# **Device Numbers:**

1. Major number
2. Minor number

## **Need of Major/Minor numbers:-used to identify specific device in Linux**

Everything (files/directories/devices) in Linux is treated as file. Every device in Linux is represented by file called device file. Every activity in Linux is performed by accessing file. If you want to write, read or modify the data, you have to do it by accessing relevant file. Kernel does not recognize device by name of device file (because one can create multiple device files of same name) instead it considers Major/Minor number pairs.

## **Major number:**

* It refers to the kind of devices (type of hardware). E.g., Hard disk, RAM, Serial ports, Parallel ports, etc.
* In simple terms, Major number refers to the group of same kind of devices.
* The same kind of devices uses same device driver. (Same kind of device must use same device driver.)
* Kernel cares major number to access/select specific device driver.
* So there is only one major number for per device driver.
* Major numbers are predefined for different kind of devices. For example, Major number for SCSI device is 8, Major number for IDE device is 3 and so on.

## **Minor Numbers:**

* It refers to the instance of that kind of device (Special characteristics of the device to be accessed). E.g., in group of serial ports, Minor number for COM1 is say 2, Minor number for COM2 is say 3 and so on.
* In simple terms, Minor number refers to the individual device of that group of devices.
* Device driver cares minor number to access/select specific device of pool of devices.

## **Notes:**

* Major/Minor number pair is unique. It means, there is unique major and minor number for specific device instance.
* Although Block and Character devices have same number pair as they are different kind of devices.
* Major number cannot be modified/changed.

### **List of devices and its device numbers:**

|  |  |  |
| --- | --- | --- |
| **Device Name** | **Type of Device** | **Major Number** |
| SCSI drives(sd\*) | Block | 8 |
| IDE drives(hd\*) | Block | 3 |
| RAM | Block | 1 |
| Loop | Block | 7 |
| sr(CD ROM) | Block | 11 |
| mem | Character | 1 |
| Tty | Character | 5 |
| ttyS | Character | 4 |
| vcs | Character | 7 |
| console | Character | 5 |
| ptmx | Character | 5 |
| Input | Character | 13 |
| sg | Character | 21 |
| fb | Character | 29 |
| raw | Character | 162 |
| usbmon | Character | 250 |
| bsg | Character | 251 |
| rtc | Character | 254 |

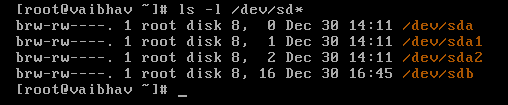
* To see all devices and their major numbers,

Command: **cat /proc/devices**

* To see major number of specific device,

Command: **ls –l /dev/<device\_name>**

Example: ls –l /dev/sd\*



Here, “b” at beginning of line indicates block device. 8 is major number. 0, 1,2,16 are minor numbers.