1. **Question 1. How To Check The Uptime Of A Linux Server?**

**Answer :**

Using uptime command we can determine how long a linux box has been running , also uptime can be viewed by the top & w command.

1. **Question 2. How To Check Which Redhat Version Is Installed On Server?**

**Answer :**

Use the command cat /etc/redhat-release , output of this command will tell you the redhat version.

1. **Question 3. How To Install Rpm Packages In Redhat & Centos Linux ?**

**Answer :**

rpm and yum command are used to install packages in redhat linux and CentOS.

1. **Question 4. How To Check The Ip Address Of Lan Card?**

**Answer :**

Using ‘ifconfig’ & ‘ip address’ command we can determine the ip address of LAN Card.

1. **Question 5. How To Determine The Hostname Of A Linux Box?**

**Answer :**

On typing the hostname command on terminal we can determine the hostname of a linux server.

1. **Question 6. How To Check The Default Gatway?**

**Answer :**

Using ‘route -n’ command we can determine the default gateway in linux.

1. **Question 7. Which Command Is Used To Check The Kernel Version ?**

**Answer :**

‘uname -r’

1. **Question 8. How To Check The Current Runlevel Of A Linux Box?**

**Answer :**

‘who -r’ and ‘runlevel’ , both of these command are used to find current run level.

1. **Question 9. What Is Initrd ?**

**Answer :**

Initrd stands for initial ram disk , which contains the temporary root filesystem and neccessary modules which helps in mounting the real root filesystem in read mode only.

1. **Question 10. What Is Bootloader?**

**Answer :**

Bootloader is a program that boots the operating system and decides from which kernel OS will boot.

1. **Question 11. How To List Hidden Files From The Command Line?**

**Answer :**

‘ls -a’ <Folder\_Name>

1. **Question 12. What Is Soft Link?**

**Answer :**

Soft link is a method to create short cuts in linux. It is similar to windows short cut feature.

1. **Question 13. How To Create A Blank File In Linux From Command Line ?**

**Answer :**

Using the command ‘touch <file-name>’

1. **Question 14. What Is Run Level 2?**

**Answer :**

Run level 2 is the multi-user mode without networking.

1. **Question 15. Why Linux Is Called Opensource?**

**Answer :**

Because One can customize the existing code and can redistribute it.

1. **Question 16. How To Check All The Installed Kernel Modules?**

**Answer :**

Using the Command ‘lsmod’ we can see the installed kernel modules.

1. **Question 17. What Is The Default Uid & Gid Of Root User?**

**Answer :**

Default uid & gid of root user is 0.

1. **Question 18. How To Change The Password Of User From The Command Line?**

**Answer :**

‘passwd <User-Name>’

1. **Question 19. What Is A Process?**

**Answer :**

Any program in execution is called a process.

1. **Question 20. What Is Name Of First Process In Linux?**

**Answer :**

‘init’ is the first process in linux which is started by kernel and whose pid is 1.

1. **Question 21. What Is The Difference Between Umask And Ulimit ?**

**Answer :**

umask stands for ‘User file creation mask’, which determines the settings of a mask that controls which file permissions are set for files and directories when they are created. While ulimit is a linux built in command which provides control over the resources available to the shell and/or to processes started by it.

You can limit user to specific range by editing /etc/security/limits.conf at the same time system wide settings can be updated in /etc/sysctl.conf

1. **Question 22. What Are The Run Levels In Linux And How To Change Them?**

**Answer :**

A run level is a state of init and the whole system that defines what system services are operating and they are identified by numbers.There are 7 different run levels present (run level 0-6) in Linux system for different purpose. The descriptions are given below.

0: Halt System (To shutdown the system)  
1: Single user mode  
2: Basic multi user mode without NFS  
3: Full multi user mode (text based)  
4: unused  
5: Multi user mode with Graphical User Interface  
6: Reboot System

To change the run level, edit the file “/etc/inittab” and change initdefault entry ( id:5:initdefault:). If we want to change the run level on the fly, it can be done using ‘init’ command.

**For example:** when we type ‘init 3′ in the commandline , this will move the system from current runlevel to runlevl 3. Current level can be listed by typing the command ‘who -r’.

1. **Question 23. What Is The Functionality Of A Puppet Server?**

**Answer :**

Puppet is an open-source and enterprise application for configuration management toll in UNIX like operating system. Puppet is an IT automation software used to push configuration to its clients (puppet agents) using code. Puppet code can do a variety of tasks from installing new software, to check file permissions, or updating user accounts and lots of other tasks.

1. **Question 24. What Is Selinux?**

**Answer :**

SELinux is an acronym for Security-enhanced Linux. It is an access control implementation and security feature for the Linux kernel. It is designed to protect the server against misconfigurations and/or compromised daemons. It put limits and instructs server daemons or programs what files they can access and what actions they can take by defining a security policy.

1. **Question 25. What Is Crontab And Explain The Fields In A Crontab ?**

**Answer :**

The cron is a deamon that executes commands at specific dates and times in linux. You can use this to schedule activities, either as one-time events or as recurring tasks. Crontab is the program used to install, deinstall or list the tables used to drive the cron daemon in a server. Each user can have their own crontab, and though these are files in /var/spool/cron/crontabs, they are not intended to be edited directly. Here are few of the command line options for crontab.

crontab -e Edit your crontab file.  
crontab -l Show your crontab file.  
crontab -r Remove your crontab file.

**Traditional cron format consists of six fields separated by white spaces:**

**The format is explained in detail below.**

\* \* \* \* \* \*

| | | | | |

| | | | | +– Year (range: 1900-3000)

| | | | +—- Day of the Week (range: 1-7, 1 standing for Monday)

| | | +—— Month of the Year (range: 1-12)

| | +——– Day of the Month (range: 1-31)

| +———- Hour (range: 0-23)

+———— Minute (range: 0-59)

1. **Question 26. What Are Inodes In Linux ? How To Find The Inode Associated With A File ?**

**Answer :**

An inode is a data structure on a filesystem on Linux and other Unix-like operating systems that stores all the information about a file except its name and its actual data. When a file is created, it is assigned both a name and an inode number, which is an integer that is unique within the filesystem. Both the file names and their corresponding inode numbers are stored as entries in the directory that appears to the user to contain the files. The concept of inodes is particularly important to the recovery of damaged filesystems. When parts of the inode are lost, they appear in the lost+found directory within the partition in which they once existed.

The following will show the name of each object in the current directory together with its inode number:

# ls -i

The avialble number inodes in a filesystem can be found using the below command :

# df -i

The other way we can get the inode details of a file by using the stat commmand.

Usage : # stat

1. **Question 1. What Is A Linux Server Used For?**

**Answer :**

A Linux server is a high-powered variant of the Linux open source operating system ,Linux is designed to handle the more demanding needs of business applications such as network and system administration, database management and Web services.

1. **Question 2. What Is The Meaning Of Red Hat?**

**Answer :**

Red Hat Enterprise Linux (RHEL) is a distribution of the Linux operating system developed for the business market. RHEL was formerly known as Red Hat Linux Advanced Server.

1. **Question 3. What Can You Type At A Command Line To Determine Which Shell You Are Using?**

**Answer :**

echo $SHELL.

1. **Question 4. Explain Lvm Snapshot?**

**Answer :**

LVM snapshots allow the administrator to create a new block device which presents an exact copy of a logical volume, frozen at some point in time.

1. **Question 5. What Is Volume Group (vg)?**

**Answer :**

The Volume Group is the highest level abstraction used within the LVM. It gathers together a collection of Logical Volumes and Physical Volumes into one administrative unit.

1. **Question 6. What Command Is Used To Remove The Password Assigned To A Group?**

**Answer :**

gpasswd -r.

1. **Question 7. What Is Logical Extent (le)?**

**Answer :**

Each logical volume is split into chunks of data, known as logical extents. The extent size is the same for all logical volumes in the volume group.

1. **Question 8. What Is Physical Extent (pe)?**

**Answer :**

Each physical volume is divided chunks of data, known as physical extents; these extents have the same size as the logical extents for the volume group.

1. **Question 9. What Are Lvm1 And Lvm2?**

**Answer :**

* 1. LVM1 and LVM2 are the versions of LVM.
  2. LVM2 uses device mapper driver contained in 2.6 kernel version.
  3. LVM 1 was included in the 2.4 series kernels.

1. **Question 10. What Is The Difference Between Lvm And Raid?**

**Answer :**

RAID provides redundancy but LVM doesn’t provide Redundancy.

1. **Question 11. What Command Should You Use To Check The Number Of Files And Disk Space Used And Each User's Defined Quotas?**

**Answer :**

repquota.

1. **Question 12. What Are The Process States In Unix?**

**Answer :**

As a process executes it changes state according to its circumstances. Unix processes have the following states:

* 1. **Running :** The process is either running or it is ready to run .
  2. **Waiting :** The process is waiting for an event or for a resource.
  3. **Stopped :** The process has been stopped, usually by receiving a signal.
  4. **Zombie :** The process is dead but have not been removed from the process table.

1. **Question 13. How We Will Check Free Space On Drive /dev/sda With Parted Command?**

**Answer :**

#parted /dev/sda  
print.

1. **Question 14. What Are The Steps To Create Lvm?**

**Answer :**

**Create physical volumes by “pvcreate” command :**

#pvcreate /dev/sda2

**Add physical volume to volume group by “vgcreate” command :**

#vgcreate VLG0 /dev/sda2

**Create logical volume from volume group by “lvcreate” command :**

#lvcreate -L 1G -n LVM1 VLG0

**Now create file system on /dev/sda2 partition by “mke2fs” command :**

#mke2fs -j /dev/VLG0/LVM1

1. **Question 15. What Is Lvm?**

**Answer :**

LVM stands for Logical Volume Manager. LVM, is a storage management solution that allows administrators to divide hard drive space into physical volumes (PV), which can then be combined into logical volume groups (VG), which are then divided into logical volumes (LV) on which the filesystem and mount point are created.

1. **Question 16. What Is 'inode'?**

**Answer :**

All UNIX files have its description stored in a structure called 'inode'. The inode contains info about the file-size, its location, time of last access, time of last modification, permission and so on. Directories are also represented as files and have an associated inode.

1. **Question 17. What Can We Do With “parted” Command Or Utility?**

**Answer :**

* 1. View the existing partition table.
  2. Add partitions from free space or additional hard drives.
  3. Change the size of existing partitions.

1. **Question 18. Tell Me The Steps To Remove The Swap File?**

**Answer :**

* 1. Firstly disable the swap file by “swapoff” command.
  2. Remove Swap file entry from /etc/fstab file.
  3. Now remove the swap file by “rm” command.

1. **Question 19. How Do You Identify The Ip Address Assigned To The Box?**

**Answer :**

The ipconfig command tells you the IP for the computer.

1. **Question 20. How Do You Identify Which Version Of Red Hat Is Installed On The Server?**

**Answer :**

Open a Red Had shell command line and type /etc/redhat-release to identify the release version for Red Hat.

1. **Question 21. Which Layer In The Osi Model Is Responsible For The User’s Application When Working With An Application Over The Network?**

**Answer :**

Layer 7 is the layer responsible for application support including support for user passwords and file sharing.

1. **Question 22. How Can You Rename A File In Red Hat Linux?**

**Answer :**

Open the Red Hat Linux shell command line and use the mv command. The mv command takes the path to the original file and the path to the newly named file in the parameters. If you don’t specify the parameters, the mv command will ask you for them.

1. **Question 23. How Do You Access Mysql On Red Hat?**

**Answer :**

Go to the shell prompt and type mysql. Linux looks up the information contained in /var/mysql/mysql.sock and connects to the port listed in the sock file. If the port is blocked or mysql isn’t installed on the system, Red Hat Linux returns an error.

1. **Question 24. What Is The Standard Directory Used To Store User Html Website Files?**

**Answer :**

First, you need to install Apache, and Apache sets a default directory for public HTML files. The standard directory is /var/www/html.

1. **Question 25. What Type Of Remote Software Can You Use To Encrypt Communication But Control Your Server?**

**Answer :**

SSH is a remote desktop software that lets you remotely control the Red Hat server using a command line but also encrypts the information across the Internet. SSH uses port 22, so you must open this port when you set up Red Hat.

1. **Question 26. When You Install Apache, What Is The Default Web Port Used To Serve Web Pages To Public Viewers?**

**Answer :**

Most web servers run on port 80, and Apache defaults to port 80 when you install the software. You can use an alternative port, but this forces the user to type a port into the browser when they access the website. The other popular port for web applications is port 8080.

1. **Question 27. What Is The Total Number Of Primary Partitions You Can Have On One Drive In Linux Red Hat?**

**Answer :**

you can have four primary partitions in Linux. This includes Red Hat and any other operating system.

1. **Question 28. What Are Some Commands That You Can Use To Create A New User To Your Systsem?**

**Answer :**

There are three commands you can use to add a user. The three commands are useradd, adduser, and linuxconf.

1. **Question 29. What Is Red Hat Network?**

**Answer :**

**Red Hat Network :**A systems management platform providing lifecycle management of the operating system and applications.

* 1. Installing and provisioning new systems.
  2. Updating systems.
  3. Managing configuration files.
  4. Monitoring performance.

Redeploying systems for a new purpose "Hosted" and "Satellite" deployment architectures.

1. **Question 30. What Are The Objectives Of Red Hat Linux?**

**Answer :**

A user who can use effectively employ Red HatEnterprise Linux to customize his or her operating environment as well as accomplish common commandline tasks and desktop productivity roles.

1. **Question 1. What Is Lvm?**

**Answer :**

LVM stands for Logical Volume Manager. LVM, is a storage management solution that allows administrators to divide hard drive space into physical volumes (PV), which can then be combined into volume groups (VG), which are then divided into logical volumes (LV) on which the filesystem and mount point are created.

1. **Question 2. What Is The Difference Between Lvm And Raid?**

**Answer :**

A RAID device is a physical grouping of disk devices in order to create a logical presentation of one device whereas LVM is a logical layer that that can be manipulated in order to create and, or expand a logical presentation of a disk device to an OS.

1. **Question 3. Explain Lvm Snapshot?**

**Answer :**

LVM snapshots allow the administrator to create a new block device which presents an exact copy of a logical volume, frozen at some point in time.

1. **Question 4. How You Will Check On Your Server Or System Device-mapper Is Installed Or Not?**

**Answer :**

**Check the following file:**

#cat /proc/misc

if this file contains “device-mapper” term it means device mapper is installed on your system.

1. **Question 5. How Are Snapshots In Lvm2 Different From Lvm1?**

**Answer :**

In LVM2 snapshots are read/write by default, whereas in LVM1, snapshots were read only.

1. **Question 6. What Is The Maximum Size Of A Single Lv?**

**Answer :**

For 2.4 based kernels, the maximum LV size is 2TB. For 32-bit CPUs on 2.6 kernels, the maximum LV size is 16TB. For 64-bit CPUs on 2.6 kernels, the maximum LV size is 8EB.

1. **Question 7. If A Volume Group Named As Vgname Already Exists But We Need To Extend This Volume Group Up To 4gb. Explain All Steps?**

**Answer :**

Firstly, create Physical volume (/dev/sdaX, where X is the partition number) of size 4GB.  
Now run following command: # vgextend vgname /dev/sdaX

1. **Question 8. If A Volume Group Vgname Have 3 Pv’s (/dev/sda5, /dev/sda6, /dev/sda7) But We Want To Remove /dev/sda7 Pv From This Vgname?**

**Answer :**

# vgreduce vgname /dev/sda7

1. **Question 9. Which Command Is Used To Extend A Logical Volume?**

**Answer :**

# lvextend -size +<addsize> /dev/<vgname>/<lvname>

resize2fs /dev/<vgname>/<lvname>

1. **Question 10. What Is The Partition Type Number For Swap, Raid And Lvm?**

**Answer :**

SWAP (82), RAID (fd) and LVM (8e)

1. **Question 11. How To Add A Disk To A Volume Group?**

**Answer :**

suppose disk is /dev/sdb  
# pvcreate /dev/sdb  
# vgextend <vgname> /dev/sdb

1. **Question 12. How To Remove A Disk From A Volume Group?**

**Answer :**

**Syntax**:

# vgreduce <vgname> <disk>  
**Example:**  
# vgreduce vgname /dev/sdb

1. **Question 13. How To Backup New Lvm Data Structures?**

**Answer :**

# vgcfgbackup /dev/vgname

1. **Question 14. Is It Possible To Increase The Logical Volume On Fly?**

**Answer :**

Yes. LVM has the feature to increase the volume without unmount it.

1. **Question 15. How To Reduce The Logical Volume? Is It Possible To Reduce On Fly?**

**Answer :**

No. we can't reduce the logical volume on fly. Here is the steps to reduce the logical volume.

* + Un-mount the filesystem
  + Run e2fsck on the volume device
  + Reduce the Filesystem using resize2fs
  + Reduce the logical Volume using lvreduce
  + Mount the filesystem back for production.

1. **Question 16. How Do You Scan The New Lun Or Disk?**

**Answer :**

Use "echo 1 > /sys/class/scsi\_host/hostx/scan" to scan disk from newly connected SAN or DISKS and also replace the "x" with number of host id present under /sys/class/scsi\_host/.

1. **Question 17. How To Scan Disks For Existing Volume Group?**

**Answer :**

Use "vgscan" to scan existing volume group from newly connected SAN or DISKS.  
But we should use "pvscan" prior to executing this command.

1. **Question 18. How To Scan A Logical Volume From Exising Volume Group?**

**Answer :**

lvscan

1. **Question 19. How To Stop The Logical Volume? Or Deactivate The Logical Volume?**

**Answer :**

"lvchange -an /dev/vg\_name/lv\_name"

1. **Question 20. How To Activate The Logical Volume Which Is In Deactivated State?**

**Answer :**

"lvchange -ay /dev/vg\_name/lv\_name".

1. **Question 21. How To Disable The Volume Group? Or Deactivate The Volume Group?**

**Answer :**

"vgchange -an volume\_group\_name".

1. **Question 22. How To Enable The Volume Group? Or Activate The Volume Group?**

**Answer :**

"vgchange -ay volume\_group\_name" .

1. **Question 23. How Do You Find That What Are The Disks Are Used For Logical Volume Mirroring?**

**Answer :**

use "lvs -a -o +devices"

1. **Question 24. What Are Steps To Perform In Order To Increase The Logical Volume On Fly?**

**Answer :**

* + Extend the logical volume
  + Increase the Filesystem size
  + Verify the status using df command or lvs command.

1. **Question 25. How To List The Imported Volume Groups?**

**Answer :**

Use "vgs" command to display the imported volume group.

1. **Question 26. How To Create Partition From The Raw Disk ?**

**Answer :**

**Using fdisk utility we can create partitions from the raw disk.Below are the steps to create partition from the raw dsik :**

* + fdisk /dev/hd\* (IDE) or /dev/sd\* (SCSI)
  + Type n to create a new partition
  + After creating partition , type w command to write the changes to the partition table.

1. **Question 27. What Does Sar Provides And At Which Location Sar Logs Are Stored ?**

**Answer :**

Sar Collect, report, or save system activity information. The default version of the sar command (CPU utilization report) might be one of the first facilities the user runs to begin system activity investigation, because it monitors major system resources. If CPU utilization is near 100 percent (user + nice + system), the workload sampled is CPU­bound.

By default log files of Sar command is located at /var/log/sa/sadd file, where the dd parameter indicates the current day.

1. **Question 28. How To Reduce Or Shrink The Size Of Lvm Partition ?**

**Answer :**

**Below are the logical Steps to reduce size of LVM partition :**

Umount the filesystem using umount command, ­use resize2fs command ,  
e.g resiz2fs /dev/mapper/myvg­mylv 10G ­Now use the lvreduce command ,  
e.g lvreduce ­L 10G /dev/mapper/myvgmylv

Above Command will shrink the size & will make the filesystem size 10GB.

1. **Question 29. How To Increase The Size Of Lvm Partition ?**

**Answer :**

**Below are the Logical Steps :**

Use the lvextend command (lvextend ­L +100M /dev/<Name of the LVM Partition> , in this example we are extending the size by 100MB.   
resize2fs /dev/<Name of the LVM Partition>  
check the size of partition using ‘df ­h’ command

1. **Question 30. Why Lvm Is Required?**

**Answer :**

LVM stands for Logical Volume Manager , to resize filesystem's size online we required LVM partition in Linux. Size of LVM partition can be extended and reduced using the lvextend & lvreduce commands respectively.

1. **Question 31. How To Create Partition From The Raw Disk?**

**Answer :**

**Using fdisk utility we can create partitions from the raw disk.Below are the steps to create partition from the raw disk :**

* + fdisk /dev/hd\* (IDE) or /dev/sd\* (SCSI)
  + Type n to create a new partition
  + After creating partition , type w command to write the changes to the partition table.

1. **Question 32. How To Decommission/remove Lvm Completely From The Host?**

**Answer :**

* + Un-mount all the logical filesystems
  + Remove the logical volumes using "lvremove" command.
  + Destroy the volume group using "vgremove" command.
  + Use "pvremove" command remove the physical volumes from the system.

1. **Question 33. If The Vg02 Has Two Physical Volumes Called /dev/sdc/ & /dev/sdd. How Do You Remove /dev/sdd From Vg02?**

**Answer :**

"vgreduce vg02 /dev/sdd/"

1. **Question 34. Assume Volume Group "vg02" Is Already Exists. How Do You Extend The Volume Group With 50gb? Provide All The Steps With Commands?**

**Answer :**

* + Get the 50GB lun from storage team.(/dev/sdd)
  + Create physcical volume ( # pvcreate /dev/sdd )
  + Extend the volume group (# vgextend vg02 /dev/sdd)

1. **Question 35. How To Extent The Volume Group?**

**Answer :**

Using "vgextend" we can increase the volume group.

1. **Question 36. What Are The Steps Involved To Create The Logical Volume From Scratch?**

**Answer :**

* + **Create a physical volume using pvcreate command:** #pvcreate /dev/sdc
  + **Create a volume group using "vgcreate" command:** #vgcreate vg02 /dev/sdc
  + **Create a logical volume using "lvcreate" command:** #lvcreate -L 100M -n vol1 vg02
  + **Create a filesystem on logical volume using mkfs command:** #mkfs -t ext4 /dev/vg02/vol1
  + **Mount the filesystem using mount command for use:**#mount -t ext4 /dev/vg02/vol1 /vol1

1. **Question 37. How Are Snapshots In Lvm2 Different From Lvm1 In Redhat Linux?**

**Answer :**

LVM1 snapshots are readonly by default where LVM2 snapshots were read/write.

1. **Question 38. What Is Lvmdump?**

**Answer :**

"lvmdump" is tool for LVM2 to collect the various information for diagnostic purposes.By default, it creates a tarball suitable for submission along with a problem report

1. **Question 39. How To Re-create The Device Files For Lvm Volumes?**

**Answer :**

Run "vgmknodes" to recreate the LVM devices files.

1. **Question 40. How To Take A Lvm Configuration Backup?**

**Answer :**

Use "vgcfgbackup vg\_name" to take the latest configuration backup of volume group. The default volume group backup location is "/etc/lvm/backup" .

1. **Question 41. How To Rename Volume Group? Can We Rename The Vg On Fly?**

**Answer :**

Yes. Its possible to rename the volume group on fly. But the mounted volumes will not reflect the same unless you re-mount the volume with new VG name. Need to update the /etc/fstab with new VG name to mount the volumes across the system reboot.

1. **Question 42. How To See The Detailed Physical Volume Information?**

**Answer :**

Use "pvdisplay /dev/disk\_name"  Ex: pvdisplay /dev/sde

1. **Question 43. How To See The Detailed Logical Volume Information?**

**Answer :**

Use "lvdisplay /dev/vg\_name/lv\_name"

1. **Question 44. How To See The Detailed Volume Group Information?**

**Answer :**

Use "vgdisplay vg\_name"

1. **Question 45. How To List The Available Physical Volumes In Lvm?**

**Answer :**

Use "pvs" command to list the available physical volumes.

1. **Question 46. How To List The Available Logical Volumes On The System?**

**Answer :**

Use "lvs" command to list the available logical volumes on the system.

**Q:1 How To check the uptime of a Linux Server ?**

Ans: Using uptime command we can determine how long a linux box has been running , also uptime can be viewed by the top & w command.

**Q:2 How to check which Redhat version is installed on Server ?**

Ans: Use the command cat /etc/redhat-release , output of this command will tell you the redhat version.

**Q:3 How to install rpm packages in Redhat & CentOS linux ?**

Ans: rpm and yum command are used to install packages in redhat linux and CentOS.

**Q:4 How to check the ip address of LAN Card ?**

Ans: Using ‘ifconfig’ & ‘ip address’ command we can determine the ip address of LAN Card.

**Q:5 How to determine the hostname of a linux box ?**

Ans: On typing the hostname command on terminal we can determine the hostname of a linux server.

**Q:6 How To check the default gatway ?**

Ans: Using ‘route -n’ command we can determine the default gateway in linux.

**Q:7 Which Command is used to check the kernel Version ?**

Ans: ‘uname -r’

**Q:8 How to check the current runlevel of a linux box ?**

Ans : ‘who -r’ and ‘runlevel’ , both of these command are used to find current run level.

**Q:9 What is Initrd ?**

Ans: Initrd stands for initial ram disk , which contains the temporary root filesystem and neccessary modules which helps in mounting the real root filesystem in read mode only.

**Q:10 What is Bootloader ?**

Ans: Bootloader is a program that boots the operating system and decides from which kernel OS will boot.

Q:11 How to list hidden files from the command line ?

Ans: ‘ls -a’ <Folder\_Name>

**Q:12 What is soft link ?**

Ans: Soft link is a method to create short cuts in linux. It is similar to windows short cut feature.

**Q:13 How to create a blank file in linux from command line ?**

Ans: Using the command ‘touch <file-name>’

**Q:14 What is run level 2 ?**

Ans: Run level 2 is the multi-user mode without networking.

**Q:15 Why linux is called OpenSource ?**

Ans: Because One can customize the existing code and can redistribute it.

**Q:16 How to check all the installed Kernel modules ?**

Ans: Using the Command ‘lsmod’ we can see the installed kernel modules.

**Q:17 What is the default uid & gid of root user ?**

Ans: Default uid & gid of root user is 0.

**Q:18 How To change the password of user from the Command Line ?**

Ans: ‘passwd <User-Name>’

**Q:19 What is a Process ?**

Ans: Any program in execution is called a process.

**Q:20 What is name of first process in linux ?**

Ans: ‘init’ is the first process in linux which is started by kernel and whose pid is 1.

**Basic Questions**

**1. What is initrd image and what is its function in the linux booting process?**

The initial RAM disk (initrd) is an initial root file system that is mounted prior to when the real root file system is available.The initrd is bound to the kernel and loaded as part of the kernel boot procedure. The kernel then mounts this initrd as part of the two-stage boot process to load the modules to make the real file systems available and get at the real root file system. Thus initrd image plays a vital role in [linux booting process](https://linoxide.com/booting/boot-process-of-linux-in-detail/" \t "_blank).

**2. Explain the terms suid, sgid and sticky bit?**

In addition to the basic file permissions in Linux, there are few special permissions that are available for executable files and directories.

**SUID :** If setuid bit is set, when the file is executed by a user, the process will have the same rights as the owner of the file being executed.

**SGID :** Same as above, but inherits group privileges of the file on execution, not user privileges. Similar way when you create a file within the directory, it will inherit the group ownership of the directories.

**Sticky bit** : Sticky bit was used on executables in linux so that they would remain in the memory more time after the initial execution, hoping they would be needed in the near future. But mainly it is on folders, to imply that a file or folder created inside a stickybit enabled folder could only be deleted by the owner. A very good implementation of sticky bit is /tmp , where every user has write permission but only users who own a file can delete them.

**3. List out few of the differences between Softlink and Hardlink?**

**a)** Hardlink cannot be created for directories. Hard link can only be created for a file.

**b)** Symbolic links or symlinks can link to a directory.

**c)** Removing the original file that your hard link points to does not remove the hardlink itself; the hardlink still provides the content of the underlying file.

**d)** If you remove the hard link or the symlink itself, the original file will stay intact.

**e)** Removing the original file does not remove the attached symbolic link or symlink, but without the original file, the symlink is useless

**4. How do you sent a mail attachment via bash console?**

"mutt" is an opensource tool for sending emails with attachments from the linux bash command line. We can install "mutt" from the binary rpm or via package manager.

For Ubuntu / Debian based destros.

# apt-get install mutt

For Redhat / Fedor based destros,

# yum install mutt

Usage :

# mutt -s "Subject of Mail" -a "path of attachment file" "email address of recipient" < "message text containing body of the message"

Eg : mutt -s "Backup Data" -a /home/backup.tar.gz admin@mywebsite.com < /tmp/message.txt

**5. What is the difference between umask and ulimit ?**

umask stands for ‘User file creation mask’, which determines the settings of a mask that controls which file permissions are set for files and directories when they are created. While ulimit is a linux built in command which provides control over the resources available to the shell and/or to processes started by it.

You can limit user to specific range by editing /etc/security/limits.conf at the same time system wide settings can be updated in /etc/sysctl.conf

**6. What are the run levels in linux and how to change them?**

A run level is a state of init and the whole system that defines what system services are operating and they are identified by numbers.There are 7 different run levels present (run level 0-6) in Linux system for the different purpose. The descriptions are given below.

0: Halt System (To shutdown the system)

1: Single user mode

2: Basic multi user mode without NFS

3: Full multi user mode (text based)

4: unused

5: Multi user mode with Graphical User Interface

6: Reboot System

To change the run level, edit the file “/etc/inittab” and change initdefault entry ( id:5:initdefault:). If we want to change the run level on the fly, it can be done using ‘init’ command.

For example, when we type ‘init 3' in the command line , this will move the system from current runlevel to runlevl 3. Current level can be listed by typing the command 'who -r'

**7. What is the functionality of a Puppet Server ?**

Puppet is an open-source and enterprise application for configuration management toll in UNIX like operating system. Puppet is an IT automation software used to push the configuration to its clients (puppet agents) using code. Puppet code can do a variety of tasks from installing new software, to check file permissions, or updating user accounts and lots of other tasks.

**8. What is SeLinux?**

SELinux is an acronym for Security-enhanced Linux. It is an access control implementation and security feature for the Linux kernel. It is designed to protect the server against misconfigurations and/or compromised daemons. It put limits and instructs server daemons or programs what files they can access and what actions they can take by defining a security policy.

**9. What is crontab and explain the fields in a crontab ?**

The cron is a deamon that executes commands at specific dates and times in linux. You can use this to schedule activities, either as one-time events or as recurring tasks. Crontab is the program used to install, deinstall or list the tables used to drive the cron daemon in a server. Each user can have their own crontab, and though these are files in /var/spool/cron/crontabs, they are not intended to be edited directly. Here are few of the command line options for crontab.

crontab -e Edit your crontab file.  
crontab -l Show your crontab file.  
crontab -r Remove your crontab file.

Traditional cron format consists of six fields separated by white spaces:

<Minute> <Hour> <Day\_of\_the\_Month> <Month\_of\_the\_Year> <Day\_of\_the\_Week> <command/program to execute>

The format is explained in detail below.

\* \* \* \* \* \*  
| | | | | |  
| | | | | +-- Year (range: 1900-3000)  
| | | | +---- Day of the Week (range: 1-7, 1 standing for Monday)  
| | | +------ Month of the Year (range: 1-12)  
| | +-------- Day of the Month (range: 1-31)  
| +---------- Hour (range: 0-23)  
+------------ Minute (range: 0-59)

**10. What are inodes in Linux ? How to find the inode associated with a file ?**

An inode is a data structure on a filesystem on Linux and other Unix-like operating systems that stores all the information about a file except its name and its actual data. When a file is created, it is assigned both a name and an inode number, which is an integer that is unique within the filesystem. Both the file names and their corresponding inode numbers are stored as entries in the directory that appears to the user to contain the files. The concept of inodes is particularly important to the recovery of damaged filesystems. When parts of the inode are lost, they appear in the lost+found directory within the partition in which they once existed.

The inode entries store metadata about each file, directory or object, but only points to these structures rather than storing the data. Each entry is 128 bytes in size. The metadata contained about each structure can include the following:

Inode number  
Access Control List (ACL)  
Extended attribute  
Direct/indirect disk blocks  
Number of blocks  
File access, change and modification time  
File deletion time  
File generation number  
File size  
File type  
Group  
Number of links  
Owner  
Permissions  
Status flags

Inode structure of a directory consists of a name to inode mapping of files and directories in that directory.In a directory, You can find the inode number corresponding to the files using the command ls -i

786727 -rw------- 1 root root 4226530 May 29 13:17 sudo.log  
786437 -rw-------. 1 root root 32640 Jun 23 20:11 tallylog  
786440 -rw-rw-r--. 1 root utmp 276096 Jul 20 06:45 wtmp  
786741 -rw------- 1 root root 9653 Jul 17 09:38 yum.log

Similar way, the number of inodes allocated, used and free in a Filesystem can be listed using df -i command

# df -i /root

Filesystem Inodes IUsed IFree IUse% Mounted on

/dev/mapper/RootVol-lvmroot

524288 80200 444088 16% /

The other way we can get the inode details of a file by using the stat command.

Usage : # stat <file name>

Example :

-sh-4.1$ stat note.txt

File: `note.txt'

Size: 4 Blocks: 8 IO Block: 4096 regular file

Device: fd05h/64773d Inode: 8655235 Links: 1

Access: (0644/-rw-r--r--) Uid: (69548/nixuser) Gid: (25000/ UNKNOWN)

Access: 2014-06-29 15:27:56.299214865 +0000

Modify: 2014-06-29 15:28:28.027093254 +0000

Change: 2014-06-29 15:28:28.027093254 +0000

**11. Why should I use DAS either NAS or SAN**

When we talk about storage, there are some solutions which exist but before choosing one solution, we need to know their role:

* **DAS** is a block device from a disk which is physically attached to the host machine (such as /dev/sda or /dev/sda1) . You must place a filesystem upon it before it can be used. There are limitations like the number of servers that can access it. Storage device, or say DAS storage has to be near to the server storage and the resources are dedicated but generally, you are not able to dedicate the hard disks to multiple computers. DAS solution is inexpensive and simple to configure. Technologies to do this include IDE, SCSI, SATA, etc.
* **NAS**  authenticates clients and provides shared to other computers and users over a network so it requires a dedicated ip address to be accessible. NAS devices generally run an embedded operating system on simplified hardware and lack peripherals like a monitor or keyboard. Network file systems can be considered safe enough to be used in a concurrent way, the protocol implementation will take care of problems due to concurrent access to the same resource (file), normally by locking the file to a single user/requester. You can set up automatic or manual backups and file copies between the NAS and all other connected devices by using a software program. It is an easy way to provide RAID redundancy to mass amount of users, it allows users permissions, folder privileges, restricted access to documents, etc
* **SAN** has the particularity to be a block level storage solution that NAS doesn’t provide. It is optimized for high volume of block level data transfer. SAN is performed best when used with fiber channel medium (optical fibers, and a fiber channel switch). It provides synchronous replication and it is an architecture to attach remote storage to make it appear as though it is locally attached. There are highly scalable, both from a capacity and performance perspective. If offers a centralized storage management. It is a solution for terabytes of storage and multiple simultaneous access to files e.g. streaming audio/video and it allows virtual environments, cloud computing, etc.

**12. If you are allowed to choose 5 commands, what are your choices?**

**1) rsync command**

The rsync command can be used to synchronize two directories or directory trees whether they are on the same computer or on different computers but it can do so much more than that. rsync creates or updates the target directory to be identical to the source directory.

rsync -aH sourcedir targetdir

The -a option is for archive mode which preserves permissions, ownerships and symbolic (soft) links. The -H is used to preserve hard links. Note that either the source or target directories can be on a remote host.

**2) sed command**

You might want to select specific lines of a file. sed, short for stream editor, is one way to do this. you want to combine multiple files that all had headers or to do a bulk find and replace a file.  
insert a blank line above every line which matches "regex"

$ sed '/regex/{x;p;x;}'

change "scarlet" or "ruby" or "puce" to "red"

$ sed 's/scarlet/red/g;s/ruby/red/g;s/puce/red/g'

**3) awk command**

awk is a programming language which allows easy manipulation of structured data and the generation of formatted reports. It is mostly used for pattern scanning and processing. It searches one or more files to see if they contain lines that match with the specified patterns and then perform associated actions. It is like sed

Print Specific Field

$ awk -F':' '{ print $1 }' /etc/group

$ date | awk '{print $2 " " $6}'

**4) lsof command**

lsof is a command line utility which is used to list the information about the files that are opened by various processes. In unix, everything is a file: pipes, sockets, directories, devices, etc. So by using lsof, you can get the information about any opened files.  
List processes which opened a specific file

# lsof /var/log/syslog

lists all open files belonging to processes owned by the user

# lsof -u username

Kill all process that belongs to a particular user

# kill -9 `lsof -t -u username

List all network connections

# lsof -i

List all network files in use by a specific process

# lsof -i -a -c ssh

List processes which are listening on a particular port

# lsof -i :25

**5) grep command**

grep is a command used to search text or searches the given file for lines containing a match to the given strings or words. By default, grep displays the matching lines.

print network connection used by firefox

# netstat -pltnu | grep firefox

print the line which contains "root" on /etc/passwd file

# cat /etc/passwd | grep root

Apart from the above basic questions, be prepared for answers for the below questions

**1.** How to set linux file/directory permissions ?

**2.** How to set ownership for files/directories ?

**3.** How to create user/group and how to modify it ?

**4.** How to find kernel / OS version and its supported bit (32/64) version ?

**5.** How to set / find interface ip address ?

**6.** How to find linux mount points and disk usage ?

**7.** What command to find memory and swap usage ?

**8.** Have a look on ps, top, grep, find, awk and dmesg commands ?

**Linux Scenario Questions**

**13. What is the difference between name based virtual hosting and IP based virtual hosting? Explain the scenario where name based virtual hosting seems useful?**

Virtual hosts are used to host multiple domains on a single apache instance. You can have one virtual host for each IP your server has, or the same IP but different ports, or the same IP, the same port but different host names. The latter are called "name based vhosts".

n IP-based virtual hosting, we can run more than one web site on the same server machine, but each web site has its own IP address while In Name-based virtual hosting, we host multiple websites on the same IP address. But for this to succeed, you have to put more than one DNS record for your IP address in the DNS database.

In the production shared webhosting environment, getting a dedicated IP address for every domains hosted in the server is not feasible in terms of cost. Most of the customers won't be able to afford the cost of having a dedicated IP address. Here is the place where the concepts of Name based virtual hosting find its place.

**14. What is network bonding in Linux and where the important configuration files involved? What is the advantage of Network Bonding?**

Network Bonding is a Linux kernel feature that allows to aggregate multiple network interfaces into a single virtual link. This is a great way to achieve redundant links, fault tolerance or load balancing networks in production system. If one of the physical NIC is down or unplugged, it will automatically move traffic to the other NIC card. Similar way the bonding will increase the interface throughput to handle the traffic it it is configured in active-active mode.

There are 7 modes starting from 0 to 6 which decides how the bonding configuration behaves.

**mode=0** (balance-rr) - Round-robin policy

It the default mode. It transmits packets in sequential order from the first available slave through the last.  
This mode provides load balancing and fault tolerance.

**mode=1** (active-backup)

Active-backup policy: In this mode, only one slave in the bond is active. The other one will become active, only when the active slave fails. The bond’s MAC address is externally visible on only one port (network adapter) to avoid confusing the switch. This mode provides fault tolerance.

**mode=2** (balance-xor)

Transmit the traffic based on [(source MAC address XOR'd with destination MAC address) modulo slave count]. This selects the same slave for each destination MAC address. This mode provides load balancing and fault tolerance.

**mode=3** (broadcast)

Broadcast policy: transmits everything on all slave interfaces. This mode provides fault tolerance.

**mode=4** (802.3ad)

Creates aggregation groups that share the same speed and duplex settings. Utilizes all slaves in the active aggregator according to the 802.3ad specification.

**mode=5** (balance-tlb) - Adaptive transmit load balancing

channel bonding that does not require any special switch support. The outgoing traffic is distributed according to the current load (computed relative to the speed) on each slave. Incoming traffic is received by the current slave. If the receiving slave fails, another slave takes over the MAC address of the failed receiving slave.

**mode=6** (balance-alb) - Adaptive load balancing

It includes balance-tlb plus receive load balancing (rlb) for IPV4 traffic, and does not require any special switch support. The receive load balancing is achieved by ARP negotiation.

Important Configuration Files involved:

/etc/sysconfig/network-scripts/ifcfg-bond0

/etc/modprobe.d/bonding.conf

/etc/sysconfig/network-scripts/ifcfg-eth[0-4]

/proc/net/bonding/bond0

**15. Explain briefly the procedure for re-installing Grub in Linux ?**

**1)**Download Ubuntu Installation / Live cd

**2)**Boot from Ubuntu Installation / Live cd - usb, burned cd etc.  
**3)**During boot select "Try Ubuntu" , Don't select install !  
**4)** Mount your Linux root partition  
sudo mount /dev/sda6 /mnt ( Assuming /dev/sda6 is the Linux root partition)  
**5)** Install / reinstall grub  
$ sudo grub-install --root-directory=/mnt/ /dev/sda ( where /dev/sda is your primary disk)  
Installation finished. No error reported.

**6)** Reboot your system, remove bootable CD and we should have the boot menu ready when the system starts.

Note : There would be slight difference when using with other distros.

**16. Explain the fields in /etc/passwd and /etc/shadow?**

The /etc/shadow file stores actual password in encrypted format with some additional properties related to user password.It mainly holds athe account aging parameters. All fields are separated by a colon (:) symbol. It contains one entry per line for each user listed in /etc/passwd file Generally, shadow file entry looks as below.

steve:$1$XOdE07rn$WA6qFm4W5UIqNfaqE5Uub.:13775:0:99999:7:::

Here is the explanation of each field.

***User name*** : Your login name

***Password***: Your encrypted password.

***Last password change*** : Days since Jan 1, 1970 that password was last changed

***Minimum***: The minimum number of days required between password changes.

***Maximum***: The maximum number of days the password is valid.

***Warn*** : The number of days before password is to expire that user is warned that his/her password must be changed

***Inactive*** : The number of days after password expires that account is disabled

***Expire*** : days since Jan 1, 1970 that account is disabled. It indicates an absolute date specifying when the login may no longer be used

The /etc/passwd file stores essential information, which is required during login /etc/passwd is a text file, that contains a list of user account related parameters like user ID, group ID, home directory, shell, etc.

Here is the sample entry from /etc/passwd file

steve:x:6902:6902::/home/steve:/bin/bash

***Username***: User's login name.

***Password***: An x character indicates that encrypted password is stored in /etc/shadow file.

***User ID (UID)***: Each user must be assigned a user ID (UID). UID 0 (zero) is reserved for root.

***Group ID (GID)***: The primary group ID

***User Info***: The comment field. It allow you to add extra information about the user.

***Home directory***: The absolute path to the directory the user will be in when they log in.

***Command/shell***: The absolute path of a command or shell (/bin/bash).

**17. How do you boot your system into the following modes, when you are in some trouble?**

**a)** Rescue mode  
**b)** Single user mode  
**c)** Emergency mode

Rescue mode provides the ability to boot a small Linux environment from an external bootable device like a CD-ROM, or USB drive instead of the system's hard drive.Rescue mode is provided to help you with your system from repairing the file system or fixing certain issues which prevent your normal operations.

In order to get into the rescue mode, change the BIOS settings of the machine to boot from the external media. Once the system started booting using bootable disk, add the keyword rescue as a kernel parameter or else you can give the parameter "linux rescue" in the graphical boot interface.

In single-user mode, the system boots to runlevel 1, but it will have many more additional functionalities compared to switching to runlevel 1 from other levels.

The local file systems can be mounted in this mode, but the network is not activated.

Use the following steps to boot into single-user mode:

**1)**At the GRUB splash screen during the booting process, press any key to enter the GRUB interactive menu.  
**2)**Select the proper version of 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.  
**4)**Press Enter to exit edit mode and type "b" to boot into single usermode now.

In emergency mode, you are booting 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 the init is corrupted, 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".

**18. In the ps results, few of the processes are having process state as "D". What does it mean? Briefly explain different process states?**

To have a dynamic view of a process in Linux, always use the top command. This command provides a real-time view of the Linux system in terms of processes. The eighth column in the output of this command represents the current state of processes. A process state gives a broader indication of whether the process is currently running, stopped, sleeping etc.

A process in Linux can have any of the following four states…

**Running** – A process is said to be in a running state when either it is actually running/ executing or waiting in the scheduler’s queue to get executed (which means that it is ready to run). That is the reason that this state is sometimes also known as ‘runnable’ and represented by (R).

**Waiting or Sleeping** – A process is said to be in this state if it is waiting for an event to occur or waiting for some resource-specific operation to complete. So, depending upon these scenarios, a waiting state can be subcategorised into an interruptible (S) or uninterruptible (D) state respectively.

**Stopped** – A process is said to be in the stopped state when it receives a signal to stop. This usually happens when the process is being debugged. This state is represented by (T).

**Zombie** – A process is said to be in the zombie state when it has finished execution but is waiting for its parent to retrieve its exit status. This state is represented by (Z).

Apart from these four states, the process is said to be dead after it crosses over the zombie state; ie when the parent retrieves its exit status. ‘Dead’ is not exactly a state, since a dead process ceases to exist.

**19. What is drop cache in Linux and how do you clear it ?**

Cache in Linux memory is where the Kernel stores the information it may need later, as memory is incredible faster than disk.

It is great that the Linux Kernel takes care about that.Linux Operating system is very efficient in managing your computer memory, and will automatically free the RAM and drop the cache if some application needs memory.

Kernels 2.6.16 and newer provide a mechanism to have the kernel drop the page cache and/or inode and dentry caches on command, which can help free up a lot of memory. Now we can throw away that script that allocated a ton of memory just to get rid of the cache.

To free pagecache:

# echo 1 > /proc/sys/vm/drop\_caches

To free dentries and inodes:

# echo 2 > /proc/sys/vm/drop\_caches

To free pagecache, dentries and inodes:

echo 3 > /proc/sys/vm/drop\_caches

This is a non-destructive operation in normal scenarios and will only free things that are completely unused. Dirty objects will continue to be in use until written out to disk and are not freeable. However it is always preferred to run "sync" first to flush useful things out to disk.

**20. Password based authentication is disabled in your infrastructure. So how do you login to the servers ?**

To improve the system security even further, most of the organizations turned to use keybased authentications instead of Password based authentication. We can enforce the key-based authentication by disabling the standard password authentication, which involves a public key private key pair. The public key is added in the server configuration file while private key is kept confidential on the client side.

Below listed is the procedure, to set up keybased authentication.

**1)** Generating Key Pairs

a) Generate an RSA key pair by typing the following at a shell prompt:

$ ssh-keygen -t rsa  
Generating public/private rsa key pair.  
Enter file in which to save the key (/home/steve/.ssh/id\_rsa):

b) Press Enter to confirm the default location (that is, ~/.ssh/id\_rsa) for the newly created key.

c) Enter a passphrase, and confirm it by entering it again when prompted to do so.

d) Copy the content of ~/.ssh/id\_rsa.pub into the ~/.ssh/authorized\_keys on the machine to which you want to connect,  
appending it to its end if the file already exists.

e) Change the permissions of the ~/.ssh/authorized\_keys file using the following command:

$ chmod 600 ~/.ssh/authorized\_keys

**2)** Now on your client side, open the remote connection agent like putty and browse your public key and try SSH to the server, you should be able to login without a password now.

# ssh server1.myserver.com  
The authenticity of host 'server1.myserver.com (192.168.44.2)' can't be established.  
RSA key fingerprint is e3:c3:89:37:4b:94:37:d7:0c:d5:6f:9a:38:62:ce:1b.  
Are you sure you want to continue connecting (yes/no)? yes  
Warning: Permanently added 'server1.myserver.com' (RSA) to the list of known hosts.  
Last login: Tue July 13 12:40:34 2014 from server2.myserver.com

**3)** Public key authentication can prevent brute force SSH attacks, but only if all password-based authentication methods are disabled. Once public key authentication has been confirmed to be working, disable regular password authentication by editing /etc/ssh/sshd\_config and set the following option to "no".

PasswordAuthentication no

**21. Explain the different Scenarios involved in TCP 3 way handshake?**

The TCP three way handshake is the process for establishing a TCP connection.We can explain 3 way handshake with a simple scenario where we assume a client computer is contacting a server to send it some information.

**a)** The client sends a packet with the SYN bit set and a sequence number of N.  
**b)** The server sends a packet with an ACK number of N+1, the SYN bit set and a sequence number of X.  
**c)** The client sends a packet with an ACK number of X+1 and the connection is established.  
**d)** The client sends the data.

The first three steps in the above process is called the three way handshake.

**22. As the disk space utilization was so high in the server, the Administrator has removed few files from the server but still the disk utilization is showing as high. What would be the reason?**

In Linux even if we remove a file from the mounted file system, that will still be in use by some application and for this application, it remains available. Its because file descriptor in /proc/ filesystem is held open..So if there are such open descriptors to files already removed, space occupied by them considered as used. You find this difference by checking them using the "df" and "du" commands. While df is to show the file system usage, du is to report the file space usage. du works from files while df works at filesystem level, reporting what the kernel says it has available.

You can find all unlinked but held open files with:

# lsof | grep '(deleted)'

This will list the filename which is open with the pid in which it is running. We can kill those Pids and which will stop these process and will recover the disk space responsible for this file.

**23. What is rDNS and explain its benefits in the Linux Domain Name Systems?**

A typical DNS lookup is used to determine which IP address is associated with a hostname, and this is called Forward DNS lookup. A reverse DNS lookup is used for the opposite, to determine which hostname is associated with an IP address. Sometimes reverse DNS lookups are required for diagnostic purposes. Today, reverse DNS lookups are used mainly for security purposes to trace a hacker or spammer. Many modern mailing systems use reverse mapping to provide simple authentication using dual lookup: hostname-to-address and address-to-hostname. The rDNS ( reverse DNS ) is implemented using a specialized zone record for reverse lookups called PTR record. PTR records always resolve to names, never IP addresses.

**24. What is sosreport, how do you generate it while working with your Redhat Support Team in production?**

Sosreport is a command-line utility in Redhat based linux destros (RHEL / CentOS) which collects system configuration and diagnostic information of your linux box like running kernel version, loaded modules, and system and service configuration files. This command also runs external programs to collect further information, and stores this output in the resulting archive. Sosreport is required when you have open a case with redhat for technical support. Redhat support Engineers will require sosreport of your server for troubleshooting purpose. To run sosreport, sos package should be installed. Sos package is part of default installation in most of linux. If for any reason this package is no installed , then use below yum command to install it manually:

# yum install sos

Generate the report

Open the terminal type sosreport command :

# sosreport

This command will normally complete within a few minutes. Depending on local configuration and the options specified in some cases the command may take longer to finish. Once completed, sosreport will generate a compressed a file under /tmp folder. The file should be provided to Redhat support representative as an attachment to open a support case.

**25. What is swappiness in Linux Memory Management and how do we configure that?**

The swappiness parameter controls the tendency of the kernel to move processes out of physical memory and onto the swap disk. Because disks are much slower than RAM, this can lead to slower response times for system and applications if processes are too aggressively moved out of memory.

swappiness can have a value of between 0 and 100

swappiness=0 tells the kernel to avoid swapping processes out of physical memory for as long as possible

swappiness=100 tells the kernel to aggressively swap processes out of physical memory and move them to swap cache

The default setting in Redhat/Ubuntu based Linux distros is swappiness=60. Reducing the default value of swappiness will probably improve overall performance for a typical Ubuntu desktop installation.

~$ cat /proc/sys/vm/swappiness

60

If we have enough RAM, we can turn that down to 10 or 15. The swap file will then only be used when the RAM usage is around 80 or 90 percent.

To change the system swappiness value, open /etc/sysctl.conf as root. Then, change or add this line to the file:

vm.swappiness = 10

Reboot for the change to take effect

You can also change the value while your system is still running

sysctl vm.swappiness=10

### ****Q1. What is the difference between LINUX and UNIX?****

A. UNIX - Only big companies are allowed to use the UNIX copyright and name. IBM AIX, Sun Solaris, and HP-UX all are UNIX operating systems. Most UNIX operating systems are commercial in nature.

**Linux is a Unix clone**. But if you consider Portable Operating System Interface (POSIX) standards then Linux can be considered as UNIX.

**Linux Is Just Kernal**

All Linux distributions include GUI system, GNU utilities, installation & management tools, GNU c/c++ Compilers, Editors (vi), and various applications like OpenOffice, Firefox.

UNIX operating systems are considered as a complete OS as everything come from a single vendor.

**License and cost**

Linux is Free. You can download it from the Internet or redistribute it under GNU licenses. Most UNIX like operating systems are not free.

**Security And Firewall**

Linux comes with open source Netfilter and IPTables based firewall tool to protect your server and desktop from the crackers and hackers. UNIX operating systems comes with its own firewall products.

**Backup And Recovery**

UNIX and Linux come with their own set of tools for backing up data to tape and other backup media. However, both Linux and UNIX share some common tools such as tar, dump/restore, and cpio etc.

##### Q2. What are Linux file systems?

A. By default, Linux supports and use ext3 or ext4 file systems. UNIX supports file systems like jfs, gpfs (AIX), jfs, gpfs (HP-UX), jfs, gpfs (Solaris).

##### Q3. What are System Startup Scripts?

A. By default, Linux and UNIX come with system initialization script but they are located in different directories:

1. HP-UX – /sbin/init.d
2. AIX – /etc/rc.d/init.d
3. Linux – /etc/init.d

##### **Q4. What are the some UNIX Operating System Names?**

A. Some of the most used UNIX operating systems are:

1. HP-UX
2. IBM AIX
3. Sun Solairs
4. Mac OS X
5. IRIX

##### **Q5. What are the Linux Distribution (Operating System) Names?**

A. Here are the some Linux operating system names:

1. Redhat Enterprise Linux
2. Fedora Linux
3. Debian Linux
4. Suse Enterprise Linux
5. Ubuntu Linux

##### **Q6. What are some common things between Linux & UNIX?**

A. Both Linux and UNIX share many common applications such as:

1. GUI, file, and windows managers (KDE, Gnome)
2. Shells (ksh, csh, bash)
3. Various office applications such as OpenOffice.org
4. Development tools like perl, php, python, GNU c/c++ compilers
5. Posix interface

##### **Q7. What does curl command do in Linux?**

A. In Linux, curl command is used to test an application's endpoint or connectivity to an upstream service endpoint. curl command will be used to determine if the application can reach another service, like a database, or checking if your service is healthy.

**curl Example:**

|  |  |
| --- | --- |
| 1  2 | $ curl -I -s myapplication:5000  HTTP/1.0 500 INTERNAL SERVER ERROR |

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This example through an exception saying that your application can't reach your server.

In the above command, the -I option shows the header information and the -s option silences the response body.

##### **Q8. What is ls command and what it does?**

A. ls lists files in a directory. In Linux System admins and developers uses this command very often. In containers, ls command can help determine your container image's directory and files.

**ls Example:**

|  |  |
| --- | --- |
| 1  2  3  4 | $ ./myapp  bash: ./myapp: Permission denied  $ ls -l myapp  -rw-r--r--. 1 root root 33 Dec 17 15:27 myapp |

### Linux Technical Interview Questions

##### **Q9. What is tail command in Linux?**

A. tail command displays the last part of a file. Generally, users don't need every log line to troubleshoot. Instead, you want to check what your logs say about the most recent request to your application.

**tail Example:**

$ tail -n 100 /var/log/httpd/access\_log

##### **Q10. What is cat command in Linux?**

A. In Linux cat command concatenates and prints files. Users might issue cat to check the contents of your dependencies file or to confirm the version of the application that you have already built locally.

**cat Example:**

|  |  |
| --- | --- |
| 1  2  3 | $ cat requirements.txt  flask  flask\_pymongo |

###### **Q11. What is grep command in Linux?**

A. grep searches file patterns. If you are looking for a specific pattern in the output of another command, grep highlights the relevant lines. Use this grep command for searching log files, specific processes, and more.

**grep Example:**

|  |  |
| --- | --- |
| 1  2 | $ cat tomcat.log | grep org.apache.catalina.startup.Catalina.start  12-Jan-2018 17:08:35.542 INFO [main] org.apache.catalina.startup.Catalina.start Server startup in 681 ms |

##### **Q12. What is ps command in Linux?**

A. ps command displays process status. Use this ps command to determine a running application or confirm an expected process.

**ps Command Example:**

|  |  |
| --- | --- |
| 1  2  3 | $ ps -ef    $ ps -ef | grep tomcat |

###### **Q13. What is env command in Linux?**

A. env command allows users to set or print the environment variables. During troubleshooting, users can find it useful for checking if the wrong environment variable prevents your application from starting.

**env Command Example:**

|  |  |
| --- | --- |
| 1  2  3  4  5  6  7  8  9 | $ env  PYTHON\_PIP\_VERSION=9.0.1  HOME=/root  DB\_NAME=test  PATH=/usr/local/bin:/usr/local/sbin  LANG=C.UTF-8  PYTHON\_VERSION=3.4.6  PWD=/  DB\_URI=mongodb://database:27017/test |

###### **Q14. What is top Command in Linux?**

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A. top command displays and updates sorted process information. Use this top command to determine which processes are running and how much memory and CPU they are consuming.

##### **Q15. What is netstat command in Linux?**

A. netstat command in Linux shows the network status. This netstat command shows network ports in use and their incoming connections.

##### **Q16. What is lsof command in Linux?**

A. lsof command lists the open files associated with your application.

##### **Q17. What is df command in Linux?**

A. Users can use df command to troubleshoot disk space issues. Here df stands for display free disk space.

**df Command Example:**

df -h

##### **Q18. What is du command in Linux?**

A. du command in Linux is used to retrieve more detailed information about which files use the disk space in a directory.

**du Command Example:**

|  |  |
| --- | --- |
| 1  2  3  4  5  6  7  8 | $ du -sh /var/log/\*  1.8M  /var/log/anaconda  384K  /var/log/audit  4.0K  /var/log/boot.log  0 /var/log/chrony  4.0K  /var/log/cron  4.0K  /var/log/maillog  64K /var/log/messages |

##### **Q19. What is iptables command in Linux?**

A. iptables command blocks or allows traffic on a Linux host, similar to a network firewall. This iptables command may prevent certain applications from receiving or transmitting requests.

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## Linux Vs Windows

|  |  |
| --- | --- |
| **LINUX** | **WINDOWS** |
| Linux is available for **free** | Windows has to be bought |
| It is **an open source OS** | It is not open source OS |
| One can customize Linux | No customizations available |
| Provides high level security | Cannot defend virus and malware attacks |
| Primary partitionig and logical partitioning available to boot | Booting available while primary partitioning only |
| Back Slash separates directories | Forward slash separates directories |
| File names are case particular | Irrespective of case while naming files |

###### **Q20. What does cd - command do?**

A. cd- command go to the previous directory.

###### **Q21. What does cd command do?**

A. Go to $HOME directory

###### **Q22. What does (cd dir && command) do?**

A. cd dir && command goes to the dir, execute the command and return to the current directory.

###### **Q23. What does pushd command do?**

A. pushhd command put current dir on stack so you can pop back to it.

### Linux Admin Interview Questions

##### **Q24. What is ls -lSr command?**

A. ls - ISr command shows files by size, biggest file will be displayed last.

##### **Q25. What is du -s \* | sort -k1,1rn | head command used for?**

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A. This command shows top disk users in current dir.

##### **Q26. What does this du -hs /home/\* | sort -k1,1h command do?**

A. This command sort path by easy to interpret disk usage.

##### **Q27. What is df -h command?**

A. This command show free space on mounted file systems.

##### **Q28. What is df -i command?**

A. df -i command shows free inodes on mounted filesystems.

##### **Q29. What is fdisk -l command used for?**

A. fdisk -I command show disks partitions sizes and types (run as root).

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##### **Q30. How do you kill program using one port in Linux?**

A. Use this command to kills the program using one port: sudo fuser -k 8000/tcp

##### **Q31. How do you limit memory usage for commands?**

A. ulimit -Sv 1000       # 1000 KBs = 1 MB  
    ulimit -Sv unlimited  # Remove limit

##### **Q32. How do you get full path of a file in Linux?**

A. Use this command: readlink -f file.txt

##### **Q33. How do you list contents of tar.gz and extract only one file?**

A. Use these commands:

* tar tf file.tgz
* tar xf file.tgz filename

##### **Q34. How do you find who is logged in?**

A. Use this command to find who logged in: w

##### **Q35. How do you check permissions of each directory to a file?**

A. It is useful to detect permissions errors, for example when configuring a web server.

namei -l /path/to/file.txt

##### **Q36. How do you run command every time a file is modified?**

A. Use this command to do:

while inotifywait -e close\_write document.tex

do

make

done

###### **Q37. How to copy text to clipboard?**

A. Use this command: cat file.txt | xclip -selection clipboard

###### **Q38. How do you check resources usage?**

A. Use this command to check resource usage: /usr/bin/time -v ls

##### **Q39. How do you run a command for a limited time?**

A. Use this command: timeout 10s ./script.sh

# Restart every 30 minutes  
while true; do timeout 30m ./script.sh; done

##### **Q40. How do you combine two lines from two sorted files in Linux?**

A. Use this command: comm file1 file2.

We can also clear swap by running swapoff -a and then swapon -a as root instead of rebooting to achieve the same effect.

**26. What is git ?**

Git is a very popular and efficient open source Version Control System. It tracks content such as files and directories. It stores the file content in BLOBs - binary large objects. The folders are represented as trees. Each tree contains other trees (subfolders) and BLOBs along with a simple text file which consists of the mode, type, name and Secure Hash Algorithm of each blob and subtree entry. During repository transfers, even if there are several files with the same content and different names, the GIT software will transfer the BLOB once and then expand it to the different files.

Wish you good luck !!!!

**Important Port numbers**  
FTP = 21  
SSH = 22  
SSL 443  
TELNET = 23  
SMTP = 25  
POP3= 110  
IMAP= 143  
IMAPS=993  
DNS = 53  
DHCP(Server) = 67  
DHCP(Client) = 68  
TFTP = 69  
HTTP = 80  
HTTPS and SSL = 443  
LDAP = 389  
APACHE = 8080  
SQUID = 3128  
MYSQL = 3306  
SMB = 445(udp)  
Active Directory = 445 (tcp)