RHCSA EXAM PREPERATION (EX200 RHEL9)

Before start examination, Login with RHL ID and Exam Code. Check all the boxes and continue.

Open chat, follow instruction given by Procter and verify yourself and exam environment.

Go to Activities and click on REDHAT icon and you will get your system's basic information of your VM's like IP address, Gateway, DNS, Hostname, root password and Question Paper.

Go to Activities and click on Manage Console: you can find 2 vm's, click on node1: view console.

Questions Solve on Primary Virtual Machine

Que 1: setup a ip address for virtual machine as

- o ip address 172.25.250.10
- o subnet mask (netmask)255.255.255.0
- o Default gateway 172.25.254.254
- o DNS (name server) 172.25.250.254 and
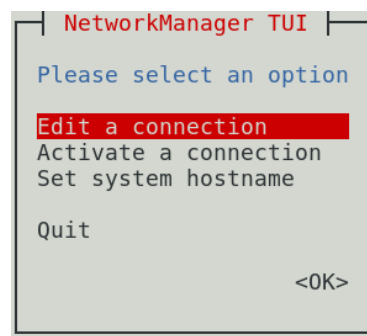- o hostname as servera.lab.example.com

  (Note: In classroom, create new connection and then solve question)

Solution:
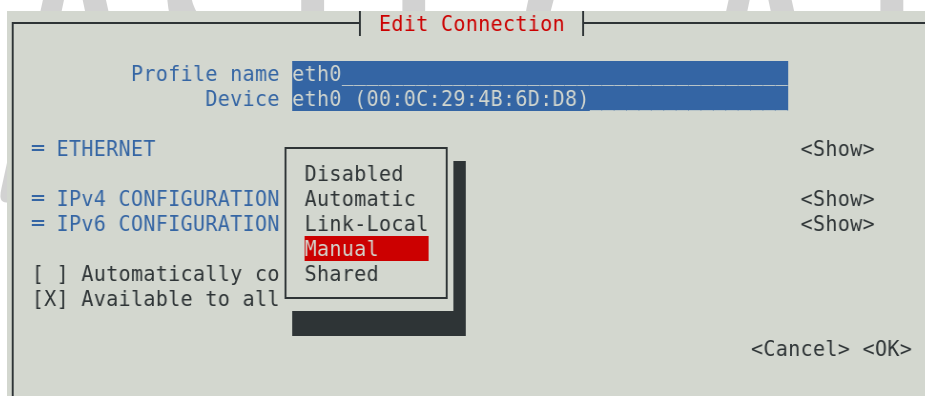
1. Run #nmtui command

[root@servera~]# nmtui

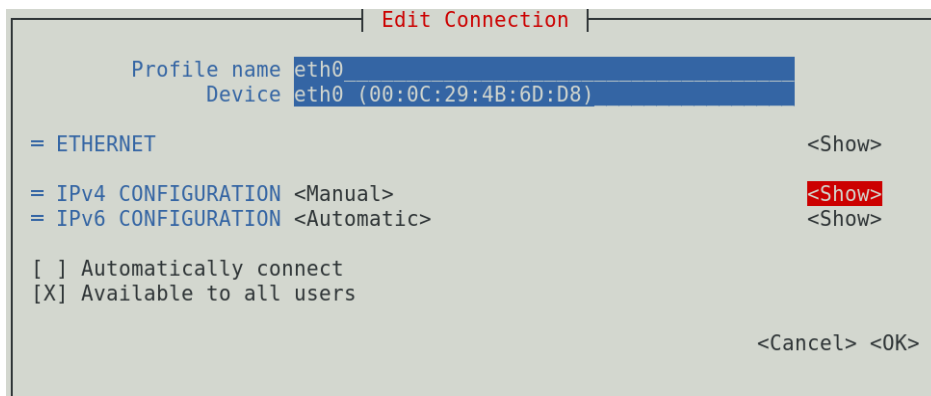**2.** Select **"Edit a connection"** option from NetworkManager TUI.

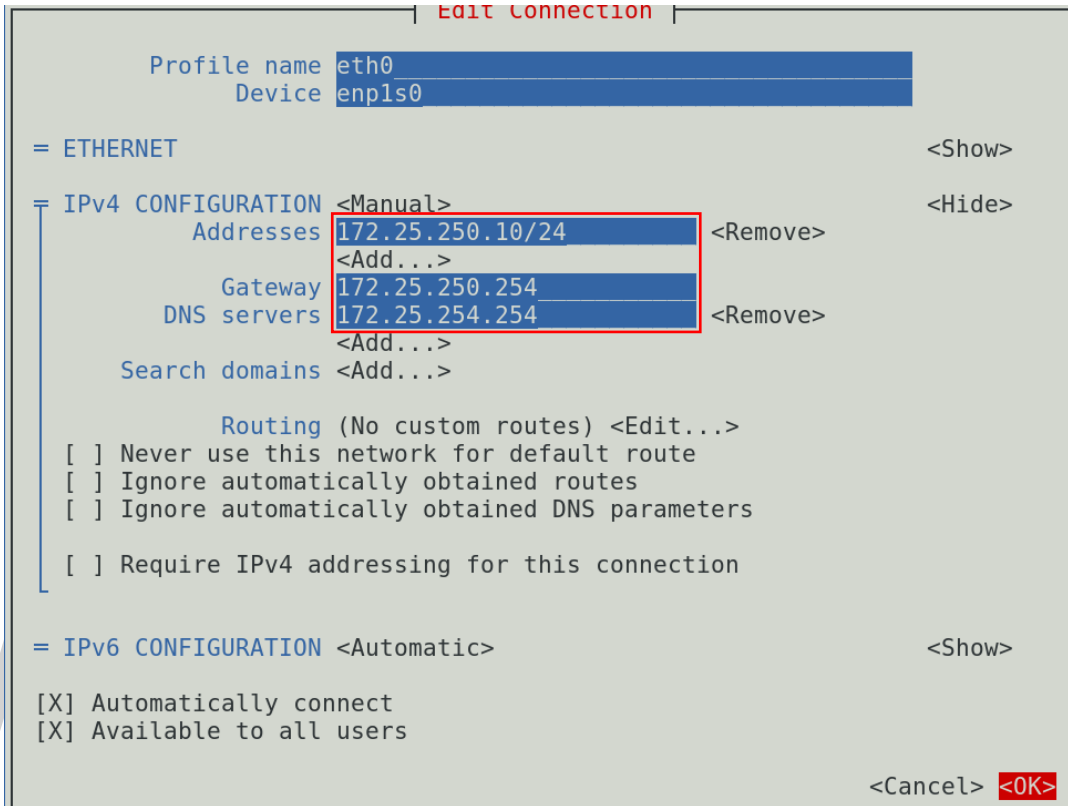**3.** Select an existing connection and hit to **"Edit"**   (*con-name might might be change in exam*)

```
┌──────────────────┐
│ ┌──────────┐      │
│ │Ethernet ↑│  <Add>      │
│ │  eth0    │  <Edit...>  │
│ │          │  <Delete>   │
│ │         █│             │
│ │          │             │
│ │          │             │
│ │         ↓│  <Back>     │
│ └──────────┘             │
└──────────────────┘
```

4. Select **IPv4 Configuration** as "**Manual**"

```
┤ Edit Connection ├
        Profile name eth0
             Device eth0 (00:0C:29:4B:6D:D8)

= ETHERNET                                          <Show>
                      ┌─────────┐
= IPv4 CONFIGURATION  │Disabled │                  <Show>
= IPv6 CONFIGURATION  │Automatic│                  <Show>
                      │Link-Local│
                      │Manual   │
[ ] Automatically co  │Shared   │
[X] Available to all  └─────────┘

                                              <Cancel> <OK>
```

5. Hit on **<show>** button in front of **IPv4 Configuration** .

```
┤ Edit Connection ├
        Profile name eth0
             Device eth0 (00:0C:29:4B:6D:D8)

= ETHERNET                                          <Show>

= IPv4 CONFIGURATION <Manual>                       <Show>
= IPv6 CONFIGURATION <Automatic>                    <Show>

[ ] Automatically connect
[X] Available to all users

                                              <Cancel> <OK>
```
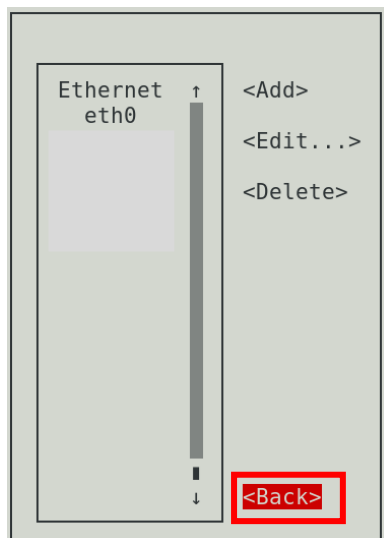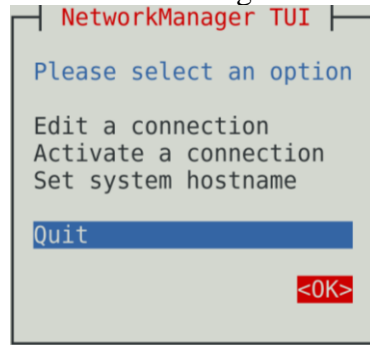
6. Add IP Address, Gateway and DNS (*which is given in question*) and then hit the **OK** button

```
                        ┤ Edit Connection ├

            Profile name eth0_____
                  Device enp1s0_____

  = ETHERNET                                             <Show>

  = IPv4 CONFIGURATION <Manual>                          <Hide>
            Addresses 172.25.250.10/24_____  <Remove>
                      <Add...>
              Gateway 172.25.250.254
          DNS servers 172.25.254.254_____    <Remove>
                      <Add...>
        Search domains <Add...>

              Routing (No custom routes) <Edit...>
  [ ] Never use this network for default route
  [ ] Ignore automatically obtained routes
  [ ] Ignore automatically obtained DNS parameters

  [ ] Require IPv4 addressing for this connection


  = IPv6 CONFIGURATION <Automatic>                       <Show>

  [X] Automatically connect
  [X] Available to all users

                                        <Cancel>  <OK>
```

7. Click on **<Back>** button to go to the options.

```
  ┌──────────────────────────────┐
  │  ┌─────────────┐┌┐           │
  │  │ Ethernet  ↑ ││ │  <Add>   │
  │  │    eth0     ││ │          │
  │  │             ││ │ <Edit...>│
  │  │             ││ │          │
  │  │             ││ │ <Delete> │
  │  │             ││ │          │
  │  │             ││ │          │
  │  │             ││ │          │
  │  │           ■ ││ │          │
  │  │           ↓ │└┘ <Back>    │
  │  └─────────────┘             │
  └──────────────────────────────┘
```

8.click on **'OK'** button to finish configuration.

```
┤ NetworkManager TUI ├

 Please select an option

 Edit a connection
 Activate a connection
 Set system hostname

 Quit

                          <OK>
```

9. Start the connection and ping Gateway to check and check hostname.

[root@localhost ~]# nmcli connection up eth0

[root@localhost ~]# ip a

eth0: flags=4099<UP,BROADCAST,MULTICAST> mtu 1500
       inet 172.25.250.10 netmask 255.255.255.0 broadcast 172.25.250.255

[root@localhost ~]# hostnamectl set-hostname servera.lab.example.com

[root@localhost ~]# hostname

Servera.lab.example.com

[root@localhost ~]# ping 172.25.254.254   *(ping to the Gateway)*

CLI METHOD:

[root@localhost ~]# nmcli connection show

[root@localhost ~]# nmcli connection modify eth0 ipv4.addresses 172.25.250.10/24 ipv4.gateway

172.25.250.254 ipv4.dns 172.25.254.254 ipv4.method manual

[root@localhost ~]# nmcli connection up eth0

[root@localhost ~]# ip a

eth0: flags=4099<UP,BROADCAST,MULTICAST> mtu 1500
       inet 172.25.250.10 netmask 255.255.255.0 broadcast 172.25.250.255

[root@localhost ~]# hostnamectl set-hostname servera.lab.example.com

[root@localhost ~]# hostname

Servera.lab.example.com

[root@localhost ~]# ping 172.25.254.254   *(ping to the Gateway)*

Que2:

Create yum repository

- o Configure yum repository using following url:
  http://content.example.com/rhel8.0/x86_64/BaseOS
  http://content.example.com/rhel8.0/x86_64/AppStream

Solution:

[root@servera~]#vim /etc/yum.repos.d/server.repo

```
[AppStream]
name=AppStreamRepo
baseurl=http://content.example.com/rhel8.0/x86_64/AppStream
enabled=1
gpgcheck=0

[BaseOS]
name=BaseOSRepo
baseurl=http://content.example.com/rhel8.0/x86_64/BaseOS
enabled=1
gpgcheck=0
```

[root@servera~]#yum clean all
[root@servera~]#yum repolist all

```
repo id                    repo name                    status
AppStream                  AppStreamRepo                enabled
BaseOS                     BaseOSRepo                   enabled
[root@localhost ~]#
```

Que 3:

Debug the selinux issue:

- Web server is running on your system.
- Web server on your system is running on non-http port 82 and it having issue to serve the content, debug the selinux issue.
- Web server the html document from /var/www/html
- It can serve /var/www/html/index/html/file1.html
- Web server serve the content on port number 82.
- Web server should be automatically at boot time.
- Web server must be available at "curl http://servera.lab.example.com/file1.html"

Solution:

[root@servera ~]# rpm -q httpd
[root@servera ~]# yum install httpd -y   (_Package already installed in exam_**)**
[root@servera ~]# semanage port -l | grep http
http_port_t   tcp   80, 81, 443, 488, 8008, 8009, 8443, 9000
[root@servera ~]# semanage port -a -t http_port_t -p tcp 82
[root@servera ~]# semanage port -l | grep http
http_port_t   tcp   82,80, 81, 443, 488, 8008, 8009, 8443, 9000

[root@servera ~]# ls -lZ /var/www/html/file1.html

[root@servera ~]#semanage fcontext -a -t httpd_sys_content_t '/var/www/html/file1.html(/.*)?'

[root@servera ~]#restorecon -vFR /var/www/html/file1.html

[root@servera ~]# ls -lZ /var/www/html/file1.html

-rwxr-xr-x. 2 root root system_u:object_r:<mark>httpd_sys_content_t</mark>:s0 6 Feb 6 2019 /var/www/html/file1.html

[root@servera ~]# firewall-cmd - -permanent - -add-port=82/tcp

[root@servera ~]# firewall-cmd - -permanent - -add-service={http,https} ←*(Not mandatory)*

[root@servera ~]# firewall-cmd - -reload

[root@servera ~]# firewall-cmd - -list-all ← *(Check firewall rules)*

[root@servera ~]# vim /etc/httpd/conf/httpd.conf

Listen <mark>82</mark>   ← *(Already define in exam)*

[root@servera ~]# systemctl restart httpd

[root@servera ~]# systemctl enable httpd

[root@servera ~]# curl http://servera.lab.example.com/file1.html

---

Que.05.

- Create the following users, groups, and group memberships:
  - A group named sysadmin.
  - A user natasha who belongs to sysadmin as a secondary group.
  - A user harry who also belongs to sysadmin as a secondary group.
  - A user sarah who does not have access to an interactive shell on the system, and who is not a member of sysadmin.
  - natasha, sarah and harry should all have the password of "thuctive".

Solution:

[root@servera ~]# groupadd sysadmin

[root@servera ~]# tail -1 /etc/group

sysadmin:x:1001:

[root@servera ~]# useradd -G sysadmin natasha

[root@servera ~]# useradd -G sysadmin harry

[root@servera ~]# useradd -s /sbin/nologin sarah

[root@servera ~]# tail -3 /etc/passwd

natasha:x:1001:1002::/home/natasha:/bin/bash

harry:x:1002:1003::/home/harry:/bin/bash

sarah:x:1003:1004::/home/sarah:/sbin/nologin

[root@servera ~]# echo "thuctive" | passwd natasha –stdin

Changing password for user sarah.

passwd: all authentication tokens updated successfully.

[root@servera ~]# echo "thuctive" | passwd harry --stdin

Changing password for user harry.

passwd: all authentication tokens updated successfully.

[root@servera ~]# echo "thuctive" | passwd sarah --stdin

Changing password for user sarah.

passwd: all authentication tokens updated successfully.

[root@servera ~]# tail -3 /etc/shadow

natasha:$6$4xW5uHL2$S22JCq5laTWChFEFZTzsXQbYyhNYl2lGhgrwVKIx9GYyo4etuPIrRfgtbScfHSzJd18DZwOzKwfgr0NvtXtOT/:17916:0:9
9999:7:::

harry:6pwTNSe5A$Hhm/gKpeZPkVTfGXz1bSEbby64BolT8YEYOFxcMtbiF6ChKwxw8VBkB/cvxGVMbs04Y6yOKpaY9G3B.p6DinF0:17916:0
:99999:7:::

sarah:6Ri0SBKKw$BUlSy/4v8XEmrH34hxlTIdAtbP.pHe8fsp4VZ5WThdb/01CJyf7CK.6EKicjX7sKxpLjKayjvxDUeGFww8OaV1:17916:0:9999
9:7:::

Que.06.

- Create a collaborative directory **/common/admin** with the following characteristics:

  o Group ownership of /common/admin is sysadmin.
  o The directory should be readable, writable, and accessible to members of sysadmin, but not to any other user.
  o (It is understood that root will have all access to all files and directories on the system.)
  o Files created in **/common/admin** will automatically have group ownership set to the sysadmin group.

Solution:

[root@servera ~]# mkdir -pv /common/admin

mkdir: created directory '/private'

mkdir: created directory '/private/admin'

[root@servera ~]# chgrp sysadmin /common/admin

[root@servera ~]# ls -ld /private/admin

drwxr-xr-x. 2 root sysadmin 6 Jan 21 04:11 /common/admin

[root@servera ~]# chmod 770 /common/admin

[root@servera ~]# ls -ld /private/admin

drwxrwx---. 2 root sysadmin 6 Jan 21 04:11 /common/admin

[root@servera ~]# chmod g+s /common/admin

[root@servera ~]# ls -ld /common/admin

drwxrws---. 2 root sysadmin 6 Jan 21 04:11 /common/admin

> ***OR***
> #mkdir -pvm 2770 /common/admin
> #chgrp sysadmin /common/admin
> # ls -ld /common/admin
> drwxrws---. 2 root sysadmin 6 Jan 21 04:11 /common/admin

Que.7.

Copy the file **/etc/fstab** to **/var/tmp**. Configure the permissions of **/var/tmp/fstab** so that:

- o The file **/var/tmp/fstab** is owned by the **root** user.
- o The file **/var/tmp/fstab** belong to the group **root**.
- o The file **/var/tmp/fstab** should not be executable by anyone.
- o The user **natasha** is able to read and write **/var/tmp/fstab**.
- o The user **harry** can neither write nor read **/var/tmp/fstab** .
  [Note: all other users (current or future) have the ability to read/var/tmp/fstab.]

Solution:

[root@servera ~]# cp -av /etc/fstab   /var/tmp/

[root@servera ~]# ls   /var/tmp

[root@servera ~]# ls -l /var/tmp/fstab

-rw-r--r--. 1 root root 465 Jan 22 00:01 /var/tmp/fstab

[root@servera ~]# setfacl -m u:natasha:rw /var/tmp/fstab

[root@servera ~]# setfacl -m u:harry:- /var/tmp/fstab

[root@servera ~]# getfacl /var/tmp/fstab

getfacl: Removing leading '/' from absolute path names

file: var/tmp/fstab

#owner: root

#group: root

#user::rw-

user:natasha:rw-

user:harry:---

group::r—

mask::rwx

other::r—

Que :8

Configure crontab

- Schedule a job for user natasha on 23:14 and run command /usr/bin/echo "hiya".

Solution:

[root@servera ~]# crontab -e -u natasha

14 23 * * * /bin/echo   "hiya"

:wq

crontab: installing new crontab

[root@servera ~]# systemctl restart crond.service

[root@servera ~]# systemctl enable crond.service

[root@servera ~]# crontab -l -u natasha

14 23 * * * /bin/echo "hiya"

Configure crontab

- Schedule a job for user harry, run on every minute
- logger "net-logging"

Solution:

[root@servera ~]# crontab -e -u harry
==*** * * * * /usr/bin/echo   "net-logging"**==
:wq
crontab: installing new crontab
[root@servera ~]# systemctl restart crond.service
[root@servera ~]# systemctl enable crond.service
[root@servera ~]# crontab -l -u   harry
* * * * * /usr/bin/echo   "net-logging"

Configure crontab

- Schedule a job for user sarah, run after every 3 minute
- logger "rh-294"

Solution:

[root@servera ~]# crontab -e -u sarah
==***/3 * * * * /usr/bin/echo   "rh-294"**==
:wq
crontab: installing new crontab
[root@servera ~]# systemctl restart crond.service
[root@servera ~]# systemctl enable crond.service
[root@servera ~]# crontab -l -u sarah
*/3 * * * * /usr/bin/echo   "rh-294"

Que.8. NTP

- Configure your system so that it is an NTP client of content.example.com.

Solution:
[root@servera ~]# vim /etc/chrony.conf

```
                                    root@localhost:~                     _  □
File  Edit  View  Search  Terminal  Help
# Use public servers from the pool.ntp.org project.
# Please consider joining the pool (http://www.pool.ntp.org/join.html).
#pool 2.rhel.pool.ntp.org iburst  ◄──►  Comment this entry
server   content.example.com        iburst  ◄──►  Append NTP server's entry with iburst
```

[root@servera ~]# systemctl restart chronyd.service
[root@servera ~]# timedatectl set-ntp true
[root@servera ~]# chronyc sources -v

```
210 Number of sources = 0

  .-- Source mode  '^' = server, '=' = peer, '#' = local clock.
 / .- Source state '*' = current synced, '+' = combined , '-' = not combined,
| /   '?' = unreachable, 'x' = time may be in error, '~' = time too variable.
||                                         .- xxxx [ yyyy ] +/- zzzz
||      Reachability register (octal) -.   |  xxxx = adjusted offset,
||      Log2(Polling interval) --.      |   |  yyyy = measured offset,
||                               \      |   |  zzzz = estimated error.
||                                |     |    \
MS Name/IP address           Stratum Poll Reach LastRx Last sample
===============================================================================
^* classroom.example.com  ◄──►  Ensure connectivity with server alias by ' * '
[root@server ~]#
```

Que.9:
- Configure autofs such that server's home directory
  classroom.example.com:/rhome/remoteuser0 are shared by nfs service.
- Mount this home directory **/rhome/remoteuser0** with nfs version4.

Solution:

[root@servera ~]# rpm -q autofs
[root@servera ~]# yum install autofs -y
[root@servera ~]# systemctl start autofs
[root@servera ~]# systemctl enable autofs
[root@servera ~]# vim /etc/auto.master

/misc   /etc/auto.misc
/rhome   /etc/auto.ldap

[root@servera ~]# vim /etc/auto.ldap

<mark>remoteuser0   -rw,fstype=nfs   classroom.example.com:/</mark>rhome/remoteuser0

:wq

[root@servera ~]# systemctl   restart   autofs

[root@servera ~]# getent   passwd

[root@servera ~]# su - remoteuser0

[remoteuser0 @servera ~]# pwd

/rhome/remoteuser0

[remoteuser0 @servera ~]# touch test.txt

[remoteuser0 @servera ~]# ls

[remoteuser0 @servera ~]# logout

Que.10:

- Find files in your system which is owned by natasha user & copy all the files on /root/backup directory.

Solution:

root@servera ~]# mkdir -pv /root/backup

mkdir: created directory '/backup'

[root@servera ~]# find / -user natasha -exec cp -arv '{}' /root/backup \;

[root@servera ~]# ls -la /root/backup

total 0

drwxr-xr-x. 2 natasha natasha 6 Jan 26 2014 extensions

-rw-rw----. 1 natasha mail   0 Jan 21 03:58 natasha

drwxr-xr-x. 2 natasha natasha 6 Jan 26 2014 plugin

Que.11:

- Create the following user name alex with uid 3228 and set the password "xander".

Solution:

[root@servera ~]# useradd -u 3228 alex

[root@servera ~]# tail /etc/passwd

alex:x:<mark>3228:3228</mark>::/home/alex:/bin/bash

[root@servera ~]# echo "xander" | passwd alex --stdin

passwd: all authentication tokens updated successfully.

[root@servera ~]# tail /etc/shadow

alex:6Dk4tblFc$nA9HgXqfdrk13HkdkhPbLz/KJ/Khl4/EnFBNcB27/a2wA/sI0uuYkhyOu78EXLFu/VMbWvDaqWs.3P4NTbLuS

1:17918:0:99999:7:::

Que.12:

- Search the string "ach" in /usr/local/share/applications/meminfo.cache file and copy the all lines in /root/result file

Solution:

[root@servera ~]# grep   "ach" /usr/local/share/applications/meminfo.cache > /root/result

[root@servera ~]# cat /root/result

Que.13:

Create Archive:

- Create an archive named "archive.tar.bz2".
- Compress using bzip2.
- create archive in /root directory.
- files to be archive from /etc.

Solution:

[root@servera ~]# yum install bzip2 -y

[root@servera ~]# tar -cvjf /root/archive.tar.bz2 /etc

[root@servera ~]# ls /root

archive.tar.bz2

Create Archive:

- Create an archive named "archive.tgz" in /root directory
- Compress by gzip compression method.
- files to be archive from /etc.

Solution:

[root@servera ~]# tar -cvzf /root/archive.tgz /etc

[root@servera ~]# ls /root

archive.tgz

Que.14:

- Set default Permissions for user alex for all newly created files and directories.
- set permission for newly created files r--r--r--.
- set permission for newly created directories r-xr-xr-x.

Solution:

 Calculate umask

Directory					
r-x	r-x	r-x	7	7	7
5	5	5	5	5	5
			2	2	2

[root@servera ~]# vim /home/alex/.bashrc
umask 222
:wq
[root@servera ~]# su - alex
[root@servera ~]# touch test
[root@servera ~]# mkdir data
dr-xr-xr-x. 2 alex alex 6 Jan 26 2022 data
-r--r--r--. 1 alex alex 0 Jan 26 2022 test

Que.15:
- Write a script mysearch to list the content of /usr that are below 50KiB and above 10KiB and that files having SUID permission.
- Script should be present in /usr/local/bin.
- After execution, script should automatically write all the lines and save it to the /root/line file.

Solution:
[root@servera ~]# vim   /usr/local/bin/mysearch
#!/bin/bash
find /usr -size +10k -size -50k -perm /u+s > /root/line
:wq
[root@servera ~]# chmod a+x /usr/local/bin/mysearch
[root@servera ~]# bash /usr/local/bin/mysearch
[root@servera ~]# cat /root/line

Sample Que for Script
- Write a script myfiles to list the content of /usr/bin that are below 50MiB and Above 10 MiB which is having sgid permission .
- Script should be present in /usr/local/bin.
- After execution, script should automaticaly write all the lines and save it to the /root/archline file.

Solution:
[root@servera ~]# vim   /usr/local/bin/myfiles
#!/bin/bash
find /usr -size +10M -size -50M -perm /g+s > /root/archline
:wq
[root@servera ~]# chmod a+x /usr/local/bin/myfiles
[root@servera ~]# bash /usr/local/bin/myfiles
[root@servera ~]# cat /root/archline

Que.16:
- configure user harry.
- print message "Linux system Administrator".

Solution:

[root@servera ~]# vim /home/harry/.bashrc

     echo "Linux System Administrator"

     :wq

[root@servera ~]#su - harry

     Linux System Administrator

[harry@servera ~]$ logout

Que.17:
- Make sudoer group.
- Group Members of sysadmin can run all the commands using sudo.
- users does not required password while using system binary with sudo

Solution:

[root@servera ~]# vim /etc/sudoers.d/sysadmin

     %sysadmin   ALL=(ALL)   NOPASSWD:ALL

     :wq

Que.18:

Build image named watcher from this https://<Image_url> file by the user rocky from https://<registry_url> registry. (User name and password given in instruction and info tab)

Solution:

[root@servera ~]#su – rocky OR   #ssh rocky@<local_IP>

[rocky@servera ~]$ podman login https://<registry_url>

User Name: rocky

Password: <given.in.exam>

[rocky@servera ~]$ wget http://<Image_url>

[rocky@servera ~]$ ls

[rocky@servera ~]$ podman build -t watcher .

```
Getting image source signatures
Copying blob 88ad12232aa1 done      |
Copying blob efc2b5ad9eec done      |
Copying blob fce1785eb819 done      |
Copying blob 4f4fb700ef54 done      |
Copying blob f214daa0692f done      |
Copying blob 05383fd8b2b3 done      |
Copying config 19c71fbb71 done      |
Writing manifest to image destination
COMMIT watcher
--> 19c71fbb7140
Successfully tagged localhost/watcher:latest
```

[rocky@servera ~]$ podman images

```
REPOSITORY              TAG       IMAGE ID        CREATED       SIZE
localhost/watcher       latest    19c71fbb7140   5 days ago   152 MB
```

[rocky@servera ~]$ logout

Que.19.
- **Run a container named ascii2pdf. using the newly created image.**
- **Attach the volume /opt/input and /opt/processed with container /action/incoming and /action/outgoing respectively.**
  - **Create a service container-ascii2pdf.service**
  - **Ensure that container-ascii2pdf.service will run automatically at system boot.**

Solution:
[root@servera ~]# mkdir -m 777 /opt/input /opt/processed
[root@servera ~]# chown rocky:rocky /opt/input /opt/processed
[root@servera ~]# su – rocky   OR   #ssh rocky@<local_IP>
[rocky@servera ~]$ podman run -d --name ascii2pdf -v /opt/input:/action/incoming:Z -v /opt/processed:/action/outgoing:Z   watcher
[rocky@servera ~]$ podman ps -a
[rocky@servera ~]$ ls -a
.config
[rocky@servera ~]$ mkdir -p .config/systemd/user
[rocky@servera ~]$ cd .config/systemd/user
[rocky@servera ~]$ podman generate systemd --name ascii2pdf –files
[rocky@servera ~]$ ls
container- ascii2pdf.service
[rocky@servera ~]$ systemctl - - user start container- ascii2pdf.service

---

[rocky@servera ~]$ systemctl - - user enable container- ascii2pdf.service
[rocky@servera ~]$ systemctl - - user status container- ascii2pdf.service
[rocky@servera ~]$ logout
[root@servera ~]# reboot

Cross verify:
reboot
#su – rocky
$podman exec -it monitor
/bin/bash
sh-5.0# ls /
action
sh-5.0#ls /action
incoming   outgoing
sh-5.0#exit

Note: Reboot the Primary Virtual Machine after solve the questions.

Questions Solve on Secondary Virtual Machine

Que.1: RHEL-9

- Break root Password:
- Break root password to login and access the serverb.
- Password must be "India@01".

Solution:

STEP 1: Restart the Server

STEP 2: In the OS selection screen,

 SELECT the '*Red Hat Enterprise Linux Server (4.18.0-240.el8.x86_64) 8.3 (Ootpa)*' and then PRESS **'e'**.
(In Exam select second kernel e.g. rescue kernel)

NOTE: The screen stays for only 4 sec, so in order to halt the screen, you should press UP and DOWN arrow before it changes the screen.

STEP 3: On the following screen, You can find the Kernel line starts with word "**linux**"

Go to end of that line [PRESS END Key] and give SPACE and append with **rd.break .**

```
load_video
set gfxpayload=keep
insmod gzio
linux ($root)/vmlinuz-5.14.0-162.6.1.el9_1.x86_64 root=/dev/mapper/rhel-root r\
w crashkernel=1G-4G:192M,4G-64G:256M,64G-:512M resume=/dev/mapper/rhel-swap rd\
.lvm.lv=rhel/root rd.lvm.lv=rhel/swap rhgb quiet rd.break
initrd ($root)/initramfs-5.14.0-162.6.1.el9_1.x86_64.img $tuned_initrd




     Press Ctrl-x to start, Ctrl-c for a command prompt or Escape to
     discard edits and return to the menu. Pressing Tab lists
     possible completions.
```

Press **CTRL + X** start emergency mode.

```
     Press Ctrl-x to start, Ctrl-c for a command prompt or Escape to
     discard edits and return to the menu. Pressing Tab lists
     possible completions.
```

STEP 4: On **switch_root:/#** prompt, give the following 2 commands to mount the system

switch_root:/# mount –o remount,rw /sysroot switch_root:/# chroot /sysroot

```
Entering emergency mode. Exit the shell to continue.
Type "journalctl" to view system logs.
You might want to save "/run/initramfs/rdsosreport.txt" to a USB stick or /boot
after mounting them and attach it to a bug report.


switch_root:/# mount -o remount,rw /sysroot
switch_root:/# chroot /sysroot
sh-4.2#
```

STEP 5: On **sh-4.2#** prompt, give the command to change the root password as follows (password provided in information)

Sh-4.2# echo "India@1" | passwd --stdin root

```
switch_root:/# mount -o rw,remount /sysroot
switch_root:/# chroot /sysroot
sh-4.4# echo "India@1" | passwd root --stdin
Changing password for user root.
passwd: all authentication tokens updated successfully.
```

NOTE: Password is given in question for the root user.

STEP 6: Type the following command to create a new hidden file called **.autorelabel**

```
passwd: all authentication tokens updated successfully.
sh-4.2# touch /.autorelabel
sh-4.2# _
```

STEP 7: Type **Exit** (twice) to exit and logout.

```
sh-4.2# exit
exit
switch root:/# exit
logout
[ 1242.836148] piix4_smbus 0000:00:07.3: SMBus Host Controller not enabled!
```

Que2:

Create yum repository

- o Configure yum repository using following url:
- o http://content.example.com/rhel8.0/x86_64/BaseOS
- o http://content.example.com/rhel8.0/x86_64/AppStream

Solution:
[root@serverb~]#vim /etc/yum.repos.d/server.repo

```
[AppStream]
name=AppStreamRepo
baseurl=http://content.example.com/rhel8.0/x86_64/AppStream
enabled=1
gpgcheck=0

[BaseOS]
name=BaseOSRepo
baseurl=http://content.example.com/rhel8.0/x86_64/BaseOS
enabled=1
gpgcheck=0
```

[root@serverb~]#yum clean all
[root@serverb~]#yum repolist

```
repo id                    repo name                     status
AppStream                  AppStreamRepo                 enabled
BaseOS                     BaseOSRepo                    enabled
```

Que.3:

- Configure System Tuning:
- Choose the recommended Tuned profile for your virtual machine and set it as active profile.

Solution:

```
[root@serverb ~]# tuned-adm active
Current active profile: virtual-host
[root@serverb ~]# tuned-adm recommend
virtual-guest
[root@serverb ~]# tuned-adm profile virtual-guest
[root@serverb ~]# tuned-adm active
Current active profile: virtual-guest
[root@serverb ~]#
```

Que.4:

- Create a SWAP partition of 450 megabyte and make available at next reboot.

Solution:

```
[root@serverb ~]# lsblk
NAME              MAJ:MIN RM   SIZE RO TYPE MOUNTPOINT
sda                 8:0    0    15G  0 disk
├─sda1              8:1    0     1G  0 part /boot
└─sda2              8:2    0    14G  0 part
  ├─rhel-root     253:0    0  12.5G  0 lvm  /
  └─rhel-swap     253:1    0   1.5G  0 lvm  [SWAP]
sdb                8:16    0     5G  0 disk
└─sdb1             8:17    0     1G  0 part
  └─myvolume-database 253:2 0  300M  0 lvm  /mydatabase
sdc                8:32    0     5G  0 disk
```

[root@serverb ~]# fdisk /dev/sdb

Welcome to fdisk (util-linux 2.32.1).

Changes will remain in memory only, until you decide to write them.

Be careful before using the write command.

Command (m for help): n↵

Partition type

  p primary (1 primary, 0 extended, 3 free)

  e extended (container for logical partitions)

Select (default p): ↵

Using default response p.

Partition number (2-4, default 2): ↵
First sector (2099200-10485759, default 2099200): ↵
Last sector, +sectors or +size{K,M,G,T,P} (2099200-10485759, default 10485759): +450M ↵
Created a new partition 2 of type 'Linux' and of size 450 MiB.
Command (m for help): w ↵
The partition table has been altered.
Syncing disks.
[root@serverb ~]# partprobe
Warning: Unable to open /dev/sr0 read-write (Read-only file system). /dev/sr0 has been opened read-only.
[root@serverb ~]# partprobe /dev/sdb
[root@serverb ~]# fdisk -l /dev/sdb

Device	Boot	Start	End	Sectors	Size	Id	Type
/dev/sdb1		2048	2099199	2097152	1G	83	Linux
/dev/sdb2		2099200	3020799	921600	450M	83	Linux

[root@serverb ~]# mkswap /dev/sdb2
Setting up swapspace version 1, size = 450 MiB (471855104 bytes)
no label, UUID=eac4b708-57f4-42bf-a728-4aaa0b9c1fc2
[root@serverb ~]# blkid
/dev/sdb1: UUID="L04q7C-1BJv-OzEu-tEsu-a2su-Vrts-PPcIS2" TYPE="LVM2_member" PARTUUID="effde5a5-01"
/dev/mapper/rhel-root: UUID="ed04e735-7611-40a5-936c-b32616e21e14" BLOCK_SIZE="512" TYPE="xfs"
/dev/mapper/rhel-swap: UUID="f6b7aa0a-1dc4-4606-a14c-c19f60bae86f" TYPE="swap"
/dev/mapper/myvolume-database: UUID="46968653-7f98-465f-a2f1-0225fe03fae8" BLOCK_SIZE="1024" TYPE="ext4"
/dev/sdb2: UUID="eac4b708-57f4-42bf-a728-4aaa0b9c1fc2" TYPE="swap" PARTUUID="effde5a5-02"
[root@serverb ~]# vim /etc/fstab

```
# After editing this file, run 'systemctl daemon-reload' to update systemd
# units generated from this file.
#
/dev/mapper/rhel-root    /                        xfs     defaults      0 0
UUID=6a9cedf4-03f7-4083-955e-b944191a7723 /boot                xfs     defaults        0 0
/dev/mapper/rhel-swap    none                     swap    defaults      0 0
/dev/myvolume/database  /mydatabase ext4 defaults 0 0
/dev/sdb2 swap swap defaults 0 0
```

[root@serverb ~]# swapon -a
[root@serverb ~]# free -h

	total	used	free	shared	buff/cache	available
Mem:	2.8Gi	1.3Gi	761Mi	19Mi	761Mi	1.3Gi
Swap:	1.9Gi	0B	1.9Gi			

[root@serverb ~]# cat /proc/swaps

Filename	Type	Size	Used	Priority
/dev/dm-1	partition	1572860	0	-2
/dev/sdb2	partition	460796	0	-3

Que.5:

- Create the volume group with name myvol with PE size 16 MB and create the lvm name college with the 25 L.E. (Total PE 25) and format this lvm with vfat and mount this lvm permanently on /mycollege.

Solution:

PE size = 16 MB   Total PE = 25
16 * 25 = 400   ← (PE_size * Total_PE) +(1 PE)
400 + 16 = 416   ← (This is the partition size)
[root@serverb ~]# fdisk /dev/sdb
Welcome to fdisk (util-linux 2.32.1).
Changes will remain in memory only, until you decide to write them.
Be careful before using the write command**.**
Command (m for help): n ↵
Partition type
  p primary (1 primary, 0 extended, 3 free)
  e extended (container for logical partitions)
Select (default p): ↵
Using default response p.
Partition number (2-4, default 3): ↵
First sector (2099200-10485759, default 2099200): ↵
Last sector, +sectors or +size{K,M,G,T,P} (2099200-10485759, default 10485759): +416M ↵
Created a new partition 3 of type 'Linux' and of size 416 MiB.
Command (m for help): w ↵
The partition table has been altered.
Syncing disks.
[root@serverb ~]# partprobe

[root@serverb ~]# fdisk -l /dev/sdb

Device	Boot	Start	End	Sectors	Size	Id	Type
/dev/sdb1		2048	2099199	2097152	1G	83	Linux
/dev/sdb2		2099200	3020799	921600	450M	83	Linux
/dev/sdb3		3020800	4031528	800215	416M	83	Linux

[root@serverb ~]# pvcreate   /dev/sdb3
  Physical volume "/dev/vdb3" successfully created.
[root@serverb ~]# vgcreate   -s   16M   myvol   /dev/vdb8
  Volume group "myvol" successfully created
[root@serverb ~]# vgdisplay myvol
      --- Volume group ---
  VG Name   myvol
  System ID

Format	lvm2
Metadata Areas	1
Metadata Sequence No	1
VG Access	read/write
VG Status	resizable
MAX LV	0
Cur LV	0
Open LV	0
Max PV	0
Cur PV	1
Act PV	1
VG Size	**400.00 MiB**
PE Size	**16.00 MiB**
Total PE	**25**
Alloc PE / Size	0 / 0
Free PE / Size	25 / 400.00 MiB
VG UUID	qUNhJM-Xckh-xFIo-nKIE-09qy-xst2-y5mhuw

[root@serverb ~]# lvcreate -l 25 -n college myvol

Logical volume "college" created.

[root@serverb ~]# lvdisplay

```
      --- Logical volume ---
```

LV Path	/dev/myvol/college
LV Name	college
VG Name	myvol
LV UUID	Ro0p2U-HtZp-h7Zm-PSAR-mrU7-3lhs-v9NSYT
LV Write Access	read/write
LV Creation host, time	servera.example.com, 2019-02-18 07:34:34 +0530
LV Status	available
# open	0
LV Size	**400.00 MiB**
Current LE	**25**
Segments	1
Allocation	inherit
Read ahead sectors	auto
currently set to	8192
Block device	253:3

[root@serverb ~]# mkfs.vfat   /dev/myvol/college

mkfs.fat 3.0.20 (12 feb 2019)

unable to get drive geometry, using default 255/63

[root@serverb ~]# mkdir   /mycollege

[root@serverb ~]# vim /etc/fstab

```
# /etc/fstab
# Created by anaconda on Thu Dec 31 11:01:56 2020
#
# Accessible filesystems, by reference, are maintained under '/dev/disk/'.
# See man pages fstab(5), findfs(8), mount(8) and/or blkid(8) for more info.
#
# After editing this file, run 'systemctl daemon-reload' to update systemd
# units generated from this file.
#
/dev/mapper/rhel-root   /       xfs     defaults      0 0
UUID=6a9cedf4-03f7-4083-955e-b944191a7723 /boot  xfs  defaults      0 0
/dev/mapper/rhel-swap   none    swap    defaults      0 0
/dev/myvolume/database /mydatabase ext4 defaults 0 0
/dev/sdb2 swap swap defaults 0 0
/dev/myvol/college /mycollege vfat defaults 0 0
```

[root@serverb ~]# mount -a

[root@serverb ~]# df -hT

Filesystem	Type	Size	Used	Avail	Use%	Mounted on
/dev/mapper/rhel-root	xfs	13G	4.4G	8.2G	35%	/
/dev/sda1	xfs	1014M	240M	775M	24%	/boot
/dev/mapper/myvolume-database	ext4	283M	2.1M	262M	1%	/mydatabase
/dev/mapper/myvol-college	vfat	397M	0	397M	0%	/mycollege

Que.6:

- Resize the Lvm partition "mydatabase" to 500M.
- (Ensure that the mount has been between the range of 482M to 496M)

Solution:

[root@serverb ~]# df -hT

Filesystem	Type	Size	Used	Avail	Use%	Mounted on
/dev/mapper/myvolume-database	ext4	283M	2.1M	262M	1%	/mydatabase

[root@serverb ~]# lvextend -L 510M /dev/myvolume/database ←(*Add extra 10M to adjust range*)

Size of logical volume myvolume/database changed from 300.00 MiB (75 extents) to 510.00 MiB (125 extents).

Logical volume myvolume/database successfully resized.

[root@serverb ~]# resize2fs /dev/myvolume/database

resize2fs 1.45.6 (20-Mar-2020)

Filesystem at /dev/myvolume/database is mounted on /mydatabase; on-line resizing required

old_desc_blocks = 3, new_desc_blocks = 4

The filesystem on /dev/myvolume/database is now 512000 (1k) blocks long.

[root@serverb ~]# df -hT

Filesystem	Type	Size	Used	Avail	Use%	Mounted on
/dev/mapper/myvolume-database	ext4	487M	2.3M	458M	1%	/mydatabase

Thank You…... Best of luck ……