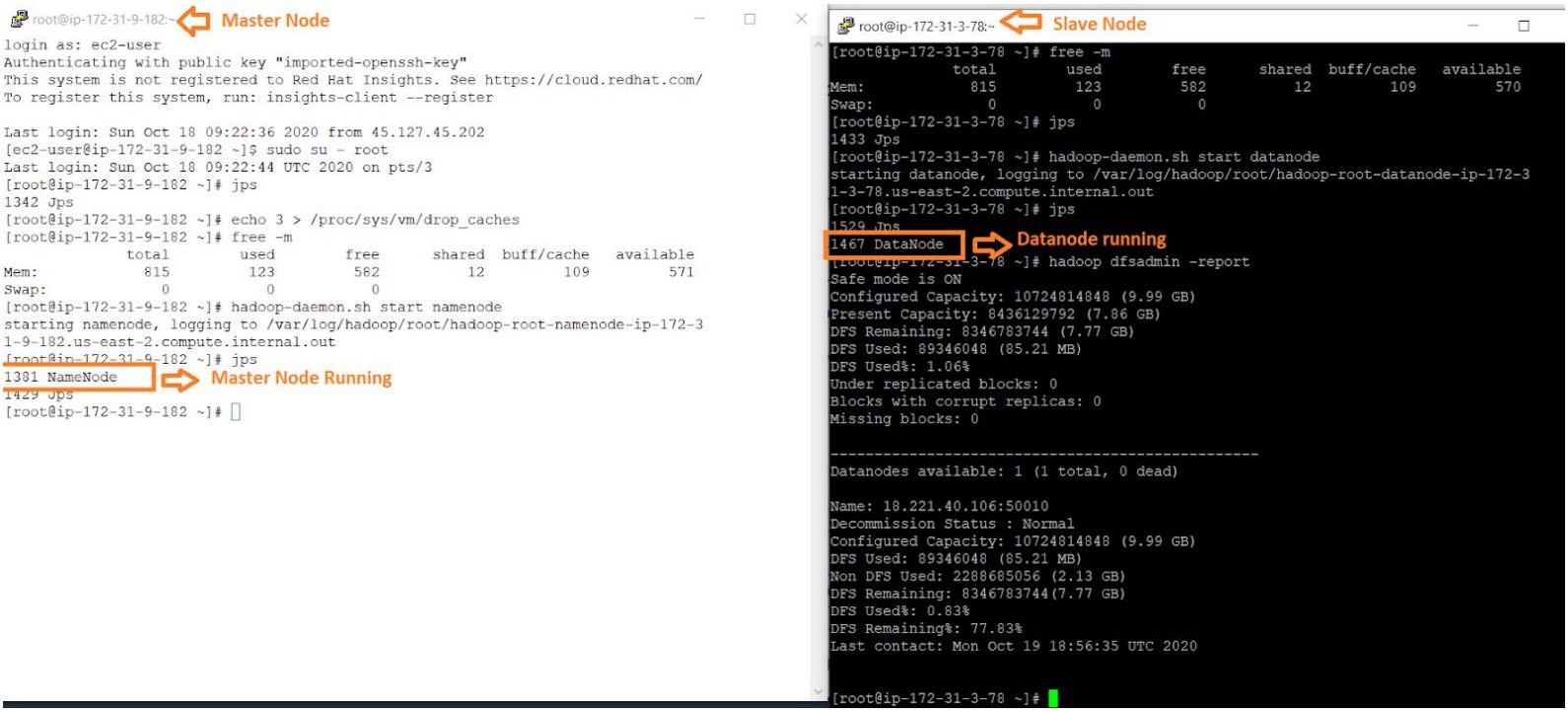
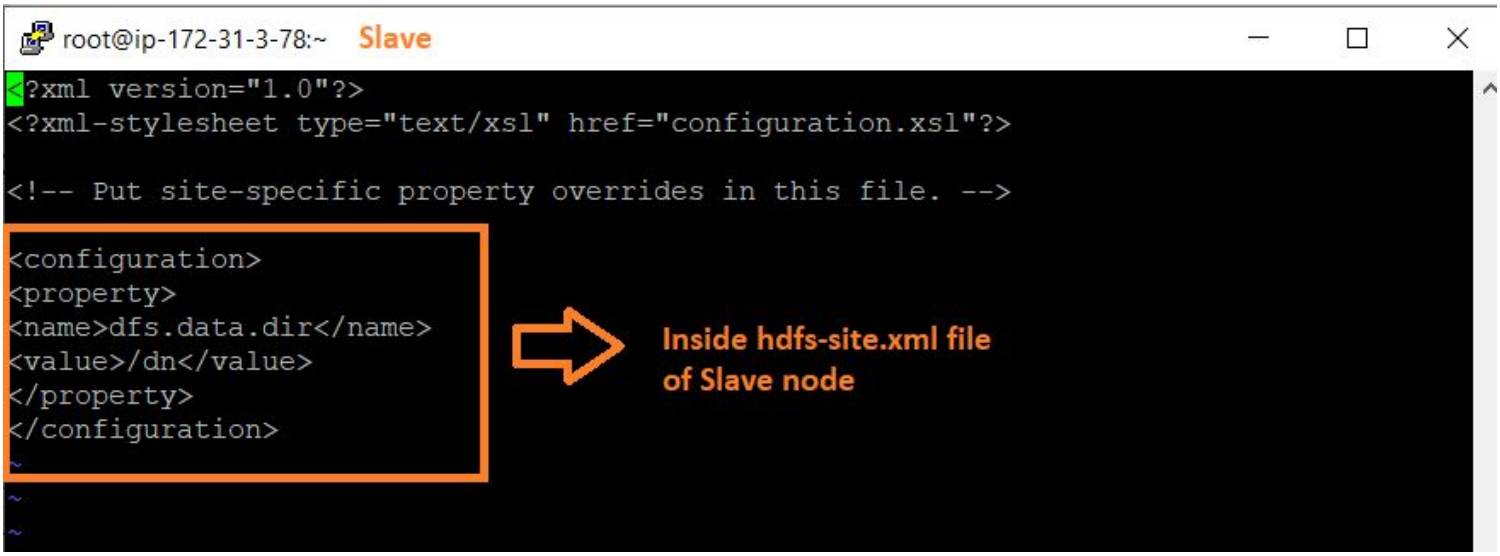
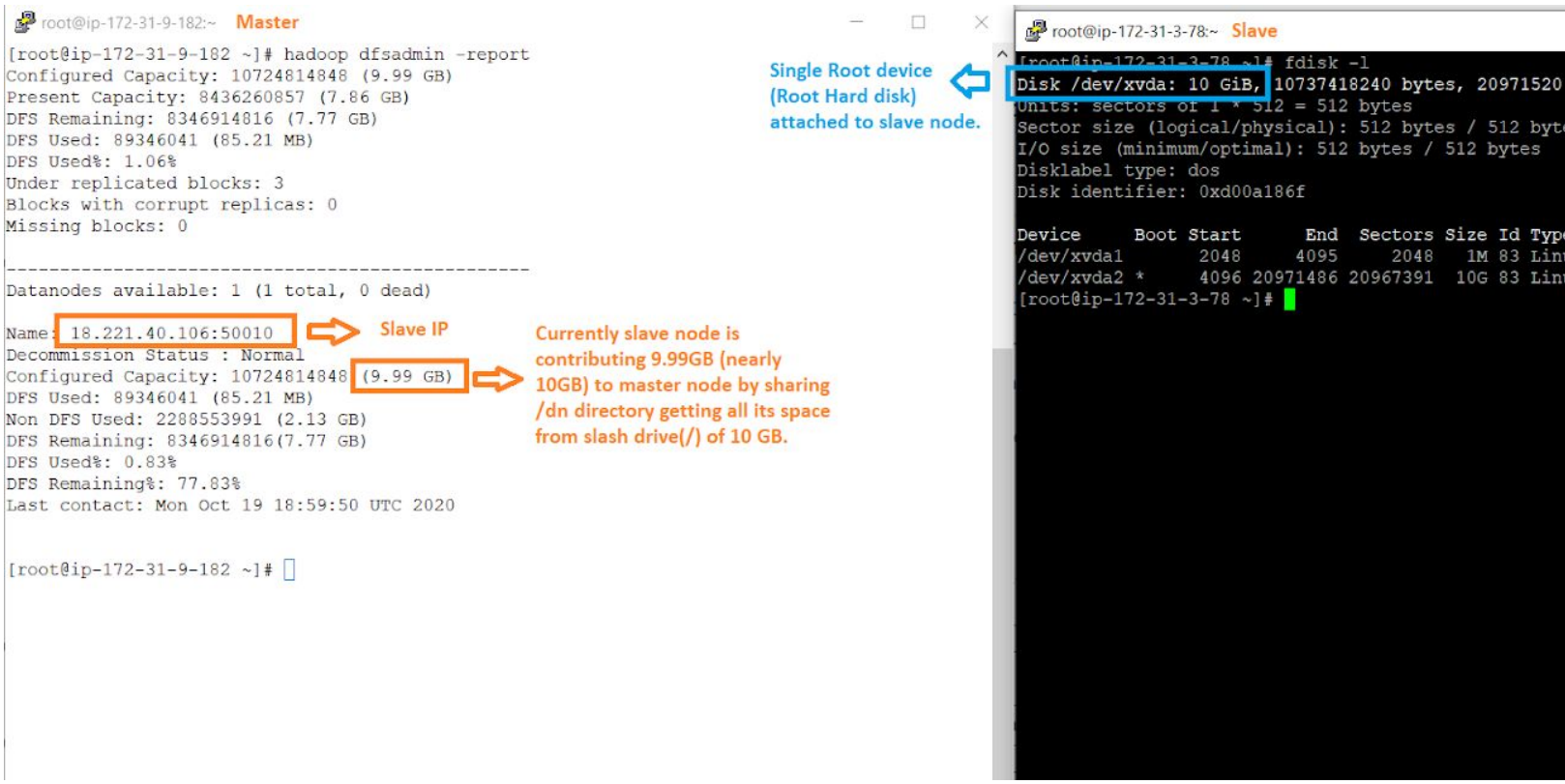
Task 4.1

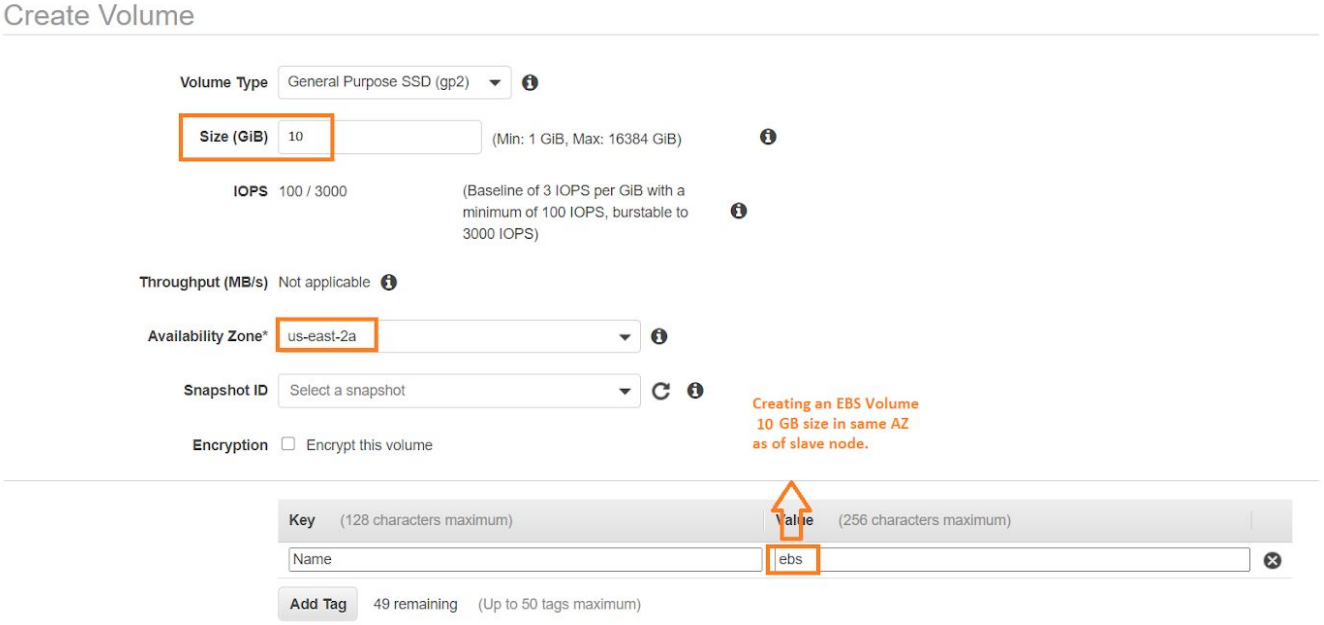
🔷Question- In a Hadoop cluster, find how to contribute limited/specific amount of storage as slave to the cluster?

🔷Answer- Create a partition in the hard disk of desired size and mount it o the directory shared to master node.






root@ip-172-31-9-182:~ Master
[root@ip-172-31-9-182 ~]# hadoop dfsadmin -report
Configured Capacity: 10724814848 (9.99 GB)
Present Capacity: 8436260857 (7.86 GB)
DFS Remaining: 8346914816 (7.77 GB)
DFS Used: 89346041 (85.21 MB)
DFS Used%: 1.06%
Under replicated blocks: 3
Blocks with corrupt replicas: 0
Missing blocks: 0
Datanodes available: 1 (1 total, 0 dead)
Name: 18.221.40.106:50010
Slave IP
Decommission Status : Normal
Configured Capacity: 10724814848 (9.99 GB)
DFS Used: 89346041 (85.21 MB)
Non DFS Used: 2288553991 (2.13 GB)
DFS Remaining: 8346914816(7.77 GB)
DFS Used%: 0.83%
DFS Remaining%: 77.83%
Last contact: Mon Oct 19 18:59:50 UTC 2020
[root@ip-172-31-9-182 ~]#
Currently slave node is contributing 9.99GB (nearly 10GB) to master node by sharing /dn directory getting all its space from slash drive(/) of 10 GB.
Single Root device (Root Hard disk) attached to slave node.
root@ip-172-31-3-78:~ Slave
[root@ip-172-31-3-78 ~]# fdisk -l
Disk /dev/xvda: 10 GiB, 10737418240 bytes, 20971520
Units: sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 byt
I/O size (minimum/optimal): 512 bytes / 512 bytes
Disklabel type: dos
Disk identifier: 0xd00a186f
Device Boot Start End Sectors Size Id Typ
/dev/xvda1 2048 4095 2048 1M 83 Lin
/dev/xvda2 * 4096 20971486 20967391 10G 83 Lin
[root@ip-172-31-3-78 ~]#


Create Volume
Volume Type General Purpose SSD (gp2)
Size (GiB) 10
(Min: 1 GiB, Max: 16384 GiB)
IOPS 100 / 3000
(Baseline of 3 IOPS per GiB with a minimum of 100 IOPS, burstable to 3000 IOPS)
Throughput (MB/s) Not applicable
Availability Zone* us-east-2a
Snapshot ID Select a snapshot
Encryption Encrypt this volume
Creating an EBS Volume 10 GB size in same AZ as of slave node.
Key (128 characters maximum)
Value (256 characters maximum)
Name
ebs
Add Tag
49 remaining
(Up to 50 tags maximum)

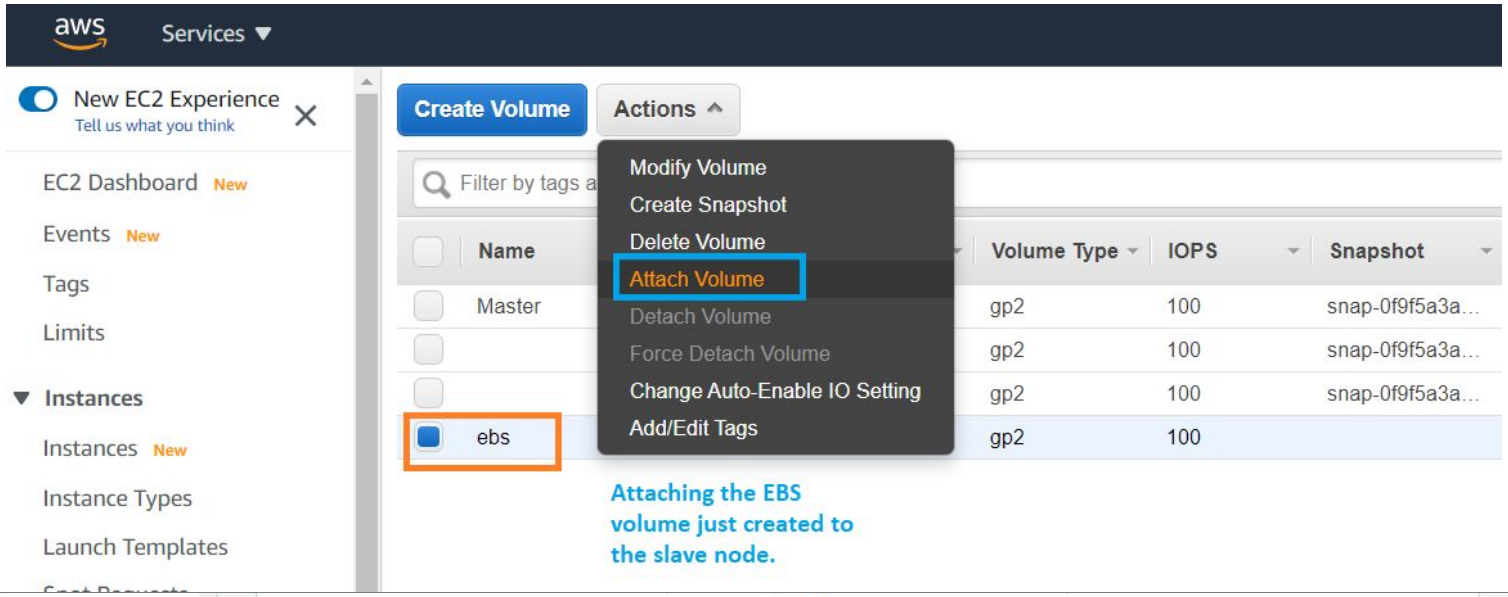
Volumes > Create Volume

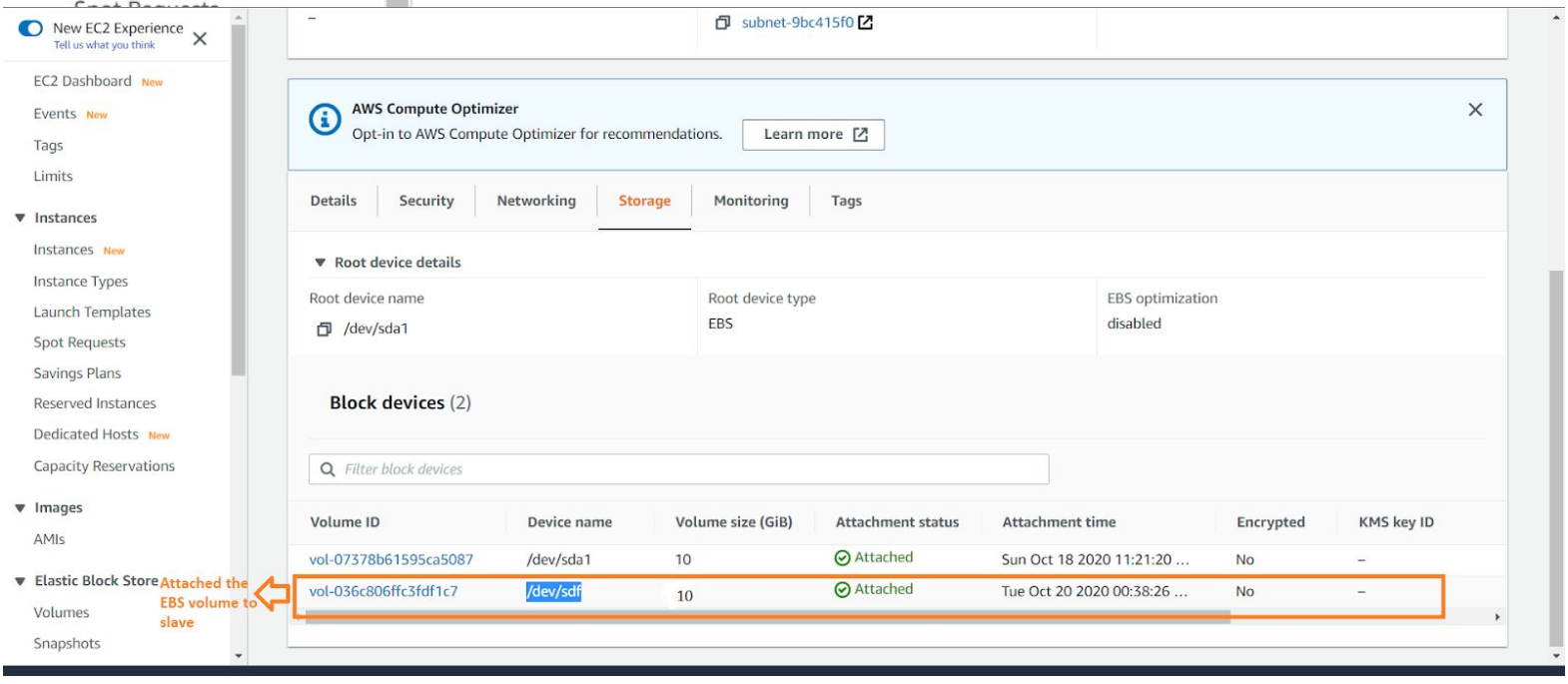
Create Volume

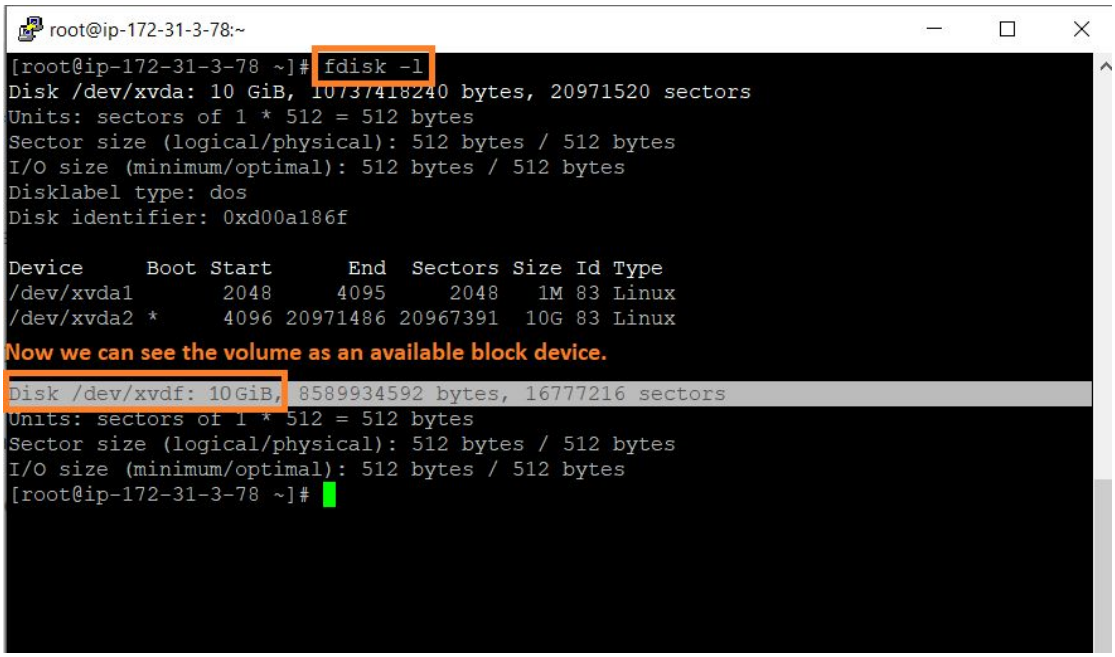
Volume created successfully

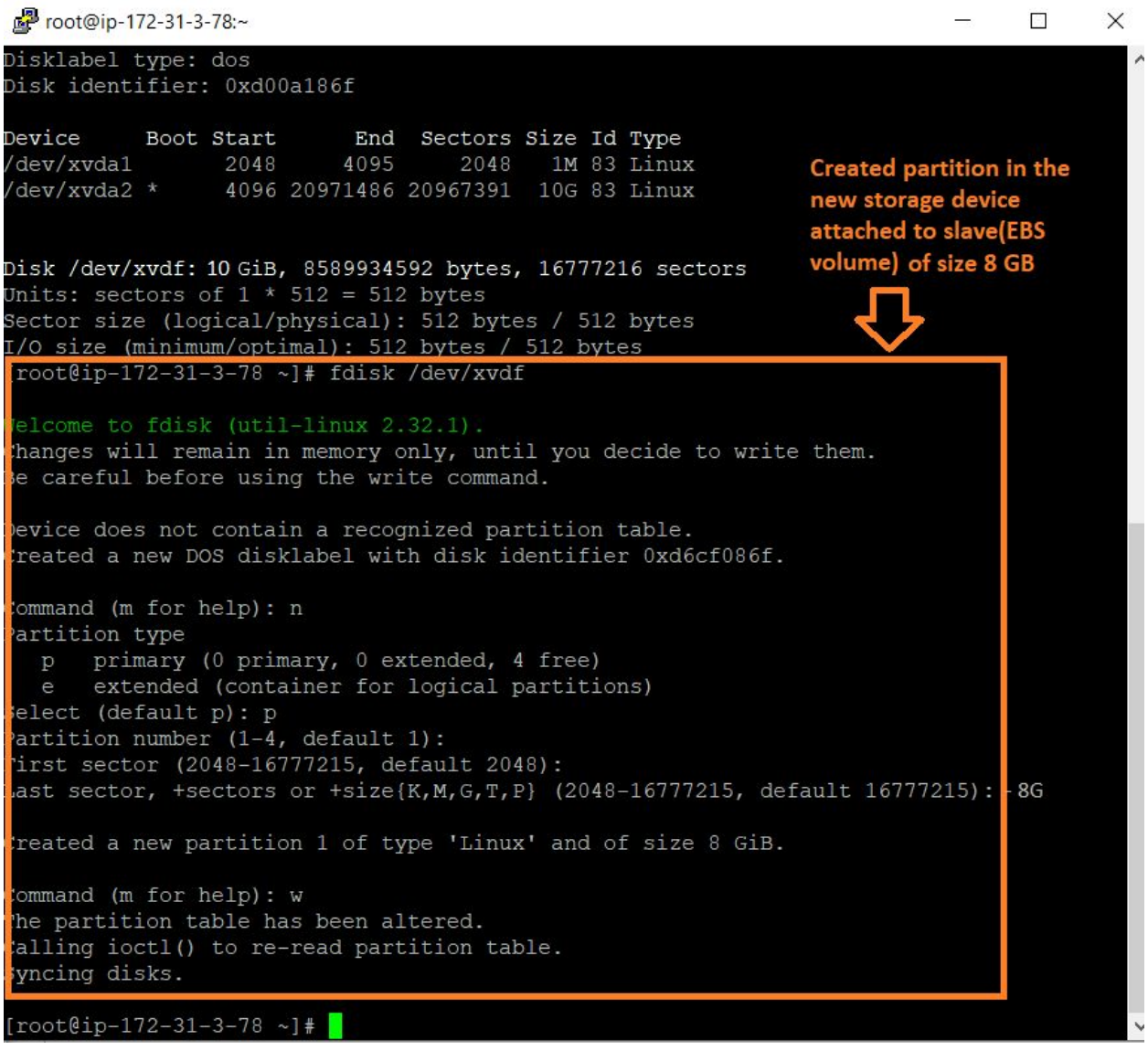
Volume ID vol-036c806ffc3fdf1c7

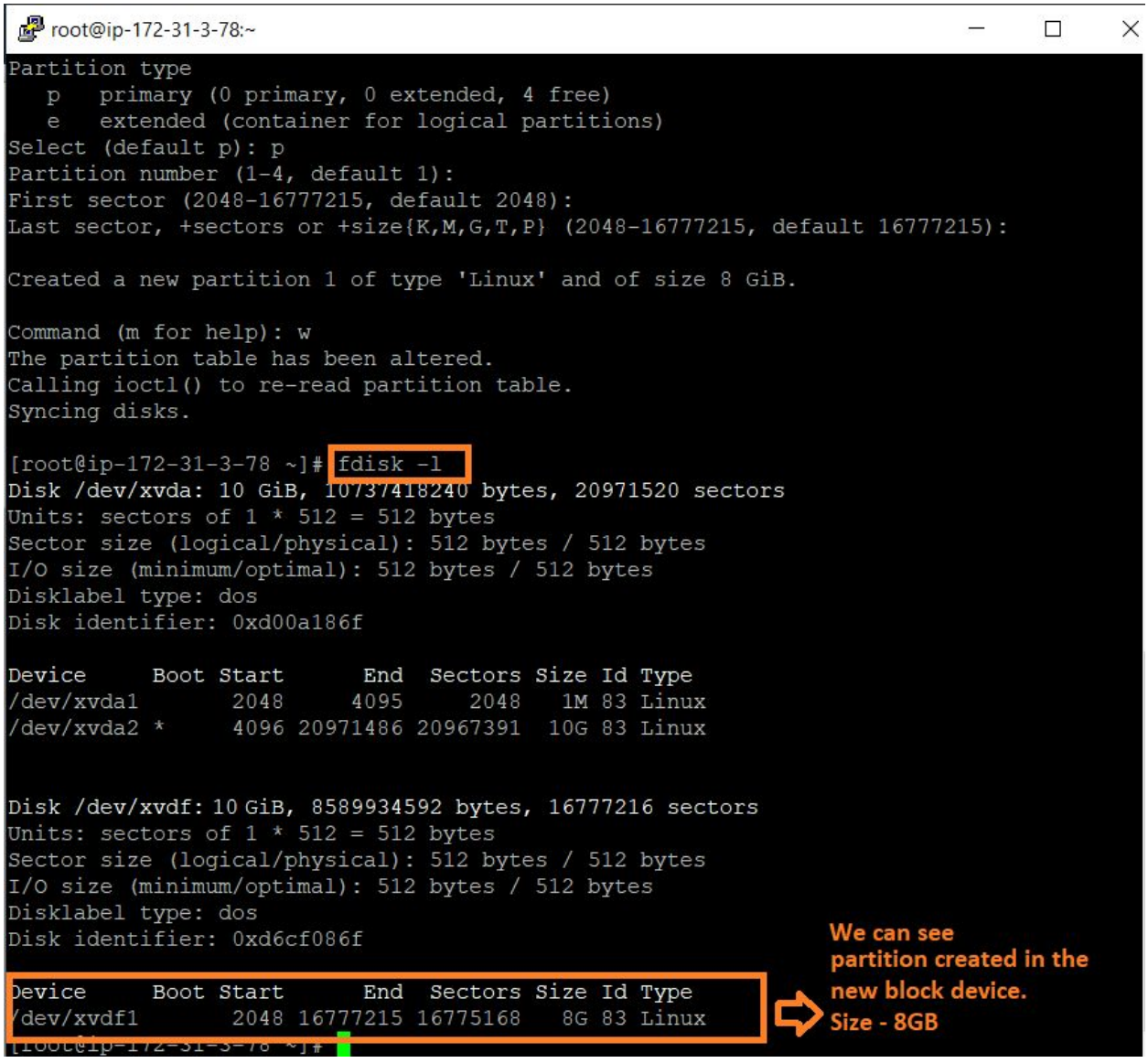
Close

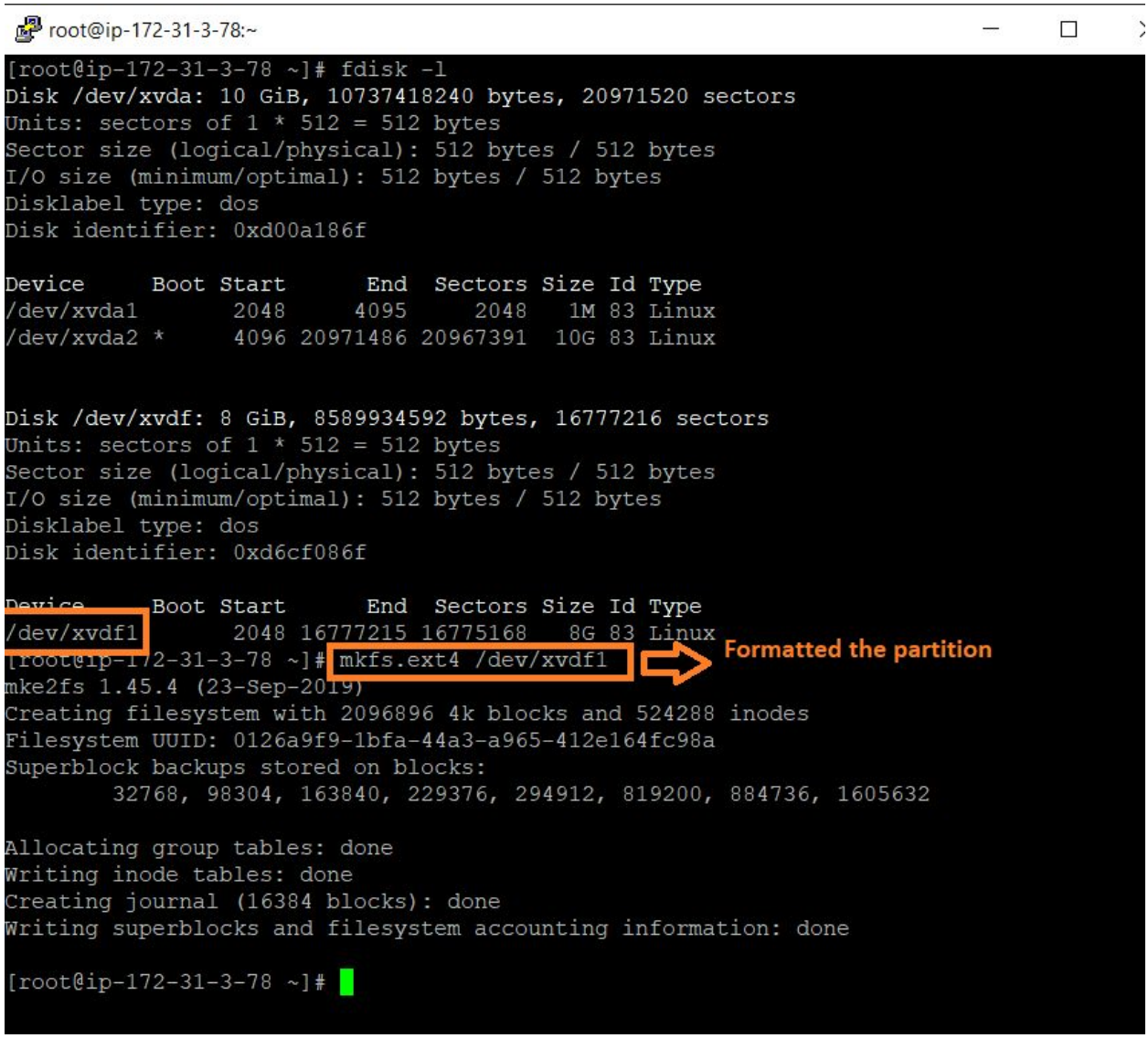


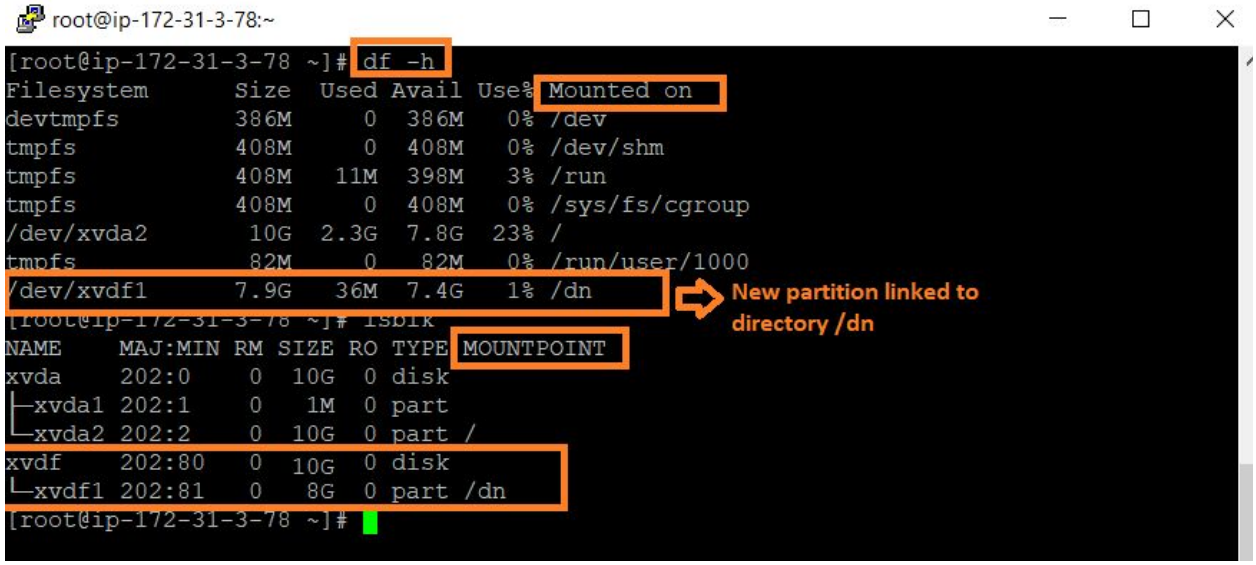



root@ip-172-31-3-78:~
[root@ip-172-31-3-78 ~]# fdisk -l
Disk /dev/xvda: 10 GiB, 10737418240 bytes, 20971520 sectors
Units: sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes
Disklabel type: dos
Disk identifier: 0xd00a186f
Device Boot Start End Sectors Size Id Type
/dev/xvda1 2048 4095 2048 1M 83 Linux
/dev/xvda2 * 4096 20971486 20967391 10G 83 Linux
Now we can see the volume as an available block device.
Disk /dev/xvdf: 10 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
[root@ip-172-31-3-78 ~]#


root@ip-172-31-3-78:~
Disklabel type: dos
Disk identifier: 0xd00a186f
Device Boot Start End Sectors Size Id Type
/dev/xvda1 2048 4095 2048 1M 83 Linux
/dev/xvda2 * 4096 20971486 20967391 10G 83 Linux
Disk /dev/xvdf: 10 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
Created partition in the new storage device attached to slave(EBS volume) of size 8 GB
[root@ip-172-31-3-78 ~]# fdisk /dev/xvdf
elcome to fdisk (util-linux 2.32.1).
hanges will remain in memory only, until you decide to write them.
e careful before using the write command.
evice does not contain a recognized partition table.
reated a new DOS disklabel with disk identifier 0xd6cf086f.
ommand (m for help): n
artition type
p primary (0 primary, 0 extended, 4 free)
e extended (container for logical partitions)
elect (default p): p
artition number (1-4, default 1):
irst sector (2048-16777215, default 2048):
ast sector, +sectors or +size{K,M,G,T,P} (2048-16777215, default 16777215): +8G
reated a new partition 1 of type 'Linux' and of size 8 GiB.
ommand (m for help): w
he partition table has been altered.
alling ioctl() to re-read partition table.
yncing disks.
[root@ip-172-31-3-78 ~]#


root@ip-172-31-3-78:~
Partition type
p primary (0 primary, 0 extended, 4 free)
e extended (container for logical partitions)
Select (default p): p
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):
Created a new partition 1 of type 'Linux' and of size 8 GiB.
Command (m for help): w
The partition table has been altered.
Calling ioctl() to re-read partition table.
Syncing disks.
[root@ip-172-31-3-78 ~]# fdisk -l
Disk /dev/xvda: 10 GiB, 10737418240 bytes, 20971520 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: 0xd00a186f
Device Boot Start End Sectors Size Id Type
/dev/xvda1 2048 4095 2048 1M 83 Linux
/dev/xvda2 * 4096 20971486 20967391 10G 83 Linux
Disk /dev/xvdf: 10 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
Disklabel type: dos
Disk identifier: 0xd6cf086f
Device Boot Start End Sectors Size Id Type
/dev/xvdf1 2048 16777215 16775168 8G 83 Linux
We can see partition created in the new block device. Size - 8GB


root@ip-172-31-3-78:~
[root@ip-172-31-3-78 ~]# fdisk -l
Disk /dev/xvda: 10 GiB, 10737418240 bytes, 20971520 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: 0xd00a186f
Device Boot Start End Sectors Size Id Type
/dev/xvda1 2048 4095 2048 1M 83 Linux
/dev/xvda2 * 4096 20971486 20967391 10G 83 Linux
Disk /dev/xvdf: 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
Disklabel type: dos
Disk identifier: 0xd6cf086f
Device Boot Start End Sectors Size Id Type
/dev/xvdf1 2048 16777215 16775168 8G 83 Linux
[root@ip-172-31-3-78 ~]# mkfs.ext4 /dev/xvdf1
Formatted the partition
mke2fs 1.45.4 (23-Sep-2019)
Creating filesystem with 2096896 4k blocks and 524288 inodes
Filesystem UUID: 0126a9f9-1bfa-44a3-a965-412e164fc98a
Superblock backups stored on blocks:
32768, 98304, 163840, 229376, 294912, 819200, 884736, 1605632
Allocating group tables: done
Writing inode tables: done
Creating journal (16384 blocks): done
Writing superblocks and filesystem accounting information: done
[root@ip-172-31-3-78 ~]#


root@ip-172-31-3-78:~
[root@ip-172-31-3-78 ~]# df -h
Filesystem Size Used Avail Use% Mounted on
devtmpfs 386M 0 386M 0% /dev
tmpfs 408M 0 408M 0% /dev/shm
tmpfs 408M 11M 398M 3% /run
tmpfs 408M 0 408M 0% /sys/fs/cgroup
/dev/xvda2 10G 2.3G 7.8G 23% /
tmpfs 82M 0 82M 0% /run/user/1000
/dev/xvdf1 7.9G 36M 7.4G 1% /dn
New partition linked to directory /dn
[root@ip-172-31-3-78 ~]# lsblk
NAME MAJ:MIN RM SIZE RO TYPE MOUNTPOINT
xvda 202:0 0 10G 0 disk
├─xvda1 202:1 0 1M 0 part
└─xvda2 202:2 0 10G 0 part /
xvdf 202:80 0 10G 0 disk
└─xvdf1 202:81 0 8G 0 part /dn
[root@ip-172-31-3-78 ~]#


root@ip-172-31-9-182:~
Datanodes available: 1 (1 total, 0 dead)
Name: 18.221.40.106:50010
Slave IP
Decommission Status : Normal
Configured Capacity: 10724814848 (9.99 GB)
Initially slave shared 9.99 GB to master as /dn was in slash drive(10 GB)
DFS Used: 89346041 (85.21 MB)
Non DFS Used: 2288553991 (2.13 GB)
DFS Remaining: 8346914816(7.77 GB)
DFS Used%: 0.83%
DFS Remaining%: 77.83%
Last contact: Mon Oct 19 18:59:50 UTC 2020
[root@ip-172-31-9-182 ~]# hadoop dfsadmin -report
Configured Capacity: 8386961408 (7.81 GB)
Present Capacity: 7992348672 (7.44 GB)
DFS Remaining: 7903006720 (7.36 GB)
DFS Used: 89341952 (85.2 MB)
DFS Used%: 1.12%
Under replicated blocks: 3
Blocks with corrupt replicas: 0
Missing blocks: 0

Datanodes available: 1 (1 total, 0 dead)
Name: 18.221.40.106:50010
Slave IP
Decommission Status : Normal
Configured Capacity: 8386961408 (7.81 GB)
Now the /dn directory is linked to partition of size 8GB. Hence sharing its total space(nearly 8 GB) to master.
DFS Used: 89341952 (85.2 MB)
Non DFS Used: 394612736 (376.33 MB)
DFS Remaining: 7903006720(7.36 GB)
DFS Used%: 1.07%
DFS Remaining%: 94.23%
Last contact: Mon Oct 19 19:23:39 UTC 2020
[root@ip-172-31-9-182 ~]#