

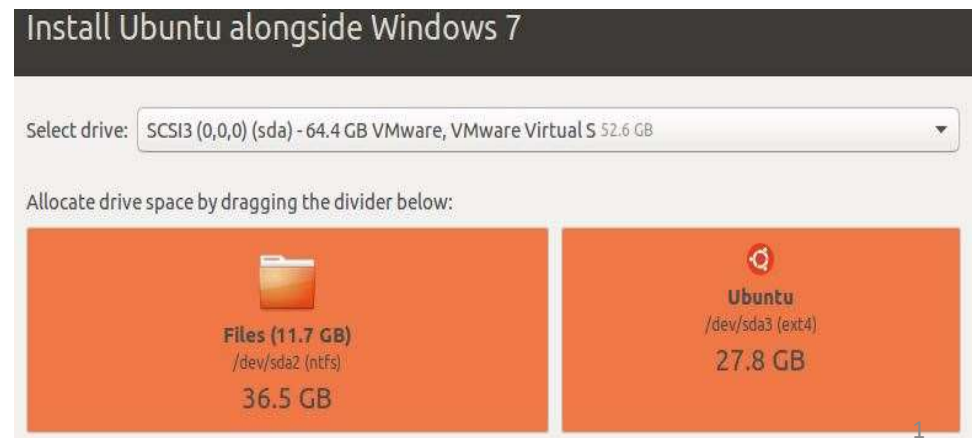
Technical Comparisons – *File System*

Microsoft Windows

- FAT16 (used in DOS and Windows 3.x)
- FAT32 (used in Win95, Win98)
- ExFAT
- **NTFS** (used in XP until present)
- ReFS (optional use in Server 2012, Server 2016)

Linux Distros

- Ext2
- Ext3
- **Ext4**



Some of the many reasons why more admins are beginning to implement Linux into their infrastructures for File Servers and Web Servers.

Windows NTFS has a practical maximum partition limit of 2TB (*ACL is limited if higher*). But, unlike Windows, Linux Ext4 has a fully applicable maximum partition size 16TB.

For Windows NTFS, this is also the maximum path length. But, unlike Windows, Linux Ext4 has a maximum path length of 4096.

FEATURE	FAT32	NTFS
Max. Partition Size	2TB	2TB
Max. File Name	8.3 Characters	255 Characters
Max. File Size	4GB	16TB
File/Folder Encryption	No	Yes
Fault Tolerance	No	Auto Repair
Security	Only Network	Local and Network
Compression	No	Yes
Conversion	Possible	Not Allowed
Compatibility	Win 95/98/2K/2K3/XP	Win NT/2K/XP/Vista/7

THE LINUX FILE SYSTEM

★ THE LINUX FILE SYSTEM HAS A TREE LIKE STRUCTURE.

THE TREE LIKE STRUCTURE IS ALSO REFERRED TO AS THE DIRECTORY TREE

WINDOWS USERS USUALLY USE THE WORD FOLDER , HOWEVER, IN LINUX TERMINOLOGY, FOLDERS ARE REFERRED TO AS DIRECTORIES



SO WHAT WINDOWS USERS REFER TO AS A FOLDER
LINUX USERS REFER TO AS A DIRECTORY
(THEY ARE THE SAME THING)

THE DIRECTORY TREE



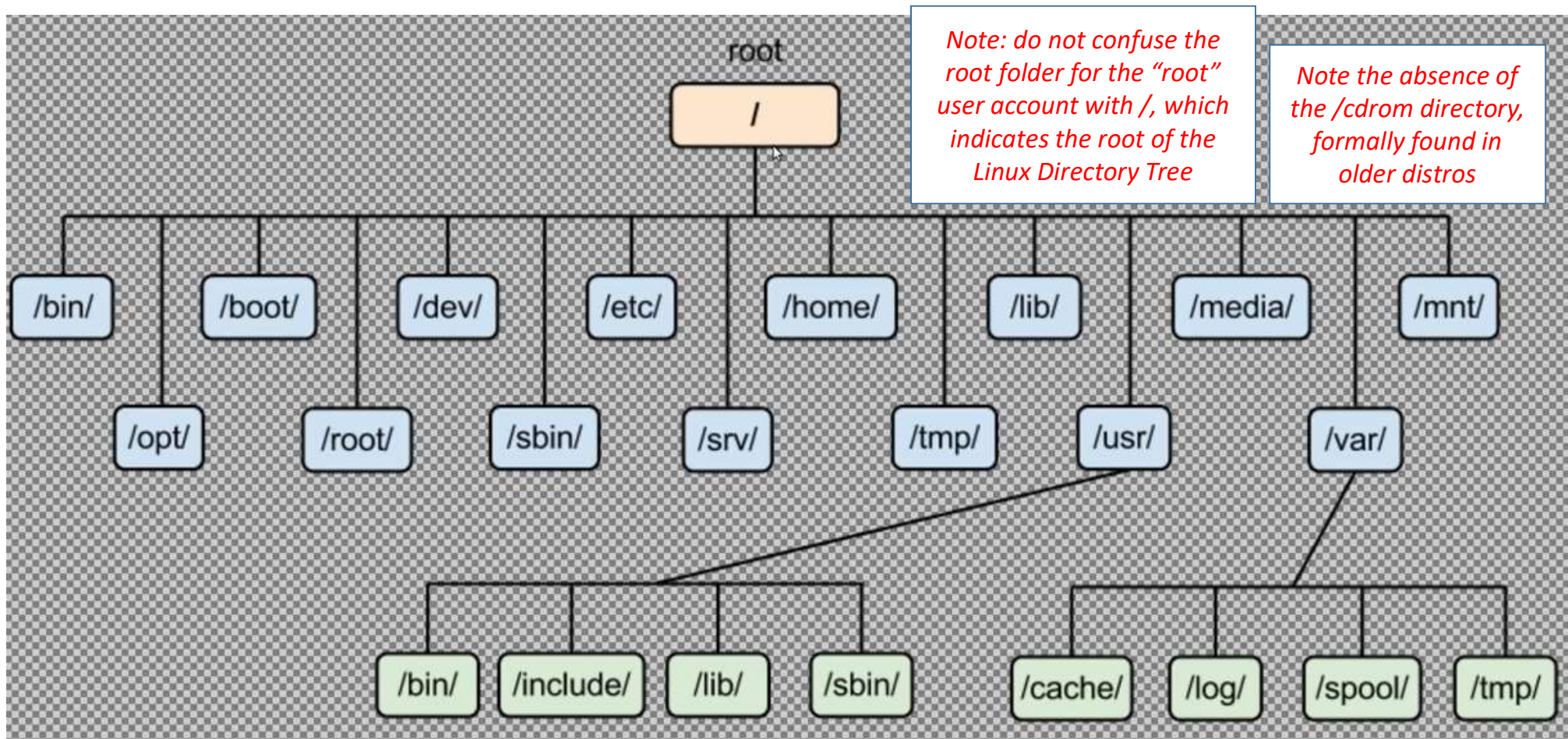
PRETTY MUCH LIKE A FAMILY TREE, IN LINUX FILE SYSTEM , EACH DIRECTORY (OR FILE) HAS A PARENT. HOWEVER, THE ONLY EXCEPTION IS IS THE ROOT DIRECTORY.THE ROOT DIRECTORY HAS NO PARENTS AND IS REPRESENTED BY A FORWARD SLASH /

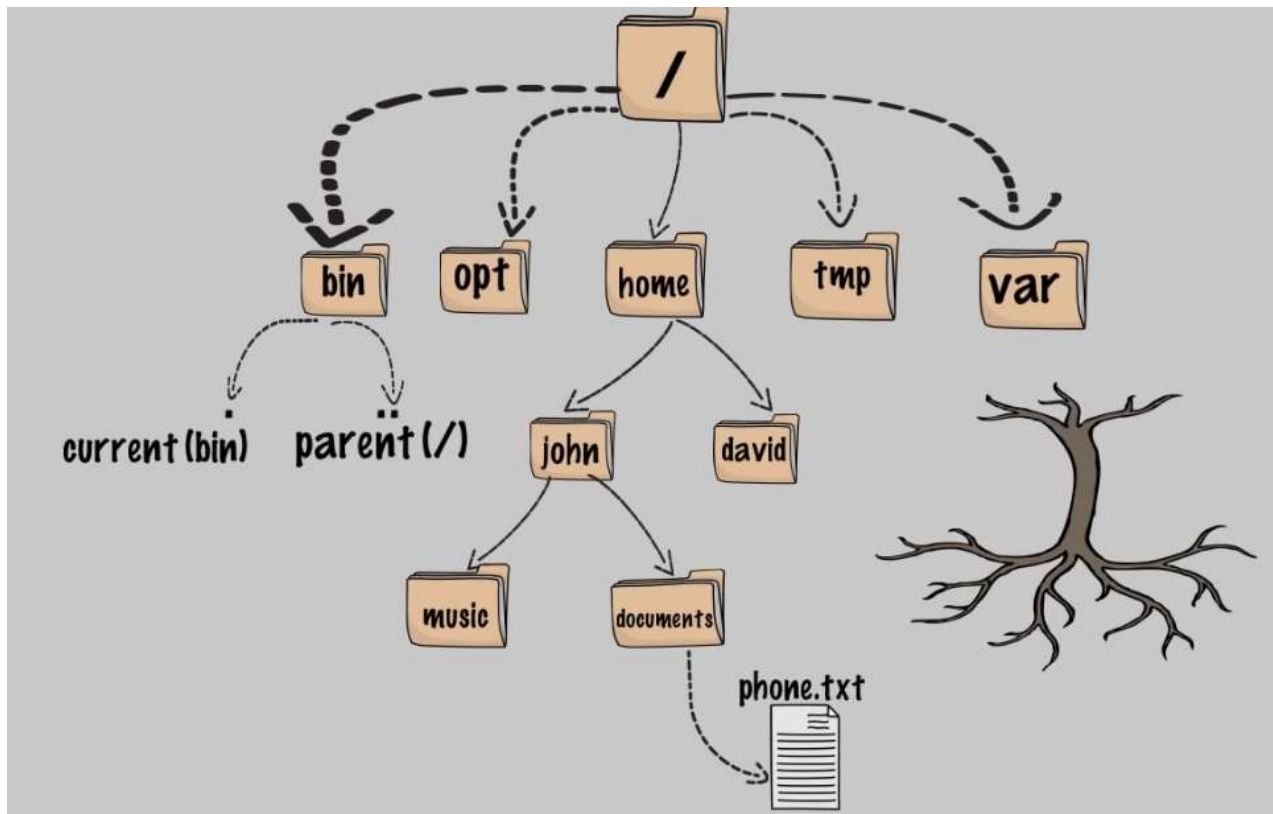
THE ROOT DIRECTORY IS THE FIRST DIRECTORY (TOP MOST) IN OUR DIRECTORY TREE. THE ROOT DIRECTORY CONTAINS FILES AND SUBDIRECTORIES, WHICH CONTAIN MORE FILES AND SUBDIRECTORIES AND SO ON.

**See Lesson Handout “04-Linux Directory Descriptions,
incl File Locations.docx” for more comprehensive
descriptions listings.**

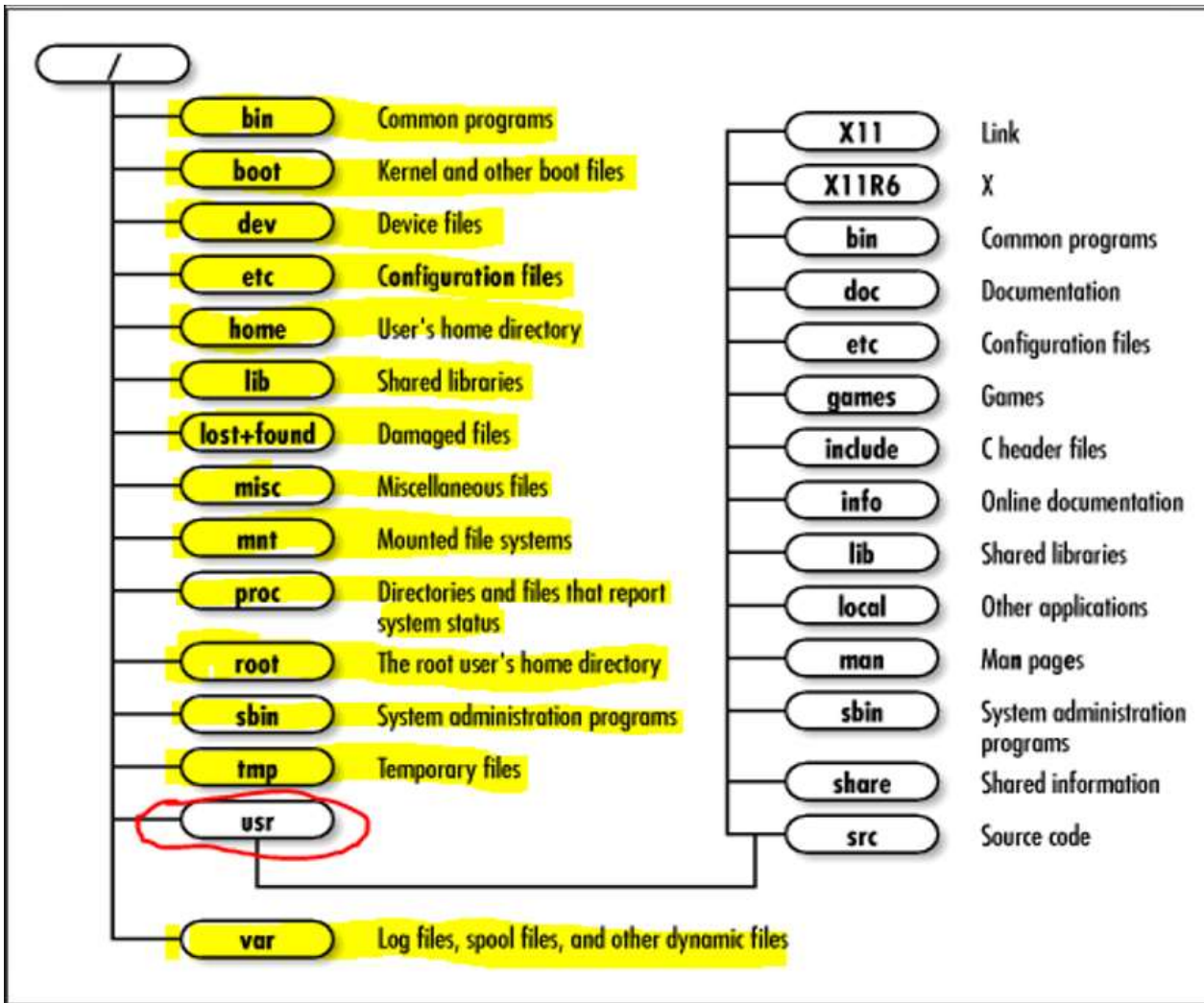
**This document will, in detail, describe the Directories
in the tree, and will also give information as to the
location and description of very important Linux
system files.**

The Linux Directory Tree - graphical breakdown





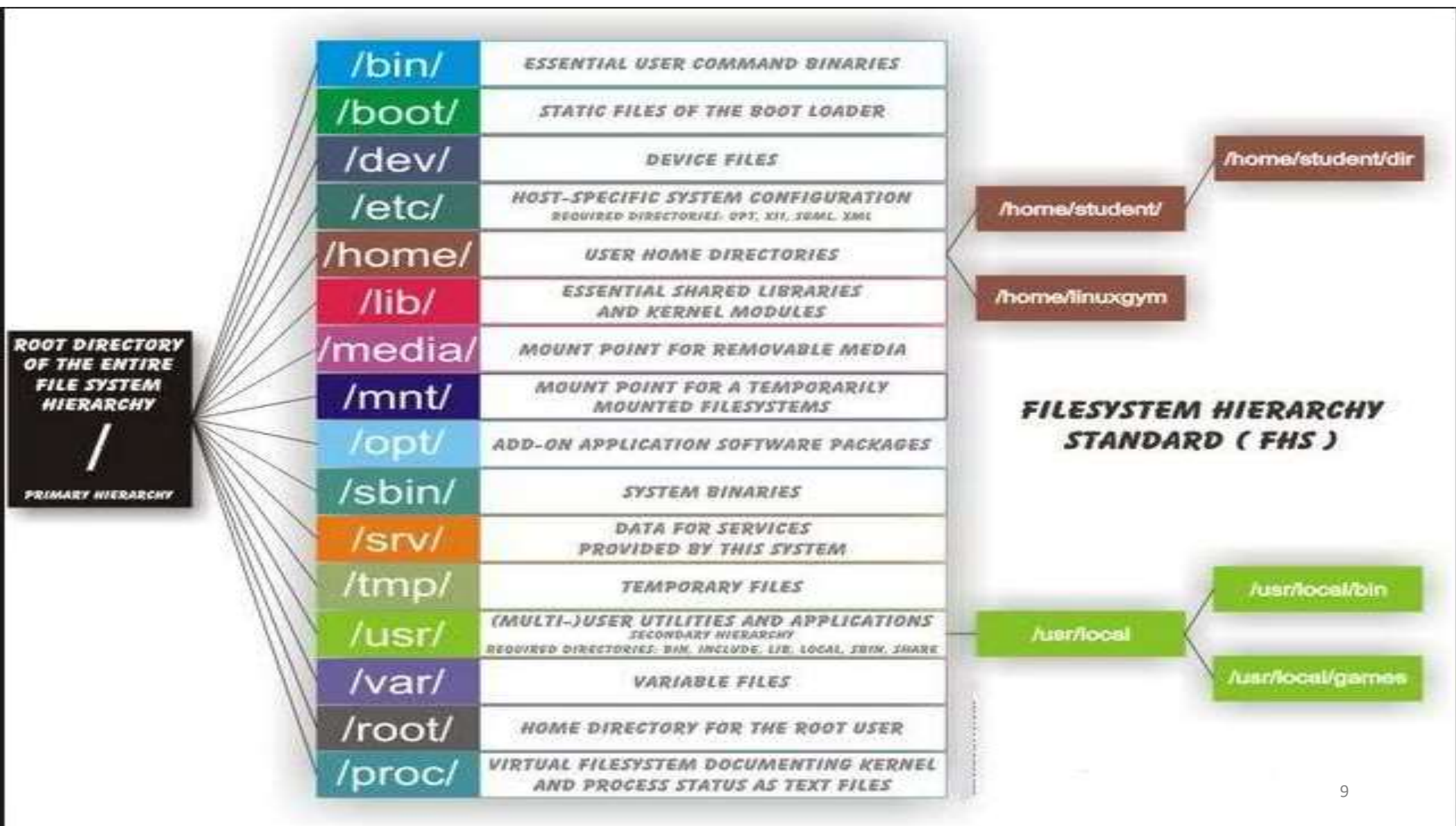
The Linux Directory Tree – directory descriptions



Note: Unlike Windows, Linux does NOT use drive letters to designate mounted volumes. Disks are in `/dev` and mounted filesystems are in `/mnt`

Note the absence of the `/cdrom` directory found in older distros

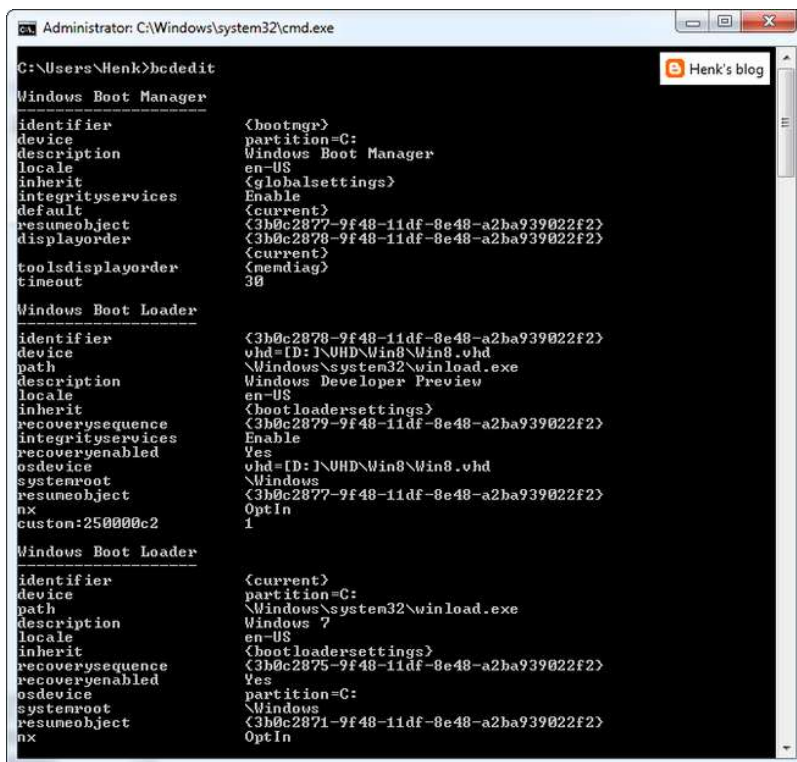
Note: The `usr` directory contains the Multi-User Utilities and Applications



Technical Comparisons - *Bootloader Configurations*

Microsoft NTDLR editor

- Bcdedit



```
Administrator: C:\Windows\system32\cmd.exe
C:\Users\Henk>bcdedit

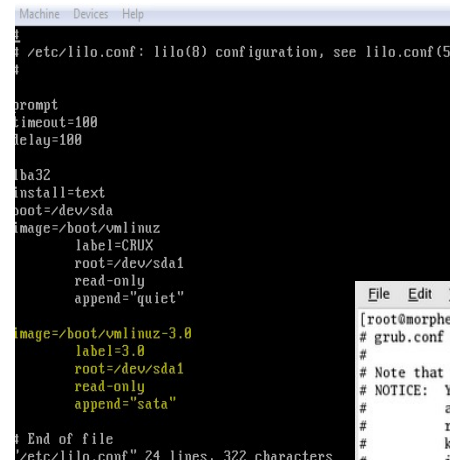
Windows Boot Manager
-----
identifier             <bootmgr>
device                 partition=C:
description            Windows Boot Manager
locale                 en-US
inherit                <globalsettings>
integrityservices      Enable
default               <current>
resumeobject           <3b0c2877-9f48-11df-8e48-a2ba939022f2>
displayorder          <3b0c2878-9f48-11df-8e48-a2ba939022f2>
toolsdisplayorder     <current>
timeout               30

Windows Boot Loader
-----
identifier             <3b0c2878-9f48-11df-8e48-a2ba939022f2>
device                 vhd=[D:]\UHD\Win8\Win8.vhd
path                  \Windows\system32\winload.exe
description            Windows Developer Preview
locale                 en-US
inherit                <bootloadersettings>
recoverysequence      <3b0c2879-9f48-11df-8e48-a2ba939022f2>
integrityservices      Enable
recoveryenabled        Yes
osdevice              vhd=[D:]\UHD\Win8\Win8.vhd
systemroot             \Windows
resumeobject           <3b0c2877-9f48-11df-8e48-a2ba939022f2>
nx                     OptIn
custon:250000c2        1

Windows Boot Loader
-----
identifier             <current>
device                 partition=C:
path                  \Windows\system32\winload.exe
description            Windows ?
locale                 en-US
inherit                <bootloadersettings>
recoverysequence      <3b0c2875-9f48-11df-8e48-a2ba939022f2>
recoveryenabled        Yes
osdevice              partition=C:
systemroot             \Windows
resumeobject           <3b0c2871-9f48-11df-8e48-a2ba939022f2>
nx                     OptIn
```

Linux configuration files

- /etc/lilo.conf
- /boot/grub/grub.conf

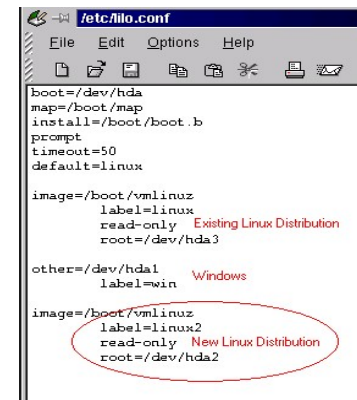


```
Machine: Devices: Help
#
# /etc/lilo.conf: lilo(8) configuration, see lilo.conf(5)
#
prompt
timeout=100
delay=100

ba32
install=text
boot=/dev/sda
image=/boot/vmlinuz
label=CRUX
root=/dev/sda1
read-only
append="quiet"

image=/boot/vmlinuz-3.8
label=3.8
root=/dev/sda1
read-only
append="sata"

# End of file
/etc/lilo.conf" 24 lines, 322 characters
```

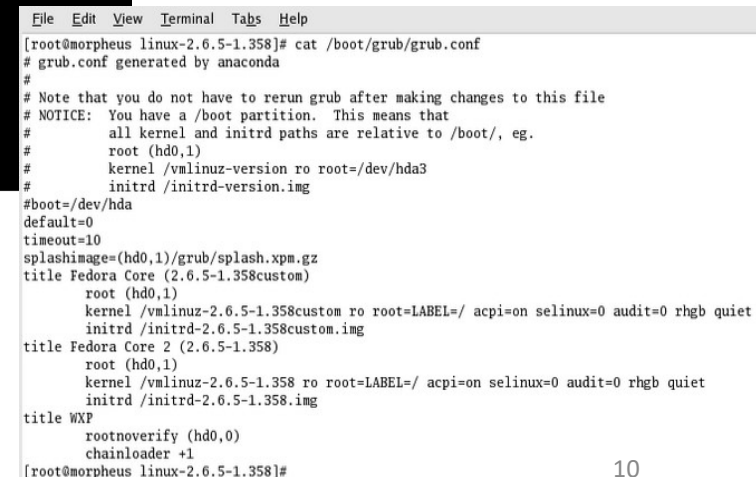


```
/etc/lilo.conf
File Edit Options Help
boot=/dev/hda
map=/boot/map
install=/boot/boot.b
prompt
timeout=50
default=linux

image=/boot/vmlinuz
label=linux
read-only Existing Linux Distribution
root=/dev/hda3

other=/dev/hda1
label=win Windows

image=/boot/vmlinuz
label=linux2
read-only New Linux Distribution
root=/dev/hda2
```



```
File Edit View Terminal Tabs Help
[root@morpheus linux-2.6.5-1.358]# cat /boot/grub/grub.conf
# grub.conf generated by anaconda
#
# Note that you do not have to rerun grub after making changes to this file
# NOTICE: You have a /boot partition. This means that
# all kernel and initrd paths are relative to /boot/, eg.
# root (hd0,1)
# kernel /vmlinuz-version ro root=/dev/hda3
# initrd /initrd-version.img
#boot=/dev/hda
default=0
timeout=10
splashimage=(hd0,1)/grub/splash.xpm.gz
title Fedora Core (2.6.5-1.358custom)
root (hd0,1)
kernel /vmlinuz-2.6.5-1.358custom ro root=LABEL=/ acpi=on selinux=0 audit=0 rhgb quiet
initrd /initrd-2.6.5-1.358custom.img
title Fedora Core 2 (2.6.5-1.358)
root (hd0,1)
kernel /vmlinuz-2.6.5-1.358 ro root=LABEL=/ acpi=on selinux=0 audit=0 rhgb quiet
initrd /initrd-2.6.5-1.358.img
title WXP
rootnoverify (hd0,0)
chainloader +1
[root@morpheus linux-2.6.5-1.358]#
```