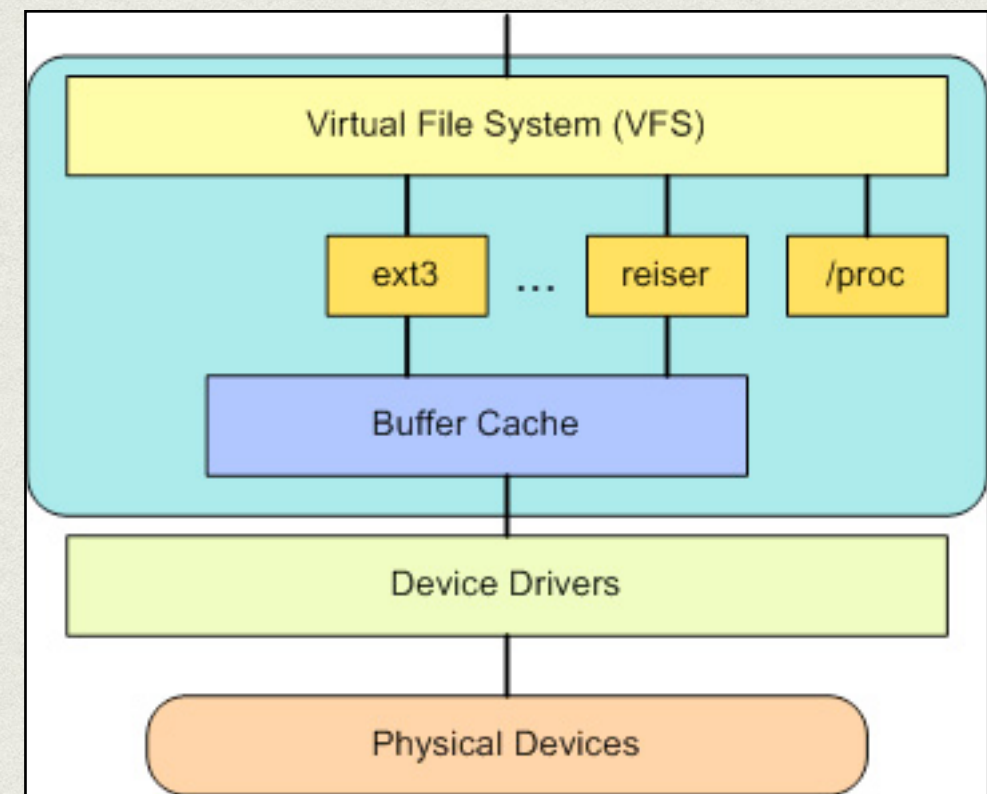


FILESYSTEM ADMINISTRATION

mount? umount? mkfs? fsck?

KERNEL VFS LAYER

- VFS: Virtual File System
- One layer of the kernel is the VFS Abstraction layer. This layer defines a basic interface that all filesystem drivers at minimum must implement.



<http://www.ibm.com/developerworks/linux/library/l-linux-kernel/>

VFS

- From the user's perspective, the filesystem is simply a hierarchy of directories and files.
- But in reality, some branches might reside on a networked file server, some might be on an optical disc, some on internal drives..
- VFS allows the kernel to stitch all of these disparate storage systems into one cohesive interface!

/ AGAIN

- / is the root of the filesystem, forming the foundation upon which all access is provided.
- When additional filesystems need to be accessible, all that needs to be decided is the pathname to a directory where users can see the filesystem.
- This is known as the mount point.
- The mount point is how the kernel tracks thresholds between filesystems.

LET'S SEE THIS ON
THE WHITEBOARD

MOUNT

- `mount`: Attach a filesystem to a given mount point
 - Creates the “detour” sign
 - Linux supports dozens of different filesystem types, available by the simple `-t` option to the `mount` command:
 - `mount -t smbfs //windoze/share /windoze-share`

UMOUNT

- `umount`: detach mounted filesystem
 - Simply removes the “detour” sign
 - Mount point becomes a simple directory again
 - Generally only need to pass mount point as argument:
- `umount /windoze-share`

PARTITIONING

- What is partitioning?
 - Splitting up a hard drive into organizable chunks
- Why?
 - Isolates filesystem corruption
 - Simplifies/speeds backups
 - Allows optimizing filesystems to tasks

PARTITIONING TOOLS

- `fdisk`: Works on one disk at a time, allows for viewing and manipulating partition table at a very low level
- `parted`: Excellent partitioning tool with features to restore corrupted partitions and more
- `Gnome Disk Utility`: Graphical partitioning tool with support for logical volumes, encrypted volumes and more

MKFS

- `mkfs`: format a device to create a new filesystem
 - “Paints the parking stripes” for the filesystem structure
 - Creates superblock, block groups, superblock copies, bitmaps and inode tables and creates basic structure on disk
 - Through `-t` option, `mkfs` can create different types of filesystems

FILESYSTEM INTEGRITY CHECKS

- `fsck`: Filesystem Check
 - Generally only run when a filesystem needs it:
 - Mount count
 - Last check
 - Dirty
 - Checks all of the filesystem structures for accuracy and completeness

DEMONSTRATIONS

- Now for some demonstrations of the various filesystem administration tasks and tools

EXERCISES

- Un-mount the /lab filesystem.
- Rebuild the /lab filesystem (better figure out the right device name!) using ext3, a blocksize of 1k, and a reserve space of 2%. Confirm settings with tune2fs. Mount the /lab filesystem when complete.
- Un-mount the /lab filesystem and force an integrity check. Re-mount the /lab filesystem. Use e2label to set the filesystem label on /lab to '/lab'.