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
```