

Assignment No. 02

Q.1) Explain the contents of /etc/groups and etc/password files.

/etc/groups:

- This file contains information for each account.
- All the groups are listed in the file.
- The /etc/groups file can be modified by the useradd command.
- To see all the groups available we use the command:
`cat /etc/group`

/etc/password

- It keeps information about user account and password.
- This file holds majority of information about accounts on the Unix system.
- We can also verify whether user has been created by running the following command:
`cat /etc/passwd`

Q.2 How group and user be manipulated using Linuxconf?

Adding a user account:

1. Start Linuxconf by typing 'linuxconf' at the shell prompt.
2. Enter root password when prompted.
3. Open [Config] → [User accounts] → [Normal] → [User accounts]
4. Select Add
5. Enter the account's login and full names

6. Enter information in other fields only as necessary.
7. Select accept
8. Enter initial password for the account.
9. Re-enter the initial password for the account in the confirmation field.
10. Select Accept.

Creating a group:

1. Start linuxconfig by typing 'linuxconf' at the shell prompt.
2. Enter root's password when prompted (if not already root)
3. Open [config] → [users accounts] → [Normal] → [Group definition]
4. Select Add
5. Enter the group name, and optionally alternate members.
6. Select Accept.

Delete group

(Step 1 through 3 same as above.)

4. Select the group you wish to ~~discover~~ delete.
5. Select Del
6. Confirm deletion.

Q3) Describe different type of permission and their manipulation in Linux.

- Firstly there are three types of people to whom we can give the permissions to:

u - user

g - group

o - others

a - all

- There are a total of three types of permissions for the files:

r - read , w - write and x - execute.

- whereas for directories, there are only two permissions as they cannot be executed.

r - read , w - write .

- To check the permissions to the file we must use the command - ls -l .

The output of the command will contain the following

- r w - r - x r - -
① ② ③ ④

Here, ① signifies whether it is file (-) or directory (d)

② This specifies the permission for user (here read, write)

③ This specifies the permission for group, here read, execute

④ This specifies the permission for others, here read-only.

- Manipulation of the user commands can be done in two ways:

- 1) chmod.

- This is used to change the permissions of existing files.

- example,

chmod 777 file1.c

- This will set all permissions to read, write and execute.

chmod a+w file1.c

- This will add write permission to all users.

- 2) umask

- This command is used to create a mask which defines how/what permissions newly created files will have.

- Example, umask 345

the above command will set the umask value to 345.

- Thus, if we create a new file,

touch one.txt.

- It will be created with following permissions:

-r--w-x-w-

i.e. user will be only-read, group will write and execute, whereas others will write-only.

Q.4) Write about the following:

1) chmod command:

- Stands for change mode.
- Used to change access mode of a file.
- Syntax - `chmod [reference] [operator] [mode] file....`
- Example:

 `chmod 0=rwx file1.c`

 `chmod 765 file.txt`

2) Su command:

- Stands for super user.
- Gives access to the root shell by verifying that user is super user.
- Syntax : `sudo su`
- Unlike sudo, su command proto promotes the user shell by giving the user root access.

3) Kernel:

- The kernel is the core of the operating system
- It is the one programme running at all times on the computer.
- It consists of everything below the System-call interface and above the physical hazard.

4) KDE:

- It is a desktop environment allowing daily tasks without relying on command line.
- KDE is a desktop windowing platform with a GUI released in the form of an open source package.
- It was initially released in the year 1996.

5. GNOME

- GNOME is a free, open source software that runs on Linux and most BSD derivatives.
- It is the default desktop environment on various operating systems such as fedora, redhat, CentOS, debian.
- It was previously used in Ubuntu but is now replaced by Ubuntu's very own Unity desktop environment.
- GNOME was released in the year 1999.

Q.5) Describe history of X-window. Also write a note on KDE

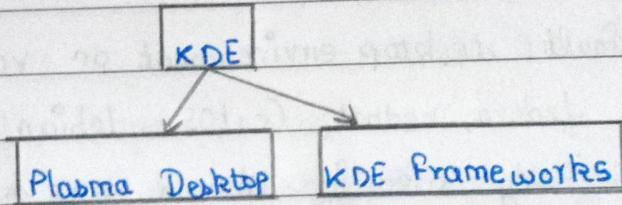
- The X window System is a windowing system for bitmap displays, common on Unix-like operating systems.
- X provides the basic framework for a GUI environment: drawing and moving windows on the display device and interacting with a mouse and keyboard.
- The original X-windowing system was announced in 1984 and

developed at MIT.

The latest version of X window system came in the year 2012, and was called 'X11R7.1'

KDE:

- It stands for K desktop environment.
- It is a desktop environment that allows carrying out daily tasks without relying on the command line interface.
- Two common products of KDE are Plasma desktop and KDE frameworks.



- They are designed to run on Microsoft Windows, Android, Unix desktops, etc.
- It provides tools and documents for the developers to write applications.
- KDE is majorly written in C++.
- KDE was founded by Matthias Ettrich and is developed by KDE community.

Q.6) Explain the purpose, Syntax and different options used with "chmod" and "chown" command with the help of suitable examples:

chmod :

- Used to change the access mode of the file or directory.

• Syntax: chmod [reference] [operator] [permission] file ...

- The reference part can contain one of the following:

• r - read

• u - user

• g - group

• o - other

• a - all

- The operator can have one of the following three :

• '=' Permission 'equals' to

• '+' Add permission

• '-' Remove/revoke permission.

- The permission can be one of the following :

• r - read

• w - write

• x - execute .

• Example,

chmod u+rwx file2.cpp

• This command would add the read, write and execute permission to the current user.

chown:

- This command is used to change the owner of the file

- Syntax - chown: chown owner:group filename

- Example:

- sudo chown -v :group1 file1.

- The above command will change the ownership of file 1 to the group1.

- the attribute '-v' is optional and stands for verbose.

- It is important to be in super user mode to execute chown.

- sudo chown -v root:group1 file2

- The above command will change the file owner to root and file group to 'group1'

- sudo chown pratyay file3

- The above command will only change the file owner to pratyay pratyay.

Q.7) What is shadow file?

→ • /etc/shadow is used to increase the security level of passwords by restricting all but highly privileged users' access to hashed password data.

• This data is kept in files owned by and accessible only by the Super user.

• System administrators can reduce the likelihood of brute force attacks by making the list of hashed passwords unreadable by

unprivileged users.

- It is also known as shadow password file.

Q8. Define "su" command with example:

- su stands for "Super user" or "Substitute user"
- The "su" command is an utility which allows you to run commands with another user's privileges, by default the root user.
- Using "su" is the simplest way to switch to the administrative account in the current login session.
- Syntax :

su [options] [user [argument]]

- when invoked without any option, the default behaviour of su is to run an interactive shell as root:

example:

~\$ sudo su

enter password:

:#

- To switch to another user account, pass the username as an argument to su :

su pratikay .

- The above command will start a shell configured by init as per the run level for the user 'pratikay'.

Q.9 Difference between KDE and GNOME.

Points	KDE	GNOME
Definition	KDE is a desktop working platform with the GUI released in the form of an open source package.	GNOME is a desktop environment composed of free and open source software that runs on Linux and most BDC derivatives
Founders	Miguel de Icaza and Federico Mena.	Matthias Ettrich
Development	Developed by KDE community	developed by the GNOME project.
Initial release	Released in the year 1996	Released in the year 1999
Minimum System requirements	Requires 1GHz CPU and 615 MB RAM.	Requires 700 MHz CPU and 768 MB RAM.
Coding languages	C++	C, C++, Python, Javascript
Complexity	More complex than GNOME	GNOME is less complex

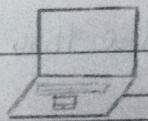
Q.10) Differentiate the inetd and xinetd process.

	inetd	xinetd
Acronym	internet service daemon	Extended internet service daemon.
Functionality	It is a super server daemon on many unix systems that provides internet services.	It is an open source, super server daemon which runs on many unix like systems and manages internet based connectivity.
Predecessor / Successor	It is the predecessor / older option before xinetd.	It is the successor for inetd.
Secure	It is less secure than xinetd	It is more secure than inetd.
Status	It has been deprecated by most modern Linux distributions	It is being implemented by most modern linux distributions.

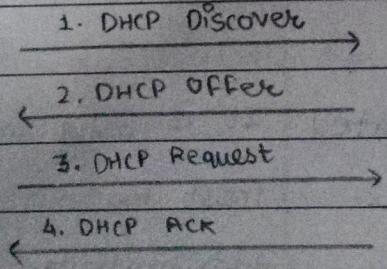
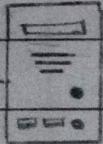
	inetd	xinetd
complexity	It is less complex than xinetd	It is more complex than inetd.
Access/control	Provides less configuration control options.	Provides more granularity of control.
Configuration files	Uses one configuration file with one line per service	Uses one configuration directory with one file per service.

Q.11) Describe working of DHCP with suitable diagrams.

Host A



DHCP Server



Working of DHCP Server:

- DHCP works at application layer by dynamically assigning the IP address to client and this happens through the exchange of a series of messages called transactions of DHCP conversation.
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1. DHCP Discovery:

- The DHCP client broadcasts messages to discover the DHCP server.
- The client computer sends a packet with the default broadcast destination of 255.255.255.255 or the specific subnet broadcast address if any configured.
- This 255.255.255.255 is a special broadcast address for this network.

2. DHCP Offer:

- When a DHCP server receives a DHCP discover message, it either suggests or offers an IP address to the client by sending a DHCP offer message to the client.
- The offer message contains the IP address of the server, MAC address of client, subnet mask, DNS, default gateway, etc.

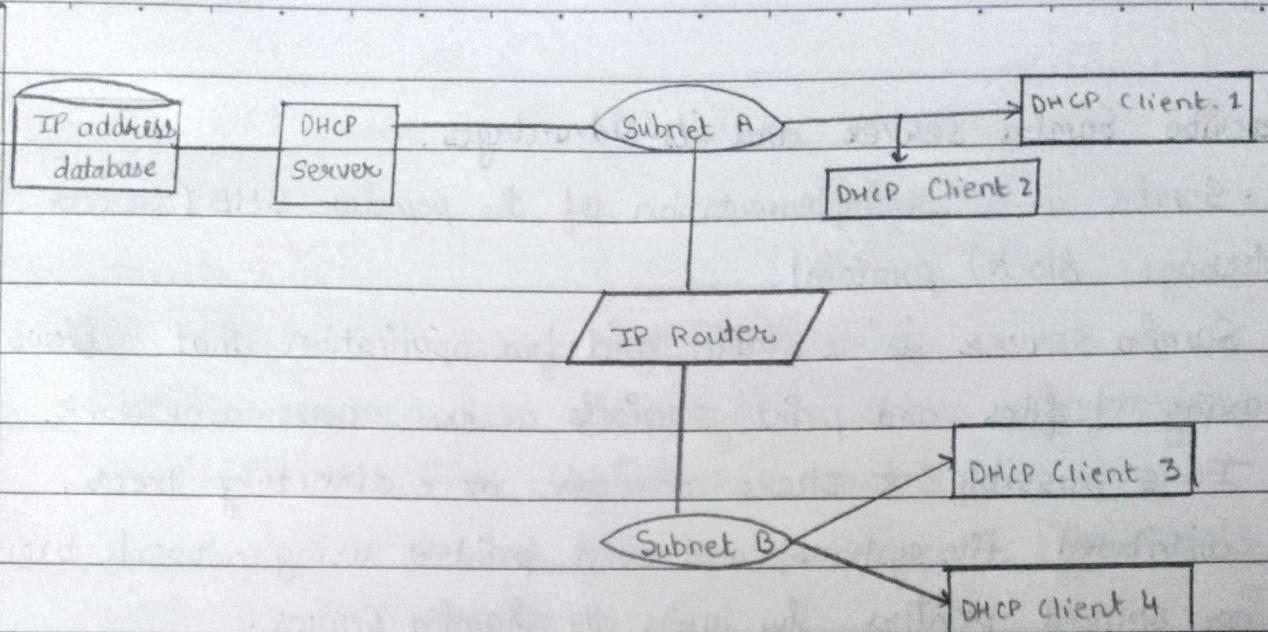
DHCP request:

3. DHCP Request:

- In most cases the client can receive multiple DHCP offers because in a network there can be many DHCP servers as they provide fault tolerance.
- If the IP address of one server fails then the other can provide backup.
- But the client will accept only one DHCP offer, in response to the offer, only the rest other offers will be rejected.
- In response to the offer, a DHCP request is sent requesting the offered IP address from the DHCP server.

4. DHCP ACK.

- Stands for DHCP Acknowledgement
- The DHCP server then sends acknowledgement to the client confirming the DHCP timer to the client.
- At this step, the IP configuration is completed and the client can use new IP settings.



How DHCP Works

Q.12 What is TCP Wrapper?

- A TCP wrapper is an additional layer of protocol/protection by defining which host are or are not allowed to connect to wrapped network services.
- One such wrapped service is xinetd.
- To use TCP wrapper, the TCP wrapper package is installed by default.
- The package provides host based access control to network services.
- The most important component in the package is the '/usr/lib/libwrapper' or '/usr/lib/libwrap.a'.

Q.13) Describe Samba Server and its advantages.

- - Samba is a reimplementation of the popular SMB (Server Message Block) protocol.
 - Samba server is a stable and free application that allows sharing of files and print service's access across a network.
 - It is possible to share one or more directory trees, distributed file systems, and even printers using network browsing or shared printers by using the Samba Server.
 - The Samba suite revolves around a pair of unix daemons that provide shared resources - called shares or services - to SMB clients on the network.
 - These commands are:
 1. smbd : It handles file and printer sharing and provides authentication and authorization for SMB clients.
 2. nmbd : • It supports NetBIOS name Service and WINS which is Microsoft's implementation of a NetBIOS name server (NBNS).
 - It also assists with network browsing

Q.14) Describe NFS server and NIS server.

NFS Server:

- NFS stands for Networking File Sharing.
- It is a protocol that allows you to share directories and files with other Linux clients over a network.
- Shared directories are typically created on a file server running the NFS server components.
- Users add file to them which are then shared with other users who have access to the folder.
- NFS file share is mounted on a client machine making it available just like a folder.
- NFS is particularly useful when disk space is limited and you need to exchange public data between client computers.

NIS Server:

- NIS stands for Network Information System.
- NIS is a network service that allows authentication and login information to be stored on a centrally located server.
- This includes username, and password database for login authentication, database of user groups and the location of home directories.
- One NIS domain name is configured server is 192.168.0.254.

Q15) Compare SMTP and POP3 with 4 points.

	SMTP	POP3
Acronym	Simple Mail Transfer Protocol	Post office protocol Version 3.
Use	It is used for addressing sending message.	It is used for accessing message.
Port number	25	110
also known as	push protocol	pop protocol
	It transfers mail from Sender's computer to the mailbox present on receiver's mail server.	It allows to retrieve and organise mails from mailbox or receiver mail server to receiver computer.