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:

$ sudo /sbin/fdisk -l

Disk /dev/sda: 2000.4 GB, 2000398934016 bytes, 3907029168 sectors

Units = sectors of 1 * 512 = 512 bytes

Sector size (logical/physical): 512 bytes / 4096 bytes

I/O size (minimum/optimal): 4096 bytes / 4096 bytes

Disk label type: dos

Disk identifier: 0x000852df

Device Boot	Start	End	Blocks	Id	System
/dev/sda1	2048	1048578047	524288000	8e	Linux LVM
/dev/sda2	1048578048	2097154047	524288000	8e	Linux LVM
/dev/sda3	2097154048	3907028991	904937472	5	Extended
/dev/sda5	2097156096	3145732095	524288000	8e	Linux LVM
/dev/sda6	3890448384	3907028991	8290304	82	Linux swap / Solaris

Disk /dev/sdb: 256.1 GB, 256060514304 bytes, 500118192 sectors

Units = sectors of 1 * 512 = 512 bytes

Sector size (logical/physical): 512 bytes / 4096 bytes

I/O size (minimum/optimal): 4096 bytes / 4096 bytes

Disk label type: dos

Disk identifier: 0x00089e7f

Device Boot	Start	End	Blocks	Id	System
/dev/sdb1	2048	40962047	20480000	83	Linux
/dev/sdb2	40962048	500118191	229578072	83	Linux

Disk /dev/sdc: 256.1 GB, 256060514304 bytes, 500118192 sectors

Units = sectors of 1 * 512 = 512 bytes

Sector size (logical/physical): 512 bytes / 4096 bytes

I/O size (minimum/optimal): 4096 bytes / 4096 bytes

Disk label type: dos

Disk identifier: 0x00022650

Device Boot	Start	End	Blocks	Id	System
/dev/sdc1	2048	500117503	250057728	83	Linux

Disk /dev/loop0: 2562 MB, 2562695168 bytes, 5005264 sectors

Units = sectors of 1 * 512 = 512 bytes

Sector size (logical/physical): 512 bytes / 512 bytes

I/O size (minimum/optimal): 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:

```
$ sudo mkfs -t ext4 /dev/sda10
```

```
$ 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: