

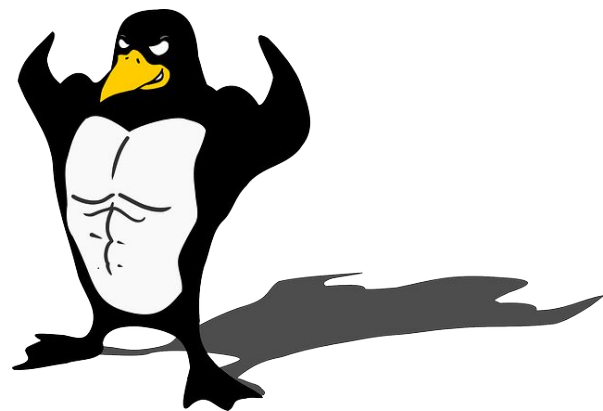
Basics of Linux



- Unix Team

Topics to be discussed in today's session

- Introduction
- History of Unix
- User Management
- Directory Hierarchy
- Basic commands
- File System Permissions
- Standard Unix Streams
- Monitoring
 - Memory
 - CPU
 - Network
 - Disk
- Remote sessions
- Need Help !
- FAQ
- Q&A



Introduction



- Open Source
- Multiuser
- Hierarchical File System
- Shell
- Security

History of Unix



1969	AT&T Bell Labs UNICS system -designed by Ken Thompson & Dennis Ritchie
1970	UNICS finally became UNIX
1973	UNIX rewritten in C, making it portable to different hardware
Mid 1970s	University of California at Berkeley (BSD) contributed many important features like vi, C shell etc.
1982	AT & T came back and started commercial production- Editions ->Systems
Late 1980s	AT & T released SVR4 unification of SV3.2,BSD,SunOs & XENIX
1991	Linux from Linus Torvalds
1990s	POSIX Standard, MIT introduced X-Windows

BIOS	Basic Input/Output System executes MBR
MBR	Master Boot Record executes GRUB
GRUB	Grand Unified Bootloader executes Kernel thegeekstuff.com
Kernel	Kernel executes /sbin/init
Init	Init executes runlevel programs
Runlevel	Runlevel programs are executed from /etc/rc.d/rc*.d/



User & Group Management

User : Users are the login account through which we can access the resources and features of an operating system.

Group : Groups are the place where user accounts are placed for security and policy implementation.

Important file locations:

/etc/passwd : users details file

/etc/shadow : users encrypted password file

/etc/group : groups details file

root : x : 0 : 0 : root : /root : /bin/bash

root : user name

x : link to shadow file

0 : user ID

0 : Group (primary) ID

root : comment of user

/root : home directory of user

/bin/bash : user shell

Contd..



groupadd <group name>

To create new group

useradd <user name>

To create new user

passwd <user name>

To create or change user password

useradd -g <primary group> -G <sec group1> <sec group2> <username>

To create a user with specific primary group and secondary group.

[-g : Primary group, -G : Secondary group]

usermod -g <groupname> <existing name>

To modify primary group name

usermod -G <groupname1>,<groupname2> <existing user name>

To change or modify secondary group

Contd..



useradd -d “directory name with location” <user name>

To give a new home directory

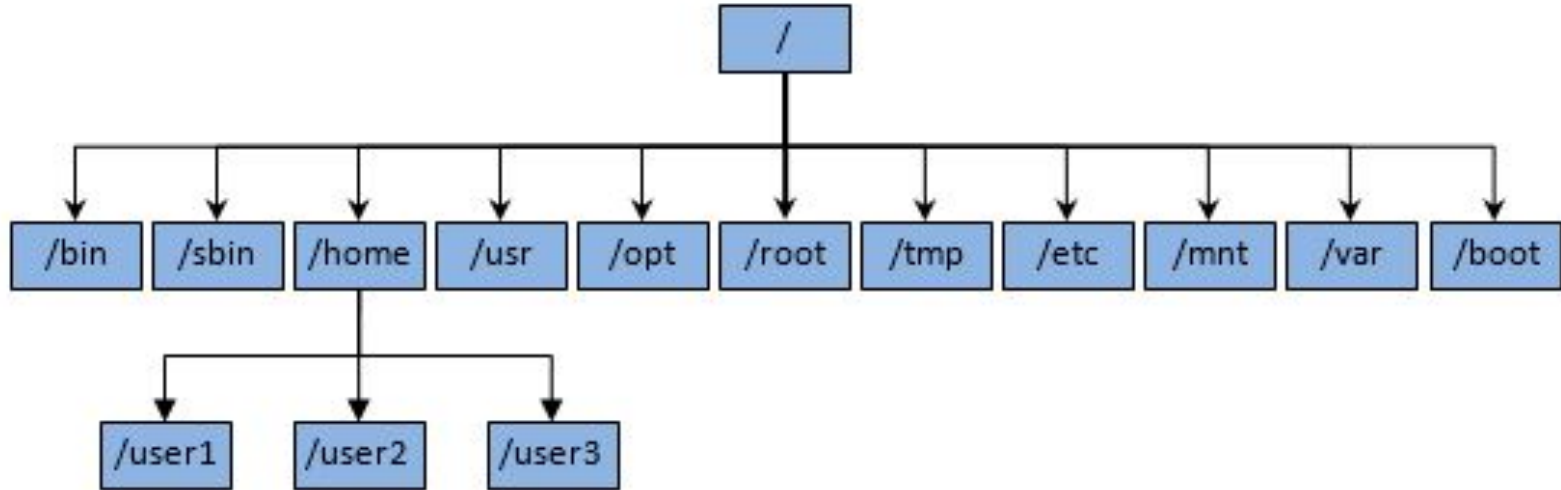
useradd -c “comment” -g <groupname> <username>

To give comment for a user

usermod -c “comment” <user name>

To change or modify user comment

Unix Filesystem & Directory structure

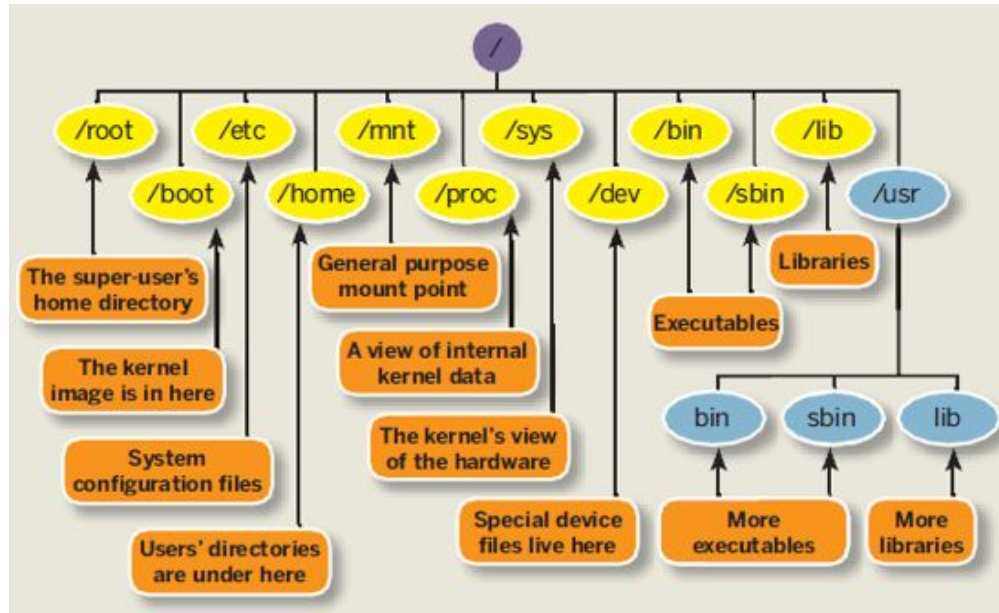


Contd..



- /bin : normal command execution directory
- /sbin : administrative command execution directory
- /boot : boot loader directory it contains GRUB
- /etc : configuration file directory
- /proc : current process info directory
- /media: external media device mount point
- /mnt : network or local mount point
- /opt : third party software installation directory
- /usr : entire installation and own software installation directory
- /lost+found : recovery directory
- /var : log directory
- /root : root user home directory
- /home: normal user home directory

Directory Hierarchy



Basic commands for accessing Directories and files



- cat - concatenate files and print on the standard output
- more - More is a filter for paging through text one screenful at a time
- less - opposite of more. Less is a program similar to more (1), but which allows backward movement in the file as well as forward movement.
- ls - list directory contents
- vi - text editor
- mkdir - creates a directory
- pwd - print name of current/working directory
- grep, egrep, fgrep - print lines matching a pattern-
- cd - change directory
- mv - move files/directories
- cp - copy files/directories
- rm - remove files/directories
- du - Reports disk space usage by directory
- touch - create files/change file timestamps
-

Basic commands for accessing Directories and files - cont...



- `df` - Show the amount of disk space used on each mounted filesystem.
- `ln` - Creates a symbolic link to a file.
- `Find`, `locate` - search for a file with name or type or extension etc.
- `sort` - sort the files in ascending or descending order
- `uniq` - filter the uniq strings
- `date` - show current date of the server with timezone
- `uname` - print system information
- `dmidecode` - DMI(Desktop Management Interface) table decoder
- `uptime` - tell how long the system has been running
- `whoami`, `who`, `w` - print effective userid, show who is logged on, and what they are doing
- `last` - show listing of last logged in users
- `su` - switch user
- `Id` - print real and effective user and group IDs
- `diff`, `sdiff`, `vimdiff` - compares two files
- `wc` - count the words and lines in a file

File Types & Permissions



Here are those files type.

1. Regular file(-)
2. Directory files(d)

Special files

1. Block file(b)
2. Character device file(c)
3. Named pipe file or just a pipe file(p)
4. Symbolic link file(l)
5. Socket file(s)

Owner

rwx

4+2+1



7

Group

rwx

4+2+1



7

Other

rwx

4+2+1



7

Contd..



Permissions – In Linux, each and every file/directory will have permissions.

we have three different kind of permissions for each file/dir.

- read -r

- write -w

- execute -x

- no permission - -

- These permissions are having the numerical values assigned like:

read – 4 write – 2 execute – 1 no permission - 0

- We have three different kinds of users for each file/dir and each user will have three different permissions

- owner -u

- group -g

- others -o

owner –means who created the file.

group – means no. of users belongs to that group

Contd..



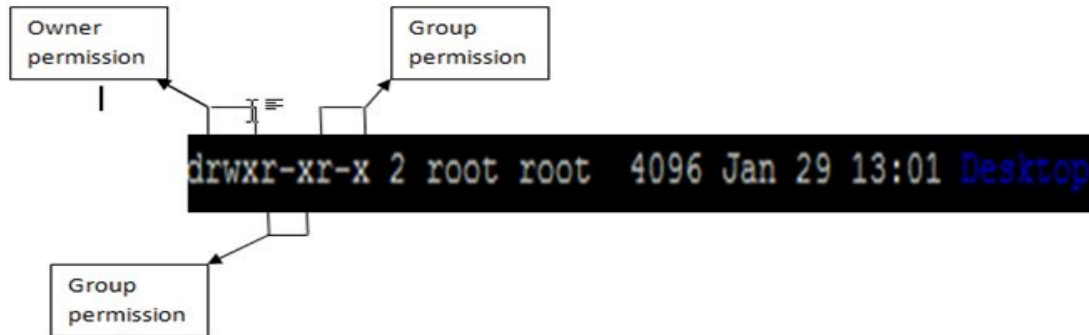
To change the file permissions or changing the ownership and groups of file/dir. We use the following commands:

chmod – To change the file/dir permissions

chown – To change the file/dir ownership

chgrp – To change the file/dir group.

- To know the permissions of a file/dir use the command : `ls -l`
In the o/p of `ls -l` command first column will have the permissions information.



Standard Unix Streams



Under normal circumstances, every Unix program has three streams (files) opened for it when it starts up –

- **stdin** – This is referred to as the *standard input* and the associated file descriptor is 0. This is also represented as STDIN. The Unix program will read the default input from STDIN.
- **stdout** – This is referred to as the *standard output* and the associated file descriptor is 1. This is also represented as STDOUT. The Unix program will write the default output at STDOUT
- **stderr** – This is referred to as the *standard error* and the associated file descriptor is 2. This is also represented as STDERR. The Unix program will write all the error messages at STDERR.

Standard Unix Streams - contd...



Basically you can:

1. redirect stdout to a file
2. redirect stderr to a file
3. redirect stdout to a stderr
4. redirect stderr to a stdout
5. redirect stderr and stdout to a file
6. redirect stderr and stdout to stdout
7. redirect stderr and stdout to stderr

Example

```
$ command > /dev/null 2>&1
```

Monitoring



1. CPU : `top`, `cat /proc/cpuinfo`, `sar -u`
2. Memory : `free`, `cat /proc/meminfo`, `sar -r`, `vmstat`
3. Network : `ifconfig -a`, `netstat -nr`
4. Disk : `df -hTP`, `fdisk -l`, `ls -lrth /dev/sd*`





Remote commands

- rsync
- ssh,scp,sftp
- curl
- wget
- ftp
- telnet



Need Help !

Help :- it provides information about the command including options but not elaborately
unixprod# <command_name> --help

Whatis :- it provides the information about the command with out the sub commands(options)
unixprod# whatis <commad_name>

Info :- it provides the information of all the commands.

Man :- manual, providing all information of the command
unixprod# man <command_name>

Whereis:- locates a binary,source,and manual page for a command
unixprod# whereis <comman_name>

Which:- locate a command
unixprod#: which <command_name>

Questions



- 1) _____ command is used to count the total number of lines, words and character in a file?
- 2) _____ command is used to remove the directory?
- 3) _____ command is used to remove files?
- 4) _____ command is used to list contents of directories?
 1. tar
 2. dir
 3. lp
 4. ls
- 5) Which of the following is a command in Linux?
 1. w
 2. x
 3. t
 4. All of the Above
 5. None of the Above



6) Linux is _____.

1. Free and Close Source
2. Free and Open Source
3. Non-free and Close Source
4. Non-free and Open Source

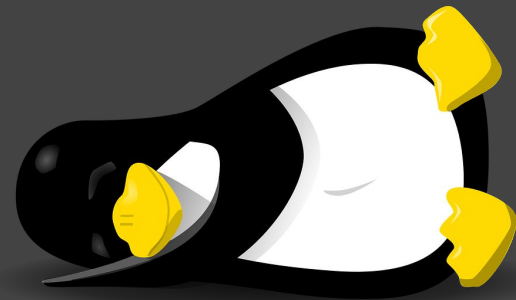
7) Unix Operating System from IBM is

1. AIX
2. MAC
3. BSD
4. AUX

8) Which among the following is not an editor in Linux

- a. emacs
- b. vi
- c. vim
- d. Notepad

Q&A



Thank You!



