

LVM Snapshots in Linux

A snapshot in Linux LVM (Logical Volume Manager) is a point-in-time copy of a logical volume. It is useful for creating backups or testing changes without altering the original data.

Steps to Create an LVM Snapshot

1. Identify the Logical Volume

Check the logical volumes available on your system using the `lvdisplay` command:

```
lvdisplay
```

2. Ensure Free Space in the Volume Group

Snapshots require free space in the Volume Group. Verify free space using:

```
vgs
```

3. Create the Snapshot

Use the `lvcreate` command to create a snapshot of the logical volume. Replace `<size>`, `<snapshot_name>`, and `<logical_volume_path>` with appropriate values:

```
lvcreate -L <size> -s -n <snapshot_name> <logical_volume_path>
```

Example:

```
lvcreate -L 500M -s -n data_snapshot /dev/vg_name/data_lv
```

4. Mount the Snapshot

Mount the snapshot to a directory for access.

```
mount /dev/vg_name/data_snapshot /mnt/snapshot
```

5. Verify the Snapshot

Use `df -h` or `ls` to ensure the snapshot is mounted correctly and data is accessible.

```
df -h
```

6. Revert from Snapshot (Optional)

If you need to revert the original logical volume to the snapshot, use:

```
lvconvert --merge /dev/vg_name/data_snapshot
```

Reboot or unmount the logical volume to complete the merge.

7. Remove the Snapshot

To delete the snapshot after use:

lvremove /dev/vg_name/data_snapshot

```
[root@nod1 ~]# lsblk
NAME                                MAJ:MIN RM  SIZE RO TYPE MOUNTPOINT
sr0                                11:0    1 1024M  0 rom
nvme0n1                            259:0    0   20G  0 disk
├─nvme0n1p1                        259:1    0    1G  0 part /boot
├─nvme0n1p2                        259:2    0   19G  0 part
│   └─rhel_server-root            253:0    0   17G  0 lvm /
│       └─rhel_server-swap        253:1    0    2G  0 lvm [SWAP]
nvme0n2                            259:3    0   20G  0 disk
nvme0n3                            259:4    0   20G  0 disk
├─nvme0n3p1                        259:5    0  512M  0 part
├─nvme0n3p2                        259:6    0    2G  0 part
│   └─datastore-database          253:2    0   800M  0 lvm
```

```
datastore-database 253:2    0   800M  0 lvm
[root@nod1 ~]# fdisk /dev/nvme0n2

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.

Command (m for help): n
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 (2048-41943039, default 2048):
Last sector, +sectors or +size{K,M,G,T,P} (2048-41943039, default 41943039): +10G

Created a new partition 1 of type 'Linux' and of size 10 GiB.

Command (m for help): t
Selected partition 1
Hex code (type L to list all codes): 8e
Changed type of partition 'Linux' to 'Linux LVM'.
```

Changed type of partition 'Linux' to 'Linux LVM'.

Command (m for help): p

Disk /dev/nvme0n2: 20 GiB, 21474836480 bytes, 41943040 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: 0xfc862658

Device	Boot	Start	End	Sectors	Size	Id	Type
/dev/nvme0n2p1		2048	20973567	20971520	10G	8e	Linux LVM

Command (m for help): w

The partition table has been altered.

Calling ioctl() to re-read partition table.

Syncing disks.

[root@nod1 ~]#

[root@nod1 ~]# lsblk

NAME	MAJ:MIN	RM	SIZE	RO	TYPE	MOUNTPOINT
sr0	11:0	1	1024M	0	rom	

sr0	11:0	1	1024M	0	rom	
nvme0n1	259:0	0	20G	0	disk	
└─nvme0n1p1	259:1	0	1G	0	part	/boot
└─nvme0n1p2	259:2	0	19G	0	part	
└─rhel_server-root	253:0	0	17G	0	lvm	/
└─rhel_server-swap	253:1	0	2G	0	lvm	[SWAP]
nvme0n2	259:3	0	20G	0	disk	
└─nvme0n2p1	259:7	0	10G	0	part	
nvme0n3	259:4	0	20G	0	disk	
└─nvme0n3p1	259:5	0	512M	0	part	
└─nvme0n3p2	259:6	0	2G	0	part	
└─datastore-database	253:2	0	800M	0	lvm	

[root@nod1 ~]# pvcreate /dev/nv

nvme0 nvme0n1p1 nvme0n2 nvme0n3 nvme0n3p2

nvme0n1 nvme0n1p2 nvme0n2p1 nvme0n3p1 nvram

[root@nod1 ~]# pvcreate /dev/nvme0n2p1

WARNING: dos signature detected on /dev/nvme0n2p1 at offset 510. Wipe it? [y/n]: y

Wiping dos signature on /dev/nvme0n2p1.

Physical volume "/dev/nvme0n2p1" **successfully** created.

[root@nod1 ~]# pvs

PV	VG	Fmt	Attr	PSize	PFree
/dev/nvme0n1p2	rhel_server	lvm2	a--	<19.00g	0

```

/dev/nvme0n1p2 rhel_server lvm2 a-- <19.00g 0
/dev/nvme0n2p1 lvm2 --- 10.00g 10.00g
/dev/nvme0n3p2 datastore lvm2 a-- 1.99g 1.21g
[root@nod1 ~]# vgcreate my_vg /dev/nvme0n2p1
Volume group "my_vg" successfully created
[root@nod1 ~]# vgs
VG          #PV #LV #SN Attr   VSize   VFree
datastore   1   1   0 wz--n-   1.99g   1.21g
my_vg       1   0   0 wz--n- <10.00g <10.00g
rhel_server 1   2   0 wz--n- <19.00g 0
[root@nod1 ~]# lvcreate -L 5G -n my_lv my_vg
Logical volume "my_lv" created.
[root@nod1 ~]# lvs
LV          VG          Attr      LSize   Pool Origin Data%  Meta%
Move Log Cpy%Sync Convert
database    datastore  -wi-a----- 800.00m

my_lv       my_vg       -wi-a----- 5.00g

root        rhel_server -wi-ao---- <17.00g

swap        rhel_server -wi-ao---- 2.00g

```

```

[root@nod1 ~]# mkfs.ext4 /dev/my_vg/my_lv
mke2fs 1.44.3 (10-July-2018)
Creating filesystem with 1310720 4k blocks and 327680 inodes
Filesystem UUID: e72ca96a-2c4d-46e9-8a22-836eb7fdb8e0
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@nod1 ~]# mkdir /mnt/my_data
[root@nod1 ~]# mount /dev/my_vg/my_lv /mnt/my_data/
[root@nod1 ~]# df -h
Filesystem                Size      Used Avail Use% Mounted on
devtmpfs                  969M         0   969M   0% /dev
tmpfs                     984M         0   984M   0% /dev/shm
tmpfs                     984M    9.4M   974M   1% /run
tmpfs                     984M         0   984M   0% /sys/fs/cgroup
/dev/mapper/rhel_server-root 17G     3.9G    14G   23% /
/dev/nvme0n1p1            1014M    153M   862M   15% /boot
tmpfs                     197M     16K   197M   1% /run/user/42

```

```

/dev/mapper/my_vg-my_lv      4.9G   20M   4.6G    1% /mnt/my_data
[root@nod1 ~]# cp /usr/ /mnt/my_data/
cp: -r not specified; omitting directory '/usr/'
[root@nod1 ~]# cp -r /usr/ /mnt/my_data/
^C
[root@nod1 ~]# df -h

```

Filesystem	Size	Used	Avail	Use%	Mounted on
devtmpfs	969M	0	969M	0%	/dev
tmpfs	984M	0	984M	0%	/dev/shm
tmpfs	984M	9.4M	974M	1%	/run
tmpfs	984M	0	984M	0%	/sys/fs/cgroup
/dev/mapper/rhel_server-root	17G	3.9G	14G	23%	/
/dev/nvme0n1p1	1014M	153M	862M	15%	/boot
tmpfs	197M	16K	197M	1%	/run/user/42
tmpfs	197M	4.0K	197M	1%	/run/user/0
/dev/mapper/my_vg-my_lv	4.9G	96M	4.5G	3%	/mnt/my_data

```

[root@nod1 ~]# cp -r /usr/ /mnt/my_data/

```

```

[root@nod1 ~]# df -h

```

Filesystem	Size	Used	Avail	Use%	Mounted on
devtmpfs	969M	0	969M	0%	/dev
tmpfs	984M	0	984M	0%	/dev/shm
tmpfs	984M	9.4M	974M	1%	/run
tmpfs	984M	0	984M	0%	/sys/fs/cgroup
/dev/mapper/rhel_server-root	17G	3.9G	14G	23%	/
/dev/nvme0n1p1	1014M	153M	862M	15%	/boot
tmpfs	197M	16K	197M	1%	/run/user/42
tmpfs	197M	4.0K	197M	1%	/run/user/0
/dev/mapper/my_vg-my_lv	4.9G	126M	4.5G	3%	/mnt/my_data

```

[root@nod1 ~]#
[root@nod1 ~]#
[root@nod1 ~]#
[root@nod1 ~]# lvcreate -L 1G -s -n my_snapshot /dev/my_vg/my
Snapshot origin LV my not found in Volume group my_vg.
[root@nod1 ~]# lvcreate -L 1G -s -n my_snapshot /dev/my_vg/my_lv
Logical volume "my snapshot" created.

```

```

[root@nod1 ~]# lvcreate -L 1G -s -n my_snapshot /dev/my_vg/my
Snapshot origin LV my not found in Volume group my_vg.
[root@nod1 ~]# lvcreate -L 1G -s -n my_snapshot /dev/my_vg/my_lv
Logical volume "my_snapshot" created.
[root@nod1 ~]# lvs

```

LV	VG	Attr	LSize	Pool	Origin	Data%	Met
database	datastore	-wi-a-----	800.00m				
my_lv	my_vg	owi-aos---	5.00g				
my_snapshot	my_vg	swi-a-s---	1.00g		my_lv	0.01	
root	rhel_server	-wi-ao----	<17.00g				
swap	rhel_server	-wi-ao----	2.00g				

```

[root@nod1 ~]# mount /dev/my_vg/my_snapshot /mnt/my_snapshot
mount: /mnt/my_snapshot: mount point does not exist.
[root@nod1 ~]# mkdir /mnt/my_snapshot
[root@nod1 ~]# mount /dev/my_vg/my_snapshot /mnt/my_snapshot

```

```

[root@nod1 ~]# mount /dev/my_vg/my_snapshot /mnt/my_snapshot
[root@nod1 ~]# ls /mnt/my_snapshot/
etc lost+found usr
[root@nod1 ~]#
[root@nod1 ~]#
[root@nod1 ~]#
[root@nod1 ~]#
[root@nod1 ~]#
[root@nod1 ~]#
[root@nod1 ~]#
[root@nod1 ~]#
[root@nod1 ~]#
[root@nod1 ~]# lvre
lvreduce lvremove lvrename lvresize
[root@nod1 ~]# lvconvert --merge /dev/my_vg/my_snapshot
Delaying merge since origin is open.
Merging of snapshot my_vg/my_snapshot will occur on next activation of my_vg/my_lv.
[root@nod1 ~]#

```