Redundant Array of Inexpensive Disks

Logical Volume Manager
Redundant Array of Inexpensive Disks

- Disk abstraction technology
- Speed / Redundancy
- Multi-disk
- Multiple RAID levels
  - Striping
  - Parity
  - Mirroring
  - Multi-path (Linux)
Striping

- Every other chunk of data on the virtual disk written to different device.
- Speed
  - Writes parallel
  - Read parallel
- Not redundant
Parity

- At least a disk’s worth of space used
- XOR parity information stored
- Redundant
- Can only handle 1 device failure per layer of parity
- Slow
Mirroring

- Data repeated across multiple devices
- Redundant
- Handles any number of disk failures
- Speed
  - Fast reads
  - Slow writes
Levels

RAID 0  Striping
RAID 1  Mirroring
RAID 2  Striping at the bit level
RAID 3  Striping at the byte level
       Dedicated parity disk
RAID 4  Striping
       Dedicated parity disk
RAID 5  Striping
       Distributed parity
RAID 6  Striping
       Two layers of distributed parity
Redundant Array of Inexpensive Disks

Logical Volume Manager
Logical Volume Manager

- Disk abstraction technology
- Can do RAID, not meant for RAID
- Makes handling disks easier
Overview

- Physical Volumes
- Volume Groups
- Logical Volumes
Physical Volumes

- Actual drives
- Declared with ‘pvcreate’
- Any block device
Volume Groups

- Groups of physical volumes
- Declared with ‘vgcreate’
- LVM’s equivalent of a hard drive
- Support for thin sub-volumes
Logical Volumes

- Devices created on Volume Group
- LVM’s equivalent of a partition
- Stored in no particular order
- Stored on no particular drive
- Resize-able
- Snapshot-able
- Mirror-able
- Stripe-able
- Created using ‘lvcreate’
What to get out of this

There is no right way to do LVM, it instead depends on exactly what kind of setup you want.