FAQ: Drive Partition Limits

What is the 2.2TB limitation?

Users upgrading a computer system with a larger hard disk drive may have problems using more than 2.2 terabytes (TB) of disk space. This limit arises from the maximum size of the master boot record (MBR) partitioning method used by most personal computers.

This document explains the issue and discusses long term solutions based on GPT and Unified EFI (UEFI) specifications.

Why does this limitation exist?

This limitation dates back to the 1980s and the original IBM PC. This introduced the master boot record (MBR) partitioning scheme to describe hard disk partitions.

BIOS systems with MBR disks use 32-bit values to describe the starting offset and length of a partition. Due to this size limit, MBR allows a maximum disk size of approximately 2.2 TB and a maximum of four primary partitions.

How does this affect today's computers?

To meet the demands of modern computer users, hard disk drive manufacturers will produce disks in excess of 2 TB in 2010. Users upgrading a computer system by adding or replacing an existing hard disk drive with a larger drive may encounter problems using more than 2.2 TB of disk space.

How will BIOS and OS address this limit?

The UEFI specification defines a new model for the interface between personal-computer operating systems and platform firmware, updating BIOS interfaces such as MBR.

UEFI supports the GUID Partition Table (GPT), a more flexible partitioning scheme. GPT disks use 64-bit values to describe partitions, allowing larger partitions. GPT also fixes other issues related to MBR (data integrity, backup tables, maximum number of partitions, …).

Using 64-bit values, GPT can handle disks of up to 9.4×10^{21} bytes or 9.4 zettabytes (ZB).

Will the OS boot to a partition over 2.2TB?

Only operating systems supporting UEFI and GPT are expected to boot from partitions larger than 2.2TB. This also requires the underlying firmware to implement UEFI.

Microsoft and Linux already support UEFI in newer OS revisions. Microsoft has published several documents related to UEFI & GPT:

- Windows and GPT FAQ [Microsoft WHDC]
- UEFI and Windows [Microsoft WHDC]

What other benefits does UEFI bring?

For more information on UEFI, check out the specifications posted at www.uefi.org