**Linux Interview Questions**

1. You have just installed a new network card on your RHEL 5 server. When the server is booted up, it does not appear to recognize the new card or its interfaces. What steps do you take to diagnose and correct the issue?

*ANSWER: Typically this is a driver issue. Check first that the card is visible on the PCI bus with ‘lscpi’. Check to see if necessary kernel modules are loaded (with ‘lsmod’). If they are not, they may need to be added to /etc/modprobe.conf (/etc/modules.conf was the file in RHEL 3), after which it is usually best to rebuild the init root disk (with ‘mkinitrd’). If the candidate suggests getting the module from HW vendor keep asking to see if the candidate is familiar with the “tainted kernel” concept.*

1. How do you determine if an interface has errors?

‘ifconfig – for counters since boot, netstat –in –c 2 to display instant statistics every 2 seconds’

1. How do you determine the speed and mode of a NIC?

‘ethtool is the standard, miitool is deprecated, but show the candidate has a clue about this.

1. What is bonding?

‘A kernel module that creates a virtual NIC over a minimum of 2 physical NICs to provide redundancy or load balancing (different modes available: round-robin, link aggregation, XOR, etc.)’

1. What run levels are available in Linux? How can I switch a server from one run level to another?

*ANSWER: Linux has seven run levels, though one of them (4) is typically undefined and can be used for special purposes: 0 (halt), 1 (single-user mode), 2 (multi-user mode, console access only, no networking), 3 (multi-user mode, console access only, with networking), 4 (not used/user-definable), 5 (multi-user mode, with display manager and console logins), 6 (reboot). A server is switched from one run level to another using the ‘init’ command.*

1. What is meant by the term “load average” within a Linux context, and how is it assessed on a Linux system?

*ANSWER: Load average refers to the average number of processes in the run queue, i.e. processes that are either running on the CPU, waiting for the CPU, or in an uninterruptible sleep state waiting on I/O (typically waiting for disk activity). It is typically assessed over 1-minute, 5-minute, and 15-minute intervals. It can be assessed using a number of tools, with ‘top’, ‘w’, ‘uptime’, ‘xload’, and ‘tload’ being among the most widely used. It can also be assessed by reading the contents of /proc/loadavg.*

1. Where in the operating system would you look to find the World Wide Name of an interface on a host bus adapter?

*ANSWER: This, as well as other information regarding the HBA, can be read from /proc/scsi/<driver>/<interface> (e.g., /proc/scsi/lpfc/1 would be interface 1 on an Emulex LightPulse Fibre Channel card.)*

1. How do you list all the disk in the system?

‘fdisk –l; cat /proc/partitions; ls -la /dev/disk/by-path’

1. Provide examples of filesystems for the OS and their role.

‘”/boot” – a must for LVM installations, “/”, “ /home”, “/var” and any variation. A big minus will be attempts to place /bin, /lib or /usr (the LVM binaries are located in /usr/sbin) in a separate mount point’

1. What command is used to update an existing Red Hat package? What if you’re not sure whether it’s already installed or not, but don’t want it installed if it’s not?

*ANSWER: If you know the package is installed and want to update it, you can use ‘rpm –Uvh <package-filename>’. If it is not installed, though, this will install the package. If you do not know whether it is installed or not, and do not wish to install it if it isn’t, use the “freshen” option: ‘rpm –Fvh <package-filename>’.*

1. How is an installed package backed out, and what steps must be taken prior to installation to ensure that this can be done? What else must be done if ‘yum’ is in use?

*ANSWER: The ‘rpm’ command has a mostly undocumented “--rollback” switch to facilitate backouts. (e.g., ‘rpm –Uvh –rollback “2:00pm”’ would back out package installed/updated after 2:00pm the same day.) In order to use it, either add “%\_repackage\_all\_erasures 1” to the /etc/rpm/macros file or add the “--repackage” switch to the ‘rpm’ command when the package is installed or updated. This will cause ‘rpm’ to repackage the original package in /var/spool/repackage so that it is available if and when the rollback is invoked. If ‘yum’ is in use, “tsflags=repackage” must also be added to /etc/yum.conf.)*

1. Where would you install a SecureShell public key to permit access from a remote system?

*ANSWER: ${HOME}/.ssh/authorized\_keys*

1. What are the files used for initializing the environment for a shell and the order they are read? ‘depends on the shell, the key point is that the files under /etc for profile are always read and they are read first. Here is the example for bash: When bash is invoked as an interactive login shell, or as a non-interactive shell with the --login option, it first reads and executes commands from the file /etc/profile, if that file exists. After reading that file, it looks for ~/.bash\_profile, ~/.bash\_login, and ~/.profile, in that order, and reads and executes commands from the first one that exists and is readable.’
2. Where do you set an environment variable to be valid for all users?

‘/etc/profile’

1. You attempt to access a remote system using SecureShell, but are confronted with a warning of a possible “man-in-the-middle” attack and are denied access because host verification has failed. Where would you look in order to troubleshoot the problem?

*ANSWER: Likely the issue can be corrected by removing the offending key from ${HOME}/.ssh/known\_hosts, but if this key is known to have been valid in the past, an investigation should be performed to determine whether the private SSH key on the target system has been changed since the last access, and if so whether such a change was in fact authorized.*

1. For whatever reason, you are unable to access the root account from a Linux system’s console. You know that the password was recently changed, however the password that was supposed to have been set is not working. You have no private user account on the box. How can you break into the system?

*ANSWER: The most obvious answer is to insert either the installation media or a prepared rescue disk, cycle power on the server, bring the server up in rescue mode, mount the root filesystem, ‘chroot’ to the mounted root filesystem, reset the password (with the ‘passwd’ command), exit the ‘chroot’ session, unmount the root filesystem, remove the install/rescue disk, and reboot. Alternatively, the root password can be removed altogether by editing the /etc/passwd file while the root filesystem is mounted. There are probably other solutions as well.*

1. What are the fields for cron?

‘minute, hour, day on month, month, day of week, command’

1. A script ran in the command line works perfectly, but it generates a lot of errors when running from cron. What is the most likely cause?

‘cron does not initialize the shell environment so variables like PATH may not contain what is expected. Always use full path when invoking commands. Also cron has no tty so scripts/commands that require a tty will not work’

1. How do you see in real-time all the System Calls of a running process?

‘strace’

1. What permissions must a directory have so that everyone can ‘cd’ into it but not see its content?

‘--x for others’

1. What permissions does /tmp have? What does t means?

‘rwxrwxrwxt (777 and sticky). t means that the sticky bit is on and that ensures that only the owner of a file (and root) can delete that file’

1. What is the first process started on Linux? What is the config file for init and what does it contain?

‘init, PID 1. /etc/inittab. It contains info about runlevels, the default run-level, specific traps (crtl+alt+del) and some daemons that need to be started by init and monitored if respawn is specified (a good example are the physical consoles available on the server tty1, tty2)’

1. How do you list all the modules that are loaded in kernel and how do you determine the parameters than can be configured for a kernel module?

‘lsmod and modinfo <module\_name>’

1. What is /proc and /sys?

‘Pseudo filesystems that reside in memory that contain the system state and kernel interface. /sys is specific for kernel with a minimum 2.6.x version’

1. What are zombie processes and do the zombie processes consume resources?

‘processes that have terminate their work (are dead), but who’s parent process died before them (or is unavailable) and therefore the parent wasn’t able to delete it from the processes table. Zombie processes do not use resources, they are just records in the processes table. A zombie process only occupies a PID’

1. What happens if you try to send a SIGKILL to a zombie process?

‘Nothing as the process is dead and it no longer reads its signal queue’

1. How many standard signals are in Linux/Unix and explain a few you are most familiar with?

’15 total. At least SIGHUP, SIGKILL and SIGTERM should be explained by the candidate. The entire list is:

SIGHUP 1 Term Hangup detected on controlling terminal or death of controlling process

SIGINT 2 Term Interrupt from keyboard

SIGQUIT 3 Core Quit from keyboard

SIGILL 4 Core Illegal Instruction

SIGABRT 6 Core Abort signal from abort(3)

SIGFPE 8 Core Floating point exception

SIGKILL 9 Term Kill signal

SIGUSR1 10 Term User-defined signal 1

SIGSEGV 11 Core Invalid memory reference

SIGUSR2 12 Term User-defined signal 2

SIGPIPE 13 Term Broken pipe: write to pipe with no readers

SIGALRM 14 Term Timer signal from alarm(2)

SIGTERM 15 Term Termination signal’

1. What is the sequence of commands to extend a filesystem based on an LVM volume?

‘pvcreate, vgextend, lvextend, resize2fs’

1. Describe the difference between a hard link and a symbolic link.

‘hard link same inode intra filesystem; symbolic link special file inter filesystem’

1. How do you determine what dynamic libraries are linked with a binary.

‘ldd’

1. What does the command “kill” do?

‘Sends messages (signals) to a process.’

1. How to scan for a FC LUN?

‘echo ‘- - -‘ > /sys/class/scsi\_host/host<X>/scan and if needed echo ‘1’ > /sys/class/fc\_host/host<X>/issue\_lip’

1. df and du. Deleted open files.
2. Describe the BOOT process.

‘BIOS/Boot Loader (2 stages GRUB)/init …’

1. How would you change the active slave in a bond interface?

‘ifensalve’

1. Location of kernel modules.
2. Location of users’ cron file
3. Determine backup superblock for ext3 on a damaged filesystem.

Ans. Step 1. Find the backup superblock locations:

# dumpe2fs /dev/sda2 | grep –I superblock

#e2fsck –b “backup superblock no.” /dev/sda2

1. Please explain how the “three way handshake” for a TCP connection is perfomed.
2. Difference between ‘rm –rf \*’ and ‘rm –rf .’
3. What are special permissions
4. What is syntax of cron scheduling? Wht is anacron? How to schedule cron in seconds ?
5. How to check open ports on server ?
6. My ethernet name has been changed after a reboot and my network is down. How will you troubleshoot?

Ans. The device names changes most commonly when there is a hardware change on the server. You need to add correct the persistent udev rules. (/etc/udev/rules.d/30-net-persistent-rules\*)

1. I found that, my server has physical volumes created on one of the LUN path (/dev/sdb ) instead of Pseudo (/dev/emcpowera) name of the LUN. What are the consequences of this and how will you correct ?

Ans. If that specific path fails, the filesystem will become unavailable. To correct that just put a filter in /etc/lvm.conf so that lvm doesn’t recognize the /dev/sd\* devices but just the /dev/emcpower\* devices.

1. What is load average of a server and ideally how much it should be?

Ans. Its an average of system load for last 1, 5 and 15 minutes. The load average should be in ratio of no. of servers. Load average = 1 x No. of CPUs (Example, load average 32 is fine if no. of cpus in the server is 32 or more.)

1. I have sufficient disk space but unable to create new files. What can be the reason?

Ans. Check the inode counts with df –ih . If the indoes utilization is 100%, new files cannot be created.

How will you resolve the issue?

Ans. Its not possible to increase the no. of inodes, create a new bigger filesystem and copy the data over here and rename this filesystem.

1. How ll you check if the filesystem is running clean or with errors. How ll you clean if it has errors?

Ans. Run Dupe2fs on the filesystem, it will show you the state of filesystem. If its is dirty, clean it with fsck.

1. While running ntpdate, there is an error saying “ntpd socket already exists” and it doesn’t allow you to sync the system time to NTP server. What is the reason ?

Ans. Ntpdate command doesn’t work if ntpd is running. Stop the ntpd service first and then run ntpdate.

1. On which port ntp works?

Ans. NTP uses UDP/IP packets for data transfer because of the fast connection setup and response times. The official port number for the NTP (that ntpd and ntpdate listen and talk to) is 123.

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1. What are special permissions in Linux? Where are they applied by default ?

Ans. Suid : Applied on a executable file to allow users to run the command with the privileges of owner of that file. Its applied on /usr/sbin/passwd

Sgid: Applied on directories to share data among group members. The files created under a sgid applied directory will take group ownership from the parent directory instead of the user creating file.

Sticky Bit : Applied on directory, users cannot delete the files owned by other users but can read and modify. By default applied on /tmp.

1. Find the processes consuming most of the swap in your server.

Ans. Run top -> shift+o -> p

1. How can you schedule cron in seconds ?

Ans. Not possible

1. What are positional parameters in shell scripting?

Ans. $# : No. of arguments used

$0: Name of script

$1: First Argument

$2: 2nd Argument

1. How to configure default Gateway ? /etc/sysconfig/network
2. How to configure network routes? **ip route add {NETWORK} via {IP} dev {DEVICE}**
3. What is network bonding ‘A kernel module that creates a virtual NIC over a minimum of 2 physical NICs to provide redundancy or load balancing (different modes available: round-robin, link aggregation, XOR, etc.)’
4. What are various mounting options? How to use “\_netdev” , “no\_root\_squash”, “hard”, “soft” mounting options.

file\_system dir type options dump pass . The filesystem resides on a device that requires network access (used to prevent the system from attempting to mount these filesystems until the network has been enabled on the system).

root\_squash

Map requests from uid/gid 0 to the anonymous uid/gid. Note that this does not apply to any other uids or gids that might be equally sensitive, such as user bin or group staff.

no\_root\_squash

Turn off root squashing. This option is mainly useful for diskless clients.

all\_squash

Map all uids and gids to the anonymous user. Useful for NFS-exported public FTP directories, news spool directories, etc. The opposite option is no\_all\_squash, which is the default setting.

1. On which port iscsi works?

Ans. 3260

1. How to setup Network bonding and and check status of running bond.
2. How to increase capacity of raid 0 ?
3. What is critical section in raid 5 ? mdadm failed to reassemble the array. After several attempts I got:  
   'Failed to restore critical section for reshape, sorry.'
4. What is TCP wrappers ? A TCP Wrapper is a library that provides simple access control and standardized logging for supported applications that accept connections over a network. A TCP Wrapper is a host-based networking access control list (ACL) system and used to filter network access to Internet. TCPD (TCP Wrappers) Benefits
5. Logging - Connections that are monitored by TCPD are reported through the syslog facility.
6. Access Control - TCPD supports a simple form of access control that is based on pattern matching. You can even hook the execution of shell commands/script when a pattern matches.
7. Host Name Verification - TCPD verifies the client host name that is returned by the address->name DNS server by looking at the host name and address that are returned by the name->address DNS server.
8. **Spoofing Protection** Spoofing and bad address attack tries to fool the server and try to claim that packets had come from local address/network.
9. **Explain memory utilization in Linux**.

Ans. When there are no more physical memory pages available, the kernel swaps some older pages back to disk. (If they are code pages that have not been changed, then they are just discarded; otherwise they are written to the swap areas.)

Disk drives are mechanical devices; reading and writing to disk is several orders of magnitude slower than accessing physical memory. If the total memory pages required significantly exceed the physical memory available, the kernel starts spending more time swapping pages than executing code. The system begins thrashing, and slows down to a crawl. If this increases to a point where the swap device becomes fully utilized, the system can virtually come to a standstill. This is definitely a situation we want to avoid.

When extra physical memory is not in use, the kernel attempts to put it to work as a disk buffer cache. The disk buffer stores recently accessed disk data in memory; if the same data is needed again it can be quickly retrieved from the cache, improving performance. The buffer grows and shrinks dynamically to use the memory available, although priority is given to using the memory for paging. Thus, all the memory you have is put to good use.

**Here is a typical output on my system:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| total | Used | Free | shared | Buffers |
| Mem: | 7096 | 5216 | 1880 | 2328 |
| Swap: | 19464 | 0 | 19464 | 2800 |

The information is shown in kilobytes (1024 bytes). The “total” memory is the amount available after loading the kernel. Any memory being used for processes or disk buffering is listed as “used.” Memory that is currently unused is listed in the “free” column. Note that the total memory is equal to the sum of the “used” and “free” columns.

The memory indicated as “shared” is an indication of how much memory is common to more than one process. A program such as the shell typically has more than one instance running. The executable code is read-only and can be shared by all processes running the shell.

----------------------------------------------------------------------------------------------------

-bash-3.2$ free -m  
total used free shared buffers cached  
Mem: 15364 6738 8625 0 211 4011  
-/+ buffers/cache: 2514 12849  
Swap: 12001 0 12001

The first row, labeled Mem, displays physical memory utilization, including the amount of memory allocated to buffers and caches. A buffer, also called buffer memory, is usually defined as a portion of memory that is set aside as a temporary holding place for data that is being sent to or received from an external device, such as a HDD, keyboard, printer or network.

he second line of data, which begins with -/+ buffers/cache, shows the amount of physical memory currently devoted to system buffer cache. This is particularly meaningful with regard to application programs, as all data accessed from files on the system that are performed through the use of read() and write() system calls1 pass through this cache. This cache can greatly speed up access to data by reducing or eliminating the need to read from or write to the HDD or other disk.

The third row, which begins with Swap, shows the total swap space as well as how much of it is currently in use and how much is still available.

1. **Q.4 How to remove journaling from a ext3 filesystem?**

Ans. If you have created a journal on a former ext2, it can be removed if it needs to be reverted to ext2:

# tune2fs -O ^has\_journal /dev/DEV

1. **Q.5 What is Superblock and how to restore filesystem from superblock?**

Ans. A superblock is located at position 0 of every partition, contains vital information about the filesystem and is needed at a fielsystem check.  
  
The information stored in the superblock are about what sort of fiesystem is used, the I-Node counts, block counts, free blocks and I-Nodes, the numer of times the filesystem was mounted, date of the last filesystem check and the first I-Node where / is located.  
  
Thus, a damaged superblock means that the filesystem check will fail.

Ans. Find out superblock location for /dev/sda2:  
# dumpe2fs /dev/sda2 | grep superblock

Sample output:

Primary superblock at 0, Group descriptors at 1-6

Backup superblock at 32768, Group descriptors at 32769-32774

Backup superblock at 98304, Group descriptors at 98305-98310

Backup superblock at 163840, Group descriptors at 163841-163846

Backup superblock at 229376, Group descriptors at 229377-229382

Backup superblock at 294912, Group descriptors at 294913-294918

Now check and repair a Linux file system using alternate superblock # 32768:  
# fsck -b 32768 /dev/sda2

Now try to mount file system using mount command:  
# mount /dev/sda2 /mnt  
You can also use superblock stored at 32768 to mount partition, enter:  
# mount sb={alternative-superblock} /dev/device /mnt  
# mount sb=32768 /dev/sda2 /mnt

1. **Q.6 What are different Filesystem Data Modes?**

Ans. Data Mode  
=========  
There are 3 different data modes:  
  
\* writeback mode  
In data=writeback mode, ext4 does not journal data at all. This mode provides a similar level of journaling as that of XFS, JFS, and ReiserFS in its default mode - metadata journaling. A crash+recovery can cause incorrect data to appear in files which were written shortly before the crash. This mode will typically provide the best ext4 performance.  
  
\* ordered mode  
In data=ordered mode, ext4 only officially journals metadata, but it logically groups metadata information related to data changes with the data blocks into a single unit called a transaction. When it's time to write the new metadata out to disk, the associated data blocks are written first. In general, this mode performs slightly slower than writeback but significantly faster than journal mode.  
  
\* journal mode  
data=journal mode provides full data and metadata journaling. All new data is written to the journal first, and then to its final location.  
In the event of a crash, the journal can be replayed, bringing both data and  
metadata into a consistent state. This mode is the slowest except when data  
needs to be read from and written to disk at the same time where it outperforms all others modes. Curently ext4 does not have delayed allocation support if this data journalling mode is selected.

Q.7 **. What is the difference between Swapping and Paging?**

Swapping:

Whole process is moved from the swap device to the main memory for execution. Process size must be less than or equal to the available main memory. It is easier to implementation and overhead to the system. Swapping systems does not handle the memory more flexibly as compared to the paging systems.

Paging:

Only the required memory pages are moved to main memory from the swap device for execution. Process size does not matter. Gives the concept of the virtual memory. It provides greater flexibility in mapping the virtual address space into the physical memory of the machine. Allows more number of processes to fit in the main memory simultaneously. Allows the greater process size than the available physical memory. Demand paging systems handle the memory more flexibly.

**Monitoring**

1. How to see all the mounted filesystems? Df - h command - Shoe file system disk space usage.

2. How to see current memory, cpu and swap utilization? Vmstat free –m top

3. How to reduce the memory , cpu and swap utilization?

## 4. What are the various monitoring commands? Top ,vmstat, w, uptime, ps, free, iostat, sar, mpstat, netstat, strace

5. How SAR works? sar - Collect, report, or save system activity information. The sar command writes to standard output the contents of selected cumulative activity counters in the operating system. The accounting system, based on the values in the count and interval parameters, writes information the specified number of times spaced at the specified intervals in seconds. If the interval parameter is set to zero, the sar command displays the average statistics for the time since the system was started. If the interval parameter is specified without the count parameter, then reports are generated continuously. The collected data can also be saved in the file specified by the -o filename flag, in addition to being displayed onto the screen. If filename is omitted, sar uses the standard system activity daily data file, the /var/log/sa/sadd file, where the dd parameter indicates the current day. By default all the data available from the kernel are saved in the data file.

6. How to see no. of CPUs installed in the system? cat /proc/cpuinfo, lscpu

7. What is a bearable load average ? Load Average is the value which represents the load on your system for a specific period of time. Also it can be considered the ratio of the number of active tasks to the number of available CPUs.

8. How to see current runlevel? who –r, runlevel

9. What is inode and superblock superblock, which contains information about file system such as:

* File system type
* Size
* Status
* Information about other metadata structures Each inode stores the attributes and disk block location(s) of the filesystem object's data.

10. How to see inode utilization and how can they be increased ? You can use ls -i command to see inode number of file. You can also use stat command to find out inode number and its attribute:

**Boot Process**

1. What is the boot process ? 

2. Differentiate various run levels ? Following are the available run levels

* 0 – halt
* 1 – Single user mode
* 2 – Multiuser, without NFS
* 3 – Full multiuser mode
* 4 – unused
* 5 – X11
* 6 – reboot

3. What is Single User and Rescue mode ? **Booting into Rescue Mode**  
  
Rescue mode provides the ability to boot a small Linux environment entirely from CD-ROM, or some other boot method, instead of the system's hard drive.  
  
As the name implies, rescue mode is provided to rescue you from something. During normal operation, your Linux system uses files located on your system's hard drive to do everything — run programs, store your files, and more.  
  
Once you have booted using bootable disk, add the keyword rescue as a kernel parameter.  
  
**linux rescue**  
  
**Booting into Single-User Mode**  
  
One of the advantages of single-user mode is that you do not need a boot CD-ROM; however, it does not give you the option to mount the file systems as read-only or not mount them at all.  
  
In single-user mode, your computer boots to runlevel 1. Your local file systems are mounted, but your network is not activated.  
  
use the following steps to boot into single-user mode:  
  
1.At the GRUB splash screen at boot time, press any key to enter the GRUB interactive menu.  
2.Select Linux with the version of the kernel that you wish to boot and type a to append the line.  
3.Go to the end of the line and type single as a separate word (press the Spacebar and then type single). Press Enter to exit edit mode.  
  
**Emergency Mode**  
  
In emergency mode, you are booted into the most minimal environment possible. The root file system is mounted read-only and almost nothing is set up. The main advantage of emergency mode over single-user mode is that the init files are not loaded. If init is corrupted or not working, you can still mount file systems to recover data that could be lost during a re-installation.  
  
To boot into emergency mode, use the same method as described for single-user mode, with one exception, replace the keyword single with the keyword emergency.

Read more: <http://linuxpoison.blogspot.in/2008/03/howto-boot-system-into-resucesingle.html#ixzz3Dks4wLwp>

## 4. What are rc scripts ? How a run level switch happens ? The actual scripts that control services are in /etc/rc.d. These scripts are automatically run at boot time, but they can be called manually if necessary. The following example shows how to start the SSH daemon that we enabled in the previous section: Linux Change Run Level Command

Use the init command to change rune levels:  
# init 1

## Runlevel And Its Usage

The Init is the parent of all processes with PID # 1. Its primary purpose is to create processes from a script stored in the file /etc/inittab file. This file usually has entries which cause init to spawn gettys on each line that users can log in. A runlevel is nothing but a software configuration of the Linux system which allows only a selected group of processes to exist. The processes spawned by init for each of these runlevels are defined in the /etc/inittab file. Init can be in one of eight runlevels as follows:

* Runlevel 0 is halt
* Runlevel 1 is single-user
* Runlevels 2-5 are multi-user (some distro uses RUN level 5 to start X [KDE/Gnome])
* Runlevel 6 is for rebooting system

For example, typing the **init 3** command will move system to run level 3:

# init 3

On most Linux server system default run level is 3 and on most Linux Desktop system default run level is 5. The default run level is defined by the initdefault line at the top of /etc/inittab file under CentOS / Fedora / Redhat / RHEL / Debian Linux. To change the default run level, edit /etc/inittab file, and edit entry initdefault:

# vi /etc/inittab

Set initdefault to 5, so that you can boot to X next time when Linux comes up:

id:5:initdefault:

Save and close the file. Reboot the system to see changes:  
# reboot

5. What is boot configuration file ?

6. Where are the boot logs saved ? **/var/log/messages**

7. How to restore corrupted GRUB?

Ans. Grub-install hd0,0

8. What is PXE boot ? The Preboot Execution Environment (PXE) is a method of network booting blade and cluster systems. It is the core technology for Intel's Wired for Management (WfM) initiative and is supported by most commercial network interfaces. You can install a blade operating system image with minimal effort from a central location by using PXE

9. How to put a boot password?

Ans. Generate the password with #grub-md5-crypt and the generated password in the grub.conf file below line as below:

password --md5 <password-hash>

10. What is Single User Mode, Rescue Mode and Emergency Mode?

Ans. In emergency mode, you are booted into the most minimal environment possible. The root file system is mounted read-only and almost nothing is set up. The main advantage of emergency mode over single-user mode is that the init files are not loaded. If init is corrupted or not working, you can still mount file systems to recover data that could be lost during a re-installation.

To boot into emergency mode, use the same method as described for single-user mode in [Section 36.1.3, “Booting into Single-User Mode”](https://access.redhat.com/site/documentation/en-US/Red_Hat_Enterprise_Linux/6/html/Installation_Guide/ap-rescuemode.html#s1-rescuemode-booting-single) with one exception, replace the keyword single with the keyword emergency.

**File System Basics**

1. What is hard link and symbolic link ?

2. How to identfy a link file ?

3. How to remove a link file ?

4. what are link counters ?

Ans. The link count is the number of hard links to a file or directory.  
  
For directories, this is always (I believe always) 2+number of subdirectories. (The first 2 are the link from the parent to it and it's own '.' reference. Each subdirectory is the '..' in that subdirectory.)  
  
For regular files, this is generally 1, unless there are multiple hard links to that file.

5. What are inodes ?

6. What is journalling ?

7. What are the differences between ext2, ext3 and ext4 ?

8. What are the steps to create a new filesystem

LVM

1. Why do I need LVM ?

2. What is difference between LVM1 and LVM2 ?

Ans.

| Features | LVM1 | LVM2 |
| --- | --- | --- |
| RHEL AS 2.1 support | No | No |
| RHEL 3 support | Yes | No |
| RHEL 4 support | No | Yes |
| Transactional metadata for fast recovery | No | Yes |
| Shared volume mounts with GFS | No | Yes |
| Cluster Suite failover supported | Yes | Yes |
| Striped volume expansion | No | Yes |
| Max number PVs, LVs | 256 PVs, 256 LVs | 2\*\*32 PVs, 2\*\*32 LVs |
| Max device size | 2 Terabytes | 8 Exabytes (64-bit CPUs) |
| Volume mirroring support | No | Yes, in Fall 2005 |

3. How to create a new filesystem using LVM ?

4. What is PE and LE ?

5. What is default size of PE ?

Ans. 4Mb

6. How to save and restore the volume group configuration ?

7. How to activate - deactivate a volume ?

8. How to extend/shrink a LV ?

9. What is LVM snapshot and its benefits ?

10. What are all mounting options in defaults

Ans. Check the options under man page of mount command

Suid, rw, dev(Interpret block special device), exec (Prmit execution of binary), auto (can be mounted with mount -a), nouser (normal users can not mount), async (uses async for io) and realitime ()

RAID

1. What is RAID and its most common forms ?

2. Which one is better - hardware or software raid ?

3. What is raid 0, 1, 5, 10 and 01 ?

Storage

1. How to find the WWWN no. ?

2. What is meaning of WWWN and WWPN nos ?

3. How to scan for new Luns ?

4. What is multipathing ?

5. How to find whether a disk is local or SAN disk ?

6. What is difference between SAN and NAS ?

Network

1. What is the network configuration file ?

2. How to check the status of network interfaces ?

3. How to set the default gateway ?

4. How to create the reboot persistent routes ?

5. What is bonding and how to create it ?

6. How to check the status of bond0 ?

7. How to change the parameters of ethernets ?

8. How to monitor the network performance?

9. What are various bonding modes ?

10. What is virtual ip and how to set it ?

11. What are various IP address classes ?

12. How to find the installed NIC in a server?

13. What is a network socket ?

Services and Process

1. How to start/stop a service ?

2. How to apply the changes without restarting a service?

3. What are transient and standalone services?

4. How to check all the running services in a runlevel?

5. How to check all the running process in a server?

6. What is a zombie process and how to tackle it ?

7. How to restart a hung process ?

8. What are various kill signals ?

9. What are xinetd services? How to enable telnet service on linux server ?

General

1. What are special permissions ?

2. What is the difference between tar, cpio and zip ?

3. What is the differnce between telnet and ssh?

4. On which port ssh, telnet, ftp, dhcp, dns , http, https, smtp , IMAP, LDAP works?

5. What is tcp wrapper

6. How to install a package ?

7. How to install a kernel ?

8. What is difference between rpm-F and rpm -U

9. What is meaning for rwx permissions for a directory.

10. Your password files has been deleted/corrupted. How will you restore ?

11. What is login.defs and /etc/skel ?

12. While unmounting there is a error, filesystem busy. What are the remediation steps ?

13. How to create tar archive, how to see the archived contents and how to extract ?

14. How to recover root password

15. How to check kernel and os version running

16. How many packages are currently installed in the system ?

17. How to make password less authentication ?

18. What is ssh known\_hosts file ?

19. How to restrict a user/host for ssh on the server.

Ans. Add the below lines in /etc/ssh/sshd\_config

AllowUsers admin bob

AllowGroups sshusers

DenyUsers user1 user2

20. What is SFTP, on which port it works ?

21. How to check serial no. of server ?

22. What are file attributes ? How to list and how to change ?

23. What are backup types? Difference between incremental and differential backups ?

24. How to change the time zone ?

25. How to remount the / filesystem in writable mode.

26. How to extend the filesystem when lun is extended by storage team ?

Package Management

1. Difference between yum and rpm
2. Up2date command
3. What is satellite server
4. How to update kernel
5. Difference between rpm –U and rpm –F
6. How to check which packages provides the specific file or feature ?

Ans. Yum provides package-name

1. How to use yum for packages residing locally on the machine

Ans. Yum localinstall package-name

1. How to register your server with rhn/satellite

Ans. Rhn-register

1. Where is rpm database stored ?
2. How to check architecture of rpm package ?
3. Without installing the package, how to check what files, it will install ?
4. How to upgrade version from RHEL 5.2 to 5.8 ?
5. Can you edit /etc/redhat-release ?

User Management

1. How to add a group to a user

2. How to lock/unlock a user

3. All fields of /etc/passwd and /etc/shadow

4. What is meaning of setting group password

5. How to check password status of a user

6. How to set passwod policy of a user

7. What is /etc/skel file

8. What is the flow of user login

9. What will be the ownership of files owned by a deleted user

10. How to change user’s home direcroty, login shell, uid , gid etc.

11. How to set ACLs so that the directory’s created in a ACL applied directory get inherited ACLs

set.

12. Explain /etc/default/useradd

NFS

1. What is hard and soft mounting?

2. What are daemons for NFS ?

3. What is No Stale error in NFS ?

4. How to see which version of NFS is presently running ?

5. What is impact of version mismatch ?

6. What is no\_root\_squash ?

7. What is difference between nfs V3 and V4 ?

8. How to change nfs port in v3 ?

SSH

1. On which port ssh works?
2. What is configuration file for ssh ?
3. How will you Allow/Deny a user to ssh in your server ?
4. What is difference between ssh and telnet ?
5. How to make ssh work on a different port ?

Ans. Edit /etc/ssh/sshd\_config and add the line below

Port N (N is new port no.)

1. How to connect ssh server on the new port ?

Ans. ssh 192.168.1.10 –p N

Q. what is major and minor nos.