

## Task - 4.1

### Contribute limited/specific amount of storage as slave to Hadoop cluster

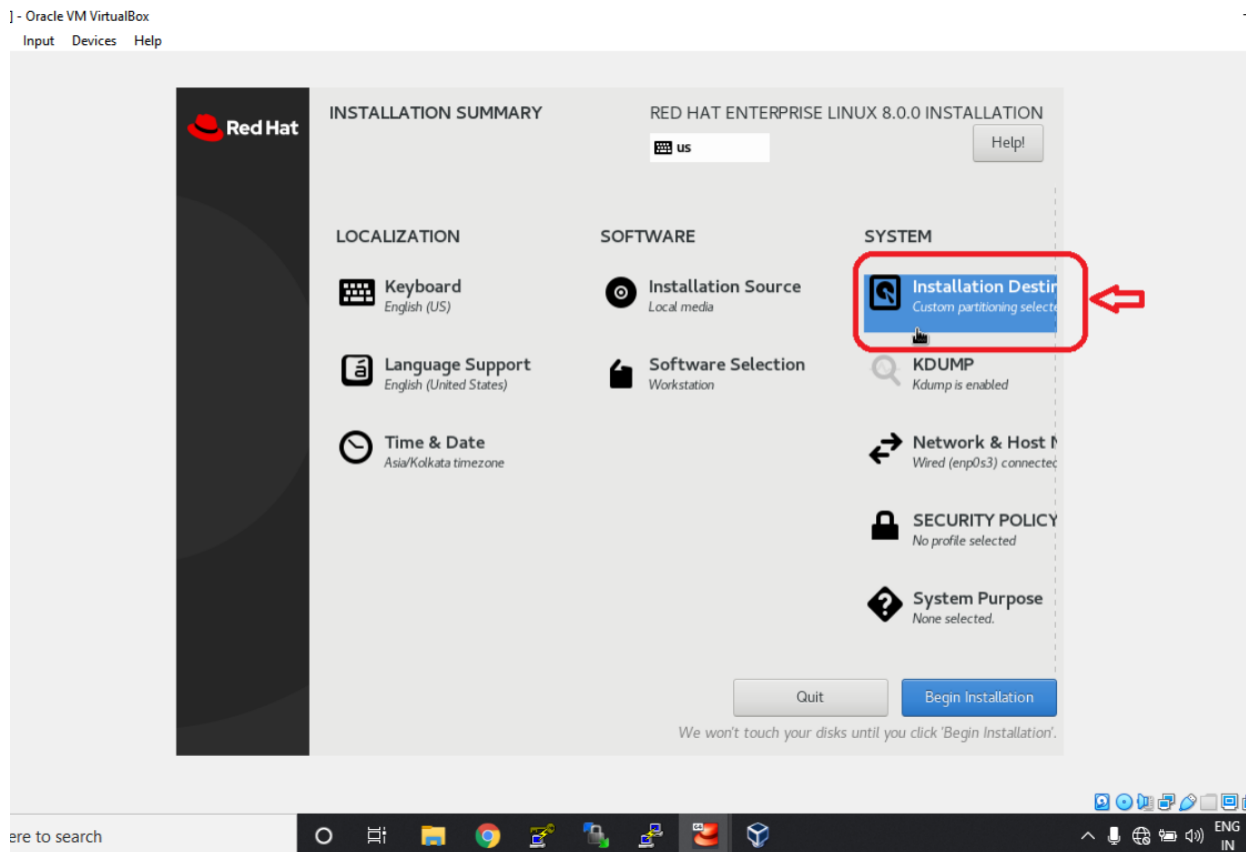
To contribute limited amount of storage as slave to hadoop cluster, we need to first create partition in the harddisk or block device from which slave contributes its storage to hadoop master.

There are two ways to do this:-

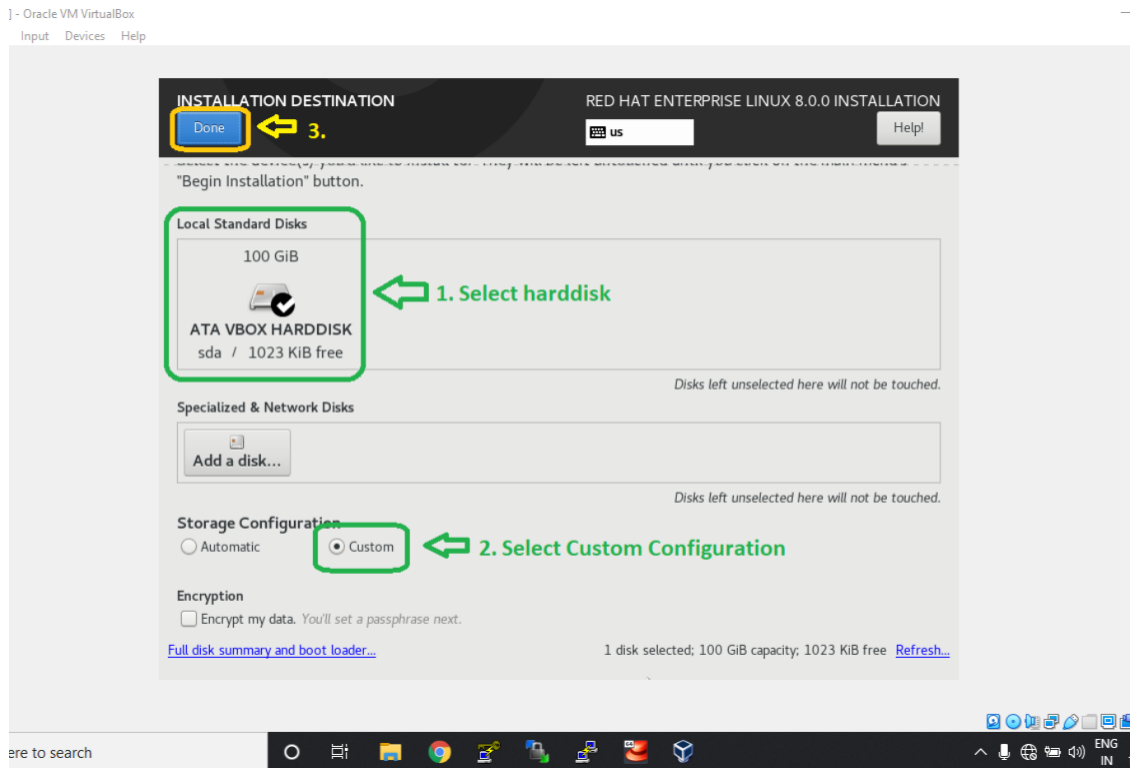
1. Create a partition of your desired size in main harddisk before installing OS and then configure hadoop file accordingly.
2. Attach a new harddisk and create a partition of your desired size in the new harddisk and then mount the partition to the slave folder which contributes space to master.

### Creating partition in main disk before installing OS

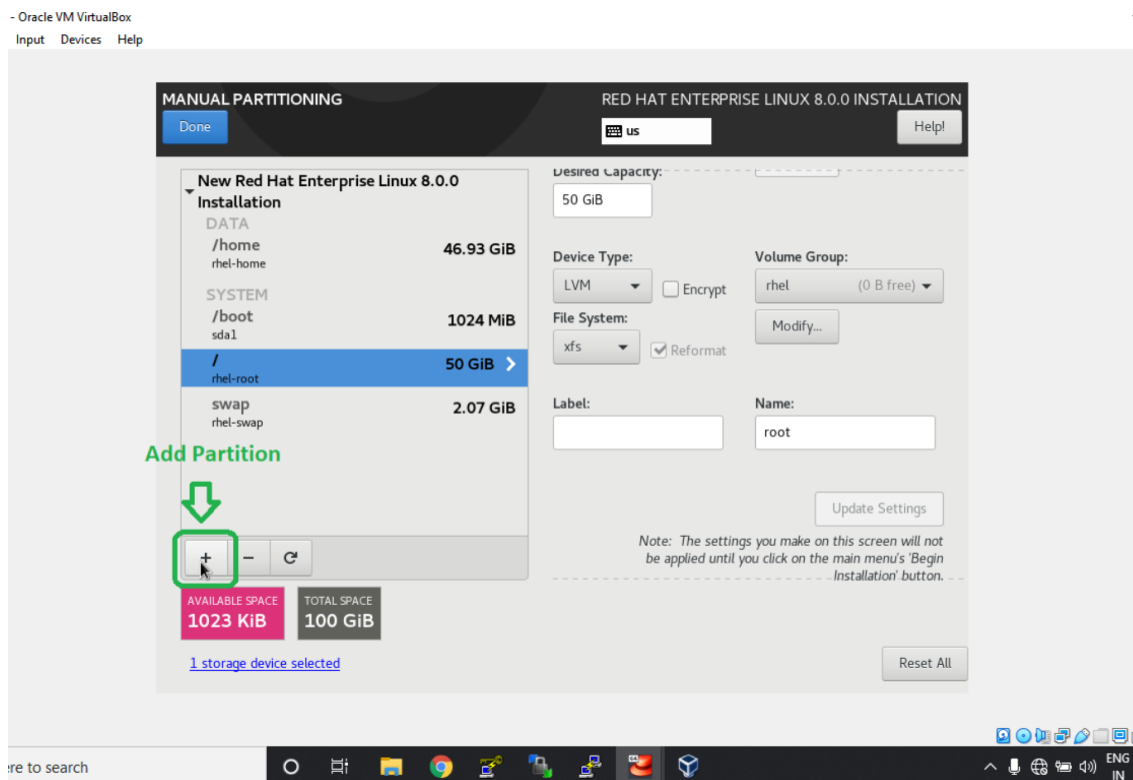
1. Select Installation Destination.

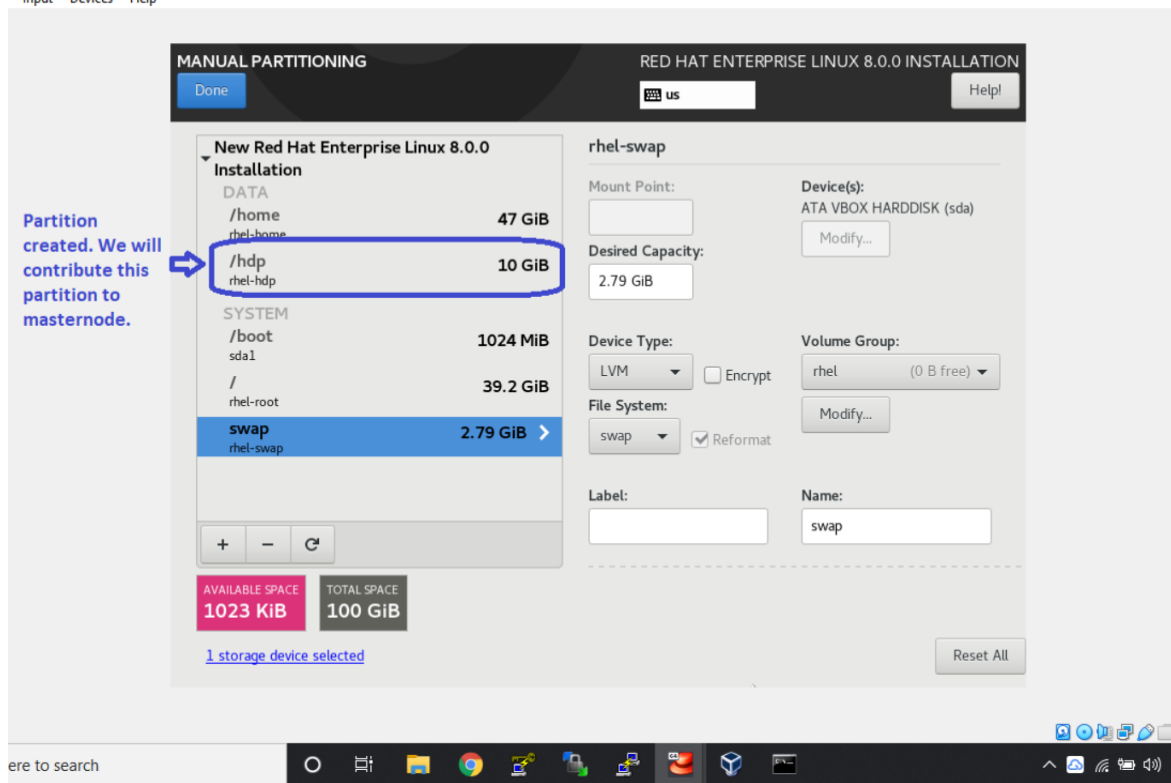
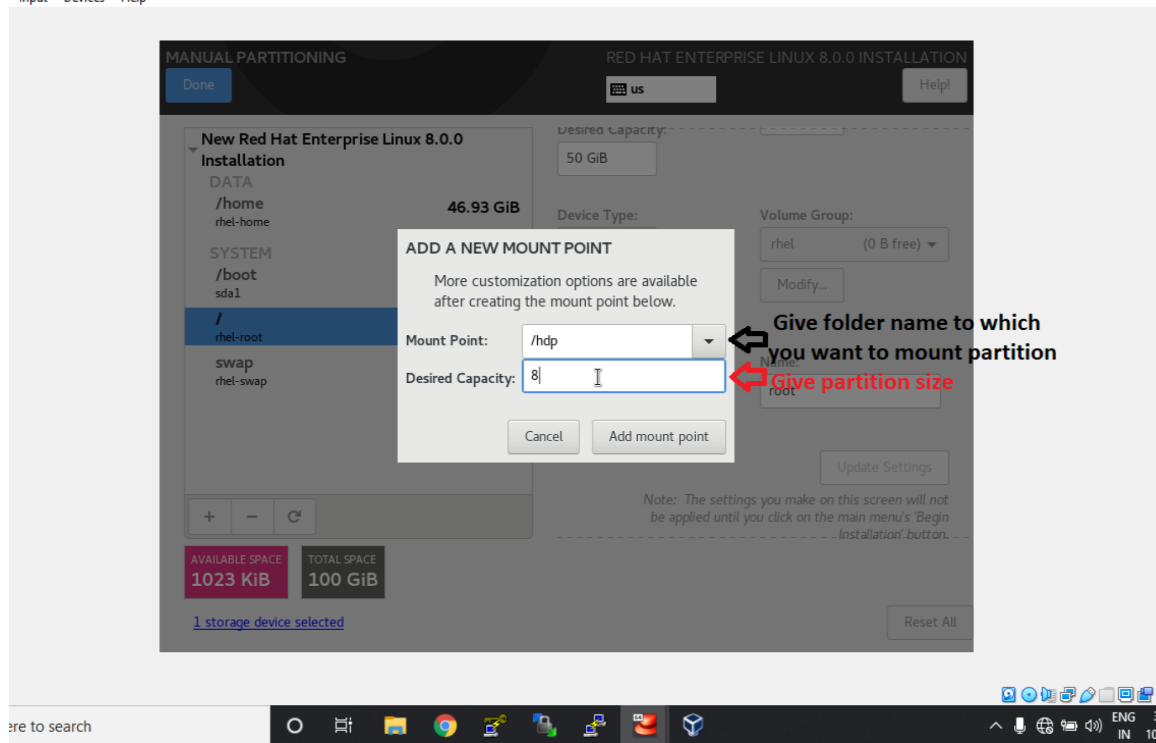


## 2. Select harddisk and congiguration type Custom.

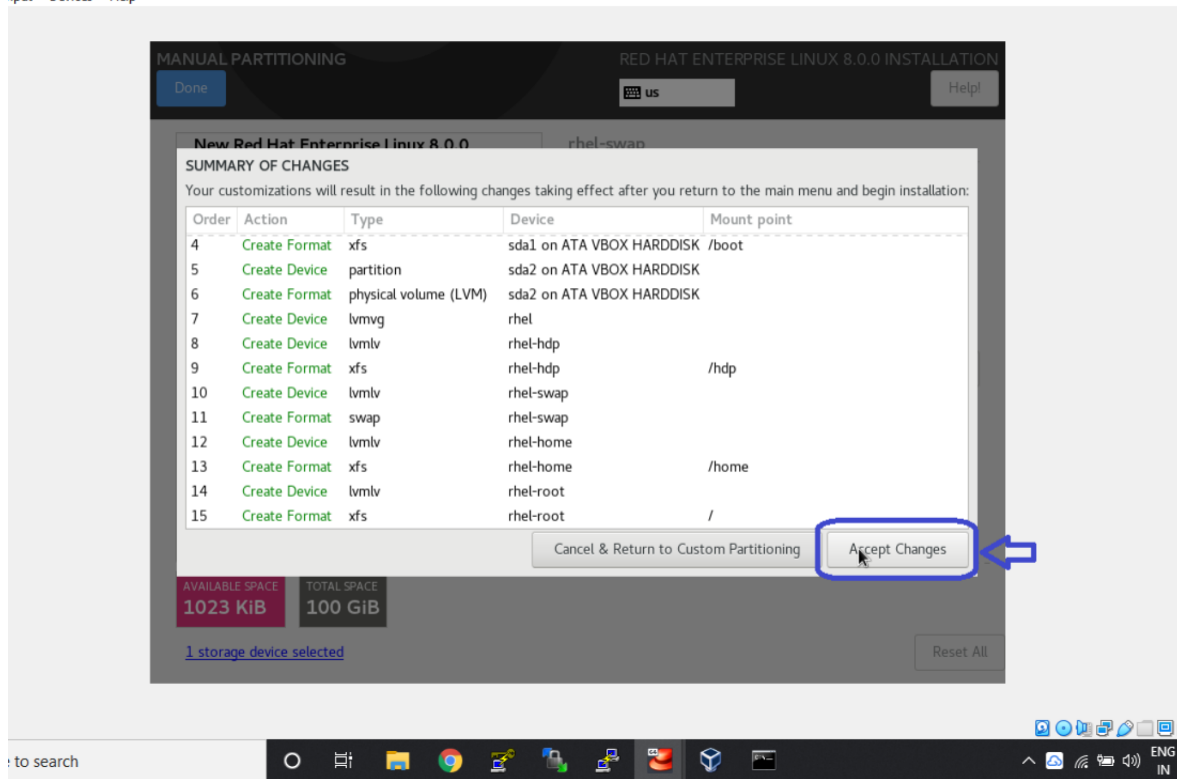


## 3. Create Partition.



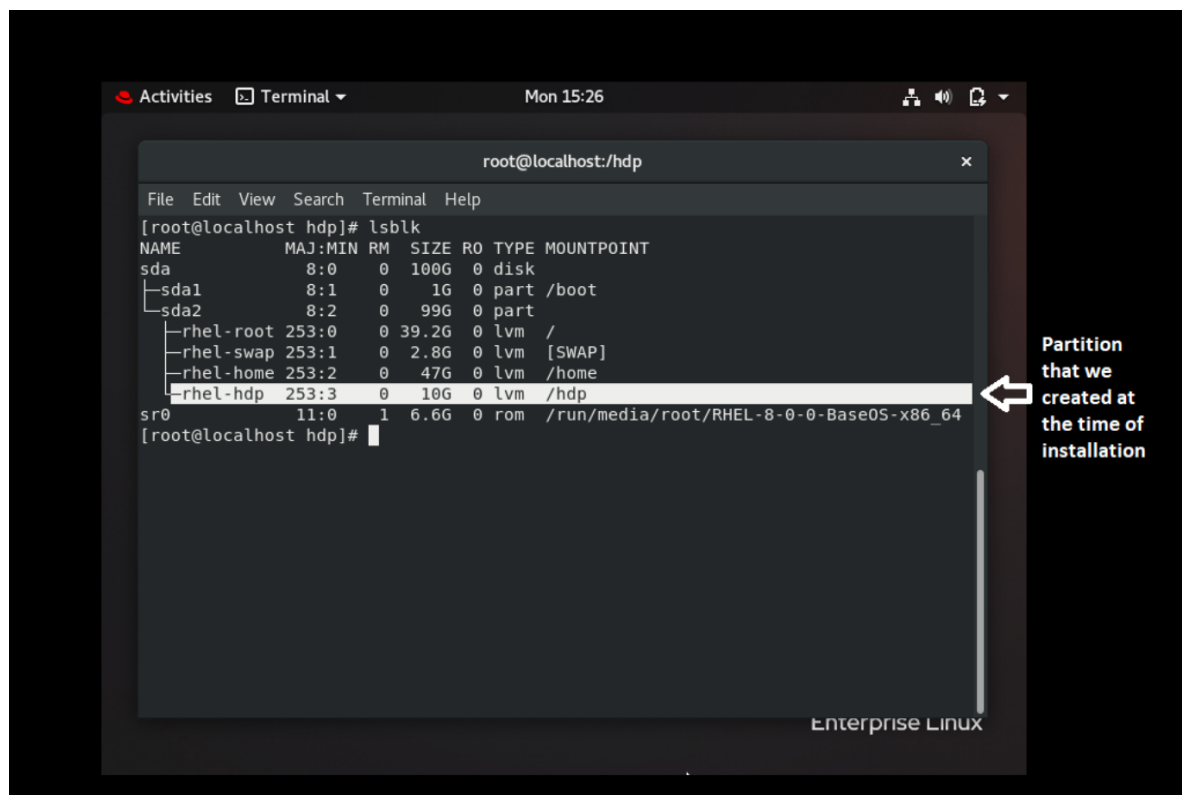


Similarly, you can create other partitions.

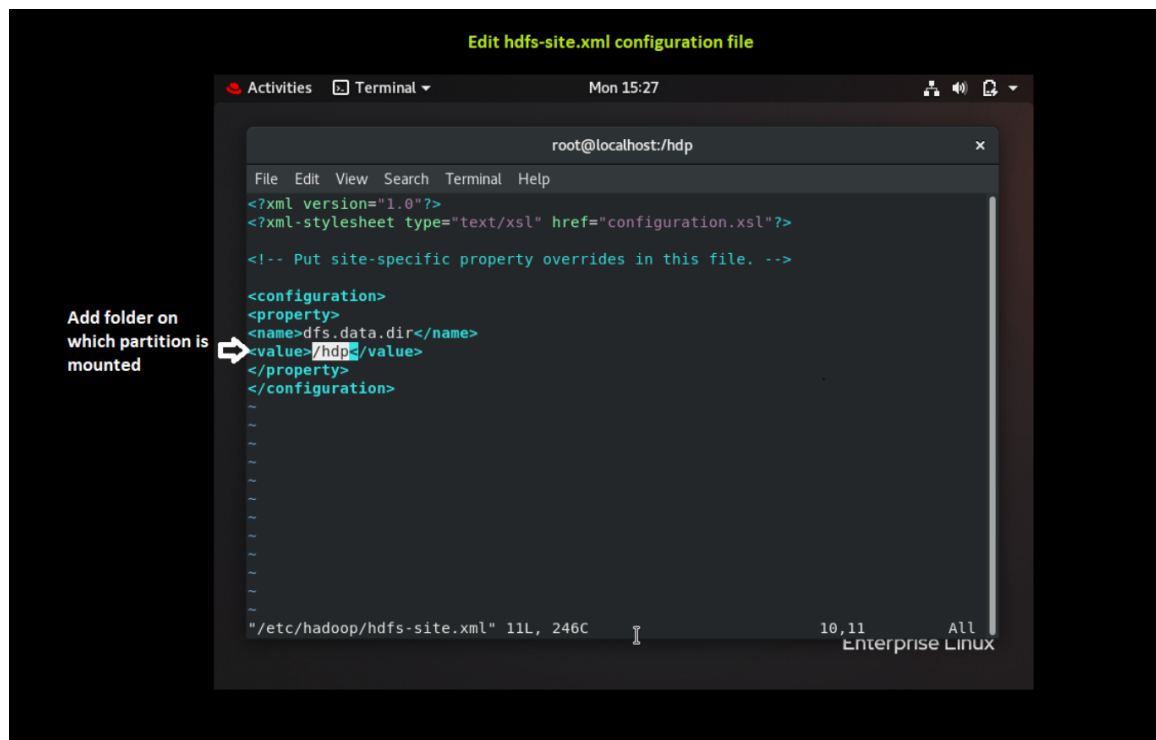


Now install OS.

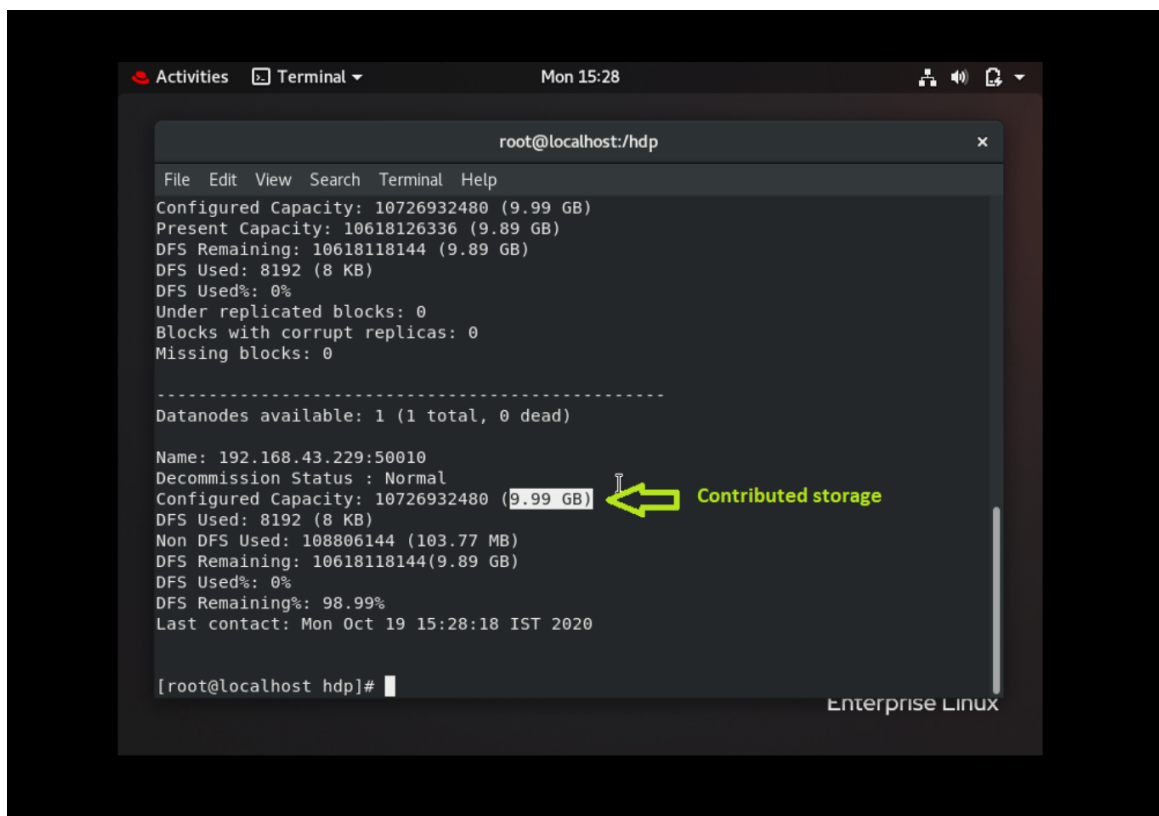
Open terminal. You can use lsblk command to see the partitions created.



4. Edit hdfs-site.xml configuration file using command `#vim etc/hadoop/hdfs-site.xml` and save changes.

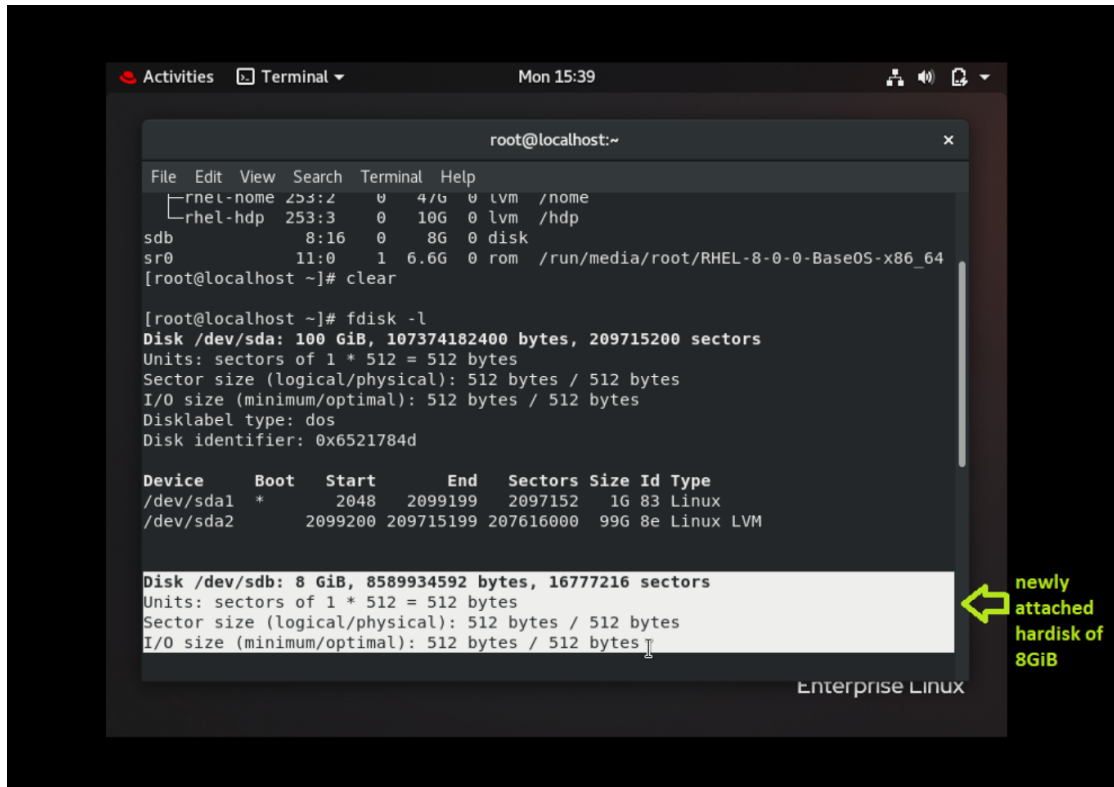


5. Start datanode using command `#hadoop-daemon.sh start datanode`  
Check storage contributed using command `#hadoop dfsadmin -report`



## Creating partition in newly attached harddisk

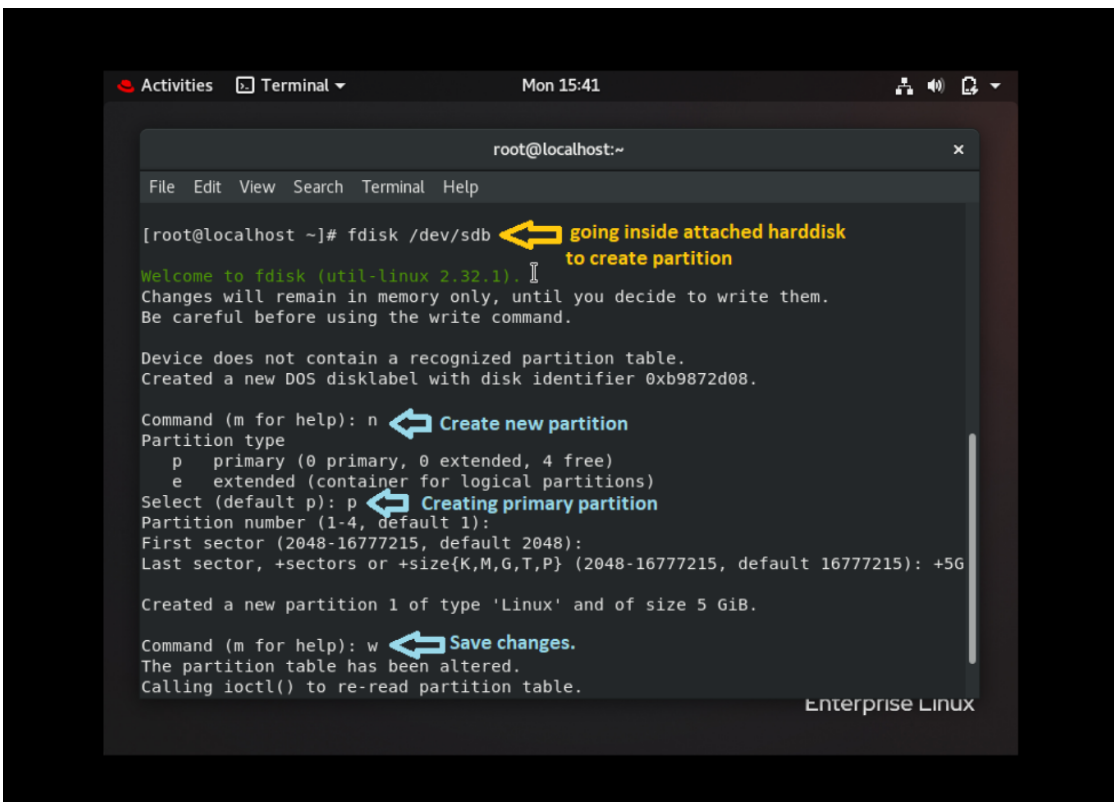
1. Attach harddisk by going to respective VM settings. Here I have added 8GiB harddisk to my slave VM.



The screenshot shows a terminal window titled 'root@localhost:~' with a menu bar (File, Edit, View, Search, Terminal, Help). The terminal output shows the command 'fdisk -l' being executed, displaying information for two disks: /dev/sda and /dev/sdb. /dev/sda is a 100 GiB disk with two partitions: /dev/sda1 (16 GiB Linux) and /dev/sda2 (99 GiB Linux LVM). /dev/sdb is an 8 GiB disk with no partitions. A yellow arrow points to the information for /dev/sdb, with the text 'newly attached harddisk of 8GiB' next to it.

```
root@localhost:~  
File Edit View Search Terminal Help  
└─rhel-nome 253:2 0 4/6 0 lvm /nome  
└─rhel-hdp 253:3 0 10G 0 lvm /hdp  
sdb 8:16 0 8G 0 disk  
sr0 11:0 1 6.6G 0 rom /run/media/root/RHEL-8-0-0-BaseOS-x86_64  
[root@localhost ~]# clear  
  
[root@localhost ~]# fdisk -l  
Disk /dev/sda: 100 GiB, 107374182400 bytes, 209715200 sectors  
Units: sectors of 1 * 512 = 512 bytes  
Sector size (logical/physical): 512 bytes / 512 bytes  
I/O size (minimum/optimal): 512 bytes / 512 bytes  
Disklabel type: dos  
Disk identifier: 0x6521784d  
  
Device Boot Start End Sectors Size Id Type  
/dev/sda1 * 2048 2099199 2097152 16 83 Linux  
/dev/sda2 2099200 209715199 207616000 99G 8e Linux LVM  
  
Disk /dev/sdb: 8 GiB, 8589934592 bytes, 16777216 sectors  
Units: sectors of 1 * 512 = 512 bytes  
Sector size (logical/physical): 512 bytes / 512 bytes  
I/O size (minimum/optimal): 512 bytes / 512 bytes  
Enterprise Linux
```

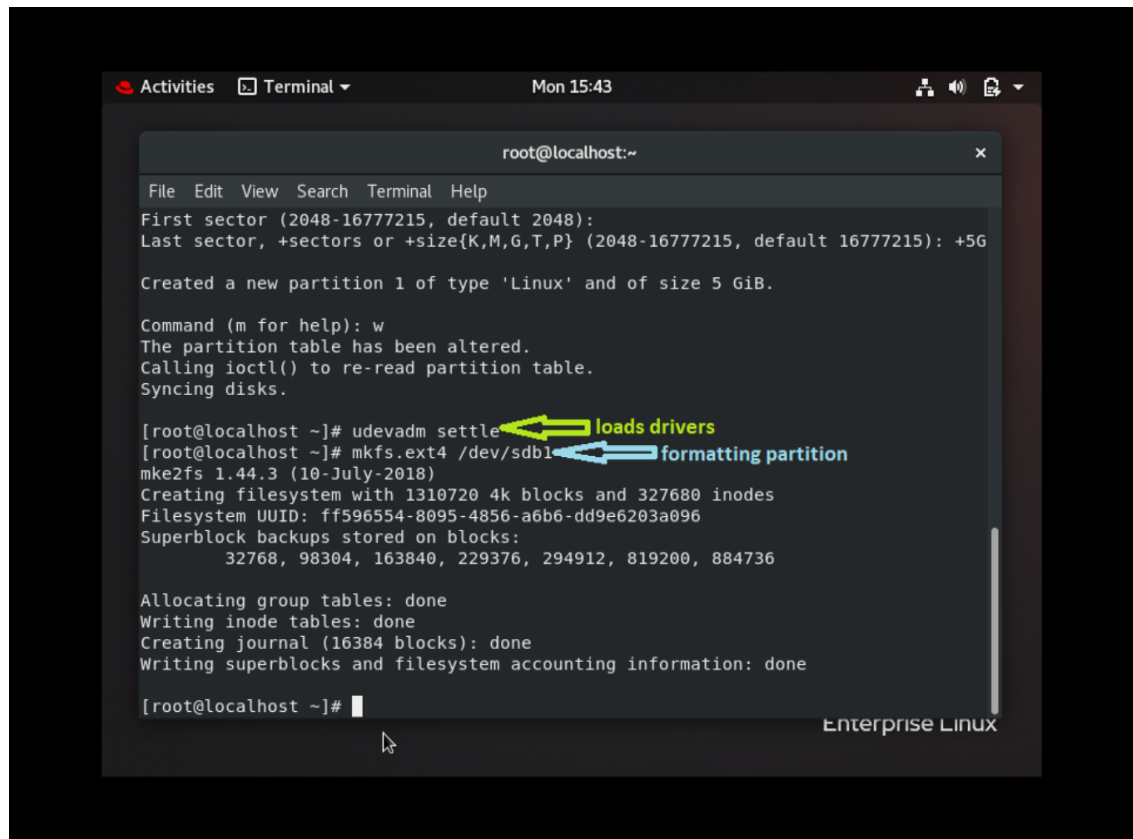
2. Create a new partition. I have created a partition of 5GiB which will be contributed to cluster.



The screenshot shows a terminal window titled 'root@localhost:~' with a menu bar (File, Edit, View, Search, Terminal, Help). The terminal output shows the command 'fdisk /dev/sdb' being executed. The prompt 'going inside attached harddisk to create partition' is shown with a yellow arrow. The terminal output shows the 'fdisk' utility starting, displaying the disk identifier and the command 'n' to create a new partition. The partition type is set to 'p' (primary), and the partition number is set to '1'. The first sector is 2048, and the last sector is 16777215, resulting in a partition of size 5 GiB. The prompt 'Save changes' is shown with a yellow arrow. The terminal output shows the partition table being altered and the 'ioctl()' call being made to re-read the partition table.

```
root@localhost:~  
File Edit View Search Terminal Help  
[root@localhost ~]# fdisk /dev/sdb ← going inside attached harddisk  
                                   to create partition  
Welcome to fdisk (util-linux 2.32.1).  
Changes will remain in memory only, until you decide to write them.  
Be careful before using the write command.  
  
Device does not contain a recognized partition table.  
Created a new DOS disklabel with disk identifier 0xb9872d08.  
  
Command (m for help): n ← Create new partition  
Partition type  
p primary (0 primary, 0 extended, 4 free)  
e extended (container for logical partitions)  
Select (default p): p ← Creating primary partition  
Partition number (1-4, default 1):  
First sector (2048-16777215, default 2048):  
Last sector, +sectors or +size{K,M,G,T,P} (2048-16777215, default 16777215): +5G  
  
Created a new partition 1 of type 'Linux' and of size 5 GiB.  
  
Command (m for help): w ← Save changes.  
The partition table has been altered.  
Calling ioctl() to re-read partition table.  
Enterprise Linux
```

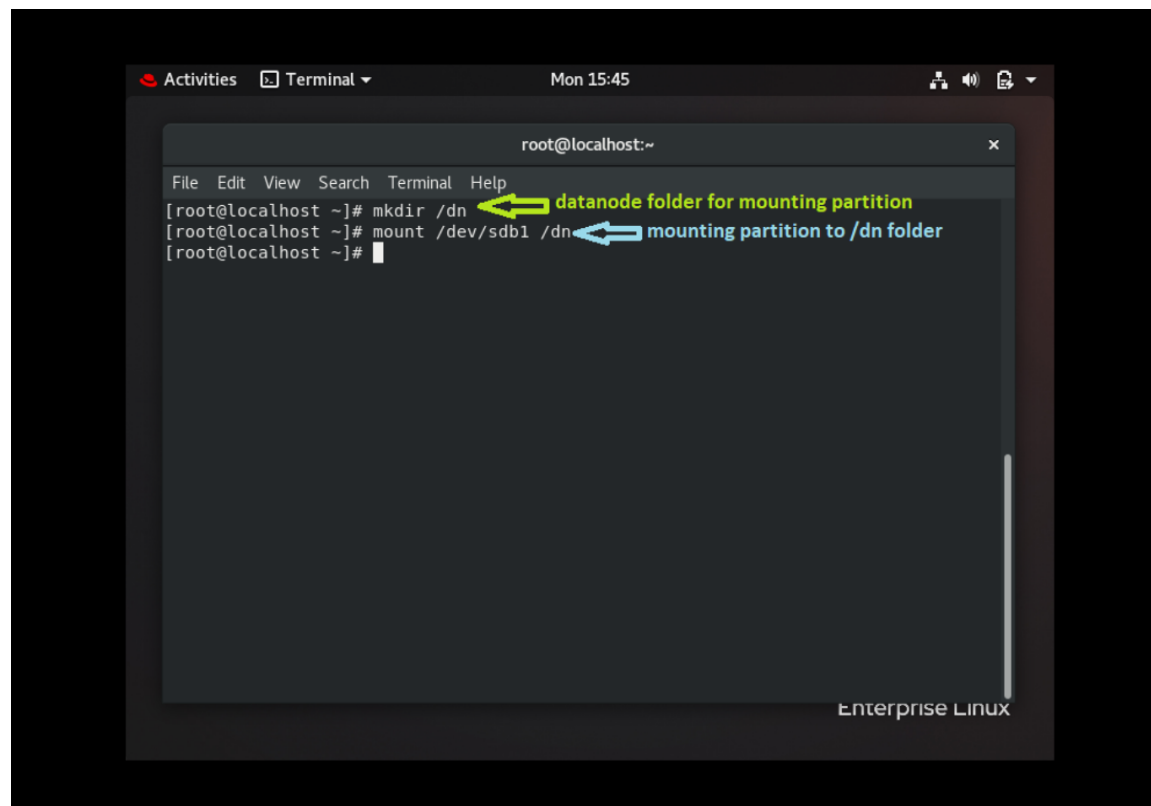
### 3. Format Partition.



A terminal window titled 'root@localhost:~' showing the process of formatting a partition. The window has a menu bar with 'File', 'Edit', 'View', 'Search', 'Terminal', and 'Help'. The terminal output shows the creation of a new partition of type 'Linux' and size 5 GiB. It then prompts for a command (m for help) and shows the partition table being altered. The user enters 'udevadm settle', which is annotated with a yellow arrow and the text 'loads drivers'. The user then enters 'mkfs.ext4 /dev/sdb1', which is annotated with a blue arrow and the text 'formatting partition'. The terminal output shows the creation of the filesystem with 1310720 4k blocks and 327680 inodes. The filesystem UUID is ff596554-8095-4856-a6b6-dd9e6203a096. Superblock backups are stored on blocks: 32768, 98304, 163840, 229376, 294912, 819200, 884736. Allocating group tables is done. Writing inode tables is done. Creating journal (16384 blocks) is done. Writing superblocks and filesystem accounting information is done. The prompt is [root@localhost ~]#.

```
root@localhost:~  
File Edit View Search Terminal Help  
First sector (2048-16777215, default 2048):  
Last sector, +sectors or +size{K,M,G,T,P} (2048-16777215, default 16777215): +5G  
  
Created a new partition 1 of type 'Linux' and of size 5 GiB.  
  
Command (m for help): w  
The partition table has been altered.  
Calling ioctl() to re-read partition table.  
Syncing disks.  
  
[root@localhost ~]# udevadm settle  
[root@localhost ~]# mkfs.ext4 /dev/sdb1  
mke2fs 1.44.3 (10-July-2018)  
Creating filesystem with 1310720 4k blocks and 327680 inodes  
Filesystem UUID: ff596554-8095-4856-a6b6-dd9e6203a096  
Superblock backups stored on blocks:  
    32768, 98304, 163840, 229376, 294912, 819200, 884736  
  
Allocating group tables: done  
Writing inode tables: done  
Creating journal (16384 blocks): done  
Writing superblocks and filesystem accounting information: done  
  
[root@localhost ~]#
```

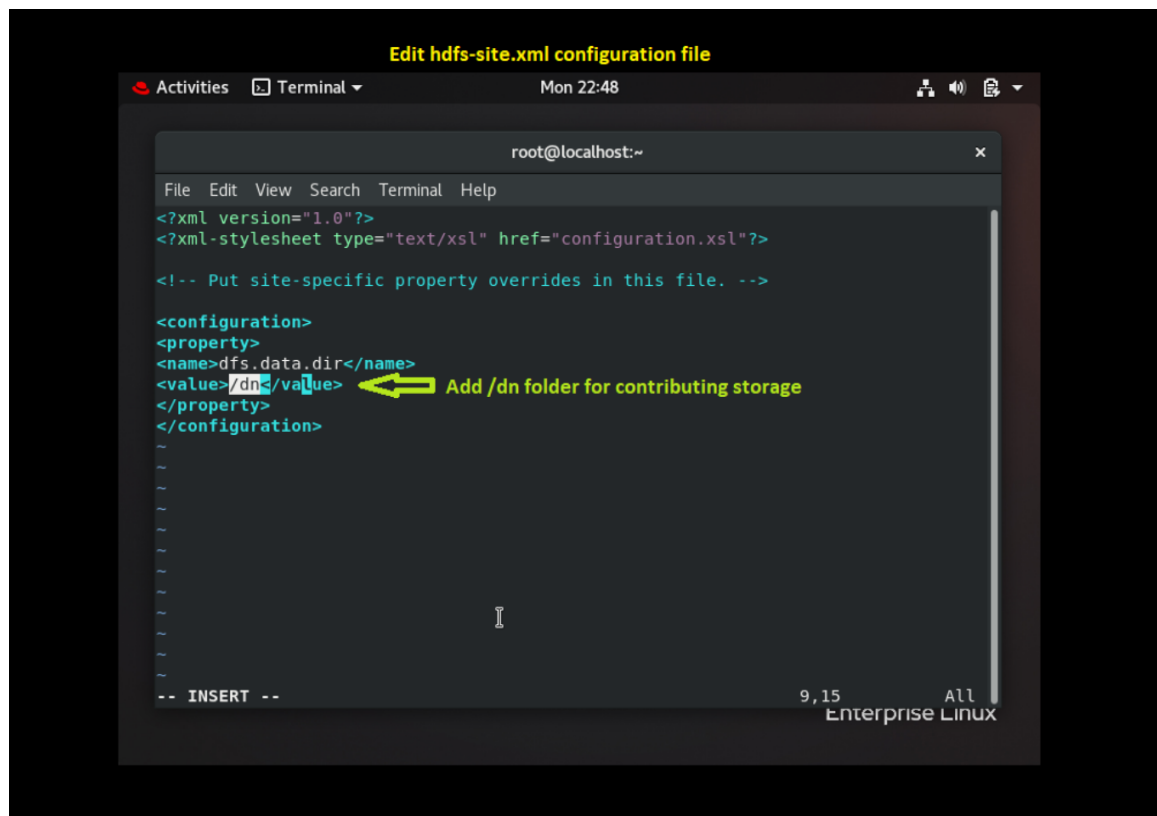
### 4. Mount partition.



A terminal window titled 'root@localhost:~' showing the process of mounting a partition. The window has a menu bar with 'File', 'Edit', 'View', 'Search', 'Terminal', and 'Help'. The terminal output shows the user entering 'mkdir /dn', which is annotated with a yellow arrow and the text 'datanode folder for mounting partition'. The user then enters 'mount /dev/sdb1 /dn', which is annotated with a blue arrow and the text 'mounting partition to /dn folder'. The prompt is [root@localhost ~]#.

```
root@localhost:~  
File Edit View Search Terminal Help  
[root@localhost ~]# mkdir /dn  
[root@localhost ~]# mount /dev/sdb1 /dn  
[root@localhost ~]#
```

5. Edit `hdfs-site.xml` configuration file using command `#vim etc/hadoop/hdfs-site.xml` and save changes.



6. Start datanode using command `#hadoop-daemon.sh start datanode`  
Check storage contributed using command `#hadoop dfsadmin -report`

