



Logical

Volume

Manager

The Basics

Logical Volume Manager Basics

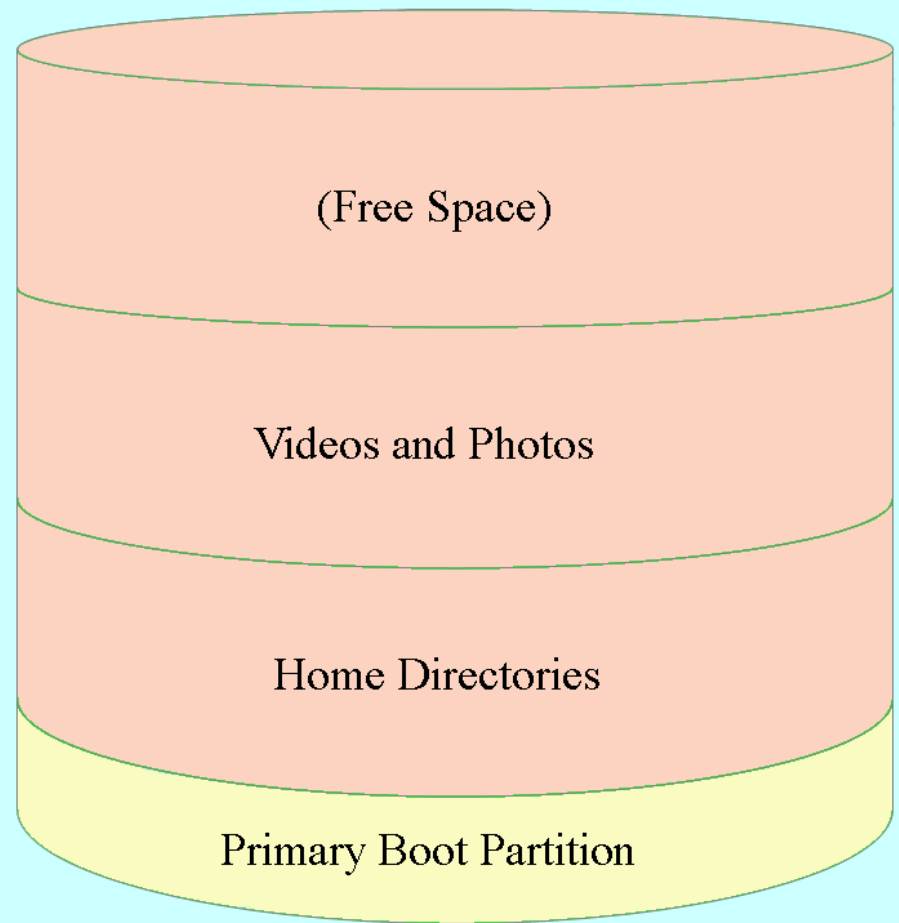
- I'm no expert.
- Everything I know came from:
 - ♦ An ALUG program by Steve Alexander in January 2008.
 - ♦ My usual researching of the topic for details as needed.
 - ♦ And of course trial and error.
- This will be a few slides followed by a live demonstration.

Basic Partitions

- A hard drive can have one to four partitions.
- One partition can be an extended partition.
- The extended partition can have any number of partitions within it.
- DOS/Windows limits the total number of partitions to 24 (drive letters C: through Z:)
- Linux has no such limitation. I experimented and decided to stop after I hit 32.
- With an extended partition we could divide lots of things up into their own separate partition.

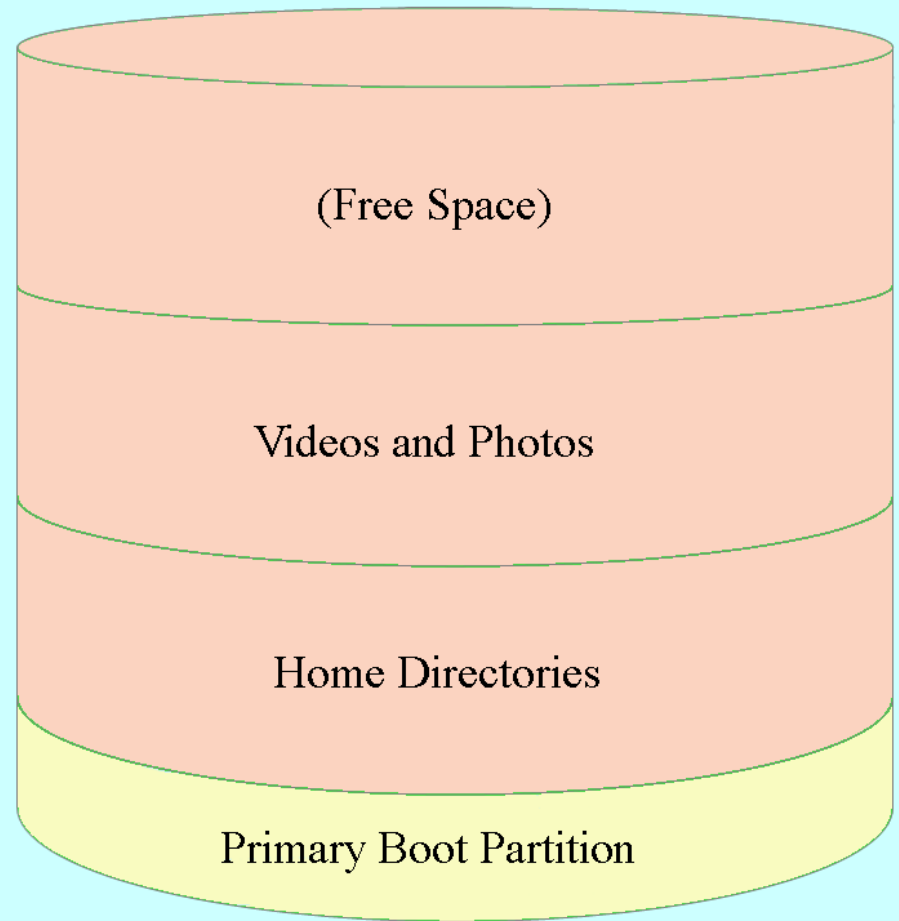
Why Not Use Extended Partitions?

- As our video and photo library grows we can use gparted to grow into the free space.
- We could even resize the home directories smaller and grow that direction although it takes a LONG time.



Why Not Use Extended Partitions?

- But what if we need to grow the Home Directories partition?
- It's MUCH more difficult.
- And the associated mount points must be unmounted during all changes.
- BACKUP is essential.



Logical Volume Manger

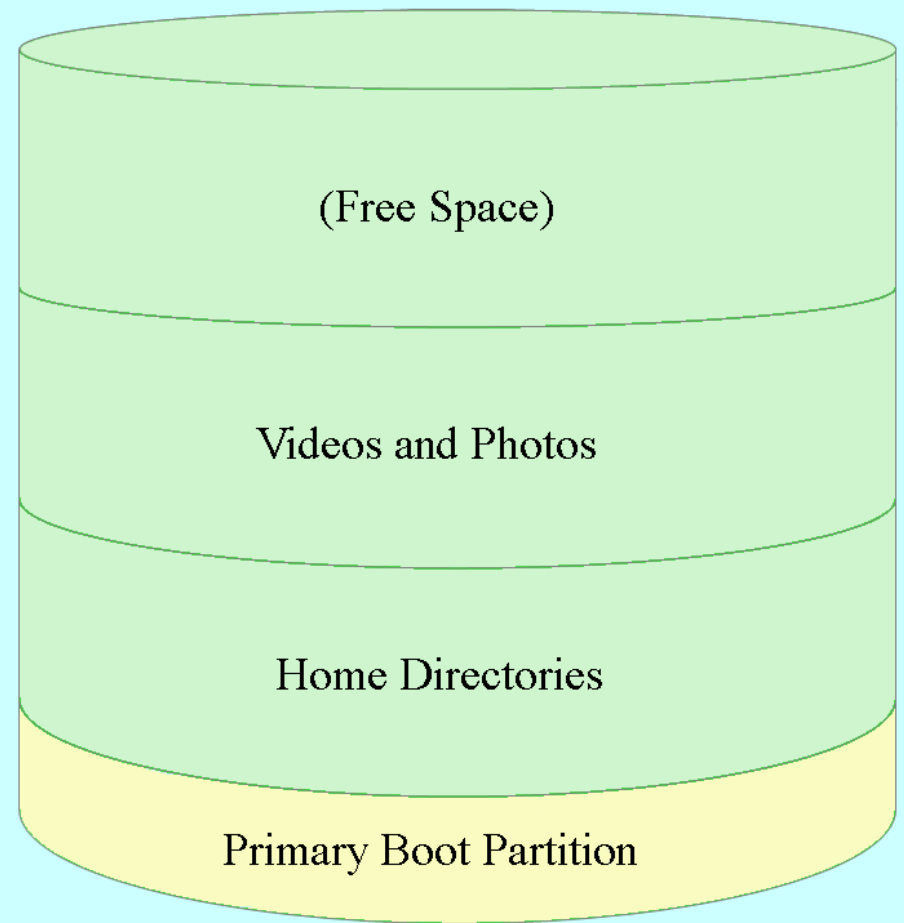
- You add a physical partition to LVM. Usually the whole disk or at least a big part of it.
- LVM then creates logical partitions within the managed space.
- You can add more physical partitions to be managed by LVM.
- Logical partitions can be created, deleted or resized on-the-fly with no down time except to affected users. Resizing upward does not impact users at all.

LVM Structure

- LVM is structured at three levels:
 1. Storage Group – Contains one or more physical volumes (partitions).
 2. Physical Volumes – Usually the whole drive or the bulk of the drive.
 3. Logical Volumes – The logical volume that is available for use via a mount point.
- When you add a physical volume to LVM you can select which storage group it belongs to. If none are present you would then create the storage group.

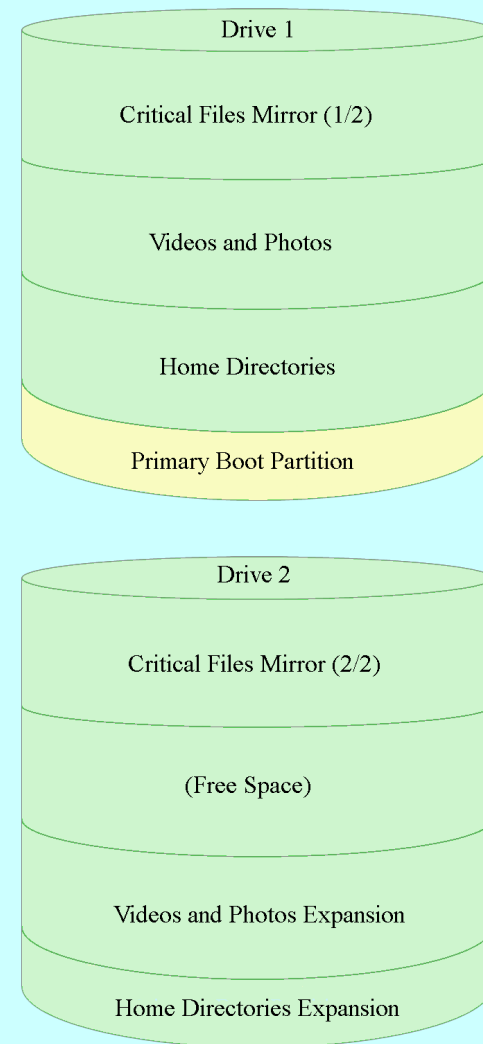
LVM to the Rescue!

- We can grow and shrink logical partitions at will and on the fly. No need to unmount partitions to do most things.
- Logical partitions do NOT need to be contiguous. A logical partition can be in several pieces and even on separate physical volumes.

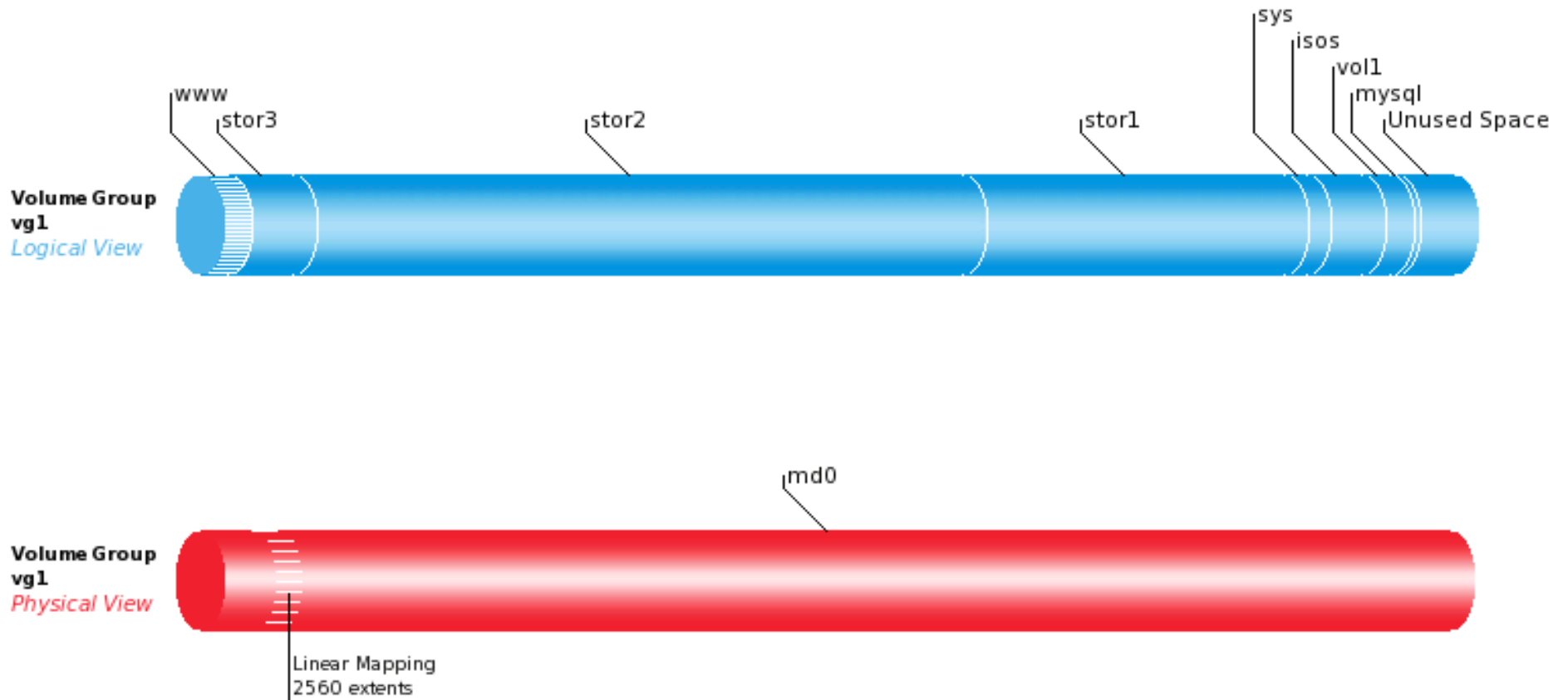


LVM Makes Expansion Easy

- Or you can just add another drive to the storage group and expand onto that.
- You can also create a logical partition that is mirrored. You will need at least 3 physical volumes – 2 for the data and 1 for the mirror log.



My Current LVM



Demo Time

- Create a minimum single physical volume LVM storage group
- Create a logical volume (www)
- Create a second logical volume (home)
- Make www bigger
- Shrink the home
- Add 2 more physical volumes
- Create a mirrored logical volume (mirrored)
- Create a striped logical volume (test)
- Migrate a logical volume to another physical volume
- Create a second storage group