**How to add/change volume sizes**

For explanation purposes we will use the following coloring scheme:

Example volume names…………………………………………………………..…example\_volume

Commands………………………………………………..command to be executed

Paths….…………………………………………………………………/path/to/file

1. **Disk**

To see all Disks use the commands:

lsblk -OR- fdisk -l

**Add New Disk**

1. Add new disk in volume/disk management service (e.g. vSphere, 3PAR…).
2. You’ll notice the new Disk when running lsblk. The disk, sdX, will be standing alone with no partition (chronological letter for “X”). For the example: sdg.

**Extend Existing Disk**

1. Extend disk in volume/disk management service (e.g. vSphere, 3PAR…), for this example we will extend disk sdg.
2. To rescan the disk to show extra space, run:

echo 1 > /sys/class/block/sdg/device/rescan

1. You’ll notice the Disk was extended when running lsblk.
2. **Partition**

To see all partitions use the commands:

lsblk -OR- fdisk -l

for the example we will use disk /dev/sdg and create/extend partition /dev/sdg1

to enter partition altering/creating mode, run:

parted /dev/sdg

once inside “PARTED” you can run p to display the partition table and h for help

**Add new partition**

1. First make sure the disks label is set to “gpt”:

mklabel gpt

1. create the first partition:

mkpart primary 1 -1

1. set the partition with flag lvm:

set 1 lvm on

1. quit:

q

1. now you can see the new partition when running lsblk, you will see sdg1.

**Extend existing partition**

1. First you’ll have to remove the current partition (in this case 1 – sdg1) to recreate it with the extended storage:

rm 1

1. then recreate the same partition:

mkpart primary 1 -1

1. reset the partition with flag lvm:

set 1 lvm on

1. quit:

q

1. now you can see the extended partition when running lsblk, you will see sdg1 with extended storage.
2. **Physical Volumes**

Use pvs to see all PVs in the system or pvdisplay for more details.

After you have a valid partition, for example /dev/sdg1

1. pvcreate /dev/sdg1
2. pvresize /dev/sdg1
3. **Volume Groups**

Use vgs to see all PVs in the system or vgdisplay for more details.

After you have a valid PV, for example /dev/sdg1

We are going to create/extend a VG, name for example vg\_example

1. vgcreate vg\_example /dev/sdg1
2. vgextend vg\_example /dev/sdg1
3. **Logical Volumes**

Use lvs to see all PVs in the system or lvdisplay for more details.

After you have a valid VG, for example vg\_example

We are going to create/extend a LV, name for example lv\_example

1. lvcreate --name lv\_example -l +100%FREE vg\_example

-OR-

lvcreate --name lv\_example -L 50GB vg\_example

1. lvextend -l +100%FREE /dev/mapper/vg\_example-lv\_example

-OR-

lvextend -L 60GB /dev/mapper/vg\_example-lv\_example

1. **File Systems**

Use df -h to see all mounted FSs.

For the example we will call our FS example\_FS and it will be mounted on /FS/example.

1. To create a new FS first create the mount point:

mkdir -p /FS/example

1. If partition is new, assign TYPE to FS:

mkfs.xfs /dev/mapper/vg\_example-lv\_example

1. To mount your FS from your LV to your mount point:

mount /dev/vg\_example/lv\_example /FS/example

1. For permanent mount point add a mounting line to the file /etc/fstab:

/dev/vg\_example/lv\_example /FS/example xfs defaults 0 0

1. To resize your FS once the LV has been extended:

xfs\_growfs /FS/example

-OR-

resize2fs /FS/example

1. **Multipath**

For the example, the name of the volume will be: “test\_vol”

1. First make sure you changed the size of the volume from the relevant volume management service (vSphere, 3PAR…).
2. Rescan disks of multipath so it will be able to see the new disk: rescan-scsi-bus.sh -a and then run multipath
3. You’ll notice that when you run lsblk and multipath -ll there is a new component (also in the file /etc/multipath/bindings), usually named mpathX (a chronological letter instead of “X”). in this case we’ll assume mpathb.
4. Run multipath -f mpathb (relevant letter instead of “b”) to flush out the new disk so we can assign it a proper name.
5. Edit the file /etc/multipath/bindings, and change “mpathb” to “test\_vol”.
6. Run multipath to rescan all disks and then you’ll notice the new disk name “test\_vol” in all places: lsblk, multipath -ll.
7. From here on you should follow the proper procedure of creating: PV, VG, LV. Only that your PV will be created from /dev/mapper/test\_vol instead of /dev/sdX.
8. pvcreate /dev/mapper/test\_vol
9. see sections 1. PVs, 2. VGs, 3. LVs, 4. FSs
10. after you’re done, you can see the resized FS with df -h
11. **Remove Disk from Logical Volume**

For the example, the name of the disk will be: “sdb1”, and the name of the VG will be: “vg\_example”

1. You can see that our LV is distributed across multiple disks: pvs -o+pv\_used
2. We want to move the extents of /dev/sdb1 (that has 100Gb) to other disks in order to remove the disk.
3. make sure you have enough space in other disks to move the entire data (all the 100Gb of space is needed even if not used).
4. pvmove /dev/sdb1
5. Check again to see usage of the disk with pvs -o+pv\_used, you should see all of the disk is free now (used=0).
6. Now we want to extract the PV from the VG: vgreduce vg\_example /dev/sdb1.
7. Now the disk can be removed safely, pvremove /dev/sdb1