LVM Logical volumes

CONCEPTS

Disks become PVs, PVs pool into a VG, and you carve LVs out of the VG. An LV is a block device: put a filesystem on it.

Disk / partition /dev/sdb1
↓ pvcreate
Physical volume PV
↓ vgcreate
Volume group VG, pool of extents
↓ lvcreate
Logical volume /dev/<vg>/<lv>

INSPECT

pvs
List physical volumes

vgs
List volume groups with free space

lvs
List logical volumes

lvs -a -o +devices
Show LVs and the PVs they use

lsblk
Show the block device tree

PHYSICAL VOLUMES

pvcreate *<dev>*...
Initialise a disk or partition

pvresize *<dev>*
Grow a PV after the disk got bigger

pvmove *<old-pv>* [*<new-pv>*]
Move all extents off a PV

VOLUME GROUPS

vgcreate *<vg>* *<pv>*...
Create a VG from PVs

vgextend *<vg>* *<pv>*...
Add PVs to a VG

vgreduce *<vg>* *<pv>*
Remove an empty PV from a VG

VOLUME GROUPS (cont.)

vgchange -ay *<vg>*
Activate all LVs in a VG

LOGICAL VOLUMES

lvcreate -L *<size>* **-n** *<lv>* *<vg>*
Create an LV of a fixed size

lvcreate -l 100%FREE -n *<lv>* *<vg>*
Create an LV from all free space

mkfs.ext4 /dev/*<vg>*/*<lv>*
Put a filesystem on the LV

mount /dev/*<vg>*/*<lv>* *<dir>*
Mount the LV

lvremove *<vg>*/*<lv>*
Delete an LV (data is lost)

lvchange -ay *<vg>*/*<lv>*
Activate an LV

RESIZE

lvextend -L +*<size>* *<vg>*/*<lv>*
Grow an LV by an amount

lvextend -l +100%FREE *<vg>*/*<lv>*
Grow an LV into all free space

lvextend -r -L +*<size>* *<vg>*/*<lv>*
Grow the LV and its filesystem

Shrinking order: unmount, fsck, shrink the filesystem, then reduce the LV, never the other way round. Prefer lvresize -r and take a backup first.

SNAPSHOTS

lvcreate -s -L *<size>* **-n** *<snap>* *<vg>*/*<lv>*
Snapshot an LV

RECIPES

New data disk to mounted volume

```
pvcreate /dev/sdb
vgcreate data /dev/sdb
lvcreate -l 100%FREE -n files data
mkfs.ext4 /dev/data/files
mount /dev/data/files /srv/files
```