Practice Test 3 RHCSA (EX200)

Question 1

1. Assume that you forget the root password. Reset the root password for ServerB. Change it to “passmypass” to gain access to the system.
   - `e`
   - `rd.break`
   - Ctrl + X
   - `mount -o remount rw /sysroot`
   - `chroot /sysroot`
   - `passwd root`
   - `/.autorelabel`
   - `exit`
   - `reboot`

Question 2

2. RHEL Repository Server is available at "http://192.168.1.12". Configure your client-server “ServerB” to use this repository and disable the usage of any other repositories.
   - `mv /etc/yum.repos.d/*.repo /tmp/`
   - `subscription-manager clean`
   - `vi /etc/yum.repos.d/local.repo`

File editor:

```
[LocalRepo_BaseOS]
name = BaseOS local repo in a server
baseurl = http://192.168.1.12/rhel9_repo/BaseOS
metadata_expire = -1
enabled = 1
gpgcheck = 0

[LocalRepo_AppStream]
name = AppStream local repo in a server
baseurl = http://192.168.1.12/rhel9_repo/AppStream
metadata_expire = -1
enabled = 1
gpgcheck = 0
```

- - `dnf clean all`
  - `dnf repolist`
  - `dnf update -y`

Question 3

3. On ServerB, create a NetworkManager connection profile named "myprofile3" for the enp0s3 device with the following settings statically:
    - Static IPv4 Address: 192.168.1.4/24
    - Static IPv6 Address: fd01::103/64
    - IPv4 default gateway: 192.168.1.1
    - IPv6 default gateway: fd01::100
    - IPv4 DNS servers: 8.8.8.8
    - IPv6 DNS server: fd01::111
    - DNS search domain: google.com
    - Use `nmtui` to add a connection profile named `myprofil3` out of the device `enp0s3`
    - `nmcli connection modify myprofile3 ipv4.addresses 192.168.1.4/24`
    - `nmcli connection modify myprofile3 ipv6.addresses fd01::103/64`
    - `nmcli connection modify myprofile3 ipv4.method manual`
    - `nmcli connection modify myprofile3 ipv6.method manual`
    - `nmcli connection modify myprofile3 ipv4.gateway 192.168.1.1`
    - `nmcli connection modify myprofile3 ipv6.gateway fd01::100`
    - `nmcli connection modify myprofile3 ipv4.dns 8.8.8.8`
    - `nmcli connection modify myprofile3 ipv6.dns fd01::101`
    - `vi /etc/resolv.conf`
        - Add the line: `search google.com`
    - `nmcli connection down myprofile3 && nmcli connection up myprofile3`

Question 4

4. On ServerB, enable packet forwarding on IPV4.
    - `sysctl net.ipv4.ip_forward`
    - `cd /etc/sysctl.d/`
    - `vi 99-sysctl.conf`
        - Add the line: `net.ipv4.ip_forward = 1`
    - `sysctl -p`
    - `sysctl net.ipv4.ip_forward`

Question 5

5. Enable IPV6 packet forwarding on ServerB. This should persist after a reboot.
    - `sysctl net.ipv6.conf.all.forwarding`
    - `vi /etc/sysctl.conf`
        - Add the line: `net.ipv6.conf.all.forwarding = 1`
    - `sysctl -p`

Question 6

6. On the serverB, schedule a cron job that prints "Break Time!" Every two hours on weekdays on your current screen. Use the root user as the user performing the cron job.
    - `tty` // Print the file name of the terminal connected to standard input.
    - `crontab -e`

- Add the line: `00 */2 * * 1-5 echo "Break Time!" > /dev/pts/0` // "/dev/pts/0" is the output of the "tty" command.
- `crontab -l`

Question 7

7. On ServerB, create a 512M partition using /dev/sdb, make it an ext4 file system, automatically mounted at startup under “/mnt/data”.
   - `fdisk /dev/sdb`
     - `n` `p` `1` `Enter` `+512M` `p` `w`
   - `mkfs.ext4 /dev/sdb1`
   - `mkdir -p /mnt/data`
   - `vi /etc/fstab`
     - Add the line: `/dev/sdb1 /mnt/data ext4 defaults 0 0`
   - `mount -a`

Question 8

8. On ServerB, change the user sam login shell to bash.
   - `grep sam /etc/passwd`
   - `usermod -s bin/bash sam`

Question 9

9. On ServerB, create a user john with UID 1250 and expiry date 2027-12-21.
   - `/useradd -u 1250 -e 2027-12-21 john`
   - `id john`
   - `chage -l john`

Question 10

10. On ServerB, copy “/etc/hosts” file to the “/var/” directory with the name "nhosts", then do the following:
    - User sam can read, write, and execute the "nhosts" file.
    - User john can only read the "nhosts" file.
    - `cp /etc/hosts /var/nhosts`
    - `setfacl -m u:sam:rwx /var/nhosts`
    - `setfacl -m u:john:r-- /var/nhosts`
    - `getfacl /var/nhosts`

Question 11

11. On ServerB, using /dev/sdb, do the following:
    1. Create a 4GiB LVM volume group named “vgroup”.
    2. Create a 1GiB LVM logical volume named “lvol” inside the “vgroup” LVM volume group.

3. The “lvol” LVM logical volume should be formatted with the ext4 filesystem and mounted persistently on the “/lvol” directory.
4. Extend the ext4 filesystem on “lvol” by 100M.

- `fdisk /dev/sdb`
  - `n` `p` `2` `Enter` `+4` `p` `l` `t` `2` `8e` `p` `w`
- `pvcreate /dev/sdb2`
- `pvdisplay`
- `vgcreate /dev/sdb2 vgroup`
- `vgdisplay`
- `lvcreate -L 1G --name lvol vgroup`
- `lvdisplay`
- `mkfs.ext4 /dev/vgroup/lvol`
- `mkdir /lvol`
- `mount /dev/vgroup/lvol /lvol`
- `df -h`
- `vi /etc/fstab`
  - Add the line: `/dev/mapper/vgroup-lvol /lvol ext4 defaults 0 0`
- `mount -a`
- `lvextend -L +100M /dev/vgroup/lvol`

Question 12

12. On ServerB, optimize the system to run in a virtual machine for the powersave use-case tuned profile.
    - `systemctl start tuned`
    - `tuned-adm active`
    - `tuned-adm profile virtual-guest powersave`
    - `tuned-adm active`

Question 13

13. On ServerB, write a script "/sum.sh" that can do the arithmetical operation by giving the sum of two integers entered by any user.
    - `vi /sum.sh`

File editor:

```
echo "Enter number 1:"
read x
echo "Enter number 2:"
read y
(( sum = x + y))
echo "The result is = $sum"
```

- - `chmod a+x /sum.sh`
  - `/sum.sh`

Question 14

14. On ServerB, configure a basic web server that displays “Welcome to the RHCSA Practice Exam!” once connected to it. Ensure the firewall allows http/https services.
    - `dnf install httpd -y`
    - `systemctl start httpd`
    - `firewall-cmd --list-all`
    - `firewall-cmd --add-service=http --permanent`
    - `firewall-cmd --add-service=https --permanent`
    - `firewall-cmd --reload`
    - `vi /var/www/html/index.html`
        - Add the line: `Welcome to the RHCSA Practice Exam!`
    - `curl localhost`

Question 15

15. On ServerB, find all files that are larger than 5MB in the “/etc” directory and copy them to “/find/5mfiles”.
    - `mkdir -p /find/5mfiles`
    - `find /etc/ -size +5M -exec cp {} /find/5mfiles \;`

Question 16

16. On ServerB, all new users should have a file name “Welcome” in their home folder after account creation.
    - `touch /etc/skel/Welcome`

Question 17

17. On ServerB, all user passwords should expire after 60 days and be at least 9 characters in length.
    - `vi /etc/login.defs`
        - Change line to: `PASS_MAX_DAYS = 60`
    - `vi /etc/security/pwquality.conf`
        - Change line to: `minlen = 9`

Question 18

18. On ServerB, create users alex, peter, carl, and dan, then do the following:
    1. alex and peter are members of the accounting group. carl and dan are members of the finance group.
    2. Create shared group directories “/groups/accounting” and “/groups/finance”.
    3. Make the group “accounting” the owner group of the “/groups/accounting” directory, and the group “finance” the owner group of the “/groups/finance” directory.
    4. Grant the groups that own the accounting and finance directories full access to these directories.
    5. Others don't have access to the (accounting/finance) directories.
    6. New files created in the directories (accounting/finance) belong to the group of which the directory is a member.
    7. Members of the group “finance” have read and execute permissions on the “/groups/accounting” directory and all of its subdirectories and files.
    - `groupadd accounting`
    - `groupadd finance`
    - `useradd alex && useradd peter && useradd carl && useradd dan`

- `usermod -aG accounting alex && usermod -aG accounting peter`
- `usermod -aG finance carl && usermod -aG finance dan`
- `cat /etc/passwd`
- `mkdir -p /groups/accounting`
- `mkdir -p /groups/finance`
- `ls -ld /groups/accounting`
- `chgrp accounting /groups/accounting`
- `chgrp finance /groups/finance`
- `chmod g+rwx /groups/accounting`
- `chmod g+rwx /groups/finanace`
- `chmod o-rwx /groups/accounting`
- `chmod o-rwx /groups/finance`
- `chmod g+s /groups/accounting`
- `chmod g+s /groups/finance`
- `setfacl -Rm g:finance:r-x /groups/accounting`
- `getfacl /groups/accounting`
- `ls -ld /groups/finance`

Question 19

19. Set up SSH Passwordless root Login in ServerA.
    - `ping 192.168.1.11`
    - `ssh-keygen`
    - `ssh-copy-id root@192.168.1.11`
    - `ssh root@192.168.1.11`

Question 20

20. Permit root login on ServerB.
    - `vi /etc/ssh/sshd_config`
        - Change line to: `PermitRootLogin yes`

Question 21

21. On ServerB, set SELinux to “enforcing” mode.
    - `getenforce`
    - `setenforce 1`

- OR
    - `vi /etc/selinux/config`
        - Change line to: `SELINUX=enforcing`

Question 22

22. On ServerB, do the following:

1. Install container-tools.
2. Use podman to search for the official httpd container.
3. Inspect the httpd image using skopeo.
4. Use podman to pull the httpd image.
5. Set the "container_manage_cgroup" SELinux Boolean value to "on" and make it persistent.

- `dnf install container-tools -y`
- `podman search httpd --filter=is-official`
- `skopeo inspect docker://docker.io/library/httpd`
- `podman pull docker.io/library/httpd`
- `stesebool -P container_manage_cgroup`

Question 23

23. Which of the following commands replaces each occurrence of 'sam' in the file letter with 'Sam' and writes the result to the file newletter?
    - `sed 's/sam/Sam/g' letter > newletter` // We need the `g` term to keep searching for 'sam' patterns in the file until the end.

Question 24

24. Which of the following command sequences overwrites the file sample.txt?
    - `echo "Hello There!" > sample.txt`

Question 25

25. What is the default nice level when a process is started using the nice command?
    - 10

Question 26

26. Which of the following settings for umask ensures that new files have the default permissions -rw-r----- ?
    - -rw-r----- = 640
    - 666 - 640 = 027 // Rememebr base permission for files is 666 and has to be usbtracted by the umask value in order to get the actual default permissions
        - 0027

Question 27

27. Which of the following commands set the sticky bit for the directory /tmp? (Choose TWO correct s.)
    - `chmod +t /tmp`
    - `chmod 1775 /tmp`
        - the '1' at the start of the octal value indicates to have 's' and 't' terms on permissions

Question 28

28. What is the output of the following command?
    for code in a b c; do
    echo -n ${code};
    done
    - abc

Question 29

29. Which command makes the shell variable named VARIABLE visible to subshells?
    - `export VARIABLE`

Question 30

30. Which command is used to sync the hardware clock to the system clock? (Specify ONLY the command without any path or parameters.)
    - hwclock
    - ntpd // Not a command
    - timesync // Not a command
    - timedatectl // Does not sync hw clock with sys clock
    - `hwclock` is the correct answer

Question 31

31. The output of the program date should be saved in the variable actdate. What is the correct statement?
    - actdate=`date`
    - date | actdate
    - actdate=date
    - set actdate='date'
    - `actdate = \`date\``

Question 32

32. After issuing:
    function myfunction { echo $1 $2 ; }
    in Bash, which output does:
    myfunction A B C
    Produce?
    - B C
    - C B A
    - A B
    - A B C
    - A B
        - Please note how functions are structured (the '{ }' signs and spaces are required as well as the ';' sign to end command)

Question 33

33. On ServerB, search the user sam data in the “/etc/passwd” file and append the output in “/users/data”.
    - `mkdir /users`
    - `touch /users/data`
    - `grep sam /etc/passwd >> /users/data`

Question 34

34. On ServerB, build an image named "are_you_ready" from a Containerfile that shows "Are You Ready?" when you run a container. You are required to run a new container from the "are_you_ready" image and name it "are_you_ready_run ". The Containerfile should follow these instructions:
    - Base Image: Red Hat Universal Base Image 8 (ubi8/ubi).
    - The container should display "Are You Ready?" once you run it.
    - `mkdir ~/Are_You_Ready`
    - `cd ~/Are_You_Ready`
    - `vi are_you_ready_cp`
        - Add the line: `echo "Are You Ready???????"`
    - `chmod 755 are_you_ready_cp` // In order for it to be executable
    - `podman search ubi8` // Get the ubi8/ubi image name
    - `vi Containerfile`

File editor:

```
FROM registry.access.redhat.com/ubi8/ubi
COPY are_you_ready_cp /usr/local/bin
ENTRYPOINT "/usr/local/bin/are_you_ready"    # ENTRYPOINT ["echo", "Are you Ready?"] (also works)
```

- Note `are_you_ready` is the name of the file in the host directory that will be copied to the container
- In this case `/usr/local/bin` can be replaced by whatever other location in the container, even just `/` would also work
- The ENTRYPOINT keyword works as the CMD keyword but without having the option to enter command-line parameters
    - In this case the ENTRYPOINT is being used to run a "script"
    - `buildah build -t are_you_ready .` // Build image based on a Containerfile
    - `podman run --name are_you_ready_run are_you_ready`

Question 35

35. On ServerB, using disk /dev/sdb, do the following:
    1. Create a 5T thin provisioned volume "mythinvol" under the 2G thin pool "mythinpool" in the 4G volume group "myvg".
    2. Extend the size of "mythinpool" by 1G.
    3. Rename the thin pool from "mythinpool" to "thinpool1".
    4. Rename the thin provisioned volume from "mythinvol" to "thinvol1".
    - `lsblk`
    - `fdisk /dev/sdb`
        - `p` `n` `p` `3` `Enter` `+4G` `p` `l` `t` `3` `8e` `p` `w`
    - `lsblk`
    - `pvcreate /dev/sdb3`
    - `pvs`

- `vgcreate myvg /dev/sdb3`
- `vgs`
- `lvcreate -L 2G --thinpool mythinpool myvg`
- `lvcreate -V 5T -T -n mythinvol myvg/mythinpool`
  - Note the `-V` option stands for "virtual size" and the `-T` specifies to create a thin volume.
- `lvs`
- `lvextend -L +1G /dev/myvg/mythinpool`
- `lvrename /dev/myvg/mythinpool thinpool1`
- `lvrename /dev/myvg/mythinvol thinvol1`
- `lvs`

Question 36

36. On ServerB, configure autofs to mount the "/home" directory of the remote NFS server at boot time. The remote NFS server's IP address is "192.168.1.100" and the exported directory is "/nfs/home". Ensure that the mount is accessible to all users on the local system.
    - `dnf install autofs -y`
    - `dnf install nfs-utils -y`
    - `vi /etc/auto.master`
      - Add the line: `/home /etc/auto.nfs --ghost --timeout 30`
    - `vi /etc/auto.nfs`
      - Add the line: `* -fstype=nfs,rw,soft,initr 192.168.1.100:/nfs/home`
    - `systemctl enable autofs --now`

!!! Question 37

37. Which of the following commands overwrites the bootloader located on /dev/sda without overwriting the partition table or any data following it?

    - `# dd if=/dev/zero of=/dev/sda bs=512`
    - `# dd if=/dev/zero of=/dev/sda bs=440 count=1`
    - `# dd if=/dev/zero of=/dev/sdabs=512 count=1`
    - `# dd if=/dev/zero of=/dev/sda bs=440`
    - `# dd if=/dev/zero of=/dev/sda bs=440 count=1`

    Overall explanation
    The MBR is 512 bytes. The partition table is at the end, in the area after 440 bytes so, if you wanted to overwrite the bootloader located on /dev/sda without overwriting the partition table or any data following it, then you could use the command:
    `dd if=/dev/zero of=/dev/sda bs=440 count=1`

    Note that

    - This command is used to overwrite the first 440 bytes (or 1 boot sector) of the hard disk drive with zeros. This can be used as a security measure to prevent data recovery or to remove a boot loader, as it removes the boot loader code from the drive.

    Important

- It is important to note that this command should be used with caution, as it can permanently erase data and render the drive unusable if not used correctly.

Question 38

38. On ServerB, write a script named “/find_rf.sh” that prints out a list of files owned by root and with the SUID bit set in /usr.

    ```
    – `vi /find_rf.sh`
    ```

    File editor:

```
#!/bin/bash
find /usr/ –type f –user root –perm –u=s
```

- Note the `–perm` option as well as how the 'mode' has a `–` first in `–u=s`, this allow us to find files that have that permissions but not necessarily only that permission.
  - `chmod a+x /find_rf.sh`
  - `/find_rf.sh`

Question 39

39. Which of the following commands will send output from the program myapp to both standard output (stdout) and the file myfile.log?
    - myapp | cat > myfile.log
    - myapp | tee myfile.log
    - cat < myapp | cat > myfile.log
    - myapp 0>&1 | cat > myfile.log
    - `myapp | tee myfile.log`
      - The `tee` command outputs text to both files and stdout

Question 40

40. Which of the following is the device file name for the second partition on the only SCSI drive?
    - /dev/sd1p2
    - /dev/sda2
    - /dev/sd0a2
    - /dev/hda1
    - `/dev/sda2`
      - If the SCSI is the only drive in the machine it is probable that its file name is `/dev/sda2`

Question 41

41. Which signal is missing from the following command that is commonly used to instruct a daemon to reinitialize itself, including reading configuration files?

`# killall -s _______ daemon`

- KILL, SIGKILL, 9
- STOP, SIGSTOP, 19
- INT, SIGINT, 2
- HUP, SIGHUP, 1
- HUP, SIGHUP, 1
  - Note you can list all the signals by doing `kill -l`
  - The SIGHUP signal disconnects a process from the parent process. This an also be used to restart processes. For example, "killall -SIGUP compiz" will restart Compiz. This is useful for daemons with memory leaks.

Question 42

42. On ServerB, please complete the following tasks for the file "/home/$USER/myFile" which currently has the permissions "-rw-r--r--":
    1. Grant execute permission to the file owner.
    2. Revoke read and write permissions for both group and other users.

- `touch /home/$USER/myFile`
- `ls -l /home/$USER`
- `stat -c %a myFile`
  - The `stat` command can display file or file system status in various formats when the `-c` option is specified
  - The `%a` format allows us to see the permission bits of a file in octal value
- `chmod u+x /home/$USER/myFile`
- `chmod go-rw /home/$USER/myFile`
- `ls -l /home/$USER`

Question 43

43. While trying to access the "/home/Passwords" file on ServerA, you received a "Permission Denied" error message. You suspect there may be a file permission issue. Please diagnose and correct the problem.

    Assuming the following:

    - The user trying to access the file is Sam.
    - The file group owner should be admins.

    Note
    You must create the file like the following to create the error that you are responsible for resolving as required by the task, by following these steps:

- `touch /home/Passwords`
- `chmod 000 /home/Passwords`
- `groups`
- `usermod -aG admins Sam`
- `chown Sam /home/Passwords`
- `chmod u+rw /home/Passwords`
- `chmod g+rw /home/Passwords`