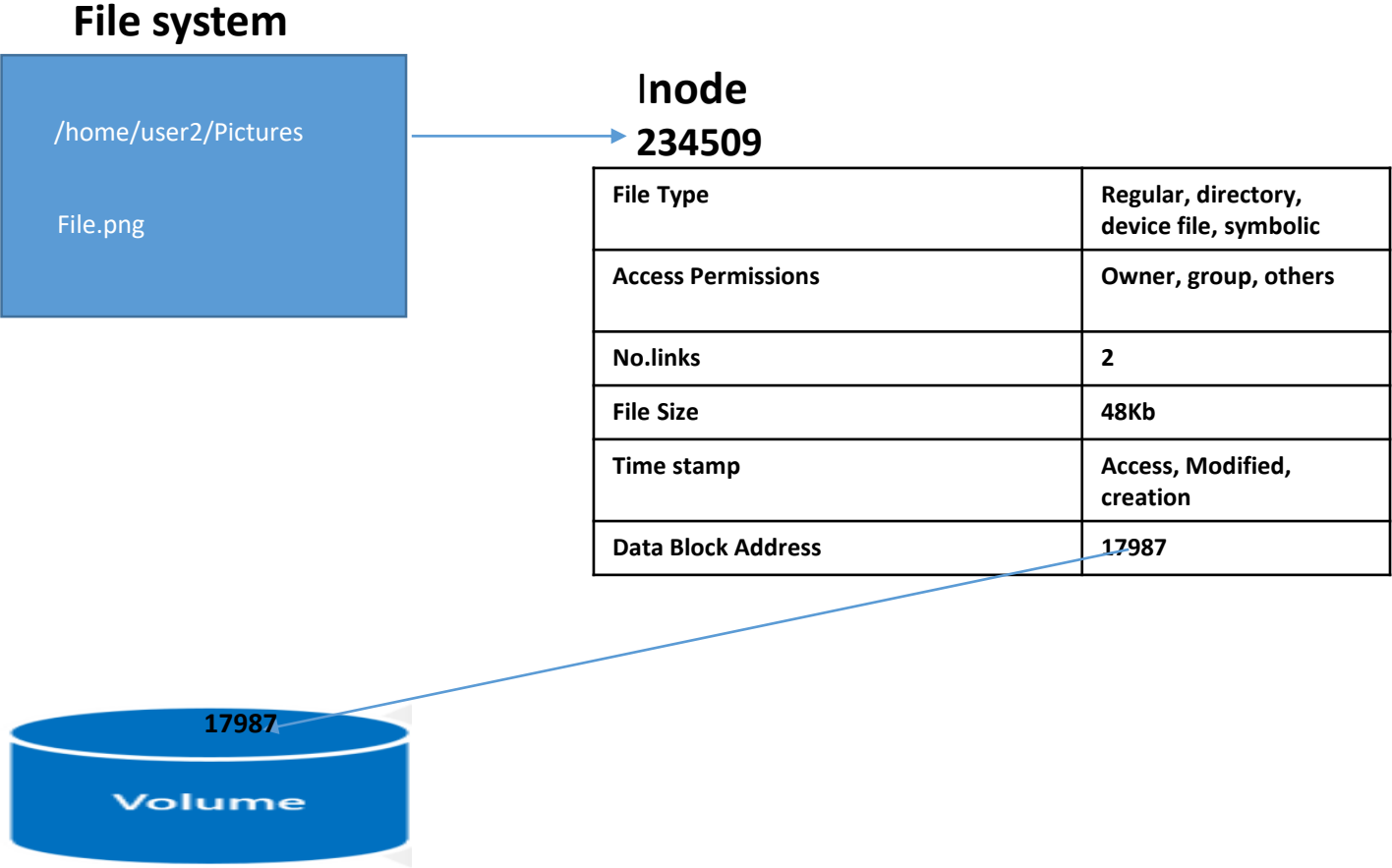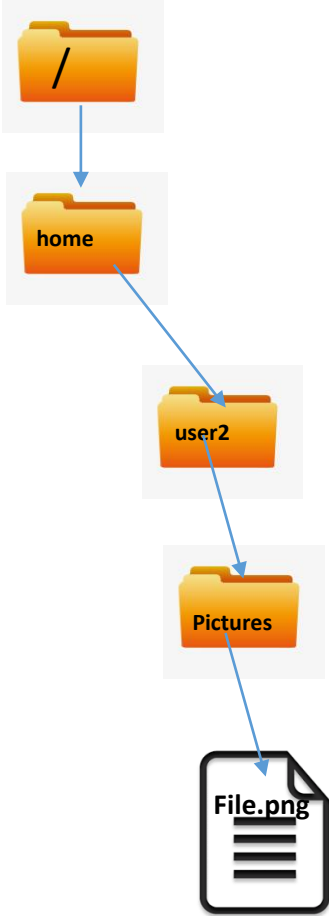# File system, Inode and Links

What will you learn:

★ What is a file system

★ What is an inode

★ What is an Inode Table

★ Differences between Soft Link and Hard Link

File system and Inode

/

home

user2

Pictures

File.png

File system

/home/user2/Pictures

File.png

Inode
234509

File Type	Regular, directory, device file, symbolic
Access Permissions	Owner, group, others
No.links	2
File Size	48Kb
Time stamp	Access, Modified, creation
Data Block Address	17987

17987

Volume

Soft Link and Hard Link

Soft Link = Symbolic Link

Org_file

**Inode
678900**

File Type	Regular
Access Permissions	Owner, group, others
No.links	1
File Size	48Kb
Time stamp	Access, Modified, creation
Data Block Address	17987

Link_File

**Inode
678903**

File Type	Symbolic
Access Permissions	Owner, group, others
No.links	0
File Size	48Kb
Time stamp	Access, Modified, creation
Data Block Address	

17987

Volume

Hard Link

Org_file

Inode
678900

File Type	Regular
Access Permissions	Owner, group, others
No.links	1
File Size	48Kb
Time stamp	Access, Modified, creation
Data Block Address	17987

Link_File

Inode
678900

File Type	Regular
Access Permissions	Owner, group, others
No.links	0
File Size	48Kb
Time stamp	Access, Modified, creation
Data Block Address	17987

17987

Volume

- Hard link can be created for only Files not for directories

- Hard link has to be in the same filesystem

- Soft Link can be created for directories
- Soft Link can be on different file system

Summary:

❖ File system   : which controls how data to be retrieved and stored on a storage device.
                      File system stores the file name and file path.

❖ Inode   : is a reference number to an inode table, all files will have an inode number

❖ Inode Table   : which contains all information about a file except file name and file path

Soft link	Hard link
Different Inode number	Same inode number
Link can create on different file system	Link has to be in the same file system
Link file type is symbolic link	file type is regular file
Link file refer to source file's Inode	Direct link to storage
Data cannot be accessed once source file deleted	Data can be accessed even the source file deleted
can be created for directories and files	Only on files

What will you learn:

⭐ How to create soft link and hard link

⭐ Practical experiments using both link types

⭐ Remove links

$ln   <Original file Name> <Link File Name>   ->Hard link

$ln -s <Original file Name> <Link File Name>   ->Soft Link

$ls -li   -> to list inode of a file or directory

$unlink <file name> -> to unlink file/directory

Summary:

$ln –s <org_file> <Link File>   -> To create soft link

$ln <org_file> <Link_file>   -> To create hard link

$unlink   -> to remove a link

$ls –li   -> to list inode number