

**Task 1** – Create a user with your last name and give it admin access equivalent to ROOT user.

Creating a user, providing a password and verifying:

```
[root@B1-ACC-TR2-LIN-SRV-173 ~]# useradd jeetu
[root@B1-ACC-TR2-LIN-SRV-173 ~]# passwd jeetu
Changing password for user jeetu.
New password:
BAD PASSWORD: The password is a palindrome
Retype new password:
passwd: all authentication tokens updated successfully.
[root@B1-ACC-TR2-LIN-SRV-173 ~]#
[root@B1-ACC-TR2-LIN-SRV-173 ~]# tail -1 /etc/passwd
jeetu:x:1001:1001::/home/jeetu:/bin/bash
```

Providing the root equivalent access (using command “visudo”):

```
[root@B1-ACC-TR2-LIN-SRV-173 ~]# visudo
```

Go to line 100, and add your user entry like given below:

```
##
## Allow root to run any commands anywhere
root    ALL=(ALL)        ALL
jeetu    ALL=(ALL)        ALL
```

Login to the “jeetu” user and list the sudo access:

```
[root@B1-ACC-TR2-LIN-SRV-173 ~]# sudo su - jeetu
[jeetu@B1-ACC-TR2-LIN-SRV-173 ~]$
[jeetu@B1-ACC-TR2-LIN-SRV-173 ~]$ sudo -l

We trust you have received the usual lecture from the local System
Administrator. It usually boils down to these three things:

    #1) Respect the privacy of others.
    #2) Think before you type.
    #3) With great power comes great responsibility.

[sudo] password for jeetu:
Matching Defaults entries for jeetu on B1-ACC-TR2-LIN-SRV-173:
    !visiblepw, always_set_home, match_group_by_gid,
    always_query_group_plugin, env_reset, env_keep="COLORS DISPLAY
    HOSTNAME HISTSIZE KDEDIR LS_COLORS", env_keep+="MAIL PS1 PS2 QTDIR
    USERNAME LANG LC_ADDRESS LC_CTYPE", env_keep+="LC_COLLATE
    LC_IDENTIFICATION LC_MEASUREMENT LC_MESSAGES", env_keep+="LC_MONETARY
    LC_NAME LC_NUMERIC LC_PAPER LC_TELEPHONE", env_keep+="LC_TIME LC_ALL
    LANGUAGE LINGUAS _XKB_CHARSET XAUTHORITY",
    secure_path=/sbin\:/bin\:/usr/sbin\:/usr/bin

User jeetu may run the following commands on B1-ACC-TR2-LIN-SRV-173:
    (ALL) ALL
[jeetu@B1-ACC-TR2-LIN-SRV-173 ~]$
```

Activate Windows  
Go to Settings to activate Windows.

**Task 2** - create a user with the following details in a single (useradd command)

- username : rocky
  - user id : 5000
  - comment : Silvester
  - default shell : /bin/sh
- 

Solution:

```
[root@B1-ACC-TR2-LIN-SRV-173 ~]# useradd -s /bin/sh -u 5000 -c "Silvester" rocky
[root@B1-ACC-TR2-LIN-SRV-173 ~]# tail -1 /etc/passwd
rocky:x:5000:5000:Silvester:/home/rocky:/bin/sh
```

**Task 3** - create a group name ltidemo with 3 users (duser1, duser2 and duser3) and give them RWX permissions on a new directory "/demo" and verify. Now, remove the "write" access of duser2 from the same directory without removing the user from the group.

```
[root@B1-ACC-TR2-LIN-SRV-173 ~]# groupadd ltidemo
[root@B1-ACC-TR2-LIN-SRV-173 ~]# useradd -G ltidemo duser1
[root@B1-ACC-TR2-LIN-SRV-173 ~]# useradd -G ltidemo duser2
[root@B1-ACC-TR2-LIN-SRV-173 ~]# useradd -G ltidemo duser3
[root@B1-ACC-TR2-LIN-SRV-173 ~]# mkdir /demo
[root@B1-ACC-TR2-LIN-SRV-173 ~]# ls -ld /demo
drwxr-xr-x 2 root root 6 Sep 12 16:43 /demo
[root@B1-ACC-TR2-LIN-SRV-173 ~]# chmod 770 /demo
[root@B1-ACC-TR2-LIN-SRV-173 ~]# chgrp ltidemo /demo
[root@B1-ACC-TR2-LIN-SRV-173 ~]# ls -ld /demo
drwxrwx--- 2 root ltidemo 6 Sep 12 16:43 /demo
[root@B1-ACC-TR2-LIN-SRV-173 ~]#
```

Removing access of duser2 for same directory.

```
[root@B1-ACC-TR2-LIN-SRV-173 ~]# ls -ld /demo
drwxrwx--- 2 root ltidemo 6 Sep 12 16:43 /demo
[root@B1-ACC-TR2-LIN-SRV-173 ~]# getfacl /demo
getfacl: Removing leading '/' from absolute path names
# file: demo
# owner: root
# group: ltidemo
user::rwx
group::rwx
other::---
```

Giving read only access to directory:

```
[root@B1-ACC-TR2-LIN-SRV-173 ~]# ls -ld /demo
drwxrwx---+ 2 root ltidemo 6 Sep 12 16:43 /demo
[root@B1-ACC-TR2-LIN-SRV-173 ~]# setfacl -m u:duser2:r-x /demo
[root@B1-ACC-TR2-LIN-SRV-173 ~]# getfacl /demo
getfacl: Removing leading '/' from absolute path names
# file: demo
# owner: root
# group: ltidemo
user::rwx
user:duser2:r-x
group::rwx
mask::rwx
other::---
```



**Task 4** - Display the following values using commands:

- Name of your linux system
  - IP address of your system.
  - Free and available RAM
- 

Name of your linux system:

```
[root@B1-ACC-TR2-LIN-SRV-173 ~]# hostname
B1-ACC-TR2-LIN-SRV-173
[root@B1-ACC-TR2-LIN-SRV-173 ~]#
[root@B1-ACC-TR2-LIN-SRV-173 ~]# hostnamectl
Static hostname: B1-ACC-TR2-LIN-SRV-173
Pretty hostname: Lin-Server
Icon name: computer-vm
Chassis: vm
Machine ID: e2a825bfaf494fdb9ba5359d34e1dd08
Boot ID: fea187d872b341ef9dd89704b9440cbe
Virtualization: vmware
Operating System: CentOS Stream 9
CPE OS Name: cpe:/o:centos:centos:9
Kernel: Linux 5.14.0-583.el9.x86_64
Architecture: x86-64
Hardware Vendor: VMware, Inc.
Hardware Model: VMware Virtual Platform
Firmware Version: 6.00
[root@B1-ACC-TR2-LIN-SRV-173 ~]#
```

IP address of your system.

```
[root@B1-ACC-TR2-LIN-SRV-173 ~]# hostname -I
172.22.61.173
[root@B1-ACC-TR2-LIN-SRV-173 ~]# ip address
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN group default qlen 1000
    link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
    inet 127.0.0.1/8 scope host lo
        valid_lft forever preferred_lft forever
    inet6 ::1/128 scope host
        valid_lft forever preferred_lft forever
2: ens160: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc mq state UP group default qlen 1000
    link/ether 00:50:56:b1:43:1c brd ff:ff:ff:ff:ff:ff
    altname enp3s0
    inet 172.22.61.173/24 brd 172.22.61.255 scope global noprefixroute ens160
        valid_lft forever preferred_lft forever
    inet6 fe80::250:56ff:feb1:431c/64 scope link noprefixroute
        valid_lft forever preferred_lft forever
[root@B1-ACC-TR2-LIN-SRV-173 ~]#
```

```
[root@B1-ACC-TR2-LIN-SRV-173 ~]# ifconfig | grep inet
    inet 172.22.61.173 netmask 255.255.255.0 broadcast 172.22.61.255
    inet6 fe80::250:56ff:feb1:431c prefixlen 64 scopeid 0x20<link>
    inet 127.0.0.1 netmask 255.0.0.0
    inet6 ::1 prefixlen 128 scopeid 0x10<host>
[root@B1-ACC-TR2-LIN-SRV-173 ~]#
```

Free and available RAM:

```
[root@B1-ACC-TR2-LIN-SRV-173 ~]# free -h
              total        used        free      shared  buff/cache   available
Mem:           3.5Gi        824Mi        2.5Gi         15Mi         463Mi        2.7Gi
Swap:           4.0Gi           0B         4.0Gi
[root@B1-ACC-TR2-LIN-SRV-173 ~]#
```

## Task 5 – remove the RAID 0 from linux

Listing RAID details:

```
[root@B1-ACC-TR2-LIN-SRV-173 ~]# lsblk
NAME                MAJ:MIN RM  SIZE RO TYPE  MOUNTPOINTS
sda                  8:0      0   60G  0 disk
├─sda1               8:1      0    2G  0 part  /boot
├─sda2               8:2      0    1G  0 part  /boot/efi
└─sda3               8:3      0   44G  0 part
   ├─cs-root         253:0     0   10G  0 lvm    /
   ├─cs-swap         253:1     0    4G  0 lvm    [SWAP]
   ├─cs-tmp          253:2     0    5G  0 lvm    /tmp
   ├─cs-var          253:3     0   20G  0 lvm    /var
   └─cs-home         253:4     0    5G  0 lvm    /home
sdb                  8:16     0   30G  0 disk
├─sdb1               8:17     0   10G  0 part
│ └─md0              9:0      0   20G  0 raid0
sdc                  8:32     0   30G  0 disk
├─sdc1               8:33     0   10G  0 part
│ └─md0              9:0      0   20G  0 raid0
sr0                  11:0     1 1024M  0 rom
[root@B1-ACC-TR2-LIN-SRV-173 ~]#
```

Listing details:

```
[root@B1-ACC-TR2-LIN-SRV-173 ~]# mdadm --detail /dev/md0
/dev/md0:
        Version : 1.2
  Creation Time : Fri Sep 12 04:47:22 2025
    Raid Level : raid0
    Array Size : 20953088 (19.98 GiB 21.46 GB)
    Raid Devices : 2
    Total Devices : 2
 Persistence : Superblock is persistent
```

Unmount the mounted RAID partition:

```
# umount /raid0
```



Stopping the RAID:

```
[root@B1-ACC-TR2-LIN-SRV-173 ~]# mdadm --stop /dev/md0
mdadm: stopped /dev/md0
[root@B1-ACC-TR2-LIN-SRV-173 ~]#
[root@B1-ACC-TR2-LIN-SRV-173 ~]#
```

Removing the RAID:

```
# mdadm --remove /dev/md0
```

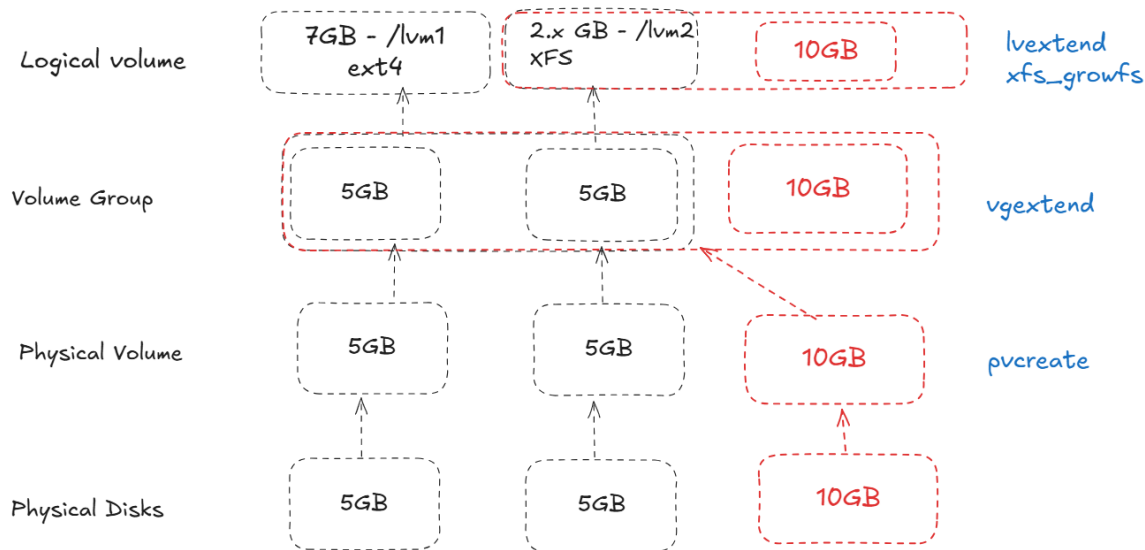
Run the following command:

```
[root@B1-ACC-TR2-LIN-SRV-173 ~]# mdadm --manage /dev/md0 --remove /dev/sdb1
mdadm: error opening /dev/md0: No such file or directory
[root@B1-ACC-TR2-LIN-SRV-173 ~]#
[root@B1-ACC-TR2-LIN-SRV-173 ~]# mdadm --manage /dev/md0 --remove /dev/sdc1
mdadm: error opening /dev/md0: No such file or directory
[root@B1-ACC-TR2-LIN-SRV-173 ~]#
[root@B1-ACC-TR2-LIN-SRV-173 ~]# mdadm --zero-superblock /dev/sdb1 /dev/sdc1
[root@B1-ACC-TR2-LIN-SRV-173 ~]#
[root@B1-ACC-TR2-LIN-SRV-173 ~]# mdadm -E /dev/sdb1 /dev/sdc1
mdadm: No md superblock detected on /dev/sdb1.
mdadm: No md superblock detected on /dev/sdc1.
[root@B1-ACC-TR2-LIN-SRV-173 ~]#
[root@B1-ACC-TR2-LIN-SRV-173 ~]#
```

Verify:

```
[root@B1-ACC-TR2-LIN-SRV-173 ~]# lsblk
NAME                MAJ:MIN RM  SIZE RO TYPE MOUNTPOINTS
sda                  8:0      0   60G  0 disk
├─sda1                8:1      0    2G  0 part /boot
├─sda2                8:2      0    1G  0 part /boot/efi
└─sda3                8:3      0   44G  0 part
   ├─cs-root          253:0     0   10G  0 lvm  /
   ├─cs-swap          253:1     0    4G  0 lvm  [SWAP]
   ├─cs-tmp           253:2     0    5G  0 lvm  /tmp
   ├─cs-var            253:3     0   20G  0 lvm  /var
   └─cs-home          253:4     0    5G  0 lvm  /home
sdb                  8:16     0   30G  0 disk
└─sdb1                8:17     0   10G  0 part
sdc                  8:32     0   30G  0 disk
└─sdc1                8:33     0   10G  0 part
sr0                  11:0     1 1024M  0 rom
[root@B1-ACC-TR2-LIN-SRV-173 ~]#
```

**Task 6** – Create 2 LVM using the /dev/sdb and /dev/sdc with EXT4 with 7GB LVM and XFS with 3GB LVM file system respectively. Add another 10GB and extend 2<sup>nd</sup> LVM from ~3GB to ~13GB and verify.



### Solution:

Listing current status:

```
[root@B1-ACC-TR2-LIN-SRV-173 ~]# lsblk /dev/sdb /dev/sdc
NAME MAJ:MIN RM SIZE RO TYPE MOUNTPOINTS
sdb   8:16    0  30G  0 disk
sdc   8:32    0  30G  0 disk
[root@B1-ACC-TR2-LIN-SRV-173 ~]#
```

Creating 5-5GB partitions using /dev/sdb and /dev/sdc

```
[root@B1-ACC-TR2-LIN-SRV-173 ~]# lsblk /dev/sdb /dev/sdc
NAME      MAJ:MIN RM  SIZE RO TYPE MOUNTPOINTS
sdb        8:16    0   30G  0 disk
└─sdb1     8:17    0    5G  0 part
sdc        8:32    0   30G  0 disk
└─sdc1     8:33    0    5G  0 part
[root@B1-ACC-TR2-LIN-SRV-173 ~]#
```

Creating physical volume:

```
[root@B1-ACC-TR2-LIN-SRV-173 ~]# pvcreate /dev/sdb1 /dev/sdc1
Physical volume "/dev/sdb1" successfully created.
Physical volume "/dev/sdc1" successfully created.
[root@B1-ACC-TR2-LIN-SRV-173 ~]# pvs
PV          VG Fmt  Attr PSize  PFree
/dev/sda3   cs  lvm2 a--  44.00g 4.00m
/dev/sdb1   lvm2 ---   5.00g 5.00g
/dev/sdc1   lvm2 ---   5.00g 5.00g
[root@B1-ACC-TR2-LIN-SRV-173 ~]#
```



Creating volume group:

```
[root@B1-ACC-TR2-LIN-SRV-173 ~]# vgcreate vg /dev/sdb1 /dev/sdc1
Volume group "vg" successfully created
[root@B1-ACC-TR2-LIN-SRV-173 ~]#
[root@B1-ACC-TR2-LIN-SRV-173 ~]# vgs
VG #PV #LV #SN Attr   VSize  VFree
cs   1   5   0 wz--n- 44.00g 4.00m
vg   2   0   0 wz--n-  9.99g 9.99g
```

Creating logical volume:

```
[root@B1-ACC-TR2-LIN-SRV-173 ~]# lvcreate -n lv1 -L +7G vg
Logical volume "lv1" created.
[root@B1-ACC-TR2-LIN-SRV-173 ~]# lvcreate -n lv2 -l 100%FREE vg
Logical volume "lv2" created.
[root@B1-ACC-TR2-LIN-SRV-173 ~]# lvs
LV VG Attr      LSize  Pool Origin Data%  Meta%  Move Log Cpy%Sync Convert
home cs -wi-ao---- 5.00g
root cs -wi-ao---- 10.00g
swap cs -wi-ao---- 4.00g
tmp  cs -wi-ao---- 5.00g
var  cs -wi-ao---- 20.00g
lv1  vg -wi-a----- 7.00g
lv2  vg -wi-a----- 2.99g
[root@B1-ACC-TR2-LIN-SRV-173 ~]#
```

Creating a directories /lvm1 and /lvm2. Also, creating EXT4 partition for LV1.

```
[root@B1-ACC-TR2-LIN-SRV-173 ~]# mkdir /lvm1
[root@B1-ACC-TR2-LIN-SRV-173 ~]# mkdir /lvm2
[root@B1-ACC-TR2-LIN-SRV-173 ~]# mkfs.ext4 /dev/vg/lv1
mke2fs 1.46.5 (30-Dec-2021)
Discarding device blocks: done
Creating filesystem with 1835008 4k blocks and 458752 inodes
Filesystem UUID: 885f96b3-057f-44b7-ad37-d8b667197329
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
```

Creating XFS partition for LV2.

```
[root@B1-ACC-TR2-LIN-SRV-173 ~]# mkfs.xfs /dev/vg/lv2
meta-data=/dev/vg/lv2      isize=512    agcount=4, agsize=196096 blks
               =           sectsz=512    attr=2, projid32bit=1
               =           crc=1        finobt=1, sparse=1, rmapbt=0
               =           reflink=1    bigtime=1 inobtcount=1 nrext64=0
data        =             bsize=4096    blocks=784384, imaxpct=25
               =             sunit=0     swidth=0 blks
naming      =version 2      bsize=4096    ascii-ci=0, ftype=1
log         =internal log   bsize=4096    blocks=16384, version=2
               =           sectsz=512    sunit=0 blks, lazy-count=1
realtime    =none          extsz=4096    blocks=0, rtextents=0
Discarding blocks...Done.
[root@B1-ACC-TR2-LIN-SRV-173 ~]#
```



Mounting the partition:

```
[root@B1-ACC-TR2-LIN-SRV-173 ~]# mount /dev/vg/lv1 /lvm1
[root@B1-ACC-TR2-LIN-SRV-173 ~]# mount /dev/vg/lv2 /lvm2
[root@B1-ACC-TR2-LIN-SRV-173 ~]#
[root@B1-ACC-TR2-LIN-SRV-173 ~]# df -h /lvm1 /lvm2
Filesystem                Size      Used Avail Use% Mounted on
/dev/mapper/vg-lv1        6.8G       24K   6.5G   1% /lvm1
/dev/mapper/vg-lv2        3.0G      54M   2.9G   2% /lvm2
[root@B1-ACC-TR2-LIN-SRV-173 ~]#
[root@B1-ACC-TR2-LIN-SRV-173 ~]# df -hT /lvm1 /lvm2
Filesystem                Type      Size      Used Avail Use% Mounted on
/dev/mapper/vg-lv1        ext4      6.8G       24K   6.5G   1% /lvm1
/dev/mapper/vg-lv2        xfs       3.0G      54M   2.9G   2% /lvm2
[root@B1-ACC-TR2-LIN-SRV-173 ~]#
```

Extending the partition:

Creating 10 GB partition from /dev/sdc:

```
[root@B1-ACC-TR2-LIN-SRV-173 ~]# fdisk -l /dev/sdb
Disk /dev/sdb: 30 GiB, 32212254720 bytes, 62914560 sectors
Disk model: Virtual disk
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: 0xae7d2cb6

Device     Boot      Start          End      Sectors   Size Id Type
/dev/sdb1             2048    10487807    10485760     5G 8e Linux LVM
/dev/sdb2          10487808    31459327    20971520    10G 8e Linux LVM
[root@B1-ACC-TR2-LIN-SRV-173 ~]#
```

Creating PV:

```
[root@B1-ACC-TR2-LIN-SRV-173 ~]# pvcreate /dev/sdb2
Physical volume "/dev/sdb2" successfully created.
```

Extending VG:

```
[root@B1-ACC-TR2-LIN-SRV-173 ~]# vgs
VG #PV #LV #SN Attr   VSize  VFree
cs  1  5  0 wz--n- 44.00g 4.00m
vg  2  2  0 wz--n-  9.99g  0
[root@B1-ACC-TR2-LIN-SRV-173 ~]# vgextend vg /dev/sdb2
Volume group "vg" successfully extended
[root@B1-ACC-TR2-LIN-SRV-173 ~]# vgs
VG #PV #LV #SN Attr   VSize  VFree
cs  1  5  0 wz--n- 44.00g 4.00m
vg  3  2  0 wz--n- <19.99g <10.00g
[root@B1-ACC-TR2-LIN-SRV-173 ~]#
```



Extending LV (lv2):

```
[root@B1-ACC-TR2-LIN-SRV-173 ~]# lvs
LV VG Attr      LSize  Pool Origin Data%  Meta%  Move Log Cpy%Sync Convert
home cs -wi-ao---- 5.00g
root cs -wi-ao---- 10.00g
swap cs -wi-ao---- 4.00g
tmp  cs -wi-ao---- 5.00g
var  cs -wi-ao---- 20.00g
lv1  vg -wi-ao---- 7.00g
lv2  vg -wi-ao---- 2.99g
```

Extending the LV:

```
[root@B1-ACC-TR2-LIN-SRV-173 ~]# lvextend -l 100%FREE /dev/vg/lv2
Size of logical volume vg/lv2 changed from 2.99 GiB (766 extents) to <10.00 GiB (2559 extents).
Logical volume vg/lv2 successfully resized.
[root@B1-ACC-TR2-LIN-SRV-173 ~]# lvs
LV VG Attr      LSize  Pool Origin Data%  Meta%  Move Log Cpy%Sync Convert
home cs -wi-ao---- 5.00g
root cs -wi-ao---- 10.00g
swap cs -wi-ao---- 4.00g
tmp  cs -wi-ao---- 5.00g
var  cs -wi-ao---- 20.00g
lv1  vg -wi-ao---- 7.00g
lv2  vg -wi-ao---- <10.00g
[root@B1-ACC-TR2-LIN-SRV-173 ~]#
```

Checking the size – updated size isn't available.

```
[root@B1-ACC-TR2-LIN-SRV-173 ~]# df -hT /lvm2
Filesystem Type Size Used Avail Use% Mounted on
/dev/mapper/vg-lv2 xfs 3.0G 54M 2.9G 2% /lvm2
```

Resizing the current available:

```
[root@B1-ACC-TR2-LIN-SRV-173 ~]# df -hT /lvm2
Filesystem Type Size Used Avail Use% Mounted on
/dev/mapper/vg-lv2 xfs 3.0G 54M 2.9G 2% /lvm2
[root@B1-ACC-TR2-LIN-SRV-173 ~]#
[root@B1-ACC-TR2-LIN-SRV-173 ~]# xfs_growfs /lvm2
meta-data=/dev/mapper/vg-lv2 isize=512 agcount=4, agsize=196096 blks
= sectsz=512 attr=2, projid32bit=1
= crc=1 finobt=1, sparse=1, rmapbt=0
= reflink=1 bigtime=1 inobtcount=1 nnext64=0
data = bsize=4096 blocks=784384, imaxpct=25
= sunit=0 swidth=0 blks
naming =version 2 bsize=4096 ascii-ci=0, ftype=1
log =internal log bsize=4096 blocks=16384, version=2
= sectsz=512 sunit=0 blks, lazy-count=1
realtime =none extsz=4096 blocks=0, rtextents=0
data blocks changed from 784384 to 2620416
[root@B1-ACC-TR2-LIN-SRV-173 ~]#
[root@B1-ACC-TR2-LIN-SRV-173 ~]# df -hT /lvm2
Filesystem Type Size Used Avail Use% Mounted on
/dev/mapper/vg-lv2 xfs 10G 104M 9.9G 2% /lvm2
[root@B1-ACC-TR2-LIN-SRV-173 ~]#
```