Tanvir

Linux Command'S

Package Management-

- Package management involves installing and removing applications on system
- In earlier days this process is hard because user had to compile source code manually
- Today tools make package management easy with simple commands

Packaging Systems-

Different linux distribution use different packaging systems however most packages fall into two main categories

- deb for Debian-based distribution
- .rpm for RedHat-based distribution

Package Files-

Package files is collection of software files ,which can include installable scripts, library files ,configuration files, manuals

Repositories-

Repositories are places thousands of packages are stored and made available for users, make it easy to install applications from these location

Dependencies-

Software often depends on other packages for proper installation and functionning

Package tools-

Two types of package management tool:

1. **High-level tools**: used for metadata searching and dependency resolution
   - Debian: 'apt-get'
   - RedHat: 'yum'

2. **Low-Level Tool** : used for installing and removing package files
   - Debian: 'dpkg'
   - RedHat: 'rpm'.

"APT"

A packet management Tool(its like play store that make it easy to download applications)

Common commands –

a) root@kali:/etc/apt# **apt-get update**
   →(**Update the packet list**) This command fetches latest information about available package and their versions.
b) root@kali:/etc/apt# **apt-get upgrade**→(upgrade installed packages)
c) root@kali:/etc/apt# **apt-get clean** →(clean temporary files) delete unwanted data
d) root@kali:/etc/apt# **apt-get autoclean**→(Auto-clean old data) this command clean unnecessary packages ,waste data all clean (do daily basis)
   Example Scenario->
   Suppose you want to install and manage vsftpd, an FTP server package, on your Debian-based system:

e) root@kali:/etc/apt# **apt-cache search vsftpd**→(search for package)this command searches for a package in repositories.
f) root@kali:/etc/apt# **apt-get install vsftpd**→(install a package) this command install specific package

g) root@kali:/etc/apt# **apt-cache depends vsftpd** →(show package dependencies) this command shows dependencies of specified package

h) root@kali:/etc/apt# **apt-get install -s vsftpd**→(Simulate an installation) this command simulate the installation of package without actually installing it

i) root@kali:/etc/apt# **apt-get remove vsftpd**→ (remove packages) remove specified packages

j) root@kali:/etc/apt# **apt-get purge vsftpd**→(purge a package) this command remove packages along with configuration files and dependencies

k) root@kali:/home# **apt-get dist-upgrade**→(upgrade the distribution)this command upgrade the system to new release including the kernel version

l) root@kali:/home# **apt-get autoremove** →(Auto-remove unused pacakeges) remove packages were automatically installed

m) root@kali:/etc/apt# **apt-get install -f**→fixed broken dependencies

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"Debian------dpkg tool"

Example Scenario->Download zoom Meeting by 3rd party

Before installing any software known your operating system and architecture

1) root@kali:**# cat /etc/issue**→checking your system information

2) root@kali:# uname -a→Check System Architecture(34bit or 64 bit)
According to both configuration download software

3) root@kali:#cd /root/downloads→assuming that you have already downloaded the zoom package to our system and it navigate to the download directory

4) root@kali:downloads# ls →check downloaded data

5) root@kali:downloads#dpkg -i zoom_amd64.deb→(install zoom package)//might be encounter error due to missing dependencies

6) root@kali:downloads#apt-get update→(fixing dependency so update package information) update package file from their sorches

7) root@kali:downloads#apt-get -f upgrade→fixed broken dependencies by installing necessary packages

8) root@kali:downloads#dpkg -i zoom_amd64.deb→reinstall zoom packages

9) root@kali:downloads#dpkg –get-selections |grep zoom→show data related to zoom

10) root@kali:#Zoom →launch zoom application

Removing Zoom from system

1) root@kali:downloads#dpkg –remove zoom→this command remove zoom package but leaves configuration files behind

2) root@kali:downloads# dpkg --purge zoom→whole config and all remove

3) root@kali:downloads# dpkg -l | grep zoom→show data related to zoom

"Aptitude command"

Aptitude command provides additional features and more user friendly interface that apt

1) installing packages→ root@kali:#aptitude install vsftpd →package name

2) updating packetlist→ root@kali:#aptitude update

3) upgrade install package→ root@kali:# aptitude upgrade

4) full distribution upgrade→ aptitude full-upgrade

5) remove package→ root@kali:# aptitude remove vsftpd

6) purging package→ root@kali:# apt-get purge vsftpd

7) fixing broken dependencies→ root@kali:# aptitude install -f

8) searching for a package→ root@kali:# aptitude search vsftpd

Suppose you want to install and manage the 'vsftpd'

- Aptitude update→ root@kali:/etc/apt# aptitude update
- Install package→ root@kali:/ etc/apt# aptitude install vsftpd
- fixed broken dependencies→ root@kali:/ etc/apt# aptitude install -f
- Remove package → root@kali:/ etc/apt# aptitude remove vsftpd
- Purge package → root@kali:/ etc/apt# aptitude purge vsftpd

Tanvir

"Sudo +su command"

Su(Switch user)→this command is used to switch user by entering their password.

        it opens new shell session and completely change environment

      Example:'su username'(switches user to root)

Note: **to exit from current user just use 'exit'command**

Sudo (Super user do)→allow to user to execute command with superuser privileges without switching root user account

      Example:'sudo apt-get update' (update packet list with root privileges)

Types Of users?

- ❖ Normal User→Starts with '$'(home directory).
- ❖ Superuser(root)→starts with'#'(full admin access).
- ❖ Service user→Special user Account for running Services.

How to change User?

```
$ mkdir /technology
# Output: Permission denied
$ sudo mkdir /technology
# Directory created successfully
```

- • Check current user →**'whoami'.**
- • Create new user→**sudo useradd -m Tanvir.**
- • Set Password to new user→ **sudo passwd Tanvir.**

Switching to the new user?

- ❖ Example- **su -Tanvir** and prompt: password '**Tanvir**'
  'Exit' command for return in previous

Difference between 'su -Tanvir' and 'su Tanvir'

'su -Tanvir'	'su Tanvir'
1)full switch, new place	Quick switch ,same place
2)switch in Tanvir's home directory and environment	You stay in same directory

Caution:- Using 'sudo su ' is risky because it switches to root user and can lead to accidental system Changes avoid using it until you are experienced .

Tanvir

"Simple Commands"

Commands	Discriptions
1) Mkdir 'folder'	-Create new directory Folder Eg.mkdir Testing //create empty folder Testing
2) Cd	-for Change directory Two types- **Absolute Path**- full path starting from the root ('/') Cd/bin/file1.txt **Relative Path**- part relative to current directory Cd file1.txt Cd .. for one step back..
3) Touch	-use to create file E.g. Touch file1.txt
4) Cat>'file name'	- create file with contents E.g. cat>file2.txt
5) Cat 'file name'	-to see file with text
6) Cat 'file1.txt file2.txt>file3.txt'	-copy file 1 and file 2 content in file 3
7) ls	-List directory
8) ls -lr	-List in detailed format +in reverse order
9) ls *.txt/.py	-Showing .txt files in directory and py
10) pwd	-present working Directory
11) cp	Copy file or directory E.g. cp -r folder1 folder2 Cp file1.txt file2.txt
12) mv	Move file or folder in other directory E.g. mv folder1 folder2
13) head	Fetch 1st 10 data E.g. Head file4.txt
14) tail	Fetch last 10
15) Vi	For edit file and add contents Insert mode- 'I' Exit insert mode-'ESC' Save changes-':w' Quite without saving-':q!' Save and exit-':wq'
16) tac	Show data in reverse line order
17) more	Display large content in partition form E.g. 25% Enter 75%

18) id	Display group Id or user id
	Eg. `tanvir@tanvir-VirtualBox:~/Testing$ id`
	`uid=1000(tanvir) gid=1000(tanvir) groups=1000(tanvir),4(adm),24(cdrom),27(sudo)`
	`,30(dip),46(plugdev),116(lpadmin),126(sambashare)`

19) clear	Clear all the content
20) grep	Filter to search given pattern in file E.g. `tanvir@tanvir-VirtualBox:~/Testing$ grep ta file4.txt` `Welcome tanvir in ubuntoo`

21) diff	Compare contents from two different files
	similar content ignore
	`nvir@tanvir-VirtualBox:~/Testing$ diff file3.txt file4.txt`
	`1,28`
	`Tanvir Sayyad`

22) ping	Check the connectivity
	`anvir@tanvir-VirtualBox:~/Testing$ ping github.com`
	`ING github.com (20.207.73.82) 56(84) bytes of data.`
	`4 bytes from 20.207.73.82 (20.207.73.82): icmp_seq=1 ttl=115 time=41.1 ms`

23) history	Review all command till now you executed

24) hostname	Display Hostname
	`tanvir@tanvir-VirtualBox:~$ hostname`
	`tanvir-VirtualBox`

25) hostname -i	Display host Ip
	`anvir@tanvir-VirtualBox:~$ hostname -i`
	`27.0.1.1`

26) chmod	Group permission to access file

27) chmod u=r "filename"
28) chmod u=w "filename"
29) chmod u+r "file1.txt"
 // for access
	It only read data mode
	`anvir@tanvir-VirtualBox:~/Testing$ chmod u=r file3.tx`
	`anvir@tanvir-VirtualBox:~/Testing$ cat file3.txt`
	`Welcome tanvir in ubuntoo`
	`lways happy with you`
	`anvir@tanvir-VirtualBox:~/Testing$ ls -l file3.txt`
	`r--rw-r-- 1 tanvir tanvir 48 Jun 19 20:10 file3.txt`
	Able to make changes
	`tanvir@tanvir-VirtualBox:~/Testing$ chmod u=w file3.txt`
	`tanvir@tanvir-VirtualBox:~/Testing$ ls -l file3.txt`
	`--w-rw-r-- 1 tanvir tanvir 48 Jun 19 20:10 file3.txt`

30) nl	Display line numbers before content
	`tanvir@tanvir-VirtualBox:~/Testing$ nl file4.txt`
	`     1   Tanvir Sayyad`
	`     2   A`
	`     3   B`

31) wc	Count lines,words and character of files
	`tanvir@tanvir-VirtualBox:~/Testing$ wc file4.txt`
	`  30   36 115 file4.txt`
	`   L    W    C`

32)	Used to remove duplicate contents
33) rmdir	Delete empty directory
34) rm	Remove only files

"System Information commands"

35) Uname -a	Print system info Like. Display version machine info
36) Df -h	Print system report display diskspace (GB,MB)
37) Du -h filename	Display file space Show disk uses path
38) top	It display all info about CPU sage, memory
39) ps	The ps command provide snapshot of current process

'Netwok command'

ping google.com	(Test network host reachable and measures response time Check) website or device is online and responsive
Ifconfig Ip addr show	Displays or configure network interface setting Used it to view ip address and network config on your device
nslookup google.com	Use it to troubleshoot DNS issues and verify domain resolution
curl http://example.com	Use it to download web pages or send request to a server
wget http://example.com/file.zip	Download files from internet
ssh user@remote_host	Securely connects to a remote host. Use it to remotely manage and interact with another computer
netstat -an	Displays network connections, routing tables, and interface statistics.
traceroute google.com	**Shows the path packets take to reach a network host**
hostname	Shows or sets the system's hostname.
ss	display detailed information about network sockets.
Netstat -tuln	Check for all listening ports and established connections. • t: Show TCP sockets.

	`-u`: Show UDP sockets. `-l`: Show only listening sockets. `-n`: Show numerical addresses instead of resolving them to hostnames.

Scenario: Troubleshooting Network Connectivity Issues

You are a system administrator, and users report that they can't access your company's website, "github.com/tanvirSayyad". You need to diagnose and resolve the issue.

1) check if the websites server is reachable (ping github.com) if not then.
2) check network interface configuration to ensure your system has the correct network settings(ifconfig/ip addr show) ckeck all ip,subnet,gateway setting
3) Look for the IP address associated with "github.com". Verify it's correct. (nslookup github.com)

4) Check for any points where the connection drops or slows down. (traceroute github.com)
5) Check for active listening sockets and connections on your system to ensure no unexpected network activity is blocking access.(netstat -tuln)
6) The HTML content of the webpage or an error message. Verify if the webpage is accessible(curl http://github.com/tanvirSayyad)
7) Download a file from "github.com/tanvirSayyad" to test server response and file access.(wget http://github.com/tanvirSayyad/file.zip)
8) Securely connect to the server hosting "github.com/tanvirSayyad" to check server-side configurations.(ssh user@server_ip_address)
9) The current hostname of your system. Verify it's set correctly.(hostname)

"Text Processing Command"

```
tanvir@tanvir-VirtualBox:~/Testing$ cat file5.txt
Tanvir 25 Pune
abhijit 24 pune
bob 23 chicago
dam 34 banglore
```

Create data for texting

```
tanvir@tanvir-VirtualBox:~/Testing$ awk '{print $0}' file5.txt
Tanvir 25 Pune
abhijit 24 pune
bob 23 chicago
dam 34 banglore
```

grep	**P**rint all lines that matches pattern
awk '{ print $0 }' file5.txt	Showing all data in tabular format ```tanvir@tanvir-VirtualBox:~/Testing$ awk '{print $0}' file5.txt``` Tanvir 25 Pune abhijit 24 pune
Awk'{print $1,$2}' file5.txt	Print 1st and 2nd column ```tanvir@tanvir-VirtualBox:~/Testing$ awk '{print $1,$2}' file5.txt``` name age Tanvir 25 abhijit 24
Awk '{print NR,$0}'	Print all data with number ```tanvir@tanvir-VirtualBox:~/Testing$ awk '{print NR,$0}' file5.txt``` 1 2 name age city 3 Tanvir 25 Pune 4 abhijit 24 pune
Awk 'print $1,NF'	Print 1st and last line

Scenario: You have a large log file `server.log` and you want to analyze it to find out how many times a specific error occurred, extract the lines containing the error, and count the number of occurrences.

- **grep**: Search for the error pattern in the log file.(grep "ERROR" server.log) // its used for find pattern

- **wc**: Count the number of occurrences of the error. (grep "ERROR" server.log | wc -l) display number of lines

- **awk**: Extract specific columns from the log file.(grep "ERROR" server.log | awk '{ print $1, $2, $5 }')