LX0-103/101-400 Exam Questions

1. You are designing the implementation of a new Linux server in your company's network. This server will function as an internal web server for your organization. This web server will provide a web-enabled database application that employees will use to manage their vacation and sick leave time. What daemons must be included in your specifications? (Choose two.)
    a. Apache
    b. MySQL
    c. Samba
    d. Telnet
    e. Pure-FTP

2. Which file system does not use journaling?
    a. ReiserFS
    b. Ext2
    c. Ext3
    d. XFS

3. You're installing a new Linux workstation. Assuming you want to use POSIX users and permissions, which file systems can you select from during the installation? (Choose two.)
    a. NTFS
    b. FAT32
    c. ReiserFS

d. FAT16

e. Ext4

4. When you are installing a Linux system, which directory must you create a separate disk partition for?

   a. /home

   b. /

   c. /var

   d. /usr

5. Which environment variable specifies the location of the man pages on a Linux system?

   a. PATH

   b. MANPATH

   c. SHELL

   d. HOST

6. Which manual section contains man pages for administrative utilities used by the root user?

   a. 1

   b. 3

   c. 5

   d. 8

7. You need more information on the chgrp command. Which commands can be used to learn how to use this utility? (Choose two.)
    a. man chgrp
    b. help chgrp
    c. chgrp /help
    d. info chgrp
    e. chgrp –man

8. You need to edit the /etc/samba/smb.conf file with a text editor. Which commands will do this? (Choose two.)
    a. sed /etc/samba/smb.conf
    b. cat /etc/samba/smb.conf
    c. vim /etc/samba/smb.conf
    d. fedit /etc/samba/smb.conf
    e. vi /etc/samba/smb.conf

9. You need to create a new text file named /home/ksanders/orders.txt. Which commands will do this? (Choose two.)
    a. vi /home/ksanders/orders.txt
    b. newfile /home/ksanders/orders.txt
    c. mkfile /home/ksanders/orders.txt
    d. fedit /home/ksanders/orders.txt
    e. touch /home/ksanders/orders.txt

10. You've opened the /tmp/settings.txt file in the vi editor. You need to enter new text into the file. Which keys will switch you to Insert mode? (Choose two.)
    a. Insert
    b. Esc
    c. Ctrl-E
    d. I
    e. Alt-R

11. You've opened a configuration file on your Linux system in the vi text editor. You've made changes to the file but realize that a number of mistakes have been made. You want to close the file without saving any changes and start over. Which command will do this?
    a. :q
    b. :quit
    c. :exit!
    d. :q!

12. You're working from the shell prompt on a Linux system and the current directory is /var/opt. Which commands can be used to switch to the /var/log directory? (Choose two.)
    a. cd log
    b. cd /var/log
    c. cd ./log
    d. cd ..log
    e. cd ../log

13. Which command displays a listing of the contents of the current directory in the file system, including hidden files?
    a. ls –h
    b. ls –R
    c. ls –l
    d. ls –a
    e. ls

14. You need to create a new directory in your user's home directory named MyFiles. Which command can be used to do this?
    a. mkdir ~/myfiles
    b. mkdir ~/MyFiles
    c. md ~/myfiles
    d. mkdir ~MyFiles
    e. md ~/MyFiles

15. Which utilities can be used to view the contents of a text file from the shell prompt? (Choose two.)
    a. head
    b. less
    c. type
    d. touch
    e. print

16. You need to monitor the messages being written to the /var/log/messages file while troubleshooting a Linux daemon that won't start correctly. Which command can you use to monitor the file and display each new message on the screen as it is added?
    a. tail /var/log/messages
    b. tail –f /var/log/messages
    c. less –f /var/log/messages
    d. cat –f /var/log/messages
    e. cat /var/log/messages | more

17. You need to rename a file in the current directory named myfile.txt to myfile.old. Which command will do this?
    a. mv myfile.txt myfile.old
    b. ren myfile.txt myfile.old
    c. rendir myfile.txt myfile.old
    d. rename myfile.txt myfile.old
    e. cp myfile.txt myfile.old

18. Which shell command can be used to display information about your Linux system, such as the kernel version number, processor type, and system hostname?
    a. uname
    b. netstat
    c. whoami
    d. top

e. exec

19. Which bash shell environment variable is used to configure the characters displayed in the shell prompt?

    a. DISPLAY

    b. SHELL

    c. ENV

    d. PS1

20. You need to capture new entries as they are added at the end of the /var/log/messages file to the troubleshooting.txt file in your home directory. Which command will do this?

    a. tail /var/log/messages > ~/troubleshooting.txt

    b. tail –f /var/log/messages > ~/troubleshooting.txt

    c. tail –f /var/log/messages 2> ~/troubleshooting.txt

    d. tail –f /var/log/messages | ~/troubleshooting.txt

21. You need to send the contents of the ~/troubleshooting.txt file to the grep command and identify any lines containing the text FAILED. Which commands will do this? (Choose two.)

    a. grep FAILED | ~/troubleshooting.txt

    b. cat ~/troubleshooting.txt < grep FAILED

    c. cat ~/troubleshooting.txt > grep FAILED

    d. cat ~/troubleshooting.txt | grep FAILED

e. grep <~/troubleshooting.txt FAILED

22. Which directory in the Linux file system is actually a pseudo file system that is dynamically created whenever it is accessed?

    a. /opt
    b. /sbin
    c. /proc
    d. /srv
    e. /tmp

23. Prior to using the locate command to find a file, you decide to manually refresh the index of files in your Linux file system. Which shell command will do this?

    a. updatedb
    b. locatedb
    c. locate –i
    d. locate –S

24. You need to create a symbolic link between a file named myapp in the bin subdirectory of your user's home directory and an executable file named myapp located in /var/opt. Which command will do this?

    a. ln ~/bin/myapp /var/opt/myapp
    b. ln /var/opt/myapp ~/bin/myapp
    c. ln –s ~/bin/myapp /var/opt/myapp
    d. ln –s /var/opt/myapp ~/bin/myapp

25. Which component in the Linux boot process is a small ramdisk in memory to which a temporary root file system is copied?
    a. bootloader
    b. initrd image
    c. vmlinuz-<version>.gz file
    d. linuxrc executable

26. You want to configure your menu.lst file such that users must enter a password when they select a GRUB menu item. Which elements must be added to the file to accomplish this? (Choose two.)
    a. password
    b. gfxmenu
    c. grub-md5-crypt
    d. chainloader
    e. lock

27. On a Linux system that uses the init daemon, which Linux configuration file specifies the default runlevel that the system will boot into on startup?
    a. /etc/boot
    b. /etc/bash.bashrc
    c. /etc/inittab
    d. /etc/mtab

28. Your Linux system uses BSD-type init scripts. Some of the symbolic link files in your /etc/init.d/rc3.d directory include S05cifs, S11cron, S08ntp, and S07alsasound. When your system enters runlevel 3, what order will the services be started in?
    a. S07alsasound, S08ntp, S11cron, S05cifs
    b. S05cifs, S07alsasound, S08ntp, S11cron
    c. S11cron, S08ntp, S07alsasound, S05cifs
    d. S07alsasound, S05cifs, S11cron, S08ntp
    e. Depends on the configuration specified in the /etc/inittab file

29. Which shell commands will shut down and power off the Linux system? (Choose two.)
    a. shutdown –c
    b. shutdown +10 –h Please save your work and log out.
    c. shutdown +10 –r Please save your work and log out.
    d. init 0
    e. init 6

30. You want to install the gftp-2.0.19-7.1.x86_64.rpm package on your Linux system. During the installation, you want a progress bar to be displayed. Which commands can be used to do this? (Choose two.)
    a. rpm –ihv gftp-2.0.19-7.1.x86_64.rpm
    b. rpm –i gftp-2.0.19-7.1.x86_64.rpm
    c. rpm –Uhv gftp-2.0.19-7.1.x86_64.rpm
    d. rpm –e gftp-2.0.19-7.1.x86_64.rpm

e. rpm –qi gftp-2.0.19-7.1.x86_64.rpm

31. You need to download and install the gcc package using yum. Which commands will do this? (Choose two.)
    a. yumdownloader gcc
    b. yum update gcc
    c. yum install gcc
    d. yum list available
    e. yum localinstall gcc

32. You recently installed the package 3dchess_0.8.1-16_i386.deb on your Ubuntu Linux system. You want to view information about this package. Which command option can you use with the dpkg command to do this?
    a. –p
    b. –I
    c. –r
    d. –L

33. You need to view the shared libraries required by the vi text editor. Which command will do this?
    a. ldconfig –N /usr/bin/vi
    b. ldd –u /usr/bin/vi
    c. ldconfig –p /usr/bin/vi
    d. ldd –v /usr/bin/vi

34. You want to display a list of partitions configured on the first SATA hard disk drive in your Linux system. Which shell command will do this?
    a. fdisk /dev/hda –l
    b. fdisk /dev/sda –l
    c. fdisk /dev/sdb
    d. partprobe /dev/sda

35. Which option in field 4 of a mount entry in the /etc/fstab file causes file system changes to be cached and then written later when the system isn't busy?
    a. rw
    b. sync
    c. async
    d. atime

36. Which command can be used to monitor inode usage in your Linux file systems?
    a. du –h
    b. df –i
    c. df –hT
    d. du –a

37. You want to create a backup of the /home directory named backup.tar on an external USB hard drive mounted in /media/usb. Which command will do this?
    a. tar –c /media/usb/backup.tar /home

b. tar –xvf /media/usb/backup.tar /home

c. tar –cvf /home /media/usb/backup.tar

d. tar –cvf /media/usb/backup.tar /home

38. You want to upgrade your Linux system with a larger hard disk drive. You've installed a second SATA hard disk drive in your system and booted it off of a LiveCD Linux distribution. Which command will clone the contents of the first SATA hard disk to the new, second hard disk?

    a. dd if=/dev/sdb1 of=/dev/sda1

    b. dd if=/dev/sda1 of=/dev/sdb1

    c. dd if=/dev/sda of=/dev/sdb

    d. dd if=/dev/sdb of=/dev/sda

39. You need to change ownership of the /tmp/schedule.txt file from your user account (tuxpenguin) to the ksanders user. Assuming you are currently logged in as tuxpenguin, which command can be used to do this?

    a. chown tuxpenguin /tmp/schedule.txt

    b. chown –u=tuxpenguin /tmp/schedule.txt

    c. chown ksanders /tmp/schedule.txt

    d. This can't be done. Only root can change ownership.

40. The /shared directory in your Linux file system has the Execute (x) permission assigned to the owning group. Which of the following is true of this directory?

    a. Users who are members of the owning group are allowed to enter the directory.

b. Users who are members of the owning group are allowed to list the contents of the directory.

c. Users who are members of the owning group are allowed to add or delete files from the directory.

d. Users who are members of the owning group are allowed to run executable files in the directory.

41. You need to change the mode of the contacts.odt file to rw–rw–r– –. Which commands will do this (assuming contacts.odt is in the current directory)? (Choose two.)

    a. chmod u=rw,g=rw,o=r contacts.odt

    b. chmod 551 contacts.odt

    c. chmod u=rwx,g=rwx,o=r contacts.odt

    d. chmod g-rw contacts.odt

    e. chmod 664 contacts.odt

42. The value of umask on your Linux system is set to 0023. You create a new file in your home directory named schedule.odt. What is this file's default mode after you create it?

    a. rw–rw–rw–

    b. rw–r––r– –

    c. rw–r– –r–x

    d. rw–rw–rwx

43. Which special permission, when assigned to an executable file, causes the user who runs the file to temporarily become a member of the file's owning group?
    a. SUID
    b. SGID
    c. Sticky Bit
    d. Execute

44. Which command is used to scan your Linux file system for disk usage and to create your quota files?
    a. repquota
    b. quotaon
    c. quotacheck
    d. edquota

45. Prior to loading a kernel module, you can run which command to build the modules.dep file to identify dependencies between modules?
    a. depmod
    b. lsmod
    c. modinfo
    d. insmod
    e. modprobe

46. Which hard disk drive geometry parameter refers to the concentric parallel tracks on all sides of all platters in the drive?

a. Heads
b. Cylinders
c. Sectors
d. Landing Zone

47. Which interrupts on an x86 architecture PC are hard-wired to specific system devices and can't be allocated to add-in devices? (Choose two.)
    a. 1
    b. 3
    c. 4
    d. 6
    e. 8

48. You need to configure the GRUB2 bootloader such that it will use the last operating system selected from the boot menu as the default operating system to be used on the next boot. Which directive should you add to the /etc/default/grub configuration file to do this?
    a. GRUB_DEFAULT=0
    b. GRUB_SAVED DEFAULT=true
    c. GRUB_HIDDEN_TIMEOUT_QUIET=true
    d. GRUB_CMDLINE_LINUX=saved

49. Which shell command displays information about USB devices connected to your Linux system?

a. hdparm

b. lsusb

c. sginfo

d. lspci

50. Which component provides applications running on the system with information about the hardware (both hot-plug and cold-plug) available in the system?

    a. hald

    b. dbus

    c. sysfs

    d. udev

51. Which term refers to a process that has finished executing and exited, but whose parent process didn't get notified that it was finished and hasn't released the child process's PID?

    a. Sleeping

    b. Uninterruptibly Sleeping

    c. Zombied

    d. Traced

52. You need to see a list of all running processes on your Linux system, not just those associated with the current shell session. Which options can you use with the ps command to do this? (Choose two.)

    a. –e

b. –l

c. –A

d. –T

e. –f

53. You need to run the updatedb command with higher priority on the system. When run normally, the updatedb process has a nice value of 0 and a priority of 80. You want it to run with a priority of around 65. Which command will do this?

    a. nice –n –15 updatedb

    b. nice –n 65 updatedb

    c. nice –n 80 updatedb

    d. nice –n 0 updatedb

54. The updatedb process is currently running in the background on your Linux system with a PID of 4588 and a job ID of 1. You want to move the updatedb process from the background to the foreground. Which command will do this?

    a. fg 4588

    b. fg 4558 –j1

    c. bg 1

    d. fg 1

    e. bg updatedb

55. Which kill signal tells the process to terminate immediately and allows the process to clean up after itself before exiting?

a. SIGHUP

b. SIGINT

c. SIGKILL

d. SIGTERM

56. Which text-processing command prints lines from each of two specified input files that have identical join fields?

a. join

b. sort

c. expand

d. cut

57. You need to change every instance of the word "fs1" to "fs2" in the /etc/hosts.allow file. The output should be written to a new file named /etc/hosts.allow.new. Which of the following commands will do this?

a. sed s/fs1/fs2/ 1> /etc/hosts.allow.new

b. cat /etc/hosts.allow | sed s/fs1/fs2/ 1> /etc/hosts.allow.new

c. cat /etc/hosts.allow | sed s/fs1/fs2/

d. cat /etc/hosts.allow | sed /fs1/fs2/ 1>/etc/hosts.allow.new

58. You need to change the owning group of the contracts.doc file from the users group to the purchasing group. Assuming the file is in the current directory, which commands can be used to do this? (Choose two.)

a. chgrp users contracts.doc

b. chown g=purchasing contracts.doc

c. chown .purchasing contracts.doc

d. chgrp users.purchasing contracts.doc

e. chgrp purchasing contracts.doc

59. Which permission allows a user to open and view a file, but does not allow a file to be modified or saved?

a. Read

b. Write

c. Execute

d. Sticky Bit

60. Your Linux distribution uses systemd. It is currently running in a text-based environment. You want to switch to a graphical environment. Which commands could you use to do this? (Choose two.)

a. systemctl isolate runlevel3.target

b. systemctl rescue.target

c. systemclt isolate multi-user.target

d. systemctl isolate runlevel5.target

e. systemctl isolate graphical.target

Quick Answer Key

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

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

46. B

47. A, E

48. B

49. B

50. A

51. C

52. A, C

53. A

54. D

55. D

56. A

57. B

58. C, E

59. A

60. D, E

Answer Explanations

1. A and B are correct. The Apache web server is frequently implemented on Linux in conjunction with the MySQL database server to develop web-based applications.

   C, D, and E are incorrect. Although these are useful services, they are not typically used to provide web-based applications.

2. B is correct. The Ext2 file system does not use journaling. However, you can use the mke2fs command with the –j option to add a journal to an existing Ext2 file system, effectively making it an Ext3 file system.

   A, C, and D are incorrect. Reiser, Ext3, and XFS all use journaling to protect the file system.

3. C and E are correct. Reiser and Ext4 both support standard POSIX users and permissions.

   A, B, and D are incorrect. Although many Linux distributions may allow you to select these file systems during installation, support and functionality will be typically limited. Specifically, they do not support POSIX users and permissions.

4. B is correct. You must create a minimum of two partitions on any Linux deployment: one for the root directory (/) and one swap partition.

   A, C, and D are incorrect. Although it is a good idea to create separate partitions for these directories in the file system, you are not required to do so.

5. B is correct. On many Linux distributions, the MANPATH environment variable is used to specify the location of the man page files. Other Linux distributions may use

the MANPATH directive in the /etc/man_db.conf file to specify where man pages are stored.

A, C, and D are incorrect. The PATH environment variable specifies the search paths. The SHELL environment variable specifies which Linux shell program will be used by default. The HOST environment variable specifies the hostname of the Linux system.

6. D is correct. Section 8 of the manual contains documentation for administrative utilities used by the root user.

   A, B, and C are incorrect. Section 1 contains documentation for shell commands that can be used by any user. Section 3 contains documentation for library functions. Section 5 contains file format descriptions and conventions.

7. A and D are correct. The man and info utilities can be used to view documentation on the chgrp command.

   B, C, and E are incorrect. There is no help shell command in Linux. The /help and –man options are not valid with the chgrp command. However, you could use the --help option with chgrp to view a summary of how to use the command.

8. C and E are correct. You can use either the vim or vi command to edit text files. In fact, the /usr/bin/vi file is actually a symbolic link to the /bin/vim executable.

   A, B, and D are incorrect. The sed editor is a stream editor and can be used to edit a text file by sending it to the input of the command. However, it's not the best choice in this scenario. The cat command only displays content on the screen. It can't be used to edit a file. There is no shell utility named fedit.

9. A and E are correct. You can use the vi command to create a new file and open it in a text editor. However, the file won't actually be created until you write to the file in the editor. You can also use the touch command to create a new, empty file in the file system.

   B, C, and D are incorrect. The newfile, mkfile, and fedit shell commands don't exist in Linux.

10. A and D are correct. You can press Insert, I, or S to enter Insert mode in the vi editor.

    B, C, and E are incorrect. The Esc key is used to return to Normal mode from Insert mode in the vi editor. The Ctrl-E and Alt-R keystrokes aren't used by the vi editor.

11. D is correct. Entering :q! in Normal mode in the vi editor will discard all changes to the file since the last save and exit the editor.

    A, B, and C are incorrect. The :q and :quit commands will only quit the editor if no changes have been made to the file. The :exit! Command will exit the editor but will also save any changes made to the file.

12. B and E are correct. The cd /var/log command uses an absolute path to change to the directory. The cd ../log command uses a relative path to change to the directory.

    A, C, and D are incorrect. Each uses an invalid relative path.

13. D is correct. The –a option causes the ls command to display normal and hidden files and directories.

    A, B, C, and E are incorrect. The –h option causes ls to display file sizes in human-readable format. The –R option causes ls to list subdirectories recursively. The –l

option causes ls to use a long listing format. The ls command alone only displays normal (non-hidden) files.

14. B is correct. The mkdir command is used to create new directories in the file system (in this case, ~/MyFiles).

    A, C, D, and E are incorrect. A is incorrect because it uses the wrong case for the directory name. C and E are incorrect because they use the incorrect command for creating new directories (md). D is incorrect because it omits the (/) character after the tilde.

15. A and B are correct. The head command displays the first few lines of a text file on the screen. The less command displays the entire text file on the screen a few lines at time.

    C, D, and E are incorrect. The type command returns what type of command is executed when you enter it. The touch command is used to create new files. The print command isn't a valid Linux shell command.

16. B is correct. The –f option causes the tail command to display the last few lines of a text file on the screen and monitor the file for new lines that may be added. As new lines are added, they are displayed on the screen as well.

    A, C, D, and E are incorrect. The tail command alone displays the last few lines of the file on the screen, but it doesn't monitor the file for new lines. The less and cat commands don't use the –f option and hence can't be used to monitor a log file for new entries. Likewise, piping the output of the cat command to the input of the more command will not display new entries as they are added to the log file.

17. A is correct. You can use the mv command to rename a file. The new file specified is created while the original file is deleted.

    B, C, D, and E are incorrect. The ren, rendir, and rename commands are not valid Linux shell commands. The cp command will create a new file using the filename specified; however, the original file remains intact.

18. A is correct. The uname command returns information about your Linux system.

    B, C, D, and E are incorrect. The netstat command displays the status of the network. The whoami command displays the username of the currently logged-in user. The top command displays a list of all applications and processes currently running on the system. The exec command is used to run other shell commands with the new process created running alongside the original shell process.

19. D is correct. The PS1 environment variable specifies the characters used to create the shell prompt.

    A, B, and C are incorrect. The DISPLAY environment variable specifies the location where output from your X display should be sent. SHELL specifies the full path to the shell executable. ENV specifies the name of the file the bash shell reads to configure its environment.

20. B is correct. The tail –f /var/log/messages > ~/troubleshooting.txt command will monitor the /var/log/messages file for new entries and write them to the troubleshooting.txt file.

    A, C, and D are incorrect. A is incorrect because it omits the –f option required for tail to monitor the log file for new entries. C is incorrect because it redirects the stdout from the tail command to the troubleshooting.txt file. D is incorrect because it attempts to pipe the output from tail to a text file, which is an invalid operation.

21. D and E are correct. D is correct because it pipes the output of the cat command to the input of the grep command. E is correct because it redirects the troubleshooting.txt file to the input of the grep command.

    A, B, and C are incorrect. A is incorrect because it attempts to pipe the output of the grep command to a text file, which is an invalid operation. B is incorrect because it tries to redirect the grep command to the input of the cat command, which is also an invalid operation. C is incorrect because it attempts to redirect the output of the cat command to another command instead of to a file.

22. C is correct. The /proc directory is a little different in that it doesn't actually exist in the file system. Instead, it's a pseudo file system that is dynamically created whenever it is accessed. It's used to access process and other system information from the Linux kernel. Within /proc are a number of different subdirectories, each identified with a number instead of a name. These numbers correspond to the process ID (PID) number of the associated process running on the system.

    A, B, D, and E are incorrect. The /opt directory contains files for some programs you install on the system. The /sbin directory contains important system management and administration files. The /srv directory contains subdirectories where some services running on the system save their files. The /tmp directory contains temporary files.

23. A is correct. The locate database file (locatedb) will be automatically updated every day with the latest changes to the file system. You can manually update the index using the updatedb command from the shell prompt.

B, C, and D are incorrect. locatedb is the name of the locate database file. The locate –i command ignores case when matching filenames. The locate –S command displays statistics about the locate database instead of searching for files.

24. D is correct. The –s option tells ln to create a symbolic link. The syntax of ln requires that the file being pointed to by the link be specified first, followed by the name of the link file to be created.

    A, B, and C are incorrect. A is incorrect because it omits the –s option required for a symbolic link. It also reverses the order of the link file and the target file in the syntax of ln. B is incorrect because it also omits the –s option. C is incorrect because it also reverses the order of the link file and the target file in the syntax of ln.

25. B is correct. With later Linux kernels, the bootloader creates a temporary ramdisk in memory during the boot process called an initrd image. This image contains a basic file system that can be used to complete a variety of startup tasks.

    A, C, and D are incorrect. The bootloader is responsible for creating the initrd image in memory during the boot process. The vmlinuz-<version>.gz file is the compressed Linux kernel file. The linuxrc file is a script that is run from the initrd file system to set up the system.

26. A and E are correct. The password element is used to specify a password and can be specified once under global options. The lock element is included within each title element to restrict access to that menu item.

    B, C, and D are incorrect. The gfxmenu element is used to specify the graphical menu displayed by GRUB at boot. The grub-md5-crypt command is a shell command used to create an encrypted password for the GRUB menu. The chainloader element is

used to tell GRUB to pass the control of the boot sequence to another bootloader (such as a Windows bootloader).

27. C is correct. The /etc/inittab file is used to specify the default system runlevel. The syntax is id:<runlevel>:initdefault:.

    A, B, and D are incorrect. The /etc/boot file is a script that is run when the system first starts, but it doesn't configure the runlevel. The /etc/bash.bashrc file is used to configure global bash shell options. The /etc/mtab file contains a list of mounted file systems.

28. B is correct. The Sx part of the symbolic link filename specifies the order in which services should be started. Lower-numbered services are started before higher-numbered services.

    A, C, D, and E are incorrect. The Sx part of the symbolic link filename specifies the order in which services should be started. Lower-numbered services are started before higher-numbered services. The /etc/inittab file specifies runlevel configuration information, but it doesn't specify the order in which services are started.

29. B and D are correct. The "shutdown +10 –h Please save your work and log out." command will halt the system after ten minutes and will prompt users with the warning message specified. The init 0 command switches the system into runlevel 0, which powers the system off.

    A, C, and E are incorrect. A is incorrect because it cancels an impending shutdown. C is incorrect because it will reboot the system after ten minutes. E is incorrect because it will reboot the system immediately.

30. A and C are correct. You can use either the –i or –U option to install a package. The –h and –v options are used to display a progress indicator while the package is installed.

    B, D, and E are incorrect. B is incorrect because it installs the package, but it doesn't display a progress bar. D is incorrect because it uninstalls the package. E is incorrect because it only displays summary information about the package.

31. B and C are correct. The yum install gcc command will download the gcc package file from the configured software repository and install it on the system. The yum update gcc command will also download and install the gcc package if it determines that the package hasn't been installed.

    A, D, and E are incorrect. The yumdownloader gcc command will download the package, but it won't install it. The yum list available command displays a list of all packages available for installation in the configured repositories. The yum localinstall command is used to install a package that has already been downloaded.

32. A is correct. The –p option is used with the dpkg command to display information about an installed package.

    B, C, and D are incorrect. The –I option displays information about a package that isn't currently installed. The –r option uninstalls the package without removing its configuration files. The –L option simply lists all files that were installed by the package on the system.

33. D is correct. The ldd –v /usr/bin/vi command will display the shared libraries required by the vi text editor.

    A, B, and C are incorrect. The ldconfig command is used to manage links to shared libraries. The –u option causes ldd to display a list of unused direct dependencies.

34. B is correct. The fdisk /dev/sda –l command will display a listing of partitions on the first SATA hard disk drive in the system.

    A, C, and D are incorrect. A is incorrect because it would only work on older versions of the Linux kernel with older PATA hard drives. C is incorrect because it would open fdisk for the second SATA hard disk drive in the system. D is incorrect because it uses the incorrect syntax for the partprobe command. Including the –s option with partprobe would display the partition table for /dev/sda.

35. C is correct. The async option enables asynchronous I/O. Changes are cached and then written when the system isn't busy.

    A, B, and D are incorrect. The rw option mounts a file system in read/write mode. The sync option enables synchronous I/O where changes are written immediately. (This can be used for removable devices such as floppy disks.) The atime option specifies that the file access time is updated in a file's inode.

36. B is correct. The df –i command can be used to view inode usage on each of your mounted file systems.

    A, C, and D are incorrect. The du command can't be used to monitor inode usage. The df –hT command is used to monitor free space instead of free inodes.

37. D is correct. The tar –cvf /media/usb/backup.tar /home command will create a backup of the /home directory named backup.tar on an external USB hard drive mounted in /media/usb.

    A, B, and C are incorrect. A is incorrect because it omits the –f option. B is incorrect because it uses the –x option (extract) instead of the –c option (create). C is incorrect

because it reverses the name of the archive file and the name of the path to be archived.

38. C is correct. The dd if=/dev/sda of=/dev/sdb command will clone the first SATA hard disk to the second SATA hard disk in the system.

    A, B, and D are incorrect. A is incorrect because it references partitions instead of entire hard disks. It also reverses the input and output file locations. B is incorrect because it also references partitions instead of entire hard disks. D is incorrect because it reverses the input and output file locations.

39. D is correct. Only root can change which user account owns a file. To change the owning group, you can be logged in as root or as the user who currently owns the file.

    A, B, and C are incorrect. A is incorrect because it retains ownership of the file by tuxpenguin. B is incorrect because it uses incorrect syntax for the chown command. C is incorrect because it uses correct syntax and would work if it were run by root instead of tuxpenguin.

40. A is correct. Assigning the Execute permission to a directory allows the associated user(s) to enter the directory.

    B, C, and D are incorrect. The Read permission allows users to list the contents of the directory. The Write permission allows users to add or delete files from the directory. The ability to run an executable is controlled by the Execute permission assigned to the file itself.

41. A and E are correct. Both commands set the mode of the contacts.odt file to rw–rw–r– –.

B, C, and D are incorrect. B is incorrect because it sets the file's mode to r–xr–x– –x. C is incorrect because it sets the file's mode to rwxrwxr– –.D is incorrect because it removes Read and Write permissions from the owning group.

42. B is correct. The default mode for new files on Linux is rw–rw–rw–. A mask of 0023 subtracts no permissions from Owner, Write (2) from Group, and Write (2) and Execute (1) from Others. The result is a mode of rw–r– –r– –.

    A, C, and D are incorrect. A is incorrect because it would require a mask of 0000. C and D are incorrect because Execute for Others is not included in the default file mode.

43. B is correct. When a user runs an executable file with the SGID set, the user temporarily becomes a member of the file's owning group.

    A, C, and D are incorrect. When an executable file is run with the SUID set, the user who ran the file temporarily becomes the file's owner. The Sticky Bit permission isn't typically assigned to a file. The Execute permission does not confer ownership.

44. C is correct. The quotacheck command is used to scan the file system for disk usage as well as your create quota files. The –amvug options are typically used with quotacheck to check all mounted file systems, check users, and check groups.

    A, B, and D are incorrect. The repquota command is used to view the current disk space used by each user. The quotaon command is used to enable quotas on the file system. The edquota command is used to create disk quotas for each user.

45. A is correct. The depmod command is used to build a file named modules.dep that is stored in /lib/modules/<kernel_version>/. Within this file, depmod lists the

dependencies between modules. This helps other kernel module management utilities ensure that dependent modules are loaded whenever you load a module.

B, C, D, and E are incorrect. The lsmod command is used to view all currently loaded kernel modules. The modinfo command is used to view information about a loaded module. The insmod and modprobe commands are used to load modules.

46. B is correct. The term "cylinders" refers to the concentric parallel tracks on all sides of all platters in the hard disk drive. Imagine a hollow cylinder that penetrates down through all the platters in a hard drive.

    A, C, and D are incorrect. The term "heads" refers to the number of read/write heads in the drive. The term "sectors" refers to the number of wedges the platters have been divided into. A "landing zone" is an area of the platter near its inner diameter where no data are stored.

47. A and E are correct. IRQ 1 is hard-wired for the keyboard, whereas IRQ 8 is hard-wired for the real-time clock. Accordingly, you can't assign these IRQs to any other devices.

    B, C, and D are incorrect. IRQs 3 and 4 are used for COM ports by default. However, if the COM ports are disabled in the BIOS, their interrupts can be used for other devices. IRQ 6 is used for the floppy drive by default. If your system doesn't have a floppy drive, you can use IRQ 6 for other devices as well.

48. B is correct. If you set GRUB_SAVED DEFAULT to true, then GRUB will automatically select the last selected operating system from the menu as the default operating system to be used on the next boot. This parameter could conflict with the GRUB_DEFAULT parameter. Therefore, you can to use either one, but not both.

A, C, and D are incorrect. The GRUB_DEFAULT =0 directive causes GRUB2 to use the first menu entry by default, regardless of what operating system was selected on the last boot. The GRUB_HIDDEN_TIMEOUT_QUIET=true directive causes no countdown timer to be displayed. The GRUB_CMDLINE_LINUX directive is used to pass options to the kernel.

49. B is correct. The lsusb command can be used to display information about USB devices connected to your Linux system.

    A, C, and D are incorrect. The hdparm command displays information about your hard drive. The sginfo command lists all connected SCSI devices. The lspci command lists all PCI devices installed in the system.

50. A is correct. 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.

    B, C, and D are incorrect. The role of the dbus daemon is to notify the system when a new hot-plug device is connected. The sysfs component provides the /sys virtual file system. The udev daemon creates a virtual file system that is mounted at /dev.

51. C is correct. A zombied process is one where the process has finished executing and exited, but the process's parent didn't get notified that it was finished and hasn't released the child process's PID. A zombied process may eventually clear up on its own. If it doesn't, you may need to manually kill the parent process.

    A, B, and D are incorrect. A sleeping process has entered a not-runnable state but is still loaded. A process that is uninterruptibly sleeping is also still loaded, but in a

sleep state that won't allow it to respond immediately to a signal. A traced process is simply a stopped process.

52. A and C are correct. The –e and –A options (and the –a option to an extent) will cause ps to display a listing of all processes running on the system, not just those associated with the current terminal session.

    B, D, and E are incorrect. The –l and –f options are used to specify extended information in the output of the command. The –T option causes ps to select all processes associated with the current terminal.

53. A is correct. In this case, the nice value is reduced to a negative number, which will increase the process's priority on the system.

    B, C, and D are incorrect. Each sets the nice value to the same value or higher than the default, which will reduce the process's priority on the system (or at least leave it the same).

54. D is correct. The fg 1 command moves the background process with a job ID of 1 to the foreground.

    A, B, C, and E are incorrect. A and B are incorrect because they use the PID with the fg command, which is not correct. C and E are incorrect because they use the bg command, which is used to move traced processes from the foreground to the background.

55. D is correct. The SIGTERM kill signal tells the process to terminate immediately and allows the process to clean up after itself before exiting.

A, B, and C are incorrect. The SIGHUP signal restarts the process with exactly the same PID that it had before. The SIGINT signal sends a Ctrl-C key sequence to the process. The SIGKILL signal is a brute-force signal that kills the process without allowing it to clean up after itself before exiting.

56. A is correct. The join command prints a line from each of two specified input files that have identical join fields. The first field is the default join field, delimited by whitespace.

    B, C, and D are incorrect. The sort command sorts the lines of a text file alphabetically. The expand command is used to process a text stream and remove all instances of the Tab character and replace them with the specified number of spaces. The cut command is used to print columns or fields that you specify from a file to the standard output.

57. B is correct. The cat /etc/hosts.allow | sed s/fs1/fs2/ 1> /etc/hosts.allow.new command will change every instance of the word "fs1" to "fs2" in the /etc/hosts.allow file and redirect the output to a new file named /etc/hosts.allow.new.

    A, C, and D are incorrect. A is incorrect because it doesn't provide any means to send the contents of the hosts.allow file to the input of sed. C is incorrect because it fails to redirect the output to the new file. D is incorrect because it omits the s option in the sed command.

58. C and E are correct. Both the chown .purchasing contracts.doc command and the chgrp purchasing contracts.doc command will change the owning group of the contracts.doc file from users to purchasing.

A, B, and D are incorrect. A is incorrect because it specifies the wrong group name. B is incorrect because it uses the incorrect syntax for the chown command. D is incorrect because it uses the incorrect syntax for the chgrp command.

59. A is correct. The Read permission allows the entity it is assigned to (Owner, Group, or Others) to open and view a file, but does not allow a file to be modified or saved.

    B, C, and D are incorrect. The Write permission allows a file to be modified and the changes saved. The Execute permission allows an executable file to be run. The Sticky Bit permission is not typically used with files.

60. D and E are correct. To switch to the systemd equivalent of runlevel 5, you could enter either "systemctl isolate runlevel5.target" or "systemclt isolate graphical.target".

    A, B, and C are incorrect. The systemctl isolate runlevel3.target and systemclt isolate multi-user.target commands are used to switch the system into a text-based, multiuser environment comparable to runlevel 3 on an init-based system. The systemctl rescue.target command switches the system to a rescue environment equivalent to runlevel 2.

Objectives

1. 102.1 Design hard disk layout: Tailor the design to the intended use of the system
2. 104.1 Create partitions and file systems: Use various mkfs commands to set up partitions and create various file systems, such as ext2, ext3, xfs, reiserfs v3, and vfat
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4. 102.1 Design hard disk layout: Allocate file systems and swap space to separate partitions or disks
5. 103.1 Work on the command line
6. 103.1 Work on the command line
7. 103.1 Work on the command line
8. 103.8 Perform basic file editing operations using v
9. 103.8 Perform basic file editing operations using vi
10. 103.8 Perform basic file editing operations using vi
11. 103.8 Perform basic file editing operations using vi
12. 103.3 Perform basic file management
13. 103.3 Perform basic file management
14. 103.3 Perform basic file management
15. 103.3 Perform basic file management
16. 103.3 Perform basic file management
17. 103.3 Perform basic file management
18. 103.1 Work on the command line: Use single shell commands and one-line command sequences to perform basic tasks on the command line

19. 103.1 Work on the command line: Use and modify the shell environment, including defining, referencing, and exporting environment variables
20. 103.4 Use streams, pipes, and redirects: Redirecting standard input, standard output, and standard error
21. 103.4 Use streams, pipes, and redirects: Pipe the output of one command to the input of another command
22. 104.7 Find system files and place files in the correct location: Understand the correct locations of files under the FHS
23. 104.7 Find system files and place files in the correct location: Find files and commands on a Linux system
24. 104.6 Create and change hard and symbolic links
25. 101.2 Boot the System: Demonstrate knowledge of the boot sequence from BIOS to boot completion
26. 102.2 Install a boot manager
27. 101.3 Change runlevels/boot targets and shut down or reboot the system: Set the default runlevel
28. 101.3 Change runlevels/boot targets and shut down or reboot the system
29. 101.3 Change runlevels/boot targets and shut down or reboot the system: Shut down and reboot from the command line
30. 102.5 Use RPM and YUM package management: Install, reinstall, upgrade, and remove packages using RPM and YUM
31. 102.5 Use RPM and YUM package management: Install, reinstall, upgrade, and remove packages using RPM and YUM
32. 102.4 Use Debian package management: Obtain package information like version, content, dependencies, package integrity, and installation status (whether or not the package is installed)

33. 102.3 Manage shared libraries: Identify shared libraries
34. 104.1 Create partitions and file systems
35. 104.3 Control mounting and unmounting of file systems: Configure file system mounting on bootup
36. 104.2 Maintain the integrity of file systems: Monitor free space and inodes
37. 103.3 Perform basic file management: Usage of tar, cpio, and dd
38. 103.3 Perform basic file management: Usage of tar, cpio, and dd
39. 104.5 Manage file permissions and ownership
40. 104.5 Manage file permissions and ownership
41. 104.5 Manage file permissions and ownership
42. 104.5 Manage file permissions and ownership: Know how to change the file creation mask
43. 104.5 Manage file permissions and ownership: Use access modes such as suid, sgid, and the sticky bit to maintain security
44. 104.4 Manage disk quotas: Set up a disk quota for a file system
45. 101.1 Determine and configure hardware settings
46. 101.1 Determine and configure hardware settings: Differentiate between the various types of mass storage devices
47. 101.1 Determine and configure hardware settings: Determine hardware resources for devices
48. 102.2 Install a boot manager
49. 101.1 Determine and configure hardware settings: Tools and utilities to list various hardware information
50. 101.1 Determine and configure hardware settings: Conceptual understanding of sysfs, udev, hald, and dbus

51. 103.5 Create, monitor, and kill processes: Monitor active processes
52. 103.5 Create, monitor, and kill processes: Select and sort processes for display
53. 103.6 Modify process execution priorities: Run a program with a higher or lower priority than the default
54. 103.5 Create, monitor, and kill processes: Run jobs in the foreground and the background
55. 103.5 Create, monitor, and kill processes: Send signals to processes
56. 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
57. 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
58. 104.5 Manage file permissions and ownership
59. 104.5 Manage file permissions and ownership: Manage access permissions on regular and special files as well as directories
60. 101.3 Change runlevels/boot targets and shut down or reboot the system