UNIX BASICS NOTES

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**UNIX BASICS**

UNIX

Unix is nothing but Operating System

Operating system is nothing but collection of Software’s

Software is nothing but collection of Program’s

Program is nothing but set of Instruction’s

Flavours of Unix:

**Vendors FlavorsHardware**

SUN (sun micro system) SOLARIS Sparc Machine

RHEL (red hat enterprise Linux) LINUX Intel Machine

IBM (Intel buzz machine) AIX Power PC

HP (Hewlett Packard) HP-UX Power PC

Types of operating system:

* Single user o.s can perform only single task at a time.

Ex: Ms-Dos

* Single user o.s can perform multiple tasks at a time.

Ex: windows xp2, win7, xp3 …. Etc..,

1. **Single user o.s**:
2. **Multi user o.s** :

* Multi user o.s can perform multiple tasks at a time.

Ex: unixflavour’s (linux,solaris,hp-ux,ibm-aix)

History of Unix:

* Unix was developed in the 1969 at bell labs research center by Ken Thompson, Dennis Ritchie.
* In 1972, Unix was rewritten in `c’ programming language.
* In 1975, the first source license for Unix was sold.
* In 1972, Dennis Ritchie & Ken Thompson introduced multiuser o.s in `c’ language on PDP-II machine.

Role of Operating System:

* Operating system acts as an interface between user and hardware.
* O.S converts H.L.L to L.L.L and L.L.L to H.L.L.

H.L.L ----> high level language L.L.L ---->low level language

Technical languages Binary language

(c,c++,java,.net….,etc..) (0’s and 1’s)

Flavors of Linux:

* Redhat o.s
* Cent o.s
* Fedora o.s
* Open Suse o.s
* Puppy o.s
* Ubuntu o.s

Difference between unix and windows:

|  |  |  |
| --- | --- | --- |
|  | Unix | Windows |
| 1. | More security. | No security. |
| 2. | No virus (no .exe files). | Virus will be effecting (.exe files). |
| 3. | Multi users at a time. | Single user at a time. |
| 4. | Multi-tasking at time (up to 400 bg). | Multi-tasking at a time (10-15 tasks). |
| 5. | Free licence source. | Without licence key we cannot install o.s. |

Architecture of Unix:

Super (or) root user (#)

Normal user ($)

USER

Psudouser ($)

SHELL

Command checker

H.L.L H.L.L

KERNAL

Core of O.S

L.L.L.L.L.L.

H/W

1).User:

* **Super user (or) root user (#):**It having all privileges. It can perform each and every task.
* **Normal user ($):**It having no privileges. He can execute only normal user commands which are allocated to it.
* **Pseudouser ($):**It having some limited privileges. Those privileges also which is given root only.

2).Shell:

* Interface between user and kernel.
* Shell is nothing but command checker.
* Most of the shells are developed in ‘c’ language
* Shell identifies whether the user is a super user or normal user or pseudo user.
* Linux supports all the shells. Default shell is bash.

**Types of shells** **Default o.s**

Bash (Bourne again shell) linux

Sh (Bourne shell) sun solaris&hp-ux

Ksh (korn shell) Ibm-aix

Csh( c shell)

3).Kernal:

* Interface between shell and hardware.
* Kernal is having as core of operating system.
* Every operating system contains kernal and kernal will communicated directly.
* It converts H.L.L to L.L.L. and L.L.L to H.L.L.

4). Hardware:

* It response for our request and sends the output.

**Basic Commands:**

**Date** :- Display date

# date

**Cal**:- Display Calendar

# cal

**Clear**: - to clear the screen

# clear

**Ls**:- List of files and directories

# ls

**Eject**:- To open the dvd-rom

# eject

**Eject -t**: - To close the dvd-rom

# eject –t

**Man (Help)**:-

Syntax: - # man <command>

eg:- # man ls

**Exit**:-exit window or logout

# exit

**Poweroff**:- Shutdown system

#poweroff

**Reboot**: - Restart system

#reboot

**Who –r**:- to see current run level

#who –r

**Uname**:- it will display current operating system name

#uname

FILE SYSTEM

Systematic arrangement of files and directories. Each and every operating system having their own file systems.

Windows --- FAT16,FAT32, NTFS

Linux --- EXT2, EXT3, EXT4, XFS

Solaris --- UFS, ZFS

Hp-ux --- HSFS

Ibm-aix --- JFS, JFS2

STRUCTURE OF ROOT FILE SYSTEM

/ **(**ROOT**)**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| /sbin | /bin | /etc | /usr | /var | /opt | /dev | /home | /tmp | /lib |

/**sbin:** It is a directory .it contains all root user commands.

/**bin:** It is a directory .it contains all normal user commands.

/**etc:** It is a directory .it contains all system configuration files.

**Ex:** /etc/passwd – it contains user’s information.

/etc/shadow – it contains passwords information.

/**usr:** It is a directory .it contains 90% of operating information and also it contains operating system files.

/**var:** It is a directory .it contains mail messages, system messages, and log messages.

/**opt:** It is a directory .it contains all 3rd party software’s.

**Ex**: 3rd party – VERITAS

**In windows:**

1st party – along with o.s. (like paint, notepad, etc…)

2nd party – o.s related (like m.s.office, etc…)

3rd party – other software’s (like c, c++, java, etc…)

/**dev:** It is a directory .it contains logical names of physical devices.

Ex: /dev/sr0 – dvd

/dev/sdb1 -- usb

/**home:** It is a default directory for normal users.

/**tmp:** It is a directory .it contains temporary files whenever we restart the system all temporary files will be deleted.

/**boot:** It is a directory .it contains all root user commands.

/**root:** It is a directory .it contains all root user commands.

/**lib:** It is a directory .it contains all library files only.

Types of files:

1. Normal file (-)
2. Hidden file (**.**)

Block file (b)

1. Linked file (**@**) or (l)
2. Socket file (s)
3. Directory file (**d**) or (**/**)
4. Piped file (p)
5. Char
6. acter special file (c)

**File:** file is nothing but collection of data.

**Directory:** directory is nothing but collection of files and directories.

* A file name should start with alpha (a1) or numeric (11).
* A file name should not start with special characters.
* File name should not separate with spaces
* A file name can create up to 255 characters.

**Creation of Files:**

**Touch**:- Its create empty files

Syntax:-

# touch<f1><f2><f3>...

# touch<filename> {1..100}

Eg:-

# touch f1 f2 f3

# touch x{1..100}

# touch m1 m2 m3 m4 m5 m6 m7 m8

**Cat**:- create new file, appending(added information into existed file) and copy

Syntax:-

# cat<f1><f2><f3>......

# cat> filename

# cat>> filename

# cat f ilename> filename

# cat filename >> filename

#cat <option> filename

Eg:-

# cat f1 f2 f3

# cat> f1

# cat>> f1

# cat f1 > f2

# cat f1 f2 >> f3

#cat –n f1

**Vi (virtual editor):**

Syntax:-

# vi<filename>

esc + : wq! (save and quit)

esc + : q! (without save and quit)

esc + : x! (save)

esc + i (insert mode )

esc + yy (line copy)

esc + <num> + yy ( number of line copy)

esc + dd (delete line)

esc + <num> + dd (number of delete line)

esc + p (paste)

esc + D (delete end of the line from )

esc + o (new line)

esc + r (one character replace )

esc + R (replace mode )

esc + : %s/<old word>/<new word>

esc + :set nu (set numbers)

esc + :set nonu ( remove numbers)

esc + :<num> (to go to perticularnum)

esc + u (to undo)

esc + yG (copy till end of the page )

esc + dG (delete till end of page)

esc + G (go to last line)

esc + dH (delete till starting of page)

esc + yH (copy till starting of page)

Eg:-

# vi test.txt

**Gedit** :- Graphical Editor

syntax :-# gedit<file name>

eg:-

# gedit test.txt

**Wild Characters:**

# ls \* (\* - it indicates All characters)

# ls ?( ? –it indicates single character)

#ls [ ] ([ ] – it indicates range)

**Creation of Directories:**

**Mkdir**:- create new Directory

Syntax:-

# mkdir<dir>

#mkdir<dir1><dir2><dir3><dir4>

# mkdir -p <dir1 path><dir2 path>…

Eg:-

# mkdir /ram

# mkdir -p /ram/ram/ /ram/raj/ /ram/laxman/

**Rmdir**:- Remove Empty Directory

Syntax:-

# rmdir<dir>

Eg:-

# rmdir /ram/laxman/

**Cd**:- Change Directory

Syntax:-

# cd<dir path>

# cd ..

# cd<dir name>

Eg:-

# cd /ram/raj/

# cd ..

# cd raj

#cd -

#cd /

**Pwd**:- Present Working Directory

Syntax:-

# pwd

**Ls Commands:**

List of files and directories.

# ls<optional><file / dir>

# ls -a (it will display all Hidden files ,directory files, normal files also)

# ls -d (it will display all directories)

# ls –m (it will display all files and directories with comma)

# ls -r (it will display files and directories in reverse order)

# ls –Q ( it will display with double quotations)

# ls -R (it will display in recursive mode)

# ls –s (it will display size of files and directories)

# ls –i (inode numbers of files and directories)

# ls –sh (size in human understandable language)

# ls -t (sort by modification time)

# ls-l (it will display all files and directories with 9 fields of output)

1st field -- permissions of file or directory.

2nd field -- link count

3rd field -- owner(user) name of file or directory.

4th field -- owners group name.

5th field -- size of file or directory.

6th field -- month of file or directory.

7th field -- date of file or directory.

8th field -- time of file or directory.

9th field -- name of file or directory.

**Cp,Mv,Rm Commands:**

**Cp(copy):-** coping of file to file, file to directory, directory to directory

Syntax:-

# cp<old file name><create file name>

# cp<filename><dir>

# cp -r <dir><dir>

Eg:-

# cp f3 z1

# cp z1 /ram/

# cp -r /ram/ /ram/raj/

**Mv(move)** :- Moving of file to file, file to directory, directory to directory and also rename

file or directory.

Syntax:-

# mv<old file name><new file name>

# mv<old dir name><new dir name>

# mv<file><dir>

# mv<exsitdir name><to dir path>

Eg:-

# mv f1 xyz

# mv /ram/ /ramu/

# mv xyz /ramu/

# mv /ramu/raj/ /ramu/ram/

**Rm(remove)** :- Removing of file, directory.

Syntax:-

# rm<f1><f2><f3>...

# rm -i <f1><f2><f3>...

# rm -if <f1><f2><f3>...

# rm -rf<f1><dir1><f2><f3> ...

# rm<filename>{1..100}

Eg:-

# rm f1 f2

# rm -i f3...

# rm -if x1 x2 x3

# rm –rf x4 /ramu/ram/ x5 x6

# rm x{1..100}

**User access & Identification commands:**

**Groupadd**:- create new group

syntax:-

#groupadd<group name>

Eg:-

#groupadddba

How find out group created or not

# cat /etc/group | grepdba

**Useradd**:- create new user

systax:- # useradd<user name>

eg:- # useradd user1

How find out user created or not

# cat /etc/group | grep user1 (or)

# id user1

**Passwd** :- Change and set password from existed user

systax:- #passwd<users name>

eg:- #passwd user1

**Chown** :- Change the ownership to File or Directory

syntax: - #chown<user name><file/dir name>

**Chgrp**:- Change the group ship to File or Directory

syntax: - # chgrp<group name><file/dir name>

eg:- # chgrpdba test.txt

**Su** :- Switching User

syntax:- #su - <user name>( '-' means login)

eg:- # su – user1

$ exit

**Userdel**:- Delete existed user

systax:- #userdel<user name>

eg:- #userdel user1

**Groupdel**:-Delete existed group

syntax:- #groupdel<group name>

Eg:- #groupdeldba

**Find** :-search for files in a directory hierarchy

syntax :- #find <path> -name <filename>

-empty

-inum

-perm

eg:- #find /root -name test

**File /Directory permissions commands:**

**Chmod** :- Change the file permissions Read, Write, Execute in user, group, other levels

sysntax:-

#chmod 755 <file (or) dir name>

#chmod -R 755 <file/dir>

#chmod u=rwx, g=rwx,o=rwx<file/dir>

#chmod u=rw,g=rw,o=rw<file/dir>

eg:-

#chmod 755 test.txt

#chmod -R 755 <file/dir>

#chmod u=rwx, g=rwx,o=rwx test.txt

#chmod u=rw,g= r,o= r test.txt

Note:-Read=4 Write=2 Execute=1

Where u=user, g=group, o=others

( -R means With contains)

**Umask**:- Set the default permission (system default permission 022)

#umask 022

NOTE:- 777 **–** 022 = 755

**Process management commands:**

**Ps**:- Report a snapshot of the current processes.

# ps -ef

**Fg**:- foreground process🡪 the process which is executing at ‘fornt end’.

# fg %<job id>

**Bg**:- background process🡪 the process which is executing at ‘back end’.

# bg %<job id>

**Kill** :- kill the session process🡪 the current running process is removed by killing process.

# kill -9 %<job id>

**Simple Filter commands:**

**More**:- it will display output in page by page and line by line process.

syntax :- # more <filename>

eg:- # more test

**Less** :-opposite of more

syntax :- # less <filename>

eg:- # less test

**Sort** :-sort lines in alphabetical order.

syntax :- #sort <filename>

eg :- #sort test

**Wc**:-prints the number of lines, words, and characters in files

syntax :- #wc<optional><filename>

eg :- #wc test

#wc -c test (-c --total number of characters)

#wc -l test (-l --total number of lines)

#wc -w test (-w –total number of words)

**Head**:-it will display by default first 10 lines only.

syntax :- #head <filename>

#head -<lines><filename>

eg:- #head test

#head -20 test

**Tail** :-it will display by default last 10 lines only.

syntax :- #tail <filename>

#tail -<lines><filename>

eg:- #tail test

#tail -20 test

**Uniq**:-if a line is continuously repeating then it will squeeze as single line and counts.

syntax :- #uniq<filename>

eg:- #uniq test

**AdvanceFilter commands:**

**Grep**:-grep means “globally search for regular expressions”.

syntax :- # grep<option><expression><filename>

-w ---- exact match

-i ---- ignore anything

-e ---- multiple expressions

-E ---- multiple expressions by using pipe symbol

-An ---- below the lines (‘n’ is number)

-Bn ---- above the lines (‘n’ is number)

-Cn ---- above&below the lines (‘n’ is number)

eg:- # grep –w u1 /etc/passwd

**Sed**:-sed means “steam editor”.

syntax :- # sed<option><filename>

p ---- Printing

i ---- Inserting data

-e ---- multiple expressions

-n ---- multiple expressions by using pipe symbol

d ---- Deleting

a ---- appending data

q ---- particular lines

eg:- # sed –n3p /etc/group

**Awk**:-awk means “aho Weinberger kerningham”.

syntax :- # awk–F “ ? ” ‘/expression/{print $1}/’<filename>

/

;

eg:- # awk –F “ : ” /u1/{print $5}’ /etc/passwd

**Find command**:

syntax :-# find < path >< option >

~ -name

/ -type (file or directory)

. -perm

-inum

-empty

eg:- # find / -name sun

# find / -type f file1

# find / -perm 622

**Memory commands**:

**Df**:- report file system disk space usage

# df

# df -h

# df -Th

**Du**:- estimate file space usage

syntax :- # du –sh<file dir>

eg:- # du -sh test /bin

**Network commands:**

**Ifconfig**:-configure a network interface

# ifconfig eth0

**Ping** :- check vether the Connect to network hosts

#ping <IP Adderss/host name>

**Who** :- show who is logged on

#who

#who am i