

Computer Science CSCI 251

Systems and Networks

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cfdisk /dev/sda

Disk: /dev/sda
Size: 465.78 GiB, 500107862016 bytes, 976773168 sectors
Label: dos, identifier: 0x9a271d12

Device	Boot	Start	End	Sectors	Size	Id	Type
/dev/sda1	*	2048	1050623	1048576	512M	b	W95 FAT32
/dev/sda2		1052670	976771071	975718402	465.3G	5	Extended
>> ↙/dev/sda5		1052672	976771071	975718400	465.3G	83	Linux
Free space		976771072	976773167	2096	1M		

Partition type: Linux (83)
Filesystem UUID: eb8d39fa-c68d-472f-8ad7-f39981070e35
Filesystem: ext4
Mountpoint: / (mounted)

cfdisk /dev/sda cont.

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Partition type: W95 FAT32 (b)
Attributes: 80
Filesystem UUID: A056-918F
Filesystem: vfat
Mountpoint: /boot/efi (mounted)

Universally Unique Identifier (UUID)

○ Usage

- labelling partitions and file system
- identify network devices and connections
- identify virtual machines
- can be generated using `uuidgen` (128 bit)

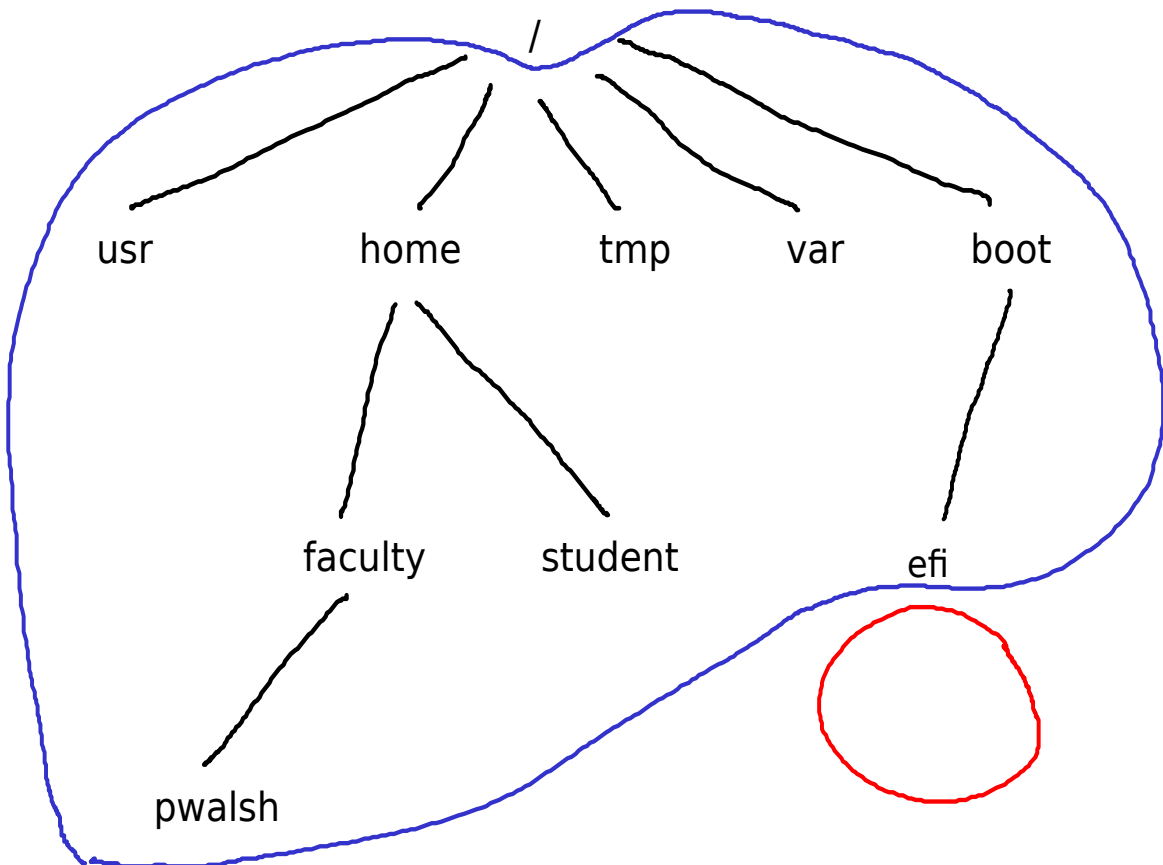
○ Partition Labelling

- better alternative to `/dev/sda1` etc.
(less prospect for ambiguity when mounting a file systems)
- `ls -l /dev/disk/by-uuid`

A056-918F -> `.././sda1`

eb8d39fa-c68d-472f-8ad7-f39981070e35 -> `.././sda5`

File System Structure



How Many Partitions? (Best Practice)

- Root
- Home
 - it is advantageous to separate your user files from the operating system files
 - a separate home partition is not required
- Swap

since 2018, a separate swap partition has been superseded by a swap file within the root partition.

Mounting

- Dynamic
 - hot-plugging
- Interactive
 - using `mount` and `umount`
- Statically
 - at boot
 - `/etc/fstab` (boot configuration table)

Fstab Table

```
[Device] [Mount Point] [File System Type]  
[Options] [Dump] [Pass]
```

```
#added by peter to /dev/fstab on cobra  
UUID=25f24ccb-557c-441c-b6a6-e57df55f2be8  
/home/peter/Usb ext3 defaults 0 0
```

○ Options

- defaults equivalent to
`rw,suid,dev,exec,auto,nouser,async`

Unix/Linux Directory Hierarchy

Why does the Unix/Linux file system have directories `/bin`, `/sbin`, `/usr/bin/` and `/usr/sbin/`?

- Unix PDP7 - 1 Disk
 - executables in `/bin`
- Unix PDP11 - 2 Disks
 - disk 1 for OS, disk 2 for `/usr`
 - later, OS spilled over into disk 2 in `/usr/bin`
- Unix PDP11 - 3 Disks
 - move `/usr` from disk 2 to disk 3 as `/home`
- Modern Hierarchy
 - `man hier`

Unix/Linux Directory Hierarchy cont.

HIER(7)

Linux Programmer's Manual

HIER(7)

NAME

hier - description of the filesystem hierarchy

DESCRIPTION

A typical Linux system has, among others, the following directories:

/ This is the root directory. This is where the whole tree starts.

/bin This directory contains executable programs which are needed in single user mode and to bring the system up or repair it.

/boot Contains static files for the boot loader. This directory holds only the files which are needed during the boot process. The map installer and configuration files should go to /sbin and /etc. The operating system kernel (initrd for example) must be located in either / or /boot.

/dev Special or device files, which refer to physical devices. See `mknod(1)`.

File Searching

○ find

- search for a file by name or other attributes
- e.g., `find . -name *.pl`
recursively search for files with the ".pl"
extension starting from the pwd

○ grep

- search for a file by contents
- e.g., `grep -R "Perl" .`
recursively search for files containing
the string "Perl" starting from the pwd