

Creating RAID, Striped and Cache Volumes



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Overview



Linear volumes are the default layout

Striped volumes and can aid performance without adding resilience

RAID volumes can add resilience

Cache volumes can make best use of SSDs



Linear Volumes

With the default linear volume, one physical volume is filled before moving onto the next PV



Striped Volumes

We can stripe data across PVs allowing improved read and write performance. Use the `-i` option to specify the the number of PVs to stripe across and `-l` (upper-case i) to specify the stripe size. Defaulting to 64K



Demo



In this first demonstration we will create a striped volume



RAID Volumes

Without the need of specific hardware we can create software RAID arrays using LVM volumes. Supporting many array types from RAID1, to RAID5 to RAID10



```
$ sudo lvcreate --type raid1 -L 500m -m 1 -n mirror_lv vg1
```

Creating Mirrored Array

RAID1 is a mirror set, duplicating data across all mirrors. We use one mirror in this example, (2 copies)



Demo



Creating a RAID1 mirror in LVM



Cache Volumes

Cache volume are generally created on SSDs and can cache disk I/O to slower spinning disks



Create traditional LV on legacy hardware
`lvcreate -n slow_lv -L 100G vg1`

Create Cache LV and specify the PV to create it on
`lvcreate -n cache_lv -L 10G vg1 /dev/<fast_ssd>`

Create MetaData LV, 1000x smaller than cache volume but no less than 8MiB
`lvcreate -n md_lv -L 10M vg1`

Combine the cache and metadata volumes to create pool
`lvconvert --type cache-pool --poolmetadata vg1/md_lv vg1/cache_lv`

Finally we create the cache volume by assigning the pool to the slower LV
`lvconvert --type cache --cachepool vg1/cache_lv vg1/slow_lv`



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Demo



Creating a cache volume



Overview



LVMs can extend beyond simple linear arrays

Striping add performance

RAID can add redundancy

Cache volumes add performance to slower disks

In general LVMs offer flexibility in your disk design

