Partitions

Under Linux, disks are divided into partitions; the term slices is not often used, but when it is, it is used interchangeably with the term partitions.

Up to four primary partitions can be created and information stored about them in the MBR (Master Boot Record). More flexibility can be obtained by creating up to three primary partitions and an extended partition, which can contain as many logical partitions as can be accommodated, which may depend on the type of disk involved. For example, SCSI disks can have only up to sixteen partitions.

The Linux kernel discovers all pre-attached hard disks during system boot, and there is normally no configuration files required to inform about what is present. In hotplug situations, the udev system will find disks upon insertion in the system and read in their partition tables.

The command line utility for creating and examining hard disk partitions is **fdisk**; to see all currently attached device, you can do:

```
 1    $ sudo /sbin/fdisk -l
 2
 3    Disk /dev/sda: 2000.4 GB, 2000398934016 bytes, 3907029168 sectors
 4    Units = sectors of 1 * 512 = 512 bytes
 5    Sector size (logical/physical): 512 bytes / 4096 bytes
 6    I/O size (minimum/optimal): 4096 bytes / 4096 bytes
 7    Disk label type: dos
 8    Disk identifier: 0x000852df
 9
10       Device Boot       Start          End        Blocks    Id     System
11    /dev/sda1              2048    1048578047     524288000    8e     Linux LVM
12    /dev/sda2        1048578048    2097154047     524288000    8e     Linux LVM
13    /dev/sda3        2097154048    3907028991     904937472     5     Extended
14    /dev/sda5        2097156096    3145732095     524288000    8e     Linux LVM
15    /dev/sda6        3890448384    3907028991       8290304    82     Linux swap / Solari
16
17    Disk /dev/sdb: 256.1 GB, 256060514304 bytes, 500118192 sectors
18    Units = sectors of 1 * 512 = 512 bytes
19    Sector size (logical/physical): 512 bytes / 4096 bytes
20    I/O size (minimum/optimal): 4096 bytes / 4096 bytes
21    Disk label type: dos
22    Disk identifier: 0x00089e7f
23
24       Device Boot      Start          End       Blocks    Id    System
25    /dev/sdb1             2048     40962047     20480000    83    Linux
26    /dev/sdb2         40962048    500118191    229578072    83    Linux
27
28    Disk /dev/sdc: 256.1 GB, 256060514304 bytes, 500118192 sectors
29    Units = sectors of 1 * 512 = 512 bytes
30    Sector size (logical/physical): 512 bytes / 4096 bytes
31    I/O size (minimum/optimal): 4096 bytes / 4096 bytes
32    Disk label type: dos
33    Disk identifier: 0x00022650
34
35       Device Boot      Start          End       Blocks    Id   System
36    /dev/sdc1             2048    500117503    250057728    83   Linux
37
38    Disk /dev/loop0: 2562 MB, 2562695168 bytes, 5005264 sectors
39    Units = sectors of 1 * 512 = 512 bytes
40    Sector size (logical/physical): 512 bytes / 512 bytes
```

The **fdisk** utility can be used to create and remove partitions and change their type.

Note that **fdisk** does not allow you to move partitions or resize them. Resizing has to be done in two steps; if you are increasing, you have to increase the size of the partition, and then increase the filesystem size (for example, with **resize2fs**); if you are decreasing the size, you have to decrease the size of the filesystem and then the partition.

Partitions can be formatted for various filesystems with the **mkfs** command, or more usually, with specific commands for each type of filesystem. For example, either of the two following commands:

```
1   $ sudo mkfs -t ext4 /dev/sda10
2   $ sudo mkfs.ext4 /dev/sda10
```

will place an ext4 filesystem on **/dev/sda10** with default options.

The **gparted** utility (and some equivalents) let you do all these operations in a graphical user-friendly manner. Starting this up (as root) gives: