

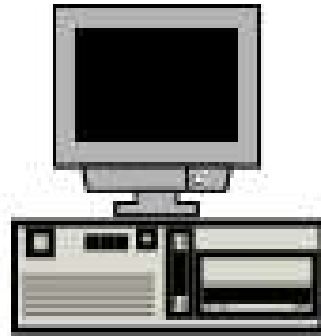
## Information Storage for Personal Computers

Data is stored in files, and these files are arranged in a logical order to enable quick and convenient access.

The major storage device used is the Hard Disk Drive (HDD) together with CD/DVDROMS and the increasingly popular USB drives.

HDDs can be divided into partitions, which are distinctly defined areas on the hard disk and can be thought of as "virtual hard disks"

For example, if you have a single physical hard disk of, say, 20GB capacity, and you have partitioned it into two 8GB partitions and one 4GB partition, it will appear to the operating system that you have two 8GB hard drives and one 4GB hard drive.



## Storage Devices

First IDE Controller

Master - HDD

Slave - HDD

Floppy disk drive

Second IDE Controller

Master - CD/DVDROM

USB drive

## Device Naming Conventions

<i>Storage Device</i>	<i>Microsoft Windows</i>	<i>Linux</i>
Floppy Disk	A: drive	/dev/fd0
First IDE Controller – Master HDD	C: drive	/dev/hda1
First IDE Controller – Slave HDD	D: drive	/dev/hdb1
Second IDE Controller – Master CDROM	E: drive	/dev/hdc
USB Drive	F: drive	/dev/sda1

*Note: It is assumed that each HDD has only one partition which occupies the whole drive.*

# Naming Conventions for Linux Partitions

Examples: /dev/hda

Can have up to 4 primary partitions, or a combination of up to 3 primary partitions and a number of logical partitions.

If you want to use only Primary partitions -

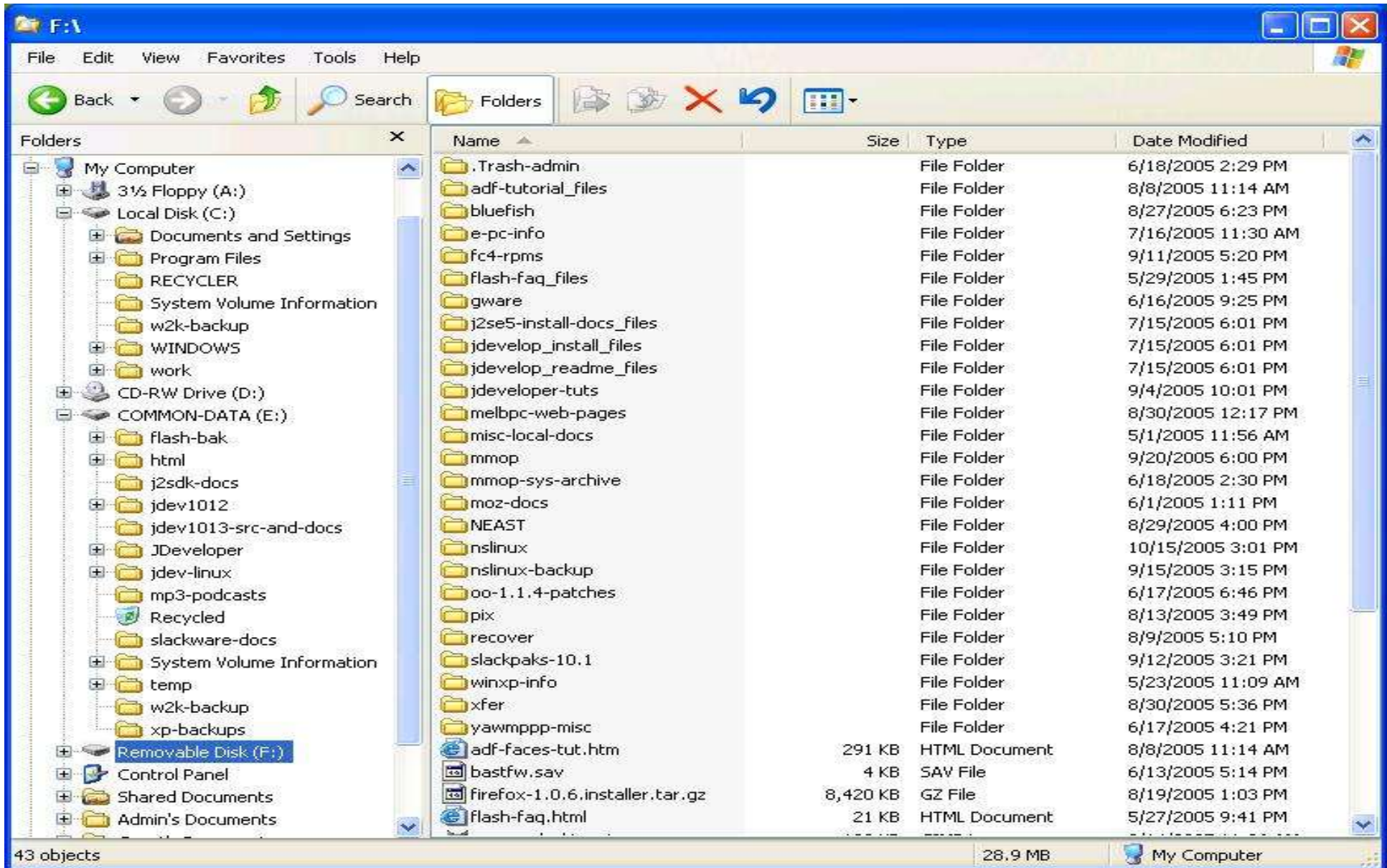
/dev/hda1 - First Primary partition    /dev/hda2 - Second Primary partition  
/dev/hda3 - Third Primary partition    /dev/hda4 - Fourth Primary partition

If you want to use both Primary and Logical partitions -

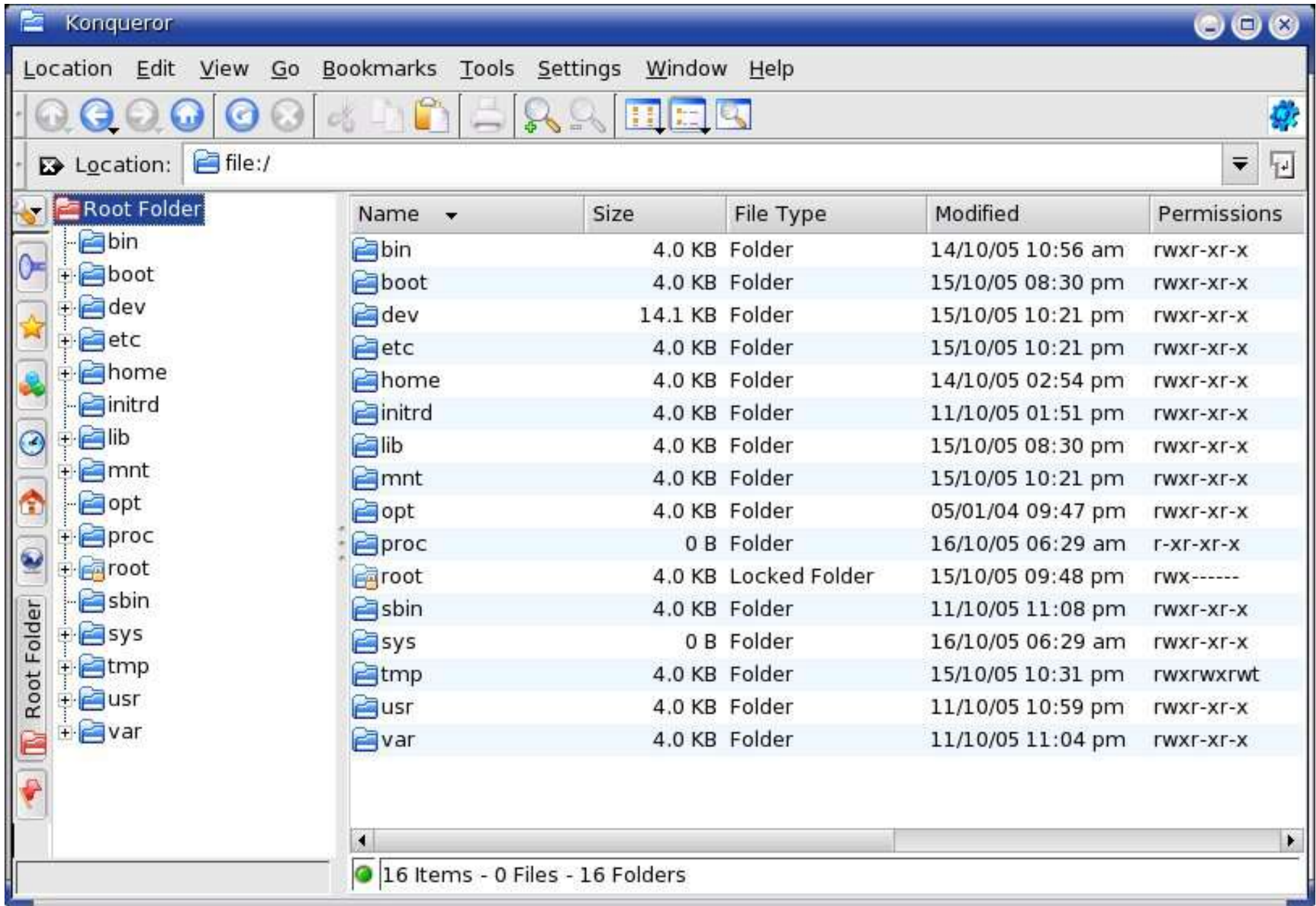
/dev/hda1 - First Primary partition    /dev/hda2 - Second Primary partition  
/dev/hda5 - First Logical partition    /dev/hda6 - Second Logical partition

# Filesystem Arrangements

With Microsoft Windows, each disk has a separate file tree



With Linux there is only one filesystem, regardless of the number of disk drives -



## Where are the Disks ?

Under Linux, disks are "mounted" at convenient points within the file system tree. Conventions have developed about exactly where these mount points are located. A mount point is simply an empty directory.

The mount points for disk drives are defined in the file */etc/fstab*, which maps the devices to their corresponding mount points, among other things. The details contained in */etc/fstab* will often be different for different distributions, and will depend on the number and type of storage devices to be used.

Under Microsoft Windows, the mount points are effectively pre-defined by the system, although the ability exists to assign the drive letters.

Comparing typical mount points:

MS Windows

Linux

A:\

/mnt/floppy

C:\

/

D:\

/home

E:\

/mnt/cdrom

F:\

/mnt/usb-drive

## Exploring the Linux Filesystem – The Top Level Directories

- /** The root directory - the top of the directory tree.
- /bin** The directory where the most important executable program files are kept - some of these files are needed to boot the system.
- /boot** The directory where the essential files used at boot time are kept, including the operating system kernel.
- /dev** The directory where Linux keeps its device files. Linux devices are treated as files.
- /etc** The directory where the global configuration files are kept. Per user configuration files are kept in the users' home directory.
- /home** The directory where all users except the root user have their files stored – there is one directory unique to each user. When a user logs in, the default directory is set to their unique home directory.
- /lib** The directory where shared library files reside. Shared libraries contain common routines needed by many different programs.

## Exploring the Linux Filesystem – The Top Level Directories

- /mnt** or **/media** These directories are where disk drives with removable media or temporarily installed drives are mounted.
- /proc** The directory where you can find “virtual files” which represent various aspects of your system. These “files” can be read to obtain information about your system.
- /root** The home directory of the root user
- /opt** The directory where optional application software can be installed – see also `/usr/local`
- /sbin** The directory where most of the system administration programs are stored.
- /tmp** The directory where many programs store temporary working files.
- /usr** The directory where programs not required to be on the root partition are kept. These programs are generally application software available to all users.
- /usr/local** The directory where software not managed by the distributions' package management software is stored.
- /var** The directory where files that change over time are stored. These files may be system log files, printer spool files or database data files.