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MALAD [W], MUMBAI – 64
(AUTONOMOUS)

(Reaccredited 'A' Grade by NAAC)
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(ISO 9001:2015)

CERTIFICATE

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Roll No: **574** **Programme**: BSc CS **Semester**: V

This is certified to be a bonafide record of practical works done by the above student in the college laboratory for the course **Linux Server Administration** (Course Code: **1852UCSPR**) for the partial fulfillment of Fifth Semester of BSc CS during the academic year 2020-2021.

The journal work is the original study work that has been duly approved in the year 2020-2021 by the undersigned.

External Examiner **Mr. Gangashankar Singh**
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Subject: Linux Server Administration **Class: T.Y.B.Sc.CS**

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Practical 1

Aim : Installing DHCP server .

Theory:

- DHCP stands for dynamic host configuration protocol
- A **DHCP Server** is a network **server** that automatically provides and assigns IP addresses, default gateways and other network parameters to client devices.
- A DHCP server automatically sends the required network parameters for clients to properly communicate on the network.

Steps:

- Ifconfig stands for interface configuration , here we have to change our ip address and netmask
- Ip addr command is used to check the current ip address of the system.

```
ksp@kali:~$ sudo ifconfig eth0 192.168.108.15 netmask 255.255.255.0
ksp@kali:~$ ip addr
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN group default qlen 1000
    link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
    inet 127.0.0.1/8 scope host lo
       valid_lft forever preferred_lft forever
    inet6 ::1/128 scope host
       valid_lft forever preferred_lft forever
2: eth0: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc pfifo_fast state UP group default qle
n 1000
    link/ether 08:00:27:a3:07:1f brd ff:ff:ff:ff:ff:ff
    inet 192.168.108.15/24 brd 192.168.108.255 scope global noprefixroute eth0
       valid_lft forever preferred_lft forever
    inet6 fe80::a00:27ff:fea3:71f/64 scope link noprefixroute
       valid_lft forever preferred_lft forever
```

- **Sudo apt-get install isc-dhcp-server** is used to install the dhcp server
- **sudo nano /etc/default/isc-dhcp-server** is used to configure the network setting in the system.
- **cat** command is uset to see the directory.
- Here we have set the I**nterfacev4="eth0"**

```
ksp@kali:~$ sudo nano /etc/default/isc-dhcp-server
ksp@kali:~$ cat /etc/default/isc-dhcp-server
# Defaults for isc-dhcp-server (sourced by /etc/init.d/isc-dhcp-server)

# Path to dhcpd's config file (default: /etc/dhcp/dhcpd.conf).
#DHCPDv4_CONF=/etc/dhcp/dhcpd.conf
#DHCPDv6_CONF=/etc/dhcp/dhcpd6.conf

# Path to dhcpd's PID file (default: /var/run/dhcpd.pid).
#DHCPDv4_PID=/var/run/dhcpd.pid
#DHCPDv6_PID=/var/run/dhcpd6.pid

# Additional options to start dhcpd with.
#       Don't use options -cf or -pf here; use DHCPD_CONF/ DHCPD_PID instead
#OPTIONS=""

# On what interfaces should the DHCP server (dhcpd) serve DHCP requests?
#       Separate multiple interfaces with spaces, e.g. "eth0 eth1".
INTERFACESv4="eth0"
INTERFACESv6=""
```

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- **sudo systemctl start isc-dhcp-server** with the help of this command I have started the dhcp server.
- **sudo systemctl status isc-dhcp-server** is used to check whether the server started properly or not.

```
ksp@kali:~$ sudo rm -f /var/run/dhcpd.pid
ksp@kali:~$ sudo rm -f /etc/dhcp/dhcpd.conf
ksp@kali:~$ sudo nano /etc/dhcp/dhcpd.conf
ksp@kali:~$ sudo systemctl start isc-dhcp-server
ksp@kali:~$ sudo systemctl status isc-dhcp-server
● isc-dhcp-server.service - LSB: DHCP server
     Loaded: loaded (/etc/init.d/isc-dhcp-server; generated)
     Active: active (running) since Sat 2020-10-31 13:25:18 IST; 17s ago
       Docs: man:systemd-sysv-generator(8)
    Process: 20789 ExecStart=/etc/init.d/isc-dhcp-server start (code=exited, status=0/SUCCESS)
      Tasks: 4 (limit: 3524)
     Memory: 7.2M
     CGroup: /system.slice/isc-dhcp-server.service
             └─20807 /usr/sbin/dhcpd -4 -q -cf /etc/dhcp/dhcpd.conf eth0

Oct 31 13:25:16 kali systemd[1]: Starting LSB: DHCP server ...
Oct 31 13:25:16 kali isc-dhcp-server[20789]: Launching IPv4 server only.
Oct 31 13:25:16 kali dhcpd[20807]: Wrote 0 leases to leases file.
Oct 31 13:25:16 kali dhcpd[20807]: Server starting service.
Oct 31 13:25:18 kali isc-dhcp-server[20789]: Starting ISC DHCPv4 server: dhcpd.
Oct 31 13:25:18 kali systemd[1]: Started LSB: DHCP server.
```

- **sudo dhcpd -T eth0** this is used to test the dhcp sever , here it is running successfully.

```
ksp@kali:~$ sudo dhcpd -T eth0
Internet Systems Consortium DHCP Server 4.4.1
Copyright 2004-2018 Internet Systems Consortium.
All rights reserved.
For info, please visit https://www.isc.org/software/dhcp/
Config file: /etc/dhcp/dhcpd.conf
Database file: /var/lib/dhcp/dhcpd.leases
PID file: /var/run/dhcpd.pid
Wrote 0 leases to leases file.
Lease file test successful, removing temp lease file: /var/lib/dhcp/dhcpd.leases.1604130965
ksp@kali:~$ done roll no 6065
```

Video link (practical 1):

- https://drive.google.com/file/d/1Mp6wZVUJfcTE8hYmEll0JBIoPuXqwsKL/view?usp
  =sharing

Practical 2

Aim: Initial settings: Add a user, Network settings, Configure services and List of services.

Theory:

- we can add particular user in the sytems to access the dhcp server and the system also.
- We can give the personal details and all information of the user.

Steps:

- **sudo adduser user_name** with this command we can add the personal details of the new user (password,full name, room number, work phone, home phone, other).

```
ksp@kali:~$ sudo adduser ksp_574
Adding user `ksp_574' ...
Adding new group `ksp_574' (1005) ...
Adding new user `ksp_574' (1005) with group `ksp_574' ...
Creating home directory `/home/ksp_574' ...
Copying files from `/etc/skel' ...
New password:
Retype new password:
passwd: password updated successfully
Changing the user information for ksp_574
Enter the new value, or press ENTER for the default
        Full Name []: kuldeep
        Room Number []: 574
        Work Phone []:
        Home Phone []:
        Other []:
Is the information correct? [Y/n] y
```

- now configuration of dhcp server .
- **sudo systemctl enable isc-dhcp-server** to enable the dhcp.

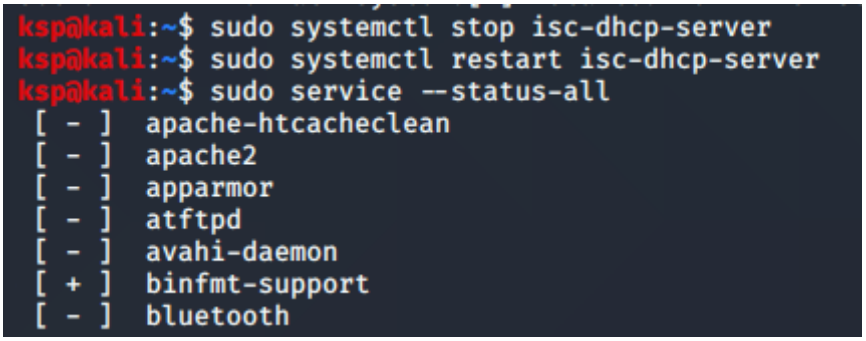
```
ksp@kali:~$ sudo nano /etc/dhcp/dhcpd.conf
ksp@kali:~$ sudo systemctl enable isc-dhcp-server
isc-dhcp-server.service is not a native service, redirecting to systemd-sysv-install.
Executing: /lib/systemd/systemd-sysv-install enable isc-dhcp-server
```

- **sudo systemctl start isc-dhcp-server** with this command starting the server and again checking whether it is started properly or not.

```
ksp@kali:~$ sudo systemctl start isc-dhcp-server
ksp@kali:~$ sudo systemctl status isc-dhcp-server
● isc-dhcp-server.service - LSB: DHCP server
     Loaded: loaded (/etc/init.d/isc-dhcp-server; generated)
     Active: active (running) since Sat 2020-10-31 14:12:40 IST; 6s ago
       Docs: man:systemd-sysv-generator(8)
    Process: 41290 ExecStart=/etc/init.d/isc-dhcp-server start (code=exited, status=0/SUCCESS)
      Tasks: 4 (limit: 3524)
     Memory: 7.5M
     CGroup: /system.slice/isc-dhcp-server.service
             └─41306 /usr/sbin/dhcpd -4 -q -cf /etc/dhcp/dhcpd.conf eth0

Oct 31 14:12:38 kali systemd[1]: Starting LSB: DHCP server ...
Oct 31 14:12:38 kali isc-dhcp-server[41290]: Launching IPv4 server only.
Oct 31 14:12:38 kali dhcpd[41306]: Wrote 0 leases to leases file.
Oct 31 14:12:38 kali dhcpd[41306]: Server starting service.
Oct 31 14:12:40 kali isc-dhcp-server[41290]: Starting ISC DHCPv4 server: dhcpd.
Oct 31 14:12:40 kali systemd[1]: Started LSB: DHCP server.
```

- **sudo systemctl stop isc-dhcp-server** with this command we can stop the server.
- Again restating the server .
- **Sudo service –status-all** it is used to check the status of all the service which is running.



Video link(practical 2) :

- https://drive.google.com/file/d/1_XedZkJbh-0RpsIz1DIqoLLFo- zjO7YU/view?usp=sharing

Practical 3

Aim: Configure NFS server to share directories or files on your network

Theory:

- **NFS**, or Network File System, was designed in 1984 by Sun Microsystems. This distributed file system protocol allows a user on a client computer to access files over a network in the same way they would access a local storage file.
- This enables system administrators to consolidate resources onto centralized **servers** on the network.

Steps:

- **sudo apt-get –y install nfs-kernel-server** to install the nfs server .

```
ksp@kali:~$ sudo apt-get -y install nfs-kernel-server
Reading package lists ... Done
Building dependency tree
Reading state information ... Done
nfs-kernel-server is already the newest version (1:1.3.4-4).
0 upgraded, 0 newly installed, 0 to remove and 1035 not upgraded.
```

- **sudo systemctl start nfs-kernel-server** to start the nfs server.
- **mkdir** it is used to create the new directory, here I have created the **/kuldeep574/hello_TYCS**
- **sudo chmod 777 /kuldeep574/hello_TYCS** used to give the permission the directory.
- **cd (change directory)** used to enter in the directory.
- **Echo** to write anything is the txt(a.txt).

```
ksp@kali:~$ sudo systemctl start nfs-kernel-server
ksp@kali:~$ sudo mkdir -p /kuldeep574/hello_TYCS
ksp@kali:~$ sudo chown nobody:nogroup /kuldeep574/hello_TYCS
ksp@kali:~$ sudo chmod 777 /kuldeep574/hello_TYCS
ksp@kali:~$ cd /kuldeep574/hello_TYCS
ksp@kali:/kuldeep574/hello_TYCS$ echo 'hello kuldeep' >a.txt
ksp@kali:/kuldeep574/hello_TYCS$ cat a.txt
hello kuldeep
ksp@kali:/kuldeep574/hello_TYCS$ cd
```

- Here I have given the ip address (127.0.0.1) , read write permission in

```
 GNU nano 4.9.2                          /etc/exports                          Modified
# /etc/exports: the access control list for filesystems which may be exported
#               to NFS clients.  See exports(5).
#
# Example for NFSv2 and NFSv3:
# /srv/homes       hostname1(rw,sync,no_subtree_check) hostname2(ro,sync,no_subtree_check)
#
# Example for NFSv4:
# /srv/nfs4        gss/krb5i(rw,sync,fsid=0,crossmnt,no_subtree_check)
# /srv/nfs4/homes  gss/krb5i(rw,sync,no_subtree_check)
#
/kuldeep574/hello_TYCS 127.0.0.1(rw,sync,no_subtree_check)

^G Get Help  ^O Write Out  ^W Where Is  ^K Cut Text  ^J Justify  ^C Cur Pos
^X Exit      ^R Read File  ^\ Replace   ^U Paste Text ^T To Spell ^_ Go To Line
```

- **sudo systemctl restart nfs-kernel-server** restarting the nfs-server.
- **sudo ufw allow from 127.0.0.1 to any port nfs** this command is used to is give the ip address from where nfs server heve to connect with server.
- **Sudo ufw status** to check the status.

```
ksp@kali:~$ sudo nano /etc/exports
ksp@kali:~$ sudo exportfs -a
ksp@kali:~$ sudo systemctl restart nfs-kernel-server
ksp@kali:~$ sudo ufw allow from 127.0.0.1 to any port nfs
Skipping adding existing rule
ksp@kali:~$ sudo ufw status
Status: active

To                         Action      From
--                         ------      ----
22/tcp                     ALLOW       Anywhere
2049                       ALLOW       127.0.0.1
Samba                      ALLOW       Anywhere
Samba                      ALLOW       192.168.56.0/24
Samba                      ALLOW       10.0.2.0/24
123/udp                    ALLOW       Anywhere
22/tcp (v6)                ALLOW       Anywhere (v6)
Samba (v6)                 ALLOW       Anywhere (v6)
123/udp (v6)               ALLOW       Anywhere (v6)
```

- **sudo apt-get update** with this we can get the new update.
- **sudo apt-get install nfs-common** installing the package nfs-common,

```
ksp@kali:~$ sudo apt-get update
Hit:1 http://repo.mysql.com/apt/ubuntu bionic InRelease
Hit:2 http://ftp.harukasan.org/kali kali-rolling InRelease
Reading package lists ... Done
ksp@kali:~$ sudo apt-get install nfs-common
Reading package lists ... Done
Building dependency tree
Reading state information ... Done
nfs-common is already the newest version (1:1.3.4-4).
0 upgraded, 0 newly installed, 0 to remove and 1035 not upgraded.
```

- creating the client directory where we have to send the file from **/kuldeep574/hello_TYCS** to **/kuldeep574/hello_TYCS_client**
- **sudo mount 127.0.0.1:/kuldeep574/hello_TYCS /kuldeep574/hello_TYCS_client**
  this exporting the files from **/kuldeep574/hello_TYCS** to **/kuldeep574/hello_TYCS_client .**
- **ls** to list the files or directory.

```
ksp@kali:~$ sudo mkdir -p /kuldeep574/hello_TYCS_client
ksp@kali:~$ sudo mount 127.0.0.1:/kuldeep574/hello_TYCS /kuldeep574/hello_TYCS_client
ksp@kali:~$ ls
dead.letter  Downloads  hello_kul  kuldeep.txt                        Pictures     systemctl
Desktop      enable     ksp        Music                              Public       Templates
Documents    hello_ksp  ksp6065    mysql-apt-config_0.8.15-1_all.deb  samba_shared Videos
```

- **cd** going in the client directory
- **ls** listing the files
- **cat** to view the file

```
ksp@kali:~$ cd /kuldeep574/hello_TYCS_client
ksp@kali:/kuldeep574/hello_TYCS_client$ ls
a.txt
ksp@kali:/kuldeep574/hello_TYCS_client$ cat a.txt
hello kuldeep
ksp@kali:/kuldeep574/hello_TYCS_client$ done roll no 574
```

Video link (practical 3):

- https://drive.google.com/file/d/10L2U7LwPiGzKgZQlb2dYkF1CCyrak3TL/view?usp= sharing

Practical 4

Aim: SSH Server - Password Authentication Configure SSH server.

Theory:

- **OpenSSH** is a free open source set of computer tools used to provide secure and encrypted communication over a computer network by using the **ssh** protocol.
- **OpenSSH** is developed by the Open BSD group and it is released under **Simplified BSD License**

Steps:

- installing the openssh-server

```
ksp@kali:~$ sudo apt-get install -y openssh-server
Reading package lists ... Done
Building dependency tree
Reading state information ... Done
openssh-server is already the newest version (1:8.3p1-1).
0 upgraded, 0 newly installed, 0 to remove and 1033 not upgraded.
```

- now enable the ssh server.

```
ksp@kali:~$ sudo systemctl enable ssh
Synchronizing state of ssh.service with SysV service script with /lib/systemd/systemd-sysv-inst
all.
Executing: /lib/systemd/systemd-sysv-install enable ssh
```

- starting the ssh server and checking the status of the server.

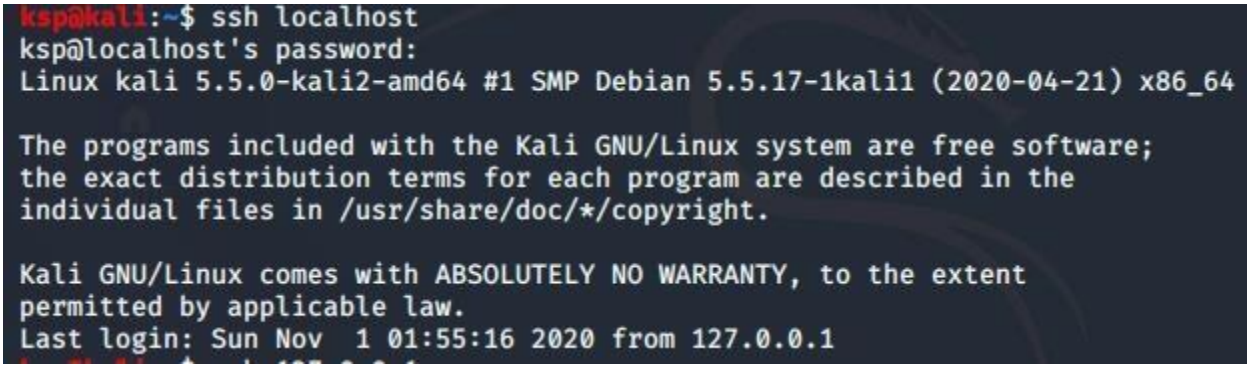
```
ksp@kali:~$ sudo systemctl start ssh
ksp@kali:~$ sudo systemctl status ssh
● ssh.service - OpenBSD Secure Shell server
     Loaded: loaded (/lib/systemd/system/ssh.service; enabled; vendor preset: disabled)
     Active: active (running) since Sun 2020-11-01 01:47:43 IST; 15min ago
       Docs: man:sshd(8)
             man:sshd_config(5)
   Main PID: 15195 (sshd)
      Tasks: 1 (limit: 3524)
     Memory: 4.8M
     CGroup: /system.slice/ssh.service
             └─15195 sshd: /usr/sbin/sshd -D [listener] 0 of 10-100 startups

Nov 01 01:47:43 kali sshd[15195]: Server listening on :: port 22.
Nov 01 01:47:43 kali systemd[1]: Started OpenBSD Secure Shell server.
Nov 01 01:49:32 kali sshd[16302]: pam_unix(sshd:auth): authentication failure; logname= uid=0 >
Nov 01 01:49:34 kali sshd[16302]: Failed password for ksp from ::1 port 55596 ssh2
Nov 01 01:49:51 kali sshd[16302]: Accepted password for ksp from ::1 port 55596 ssh2
Nov 01 01:49:51 kali sshd[16302]: pam_unix(sshd:session): session opened for user ksp by (uid=>
Nov 01 01:50:14 kali sshd[16782]: Connection closed by 127.0.0.1 port 45682 [preauth]
Nov 01 01:52:02 kali sshd[17657]: Connection closed by 127.0.0.1 port 45684 [preauth]
Nov 01 01:55:16 kali sshd[18898]: Accepted password for ksp from 127.0.0.1 port 45686 ssh2
Nov 01 01:55:16 kali sshd[18898]: pam_unix(sshd:session): session opened for user ksp by (uid=>
```

- **sudo apt-get install ufw** installing the ufw package

```
ksp@kali:~$ sudo apt-get install ufw
Reading package lists ... Done
Building dependency tree
Reading state information ... Done
ufw is already the newest version (0.36-7).
0 upgraded, 0 newly installed, 0 to remove and 1033 not upgraded.
ksp@kali:~$ sudo ufw allow ssh
Skipping adding existing rule
Skipping adding existing rule (v6)
ksp@kali:~$ sudo ufw reload
Firewall reloaded
```

- initialized the connection of ssh and the localhost.



- **ssh 127.0.0.1** it is used to give the ip address to the ssh server.
- and it is working fine.

Video link (practical 4):

- https://drive.google.com/file/d/1zsiZ8sFUfdx-IEbzvQ3EPYtm9K-_O_EtP/view?usp=sharing

Practical 5

Aim: Install Samba to share folders or files between Windows and Linux.

Theory:

- **Samba** provide file and print sharing service between **Linux** and Window system.
- **Samba** allows **Linux** to interact with Window client, **Server**, member of Active Directory, Primary domain controller, or member **server**.

Steps:

- **sudo apt-get –y install samba** used to install the samba server in the system.

```
ksp@kali:~$ sudo apt-get -y install samba
[sudo] password for ksp:
Reading package lists ... Done
Building dependency tree
Reading state information ... Done
samba is already the newest version (2:4.12.5+dfsg-3).
0 upgraded, 0 newly installed, 0 to remove and 1033 not upgraded.
```

- created the samba_shared in /home/ksp
- created the text file in the samba_shared directory that we have to share on the network. Also listing the files.

```
ksp@kali:~$ mkdir /home/ksp/samba_shared
mkdir: cannot create directory '/home/ksp/samba_shared': File exists
ksp@kali:~$ ls /home/ksp/samba_shared
a.txt  hello.txt  ksp6065.txt  smb.conf
```

- now configuring the sab.conf directory

```
ksp@kali:~$ sudo nano /etc/samba/smb.conf
ksp@kali:~$ sudo nano /etc/samba/smb.conf
```

- here I have given the path where the samba server has to find the path i.e
  /home/ksp/samba_shared
  browserable = yes
  read only = yes

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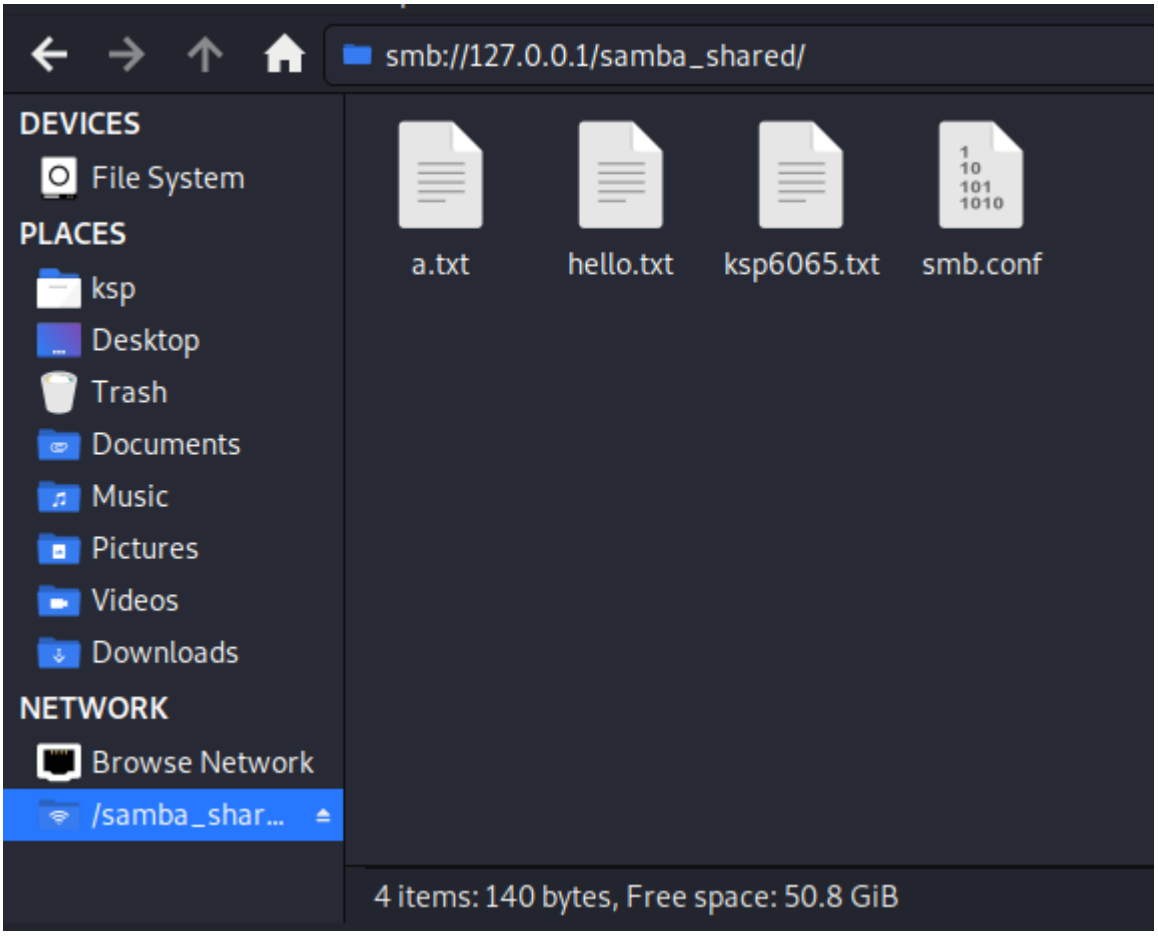
```
  GNU nano 4.9.2                          /etc/samba/smb.conf
   browseable = no
   path = /var/spool/samba
   printable = yes
   guest ok = no
   read only = yes
   create mask = 0700

# Windows clients look for this share name as a source of downloadable
# printer drivers
[print$]
   comment = Printer Drivers
   path = /var/lib/samba/printers
   browseable = yes
   read only = yes
   guest ok = no
# Uncomment to allow remote administration of Windows print drivers.
# You may need to replace 'lpadmin' with the name of the group your
# admin users are members of.
# Please note that you also need to set appropriate Unix permissions
# to the drivers directory for these users to have write rights in it
;   write list = root, @lpadmin
[samba_shared]
  comment = HELLO WORLD
  path = /home/ksp/samba_shared
  browserable = yes
  read only = yes
```

- **sudo systemctl start smbd** used to start the smbd server.
- nmbd server is started at the next command.
- **sudo ufw allow ssh** this is used to allow the smbd and nmbd server
- **sudo smbpasswd –a ksp** giving the password that I hava created while installing the samba server.

```
ksp@kali:~$ sudo systemctl start smbd
ksp@kali:~$ sudo systemctl start nmbd
ksp@kali:~$ sudo ufw allow ssh
Skipping adding existing rule
Skipping adding existing rule (v6)
ksp@kali:~$ sudo smbpasswd -a ksp
New SMB password:
Retype new SMB password:
ksp@kali:~$
```

- now set in the command line.
- Came in home directory and in that go on network click on browse network.
- And given the search the samba server address as shown in pictures **(smb://127.0.0.1/samba_shared/)**
- Now login as register user and put the valid crendenitials there,
- After valid login we can get the folder there that we had created at step 2.
- here I have got all the text files.



Video link (practical 5) :

- https://drive.google.com/file/d/1zZIc_mMcUJBiGaQdGGPokSzUiIvoKoXB/view? usp=sharing

Practical 6

Aim: Configure NTP, Install and Configure NTP Server, Configure NTP Client.

Theory:

- **NTP** stands for Network Time Protocol. It is used to synchronize the time on your **Linux** system with a centralized **NTP server**.
- A local **NTP server** on the network can be synchronized with an external timing source to keep all the **servers** in your organization in-sync with an accurate time.

Steps:

- installed the ntp server and **sntp –version** is used to check the version of the ntp server.
- And check the permission of ntp.conf directory.

```
ksp@kali:~$ sntp --version
sntp 4.2.8p14@1.3728-o Tue Mar 10 07:38:28 UTC 2020 (1)
ksp@kali:~$ cd /etc
ksp@kali:/etc$ ls -lrth *ntp.conf*
-rw-r--r-- 1 root root 2.1K Oct  7 14:20 ntp.conf
```

- **Cat ntp.conf** to view the directory.

```
ksp@kali:/etc$ cat ntp.conf
```

- **sudo ntpq –p** to view the details.

```
ksp@kali:/etc$ sudo ntpq -p
     remote           refid      st t when poll reach   delay   offset  jitter
==============================================================================
 0.debian.pool.n .POOL.          16 p    -   64    0    0.000   +0.000   0.000
 1.debian.pool.n .POOL.          16 p    -   64    0    0.000   +0.000   0.000
 2.debian.pool.n .POOL.          16 p    -   64    0    0.000   +0.000   0.000
 3.debian.pool.n .POOL.          16 p    -   64    0    0.000   +0.000   0.000
#45.86.70.11     173.212.222.171  2 u   40   64  177  273.482  +13.431  10.020
+103.134.252.11  104.211.76.226   2 u   61   64  377   76.509   -2.224  21.945
#electrode.felix 56.1.129.236     3 u   34   64  177  144.919  -13.273 152.137
+time.cloudflare 10.57.8.6        3 u   60   64  377   61.945   -1.306  10.544
#85.199.214.99 (  .GPS.           1 u   31   64  377  221.307  -33.077  30.882
+5.189.141.35 (m 17.253.54.123    2 u    1   64  377  151.015   -3.773  13.446
+ntp.in.eria.one 14.139.60.102    2 u    5   64  377   43.608   -0.233  28.523
+139.59.15.185   179.43.76.147     2 u    4   64  377   61.960   +4.478  24.106
+time.cloudflare 10.57.8.6        3 u    5   64  377   47.821   -4.034   9.048
#broadband-77-37 89.109.251.23    2 u    1   64  377  216.189  -30.409  11.404
+95.216.24.230   129.70.132.33     3 u    7   64  377  179.268   +0.431  46.643
#fayetteville.nc 42.20.202.230    2 u    5   64  377  279.066   +6.294  71.960
-185.216.231.25  17.253.26.125     2 u    2   64  373  274.479   +7.639   9.541
*104.211.76.226  .MSFT.           1 u   67   64  377   26.856  -10.344  14.345
+static.226.144. 194.58.200.20    2 u   67   64  377  174.369   -6.251   7.359
```

- sudo ufw allow ntp.

```
ksp@kali:/etc$ sudo ufw allow ntp
Skipping adding existing rule
Skipping adding existing rule (v6)
```

- started the ntp service and check the status with the help of **sudo systemctl start ntp.**

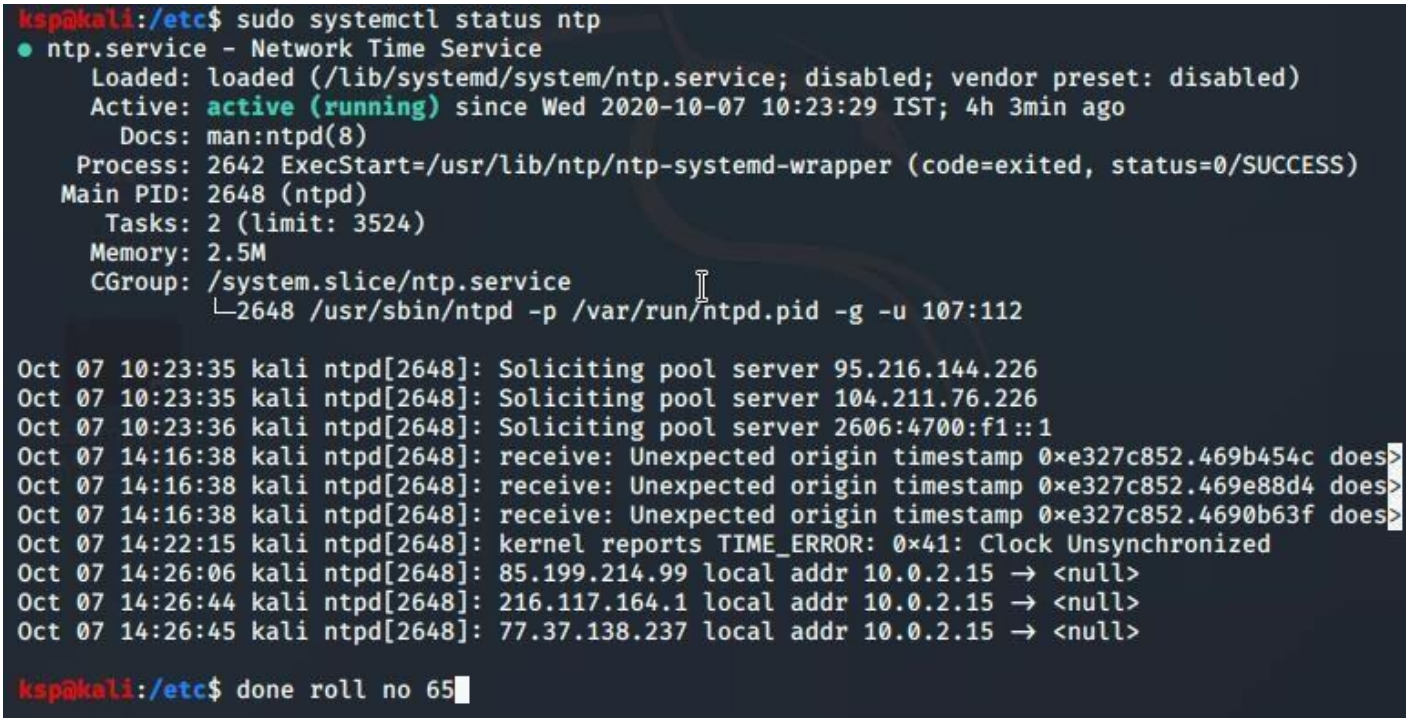
Name : kuldeep sushil patel Roll no:574

```
ksp@kali:/etc$ sudo systemctl start ntp
ksp@kali:/etc$ sudo systemctl status ntp
● ntp.service - Network Time Service
     Loaded: loaded (/lib/systemd/system/ntp.service; disabled; vendor preset: disabled)
     Active: active (running) since Wed 2020-10-07 10:23:29 IST; 4h 2min ago
       Docs: man:ntpd(8)
    Process: 2642 ExecStart=/usr/lib/ntp/ntp-systemd-wrapper (code=exited, status=0/SUCCESS)
   Main PID: 2648 (ntpd)
      Tasks: 2 (limit: 3524)
     Memory: 2.5M
     CGroup: /system.slice/ntp.service
             └─2648 /usr/sbin/ntpd -p /var/run/ntpd.pid -g -u 107:112

Oct 07 10:23:34 kali ntpd[2648]: Soliciting pool server 216.117.164.1
Oct 07 10:23:34 kali ntpd[2648]: Soliciting pool server 95.216.24.230
Oct 07 10:23:35 kali ntpd[2648]: Soliciting pool server 95.216.144.226
Oct 07 10:23:35 kali ntpd[2648]: Soliciting pool server 104.211.76.226
Oct 07 10:23:36 kali ntpd[2648]: Soliciting pool server 2606:4700:f1::1
Oct 07 14:16:38 kali ntpd[2648]: receive: Unexpected origin timestamp 0xe327c852.469b454c does>
Oct 07 14:16:38 kali ntpd[2648]: receive: Unexpected origin timestamp 0xe327c852.469e88d4 does>
Oct 07 14:16:38 kali ntpd[2648]: receive: Unexpected origin timestamp 0xe327c852.4690b63f does>
Oct 07 14:22:15 kali ntpd[2648]: kernel reports TIME_ERROR: 0x41: Clock Unsynchronized
Oct 07 14:26:06 kali ntpd[2648]: 85.199.214.99 local addr 10.0.2.15 → <null>
lines 1-21/21 (END)
```

- **sudo ntpq -p**

```
ksp@kali:/etc$ sudo ntpq -p
     remote           refid      st t when poll reach   delay   offset  jitter
==============================================================================
 0.debian.pool.n .POOL.          16 p    -   64    0    0.000   +0.000   0.000
 1.debian.pool.n .POOL.          16 p    -   64    0    0.000   +0.000   0.000
 2.debian.pool.n .POOL.          16 p    -   64    0    0.000   +0.000   0.000
 3.debian.pool.n .POOL.          16 p    -   64    0    0.000   +0.000   0.000
#45.86.70.11     173.212.222.171  2 u   42   64  377  273.482  +13.431   7.517
+103.134.252.11  104.211.76.226   2 u   63   64  377   76.509   -2.224  21.695
#electrode.felix 56.1.129.236     3 u   38   64  377  144.919  -13.273 156.832
+time.cloudflare 10.57.8.6        3 u   65   64  377   61.945   -1.306  10.546
+5.189.141.35 (m 17.253.54.123    2 u   61   64  377  151.015   -3.773  13.446
+ntp.in.eria.one 14.139.60.102    2 u   65   64  377   43.608   -0.233  28.523
+139.59.15.185   179.43.76.147    2 u   64   64  377   61.960   +4.478  24.106
+time.cloudflare 10.57.8.6        3 u   65   64  377   47.821   -4.034   9.048
#broadband-77-37 89.109.251.23    2 u   61   64  377  216.189  -30.409  11.404
+95.216.24.230   129.70.132.33    3 u   67   64  377  179.268   +0.431  46.643
#fayetteville.nc 42.20.202.230    2 u   65   64  377  279.066   +6.294  71.960
-185.216.231.25  17.253.26.125    2 u   62   64  373  274.479   +7.639   9.541
*104.211.76.226  .MSFT.           1 u   60   64  377   26.856  -10.344  14.573
+static.226.144. 194.58.200.20    2 u   59   64  377  174.369   -6.251   8.935
ksp@kali:/etc$
```

- now checked the status of ntp server.
- Its running properly and the practical done.



Video link (practical 6):

- https://drive.google.com/file/d/11Gorz55PnnwiO137aR3tIea6zsrjIZhY/view?usp=s haring

Name : kuldeep sushil patel Roll no:574

Practical 7

Aim: Install MySQL to configure database server.

Theory:

- **MySQL** is an Oracle-backed open source relational database management system (RDBMS) based on Structured Query Language (SQL).
- **MySQL** runs on virtually all platforms, including **Linux**, UNIX and Windows.
- **MySQL** is an important component of an open source enterprise stack called LAMP.

Steps:

- **sudo apt update** updated the all the directory.

```
ksp@kali:~$ sudo apt update
Get:1 http://ftp.harukasan.org/kali kali-rolling InRelease [30.5 kB]
Fetched 30.5 kB in 3s (10.6 kB/s)
Reading package lists ... Done
Building dependency tree
Reading state information ... Done
1031 packages can be upgraded. Run 'apt list --upgradable' to see them.
```

- install the wget package.

```
ksp@kali:~$ sudo apt install -y wget
Reading package lists ... Done
Building dependency tree
Reading state information ... Done
wget is already the newest version (1.20.3-1+b3).
0 upgraded, 0 newly installed, 0 to remove and 1031 not upgraded.
```

- and again updated.

```
ksp@kali:~$ sudo apt update
Get:1 http://ftp.harukasan.org/kali kali-rolling InRelease [30.5 kB]
Fetched 30.5 kB in 6s (5,019 B/s)
Reading package lists ... Done
Building dependency tree
Reading state information ... Done
1031 packages can be upgraded. Run 'apt list --upgradable' to see them.
```

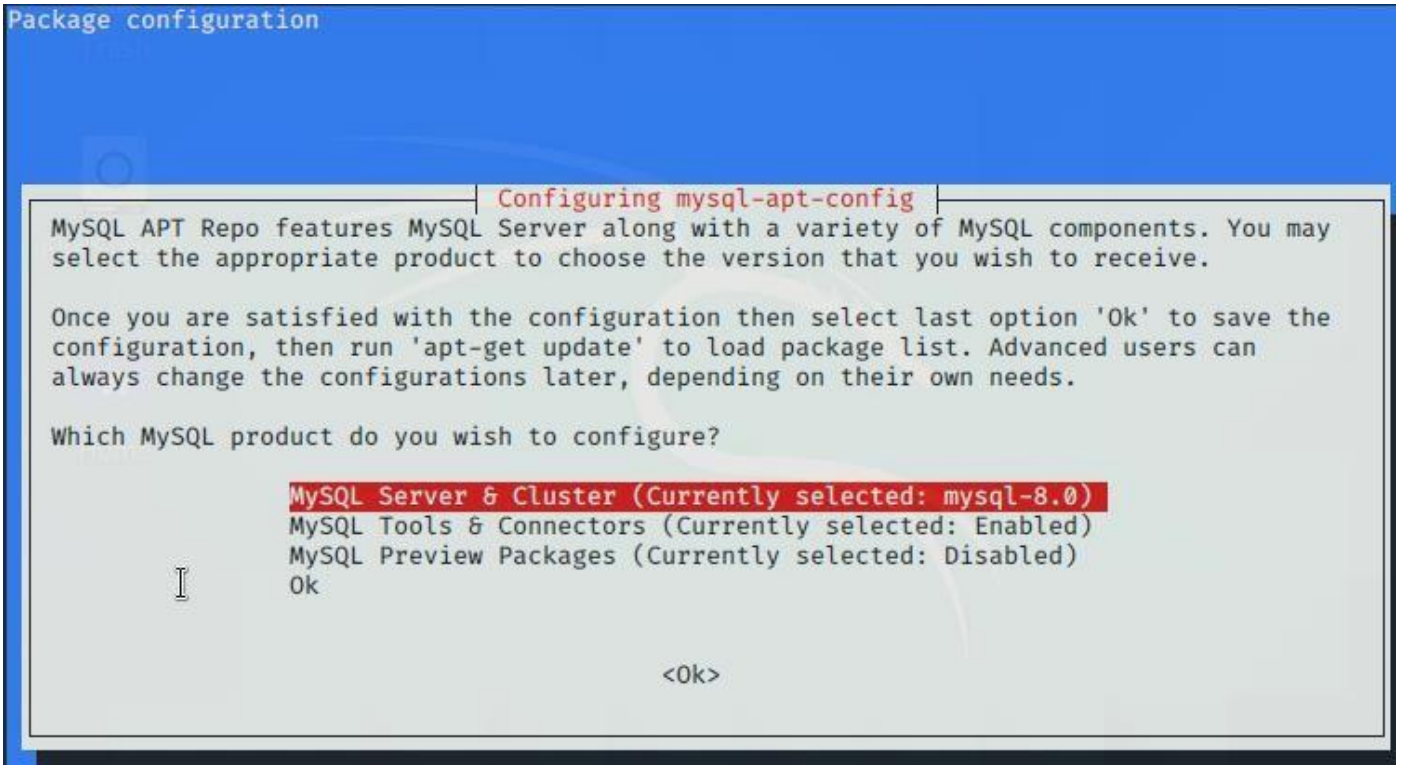
- install the mysql.

```
ksp@kali:~$ sudo wget https://dev.mysql.com/get/mysql-apt-config_0.8.15-1_all.deb
--2020-10-29 11:33:30--  https://dev.mysql.com/get/mysql-apt-config_0.8.15-1_all.deb
Resolving dev.mysql.com (dev.mysql.com) ... 137.254.60.11
Connecting to dev.mysql.com (dev.mysql.com)|137.254.60.11|:443 ... connected.
HTTP request sent, awaiting response ... 302 Found
Location: https://repo.mysql.com//mysql-apt-config_0.8.15-1_all.deb [following]
--2020-10-29 11:33:31--  https://repo.mysql.com//mysql-apt-config_0.8.15-1_all.deb
Resolving repo.mysql.com (repo.mysql.com) ... 23.57.13.25
Connecting to repo.mysql.com (repo.mysql.com)|23.57.13.25|:443 ... connected.
HTTP request sent, awaiting response ... 200 OK
Length: 35532 (35K) [application/x-debian-package]
Saving to: 'mysql-apt-config_0.8.15-1_all.deb'

           mysql-apt-c   0%[                                    ]       0  --.-KB/s
```

- sudo dpkg –i mysql

```
ksp@kali:~$ sudo dpkg -i mysql-apt-config_0.8.15-1_all.deb
dpkg: warning: files list file for package 'mysql-apt-config' missing; assuming
files currently installed
(Reading database ... 50%
```

- **selected the mysql 8.0**
- **and click on ok.**



- updated the directory.

```
ksp@kali:~$ sudo apt update
Get:1 http://repo.mysql.com/apt/ubuntu bionic InRelease [19.4 kB]
Get:2 http://ftp.harukasan.org/kali kali-rolling InRelease [30.5 kB]
Get:3 http://repo.mysql.com/apt/ubuntu bionic/mysql-8.0 Sources [961 B]
Get:4 http://repo.mysql.com/apt/ubuntu bionic/mysql-apt-config amd64 Packages [563 B]
Get:5 http://repo.mysql.com/apt/ubuntu bionic/mysql-8.0 amd64 Packages [8,006 B]
Get:6 http://repo.mysql.com/apt/ubuntu bionic/mysql-tools amd64 Packages [6,877 B]
Fetched 66.3 kB in 4s (15.0 kB/s)
Reading package lists... Done
Building dependency tree
Reading state information... Done
1031 packages can be upgraded. Run 'apt list --upgradable' to see them.
```

- **sudo apt-get install mysql-community-server** installed the mysql server.

```
ksp@kali:~$ sudo apt-get install mysql-community-server
Reading package lists ... Done
Building dependency tree
Reading state information ... Done
The following additional packages will be installed:
  libaio1 libmecab2 mecab-ipadic mecab-ipadic-utf8 mecab-utils mysql-client mysql-common
  mysql-community-client mysql-community-client-core mysql-community-client-plugins
  mysql-community-server-core
The following NEW packages will be installed:
  libaio1 libmecab2 mecab-ipadic mecab-ipadic-utf8 mecab-utils mysql-client mysql-common
  mysql-community-client mysql-community-client-core mysql-community-client-plugins
  mysql-community-server mysql-community-server-core
0 upgraded, 12 newly installed, 0 to remove and 1031 not upgraded.
Need to get 31.0 MB of archives.
After this operation, 253 MB of additional disk space will be used.
Do you want to continue? [Y/n] y
Get:1 http://repo.mysql.com/apt/ubuntu bionic/mysql-8.0 amd64 mysql-common amd64 8.0.22-1ubuntu
18.04 [87.1 kB]
```

- updated the new mysql and all directory.

```
ksp@kali:~$ sudo apt update
Hit:1 http://repo.mysql.com/apt/ubuntu bionic InRelease
Get:2 http://ftp.harukasan.org/kali kali-rolling InRelease [30.5 kB]
Fetched 30.5 kB in 3s (10.4 kB/s)
Reading package lists ... Done
Building dependency tree
Reading state information ... Done
1031 packages can be upgraded. Run 'apt list --upgradable' to see them.
```

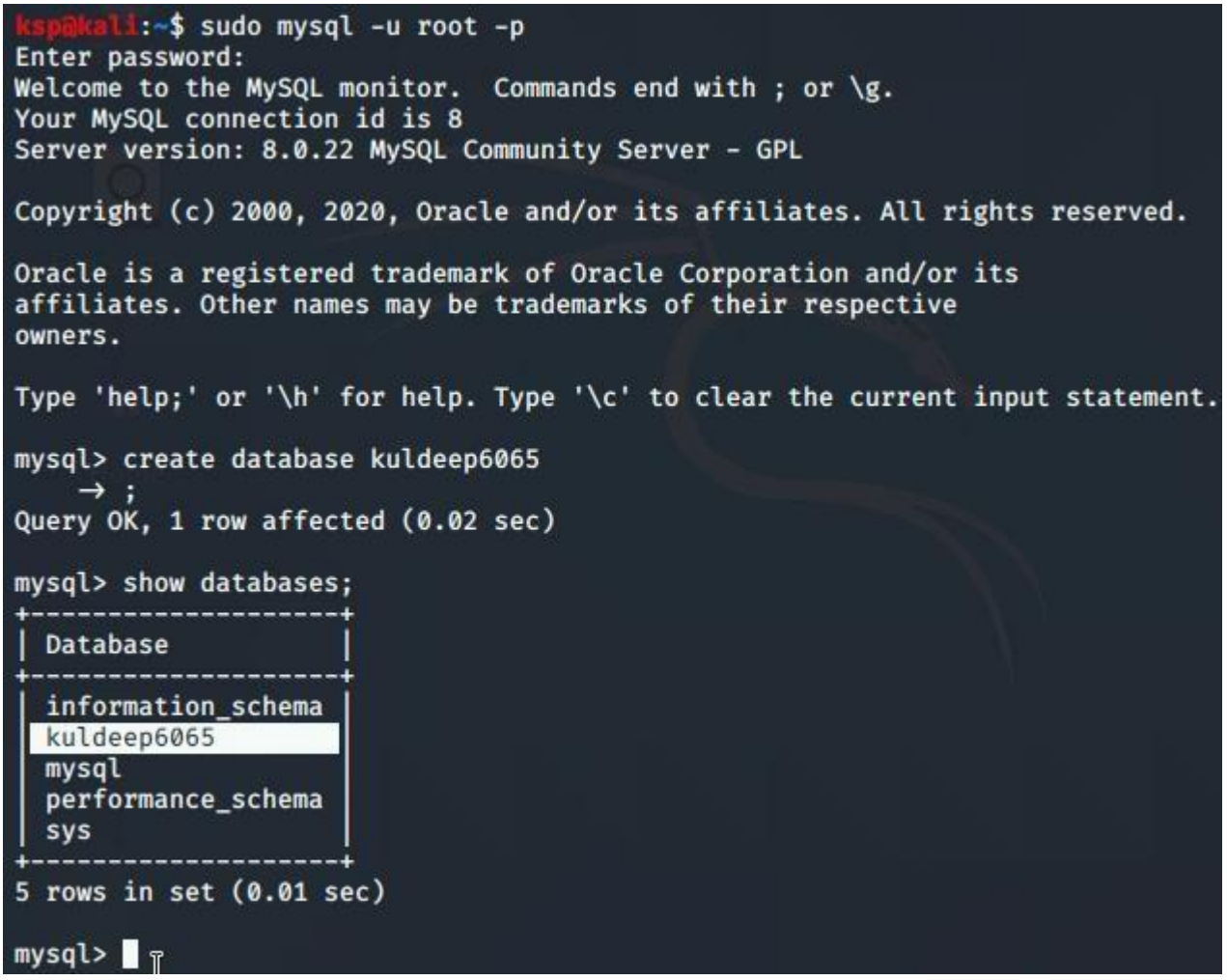
- **sudo systemctl eable –now mysql** with I hve started the sql in now option.

```
ksp@kali:~$ sudo systemctl enable --now mysql
Created symlink /etc/systemd/system/multi-user.target.wants/mysql.service → /lib/systemd/system
/mysql.service.
```

- started the mysql and checked the status.
- Here it is running properly.

```
ksp@kali:~$ sudo systemctl start mysql
ksp@kali:~$ sudo systemctl status mysql
● mysql.service - MySQL Community Server
     Loaded: loaded (/lib/systemd/system/mysql.service; enabled; vendor preset: disabled)
     Active: active (running) since Thu 2020-10-29 11:38:10 IST; 32s ago
       Docs: man:mysqld(8)
             http://dev.mysql.com/doc/refman/en/using-systemd.html
    Process: 12213 ExecStartPre=/usr/share/mysql-8.0/mysql-systemd-start pre (code=exited, sta>
   Main PID: 12450 (mysqld)
     Status: "Server is operational"
      Tasks: 38 (limit: 3524)
     Memory: 337.6M
     CGroup: /system.slice/mysql.service
             └─12450 /usr/sbin/mysqld

Oct 29 11:37:46 kali su[12257]: (to mysql) root on none
Oct 29 11:37:46 kali su[12257]: pam_unix(su-l:session): session opened for user mysql by (uid=>
Oct 29 11:38:09 kali mysqld[12450]: 2020-10-29T06:08:09.233646Z 0 [System] [MY-010116] [Server>
Oct 29 11:38:09 kali mysqld[12450]: 2020-10-29T06:08:09.246076Z 1 [System] [MY-013576] [InnoDB>
Oct 29 11:38:09 kali mysqld[12450]: 2020-10-29T06:08:09.870567Z 1 [System] [MY-013577] [InnoDB>
Oct 29 11:38:10 kali mysqld[12450]: 2020-10-29T06:08:10.031967Z 0 [System] [MY-011323] [Server>
Oct 29 11:38:10 kali mysqld[12450]: 2020-10-29T06:08:10.126488Z 0 [Warning] [MY-010068] [Serve>
Oct 29 11:38:10 kali mysqld[12450]: 2020-10-29T06:08:10.126867Z 0 [System] [MY-013602] [Server>
Oct 29 11:38:10 kali mysqld[12450]: 2020-10-29T06:08:10.170241Z 0 [System] [MY-010931] [Server>
Oct 29 11:38:10 kali systemd[1]: Started MySQL Community Server.
```

- **sudo mysql –u root –p** started the mysql
- enter the password
- **create database kuldeep6065;**
- **show databases;**
- and it is working fine done.



Video link(practical 7):

- https://drive.google.com/file/d/1XirPicN_8tBizRe8xlFOPasWqMkijlE8/view?usp=sh aring

Name : kuldeep sushil patel Roll no:574

Practical 8

Aim: configure the nis in order to share the user accounts in your local network.

Theory:

- The Network Information Service, or **NIS** (originally called Yellow Pages or YP),
- client–**server** directory service protocol for distributing system configuration data such as user and host names between computers on a computer network.

Steps:

- install the nis server.

```
ksp@kali:~$ sudo apt-get install -y nis
Reading package lists ... Done
Building dependency tree
Reading state information ... Done
nis is already the newest version (3.17.1-5).
0 upgraded, 0 newly installed, 0 to remove and 1033 not upgraded.
```

- **sudo nano /etc/default/nis** to configure the nis server

```
ksp@kali:~$ sudo nano /etc/default/nis
```

- here I changed the NISSERVER = master
  NISCLIENT = false

```
File  Actions  Edit  View  Help
  GNU nano 4.9.2                          /etc/default/nis
#
# /etc/defaults/nis     Configuration settings for the NIS daemons.
#

# Are we a NIS server and if so what kind (values: false, slave, master)?
NISSERVER=master

# Are we a NIS client?
NISCLIENT=false

# Location of the master NIS password file (for yppasswdd).
# If you change this make sure it matches with /var/yp/Makefile.
YPPWDDIR=/etc

# Do we allow the user to use ypchsh and/or ypchfn ? The YPCHANGEOK
# fields are passed with -e to yppasswdd, see it's manpage.
# Possible values: "chsh", "chfn", "chsh,chfn"
YPCHANGEOK=chsh

# NIS master server.  If this is configured on a slave server then ypinit
# will be run each time NIS is started.
NISMASTER=

# Additional options to be given to ypserv when it is started.
YPSERVARGS=

# Additional options to be given to ypbind when it is started.
                                [ Read 35 lines ]
```

- **sudo nano /etc/ypserv.securenets**

```
ksp@kali:~$ sudo nano /etc/ypserv.securenets
```

- here I written my ip address and netmask as

255.255.255.0 10.0.2.0

```
File  Actions  Edit  View  Help
  GNU nano 4.9.2                        /etc/ypserv.securenets
#
# securenets    This file defines the access rights to your NIS server
#               for NIS clients (and slave servers - ypxfrd uses this
#               file too). This file contains netmask/network pairs.
#               A clients IP address needs to match with at least one
#               of those.
#
#               One can use the word "host" instead of a netmask of
#               255.255.255.255. Only IP addresses are allowed in this
#               file, not hostnames.
#
# Always allow access for localhost
255.0.0.0       127.0.0.0

# This line gives access to everybody. PLEASE ADJUST!
0.0.0.0         0.0.0.0
255.255.255.0   10.0.2.0
```

- **which gmake**

```
ksp@kali:~$ which gmake
/usr/bin/gmake
ksp@kali:~$ sudo dpkg -S `which gmake`
make: /usr/bin/gmake
ksp@kali:~$ sudo systekctl start ypserv
sudo: systekctl: command not found
ksp@kali:~$ sudo systemctl start ypserv
```

- started the ypserv and checked the status.

```
ksp@kali:~$ sudo systemctl status ypserv
● nis.service - LSB: Start NIS client and server daemons.
     Loaded: loaded (/etc/init.d/nis; generated)
     Active: active (running) since Sun 2020-11-01 03:03:43 IST; 1min 22s ago
       Docs: man:systemd-sysv-generator(8)
    Process: 51135 ExecStart=/etc/init.d/nis start (code=exited, status=0/SUCCESS)
      Tasks: 6 (limit: 3524)
     Memory: 2.2M
     CGroup: /system.slice/nis.service
             ├─51144 /usr/sbin/ypserv
             ├─51147 /usr/sbin/rpc.yppasswdd -D /etc -e chsh
             ├─51151 /usr/sbin/rpc.ypxfrd
             └─51158 /usr/sbin/ypbind -broadcast

Nov 01 03:00:46 kali systemd[1]: Starting LSB: Start NIS client and server daemons....
Nov 01 03:00:46 kali nis[51135]: Setting NIS domainname to: kuldeep.
Nov 01 03:01:41 kali ypbind[51158]: broadcast: RPC: Timed out.
Nov 01 03:02:35 kali ypbind[51158]: broadcast: RPC: Timed out.
Nov 01 03:03:29 kali ypbind[51158]: broadcast: RPC: Timed out.
Nov 01 03:03:43 kali nis[51135]: Starting NIS services: ypserv yppasswdd ypxfrd ypbindb
Nov 01 03:03:43 kali nis[51135]: .
Nov 01 03:03:43 kali systemd[1]: Started LSB: Start NIS client and server daemons..
Nov 01 03:04:23 kali ypbind[51158]: broadcast: RPC: Timed out.
```

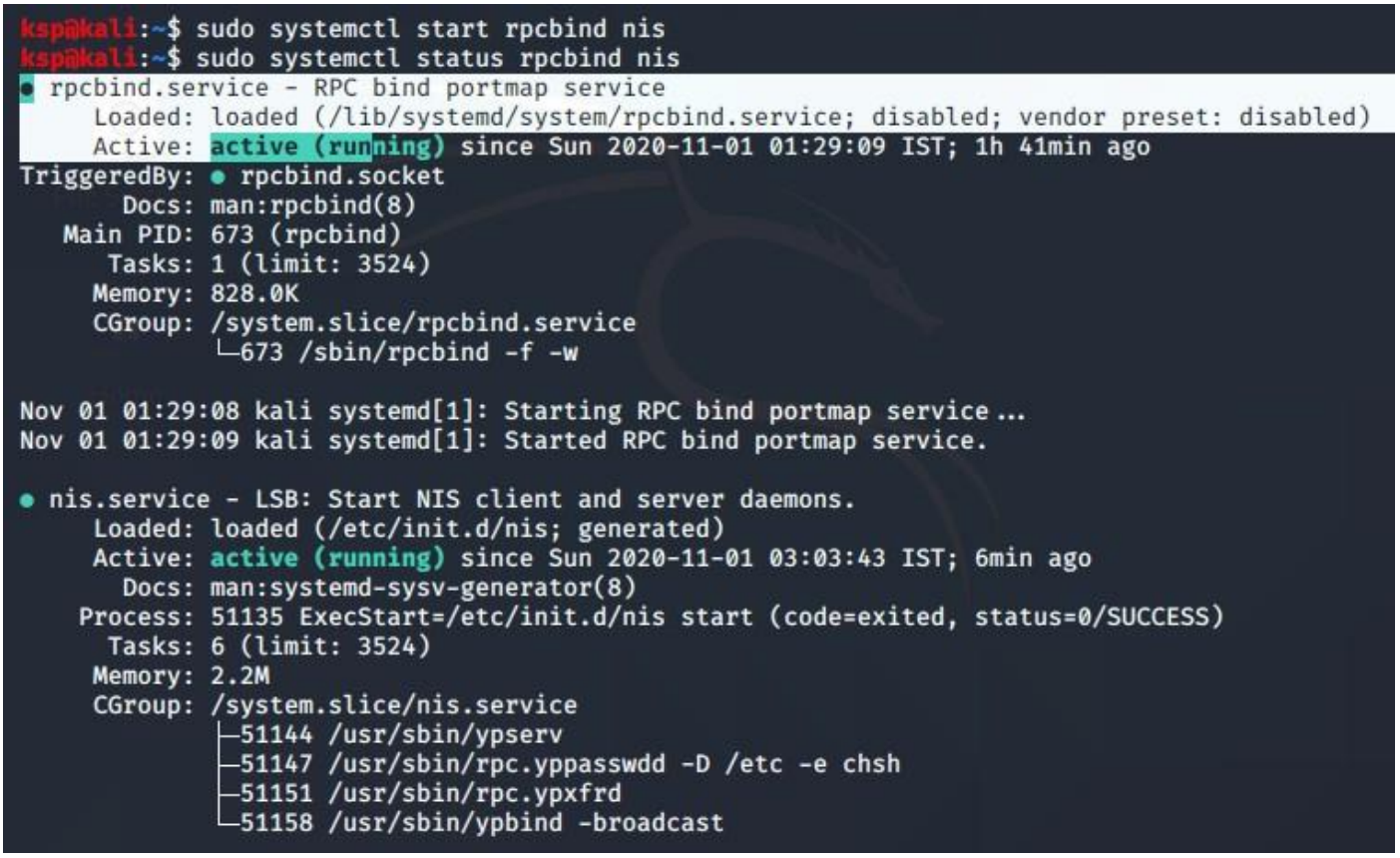
- **sudo /usr/lib/yp/ypinit -m**

```
ksp@kali:~$ sudo /usr/lib/yp/ypinit -m

At this point, we have to construct a list of the hosts which will run NIS
servers.  kali is in the list of NIS server hosts.  Please continue to add
the names for the other hosts, one per line.  When you are done with the
list, type a <control D>.
        next host to add:  kali
        next host to add:
The current list of NIS servers looks like this:

kali

Is this correct?  [y/n: y]  y
We need a few minutes to build the databases ...
Building /var/yp/kuldeep/ypservers ...
Running /var/yp/Makefile ...
gmake[1]: Entering directory '/var/yp/kuldeep'
Updating passwd.byname ...
Updating passwd.byuid ...
Updating group.byname ...
Updating group.bygid ...
Updating hosts.byname ...
Updating hosts.byaddr ...
Updating rpc.byname ...
Updating rpc.bynumber ...
Updating services.byname ...
Updating services.byservicename ...
Updating netid.byname ...
Updating protocols.bynumber ...
Updating protocols.byname ...
Updating netgroup ...
```

- started the nis and status also.

```
ksp@kali:~$ sudo systemctl start nis
ksp@kali:~$ sudo systemctl status nis
● nis.service - LSB: Start NIS client and server daemons.
     Loaded: loaded (/etc/init.d/nis; generated)
     Active: active (running) since Sun 2020-11-01 03:03:43 IST; 5min ago
       Docs: man:systemd-sysv-generator(8)
    Process: 51135 ExecStart=/etc/init.d/nis start (code=exited, status=0/SUCCESS)
      Tasks: 6 (limit: 3524)
     Memory: 2.2M
     CGroup: /system.slice/nis.service
             ├─51144 /usr/sbin/ypserv
             ├─51147 /usr/sbin/rpc.yppasswdd -D /etc -e chsh
             ├─51151 /usr/sbin/rpc.ypxfrd
             └─51158 /usr/sbin/ypbind -broadcast

Nov 01 03:03:29 kali ypbind[51158]: broadcast: RPC: Timed out.
Nov 01 03:03:43 kali nis[51135]: Starting NIS services: ypserv yppasswdd ypxfrd ypbi
Nov 01 03:03:43 kali nis[51135]: .
Nov 01 03:03:43 kali systemd[1]: Started LSB: Start NIS client and server daemons..
Nov 01 03:04:23 kali ypbind[51158]: broadcast: RPC: Timed out.
Nov 01 03:05:17 kali ypbind[51158]: broadcast: RPC: Timed out.
Nov 01 03:06:11 kali ypbind[51158]: broadcast: RPC: Timed out.
Nov 01 03:07:05 kali ypbind[51158]: broadcast: RPC: Timed out.
Nov 01 03:07:59 kali ypbind[51158]: broadcast: RPC: Timed out.
Nov 01 03:08:54 kali ypbind[51158]: broadcast: RPC: Timed out.
```

- **sudo systemctl start rpcbind nis** started the nis and checked the status.



- change the directory.
- **Sudo maked**
- **Cat ypservers**
- **sudo domainname**
- **ping kali** to check the its working fine or not.
- **ping kuldeep.com** checked the my domain whether working fine or not.

```
ksp@kali:~$ cd /var/yp
ksp@kali:/var/yp$ sudo make
gmake[1]: Entering directory '/var/yp/kuldeep'
Updating netid.byname ...
gmake[1]: Leaving directory '/var/yp/kuldeep'
ksp@kali:/var/yp$ sudo nano /etc/hosts
ksp@kali:/var/yp$ sudo nano /etc/yp.conf
ksp@kali:/var/yp$ cat ypservers
kali
ksp@kali:/var/yp$ sudo cat hosts.byname
cat: hosts.byname: No such file or directory
ksp@kali:/var/yp$ sudo domainname
kuldeep
ksp@kali:/var/yp$ ping kali
PING kali (127.0.1.1) 56(84) bytes of data.
64 bytes from kali (127.0.1.1): icmp_seq=1 ttl=64 time=0.047 ms
64 bytes from kali (127.0.1.1): icmp_seq=2 ttl=64 time=0.106 ms
64 bytes from kali (127.0.1.1): icmp_seq=3 ttl=64 time=0.091 ms
64 bytes from kali (127.0.1.1): icmp_seq=4 ttl=64 time=0.091 ms
64 bytes from kali (127.0.1.1): icmp_seq=5 ttl=64 time=0.106 ms
^C
--- kali ping statistics ---
5 packets transmitted, 5 received, 0% packet loss, time 4096ms
rtt min/avg/max/mdev = 0.047/0.088/0.106/0.021 ms
ksp@kali:/var/yp$ ping kuldeep.com
PING kuldeep.com (127.0.0.1) 56(84) bytes of data.
64 bytes from localhost (127.0.0.1): icmp_seq=1 ttl=64 time=0.038 ms
64 bytes from localhost (127.0.0.1): icmp_seq=2 ttl=64 time=0.035 ms
64 bytes from localhost (127.0.0.1): icmp_seq=3 ttl=64 time=0.152 ms
```

- **sudo /usr/lib/yp/ypinit –m**
  name as kali.kuldeep

```
ksp@kali:/var/yp$ sudo /usr/lib/yp/ypinit -m

At this point, we have to construct a list of the hosts which will run NIS
servers.  kali is in the list of NIS server hosts.  Please continue to add
the names for the other hosts, one per line.  When you are done with the
list, type a <control D>.
        next host to add:  kali
        next host to add:  kali.kuldeep
        next host to add:
The current list of NIS servers looks like this:

kali
kali.kuldeep

Is this correct?  [y/n: y]  y
We need a few minutes to build the databases ...
Building /var/yp/kuldeep/ypservers ...
Running /var/yp/Makefile ...
gmake[1]: Entering directory '/var/yp/kuldeep'
Updating passwd.byname ...
Updating passwd.byuid ...
Updating group.byname ...
Updating group.bygid ...
Updating hosts.byname ...
Updating hosts.byaddr ...
Updating rpc.byname ...
Updating rpc.bynumber ...
Updating services.byname ...
Updating services.byservicename ...
```

- **sudo nano /etc/nsswitch.conf**

```
ksp@kali:/var/yp$ sudo nano /etc/nsswitch.conf
```

- here I changed the nis at the end part.

```
  GNU nano 4.9.2                          /etc/nsswitch.conf
# /etc/nsswitch.conf
#
# Example configuration of GNU Name Service Switch functionality.
# If you have the `glibc-doc-reference' and `info' packages installed, try:
# `info libc "Name Service Switch"' for information about this file.

passwd:         files systemd nis
group:          files systemd nis
shadow:         files nis
gshadow:        files

hosts:          files mdns4_minimal [NOTFOUND=return] dns nis
networks:       files

protocols:      db files
services:       db files
ethers:         db files
rpc:            db files

netgroup:       nis
```

- **sudo reboot** rebooting the system and again login with the user name and password that is generated.

```
ksp@kali:/var/yp$ sudo reboot
```

- its working fine done.

Video link (practical 8):

- https://drive.google.com/file/d/13CQLiP6NQw9jzrUjK5qYPUH4SpSF- ak2/view?usp=sharing