8.1.4 MBR Partition Management Facts

The master boot record (MBR) partition format has been used by many operating systems, including Linux, for a number of years.

This lesson covers the following topics:

- MBR limitations and workarounds
- Partition types
- MBR partition tools

MBR Limitations and Workarounds

The MBR partition format has many limitations:

- The master boot record must be installed in the first 512 bytes of the hard disk.
- Only four standard partitions can be created on a storage device.
- The default block size of 512 bytes limits partitions to a maximum size of 2 TB.

Many workarounds have been implemented over the years to address these issues:

- Logical Block Addressing (LBA) allows the use of larger hard disks.
- Use of 4,096 byte sectors increases the maximum partition size on a disk.
- Extended partitions can contain many logical partitions.

Partition Types

A partition is a logical division of a storage device associated with a hard disk drive. A storage device using an MBR can have a single partition or multiple partitions. The most common partitioning scheme divides a disk into two different partition types:

Type	Description
Primary	A primary partition is used to store data as well as the operating system. Primary partitions: • Can hold operating system boot files. • Cannot be further subdivided into logical drives. • Can be formatted with a file system. There can be a maximum of four primary partitions or three primary partitions and one extended partition on a single hard disk drive.

Extended	An extended partition is an optional partition that contains logical partitions. Because an operating system cannot be booted from a logical partition from within an extended partition, this type of partition is not bootable. Extended partitions: • Can be further subdivided into an unlimited number of logical partitions. • Cannot be directly formatted with a file system. However, logical partitions within an extended partition can be formatted with a file system. Only one extended partition can exist on a single hard disk drive.

MBR Partition Tools

Use the following tools to create and manage partitions:

Tool	Description

fdisk	The **fdisk** utility is used to manage partitions on a hard disk. The **fdisk** utility has the following characteristics:
	• When you create a partition, **fdisk** requests a beginning/ending sector or size.
	  ◦ The size is indicated using K (kilobytes), M (megabytes), G (gigabytes), or T (terabytes).
	• When creating a partition, you specify the partition type using a hexadecimal code. Common hexadecimal codes include:
	  ◦ 0x82 (Linux swap)
	  ◦ 0x83 (Linux partition)
	  ◦ 0x85 (Linux extended partition)
	  ◦ 0x8e (Linux LVM partition)
	• Using the **-l** option displays the current partition configuration on the system.
	Type **fdisk** *[device_name]* at the command prompt to enter the **fdisk** utility. Within the **fdisk** utility, you can run the following options:
	• **l** lists the partition types supported.
	• **m** displays the help screen.
	• **n** creates a new partition.
	• **p** displays the partition table for that device.
	The **/proc/partitions** file contains a table with major and minor number of partitioned devices, their number of blocks, and the device name in /dev.
	• **q** exits fdisk without saving changes.
	• **w** writes the partition table to disk (saving the file) and exits the fdisk utility.
	• **d** deletes a partition.

partprobe	The **partprobe** command makes a request to the operating system to re-read the partition table. The operating system kernel reads the partition table and recognizes the table changes.

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