

LVM:

Migrate data from faulty disk to new disk

Here's a polished, **step-by-step** guide to safely **migrate data from a faulty LVM disk to a new one**:

Preconditions

- Backup all critical data before proceeding.

WORKFLOW:

Scenario:

- Faulty disk: `/dev/sdc` (3 GB, part of VG appvg)
- New disk: `/dev/sde` (3 GB, connected but not yet part of VG)

The `/dev/sdc` disk is experiencing hardware issues, as indicated by error logs in `/var/log/dmesg`. To maintain system stability and data integrity, the disk must be replaced without data loss or downtime.

Step 1: Provision a New Disk

- Request the **VMware** or **Azure Cloud** team to attach a new disk of **equal size (3 GB)** to the virtual machine.
- Confirm that the new disk appears as `/dev/sde`.

```
[root@localhost ~]# lsblk | grep -E 'sdc|sde'
sdc              8:32    0      3G  0 disk
sde              8:64    0      3G  0 disk
[root@localhost ~]#
```

Step 2: Initialize the New Disk as a Physical Volume

```
[root@localhost ~]#
[root@localhost ~]# pvcreate /dev/sde
Physical volume "/dev/sde" successfully created.
[root@localhost ~]#
```

Explanation:

- This command initializes **/dev/sde** so it can be managed by LVM as a physical volume (PV).

Step 3: Extend the Volume Group

```
[root@localhost ~]# vgextend appvg /dev/sde
  Volume group "appvg" successfully extended
[root@localhost ~]#
[root@localhost ~]# vgs
  VG      #PV #LV #SN Attr   VSize   VFree
  appvg   3     1    0 wz--n- <7.99g  <5.99g
  rhel    1     2    0 wz--n-  18.41g      0
  vg2     1     1    0 wz--n- <3.00g  996.00m
[root@localhost ~]#
```

```
[root@localhost ~]# pvs | grep appvg
/dev/sdb    appvg  lvm2 a--  <2.00g  <2.00g
/dev/sdc    appvg  lvm2 a--  <3.00g  1020.00m
/dev/sde    appvg  lvm2 a--  <3.00g  <3.00g
[root@localhost ~]# pvdisplay | grep -B 1 appvg
PV Name                  /dev/sdc
VG Name                  appvg
---
PV Name                  /dev/sdb
VG Name                  appvg
---
PV Name                  /dev/sde
VG Name                  appvg
[root@localhost ~]#
```

Explanation:

The new physical volume `/dev/sde` is now added to the existing volume group `appvg`, where the faulty disk `/dev/sdc` also resides.

- Current disk location of `/dev/sdc`: `appvg`
- New disk `/dev/sde` added to: `appvg`

This allows data migration *within the same VG*.

Step 4: Migrate Data from Faulty Disk to New Disk

```
[root@localhost ~]#  
[root@localhost ~]#  
[root@localhost ~]# pvmove /dev/sdc /dev/sde  
  /dev/sdc: Moved: 13.87%  
  /dev/sdc: Moved: 100.00%  
[root@localhost ~]#
```

Explanation:

This is the **core step** that safely transfers all logical volume data from the failing disk **/dev/sdc** to the healthy disk **/dev/sde**.

- **No downtime or unmounting required** – this is an *online* operation.

Step 5: Remove the Faulty Disk from Volume Group

```
[root@localhost ~]#  
[root@localhost ~]# vgreduce appvg /dev/sdc  
  Removed "/dev/sdc" from volume group "appvg"  
[root@localhost ~]#  
[root@localhost ~]# pvremove /dev/sdc  
  Labels on physical volume "/dev/sdc" successfully wiped.  
[root@localhost ~]#
```

Explanation

Once data migration completes:

- **vgreduce** removes **/dev/sdc** from the volume group.
- **pvremove** clears LVM metadata from the disk, fully detaching it from LVM control.

Step 6: Disable and Delete the Faulty Disk at OS Level

```
[root@localhost ~]# echo offline > /sys/block/sdc/device/state
[root@localhost ~]# echo 1 > /sys/block/sdc/device/delete
[root@localhost ~]# lsblk
NAME      MAJ:MIN RM  SIZE RO TYPE MOUNTPOINTS
sda        8:0    0   20G  0 disk
└─sda1     8:1    0  600M  0 part /boot/efi
└─sda2     8:2    0    1G  0 part /boot
└─sda3     8:3    0 18.4G  0 part
  ├─rhel-root 253:0  0 16.4G  0 lvm  /
  └─rhel-swap 253:1  0    2G  0 lvm  [SWAP]
sdb        8:16   0    2G  0 disk
sdd        8:48   0    3G  0 disk
└─vg2-lv02 253:2  0    2G  0 lvm  /data2
sde        8:64   0    3G  0 disk
└─appvg-lv01 253:3  0    2G  0 lvm  /data1
sr0       11:0   1   11G  0 rom
[root@localhost ~]#
```

```
[root@localhost ~]# pvs | grep appvg
/dev/sdb  appvg  lvm2 a--  <2.00g  <2.00g
/dev/sde  appvg  lvm2 a--  <3.00g  1020.00m
[root@localhost ~]# pvdisplay | grep -B 1 appvg
  PV Name               /dev/sdb
  VG Name               appvg
  --
  PV Name               /dev/sde
  VG Name               appvg
[root@localhost ~]#
```

Explanation

- The first command marks the disk as offline.
- The second command safely instructs the Linux kernel to forget the device.

This step completes the **removal of `/dev/sdc`** from both LVM and the OS-level device list.

Final Result

The faulty disk `/dev/sdc` has been:

- Replaced by `/dev/sde`
- Fully removed from the volume group and system
- Done **safely, online, and without data loss or service interruption**

Notes

- Always ensure backups are available before performing disk operations.
- Monitor `pvmove` with tools like `lvs`, `pvs`, and `vgs`.
- Use `dmesg` and `journalctl -xe` for real-time error checking.