Overview of Computers

Instructor – Dr. Shiv Ram Dubey

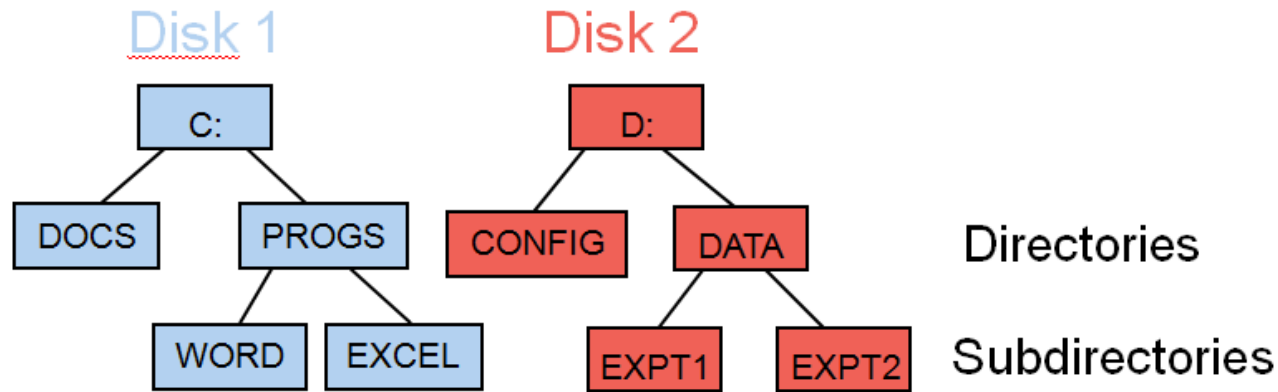## File System

File System

File System

File system:

Organizes and manages files and directories
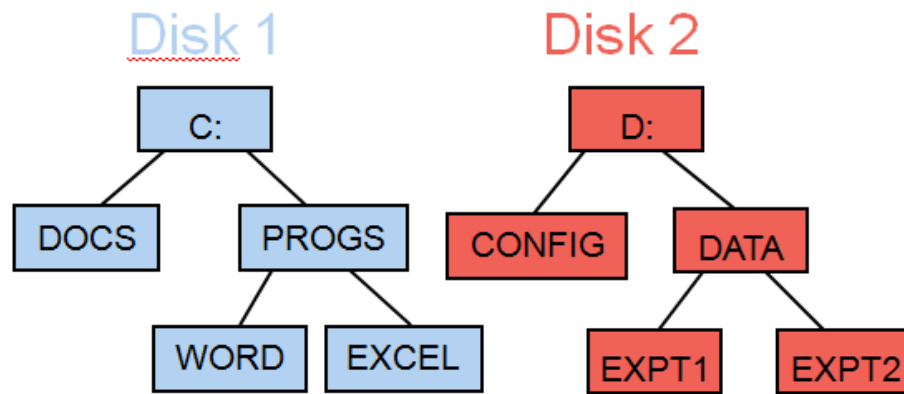
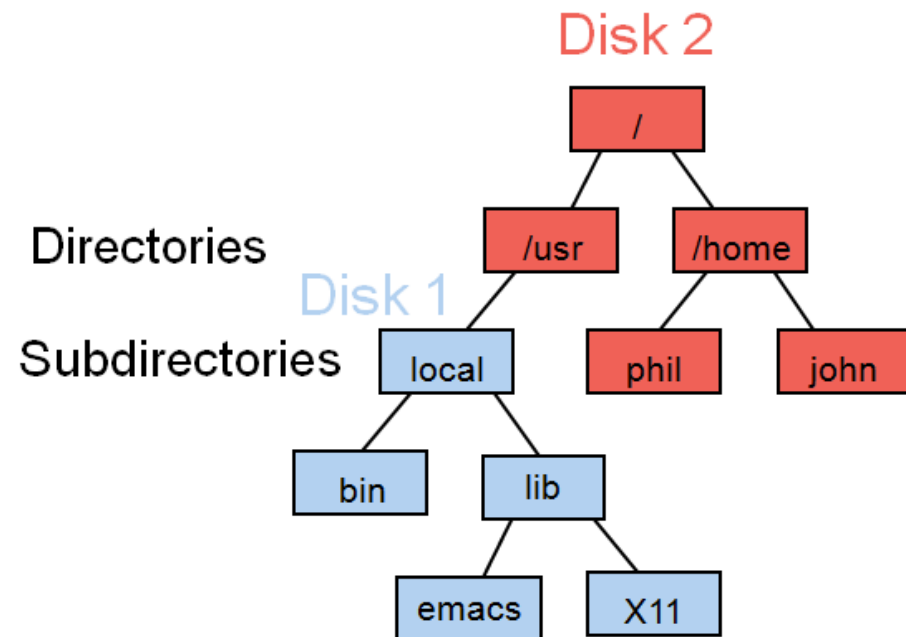# File System Organisation

File system organisation:

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File system organisation:

Windows

Unix

File System

- File system is a method for storing and organizing computer files to make it easy to find and access them.

- Most file systems make use of an underlying data storage device such as Hard Disks that offers access to an array of fixed-size blocks which is the smallest logical amount of disk space that can be allocated to hold a file.

- File systems typically have directories which associate file names with files, usually by connecting the file name to an index in a file allocation table of some sort, such as the FAT in a DOS file system, or an inode in a Unix-like file system.

File System

- **File names** are **simple strings, and per-file Metadata** is maintained which is the bookkeeping information, typically associated with each file within a file system.

- **Metadata** could contain file attributes such as file size, data and time of creation or modification of the file, owner of the file, access permissions etc.

Types of File System

- **File system types can be classified into disk file systems, network file systems and flash file systems.**

- **A disk file system is a file system designed for the storage of files on a data storage device, most commonly a disk drive e.g. FAT, NTFS, ext2, ext3 etc.**

- **A network file system is a file system that acts as a client for a remote file access protocol, providing access to files on a server e.g. Network File System (NFS), Server Message Block (SMB) etc.**

- **A flash file system is a file system designed for storing files on flash memory devices. Optimized (such as to avoid write amplification)**

File System and OS

- **Windows Operating system supports File Allocation Table (FAT) and New Technology File System (NTFS) File Systems**

- **Linux popularly supports ext2 and ext3 Extended File Systems**

- **Other flavors of Operating Systems may support other File Systems like Unix File System (UFS) in many UNIX Operating Systems and Hierarchical File System (HFS) in MAC OS X.**

- **All Operating Systems provide a user interface like Command Line (CLI) or File Browser to access and manage File System information.**

FAT

- The File Allocation Table (FAT) file system was **initially developed for DOS** Operating System.

- It was an **evolution of Microsoft's earlier operating system MS-DOS** and was the predominant File System in Windows versions like 95, 98, ME etc.

- **All the latest versions of Windows still support FAT** file system although it may not be popular.

- FAT had various versions like **FAT12, FAT16 and FAT32.** Successive versions of FAT were named after the number of bits in the table: 12, 16 and 32.

NTFS

- NTFS or the NT File System was introduced with the Windows NT operating system.

- NTFS has several improvements over FAT such as

  - Security Access Control Lists (ACL) and

  - File System Journaling: to prevent from the file system crash due to power failure or system crash while updating the file system (it records the changes it will make ahead of time)

- Later versions of Windows like Windows 2000, Windows XP, Windows Server 2003, Windows Server 2008, and Windows Vista also use NTFS.
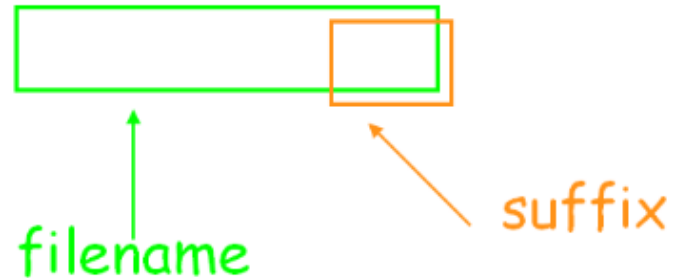
Path

Path

- The path is the logical address used by the system or the user to locate a file.

/bd_du_Palais/35/etage/4/appart/12/Dupont_ Jean.txt

path

filename

suffix

Types of Operating Systems

Stand-alone:

Network:

Embedded:

Types of Operating Systems

Stand-alone: complete operating system working on PC, laptop, mobile computing device.
like *DOS, Windows, Mac OS X, Unix, Linux*

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Embedded: OS on most PDA and small devices, like, *windows CE.net, windows mobile 2003, Palm OS, Symbian OS, Android OS and Apple iOS*

Acquiring Software

- Freeware

- Shareware

- Public-domain software

- Open-source

- Commercial software

Acquiring Software

- Freeware
  - Free to all
  - Copyrighted
  - Distributed in machine-readable format

Acquiring Software

- Shareware
  - Freely distributed for a trial period
  - Pay a nominal fee to register with the author

Acquiring Software

- Public-domain software
  - Un-copyrighted
  - May be used or altered without restriction
  - Generally developed under government grants

Acquiring Software

- Open-source
  - Free to all
  - Source code is distributed
  - May be used or altered
  - Popular under the LINUX OS

Acquiring Software

- Commercial software
  - Used most often
  - Copyrighted
  - Generally costly
  - May not be copied without permission of the manufacturer