

## Chapter 2 Review

Data for the operating system is stored on the harddrive

The harddrive can be divided up into partitions

One important partition is the swap space, which can function as virtual memory for data that is less frequently used by running programs

Other important partitions that can be commonly made would be the boot sector an area for the home directory or an area for logs. Not all of these are always separated into partitions, but they are popular choices.

When a harddrive is formatted it needs a filesystem. There are many filesystem formats out there. In the Linux/Unix world, ufs and ext4 are popular choices, FAT32 and NTFS are common choices for Windows

The Unix file system is organized as a tree structure. It starts with a root directory denoted by /. At the next level are:

- bin - place where essential binary files are stored such as the cat and echo commands
- boot - stores kernel images and the GRUB bootloader
- dev - stores a file representation of all hardware devices on the system
- etc - stores system wide configuration files
- home - stores user files and configurations
- lib - stores shared libraries used by many programs commonly
- media - place where usb sticks and other external media mount, overlapping purpose with mnt
- mnt - a place where you can mount other devices and temporary file systems, overlaps with media
- opt - place for optional installation, often proprietary software
- proc - stores special files that represent information on running processes to help the os manage
- root - the place where the root user's files are stored
- sbin - essential binaries for the root user
- tmp - a place to store temporary files for programs
- run - another temporary area to store temporary files such as sockets, more permanent than tmp
- usr - stores applications for users that are not system critical, read-only
- srv - place to put publicly shared resources for a server
- var - place where files that vary in size go, such as system logs, writable

Directories are files in Unix

There are two special files in every directory. . Stands for the current directory and .. stands for the parent or outer directory.

To create a user you can use the useradd command

To change a user's password you can use the passwd command

To create a directory you can use the mkdir command

To remove a directory you can use the rm command

To move or rename a directory you can use the mv command.

To create a file you can use the touch command

To edit the permissions of a file you should use the chmod command with flag u, g, o, r, w, x, s, t

Permissions can be added or taken away using a + or -

Permissions can be administered at the user, group, or everyone level

Privileges on a file can be read, write, or execute in any combination

There is also a sticky bit +t which will prevent other users besides the owner from renaming or deleting a file even if they have write and execute privileges on the file.

There is also the setuid and setgid bits denoted by u+s and g+s.. The setuid bit lets files who are not the owner run the file as the owner. The setgid bit on a file lets other users run the file as if the group is running it even if they are not a part of that group. The setgid it on a directory makes it so that any new files created within that directory are owned by the same group as the group of the directory itself

To change the owner of a file, you can use the chown command

To add an existing user to an existing group you can use the groupadd command with flags -a and -G

To make sure a newly created user gets a home directoyr, use the -m flag when creating the user

An inode is a data structure on the file system that contains metadata about a file or directory such as the last modified date, the owner, and the permissions.