Lecture 7

CprE 308

January 26, 2015

Intro

Today's Topics

- File System Interface

File System Interface

The File Abstraction

- A UNIX file is a simple array of bytes
- Files are made larger by writing beyond their current end
- Files are grouped into directories

Directories

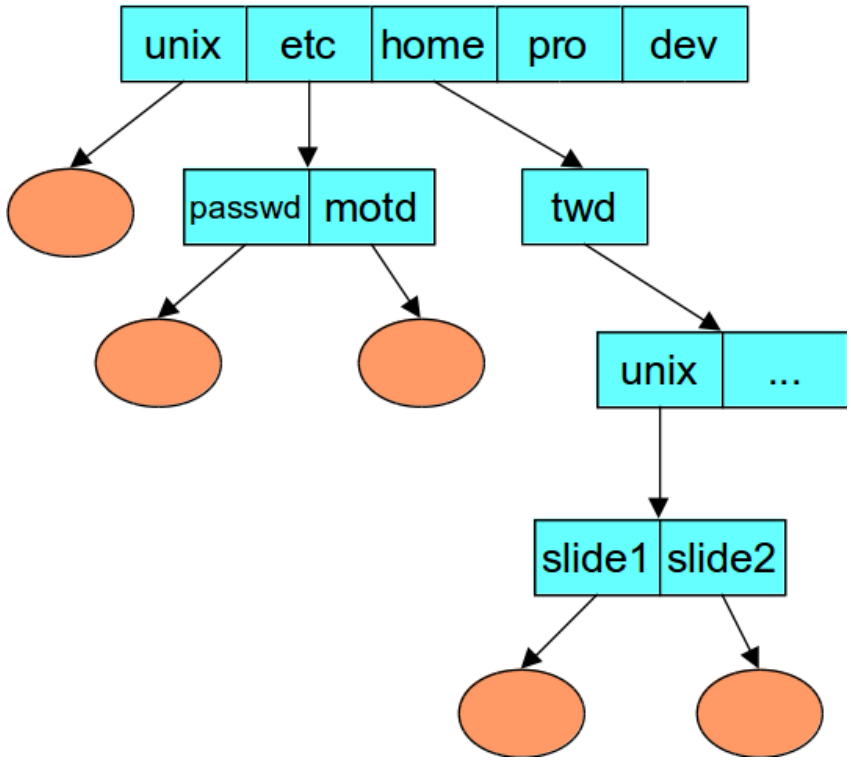

Figure 1:

Directory Representation

Component Name	Inode Number

directory entry

.	1
..	1
unix	117
etc	4
home	18
pro	36
dev	93

Figure 2:

Interface to the Programmer

1. Open a file (read, write, read-write) modes
   ```
   fd = open("file",O_RDONLY);
   ```
2. Read/Write the file
   ```
   size = read(fd,buffer,n)
   size = write(fd,buffer,n);
   ```
3. Close the file
   ```
   close(fd);
   ```

File Access Permissions

Who's allowed to do what?

- Who?
  - user (owner)
  - group
  - others (rest of the world)
- What?
  - read
  - write
  - execute

Permissions Example

```
% ls -lR
.:
total 2
drwxr-x--x  2 snt    adm    1024 Dec 17 13:34 A
drwxr-----  2 snt    adm    1024 Dec 17 13:34 B

./A:
total 1
-rw-rw-rw-  1 snt    adm     593 Dec 17 13:34 x

./B:
total 2
-r--rw-rw-  1 snt    adm     446 Dec 17 13:34 x
-rw----rw-  1 trina  adm     446 Dec 17 13:45 y
```

Seetting File Permission

```
#include <sys/types.h>
#include <sys/stat.h>
int chmod(const char *path, mode_t mode)
```

- sets the file permissions of the given file to those specified in *mode*
- only the owner of a file and the superuser may change its permissions
- nine combinable positions for *mode* (*read*/*write*/*execute* for *user*/*group*, and *others*)
  - S_IRUSR (0400), S_IWUSR (0200), S_IXUSR (0100)
  - S_IRGRP (040), S_IWGRP (020), S_IXGRP (010)
  - S_IROTH (04), S_IWOTH (02), S_IXOTH (01)