

FILE & I/O

File

What is File

File is a sequence of bytes.

File Roles

Linux follows "everything is a file" philosophy.

Almost all input/output resources such as documents, directories, hard-drives, modems, keyboards, printers and some interprocess, network communication are represented by a file.

File Category

To show file category, we use command: **ls -l**

The first column represents file category and permission. We call the first character of the column is prefix.

Linux has three basic types of files:

- Regular File

Contains data, text or program instructions.

Prefix: -

```
invistd@server:~/dev$ cd ../share
invistd@server:~/share$ ls -l
total 9
-rwxrwxrwx 1 root root 8168 Nov 19 11:10 demo
-rwxrwxrwx 1 root root  51 Nov 19 04:43 demo.c
```

- Directory

Contains a list of other files.

Prefix: d

```
total 4
drwxrwxrwx 1 root root 4096 Nov 19 11:10 share
invistd@server:~$
```

- Device File

Used to interact with external devices.

Prefix: b,c,p,s

```
crw-rw---- 1 root input 13, 69 Nov 19 03:44 event5
crw-rw---- 1 root input 13, 70 Nov 19 03:44 event6
crw-rw-r-- 1 root input 13,  0 Nov 19 03:44 js0
crw-rw-r-- 1 root input 13,  1 Nov 19 03:44 js1
crw-rw---- 1 root input 13, 63 Nov 19 03:44 mice
crw-rw---- 1 root input 13, 32 Nov 19 03:44 mouse0
```

Device File

What is Device File

All I/O devices, such as networks, disks, terminals are mapped and modeled as files. That is called device file.

Where is Device File

Device files are located in folder **/dev**.

Device File Category

If the first character is **b**, **c**, **p**, or **s**, file represents a device.

The meaning of characters:

- Character device (c)

Driver communicates with hardware by sending and receiving characters (bytes, octets).

- Block device (b)

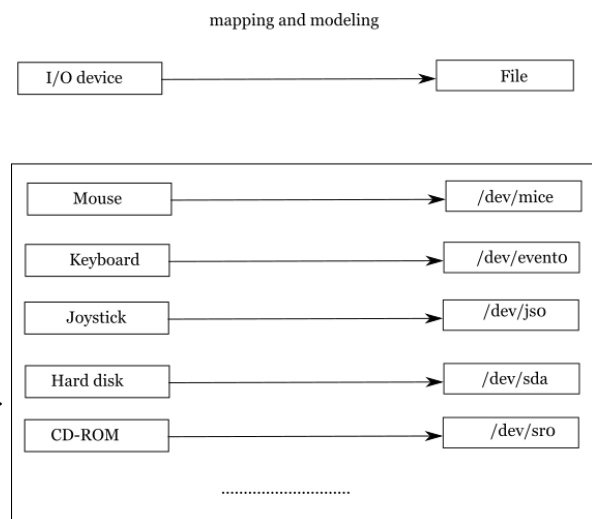
Driver communicates with hardware by sending and receiving entire blocks of data.

- Pipe device (p)

Like character device, pipe message is character. But, its endpoint is an I/O stream instead of a kernel driver.

- Socket device (s)

Special interfaces that are used for interprocess communication.



//continue: file descriptor, v-table, i-node