INTRODUCTION TO LINUX

LECTURE (6)

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Agenda

- partitions

File system

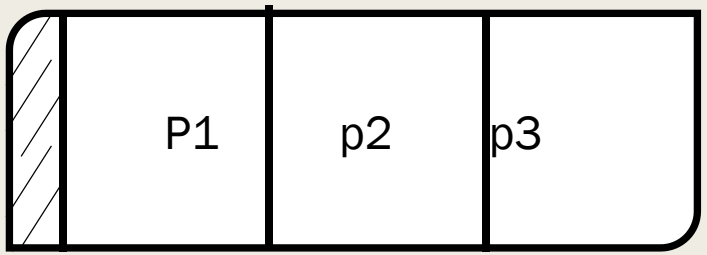
- MBR…Master Boot Record

It is the hard disk controller, it has:

1- partition table

2- file systems

3- Inode table



File system:Move a file

To move:

Within the same file system /partition

- Data → same partition
- Inode→ same Inode
- Pointer→ different pointer to the new directory

For different file system/ different partition

- Data → different partition
- Inode→ new Inode number (different inode)
- Pointer→ different pointer to the new directory
- Previous Inode → set free

To remove:

Previous Inode → set free “not removing data ” not pointing

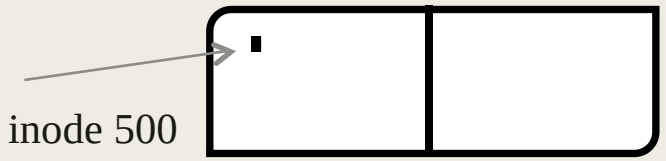
Soft links and hard links

Soft links: short cut

Inode 500→ file1

Then you created a shortcut file2

File2→ file1 ,, file1 → 500



- New name is pointing on file1 not the inode. If you deleted file1→ file2 cannot access the data

hard links: copy

Inode 500→ file1

and

Inode 500→ file2

- New name for same inode. If you deleted file1→ file2 can access the data

lab

hard links:

Touch file1

Nano file1

(this is a test file)

Ln file1 file2

Ls –li …..same inode number

Cat file1

Cat file2

Rm file1

Cat file2 .. You can access the data

soft links:

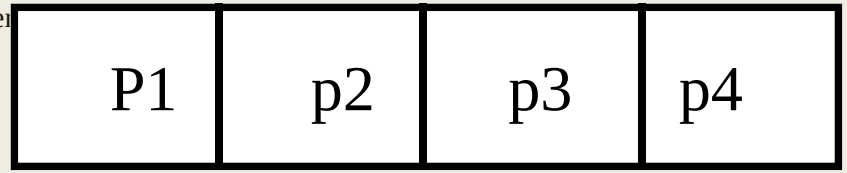
Ln -s file2 /tmp/

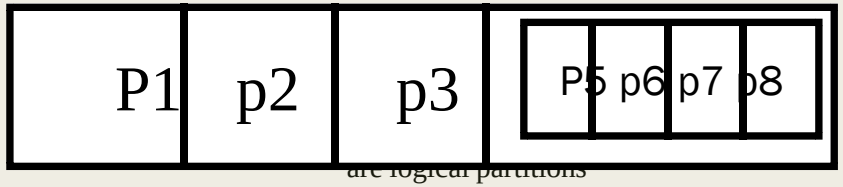
Ls –li

Ls –li /tmp/file2 …..different inode number

Partitioning

- For any hard disk, MBR has a partition table
- The size of this partition table is 64 bytes
- Each partition needs 16 bytes to save its border information
- So, max. number of partitions is 4 per



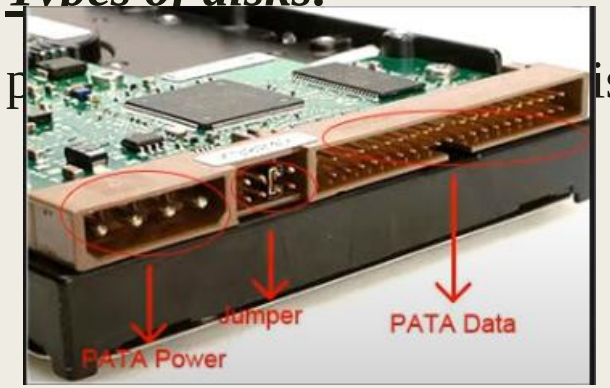


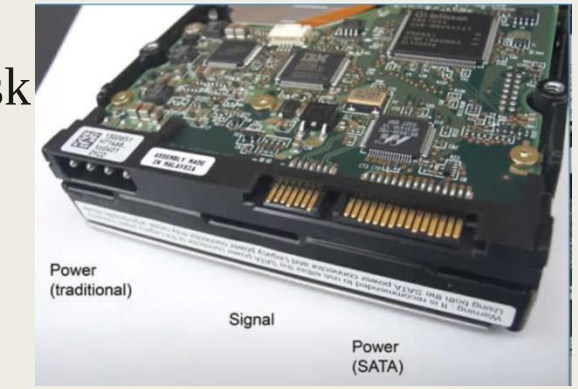
- are logical partitions
- extended

Partitioning

- ***Types of disks:***

1- p isk





4- ssd disk

Partitioning

Portions naming:

- *If it is pata*

Hda1, hda2, hda3→ first disk

Hdb1,hdb2, hdb3 → second disk

Hdb5,hdb6, hdb7 → extended partition

So on.

- *If it is sata, ssd*
- sda1, sda2, sda3→ first disk
- sdb1,sdb2, sdb3 → second disk
- sdb5,sdb6, sdb7 → extended partition
- So on

Partitioning

examples:

- hdb9

Type:pata disk number:2 partition number:9 (logical)

- sde1
- sdf
- vda3
- vde
- sdc5

Partitioning

examples:

- hdb9

  Type:pata disk number:2 partition number:9 (logical)

- sde1

  Type:psata disk number:5 partition number:1

- sdf

  Type:sata disk number:6

- vda3

  Type: virtual disk number:1 partition number:3

- vde

  Type: virtual disk number:5

- sdc5

  Type:sata disk number:3 partition number:5 (logical)

Partitioning

To display your partitions

lsblk

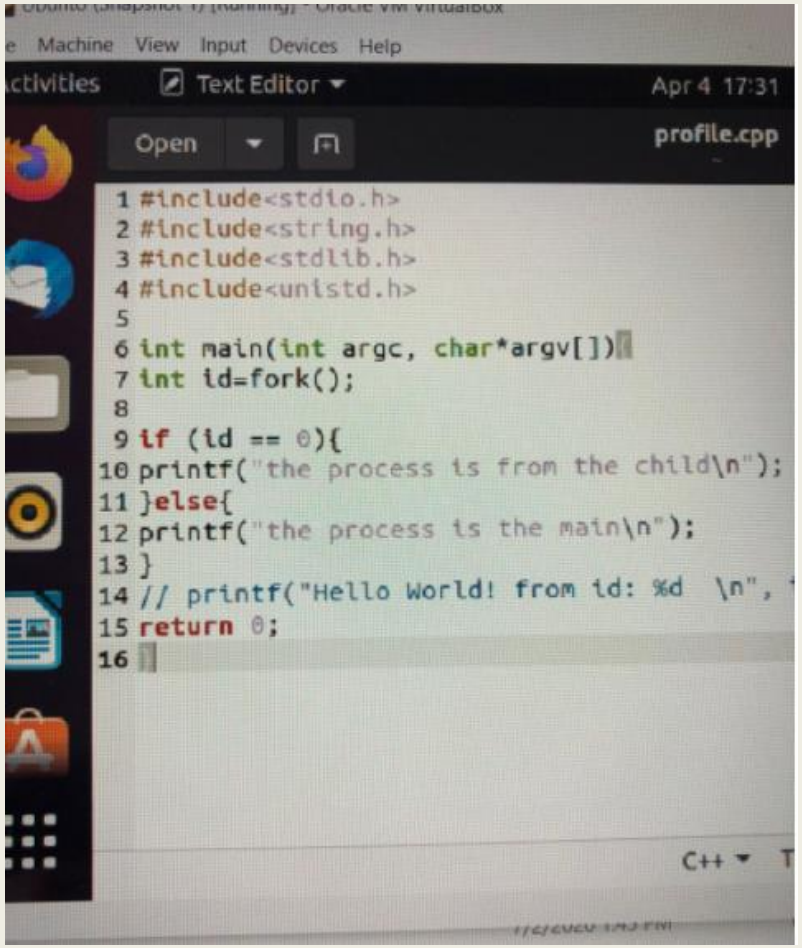
Your disk is sda , has some portions and some logical partitions

Process definition:

- ***Program***: is a file exist on your device without being run.
- ***Process:*** a running program in your device.

As an administrator you must be able to control the process, to run, to pause, to stop, and to terminate it.

To create a process using C++



Process ID

- Every process has a number, process I.D “PID”
- Every process has a parent which also has a number “PPID”

- To display the current process:

Ps

- To display the current process in all shells

Ps a

- To display more details

Ps aux

Process ID

```
[root@server ~]# ps aux
USER        PID %CPU %MEM    VSZ   RSS TTY      STAT START   TIME COMMAND
root          1  0.0  0.3 126692  7404 ?        Ss   17:48   0:02 /usr/lib/systemd/systemd --swi
root          2  0.0  0.0      0     0 ?        S    17:48   0:00 [kthreadd]
root          3  0.0  0.0      0     0 ?        S    17:48   0:00 [ksoftirqd/0]
root          5  0.0  0.0      0     0 ?        S<   17:48   0:00 [kworker/0:0H]
root          7  0.0  0.0      0     0 ?        S    17:48   0:00 [migration/0]
root          8  0.0  0.0      0     0 ?        S    17:48   0:00 [rcu_bh]
root          9  0.0  0.0      0     0 ?        S    17:48   0:00 [rcuob/0]
root         10  0.0  0.0      0     0 ?        S    17:48   0:00 [rcuob/1]
root         11  0.0  0.0      0     0 ?        S    17:48   0:00 [rcuob/2]
root         12  0.0  0.0      0     0 ?        S    17:48   0:00 [rcuob/3]
root         13  0.0  0.0      0     0 ?        S    17:48   0:00 [rcuob/4]
root         14  0.0  0.0      0     0 ?        S    17:48   0:00 [rcuob/5]
root         15  0.0  0.0      0     0 ?        S    17:48   0:00 [rcuob/6]
root         16  0.0  0.0      0     0 ?        S    17:48   0:00 [rcuob/7]
root         17  0.0  0.0      0     0 ?        S    17:48   0:00 [rcuob/8]
```

To kill process

- Lab

Ps aux …..from you tty (tty3 =^f3)

^f4 ….to go to different tty

Login

Touch file1

Nano file1 ….. to write something

^f3 ….. to go to tty3

Ps aux ….to get the process id (nano file1)

Kill 7400 …. Put PID

^f4 ….to check the process been killed

To force killing a process

Nano file1 … to write something

^f3 ….. To go to tty3

Kill -9 7400 …. Put PID

^f4 ….to check the process been killed

To find a process and kill it

- If you have a running process but you need to stop it to save your resources for another application.

- Lab

^f4 ….to go to different tty

Nano file1 ….. to write something

^f3 ….. to go to tty3

Pgrep nano …..to find process id

Kill 7400 …. Put PID

^f4 ….to check the process been killed

To find a parent of a process

- If you have a halted process but you need to stop, you can kill its parent.

- Lab

Pstree ….to know the parent

Pstree | less ….. to know the parent

Ps –ef | less …..to find parent process id

/ nano

Kill -9 3456 ….kill parent ID

It terminates the process and the parent.