1 what are the different alternate for installing RedHat Linux on your system?

- Red Hat Linux provides many ways to perform the installation such as
  booting from CD-ROM,
  booting from local disk,
  FTP, HTTP and NFS.

Hardware Issues

Hardware Issues, which need to be addressed before you can install Red Hat

- Architectures
- Device drivers
- CPU
- Memory

Architectures

Linux can run on a variety of hardware platforms for example x86, Itanium and Compaq Alpha. This course will concentrate on the x86 platform

Device drivers

The Red Hat hardware compatibility list can be found

CPUs

The installation program automatically probes for the number of CPUs. A maximum of sixteen CPUs are supported by the kernel.

Memory

Red Hat 9 on 32-bit x86 can autodetect up to a gigabyte of memory.

2 what are the hardware issues of RedHat Linux?

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3 write a note on disk structure and partitioning?

Disk structure

Partitioning provides a mechanism that allows discs to be spilt into slices. These concept

smaller slices are easier to manage and also provide a certain amount of flexibility. Each hard drive can be split up into a maximum of four primary partitions. If additional partitions are required then one of the four primary partitions can be divided further by making an extended partition. An
extended partition is simply a container which holds logical partitions.

Utilities

The partitioning tool used by the installation program is called Disk Druid and it is only available from within the Red Hat installation program.

It offers a graphical representation of your hard drive(s) and allows you to partition your hard drive(s) by using the mouse.

It also allows you to assign mount points. Disk Druid uses the following rules when assigning partitions to device names.

The 4 primary partitions are assigned unique device names of /dev/hda1, /dev/hda2, /dev/hda3 and /dev/hda4 respectively.

If one of the primary partitions is used for an extended partition then the logical partitions within this ex- tended partition are assigned device names sequentially upwards from /dev/hda5. For example the first logical partition will always be assigned /dev/hda5, the second /dev/hda6 and so on.

4 what is MBR? What are the content of a MBR?

The Master Boot Record(MBR) is the information in the first sector of a hard disk or a removable drive. It identifies how and where the systems operating system is located in order to be booted into the computers main storage access memory.

Content

The MBR is comprised of a small section of operating system independent code, a disk signature the partition table and an MBR signature. The disk signature is a unique four byte identifier for the hard drive, that is to say it should be unique for each drive attached to a system.

5)what is disk druid? what is a different options with dd?

Disk Druid is an **interactive program for editing disk partitions**. Users run it only within the Fedora installation system. Disk Druid enables you to configure Linux software RAID and LVM to provide more extensible and reliable data storage.

1. Backing up and restoring an entire disk or a partition

It is possible to save all the data from an entire disk/partition to another disk/partition. Not a simple copy as cp command but a block size copy.

a. Backup entire disk to disk

You can copy all the data (entire disk) from the disk /dev/sda to /dev/sdb. dd doesn’t know anything about the filesystem or partitions; it will just copy everything from /dev/sda to /dev/sdb.

You need to indicate the block size to be copied at time with bs option. So, this will clone the disk with the same data on the same partition.

```
# dd if=/dev/sda of=/dev/sdb bs=4096 conv=noerror,sync

97281+0 records in

97280+0 records out

99614720 bytes (100 MB) copied, 2.75838 s, 36.1 MB/s
```

This works only if the second device is as large as or larger than the first. Otherwise, you get truncated and worthless partitions on the second one. Here, if stands for input file , of stands for output file and bs stands for the block size (number of bytes to be read/write at a time). Make sure you use block sizes in multiples of 1024 bytes which is equal to 1KB. If you don't specify block size, dd use a default block size of 512 bytes. The conv value parameter *noerror* allows the tool to continue to copy the data even though it encounters any errors. The sync option allows to use synchronized I/O.

b. Creating dd disk image (file image)

You can create an image of a disk or a file image. Backing up a disk to an image will be faster than copying the exact data. Also, disk image makes the restoration much easier.

```
# dd if=/dev/sda of=/tmp/sdadisk.img
```

You can store the output file where you want but you have to give a filename ending with .img extension as above. Instead of /tmp/sdadisk.img, you could store it for example at /sdadisk.img if you want.

c. Creating a compressed disk image

Because dd creates the exact content of an entire disk, it means that it takes too much size. You can decide to compress the disk image with the command below

```
# dd if=/dev/vda | gzip -c >/tmp/vdadisk.img.gz
```

The pipe | operator makes the output on the left command become the input on the right command. The -c option writes output on standard output and keeps original files unchanged.

d. Backup a partition or clone one partition to another

Instead of an entire disk, you can only backup a simple partition. You just need to indicate the partition name in input file as below

```
# dd if=/dev/sda1 of=/dev/sdb1 bs=4096 conv=noerror,sync
```

This will synchronize the partition /dev/sda1 to /dev/sdb1. You must verify that the size of /dev/sdb1 should be larger than /dev/sda1. Or you can create a partition image as below

```
# dd if=/dev/sda1 of=/tmp/sda1.img
```

e. Restoring a disk or a partition image

Save a disk or a partition helps to restore all the data, if there is any problem with our original drive. To restore, you need to inverse the input file with the output file indicated during backup operation as below.

```
# dd if=/tmp/sdadisk.img of=/dev/sda
```

You will retrieve data that were present before the backup operation and not after the operation

e. Restoring compressed image

You need to first indicate the compressed file and the output file which is the disk compressed before.

```
# gzip -dc /tmp/vdadisk.img.gz | dd of=/dev/vda
```

The -d option here is to uncompress. Note the output file. You can mount the restored disk to see the content. Note that you will data added after the last compression backup operation.

6) What is a general approach of assigning Device Name for different partition? Explain

Ans) Disk Druid uses the following rules when assigning partitions to device names: The 4 primary partitions are assigned unique device names of /dev/hda1, /dev/hda2,

/dev/hda3 and

/dev/hda4 respectively.

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Device names are allocated to each partition. Primary partition are assigned /dev/xxy[1-4].

Logical partitions are assigned sequentially upwards from /dev/xxy5.

/dev/xxyN

xx: Indicates what type of device, hd (IDE), sd (SCSI)

y: Indicates which disk, a (the first disk), b (the second disk)

N : The actual partition number.

LINUX /dev/hda5

- the 1st logical partition on the 1st IDE drive.

/dev/sdb7

- the 3rd logical partition on the 2nd SCSI drive.

Understanding Device Names

The device names allocated to the individual partitions are deciphered as follows:

/dev/xxyN

Understanding Device Names

dev This directory contains all the device files. All possible devices reside under /dev/.

xx These two characters indicate what type of device the partition is on. For example hd indicates an IDE disk, sd would indicate a SCSI device.

y This indicates which device the partition is on. For example hda would be the first IDE disk.

N This denotes the partition. For example /dev/sdb7 would be the third logical partition on the second SCSI drive.

7) Explain the File System Mounting in Linux with an example

Ans) A quick Unix filesystem review: -

built up in an inverted tree structure. - the top of the tree is called root or /.

Mounting: - is a mechanism of attaching an extra branch to the tree structure.

- it maps partitions onto reference points in the filesystems.

- e.g. mount /dev/hda8 /usr/local

- the filesystem on /dev/hda8 can now be accessed through the /usr/local mount point. Mount points are assigned to partitions during the installation.

- this tells the installation where to put things!

The Unix Filesystem and Mount points

The Unix filesystem and Mount points

The Unix file system is built up in an inverted tree structure. At the top of the structure is a directory called root (/). Directories in general are just files that contain subdirectories and other files. The root directory contains several subdirectories which have names such as /etc, /sbin, /lib, /proc and so on. Each of these subdirectories contain files that are grouped together under a particular subdirectory because they provide a similar function. For example the /dev directory is reserved for file system entries that represent devices that are attached to the system. The /lib directory should contain only those libraries that are needed to execute the binaries in /bin and /sbin.

Here is a brief description of the subdirectories that can be found directly under the root directory: bin Essential command binaries.

boot Static files of the boot loader. dev Device files. etc Host-specific system configuration. home User home directories.

lib Essential shared libraries and kernel modules.

mnt Mount point of temporary partitions.

opt Add-on application software packages. root Home directory for the root use r . sbin Essential system binaries. tmp Temporary files. usr Secondary hierarch y . var Variable data.

The complete standard can be found at

http://www.pathnam e.com/fhs/

8) What are the different installation mode provided in RedHat Linux? Explain

Ans)