VFS

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Application :

It is program defined to perform a specific functionality directly for the user.

Ex ; word processor , database program ,tools etc...

File :

Logical contiguity (sequencial occurence) of data place on secondary device.

VFS :

VFS serves as an abstract layer that gives application access to different types of file system, local and network storage devices.

Types of file systems :

- Ext2
- NTFS
- NFS
- VFAT etc..

Device driver :

It is Program that operates or controls a perticular type of device that attached to computer. (or) Provides software interface to hardware devices enabling OS and other computer programs to access hardware function.

Hard disk :

It is a data storage device which is passive, used for storing and retriving information.Which contains information in the form of tracks and sectors.Tracks are concentric circles around the centre spindle.then tracks are divided into sectors.

Harddisk Controller :

Electrical component(active device) with in computer harddisk that enables the processor or CPU to accept write , delete & modify data to and from the harddisk.

Components of FS:

Boot Block :

Located in first few sectors of file system.This boot block contains the initial bootstrap program used to load the OS.

SuperBlock :

Contains the aggregate information about file system like total number of inodes , FS size in blocks , free block counter , free inode counter , block size ,blocks per group,mount counters and etc... (It is maintained per file system.)

Inode :

Linux every file is recongnized with integer number known as inode number.Every file will have its own discriptor.

It contains :

- File types & access rights
- Owner and group identifiers
- file length in bytes
- no. Of data blocks in the file
- various timestamp attributes(file access time, inode access time & file modified time)

pointers to datablocks (12 direct , 1 -1 level ,2 levl , 3 level)

Struct dentry

Maintained per directory, contains the list of entries in the directories.It is to provide hirarchical organization of file.

Directory is FS object & it has an inode just like file,containing records which assocoiated each name with inode.

Struct file :

dynamic entity maintained per session.If an application opens, read, close a file.So kernel VFS will open a session through application to record the transactions.

Address space :

Object embeded in the inode.which is used to hold the data in the form of some radix tree. (or) it will have page cache.

bit map:

one method used to track allocated sectors.A zero would indicate a free sector, while a one indicates a sector in use.

Inode bit map:

indicates number of possible inodes in a block group.keeps track of allocated inode.

Data block bit map:

Indicates number of possible blocks in a block group.Keeps track of all allocated blocks in block group.

Inode Table :

The inode table is used to keep track of every directory, regular file, symbolic link, or special file; their location, size, type and access rights are all stored in inodes. There is no filename stored in the inode itself, names are contained in directory files only.

Datablock :

Which contains the actual contents of file.it is a basic unit of storage.Partitions or disk with a secondary file system is divided into small group sectors called blocks.

Block group discriptor :

The block group descriptor table is an array of block group descriptor, used to define parameters of all the block groups. It provides the location of the inode bitmap and inode table, block bitmap, number of free blocks and inodes, and some other useful information

/dev/sda1 :

It is an abstraction of Harddisk (which represents the harddisk partition.).

VFS will maintains cache of directory lookup to enable easy location of frequently accessed directories.i.e : dentry cache

Page cache

buffer cache

inode cache