdir("dir1/subdir", 0700);
4. mkdir("dir2", 0600);
5. mkdir("dir2/subdir", 0700);
6. mkdir("dir3", 0500);
7. mkdir("dir3/subdir", 0700);
8. symlink("dir1/subdir","quick1");
9. symlink("dir2/subdir","quick2");
10. symlink("dir3/subdir","quick3");
11. return 0;
12. }

**> How do I mount and unmount a filesystem?**

How is /etc/fstab used ?

**> What is a loop back filesystem?**

**> What does a process contain? (Version 2)**

virtual memory

threads, pid, ppid

open file descriptors (files,pipes,sockets)

uid, euid

pwd

meta information (Total CPU time. Running status)

constraints (ulimits)

thread & process priority

umask

**> What is RAID? Why is it necessary?**

Making filesystems resilient:

RAID

"Redundant Array of Inexpensive Disks"

**> Copying byte streams with dd**

dd if=/dev/urandom of=~/secret.txt bs=1k count=1024

dd if=/dev/zero of=~/secret.txt bs=1k count=1024

dd if=/dev/zero of=/dev/null bs=1m count=1024

**> Examples of virtual files in /proc:**

cat /proc/sys/kernel/random/entropy\_avail

hexdump /dev/random

hexdump /dev/urandom

**> File Globbing**

What is it?

How do you prevent it?

Who does it?

**> The impossible filesystem! Fun things to do with /proc  
(why does it exist?)**

cat /proc/meminfo

cat /proc/cpuinfo

cat /proc/cpuinfo | grep bogomips

cat /proc/meminfo | grep Swap

cd /proc/self

cat maps