
Exam **EX200**

Title **Red Hat Certified System Administrator (RHCSA) Exam**

Version **10.0**

Product Type **136 Q&A with explanations**

QUESTION 1

Configure your Host Name, IP Address, Gateway and DNS.

Host name: station.domain40.example.com

/etc/sysconfig/network

hostname=abc.com

hostname abc.com

IP Address:172.24.40.40

Gateway172.24.40.1

DNS:172.24.40.1

Explanation:

```
# cd /etc/sysconfig/network-scripts/
```

```
# ls
```

```
# vim ifcfg-eth0 (Configure IP Address, Gateway and DNS) IPADDR=172.24.40.40
```

```
GATEWAY=172.24.40.1
```

```
DNS1=172.24.40.1
```

```
# vim /etc/sysconfig/network
```

```
(Configure Host Name)
```

```
HOSTNAME= station.domain40.example.com
```

OR

Graphical Interfaces:

System->Preference->Network Connections (Configure IP Address, Gateway and DNS) Vim

/etc/sysconfig/network

```
(Configure Host Name)
```

QUESTION 2

Add 3 users: harry, natasha, tom.

The requirements: The Additional group of the two users: harry, Natasha is the admin group. The user: tom's login shell should be non-interactive.

Explanation:

```
# useradd -G admin harry
```

```
# useradd -G admin natasha
```

```
# useradd -s /sbin/nologin tom
```

```
# id harry;id Natasha (Show additional group)
```

```
# cat /etc/passwd
```

```
(Show the login shell)
```

OR

```
# system-config-users
```

QUESTION 3

Create a catalog under /home named admins. Its respective group is requested to be the admin group. The group users could read and write, while other users are not allowed to access it. The files created by users from the same group should also be the admin group.

Explanation:

```
# cd /home/
```

```
# mkdir admins /
```

```
# chown .admin admins/
```

```
# chmod 770 admins/  
# chmod g+s admins/
```

QUESTION 4

Configure a task: plan to run echo hello command at 14:23 every day.

Explanation:

```
# which echo  
# crontab -e  
23 14 * * * /bin/echo hello  
# crontab -l (Verify)
```

QUESTION 5

Find the files owned by harry, and copy it to catalog: /opt/dir

Explanation:

```
# cd /opt/  
# mkdir dir  
# find / -user harry -exec cp -rfp {} /opt/dir/ \;
```

QUESTION 6

Find the rows that contain abcde from file /etc/testfile, and write it to the file/tmp/testfile, and the sequence is requested as the same as /etc/testfile.

Explanation:

```
# cat /etc/testfile | while read line;  
do  
echo $line | grep abcde | tee -a /tmp/testfile  
done  
OR  
grep `abcde' /etc/testfile > /tmp/testfile
```

QUESTION 7

Create a 2G swap partition which take effect automatically at boot-start, and it should not affect the original swap partition.

Explanation:

```
# fdisk /dev/sda  
p  
(check Partition table)  
n
```

Answer: see
explanation below.

(create new partition: press e to create extended partition, press p to create the main partition, and the extended partition is further divided into logical partitions) Enter

```
+2G
t
l
W
partx -a /dev/sda
partprobe
mkswap /dev/sda8
Copy UUID
swapon -a
vim /etc/fstab
UUID=XXXXXX swap swap defaults 0 0
(swapon -s)
```

QUESTION 8

Create a user named alex, and the user id should be 1234, and the password should be alex111.

Explanation:

```
# useradd -u 1234 alex
# passwd alex
alex111
alex111
OR
echo alex111|passwd -stdin alex
```

QUESTION 9

Install a FTP server, and request to anonymous download from /var/ftp/pub catalog. (it needs you to configure yum direct to the already existing file server.)

Explanation:

```
# cd /etc/yum.repos.d
# vim local.repo
[local]
name=local.repo
baseurl=file:///mnt
enabled=1
gpgcheck=0
# yum makecache
# yum install -y vsftpd
# service vsftpd restart
# chkconfig vsftpd on
# chkconfig --list vsftpd
# vim /etc/vsftpd/vsftpd.conf
anonymous_enable=YES
```

QUESTION 10

Configure a HTTP server, which can be accessed through <http://station.domain40.example.com>. Please download the released page from <http://ip/dir/example.html>.

Explanation:

```
# yum install -y httpd
# chkconfig httpd on
# cd /var/www/html
# wget http://ip/dir/example.html
# cp example.com index.html
# vim /etc/httpd/conf/httpd.conf
NameVirtualHost 192.168.0.254:80
<VirtualHost 192.168.0.254:80>
DocumentRoot /var/www/html/
ServerName station.domain40.example.com
</VirtualHost>
```

QUESTION 11

Configure the verification mode of your host account and the password as LDAP. And it can login successfully through ldapuser40. The password is set as "password". And the certificate can be downloaded from http://ip/dir/ldap.crt. After the user logs on the user has no host directory unless you configure the autofs in the following questions.

Explanation:

system-config-authentication

LDAP Server: ldap://instructor.example.com (In domain form, not write IP)

OR

yum groupinstall directory-client (1.krb5-workstation 2.pam-krb5 3.sssd)

system-config-authentication

1. User Account Database: LDAP

2. LDAP Search Base DN: dc=example,dc=com

3. LDAP Server: ldap://instructor.example.com (In domain form, not write IP) 4.Download CA

Certificate

5. Authentication Method: LDAP password

6.Apply

getent passwd ldapuser40

QUESTION 12

Configure autofs to make sure after login successfully, it has the home directory autofs, which is shared as /rhome/ldapuser40 at the ip: 172.24.40.10. and it also requires that, other ldap users can use the home directory normally.

Explanation:

```
# chkconfig autofs on
# cd /etc/
# vim /etc/auto.master
/rhome /etc/auto.ldap
# cp auto.misc auto.ldap
# vim auto.ldap
ldapuser40 -rw,soft,intr 172.24.40.10:/rhome/ldapuser40
* -rw,soft,intr 172.16.40.10:/rhome/&
# service autofs stop
# server autofs start
```

```
# showmount -e 172.24.40.10  
# su - ladpuser40
```

QUESTION 13

Configure the system synchronous as 172.24.40.10.

Explanation:

Graphical Interfaces:

System-->Administration-->Date & Time

OR

```
# system-config-date
```

QUESTION 14

Change the logical volume capacity named vo from 190M to 300M. and the size of the floating range should set between 280 and 320. (This logical volume has been mounted in advance.)

Explanation:

```
# vgdisplay  
(Check the capacity of vg, if the capacity is not enough, need to create pv , vgextend , lvextend)  
# lvdisplay (Check lv)  
# lvextend -L +110M /dev/vg2/lv2  
# resize2fs /dev/vg2/lv2  
mount -a  
(Verify)  
(Decrease lvm)  
# umount /media  
# fsck -f /dev/vg2/lv2  
# resize2fs -f /dev/vg2/lv2 100M  
# lvreduce -L 100M /dev/vg2/lv2  
# mount -a  
# lvdisplay (Verify)  
OR  
# e2fsck -f /dev/vg1/lvm02  
# resize2fs -f /dev/vg1/lvm02  
# mount /dev/vg1/lvm01 /mnt  
# lvreduce -L 1G -n /dev/vg1/lvm02  
# lvdisplay (Verify)
```

QUESTION 15

Create a volume group, and set 16M as a extends. And divided a volume group containing 50 extends on volume group lv, make it as ext4 file system, and mounted automatically under /mnt/data.

Explanation:

```
# pvcreate /dev/sda7 /dev/sda8  
# vgcreate -s 16M vg1 /dev/sda7 /dev/sda8  
# lvcreate -l 50 -n lvm02  
# mkfs.ext4 /dev/vg1/lvm02
```

```
# blkid /dev/vg1/lv1
# vim /etc/fstab
# mkdir -p /mnt/data
UUID=xxxxxxxx /mnt/data ext4 defaults 0 0
# vim /etc/fstab
# mount -a
# mount
(Verify)
```

QUESTION 16

Upgrading the kernel as 2.6.36.7.1, and configure the system to Start the default kernel, keep the old kernel available.

Explanation:

```
# cat /etc/grub.conf
# cd /boot
# lftp it
# get dr/dom/kernel-xxxx.rpm
# rpm -ivh kernel-xxxx.rpm
# vim /etc/grub.conf
default=0
```

QUESTION 17

Create a 512M partition, make it as ext4 file system, mounted automatically under /mnt/data and which take effect automatically at boot-start.

Explanation:

```
# fdisk /dev/vda
n
+512M
w
# partprobe /dev/vda
# mkfs -t ext4 /dev/vda5
# mkdir -p /data
# vim /etc/fstab
/dev/vda5 /data ext4 defaults 0 0
# mount -a
```

QUESTION 18

Create a volume group, and set 8M as a extends. Divided a volume group containing 50 extends on volume group lv (lvshare), make it as ext4 file system, and mounted automatically under /mnt/data. And the size of the floating range should set between 380M and 400M.

Explanation:

```
# fdisk  
# partprobe  
# pvcreate /dev/vda6  
# vgcreate -s 8M vg1 /dev/vda6 -s  
# lvcreate -n lvshare -l 50 vg1 -l  
# mkfs.ext4 /dev/vg1/lvshare  
# mkdir -p /mnt/data  
# vim /etc/fstab  
/dev/vg1/lvshare /mnt/data ext4 defaults 0 0  
# mount -a  
# df -h
```

QUESTION 19

Download `ftp://168.0.254/pub/boot.iso` to `/root`, and mounted automatically under `/media/cdrom` and which take effect automatically at boot-start.

Explanation:

```
# cd /root; wget ftp://168.0.254/pub/boot.iso  
# mkdir -p /media/cdrom  
# vim /etc/fstab  
/root/boot.iso /media/cdrom iso9660 defaults,loop 0 0  
# mount -a  
mount [-t vfstype] [-o options] device dir
```

QUESTION 20

Add admin group and set gid=600

Explanation:

```
# groupadd -g 600 admin
```

QUESTION 21

Add user: user1, set uid=601

Password: redhat

The user's login shell should be non-interactive.

Explanation:

```
# useradd -u 601 -s /sbin/nologin user1  
# passwd user1  
redhat
```

QUESTION 22

Add users: user2, user3.

The Additional group of the two users: user2, user3 is the admin group Password: redhat

Explanation:

```
# useradd -G admin user2  
# useradd -G admin user3
```

```
# passwd user2  
redhat  
# passwd user3  
redhat
```

QUESTION 23

Copy /etc/fstab to /var/tmp name admin, the user1 could read, write and modify it, while user2 without any permission.

Explanation:

```
# cp /etc/fstab /var/tmp/  
# chgrp admin /var/tmp/fstab  
# setfacl -m u:user1:rwx /var/tmp/fstab  
# setfacl -m u:user2::: /var/tmp/fstab  
# ls -l  
-rw-rw-r--+ 1 root admin 685 Nov 10 15:29 /var/tmp/fstab
```

QUESTION 24

Configure a task: plan to run echo "file" command at 14:23 every day.

Explanation:

- (a) Created as administrator
- # crontab -u natasha -e
23 14 * * * /bin/echo "file"
- (b) Created as natasha
- # su - natasha
\$ crontab -e
23 14 * * * /bin/echo "file"

QUESTION 25

Configure a default software repository for your system.

One YUM has already provided to configure your system on

http://server.domain11.example.com/pub/x86_64/Server, and can be used normally.

Explanation:

Yum-config-manager --add-repo=http://content.example.com/rhel7.0/x86-64/dvd is to generate a file vim content.example.com_rhel7.0_x86_64_dvd.repo, Add a line gpgcheck=0

Yumcleanall

Yumrepolist

Almost 4305 packages are right, Wrong Yum Configuration will lead to some following questions cannot be worked out.

QUESTION 26

Adjust the size of the Logical Volume.

Adjust the size of the vo Logical Volume, its file system size should be 290M. Make sure that the content of this system is complete.

Note: the partition size is rarely accurate to the same size as required, so in the range 270M to 320M is acceptable.

Explanation:

Addition

df -hT

lvextend -L +100M /dev/vg0/vo

Lvscan

xfs_growfs /home/ //home is the mounted directory of the LVM, this step just need to do in the practice environment, and test EXT4 does not need this step.

resize2fs /dev/vg0/vo// use this command to update in examination.

df -hT

OR

Subtraction

e2fsck -f/dev/vg0/vo

umount /home

resize2fs /dev/vg0/vo // the final required partition capacity is 100M lvreduce -l 100M /dev/vg0/vo

mount /dev/vg0/vo/home

df -hT

QUESTION 27

Create User Account.

Create the following user, group and group membership:

Adminuser group

User natasha, using adminuser as a sub group

User Harry, also using adminuser as a sub group

User sarah, can not access the SHELL which is interactive in the system, and is not a member of adminuser, natashaï¼Œharryï¼Œsarah password is redhat.

Explanation:

groupadd adminuser

useradd natasha -G adminuser

useradd haryy -G adminuser

useradd sarah -s /sbin/nologin

Passwd user name // to modify password or echo redhat | passwd --stdin user name id natasha // to view user group.

QUESTION 28

Configure /var/tmp/fstab Permission.

Copy the file /etc/fstab to /var/tmp/fstab. Configure var/tmp/fstab permissions as the following:

Owner of the file /var/tmp/fstab is Root, belongs to group root

File /var/tmp/fstab cannot be executed by any user

User natasha can read and write /var/tmp/fstab

User harry cannot read and write /var/tmp/fstab

All other users (present and future) can read var/tmp/fstab.

Explanation:

```
cp /etc/fstab /var/tmp/  
/var/tmp/fstab view the owner setfacl -m u:natasha:rw- /var/tmp/fstab setfacl -m u:harry:---  
/var/tmp/fstab  
Use getfacl /var/tmp/fstab to view permissions
```

QUESTION 29

Configure a cron Task.

User natasha must configure a cron job, local time 14:23 runs and executes: */bin/echo hiya every day.

Explanation:

```
crontab "e" "u natasha  
23 14/bin/echo hiya  
crontab -l -u natasha // view  
systemctl enable crond  
systemctl restart crond
```

QUESTION 30

Create a Shared Directory.

Create a shared directory /home/admins, make it has the following characteristics:

/home/admins belongs to group adminuser

This directory can be read and written by members of group adminuser Any files created in /home/admin, group automatically set as adminuser.

Explanation:

```
mkdir /home/admins  
chgrp -R adminuser /home/admins  
chmodg+w /home/admins  
chmodg+s /home/admins
```

QUESTION 31

Install the Kernel Upgrade.

Install suitable kernel update from:

<http://server.domain11.example.com/pub/updates>.

Following requirements must be met:

Updated kernel used as the default kernel of system start-up.

The original kernel is still valid and can be guided when system starts up.

Explanation:

Using the browser open the URL in the question, download kernel file to root or home directory.

uname "r" // check the current kernel version

rpm "ivh kernel-*".rpm

vi /boot/grub.conf // check

Some questions are: Install and upgrade the kernel as required. To ensure that grub2 is the default item for startup.

Yum repo : http://content.example.com/rhel7.0/x86_64/errata

OR

uname -r // check kernel

Yum-config-manager --add-repo=http://content.example.com/rhel7.0/x86_64/ errata

Yum clean all

Yum list kernel// install directly

Yum -y install kernel// stuck with it, do not pipe! Please do not pipe!

Default enable new kernel grub2-editenv list// check

Modify grub2-set-default `kernel` full name

Grub2-mkconfig “`/boot/grub2/grub.cfg`// Refresh

QUESTION 32

Binding to an external validation server.

System `server.domain11.example.com` provides a LDAP validation service, your system should bind to this service as required:

Base DN of validation service is `dc=example,dc=com`

LDAP is used for providing account information and validation information Connecting and using the certification of <http://server.domain11.example.com/pub/EXAMPLE-CA-CERT> to encrypt

After the correct configuration, `ldapuser1` can log into your system, it does not have HOME directory until you finish autofs questions, `ldapuser1` password is password.

Explanation:

`yum -y install sssd authconfig-gtk krb5-workstation authconfig-gtk` // open the graphical interface

Modify user account database to `ldap`, fill up DN and LDAP SERVER as questions required, use TLS to encrypt connections making tick, write <http://server.domain11.example.com/pub/EXAMPLE-CACERT> to download ca, authentication method choose `ldap` password.

You can test if the `ldapuser` is added by the following command:

`Id ldapuser1`

Note: user password doesn't need to set

QUESTION 33

Configure NTP.

Configure NTP service, Synchronize the server time, NTP server: `classroom.example.com`

Explanation:

Configure the client:

`Yum -y install chrony`

`Vim /etc/chrony.conf`

Add: `server classroom.example.com iburst`

Start: `systemctl enable chronyd`

`systemctl restart chronyd`

Validate: `timedatectl status`

QUESTION 34

Configure autofs.

Configure the autofs automatically mount to the home directory of LDAP, as required:

`server.domain11.example.com` use NFS to share the home to your system. This file system contains a preconfigured home directory of user `ldapuserX`.

Home directory of `ldapuserX` is:

server.domain11.example.com /home/guests/ldapuser

Home directory of ldapuserX should automatically mount to the ldapuserX of the local /home/guests
Home directories write permissions must be available for users ldapuser1s password is password

Explanation:

yum install -y autoofs

mkdir /home/rehome

/etc/auto.master

/home/rehome/etc/auto.ldap

Keep then exit

cp /etc/auto.misc /etc/auto.ldap

/etc/auto.ldap

ldapuserX -fstype=nfs,rw server.domain11.example.com:/home/guests/

Keep then exit

systemctl start autoofs

systemctl enable autoofs

su - ldapuserX// test

If the above solutions cannot create files or the command prompt is -bash-4.2\$, it maybe exist multilevel directory, this needs to change the server.domain11.example.com:/home/guests/ to server.domain11.example.com:/home/guests/ldapuserX. What is multi-level directory? It means there is a directory of ldapuserX under the /home/guests/ldapuserX in the questions. This directory is the real directory.

QUESTION 35

Configure a user account.

Create a user iarï¼Œuid is 3400. Password is redhat

Explanation:

useradd -u 3400 iar

passwd iar

QUESTION 36

Add a swap partition.

Adding an extra 500M swap partition to your system, this swap partition should mount automatically when the system starts up. Don't remove and modify the existing swap partitions on your system.

Explanation:

fdisk -cu /dev/vda// in the way of expanding the partition, dont make main partition

partx "a /dev/vda

mkswap /dev/vdax

swapon /dev/vdax

swapon "s

vi /etc/fstab

/dev/vdax swap swapdefaults0 0

mount -a

QUESTION 37

Search files.

Find out files owned by jack, and copy them to directory /root/findresults

Explanation:

mkdir/root/findfiles

find / -user jack -exec cp -a {} /root/findfiles/ \; ls /root/findresults

QUESTION 38

Search a String

Find out all the columns that contains the string seismic within /usr/share/dict/words, then copy all these columns to /root/lines.tx in original order, there is no blank line, all columns must be the accurate copy of the original columns.

Explanation:

grep seismic /usr/share/dict/words> /root/lines.txt

QUESTION 39

Create a backup

Create a backup file named /root/backup.tar.bz2, contains the content of /usr/local, tar must use bzip2 to compress.

Explanation:

cd /usr/local

tar "jcvf /root/backup.tar.bz2

mkdir /test

tar "jxvf /root/backup.tar.bz2 "C /test// Decompression to check the content is the same as the /usr/local after

If the questions require to use gzip to compress. change "j to "z.

QUESTION 40

Create a logical volume

Create a new logical volume as required:

Name the logical volume as database, belongs to datastore of the volume group, size is 50 PE.

Expansion size of each volume in volume group datastore is 16MB.

Use ext3 to format this new logical volume, this logical volume should automatically mount to /mnt/database

Explanation:

fdisk -cu /dev/vda// Create a 1G partition, modified when needed

partx "a /dev/vda

pvcreate /dev/vdax

vgcreate datastore /dev/vdax "s 16M

lvcreate" 1 50 "n database datastore

mkfs.ext3 /dev/datastore/database

mkdir /mnt/database

mount /dev/datastore/database /mnt/database/ df "Th

```
vi /etc/fstab
```

```
/dev/datastore /database /mnt/database/ ext3 defaults 0 0 mount "a
```

Restart and check all the questions requirements.

QUESTION 41

Configure your Host Name, IP Address, Gateway and DNS.

Host name: dtop5.dn.ws.com

IP Address: 172.28.10.5

Gateway: 172.28.10.1

DNS: 172.28.10.1

Explanation:

Configure Host Name

```
vim /etc/sysconfig/network NETWORKING=yes HOSTNAME=dtop5.dn.ws.com
```

```
GATEWAY=172.28.10.1
```

2. Configure IP Address, Gateway and DNS

Configure the network by Network Manager:



3. Validate these profiles:

a) Check gateway: # vim /etc/sysconfig/network

NETWORKING=yes

HOSTNAME=dtop5.dn.ws.com

GATEWAY=172.28.10.1

b) Check Host Name: # vim /etc/hosts

172.28.10.5 dtop5.dn.ws.com dtop5 # Added by NetworkManager

127.0.0.1 localhost.localdomain localhost

::1 dtop5.dn.ws.com dtop5 localhost6.localdomain6 localhost6

c) Check DNS: # vim /etc/resolv.conf

Generated by NetworkManager

Search dn.ws.com

Nameserver 172.28.10.1

d) Check Gateway: # vim /etc/sysconfig/network-scripts/ifcfg-eth0

DEVICE="eth0"

NM_CONTROLLED="yes"

ONBOOT=yes

TYPE=Ethernet

BOOTPROTO=none

IPADDR=172.28.10.5

PREFIX=24

GATEWAY=172.28.10.1

DNS1=172.28.10.1

DOMAIN=dn.ws.com

DEFROUTE=yes

IPV4_FAILURE_FATAL=yes

IPV6INIT=no

NAME="System eth0"

UUID=5fb06bd0-0bb0-7ffb-45f1-d6edd65f3e03

HWADDR=00:0c:29:0E:A6:C8

QUESTION 42

Create a 2G swap partition which take effect automatically at boot-start, and it should not affect the original swap partition.

Explanation:

fdisk /dev/sda

p

(check Partition table)

n

(create new partition: press e to create extended partition, press p to create the main partition, and the extended partition is further divided into logical partitions)

Enter

+2G t

8 I

82

W

```
partx -a /dev/sda
partprobe
mkswap /dev/sda8
Copy UUID
swapon -a
vim /etc/fstab
UUID=XXXXXX swap swap defaults 0 0
(swapon -s)
```

QUESTION 43

Please open the ip_forward, and take effect permanently.

Explanation:

```
vim /etc/sysctl.conf net.ipv4.ip_forward = 1
```

sysctl "w (takes effect immediately)

If no /etc/sysctl.conf option, use these commands:

```
sysctl "a |grep net.ipv4
```

```
sysctl "P net.ipv4.ip_forward = 1
```

```
sysctl -w
```

QUESTION 44

Open kmcr1 value of 5 , and can verify in /proc/ cmdline

Explanation:

```
# vim /boot/grub/grub.conf
kernel/vmlinuz-2.6.32-71.el6.x86_64 ro root=/dev/mapper/GLSvg-
GLSroot rd_LVM_LV=GLSvg/GLSroot
rd_LVM_LV=GLSvg/GLSwaprd_NO_LUKSrd_NO_MDrd_NO_DM
LANG=en_US.UTF-8 SYSFONT=latarcyrheb-sun16 KEYBOARDTYPE=pc KEYTABLE=us crashkernel=auto
rhgb quiet kmcr1=5
```

Restart to take effect and verification:

```
# cat /proc/cmdline
ro root=/dev/mapper/GLSvg-GLSroot rd_LVM_LV=GLSvg/GLSroot rd_LVM_LV=GLSvg/GLSwap
rd_NO_LUKS rd_NO_MD rd_NO_DM
LANG=en_US.UTF-8 SYSFONT=latarcyrheb-sun16 KEYBOARDTYPE=pc KEYTABLE=us rhgb quiet
kmcr1=5
```

QUESTION 45

Upgrade the kernel, start the new kernel by default. kernel download from this address:

<ftp://server1.domain10.example.com/pub/update/new.kernel>

Explanation:

Download the new kernel file and then install it.

```
[root@desktop8 Desktop]# ls
kernel-2.6.32-71.7.1.el6.x86_64.rpm
kernel-firmware-2.6.32-71.7.1.el6.noarch.rpm
[root@desktop8 Desktop]# rpm -ivh kernel-*
Preparing... #####
[100%]
1:kernel-firmware
```

```
#####
##### [ 50%]
2:kernel
#####
##### [100%]
Verify the grub.conf file, whether use the new kernel as the default boot. [root@desktop8 Desktop]#
cat /boot/grub/grub.conf
default=0
title Red Hat Enterprise Linux Server (2.6.32-71.7.1.el6.x86_64)
root (hd0,0)
kernel /vmlinuz-2.6.32-71.7.1.el6.x86_64 ro root=/dev/mapper/vol0-root rd_LVM_LV=vol0/root
rd_NO_LUKS rd_NO_MD
rd_NO_DM LANG=en_US.UTF-8 SYSFONT=latarcyrheb-sun16 KEYBOARDTYPE=pc KEYTABLE=us
crashkernel=auto rhgb quiet
initrd /initramfs-2.6.32-71.7.1.el6.x86_64.img
```

QUESTION 46

Configure iptables, there are two domains in the network, the address of local domain is 172.24.0.0 other domain is 172.25.0.0, now refuse domain 172.25.0.0 to access the server.

Explanation:

```
iptables -F
service iptables save
iptables -A INPUT -s 172.25.0.0 -j REJECT
service iptables save
service iptables restart
```

QUESTION 47

A YUM source has been provided in the
<http://instructor.example.com/pub/rhel6/dvd>
Configure your system and can be used normally.

Explanation:

```
/etc/yum.repos.d/base.repo
[base]
name=base
baseurl=http://instructor.example.com/pub/rhel6/dvd
gpgcheck=0
yum list
```

QUESTION 48

There are two different networks, 192.168.0.0 and 192.168.1.0. Your System is in 192.168.0.0 Network. One RHEL6 Installed System is going to use as a Router. All required configuration is already done on Linux Server. Where 192.168.0.254 and 192.168.1.254 IP Address are assigned on that Server. How will make successfully ping to 192.168.1.0 Network's Host?

Explanation:

```
vi /etc/sysconfig/network GATEWAY=192.168.0.254
OR
```

```
vi /etc/sysconfig/network-scripts/ifcfg-eth0 DEVICE=eth0  
BOOTPROTO=static  
ONBOOT=yes  
IPADDR=192.168.0.?  
NETMASK=255.255.255.0  
GATEWAY=192.168.0.254  
service network restart
```

Gateway defines the way to exit the packets. According to question System working as a router for two networks have IP Address 192.168.0.254 and 192.168.1.254.

QUESTION 49

Make a swap partition having 100MB. Make Automatically Usable at System Boot Time.

Explanation:

Use fdisk /dev/hda ->To create new partition.

Type n-> For New partition

It will ask for Logical or Primary Partitions. Press 1 for logical.

It will ask for the Starting Cylinder: Use the Default by pressing Enter Key.

Type the Size: +100M ->You can Specify either Last cylinder of Size here.

Press P to verify the partitions lists and remember the partitions name. Default System ID is 83 that means Linux Native.

Type t to change the System ID of partition.

Type Partition Number

Type 82 that means Linux Swap.

Press w to write on partitions table.

Either Reboot or use partprobe command.

mkswap /dev/hda? ->To create Swap File system on partition.

swapon /dev/hda? ->To enable the Swap space from partition.

free -m ->Verify Either Swap is enabled or not.

vi /etc/fstab/dev/hda? swap swap defaults 0 0

Reboot the System and verify that swap is automatically enabled or not.

QUESTION 50

There are two different networks 192.168.0.0 and 192.168.1.0. Where 192.168.0.254 and 192.168.1.254 IP Address are assigned on Server. Verify your network settings by pinging 192.168.1.0 Network's Host.

Explanation:

```
vi /etc/sysconfig/network NETWORKING=yes HOSTNAME=station?.example.com
```

```
GATEWAY=192.168.0.254
```

```
service network restart
```

```
2. vi /etc/sysconfig/network-scripts/ifcfg-eth0 DEVICE=eth0
```

```
ONBOOT=yes
```

```
BOOTPROTO=static
```

```
IPADDR=X.X.X.X
```

```
NETMASK=X.X.X.X
```

```
GATEWAY=192.168.0.254
```

```
ifdown eth0  
ifup eth0
```

QUESTION 51

One Logical Volume is created named as myvol under vo volume group and is mounted. The Initial Size of that Logical Volume is 400MB. Make successfully that the size of Logical Volume 200MB without losing any data. The size of logical volume 200MB to 210MB will be acceptable.

Explanation:

First check the size of Logical Volume: lvdisplay /dev/vo/myvol

Make sure that the filesystem is in a consistent state before reducing:

```
# fsck -f /dev/vo/myvol
```

Now reduce the filesystem by 200MB.

```
# resize2fs /dev/vo/myvol 200M
```

It is now possible to reduce the logical volume. #lvreduce /dev/vo/myvol -L 200M

Verify the Size of Logical Volume: lvdisplay /dev/vo/myvol

Verify that the size comes in online or not: df -h

QUESTION 52

One Logical Volume named /dev/test0/testvolume1 is created. The initial Size of that disk is 100MB now you required more 200MB. Increase the size of Logical Volume, size should be increase on online.

Explanation:

lvextend -L+200M /dev/test0/testvolume1 Use lvdisplay /dev/test0/testvolume1)

```
ext2online -d /dev/test0/testvolume1
```

lvextend command is used the increase the size of Logical Volume. Other command lvresize command also here to resize. And to bring increased size on online we use the ext2online command.

QUESTION 53

We are working on /data initially the size is 2GB. The /dev/test0/lvtestvolume is mount on /dat

a. Now you required more space on /data but you already added all disks belong to physical volume.

You saw that you have unallocated space around 5 GB on your harddisk. Increase the size of lvtestvolume by 5GB.

Explanation:

Create a partition having size 5 GB and change the syste id '8e'.

use partprobe command

```
pvcreate /dev/hda9 Suppose your partition number is hda9.
```

vgextend test0 /dev/hda9 vgextend command add the physical disk on volume group.

```
lvextend -L+5120M /dev/test0/lvtestvolume
```

verify using lvdisplay /dev/test0/lvtestvolume.

QUESTION 54

One Domain RHCE is configured in your lab, your domain server is server1.example.com.

nisuser2001, nisuser2002, nisuser2003 user are created on your server

192.168.0.254:/rhome/stationx/nisuser2001. Make sure that when NIS user login in your system automatically mount the home directory. Home directory is separately shared on server /rhome/stationx/ where x is your Station number.

Explanation:

use the authconfig --nisserver=<NIS SERVER> --nisdomain=<NIS DOMAIN> -- update

Example: authconfig --nisserver=192.168.0.254 --nisdomain=RHCE --update or system-config-authentication

Click on Enable NIS

Type the NIS Domain: RHCE

Type Server 192.168.0.254 then click on next and ok

You will get a ok message.

Create a Directory /rhome/stationx where x is your station number.

vi /etc/auto.master and write at the end of file /rhome/stationx /etc/auto.home --timeout=60

vi /etc/auto.home and write

* -rw,soft,intr 192.168.0.254:/rhome/stationx/&

Note: please specify your station number in the place of x.

Service autofs restart

Login as the nisuser2001 or nisuser2002 on another terminal will be Success. According to question, RHCE domain is already configured. We have to make a client of RHCE domain and automatically mount the home directory on your system. To make a member of domain, we use the authconfig with option or system-config authentication command. There are lots of authentication server i.e NIS, LDAB, SMB etc. NIS is a RPC related Services, no need to configure the DNS, we should specify the NIS server address.

Here Automount feature is available. When user tried to login, home directory will automatically mount. The automount service used the /etc/auto.master file. On /etc/auto.master file we specified the mount point the configuration file for mount point.

QUESTION 55

Make on data that only the user owner and group owner member can fully access.

Explanation:

chmod 770 /data

Verify using : ls -ld /data Preview should be like:

drwxrwx--- 2 root sysadmin 4096 Mar 16 18:08 /data

To change the permission on directory we use the chmod command.

According to the question that only the owner user (root) and group member (sysadmin) can fully access the directory so: chmod 770 /data

QUESTION 56

Who ever creates the files/directories on a data group owner should automatically be in the same group owner as data.

Explanation:

1. chmod g+s /data

2. Verify using: ls -ld /data

Permission should be like this: drwxrws--- 2 root sysadmin 4096 Mar 16 18:08 /data

If SGID bit is set on directory then who every users creates the files on directory group owner

automatically the owner of parent directory. To set the SGID bit: chmod g+s directory To Remove the SGID bit: chmod g-s directory

QUESTION 57

Your System is going to use as a Router for two networks. One Network is 192.168.0.0 and Another Network is 192.168.1.0. Both network's IP address has assigned. How will you forward the packets from one network to another network?

Explanation:

```
echo "1" >/proc/sys/net/ipv4/ip_forward  
vi /etc/sysctl.conf  
net.ipv4.ip_forward = 1
```

If you want to use the Linux System as a Router to make communication between different networks, you need enable the IP forwarding. To enable on running session just set value 1 to /proc/sys/net/ipv4/ip_forward. As well as automatically turn on the IP forwarding features on next boot set on /etc/sysctl.conf file.

QUESTION 58

Create the user named eric and deny to interactive login.

Explanation:

```
useradd eric  
passwd eric  
vi /etc/passwd  
eric:x:505:505::/home/eric:/sbin/nologin
```

Which shell or program should start at login time is specified in /etc/passwd file? By default, Redhat Enterprise Linux assigns the /bin/bash shell to the users. To deny the interactive login, you should write /sbin/nologin or /bin/false instead of login shell.

QUESTION 59

/data Directory is shared from the server1.example.com server. Mount the shared directory that:

- a. when user try to access, automatically should mount
- b. when user doesn't use mounted directory should unmount automatically after 50 seconds.
- c. shared directory should mount on /mnt/data on your machine.

Explanation:

```
1. vi /etc/auto.master  
/mnt /etc /auto.misc --timeout=50  
vi /etc/auto.misc  
data -rw,soft,intr server1.example.com:/data  
service autofs restart  
chkconfig autofs on
```

When you mount the other filesystem, you should unmount the mounted filesystem. Automount feature of linux helps to mount at access time and after certain seconds, when user unaccess the mounted directory, automatically unmount the filesystem.

/etc/auto.master is the master configuration file for autofs service. When you start the service, it reads the mount point as defined in /etc/auto.master.

QUESTION 60

One Logical Volume named lv1 is created under vg0. The Initial Size of that Logical Volume is 100MB. Now you required the size 500MB. Make successfully the size of that Logical Volume 500M without losing any data. As well as size should be increased online.

Explanation:

The LVM system organizes hard disks into Logical Volume (LV) groups. Essentially, physical hard disk partitions (or possibly RAID arrays) are set up in a bunch of equal sized chunks known as Physical Extents (PE). As there are several other concepts associated with the LVM system, let's start with some basic definitions:

Physical Volume (PV) is the standard partition that you add to the LVM mix. Normally, a physical volume is a standard primary or logical partition. It can also be a RAID array.

Physical Extent (PE) is a chunk of disk space. Every PV is divided into a number of equal sized PEs.

Every PE in a LV group is the same size. Different LV groups can have different sized PEs.

Logical Extent (LE) is also a chunk of disk space. Every LE is mapped to a specific PE.

Logical Volume (LV) is composed of a group of LEs. You can mount a file system such as /home and /var on an LV.

Volume Group (VG) is composed of a group of LVs. It is the organizational group for LVM. Most of the commands that you'll use apply to a specific VG.

Verify the size of Logical Volume: `lvdisplay /dev/vg0/lv1`

Verify the Size on mounted directory: `df -h` or `df -h mounted directory name`

Use: `lvextend -L+400M /dev/vg0/lv1`

`ext2online -d /dev/vg0/lv1` to bring extended size online.

Again Verify using `lvdisplay` and `df -h` command.

QUESTION 61

Create one partitions having size 100MB and mount it on data.

Explanation:

1. Use fdisk /dev/hda to create new partition.
2. Type n For New partitions.
3. It will ask for Logical or Primary Partitions. Press l for logical.
4. It will ask for the Starting Cylinder: Use the Default by pressing Enter Key.
5. Type the Size: +100M you can specify either Last cylinder of size here.
6. Press P to verify the partitions lists and remember the partitions name.
7. Press w to write on partitions table.
8. Either Reboot or use partprobe command.
9. Use `mkfs -t ext3 /dev/hda?`

OR

`mke2fs -j /dev/hda?` To create ext3 filesystem.

`vi /etc/fstab`

Write:

`/dev/hda? /data ext3 defaults 1 2`

Verify by mounting on current Sessions also: `mount /dev/hda? /data`

QUESTION 62

You are new System Administrator and from now you are going to handle the system and your main

task is Network monitoring, Backup and Restore. But you don't know the root password. Change the root password to redhat and login in default Runlevel.

Explanation:

When you Boot the System, it starts on default Runlevel specified in /etc/inittab:

Id:**:**initdefault:

When System Successfully boot, it will ask for username and password. But you don't know the root's password. To change the root password you need to boot the system into single user mode. You can pass the kernel arguments from the boot loader.

1. Restart the System.
2. You will get the boot loader GRUB screen.
3. Press a and type 1 or s for single mode ro root=LABEL=/ rhgb quiet s
4. System will boot on Single User mode.
5. Use passwd command to change.
6. Press ctrl+d

QUESTION 63

You are a System administrator. Using Log files very easy to monitor the system. Now there are 50 servers running as Mail, Web, Proxy, DNS services etc. You want to centralize the logs from all servers into on LOG Server. How will you configure the LOG Server to accept logs from remote host?

Explanation:

By default, system accept the logs only generated from local host. To accept the Log from other host configure:

```
vi /etc/sysconfig/syslog SYSLOGD_OPTIONS="-m 0 -r"
```

Where

-m 0 disables 'MARK' messages.

-r enables logging from remote machines

-x disables DNS lookups on messages received with -r

service syslog restart

QUESTION 64

Your System is configured in 192.168.0.0 Network and your nameserver is 192.168.0.254. Make successfully resolve to server1.example.com.

Explanation:

nameserver is specified in question,

1. Vi /etc/resolv.conf

nameserver 192.168.0.254

2. host server1.example.com

QUESTION 65

One Package named zsh is dump on <ftp://server1.example.com> under /pub/updates directory and your FTP server is 192.168.0.254. Install the package zsh.

Explanation:

```
rpm -ivh ftp://server1/example.com/pub/updates/zsh-*  
or  
Login to ftp server : ftp ftp://server1.example.com using anonymous user.  
Change the directory: cd pub and cd updates  
Download the package: mget zsh-*  
Quit from the ftp prompt : bye  
Install the package  
rpm -ivh zsh-*  
Verify either package is installed or not : rpm -q zsh
```

QUESTION 66

Some users home directory is shared from your system. Using showmount -e localhost command, the shared directory is not shown. Make access the shared users home directory.

Explanation:

```
Verify the File whether Shared or not ? : cat /etc/exports  
Start the nfs service: service nfs start  
Start the portmap service: service portmap start  
Make automatically start the nfs service on next reboot: chkconfig nfs on  
Make automatically start the portmap service on next reboot: chkconfig portmap on  
Verify either sharing or not: showmount -e localhost  
Check that default firewall is running on system?  
If running flush the iptables using iptables -F and stop the iptables service.
```

QUESTION 67

Add a new logical partition having size 100MB and create the data which will be the mount point for the new partition.

Explanation:

1. Use fdisk /dev/hda-> To create new partition.
2. Type n ->For New partitions
3. It will ask for Logical or Primary Partitions. Press l for logical.
4. It will ask for the Starting Cylinder: Use the Default by pressing Enter Keys
5. Type the size: +100M you can specify either Last cylinder of size here.
6. Press P to verify the partitions lists and remember the partitions name.
7. Press w to write on partitions table.
8. Either Reboot or use partprobe command.
9. Use mkfs -t ext3 /dev/hda?

OR

1. mke2fs -j /dev/hda? ->To create ext3 filesystem.
2. vi /etc/fstab
3. Write:
/dev/hda? /data ext3 defaults 0 0
4. Verify by mounting on current sessions also:
mount /dev/hda? /data

QUESTION 68

You have a domain named www.rhce.com associated IP address is 192.100.0.2. Configure the Apache web server by implementing the SSL for encryption communication.

Explanation:

```
vi /etc/httpd/conf.d/ssl.conf <VirtualHost 192.100.0.2> ServerName www.rhce.com DocumentRoot  
/var/www/rhce DirectoryIndex index.html index.htm ServerAdmin webmaster@rhce.com SSLEngine  
on SSLCertificateFile /etc/httpd/conf/ssl.crt/server.crt SSLCertificateKeyFile  
/etc/httpd/conf/ssl.key/server.key </VirtualHost>
```

```
cd /etc/httpd/conf
```

```
3 make testcert
```

Create the directory and index page on specified path. (Index page can download from
ftp://server1.example.com at exam time)

```
service httpd start|restart
```

```
chkconfig httpd on
```

Apache can provide encrypted communications using SSL (Secure Socket Layer). To make use of
encrypted communication, a client must request to https protocol, which uses port 443. For HTTPS
protocol required the certificate file and key file.

QUESTION 69

There is a server having 172.24.254.254 and 172.25.254.254. Your System lies on 172.24.0.0.

Make successfully ping to 172.25.254.254 by Assigning following IP: 172.24.0.x where x is your
station number.

Explanation:

Use netconfig command

Enter the IP Address as given station number by your examiner: example: 172.24.0.1

Enter Subnet Mask

Enter Default Gateway and primary name server

press on ok

```
ifdown eth0
```

```
ifup eth0
```

verify using ifconfig

In the lab server is playing the role of router, IP forwarding is enabled. Just set the Correct IP and
gateway, you can ping to 172.25.254.254.

QUESTION 70

Successfully resolve to server1.example.com where your DNS server is 172.24.254.254.

Explanation:

```
vi /etc/resolv.conf  
nameserver 172.24.254.254  
host server1.example.com
```

On every clients, DNS server is specified in /etc/resolv.conf. When you request by name it tries to
resolv from DNS server.

QUESTION 71

Your System is going use as a router for 172.24.0.0 and 172.25.0.0. Enable the IP Forwarding.

1. echo "1" >/proc/sys/net/ipv4/ip_forward
2. vi /etc/sysctl.conf net.ipv4.ip_forward=1

Explanation:

/proc is the virtual filesystem, containing the information about the running kernel.

To change the parameter of running kernel you should modify on /proc. From Next reboot the system, kernel will take the value from /etc/sysctl.conf.

QUESTION 72

Who ever creates the files/directories on archive group owner should be automatically should be the same group owner of archive.

Explanation:

chmod g+s /archive

Verify using: ls -ld /archive Permission should be like:

drwxrws--- 2 root sysuser 4096 Mar 16 18:08 /archive

If SGID bit is set on directory then who every users creates the files on directory group owner automatically the owner of parent directory.

To set the SGID bit: chmod g+s directory

To Remove the SGID bit: chmod g-s directory

QUESTION 73

Make on /archive directory that only the user owner and group owner member can fully access.

Explanation:

chmod 770 /archive

Verify using : ls -ld /archive Preview should be like:

drwxrwx--- 2 root sysuser 4096 Mar 16 18:08 /archive

To change the permission on directory we use the chmod command. According to the question that only the owner user (root) and group member (sysuser) can fully access the directory so: chmod 770 /archive

QUESTION 74

Notes:

NFSiš NFS instructor.example.com:/var/ftp/pub/rhel6/dvd

YUMiš http://instructor.example.com/pub/rhel6/dvd

ldapiš https://instructor.example.com/pub/EXAMPLE-CA-CERT

Install dialog package.

Answer: yum install dialog

QUESTION 75

SELinux must run in force mode.

Explanation:
/etc/sysconfig/selinux
SELINUX=enforcing

QUESTION 76

The firewall must be open.

Explanation:
/etc/init.d/iptables start
iptables -F
iptables -X
iptables -Z
/etc/init.d/iptables save
chkconfig iptables on

QUESTION 77

In the system, mounted the iso image /root/examine.iso to/mnt/iso directory. And enable automatically mount (permanent mount) after restart system.

Explanation:
mkdir -p /mnt/iso
/etc/fstab:
/root/examine.iso /mnt/iso iso9660 loop 0 0 mount -a
mount | grep examine

QUESTION 78

Configure your NFS services. Share the directory by the NFS Shared services.

Explanation:
/etc/init.d/rpcbind start
/etc/init.d/nfslock start
/etc/init.d/nfs start
chkconfig rpcbind on
chkconfig nfslock on
chkconfig nfs on
showmount -e localhost

QUESTION 79

1. Find all sizes of 10k file or directory under the /etc directory, and copy to /tmp/findfiles directory.
2. Find all the files or directories with Lucy as the owner, and copy to /tmp/findfiles directory.

Explanation:

```
(1)find /etc -size 10k -exec cp {} /tmp/findfiles \  
(2)find / -user lucy -exec cp -a {} /tmp/findfiles \  
;
```

Note: If find users and permissions, you need to use cp - a options, to keep file permissions and user attributes etc.

QUESTION 80

There is a local logical volumes in your system, named with common and belong to VGSRV volume group, mount to the /common directory. The definition of size is 128 MB.

Requirement:

Extend the logical volume to 190 MB without any loss of data. The size is allowed between 160-160 MB after extending.

Explanation:

```
lvextend -L 190M /dev/mapper/vgsrv-common resize2fs /dev/mapper/vgsrv-common
```

QUESTION 81

There is a local logical volumes in your system, named with shrink and belong to VGSRV volume group, mount to the /shrink directory. The definition of size is 320 MB.

Requirement:

Reduce the logical volume to 220 MB without any loss of data. The size is allowed between 200-260 MB after reducing.

Explanation:

```
cd;umount /shrink  
e2fsck -f /dev/mapper/vgsrv-shrink  
resize2fs /dev/mapper/vgsrv-shrink 220M  
lvreduce -L 220M /dev/mapper/vgsrv-shrink  
mount -a
```

QUESTION 82

Create a swap space, set the size is 600 MB, and make it be mounted automatically after rebooting the system (permanent mount).

Explanation:

```
if=/dev/zero of=/swapfile bs=1M count=600 mkswap /swapfile  
/etc/fstab:  
/swapfile swap swap defaults 0 0 mount -a
```

QUESTION 83

According the following requirements to create user, user group and the group members:

- A group named admin.
- A user named mary, and belong to admin as the secondary group.
- A user named alice, and belong to admin as the secondary group.
- A user named bobby, bobbys login shell should be non-interactive. Bobby not belong to admin as the secondary group.

Mary, Alice, bobby users must be set "password" as the user's password.

Explanation:
groupadd admin
useradd -G admin mary
useradd -G admin alice
useradd -s /sbin/nologin bobby
echo "password" | passwd --stdin mary
echo "password" | passwd --stdin alice
echo "password" | passwd --stdin bobby

QUESTION 84

According the following requirements to create a local directory /common/admin.
This directory has admin group.
This directory has read, write and execute permissions for all admin group members.
Other groups and users dont have any permissions.
All the documents or directories created in the /common/admin are automatically inherit the admin group.

Explanation:
mkdir -p /common/admin
chgrp admin /common/admin
chmod 2770 /common/admin

QUESTION 85

Update the kernel from <ftp://instructor.example.com/pub/updates>.
According the following requirements:
The updated kernel must exist as default kernel after rebooting the system.
The original kernel still exists and is available in the system.

Explanation:
rpm -ivh kernel-firm
rpm -ivh kernel...

QUESTION 86

User mary must configure a task.
Requirement: The local time at 14:23 every day echo "Hello World."

Explanation:
crontab -u mary -e
23 14 * * * echo "Hello World."

QUESTION 87

The user authentication has been provided by ldap domain in 192.168.0.254. According the following requirements to get ldapuser.

-LdapuserX must be able to login your system, X is your hostname number. But the ldapuser's home directory cannot be mounted, until you realize automatically mount by autofs server.

- All ldap user's password is "password".

Explanation:
system-config-authentication &



QUESTION 88

According the following requirements, configure autofs service and automatically mount to user's home directory in the ldap domain.

- Instructor.example.com (192.168.0.254) has shared /home/guests/ldapuserX home directory to your system by over NFS export, X is your hostname number.

- LdapuserX's home directory is exist in the instructor.example.com: /home/ guests/ldapuserX

- LdapuserXs home directory must be able to automatically mount to /home/ guests/ldapuserX in your system.

- Home directory have write permissions for the corresponding user.

However, you can log on to the ldapuser1 - ldapuser99 users after verification. But you can only get your corresponding ldapuser users. If your system's hostname is server1.example.com, you can only get ldapuser1's home directory.

Explanation:
mkdir "p /home/guests
cat /etc/auto.master:
/home/guests /etc/auto.ldap
cat /etc/auto.ldap:
ldapuser1 -rw instructor.example.com:/home/guests/ldapuser1

automatically mount all the user's home directory #* -rw instructor.example.com:/home/guests/&

QUESTION 89

Copy /etc/fstab document to /var/TMP directory. According the following requirements to configure the permission of this document.

The owner of this document must be root.

This document belongs to root group.

User mary have read and write permissions for this document.

User alice have read and execute permissions for this document.

Create user named bob, set uid is 1000. Bob have read and write permissions for this document.

All users has read permission for this document in the system.

Explanation:

```
cp /etc/fstab /var/tmp  
chown root:root /var/tmp/fstab  
chmod a-x /var/tmp/fstab  
setfacl -m u:mary:rw /var/tmp/fstab  
setfacl -m u:alice:rx /var/tmp/fstab  
useradd -u 1000 bob
```

QUESTION 90

Configure the NTP service in your system.

Explanation:

system-config-date &



QUESTION 91

Configure the FTP service in your system, allow remote access to anonymous login and download the program by this service. Service is still running after system rebooting.

Explanation:

```
yum install vsftpd  
/etc/init.d/vsftpd start  
chkconfig vsftpd on
```

QUESTION 92

Configure your web services, download from <http://instructor.example.com/pub/serverX.html> And the services must be still running after system rebooting.

Explanation:

```
cd /var/www/html  
wget http://instructor.example.com/pub/serverX.html mv serverX.html index.html /etc/init.d/httpd  
restart  
chkconfig httpd on
```

QUESTION 93

Create a volume group, and set the size is 500M, the size of single PE is 16M. Create logical volume named lv0 in this volume group, set size is 20 PE, make it as ext3 file system, and mounted automatically under data.

Explanation:

```
fdisk /dev/vda  
pvcreate /dev/vda3  
vgcreate "s 16M vg0 /dev/vda3  
lvcreate "n lv0 "l 20 vg0  
mkfs.ext3 /dev/mapper/vg0-lv0  
mkdir /data  
/etc/fstab:  
/dev/mapper/vg0-lv0 /data ext3 defaults 0 0  
mount "a  
mount | grep data
```

QUESTION 94

Download the document from <ftp://instructor.example.com/pub/testfile>, find all lines containing [abcde] and redirect to /MNT/answer document, then rearrange the order according the original content.

Explanation:

```
Download the file to /tmp first  
grep [abcde] /tmp/testfile > /mnt/answer
```

QUESTION 95

SELinux must be running in the Enforcing mode.

Explanation:

explanation below.

getenforce // Check the current mode of SELinux // SELinux runs in enforcing mode // Check

getenforce 1

getenforce

vim /etc/selinux/config selinux=enforcing // To temporarily enable SELinux

wg

sestatus

QUESTION 96

A YUM repository has been provided at http://server.domain11.example.com/pub/x86_64/Server.

Configure your system to use this location as a default repository.

Explanation:

vim/etc/yum.repos/base.repo

[base]

name=base

baseurl= http://server.domain11.example.com/pub/x86_64/Server

gpgcheck=0

enable=1

Save and Exit

Use yum list for validation, the configuration is correct if list the package information. If the Yum configuration is not correct then maybe cannot answer the following questions.

QUESTION 97

Resize the logical volume vo and its filesystem to 290 MB. Make sure that the filesystem contents remain intact.

Note: Partitions are seldom exactly the same size requested, so a size within the range of 260 MB to 320 MiB is acceptable.

Explanation:

df -hT

lvextend -L +100M /dev/vg0/vo

lvscan

xfs_growfs /home/ // home is LVM mounted directory

Note: This step is only need to do in our practice environment, you do not need to do in the real exam

resize2fs /dev/vg0/vo // Use this command to update in the real exam df -hT

OR

e2fsck -f/dev/vg0/vo

umount /home

```
resize2fs /dev/vg0/vo required partition capacity such as 100M lvreduce -l 100M /dev/vg0/vo mount  
/dev/vg0/vo /home  
df -Ht
```

QUESTION 98

Create the following users, groups, and group memberships:

A group named adminuser.

A user natasha who belongs to adminuser as a secondary group A user harry who also belongs to adminuser 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 adminuser, natasha, harry, and sarah should all have the password of redhat.

Explanation:

```
groupadd sysmgrs
```

```
useradd -G sysmgrs Natasha
```

We can verify the newly created user by cat /etc/passwd)

```
# useradd -G sysmgrs harry
```

```
# useradd -s /sbin/nologin sarrah
```

```
# passwd Natasha
```

```
# passwd harry
```

```
# passwd sarrah
```

QUESTION 99

Configure the permissions of /var/tmp/fstab

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

the file /var/tmp/fstab is owned by the root user.

the file /var/tmp/fstab belongs to the group root.

the file /var/tmp/fstab should not be executable by anyone.

the user natasha is able to read and write /var/tmp/fstab.

the user harry can neither write nor read /var/tmp/fstab.

all other users (current or future) have the ability to read /var/tmp/fstab.

Explanation:

```
cp -a /etc/fstab /var/tmp
```

```
cd /var/tmp
```

```
ls -l
```

```
getfacl /var/tmp/fstab
```

```
chmod ugo-x /var/tmp/fstab
```

[No need to do this, there won't be execute permission for the file by default]

```
# setfacl -m u:natasha:rw /var/tmp/fstab # setfacl -m u:harry:0 /var/tmp/fstab(zero)
```

[Read permission will be there for all the users, by default. Check it using ls -l /var/tmp/fstab] Verify by

```
[ ls -la /var/tmp/fstab]
```

QUESTION 100

Set cronjob for user natasha to do /bin/echo hiya at 14:23.

Explanation:

```
# crontab -e -u natasha  
23 14 * * * /bin/echo hiya  
wq!
```

QUESTION 101

Create a collaborative directory/home/admins with the following characteristics:

Group ownership of /home/admins is adminuser

The directory should be readable, writable, and accessible to members of adminuser, but not to any other user. (It is understood that root has access to all files and directories on the system.)

Files created in /home/admins automatically have group ownership set to the adminuser group

Explanation:

```
mkdir /home/admins  
chgrp -R adminuser /home/admins  
chmodg+w /home/admins  
chmodg+s /home/admins
```

QUESTION 102

Install the appropriate kernel update from <http://server.domain11.example.com/pub/updates>.

The following criteria must also be met:

The updated kernel is the default kernel when the system is rebooted

The original kernel remains available and bootable on the system

Explanation:

```
ftp server.domain11.example.com Anonymous login  
ftp> cd /pub/updates ftp> ls  
ftp> mget kernel* ftp> bye  
rpm -ivh kernel*  
vim /etc/grub.conf
```

Check the updated kernel is the first kernel and the original kernel remains available. set default=0 wq!

QUESTION 103

The system `ldap.example.com` provides an LDAP authentication service.

Your system should bind to this service as follows:

The base DN for the authentication service is `dc=domain11, dc=example, dc=com` LDAP is used to provide both account information and authentication information. The connection should be encrypted using the certificate at <http://host.domain11.example.com/pub/domain11.crt>

When properly configured, `ldapuserX` should be able to log into your system, but will not have a home directory until you have completed the autofs requirement. Username: `ldapuser11`

Password: `password`

Explanation:

```
system-config-authentication LDAP user DN=dc=domain11,dc=example,dc=com Server=  
host.domain11.example.com  
Certificate= http://host.domain11.example.com/pub/domain11.crt (enter url carefully, there maybe
```

```
// or ..)
LDAP password
OK
starting sssd
su -ldapuser11 Display Bash prompt #exit
```

QUESTION 104

Configure your system so that it is an NTP client of server.domain11.example.com

Explanation:

```
#system-config-date
```

Note: dialog box will open in that

Check mark Synchronize date and time over network. Remove all the NTP SERVER and click ADD and type

```
server.domain11.example.com
```

```
*****And then press ENTER and the press OK*****
```

QUESTION 105

Configure autofs to automount the home directories of LDAP users as follows:

host.domain11.example.com NFS-exports /home to your system.

This filesystem contains a pre-configured home directory for the user ldapuser11 ldapuser11's home directory is host.domain11.example.com /rhome/ldapuser11 ldapuser11's home directory should be automounted locally beneath /rhome as /rhome/ldapuser11

Home directories must be writable by their users

ldapuser11's password is 'password'.

Explanation:

```
vim /etc/auto.master /rhome /etc/auto.misc
```

```
wq!
```

```
# vim /etc/auto.misc
```

```
ldapuser11 --rw,sync host.domain11.example.com:/rhome/ldpauser11 :wq!
```

```
#service autofs restart
```

```
service autofs reload
```

```
chkconfig autofs on
```

```
su -ldapuser11
```

```
Login ldapuser with home directory
```

```
# exit
```

QUESTION 106

Create a user alex with a userid of 3400. The password for this user should be redhat.

Explanation:

```
useradd -u 3400 alex
```

```
passwd alex
```

```
su -alex
```

QUESTION 107

Add an additional swap partition of 754 MB to your system.
The swap partition should automatically mount when your system boots.
Do not remove or otherwise alter any existing swap partitions on your system.

Explanation:

```
fdisk -l  
fdisk -cu /dev/vda  
p n  
e or p select e  
default (first): enter  
default (last): enter n  
default(first): enter  
default(first): +754M t (1-5)  
l: 82 p  
w #reboot  
#mkswap /dev/vda5  
vim /etc/fstab  
/dev/vda5 swap swap defaults 0 0  
wq  
mount -a  
swapon -a  
swapon -s
```

QUESTION 108

Locate all the files owned by ira and copy them to the / root/findresults directory.

Explanation:

```
# find / -user ira > /root/findresults (if /root/findfiles is a file)  
# mkdir -p /root/findresults  
# find / -user ira -exec cp -a {} /root/findresults\; [ if /root/findfiles is a directory] ls /root/findresults
```

QUESTION 109

Find all lines in the file /usr/share/dict/words that contain the string seismic. Put a copy of all these lines in their original order in the file /root/wordlist. /root/wordlist should contain no empty lines and all lines must be exact copies of the original lines in /usr/share/dict/words.

Explanation:

```
grep seismic /usr/share/dict/words> /root/wordlist
```

QUESTION 110

Create a backup file named /root/backup.tar.bz2, which contains the contents of /usr/local, bar must use the bzip2 compression.

Explanation:

```
cd /usr/local  
tar -jcvf /root/backup.tar.bz2*
```

```
mkdir /test  
tar -jxvf /root/backup.tar.bz2 -C /test/
```

QUESTION 111

Create a new logical volume according to the following requirements:

The logical volume is named database and belongs to the datastore volume group and has a size of 50 extents.

Logical volumes in the datastore volume group should have an extent size of 16 MB.

Format the new logical volume with a ext3 filesystem.

The logical volume should be automatically mounted under /mnt/database at system boot time.

Explanation:

```
fdisk -cu /dev/vda  
partx -a /dev/vda  
pvcreate /dev/vdax  
vgcreate datastore /dev/vdax -s 16M  
lvcreate -l 50 -n database datastore  
mkfs.ext3 /dev/datastore/database  
mkdir /mnt/database  
mount /dev/datastore/database /mnt/database/ df -Th  
vi /etc/fstab  
/dev/datastore /database /mnt/database/ ext3 defaults 0 0 mount -a
```

QUESTION 112

Part 1 (on Node1 Server)

Task 1 [Managing Networking]

Please create new network connection with existing interface (enp1s0) using provided values:

IPv4: 172.25.X.10.255.255.0 (where X is your domain number: Domain15)

Gateway: 172.25.X.2

DNS server: 172.25.X.2

Add the following secondary IP addresses statically to your current running connection. Do this in a way that does not compromise your existing settings:

IPv4: 10.0.0.5 and set the hostname node1.domain15.example.com

Explanation:

```
*
```

```
[root@node1 ~]# nmcli connection show  
[root@node1 ~]# nmcli connection add con-name static ifname enp1s0 type ethernet ipv4.addresses  
172.25.15.10 ipv4.gateway 172.25.15.2 ipv4.dns 172.25.15.2  
[root@node1 ~]# nmcli connection modify static ipv4.method manual connection.autoconnect yes  
[root@node1 ~]# nmcli connection modify static +ipv4.addresses 10.0.0.5  
[root@node1 ~]# nmcli connection up static  
[root@node1 ~]# nmcli connection show  
[root@node1 ~]# hostnamectl set-hostname node1.domain15.example.com  
[root@node1 ~]# hostnamectl status  
[root@node1 ~]# nmcli connection down static  
*
```

```
[root@node1 ~]# nmcli connection up static
[root@node1 ~]# ip addr show
[root@node1 ~]# reboot
### For checking ###
[root@node1 ~]# ip addr show
[root@node1 ~]# netstat -nr
[root@node1 ~]# cat /etc/resolv.conf
```

QUESTION 113

Part 1 (on Node1 Server)

Task 2 [Installing and Updating Software Packages]

Configure your system to use this location as a default repository:

http://utility.domain15.example.com/BaseOS

http://utility.domain15.example.com/AppStream

Also configure your GPG key to use this location

http://utility.domain15.example.com/RPM-GPG-KEY-redhat-release

Explanation:

```
* [root@node1 ~]# vim /etc/yum.repos.d/redhat.repo
[BaseOS]
name=BaseOS
baseurl=http://utility.domain15.example.com/BaseOS
enabled=1
gpgcheck=1
gpgkey=http://utility.domain15.example.com/RPM-GPG-KEY-redhat-release
[AppStream]
name=AppStream
baseurl=http://utility.domain15.example.com/AppStream
enabled=1
gpgcheck=1
gpgkey=http://utility.domain15.example.com/RPM-GPG-KEY-redhat-release
[root@node1 ~]# yum clean all
[root@node1 ~]# yum repolist
[root@node1 ~]# yum list all
```

QUESTION 114

Part 1 (on Node1 Server)

Task 3 [Managing Local Users and Groups]

Create the following users, groups and group memberships:

A group named sharegrp

A user harry who belongs to sharegrp as a secondary group

A user natasha who also belongs to sharegrp as a secondary group

A user copper who does not have access to an interactive shell on the system and who is not a member of sharegrp.

harry, natasha and copper should have the password redhat

Explanation:

```
* [root@node1 ~]# groupadd sharegrp
[root@node1 ~]# useradd harry
[root@node1 ~]# useradd natasha
```

```
[root@node1 ~]# usermod -aG sharegrp harry
[root@node1 ~]# usermod -aG sharegrp natasha
[root@node1 ~]# useradd -s /sbin/nologin copper
[root@node1 ~]# echo "redhat" | passwd --stdin harry
[root@node1 ~]# echo "redhat" | passwd --stdin natasha
[root@node1 ~]# echo "redhat" | passwd --stdin copper
### For Checking ###
[root@node1 ~]# su - copper
This account is currently not available.
[root@node1 ~]# su - natasha
[root@node1 ~]# id
[root@node1 ~]# su - harry
[root@node1 ~]# id
```

QUESTION 115

Part 1 (on Node1 Server)

Task 4 [Controlling Access to Files]

Create collaborative directory /mnt/shares with the following characteristics:

Group ownership of /mnt/shares should be sharegrp.

The directory should be readable, writable and accessible to member of sharegrp but not to any other user. (It is understood that root has access to all files and directories on the system)

Files created in /mnt/shares automatically have group ownership set to the sharegrp group.

Explanation:

*

```
[root@node1 ~]# mkdir -p /mnt/shares
[root@node1 ~]# ls -lrt /mnt/
[root@node1 ~]# chgrp sharegrp /mnt/shares/
[root@node1 ~]# chmod 2770 /mnt/shares/
[root@node1 ~]# ls -lrt /mnt/
### For Checking ###
[root@node1 ~]# su - harry
[harry@node1 ~]$ cd /mnt/shares/
[harry@node1 shares]$ touch harry
[harry@node1 shares]$ logout
[root@node1 ~]# su - natasha
[natasha@node1 ~]$ cd /mnt/shares/
[natasha@node1 shares]$ touch natasha
[natasha@node1 shares]$ ls -lrt
-rw-rw-r--. 1 harry sharegrp 0 Mar 21 06:03 harry
-rw-rw-r--. 1 natasha sharegrp 0 Mar 21 06:03 natasha
```

QUESTION 116

Part 1 (on Node1 Server)

Task 5 [Controlling Access to Files with ACLs]

Copy the file /etc/fstab to /var/tmp. Configure the following permissions on /var/tmp/fstab.

The file /var/tmp/fstab is owned by root user

The file /var/tmp/fstab is belongs to the root group

The file /var/tmp/fstab should be executable by anyone

The user harry is able to read and write on /var/tmp/fstab

The user natasha can neither read or write on /var/tmp/fstab

All other users (Current or future) have the ability to read /var/tmp/fstab

Explanation:

```
*
```

```
[root@node1 ~]# cp -p /etc/fstab /var/tmp/
[root@node1 ~]# ls -lrt /etc/fstab
[root@node1 ~]# ls -lrt /var/tmp/fstab
[root@node1 ~]# chmod a+x /var/tmp/fstab
[root@node1 ~]# getfacl /var/tmp/fstab
[root@node1 ~]# setfacl -m u:harry:rw- /var/tmp/fstab
[root@node1 ~]# setfacl -m u:natasha:--- /var/tmp/fstab
[root@node1 ~]# getfacl /var/tmp/fstab
getfacl: Removing leading '/' from absolute path names
# file: var/tmp/fstab
# owner: root
# group: root
user::rwx
user:harry:rwx
user:natasha:---
group::r-x
mask::rwx
other::r-x
*
[root@node1 ~]# su - natasha
[natasha@node1 ~]$ cat /var/tmp/fstab
cat: /var/tmp/fstab: Permission denied
```

QUESTION 117

Part 1 (on Node1 Server)

Task 6 [Accessing Linux File Systems]

Find all lines in the file /usr/share/mime/packages/freedesktop.org.xml that contain the string ich.

Put a copy of these lines in the original order in the file /root/lines.

/root/lines should contain no empty lines and all lines must be exact copies of the original lines in /usr/share/mime/packages/freedesktop.org.xml

Explanation:

```
*
```

```
[root@node1 ~]# cat /usr/share/mime/packages/freedesktop.org.xml | grep ich > /root/lines
[root@node1 ~]# cat /root/lines
<comment xml:lang="ast">Ficheru codificáu en BinHex de Machintosh</comment>
<comment xml:lang="fr">fichier codé Macintosh BinHex</comment>
<comment xml:lang="gl">ficheiro de Macintosh codificado con BinHex</comment>
<comment xml:lang="oc">fichiér encodat Macintosh BinHex</comment>
<comment xml:lang="pt">ficheiro codificado em BinHex de Macintosh</comment>
<comment xml:lang="fr">fichier binaire aux lettres</comment>
```

QUESTION 118

Part 1 (on Node1 Server)

Task 7 [Accessing Linux File Systems]

Find all the files owned by user natasha and redirect the output to /home/alex/files.

Find all files that are larger than 5MiB in the /etc directory and copy them to /find/largefiles.

Explanation:

```
[root@node1 ~]# find / -name natasha -type f > /home/natasha/files
[root@node1 ~]# cat /home/natasha/files
/var/spool/mail/natasha
/mnt/shares/natasha
[root@node1 ~]# mkdir /find
[root@node1 ~]# find /etc -size +5M > /find/largefiles
[root@node1 ~]# cat /find/largefiles
/etc/selinux/targeted/policy/policy.31
/etc/udev/hwdb.bin
```

QUESTION 119

Part 1 (on Node1 Server)

Task 8 [Managing Local Users and Groups]

Create a user fred with a user ID 3945. Give the password as iamredhatman

Explanation:

```
*
```

```
[root@node1 ~]# useradd -u 3945 fred
[root@node1 ~]# echo "iamredhatman" | passwd --stdin fred
Changing password for user fred.
passwd: all authentication tokens updated successfully
```

QUESTION 120

Part 1 (on Node1 Server)

Task 9 [Managing Files from the Command Line]

Search the string nologin in the /etc/passwd file and save the output in /root/strings

Explanation:

```
*
```

```
[root@node1 ~]# cat /etc/passwd | grep nologin > /root/strings
[root@node1 ~]# cat /root/strings
bin:x:1:1:bin:/bin:/nologin
daemon:x:2:2:daemon:/sbin:/nologin
adm:x:3:4:adm:/var/adm:/sbin:/nologin
lp:x:4:7:lp:/var/spool/lpd:/sbin:/nologin
mail:x:8:12:mail:/var/spool/mail:/sbin:/nologin
```

QUESTION 121

Part 1 (on Node1 Server)

Task 10 [Configuring NTP/Time Synchronization]

Configure your system so that it is an NTP client of utility.domain15.example.com

The system time should be set to your (or nearest to you) timezone and ensure NTP sync is configured

Explanation:

```
*
```

```
[root@node1 ~]# yum install chrony
[root@node1 ~]# vim /etc/chrony.conf
pool utility.domain15.example.com iburst
[root@node1 ~]# systemctl enable chronyd
[root@node1 ~]# systemctl restart chronyd
[root@node1 ~]# systemctl status chronyd
[root@node1 ~]# tzselect
Please identify a location so that time zone rules can be set correctly.
Please select a continent, ocean, "coord", or "TZ".
1) Africa
2) Americas
3) Antarctica
4) Asia
11) TZ - I want to specify the time zone using the Posix TZ format.
#? 4
*
```

Please select a country whose clocks agree with yours.

```
1) Afghanistan 18) Israel 35) Palestine
2) Armenia 19) Japan 36) Philippines
3) Azerbaijan 20) Jordan 37) Qatar
4) Bahrain 21) Kazakhstan 38) Russia
5) Bangladesh 22) Korea (North) 39) Saudi Arabia
#? 5
```

The following information has been given:

Bangladesh

Therefore TZ='Asia/Dhaka' will be used.

Is the above information OK?

```
1) Yes
2) No
#? 1
```

Asia/Dhaka

```
[root@node1 ~]# chronyc sources -v
^? utility.domain15.example> 0 7 0 - +0ns[ +0ns] +/- 0ns
```

QUESTION 122

Part 1 (on Node1 Server)

Task 11 [Scheduling Future Tasks]

The user natasha must configure a cron job that runs daily at 14:23 local time and also the same cron job will run after every 2 minutes and executes:

/bin/echo hello

Explanation:

*

```
[root@node1 ~]# crontab -l -u natasha
no crontab for natasha
[root@node1 ~]# crontab -e -u natasha
23 14 * * * /bin/echo hello
* * * * * /bin/echo 2min
crontab: installing new crontab
[root@node1 ~]# crontab -l -u natasha
23 14 * * * /bin/echo hello
* * * * * /bin/echo 2min
[root@node1 ~]# systemctl status crond.service
```

*

For Checking

```
[root@node1 ~]# tail -f /var/log/cron
Mar 23 13:23:48 node1 crontab[10636]: (root) REPLACE (natasha)
Mar 23 13:23:48 node1 crontab[10636]: (root) END EDIT (natasha)
Mar 23 13:23:50 node1 crontab[10638]: (root) LIST (natasha)
Mar 23 13:24:01 node1 crond[1349]: (root) FAILED (loading cron table)
Mar 23 13:24:02 node1 CROND[10673]: (natasha) CMD (/bin/echo 2min)
```

QUESTION 123

Part 1 (on Node1 Server)

Task 12 [Accessing Network-Attached Storage]

Configure autofs to automount the home directories of user remoteuserX. Note the following:
utility.domain15.example.com(172.25.15.9), NFS-exports /netdir to your system, where user is
remoteuserX where X is your domain number

remoteuserX home directory is utility.domain15.example.com:/netdir/remoteuserX

remoteuserX home directory should be auto mounted locally at /netdir as /netdir/remoteuserX

Home directories must be writable by their users while you are able to login as any of the
remoteuserX only home directory that is accessible from your system

Explanation:

*

```
[root@host ~]#systemctl enable sssd.service
[root@host ~]#systemctl start sssg.service
[root@host ~]#getent passwd remoteuser15
[root@host ~]#yum install autofs
[root@host ~]#vim /etc/auto.master.d/home9.autofs
/netdir/remoteuser15 /etc/auto.home9
[root@host ~]#vim /etc/auto.home9
remoteuser15 "rw,sync utility.network15.example.com:/netdir/remoteuser15/&
[root@host ~]#systemctl enable autofs
[root@host ~]#systemctl restart autofs
[root@host ~]#su - remoteuser15
```

QUESTION 124

Part 1 (on Node1 Server)

Task 13 [Archiving and Transferring Files & SELinux]

Create a backup file named /root/backup.tar.bz2. The backup file should contain the content of
/usr/local and should be zipped with bzip2 compression format.

Furthermore, ensure SELinux is in enforcing mode. If it is not, change SELinux to enforcing mode.

Explanation:

*

```
[root@node1 ~]# tar cvf /root/backup.tar /usr/local/
tar: Removing leading '/' from member names
/usr/local/
/usr/local/bin/
```

```
/usr/local/etc/
[root@node1 ~]# ls
backup.tar
[root@node1 ~]# file backup.tar
backup.tar: POSIX tar archive (GNU)
[root@node1 ~]# bzip2 backup.tar
[root@node1 ~]# ls
backup.tar.bz2
[root@node1 ~]# file backup.tar.bz2
backup.tar.bz2: bzip2 compressed data, block size = 900k
[root@node1 ~]# sestatus
SELinux status: enabled
[root@node1 ~]# cat /etc/selinux/config
SELINUX=enforcing
SELINUXTYPE=targeted
[root@node1 ~]# reboot
### For Checking ###
[root@node1 ~]# sestatus
SELinux status: enabled
```

QUESTION 125

Part 1 (on Node1 Server)

Task 14 [Managing SELinux Security]

You will configure a web server running on your system serving content using a non-standard port (82)

Explanation:

```
*
```

```
[root@node1 ~]# curl http://node1.domain15.example.com
curl: (7) Failed to connect to node1.domain15.example.com port 80: Connection refused
[root@node1 ~]# yum install httpd
[root@node1 ~]# systemctl enable --now httpd
Created symlink /etc/systemd/system/multi-user.target.wants/httpd.service †
/usr/lib/systemd/system/httpd.service.
[root@node1 ~]# systemctl start httpd
[root@node1 ~]# systemctl status httpd
Status: "Running, listening on: port 80"
*
[root@node1 ~]# wget http://node1.domain15.example.com
2021-03-23 13:27:28 ERROR 403: Forbidden.
[root@node1 ~]# semanage port -l | grep http
http_port_t tcp 80, 81, 443, 488, 8008, 8009, 8443, 9000
[root@node1 ~]# semanage port -a -t http_port_t -p tcp 82
[root@node1 ~]# semanage port -l | grep http
http_port_t tcp 82, 80, 81, 443, 488, 8008, 8009, 8443, 9000
[root@node1 ~]# firewall-cmd --zone=public --list-all
[root@node1 ~]# firewall-cmd --permanent --zone=public --add-port=82/tcp
[root@node1 ~]# firewall-cmd --reload
[root@node1 ~]# curl http://node1.domain15.example.com
OK
*
root@node1 ~]# wget http://node1.domain15.example.com:82
Connection refused.
```

```
[root@node1 ~]# vim /etc/httpd/conf/httpd.conf
Listen 82
[root@node1 ~]# systemctl restart httpd
[root@node1 ~]# wget http://node1.domain15.example.com:82
2021-03-23 13:31:41 ERROR 403: Forbidden.
[root@node1 ~]# curl http://node1.domain15.example.com:82
OK
```

QUESTION 126

Part 1 (on Node1 Server)

Task 15 [Running Containers]

Create a container named logserver with the image rhel8/rsyslog found from the registry
registry.domain15.example.com:5000

The container should run as the root less user shangrila. use redhat as password [sudo user]

Configure the container with systemd services as the shangrila user using the service name,
œcontainer-logserver so that it can be persistent across reboot.

Use admin as the username and admin123 as the credentials for the image registry.

Explanation:

*

```
[root@workstation ~]# ssh shangrila@node1
[shangrila@node1 ~]$ podman login registry.domain15.example.com:5000
Username: admin
Password:
Login Succeeded!
[shangrila@node1 ~]$ podman pull registry.domain15.example.com:5000/rhel8/rsyslog
[shangrila@node1 ~]$ podman run -d --name logserver
registry.domain15.example.com:5000/rhel8/rsyslog
021b26669f39cc42b8e94eb886ba8293d6247bf68e4b0d76db2874aef284d6d
[shangrila@node1 ~]$ mkdir -p ~/.config/systemd/user
[shangrila@node1 ~]$ cd ~/.config/systemd/user
*
[shangrila@node1 user]$ podman generate systemd --name logserver --files --new
/home/shangrila/.config/systemd/user/container-logserver.service
[shangrila@node1 ~]$ systemctl --user daemon-reload
[shangrila@node1 user]$ systemctl --user enable --now container-logserver.service
[shangrila@node1 ~]$ podman ps
CONTAINER ID IMAGE COMMAND CREATED STATUS PORTS NAMES
7d9f7a8a4d63 registry.domain15.example.com:5000/rhel8/rsyslog:latest /bin/rsyslog.sh 2 seconds
ago logserver
[shangrila@node1 ~]$ sudo reboot
[shangrila@node1 ~]$ cd .config/systemd/user
[shangrila@node1 user]$ systemctl --user status
```

QUESTION 127

Part 1 (on Node1 Server)

Task 16 [Running Containers]

Configure your host journal to store all journal across reboot

Copy all journal files from /var/log/journal/ and put them in the /home/shangrila/containerlogserver

Create and mount /home/shangrila/container-logserver as a persistent storage to the container as
/var/log/ when container start

Explanation:

```
*  
[shangrila@node1 ~]$ podman ps  
CONTAINER ID IMAGE COMMAND CREATED STATUS PORTS NAMES  
d5ffe018a53c registry.domain15.example.com:5000/rhel8/rsyslog:latest /bin/rsyslog.sh 5 seconds  
ago Up 4 seconds ago logserver  
[shangrila@node1 ~]$ podman stats logserver  
Error: stats is not supported in rootless mode without cgroups v2  
[shangrila@node1 ~]$ podman stop logserver  
d5ffe018a53ca7eb075bf560d1f30822ab6fe51eba58fd1a8f370eda79806496  
[shangrila@node1 ~]$ podman rm logserver  
Error: no container with name or ID logserver found: no such container  
[shangrila@node1 ~]$ mkdir -p container-journal/  
*  
[shangrila@node1 ~]$ sudo systemctl restart systemd-journald  
[sudo] password for shangrila:  
[shangrila@node1 ~]$ sudo cp -av /var/log/journal/* container-journal/  
[shangrila@node1 ~]$ sudo cp -av /var/log/journal/* container-journal/  
[shangrila@node1 ~]$ sudo chown -R shangrila container-journal/  
[shangrila@node1 ~]$ podman run -d --name logserver -v /home/shangrila/containerjournal/:/var/log/journal:Z registry.domain15.example.com:5000/rhel8/rsyslog  
[shangrila@node1 ~]$ podman ps  
[shangrila@node1 ~]$ loginctl enable-linger  
[shangrila@node1 ~]$ loginctl show-user shangrila|grep -i linger  
Linger=yes  
*  
[shangrila@node1 ~]$ podman stop logserver  
[shangrila@node1 ~]$ podman rm logserver  
[shangrila@node1 ~]$ systemctl --user daemon-reload  
[shangrila@node1 ~]$ systemctl --user enable --now container-logserver  
[shangrila@node1 ~]$ podman ps  
CONTAINER ID IMAGE COMMAND CREATED STATUS PORTS NAMES  
3903e1d09170 registry.domain15.example.com:5000/rhel8/rsyslog:latest /bin/rsyslog.sh 4 seconds  
ago Up 4 seconds ago logserver  
[shangrila@node1 ~]$ systemctl --user stop container-logserver.service  
*[shangrila@node1 ~]$ sudo reboot  
[shangrila@node1 ~]$ podman ps -a  
CONTAINER ID IMAGE COMMAND CREATED STATUS PORTS NAMES  
7e6cd59c506a registry.domain15.example.com:5000/rhel8/rsyslog:latest /bin/rsyslog.sh 10 seconds  
ago Up 9 seconds ago logserver
```

QUESTION 128

Part 1 (on Node1 Server)

Task 17 [Accessing Linux File Systems]

Find all the files owned by user `alex` and redirect the output to `/home/alex/files`.

Explanation:

```
* root@node1 ~]# find / -user alex -type f > /home/alex/files
```

QUESTION 129

Part 2 (on Node2 Server)

Task 1 [Controlling the Boot Process]

Interrupt the boot process and reset the root password. Change it to kexdrams to gain access to the system

Explanation:

*

1. Reboot the server pressing by Ctrl+Alt+Del
2. When the boot-loader menu appears, press the cursor keys to highlight the default boot-loader entry
3. Press e to edit the current entry.
4. Use the cursor keys to navigate to the line that starts with linux.
5. Press End to move the cursor to the end of the line.
6. Append rd.break to the end of the line.
7. Press Ctrl+x to boot using the modified configuration.
8. At the switch_root prompt

*

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

```
switch_root:# chroot /sysroot
```

```
sh-4.4# echo kexdrams | passwd --stdin root
```

Changing password for user root.

passwd: all authentication tokens updated successfully.

```
sh-4.4# touch /.autorelabel
```

```
sh-4.4# exit; exit
```

*

Type exit twice to continue booting your system as usual.

QUESTION 130

Part 2 (on Node2 Server)

Task 2 [Installing and Updating Software Packages]

Configure your system to use this location as a default repository:

```
http://utility.domain15.example.com/BaseOS
```

```
http://utility.domain15.example.com/AppStream
```

Also configure your GPG key to use this location

```
http://utility.domain15.example.com/RPM-GPG-KEY-redhat-release
```

Explanation:

```
[root@node1 ~]# vim /etc/yum.repos.d/redhat.repo
[BaseOS]
name=BaseOS
baseurl=http://utility.domain15.example.com/BaseOS
enabled=1
gpgcheck=1
gpgkey=http://utility.domain15.example.com/RPM-GPG-KEY-redhat-release
[AppStream]
name=AppStream
baseurl=http://utility.domain15.example.com/AppStream
enabled=1
gpgcheck=1
```

```
gpgkey=http://utility.domain15.example.com/RPM-GPG-KEY-redhat-release
[root@node1 ~]# yum clean all
[root@node1 ~]# yum repolist
repo id repo name
AppStream AppStream
BaseOS BaseOS
[root@node1 ~]# yum list all
```

QUESTION 131

Part 2 (on Node2 Server)

Task 3 [Managing Logical Volumes]

Create a new volume group in the name of datavg and physical volume extent is 16 MB

Create a new logical volume in the name of datalv with the size of 250 extents and file system must xfs

Then the logical volume should be mounted automatically mounted under /data at system boot time

Explanation:

*

```
[root@node2 ~]# lsblk
NAME MAJ:MIN RM SIZE RO TYPE MOUNTPOINT
vdb 252:16 0 5G 0 disk
"""/dev/vdb1 252:17 0 4.2G 0 part
"""/dev/vgrz-lvrz 253:2 0 4.1G 0 lvm /datarz
vdc 252:32 0 5G 0 disk
vdd 252:48 0 5G 0 disk
vde 252:64 0 10G 0 disk
[root@node2 ~]# parted /dev/vdc mklabel msdos
[root@node2 ~]# parted /dev/vdc mkpart primary 1MiB 4200MiB
[root@node2 ~]# parted /dev/vdc set 1 lvm on
*
[root@node2 ~]# udevadm settle
[root@node2 ~]# pvcreate /dev/vdc1
Physical volume "/dev/vdc1" successfully created.
[root@node2 ~]# vgcreate -s 16M datavg /dev/vdc1
Volume group "datavg" successfully created
[root@node2 ~]# lvcreate -n datalv -L 4000M datavg
Logical volume "datalv" created.
[root@node2 ~]# mkfs.xfs /dev/datavg/datalv
[root@node2 ~]# mkdir /data
[root@node2 ~]# blkid
/dev/mapper/datavg-datalv: UUID="7397a292-d67d-4632-941e-382e2bd922ce" BLOCK_SIZE="512"
TYPE="xfs"
*
[root@node2 ~]# vim /etc/fstab
UUID=7397a292-d67d-4632-941e-382e2bd922ce /data xfs defaults 0 0
[root@node2 ~]# mount UUID=7397a292-d67d-4632-941e-382e2bd922ce /data
[root@node2 ~]# reboot
[root@node2 ~]# df -hT
Filesystem Type Size Used Avail Use% Mounted on
/dev/mapper/datavg-datalv xfs 3.9G 61M 3.9G 2% /data
```

QUESTION 132

Part 2 (on Node2 Server)

Task 4 [Managing Logical Volumes]

Resize the logical volume, lvrz and reduce filesystem to 4600 MiB. Make sure the the filesystem contents remain intact with mount point /datarz

(Note: partitions are seldom exactly the size requested, so anything within the range of 4200MiB to 4900MiB is acceptable)

Explanation:

*

```
[root@node2 ~]# lsblk
NAME MAJ:MIN RM SIZE RO TYPE MOUNTPOINT
vdb 252:16 0 5G 0 disk
"""/vdb1 252:17 0 4.2G 0 part
"""/vgrz-lvrz 253:2 0 4.1G 0 lvm /datarz
vdc 252:32 0 5G 0 disk
"""/vdc1 252:33 0 4.4G 0 part
"""/datavg-datalv 253:3 0 3.9G 0 lvm /data
vdd 252:48 0 5G 0 disk
vde 252:64 0 10G 0 disk
[root@node2 ~]# lvs
LV VG Attr LSize Pool Origin Data% Meta% Move Log Cpy%Sync Convert
lvrz vgrz -wi-ao---- 4.10g
[root@node2 ~]# vgs
VG #PV #LV #SN Attr VSize VFree
vgrz 1 1 0 wz--n- <4.15g 48.00m
[root@node2 ~]# parted /dev/vdb print
Number Start End Size Type File system Flags
1 1049kB 4456MB 4455MB primary lvm
*
[root@node2 ~]# df -hT
Filesystem Type Size Used Avail Use% Mounted on
/dev/mapper/vgrz-lvrz ext4 4.0G 17M 3.8G 1% /datarz
[root@node2 ~]# parted /dev/vdb mkpart primary 4456MiB 5100MiB
[root@node2 ~]# parted /dev/vdb set 2 lvm on
[root@node2 ~]# udevadm settle
[root@node2 ~]# pvcreate /dev/vdb2
Physical volume "/dev/vdb2" successfully created.
*
[root@node2 ~]# vgextend vgrz /dev/vdb2
Volume group "vgrz" successfully extended
[root@node2 ~]# lvextend -r -L 4600M /dev/vgrz/lvrz
Size of logical volume vgrz/lvrz changed from 4.10 GiB (1050 extents) to 4.49 GiB (1150 extents).
Logical volume vgrz/lvrz successfully resized.
[root@node2 ~]# resize2fs /dev/vgrz/lvrz
[root@node2 ~]# df -hT
Filesystem Type Size Used Avail Use% Mounted on
/dev/mapper/vgrz-lvrz ext4 4.4G 17M 4.2G 1% /datarz
```

QUESTION 133

Part 2 (on Node2 Server)

Task 5 [Managing Logical Volumes]

Add an additional swap partition of 656 MiB to your system. The swap partition should automatically mount when your system boots

Do not remove or otherwise alter any existing swap partition on your system

Explanation:

```
*  
[root@node2 ~]# lsblk  
NAME MAJ:MIN RM SIZE RO TYPE MOUNTPOINT  
vdc 252:32 0 5G 0 disk  
""""€vdc1 252:33 0 4.1G 0 part  
""""€datavg-datalv 253:3 0 3.9G 0 lvm /data  
vdd 252:48 0 5G 0 disk  
vde 252:64 0 10G 0 disk  
[root@node2 ~]# swapon -s  
Filename Type Size Used Priority  
/dev/dm-1 partition 2097148 1548 -2  
[root@node2 ~]# free -m  
total used free shared buff/cache available  
Mem: 1816 1078 104 13 633 573  
Swap: 2047 1 2046  
[root@node2 ~]# parted /dev/vdc print  
Number Start End Size Type File system Flags  
1 1049kB 4404MB 4403MB primary lvm  
*  
[root@node2 ~]# parted /dev/vdc mkpart primary linux-swap 4404MiB 5060MiB  
[root@node2 ~]# mkswap /dev/vdc2  
Setting up swap space version 1, size = 656 MiB (687861760 bytes)  
no label, UUID=9faf818f-f070-4416-82b2-21a41988a9a7  
[root@node2 ~]# swapon -s  
Filename Type Size Used Priority  
/dev/dm-1 partition 2097148 1804 -2  
[root@node2 ~]# swapon /dev/vdc2  
*  
[root@node2 ~]# swapon -s  
Filename Type Size Used Priority  
/dev/dm-1 partition 2097148 1804 -2  
/dev/vdc2 partition 671740 0 -3  
[root@node2 ~]# blkid  
/dev/vdc2: UUID="9faf818f-f070-4416-82b2-21a41988a9a7" TYPE="swap" PARTUUID="0f22a35f-02"  
[root@node2 ~]# vim /etc/fstab  
UUID=9faf818f-f070-4416-82b2-21a41988a9a7 swap swap defaults 0 0  
[root@node2 ~]# reboot  
[root@node2 ~]# swapon -s  
Filename Type Size Used Priority  
/dev/dm-1 partition 2097148 1804 -2  
/dev/vdc2 partition 671740 0 -3
```

QUESTION 134

Part 2 (on Node2 Server)

Task 6 [Implementing Advanced Storage Features]

Add a new disk to your virtual machine with a size of 10 GiB

On this disk, create a VDO volume with a size of 50 GiB and mount it persistently on /vbread with xfs filesystem

Explanation:

*

```
[root@node2 ~]# lsblk
NAME MAJ:MIN RM SIZE RO TYPE MOUNTPOINT
vdd 252:48 0 5G 0 disk
vde 252:64 0 10G 0 disk
[root@node2 ~]# yum install kmod-kvdo vdo
[root@node2 ~]# systemctl enable --now vdo
[root@node2 ~]# systemctl start vdo
[root@node2 ~]# systemctl status vdo
[root@node2 ~]# vdo create --name=vdo1 --device=/dev/vde --vdoLogicalSize=50G
[root@node2 ~]# vdostats --hu
Device Size Used Available Use% Space saving%
/dev/mapper/vdo1 10.0G 4.0G 6.0G 40% N/A
[root@node2 ~]# mkfs.xfs -K /dev/mapper/vdo1
*
[root@node2 ~]# lsblk
NAME MAJ:MIN RM SIZE RO TYPE MOUNTPOINT
vde 252:64 0 10G 0 disk
"vdo1" 253:4 0 50G 0 vdo
[root@node2 ~]# mkdir /vbread
[root@node2 ~]# blkid
/dev/mapper/vdo1: UUID="1ec7a341-6051-4aed-8a2c-4d2d61833227" BLOCK_SIZE="4096"
TYPE="xfs"
[root@node2 ~]# vim /etc/fstab
UUID=1ec7a341-6051-4aed-8a2c-4d2d61833227 /vbread xfs defaults,xsystemd.
requires=vdo.service 0 0
[root@node2 ~]# mount /dev/mapper/vdo1 /vbread/
[root@node2 ~]# df -hT
Filesystem Type Size Used Avail Use% Mounted on
/dev/mapper/vdo1 xfs 50G 390M 50G 1% /vbread
```

QUESTION 135

Part 2 (on Node2 Server)

Task 7 [Implementing Advanced Storage Features]

Create a thin-provisioned filesystem with the name think_fs from a pool think_pool using the devices.

The filesystem should be mounted on /strav and must be persistent across reboot

Explanation:

```
*
```

```
[root@node2 ~]# lsblk
NAME MAJ:MIN RM SIZE RO TYPE MOUNTPOINT
vdd 252:48 0 5G 0 disk
vde 252:64 0 10G 0 disk
"vdo1" 253:4 0 50G 0 vdo /vbread
[root@node2 ~]# yum install stratis* -y
[root@node2 ~]# systemctl enable --now stratisd.service
[root@node2 ~]# systemctl start stratisd.service
[root@node2 ~]# systemctl status stratisd.service
[root@node2 ~]# stratis pool create think_pool /dev/vdd
[root@node2 ~]# stratis pool list
```

Name Total Physical Properties
think_pool 5 GiB / 37.63 MiB / 4.96 GiB ~Ca,~Cr
*
[root@node2 ~]# stratis filesystem create think_pool think_fs
[root@node2 ~]# stratis filesystem list
Pool Name Name Used Created Device UUID
think_pool think_fs 546 MiB Mar 23 2021 08:21 /stratis/think_pool/think_fs
ade6fdaab06449109540c2f3fdb9417d
[root@node2 ~]# mkdir /strav
[root@node2 ~]# lsblk
[root@node2 ~]# blkid
/dev/mapper/stratis-1-91ab9faf36a540f49923321ba1c5e40d-thin-fsade6fdaab06449109540c2f3fdb9417d:
UUID="ade6fdaa-b064-4910-9540-c2f3fdb9417d"
BLOCK_SIZE="512" TYPE="xfs"
*
[root@node2 ~]# vim /etc/fstab
UUID=ade6fdaa-b064-4910-9540-c2f3fdb9417d /strav xfs defaults,xsystemd.
requires=stratisd.service 0 0
[root@node2 ~]# mount /stratis/think_pool/think_fs /strav/
[root@node2 ~]# df -hT
/dev/mapper/stratis-1-91ab9faf36a540f49923321ba1c5e40d-thin-fsade6fdaab06449109540c2f3fdb9417d
xfs 1.0T 7.2G 1017G 1% /strav

QUESTION 136

Part 2 (on Node2 Server)

Task 8 [Tuning System Performance]

Set your server to use the recommended tuned profile

Explanation:

```
[root@node2 ~]# tuned-adm list
[root@node2 ~]# tuned-adm active
Current active profile: virtual-guest
[root@node2 ~]# tuned-adm recommend
virtual-guest
[root@node2 ~]# tuned-adm profile virtual-guest
[root@node2 ~]# tuned-adm active
Current active profile: virtual-guest
[root@node2 ~]# reboot
[root@node2 ~]# tuned-adm active
Current active profile: virtual-guest
Current active profile: virtual-guest
```