

LX0-103/101-400 Exam Questions

1. Which command will display the default shell used by your user account?
 - a. `echo $SHELL`
 - b. `echo $ENV`
 - c. `echo $HOST`
 - d. `echo $PWD`

2. Which bash configuration files are used for non-login bash shell sessions? (Choose two.)
 - a. `/etc/profile`
 - b. `/etc/bashrc`
 - c. `~/.bashrc`
 - d. `~/.profile`
 - e. `~/.bash_profile`

3. Which user-specific bash configuration file has the highest precedence when configuring a new login shell session?
 - a. `~/.bash_profile`
 - b. `~/.bash_login`
 - c. `~/.profile`
 - d. `~/.bash_logout`

4. Which shell commands can be used to reboot your Linux system? (Choose two.)

- a. halt
 - b. shutdown
 - c. init 0
 - d. init 6
 - e. exit
5. Which commands can be used to display the version number and release number of your Linux kernel? (Choose two.)
- a. `uname -s`
 - b. `uname -rv`
 - c. `uname -p`
 - d. `uname -o`
 - e. `uname -a`
6. Where is the command history for your user account stored by the bash shell?
- a. `/etc/bash_completion.d`
 - b. `~/.profile`
 - c. `~/.bashrc`
 - d. `~/.bash_history`
7. Which environment variables are used to manage command history within the bash shell? (Choose two.)
- a. HISTSIZE
 - b. HISTCONTROL

- c. SHELL
 - d. OLDPWD
 - e. DISPLAY
8. Which bash shell file descriptor is represented by the number 2?
- a. stdin
 - b. stdout
 - c. stderr
 - d. stdpipe
9. You want to write the stdout from the ps command to a file named myprocesses in your home directory without overwriting the existing contents of that file. Which command will do this?
- a. ps 3 > ~/myprocesses
 - b. ps 1 > ~/myprocesses
 - c. ps 2 >> ~/myprocesses
 - d. ps 1 >> ~/myprocesses
10. Which vi command-line mode commands can be used to save changes to the current file being edited and close the vi editor? (Choose two.)
- a. :exit
 - b. :wq
 - c. :q
 - d. :q!

- e. :e!
11. Which vi command-mode command can be used to delete text from the insertion point to the end of the line?
- a. dw
 - b. de
 - c. d\$
 - d. dd
12. According to the Filesystem Hierarchy Standard, which directory contains code libraries used by programs in /bin and /sbin?
- a. /opt
 - b. /sbin
 - c. /lib
 - d. /usr/share
13. According to the Filesystem Hierarchy Standard, which directory contains print queues for your printers?
- a. /var/spool
 - b. /var/queues
 - c. /var/lib
 - d. /var/log

14. You need to find all the files on your system with the string “log” in their filename that are owned by the tux user. Which command will do this?

- a. `find ~/ -name “*log*” -user tux`
- b. `find / -name “*log*” -user tux`
- c. `find / -name “*.log” -u tux`
- d. `find /var -name “*log*” -u tux`

15. Which option can you use with the `ls` command to view the mode of the directories and files within the directory being listed?

- a. `-l`
- b. `-a`
- c. `-R`
- d. `-m`

16. A coworker just sent you a file named `project_schedule`. You would like to determine what type of file this is before you try to open it. Assuming the file resides in the current directory, which command can you use to do this?

- a. `cat project_schedule`
- b. `ls -la project_schedule`
- c. `type project_schedule`
- d. `file project_schedule`

17. Which statement is true regarding a hard link?

- a. The link file and the target file share the same inode.

- b. The link file and the target file each has its own inode.
 - c. The link file and the target file can be easily determined.
 - d. Hard links can only be created within the /sbin, /bin/, and /usr directories.
 - e. The link file and the target files can have different modes.
18. You need to generate a listing of files in the /etc directory that have the text string “eth0” within them. Which command can you use to do this?
- a. `grep -n eth0 /etc/*`
 - b. `grep -l eth0 /etc/*`
 - c. `grep -i eth0 /etc/*`
 - d. `grep -v eth0 /etc/*`
19. Which regular expression would match Myfile1, Myfile2, and Myfiles but would not match Myfiles23?
- a. `Myfile*`
 - b. `Myfile$`
 - c. `Myfile.`
 - d. `Myfile1 | Myfile2`
20. You are implementing an LVM volume on a server system with 16GB of RAM. You’ve added two SATA hard disks (/dev/sdb and /dev/sdc) to the system and created partitions on each one. You now need to define both of these partitions as LVM physical volumes. Which commands should you use? (Choose two.)
- a. `lvscan -v`

- b. `vgcreate DATA /dev/sdb1 /dev/sdc1`
 - c. `pvcreate /dev/sdb1`
 - d. `pvscan -v`
 - e. `pvcreate /dev/sdc1`
21. Which locale environment variable specifies the default character type and encoding for your Linux system?
- a. `LC_CTYPE`
 - b. `LC_MESSAGES`
 - c. `LC_NUMERIC`
 - d. `LC_IDENTIFICATION`
22. You need to reconfigure the settings used by the GRUB2 bootloader on your Linux system. Which file should you edit in `vi` to do this?
- a. `/boot/grub/grub.cfg`
 - b. `/boot/grub/menu.lst`
 - c. `/boot/grub/grub.conf`
 - d. `/etc/default/grub`
23. Which GRUB Legacy stage presents a graphical menu on the screen that allows the user to select the kernel image that should be loaded?
- a. Stage 1
 - b. Stage 1.5
 - c. Stage 2

- d. Stage 3
24. Which directive in the `/boot/grub/menu.lst` file specifies the `initrd` image that should be used by GRUB to create the initial ramdisk image during boot?
- a. `root`
 - b. `initrd`
 - c. `kernel`
 - d. `default`
25. Which `init` runlevel puts the system in multiuser mode with networking disabled and a command-line interface?
- a. 1
 - b. 2
 - c. 3
 - d. 5
26. Which file can be used to determine what happens when a user presses `Ctrl-Alt-Del` on a Linux system that uses `init` instead of `systemd`?
- a. `/etc/inittab`
 - b. `/etc/fstab`
 - c. `/etc/mtab`
 - d. `/etc/sysconfig/shutdown`

27. Which options can be used to switch a Linux system that uses systemd into single-user mode? (Choose two.)

- a. Select Computer | Shutdown | Restart | Single User.
- b. Select System | Shutdown | Restart | Single User.
- c. Press Ctrl-Alt-Ins.
- d. Enter “systemctl isolate runlevel1.target” at the command prompt.
- e. Enter “systemctl isolate rescue.target” at the command prompt.
- f. Enter “systemctl isolate runlevel3.target” at the command prompt.

28. You’ve just made several changes to the /etc/inittab file on an older Linux server that uses the init daemon. You need to apply the changes without rebooting the system. Which command can you use to do this?

- a. `init --reload`
- b. `init S`
- c. `init q`
- d. `init 6`

29. Where are init scripts for services stored on a system that uses System V init scripts?

- a. `/etc/rc.d/init.d`
- b. `/etc/init.d`
- c. `/etc/init.d/rc.d`
- d. `/etc/xinet.d`

30. On a system that uses BSD-type init scripts, where are the start and kill symbolic links stored that are used to start and stop services when the system enters runlevel 3?

- a. /etc/rc3.d
- b. /etc/init.d/rc3.d
- c. /etc/xinet.d
- d. /etc/rc3.d/init.d

31. You want your Linux system to automatically run the rsync command every time the system boots to synchronize files. In which file should you enter the appropriate command to accomplish this, depending on your distribution? (Choose two.)

- a. rc
- b. boot.local
- c. rc.local
- d. rc.sysinit
- e. boot

32. You've just downloaded gftp-2.0.19-7.1.x86_64.rpm file to your home directory. Which command would you use to generate a checksum value?

- a. checksum ~/gftp-2.0.19-7.1.x86_64.rpm
- b. sum ~/gftp-2.0.19-7.1.x86_64.rpm
- c. verify ~/gftp-2.0.19-7.1.x86_64.rpm
- d. rpm -V ~/gftp-2.0.19-7.1.x86_64.rpm

33. You've just downloaded the `gftp-2.0.19-7.1.x86_64.rpm` RPM package file to the current directory. Which command will check the digital signature of the downloaded file to verify that it hasn't been tampered with?
- a. `rpm --checksig gftp-2.0.19-7.1.x86_64.rpm`
 - b. `rpm --verify gftp-2.0.19-7.1.x86_64.rpm`
 - c. `rpm --tamperproof gftp-2.0.19-7.1.x86_64.rpm`
 - d. `rpm --signature gftp-2.0.19-7.1.x86_64.rpm`
34. You've just downloaded an RPM package file named `gftp-2.0.19-7.1.x86_64.rpm` to the current directory. Which commands could you use to install the package on your system? (Choose two.)
- a. `rpm -e gftp-2.0.19-7.1.x86_64.rpm`
 - b. `rpm -i gftp-2.0.19-7.1.x86_64.rpm`
 - c. `rpm -U gftp-2.0.19-7.1.x86_64.rpm`
 - d. `rpm -V gftp-2.0.19-7.1.x86_64.rpm`
 - e. `rpm -qi gftp-2.0.19-7.1.x86_64.rpm`
35. You've just downloaded the `gftp-2.0.19-7.1.x86_64.rpm` package file to the current directory. Which command could you use to check the package for dependencies?
- a. `rpm -i --test gftp-2.0.19-7.1.x86_64.rpm`
 - b. `rpm -V gftp-2.0.19-7.1.x86_64.rpm`
 - c. `rpm --deps gftp-2.0.19-7.1.x86_64.rpm`
 - d. `rpm --checkdeps gftp-2.0.19-7.1.x86_64.rpm`

36. You've installed an RPM package file named `gftp-2.0.19-7.1.x86_64.rpm` on your Linux system. What command would you use to uninstall this package?

- a. `rpm -e gftp-2.0.19-7.1.x86_64.rpm`
- b. `rpm -i gftp-2.0.19-7.1.x86_64.rpm`
- c. `rpm -U gftp-2.0.19-7.1.x86_64.rpm`
- d. `rpm -F gftp-2.0.19-7.1.x86_64.rpm`

37. You need to install the Network Time Protocol daemon (`ntp`) on your system. Which `yum` command will do this?

- a. `yum ntp`
- b. `yum install ntp`
- c. `yum update ntp`
- d. `yum upgrade ntp`

38. You want to use `apt-get` to download and install the `mysql-server` package on your Linux system. Which command can you use to do this?

- a. `apt-get install mysql-server`
- b. `apt-get update mysql-server`
- c. `apt-get upgrade mysql-server`
- d. `apt-get check mysql-server`

39. Which command is used to rebuild the library cache manually?

- a. `ldcache`
- b. `sln`

- c. ldd
 - d. ldconfig
40. You recently added a new SATA hard disk to your Linux system and want to use GUID partition table (GPT) partitions on it. You plan to use the gedit command to create a primary partition and a single extended partition containing four logical partitions on this disk. Once these are created, you plan to create ext4 file systems on the GPT partitions. Will this plan work?
- a. Yes, all GPT requirements have been met.
 - b. No, GPT doesn't use primary, extended, or logical partitions.
 - c. No, GPT only supports a single partition per hard disk.
 - d. No, GPT does not support ext4 file systems.
41. You've used fdisk to create a new partition on the first SATA hard drive in your Linux system. You want to create an ext4 file system on the new partition. Which partition type do you need to set it to?
- a. 83
 - b. 82
 - c. 64
 - d. b
42. You need to format the first partition on the second SATA drive in your system with the ext3 file system. Which command will do this?
- a. mkext3fs /dev/sdb1
 - b. mkfs -t ext3 /dev/sdb1

- c. `mkfs -t ext3 /dev/hdb`
 - d. `mkfs /dev/sdb1`
43. You created an ext3 file system on the third partition on the first SATA hard disk in your system and now need to mount it in `/mnt/shared` in read/write mode. Which commands will do this? (Choose two.)
- a. `mount -t ext3 /dev/sdc1 /mnt/shared/`
 - b. `mount -t ext3 /dev/sda3 /mnt/shared/`
 - c. `mount -t ext3 /dev/sdb1 /mnt/shared/`
 - d. `mount -t ext3 -o ro /dev/sda3 /mnt/shared/`
44. Which shell command is used to generate a list of open files on the system?
- a. `fuser`
 - b. `dumpe2fs`
 - c. `lsof`
 - d. `df`
 - e. `du`
45. You need to create a backup of your home directory to a removable hard disk drive mounted at `/media/USB`. Which tar command will do this?
- a. `tar -cfv /media/USB/backup.tar ~`
 - b. `tar -xfv /media/USB/backup.tar ~`
 - c. `tar -xzf /media/USB/backup.tar ~`
 - d. `tar -cfv ~ /media/USB/backup.tar`

46. You want to create a compressed cpio archive of all the files within your home directory to /media/usbdrive/backup.cpio.gz. Which command will do this?
- a. `cpio -ov ~ | gzip > /media/usbdrive/backup.cpio.gz`
 - b. `ls ~ | cpio -ovz > /media/usbdrive/backup.cpio.gz`
 - c. `ls ~ | cpio -ov | gzip > /media/usbdrive/backup.cpio.gz`
 - d. `cpio -ovz ~ > /media/usbdrive/backup.cpio.gz`
47. You need to change the owner of a file named /var/opt/appdb from mhuffman, who is a member of the users group, to bjohnson, who is a member of the developers group. Accordingly, you want to change the owning group to developers. Which command will do this?
- a. `chown mhuffman bjohnson /var/opt/appdb`
 - b. `chown -u "bjohnson" -g "developers" /var/opt/appdb`
 - c. `chown bjohnson /var/opt/appdb`
 - d. `chown bjohnson.developers /var/opt/appdb`
48. A file named schedule.odt has a mode of `rw-r--r--`. If jthatcher is not the file's owner but is a member of the group that owns this file, what can he do with it?
- a. He can open the file and view its contents, but he can't save any changes.
 - b. He can open the file, make changes, and save the file.
 - c. He can change ownership of the file.
 - d. He can run the file if it's an executable.

49. You need to change the permissions of a file named `widgets.odt` such that the file owner can edit the file, users who are members of the group that owns the file can view and edit it, and users who are not owners and don't belong to the owning group can't view or modify it. Which command will do this?
- a. `chmod 660 widgets.odt`
 - b. `chmod 640 widgets.odt`
 - c. `chmod 777 widgets.odt`
 - d. `chmod 644 widgets.odt`
50. A directory is owned by the `users` group and has a mode of `rxwxrwxr-T` permissions assigned to that group. What effect does this have on files within the directory?
- a. Users who are members of the `users` group can only delete files within the directory for which they are the owner.
 - b. No user is allowed to delete files in this directory.
 - c. Users who are members of the `users` group can delete any file within the directory.
 - d. Others can enter the directory and delete files within the directory for which they are the owner.
51. You want to enable quotas on the `/dev/sda3` partition, which is mounted in the `/home` directory in the file system. Which mount options need to be included in `/etc/fstab` to enable quotas when this file system is mounted? (Choose two.)
- a. `groupquotas=on`
 - b. `usrquota`
 - c. `grpquota`

- d. `userquotas=on`
- e. `fsquota`

52. You need to load a kernel module named `joydev` to support a joystick device you've connected to your Linux system. Which commands can be used to do this? (Choose two.)

- a. `insmod joydev`
- b. `modinfo joydev`
- c. `modprobe joydev`
- d. `lsmod joydev`
- e. `depmod joydev`

53. You need to get specific information about the second SCSI hard drive in your system. Which commands could you use from the shell prompt to do this? (Choose two.)

- a. `scsidump /dev/sdb`
- b. `lsusb`
- c. `sg_scan`
- d. `hdparm /dev/sdb`
- e. `lspci`

54. Which component creates a virtual file system that is mounted at `/dev`?

- a. `hald`
- b. `dbus`

- c. sysfs
- d. udev

55. You want to use `ps` to display information about only the processes associated with your current terminal session. Which commands will do this? (Choose two.)

- a. `ps`
- b. `ps -e`
- c. `ps -f`
- d. `ps -ef`
- e. `ps -ax`

56. A process on your Linux system has a nice value of 5. Which of the following nice values would increase the priority of this process? (Choose two.)

- a. -5
- b. 10
- c. 15
- d. 0
- e. 6

57. Which kill signal restarts a process with exactly the same PID that it had before?

- a. SIGHUP
- b. SIGINT
- c. SIGKILL
- d. SIGTERM

58. Which command can be used to convert uppercase characters in a text string into lowercase characters?

- a. `uniq`
- b. `wc`
- c. `tr`
- d. `split`

59. Which command can be used to format text files for printing with pagination, headers, and columns?

- a. `fmt`
- b. `od`
- c. `nl`
- d. `pr`

60. You just added a second SATA hard disk drive to your Linux system and need to create a GPT partition on it. Which command should you use to do this?

- a. `fdisk /dev/sdb`
- b. `gdisk /dev/sdb`
- c. `gdisk /dev/sda`
- d. `fdisk /dev/sda`

Quick Answer Key

1. A
2. B, C
3. A
4. B, D
5. B, E
6. D
7. A, B
8. C
9. D
10. A, B
11. C
12. C
13. A
14. B
15. A
16. D
17. A
18. B
19. C
20. C, E
21. A
22. D

- 23. C
- 24. B
- 25. B
- 26. A
- 27. D, E
- 28. C
- 29. A
- 30. B
- 31. B, C
- 32. B
- 33. A
- 34. B, C
- 35. A
- 36. A
- 37. B
- 38. A
- 39. D
- 40. B
- 41. A
- 42. B
- 43. B
- 44. C
- 45. A

- 46. C
- 47. D
- 48. A
- 49. A
- 50. A
- 51. B, C
- 52. A, C
- 53. C, D
- 54. D
- 55. A, C
- 56. A, D
- 57. A
- 58. C
- 59. D
- 60. B

Answer Explanations

1. A is correct. The `echo $SHELL` command will display the value of the `SHELL` environment variable, which contains the default shell executable used by your user account.

B, C, and D are incorrect. The `ENV` variable specifies the name of the shell configuration file used to configure the session. The `HOST` variable specifies the hostname of the system. The `PWD` directory contains the current directory path.

2. B and C are correct. The `/etc/bashrc` and `~/.bashrc` files are used to configure non-login shell sessions, although other files may be used on some distributions.

A, D, and E are incorrect. The `/etc/profile`, `~/.profile`, and `~/.bash_profile` files are used to configure login shell sessions.

3. A is correct. When a login shell is run, the `bash` shell program searches for configuration files in the following order: `~/.bash_profile`, `~/.bash_login`, `~/.profile`.

B, C, and D are incorrect. When a login shell is run, the `bash` shell program searches for configuration files in the following order: `~/.bash_profile`, `~/.bash_login`, `~/.profile`. The first file found is the one that is used. Any others are ignored.

4. B and D are correct. The `shutdown -r` command can be used to reboot the system, as can the `init 6` command.

A, C, and E are incorrect. The `halt` and `init 0` commands are used to halt the system. The `exit` command is used to end a shell session.

5. B and E are correct. The `uname -rv` command displays the version number and release number of your Linux kernel. The `uname -a` command displays information from all `uname` options, including `-r` and `-v`.

A, C, and D are incorrect. The `uname -s` option displays the system hostname. The `-p` option displays processor information, whereas the `-o` option displays the operating system.

6. D is correct. Every time you enter a command at the shell prompt, that command is saved in the `~/.bash_history` file in your home directory.

A, B, and C are incorrect. A is incorrect because it is used to configure bash shell command completion. B and C are incorrect because they are used to configure bash shell sessions.

7. A and B are correct. `HISTSIZE` configures the size of your history file. On most distributions, this is set to 1000 entries. `HISTCONTROL` controls how your command history is stored. You can set this variable to a value of `ignoredups`, `ignorespace`, `ignoreboth`, or `erasedups`.

C, D, and E are incorrect. `SHELL` specifies the path to your default shell executable. `OLDPWD` contains the directory path that was previously the current directory. `DISPLAY` specifies where output from the X server should be sent.

8. C is correct. The `stderr` bash shell file descriptor is represented by the number 2.

A, B, and D are incorrect. The `stdin` descriptor is assigned the number 3, whereas the `stdout` descriptor is assigned the number 1. D is incorrect because it is not a valid bash shell file descriptor and is a distracter.

9. D is correct. The `ps 1 >> ~/myprocesses` command writes the stdout from the `ps` command to a file named `myprocesses` in your home directory without overwriting the existing contents of that file.

A, B, and C are incorrect. A is incorrect because it tries to use the stdin file descriptor for redirecting output, which can't be done. It also overwrites the contents of the file. B is incorrect because it redirects the stdout, but it also overwrites the contents of the file. C is incorrect because it redirects the stderr to the file.

10. A and B are correct. Both the `:exit` and `:wq` commands will save any changes to the current file and then close the vi editor.

C, D, and E are incorrect. The `:q` command will close the current file and exit the editor without saving changes. The `:q!` command will discard any changes made to the current file, close it, and then exit the editor. The `:e!` command discards any changes made to the current file since the last write operation.

11. C is correct. The `d$` command deletes from the insertion point to the end of the line. The text is saved in a memory buffer.

A, B, and D are incorrect. The `dw` command deletes the word that comes immediately after the cursor, including the space following the word. The `de` command deletes the word that comes immediately after the cursor, not including the space. The `dd` command deletes the entire current line.

12. C is correct. The `/lib` directory contains libraries used by programs in `/bin` and `/sbin`.

A, B, and D are incorrect. The `/opt` directory contains files installed by some Linux applications. The `/sbin` directory contains important system management and administration files, such as `fdisk`, `fsck`, `ifconfig`, `init`, `mkfs`, `shutdown`, and `halt`. The `/usr/share` directory contains static files such as documentation files.

13. A is correct. The `/var/spool` directory contains print queues.

B, C, and D are incorrect. The `/var/queues` directory isn't specified in the FHS. The `/var/lib` directory contains library files created by various services and applications running on the system. The `/var/log` directory contains your system log files.

14. B is correct. The `find / -name "*log*" -user tux` command finds all the files on your system with the string "log" in their filename that are owned by the tux user.

A, C, and D are incorrect. A is incorrect because it only searches the current user's home directory. C is incorrect because it only finds files with an extension of *.log. It also uses an incorrect option (`-u`) for specifying the file owner. D is incorrect because it only searches the `/var` directory. It also uses an incorrect option (`-u`) for specifying the file owner.

15. A is correct. The `ls -l` command displays the mode of the directories and files within the directory being listed.

B, C, and D are incorrect. The `-a` option displays all files' directories (including hidden files and directories). The `-R` option displays directory contents recursively. The `-m` option fills the width of the screen with a comma-separated list of entries.

16. D is correct. The `file project_schedule` command will display the file's type.

A, B, and C are incorrect. The `cat` command will attempt to display the file; it won't tell you what type of file it is. The `ls -la` command will show you extended information about the file, including its mode and ownership, but it won't display the type of file it is. The `type` command likewise does not display a file's type.

17. A is correct. With a hard link, the link file and the target file share the same inode.

B, C, D, and E are incorrect. With a hard link, the link file and the target file share the same inode. Because of this, it can be difficult to tell the difference between the link file and the target file. Hard links can be created in most directories in the file system. Because the two files share the same inode, they have the same mode.

18. B is correct. The `grep -l eth0 /etc/*` command will generate a listing of files in the `/etc` directory that have the text string “eth0” within them.

A, C, and D are incorrect. The `-n` option causes `grep` to display matching line numbers. The `-i` option causes `grep` to ignore case when searching for the search string. The `-v` option displays all lines that do not contain the search string.

19. C is correct. The regular expression `Myfile.` matches exactly one character. Therefore, it would match `Myfile1`, `Myfile2`, and `Myfiles` but would not match `Myfiles23`.

A, B, and D are incorrect. The `*` character in a regular expression matches any number of characters. The `$` character matches an expression only if it appears at the end of a line. The `Myfile1 | Myfile2` regular expression matches either `Myfile1` or `Myfile2`, but would not match `Myfiles` or `Myfiles23`.

20. C and E are correct. You use the `pvcreate` command to define a partition (or even an entire disk) as an LVM physical volume.

A, B, and D are incorrect. The `lvscan` command is used to view the logical volumes defined on the system. The `pvscan` command is used to view the physical volumes defined on the system. The `vgcreate` command would be used after defining the physical volumes to create a volume group.

21. A is correct. The LC_CTYPE environment variable specifies the default character type and encoding for your Linux system. The syntax for specifying the default character encoding is <language>_<territory>.<codeset>.
- B, C, and D are incorrect. LC_MESSAGES configures natural language messages. LC_NUMERIC configures your number format. LC_IDENTIFICATION contains metadata about the locale information.
22. D is correct. You can edit the /etc/default/grub file and make whatever changes are needed and have those changes incorporated into grub.cfg when you run the update-grub or grub2-mkconfig command.
- A, B, and C are incorrect. The /boot/grub/grub.conf and /boot/grub/menu.lst files are used by GRUB Legacy, not GRUB2. The /boot/grub/grub.cfg file is dynamically created when you run the update-grub or grub2-mkconfig command and should not be edited directly.
23. C is correct. Stage 2 presents a graphical menu on the screen that allows the user to select the kernel image that should be loaded.
- A, B, and D are incorrect. Stage 1 points to the location of Stage 1.5 or Stage 2. Stage 1.5 contains any drivers needed to load Stage 2. GRUB does not implement a Stage 3, thus making this response a distracter.
24. B is correct. The initrd directive specifies the initrd image that should be used by GRUB to create the initial ramdisk image during boot.
- A, C, and D are incorrect. The root directive specifies the location of the partition that is to be mounted as the GRUB root. The kernel directive specifies the location of the Linux kernel. The default directive specifies the menu item that will be booted automatically if the user doesn't make a manual selection.

25. B is correct. Runlevel 2 puts Linux in multiuser mode with networking disabled. The command-line interface is used.

A, C, and D are incorrect. Runlevel 1 uses a command-line interface but puts the system in single-user mode. Runlevel 3 also uses a command-line interface and runs in multiuser mode; however, it also enables networking. Runlevel 5 runs Linux in multiuser mode with networking enabled and a graphical user interface.

26. A is correct. The `/etc/inittab` file is used to determine what happens when a user presses Ctrl-Alt-Del.

B, C, and D are incorrect. The `/etc/fstab` and `/etc/mtab` files contain file system mount information. The `/etc/sysconfig/shutdown` file specifies how the system will behave during the shutdown process.

27. D and E are correct. Entering “`systemctl isolate runlevel1.target`” or “`systemctl isolate rescue.target`” at the command prompt will switch a systemd distribution to single-user mode.

A, B, C, and F are incorrect. Menu options for switching to single-user mode are not provided by default in the GNOME and KDE desktop environments. The Ctrl-Alt-Ins key combination has no effect on the Linux system (unless it’s being run within a VMware virtual machine). The `systemctl isolate runleve3.target` switches the system into a text-based, multi-user environment with networking enabled.

28. C is correct. The `init q` command will tell init that changes have been made to `/etc/inittab` and that it needs to re-read its configuration.

A, B, and D are incorrect. A is incorrect because it uses incorrect syntax for the `init` command. B is incorrect because it puts the system into single-user mode. D is

incorrect because although the `init 6` command will cause the `inittab` file to be re-read, it requires the system to be rebooted to do so, which violates the conditions of the scenario.

29. A is correct. Linux distributions that use System V init scripts store them in the `/etc/rc.d/init.d` directory.

B, C, and D are incorrect. B is incorrect because it is used to store init scripts on BSD-type systems. C is incorrect because it uses an invalid directory and is a distracter. D is incorrect because it contains configuration files for daemons managed by the `xinetd` daemon.

30. B is correct. On a system that uses BSD-type init scripts, the `/etc/init.d/rc3.d` directory contains the start and kill symbolic links used to start and stop services when the system enters runlevel 3.

A, C, and D are incorrect. A is incorrect because it is used on systems that use System V-type init scripts. C is incorrect because it contains configuration files for daemons managed by the `xinetd` daemon. D is incorrect because it uses an invalid directory and is a distracter.

31. B and C are correct. The `boot.local` file is a script that is run by `init` at startup on BSD-type systems, whereas `rc.local` is run by `init` on startup on System V-type systems. If you want to run a particular command automatically at startup, you can insert the command into the appropriate file with a text editor.

A, D, and E are incorrect. The `rc` script is used to switch between runlevels while the system is running. The `rc.sysinit` and `boot` scripts are used to set the path, check the file system for errors, set the system clock, and so on. These scripts may be rewritten

during a system update, so you shouldn't put your own commands in either of these files.

32. B is correct. The `sum ~/gftp-2.0.19-7.1.x86_64.rpm` command can be used to generate a checksum value of the file.

A, C, and D are incorrect. A and C are incorrect because they use invalid Linux commands and are distracters. D is incorrect because it is used to verify a package that has already been installed.

33. A is correct. The `rpm --checksig gftp-2.0.19-7.1.x86_64.rpm` command will query the package for its digital signing key.

B, C, and D are incorrect. B is incorrect because it is used to verify a package that has already been installed. C and D are incorrect because they use invalid rpm options and are distracters.

34. B and C are correct. Either the `-i` or the `-U` option can be used to install a package with rpm.

A, D, and E are incorrect. The `-e` option causes rpm to uninstall a package. The `-V` option verifies an installed package. The `-qi` option queries a package for detailed information.

35. A is correct. The `rpm -i --test` command will check the package for dependencies.

B, C, and D are incorrect. The `rpm -V` command verifies an installed package. The `--deps` and `--checkdeps` options aren't valid options with the rpm command and are distracters.

36. A is correct. The `rpm -e` command uninstalls a package from the system.

B, C, and D are incorrect. The `rpm -i` command installs a new package. The `rpm -U` installs a package if it isn't installed or updates it if it is. The `-F` option freshens (upgrades) an installed package.

37. B is correct. The `yum install ntp` command checks the requested package's dependencies, downloads the package and its dependencies, and then installs them.

A, C, and D are incorrect. A is incorrect because it fails to supply an action to be completed by the `yum` command. C and D are incorrect because they require that the package already be installed before it is updated with a new version of the package.

38. A is correct. The `apt-get install mysql-server` command will download the requested Debian package from one of the configured repositories, along with all its dependencies, and install them.

B, C, and D are incorrect. The `apt-get update` command is used to resynchronize the package index files from their sources. The `apt-get upgrade` command is used to install the newest versions of installed packages from the sources identified in `/etc/apt/sources.list`. The `apt-get check` command updates the package cache and checks for broken dependencies.

39. D is correct. The `ldconfig` command can be used to rebuild the library cache manually.

A, B, and C are incorrect. A is incorrect because it is an invalid Linux command and is a distracter. B is incorrect because it is used to make symbolic links to dynamic libraries if the dynamic linking system isn't working for some reason. C is incorrect because it is used to view the shared libraries required by a specific application.

40. B is correct. GPT doesn't use primary, extended, or logical partitions. All GPT partitions are just regular partitions.

A, C, and D are incorrect. A is incorrect because GPT doesn't use primary, extended, or logical partitions. C is incorrect because GPT supports 128 partitions per disk. D is incorrect because GPT supports many different types of file systems.

41. A is correct. Partition type 83 specifies a standard Linux partition.

B, C, and D are incorrect. Partition type 82 is used for Linux swap partitions. Partition type 64 creates a NetWare partition. Partition type b creates a FAT 32 partition.

42. B is correct. The `mkfs -t ext3 /dev/sdb1` command will format the first partition on the second SATA drive in your system with the ext3 file system.

A, C, and D are incorrect. A is incorrect because it uses an invalid Linux command and is a distracter. C is incorrect because it uses older Linux device naming that was used in earlier versions of the Linux kernel to reference PATA (IDE) hard disks. D is incorrect because it omits the file system type, which causes `mkfs` to create an ext2 file system by default.

43. B is correct. The `mount -t ext3 /dev/sda3 /mnt/shared/` command will mount the third partition on the first SATA hard disk in `/mnt/shared` in read/write mode.

A, C, and D are incorrect. A is incorrect because it tries to mount the first partition on the third drive in the system. C is incorrect because it tries to mount the first partition on the second drive in the system. D is incorrect because it mounts the right partition but does so in read-only mode.

44. C is correct. You can use the `ls` command at the shell prompt to display a list of open files.

A, B, D, and E are incorrect. The `fuser` command displays the PIDs of processes using the specified files or file systems. The `df` command shows you where your hard drive partitions, optical drives, and other storage devices (such as USB drives) are mounted in the file system. It also shows the total size of the device and how much of that space is used. The `dumpe2fs` command displays information about ext2/3/4 file systems. The `du` command provides you with a summary of disk space usage of each file, recursively, for a specified directory.

45. A is correct. The `tar -cfv /media/USB/backup.tar ~` command will create a backup of your home directory to a removable hard disk drive mounted at `/media/USB`.

B, C, and D are incorrect. B and C are incorrect because they use the extract (`-x`) option with `tar` instead of create (`-c`). D is incorrect because it reverses the order of the directory to be backed up and the archive file to be created.

46. C is correct. The `ls ~ | cpio -ov | gzip > /media/usbdrive/backup.cpio.gz` command will generate a listing of files in your home directory, send the list to the `cpio` command to create an archive, and send the archive to `gzip` for compression.

A, B, and D are incorrect. A and D are incorrect because they fail to send a list of files to the stdin of the `cpio` command. B is incorrect because it uses an invalid `cpio` option (`-z`). B and D also fail to pipe the output of the `cpio` command to the `gzip` command.

47. D is correct. The `chown bjohnson.developers /var/opt/appdb` command changes the owner to `bjohnson` and the owning group to the `developers` group.

A, B, and C are incorrect. A and B are incorrect because they use incorrect syntax for the `chown` command. C is incorrect because although it changes the file's owner, it fails to change the owning group.

48. A is correct. The `jthatcher` user, as a member of the owning group, receives `r--` (read) permissions from the file's mode. Hence, he can open the file and view its contents, but he can't save any changes.

B, C, and D are incorrect. B is incorrect because it would require the group to have `rw-` permissions. C is incorrect because it would require the user to first gain root-level access to the file. D is incorrect because it would require the group to have the execute (`x`) permission.

49. A is correct. The `chmod 660 widgets.odt` command grants the owner `rw-` permissions, the group `rw-` permissions, and others `---` permissions.

B, C, and D are incorrect. B is incorrect because it fails to grant the group the write (`w`) permission. C is incorrect because it grants the owner, the group, and others all permissions to the file. D is incorrect because it fails to grant the group the write (`w`) permission, and it grants others read (`r`) permission to the file.

50. A is correct. The `rxwxrwx-T` mode indicates the sticky bit permission has been assigned to the directory, which negates the effect of the group write permissions. As a result, users who are members of the users group can only delete files within the directory for which they are the owner.

B, C, and D are incorrect. Because the sticky bit permission has been assigned, users who are members of the users group can only delete files within the directory for which they are the owner.

51. B and C are correct. You need to add the `usrquota` and `grpquota` options to the mount options for the file system.

A, D, and E are incorrect. All are not valid mount options in the `/etc/fstab` file.

52. A and C are correct. You can use `insmod` or `modprobe` to insert a kernel module.

B, D, and E are incorrect. The `modinfo` command is used to view more information about a loaded module. The `lsmod` command is used to view a list of loaded kernel modules. The `depmod` command is used to create a list of module dependencies.

53. C and D are correct. The `sg_scan` command scans your SCSI bus and displays a list of detected devices. The `hdparm /dev/sdb` command displays information about the second hard disk drive in your system.

A, B, and E are incorrect. A is incorrect because it uses a fictitious command and is a distracter. B is incorrect because it displays information about USB devices connected to your Linux system. E is incorrect because it lists all PCI devices installed in the system.

54. D is correct. The `udev` daemon creates a virtual file system that is mounted at `/dev`.

A, B, and C are incorrect. The Hardware Abstraction Layer (HAL) daemon (`hald`) is run automatically at startup. Its job is to provide applications running on the system with information about the hardware (both hot-plug and cold-plug) available in the system. The role of the `dbus` daemon is to notify the system when a new hot-plug device is connected to the system. The `sysfs` component provides the `/sys` virtual file system.

55. A and C are correct. The `ps` and `ps -f` commands only display information about the processes associated with your current terminal session.

B, D, and E are incorrect. The `-e` and `-x` options cause the `ps` command to display information about all processes on the system.

56. A and D are correct. The lower the nice value, the higher the priority of the process. Therefore, a nice value of 0 or -5 will increase the priority of the process.

B, C, and E are incorrect. Because the nice value of each of these answers is greater than 5, it would decrease the overall priority of the process.

57. A is correct. The `SIGHUP` kill signal restarts the process. After a restart, the process will have exactly the same PID that it had before. This is a very useful option for restarting a service for which you've made changes in a configuration file.

B, C, and D are incorrect. The `SIGINT` signal sends a Ctrl-C key sequence to the process. The `SIGKILL` signal is a brute-force signal that kills the process. If the process is hung badly, this option will force it to stop. The `SIGTERM` signal tells the process to terminate immediately. This signal allows the process to clean up after itself before exiting.

58. C is correct. The `tr` command can be used to translate uppercase characters in a text string into lowercase characters.

A, B, and D are incorrect. The `uniq` command reports or omits repeated lines. The `wc` command prints the number of newlines, words, and bytes in a file. The `split` command splits an input file into a series of files.

59. D is correct. The `pr` command is used to format text files for printing. It formats the file with pagination, headers, and columns. The header contains the date and time, filename, and page number.

A, B, and C are incorrect. The `fmt` command is used to reformat a text file, but it isn't capable of creating pagination and headers. The `od` (octal dump) command is used to dump a file, including binary files. The `nl` command determines the number of lines in a file.

60. B is correct. To create a GPT partition on the second SATA hard disk in a Linux system, you must first switch to your root user and then enter "`gdisk /dev/sdb`" at the shell prompt.

A, C, and D are incorrect. A and D are incorrect because the `fdisk` command only supports MBR partitions. C is incorrect because it manages partitions on the first hard disk in the system (`/dev/sda`) instead of the second (`/dev/sdb`).

Objectives

1. 103.1 Work on the command line: Use and modify the shell environment including defining, referencing and exporting environment variables.
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4. 103.1 Work on the command line: Use single shell commands and one-line command sequences to perform basic tasks on the command line
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6. 103.1 Work on the command line: Use and edit command history
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8. 103.4 Use streams, pipes, and redirects: Redirecting standard input, standard output, and standard error
9. 103.4 Use streams, pipes, and redirects: Redirecting standard input, standard output, and standard error
10. 103.8 Perform basic file editing operations using vi
11. 103.8 Perform basic file editing operations using vi: Insert, edit, delete, copy, and find text
12. 104.7 Find system files and place files in the correct location: Understand the correct locations of files under the FHS
13. 104.7 Find system files and place files in the correct location: Understand the correct locations of files under the FHS

14. 104.7 Find system files and place files in the correct location: Find files and commands on a Linux system
15. 103.3 Perform basic file management
16. 103.3 Perform basic file management
17. 104.6 Create and change hard and symbolic links: Identify hard and/or soft links
18. 103.7 Search text files using regular expressions: Use regular expression tools to perform searches through a file system or file content
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20. 102.1 Design hard disk layout: Knowledge of basic features of LVM
21. 103.1 Work on the command line: Use and modify the shell environment including defining, referencing and exporting environment variables
22. 102.2 Install a boot manager: Perform basic configuration changes for GRUB 2
23. 102.2 Install a boot manager: Install and configure a boot loader such as GRUB Legacy
24. 102.2 Install a boot manager: Install and configure a boot loader such as GRUB Legacy
25. 101.3 Change runlevels/boot targets and shut down or reboot the system
26. 101.3 Change runlevels/boot targets and shut down or reboot the system
27. 101.3 Change runlevels/boot targets and shut down or reboot the system: Change between runlevels/boot targets, including single-user mode
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32. 102.5 Use RPM and YUM package management: Obtain information on RPM packages such as version, status, dependencies, integrity, and signatures
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38. 102.4 Use Debian package management: Install, upgrade, and uninstall Debian binary packages
39. 102.3 Manage shared libraries
40. 104.1 Create partitions and file systems: Basic knowledge of gdisk and parted with GPT
41. 104.1 Create partitions and file systems: Manage MBR partition tables
42. 104.1 Create partitions and file systems: Use various mkfs commands to set up partitions and create various file systems
43. 104.3 Control mounting and unmounting of file systems: Manually mount and unmount file systems
44. 104.2 Maintain the integrity of file systems
45. 103.3 Perform basic file management: Usage of tar, cpio, and dd

- 46. 103.3 Perform basic file management: Usage of tar, cpio, and dd
- 47. 104.5 Manage file permissions and ownership
- 48. 104.5 Manage file permissions and ownership
- 49. 104.5 Manage file permissions and ownership: Manage access permissions on regular and special files as well as directories
- 50. 104.5 Manage file permissions and ownership: Use access modes such as suid, sgid, and the sticky bit to maintain security
- 51. 104.4 Manage disk quotas: Set up a disk quota for a file system
- 52. 101.1 Determine and configure hardware settings
- 53. 101.1 Determine and configure hardware settings: Tools and utilities to list various hardware information (e.g., lsusb, lspci, etc.)
- 54. 101.1 Determine and configure hardware settings: Conceptual understanding of sysfs, udev, hald, and dbus
- 55. 103.5 Create, monitor, and kill processes: Monitor active processes
- 56. 103.6 Modify process execution priorities: Run a program with a higher or lower priority than the default
- 57. 103.5 Create, monitor, and kill processes: Send signals to processes
- 58. 103.2 Process text streams using filters: Send text files and output streams through text utility filters to modify the output using standard UNIX commands found in the GNU textutils package
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