Pre-Installation

Booting

➜ What is Booting?
➜ Booting Process (Overview)
➜ Difference between hard boot and soft boot
➜ When can we say booting process is over?
➜ Bootstrapping?

Bootloader

➔ What is a bootloader?
➔ Where does bootloader reside?
➔ Primary and Secondary bootloader
➔ Chain loading
   ◆ Grub loads BOOTMGR instead of loading Windows directly
➔ GRUB
   ◆ */etc/grub/menu.lst* contains list of kernels
   ◆ *boot.img* is written to MBR. It reads first sector of the *core.img*.
   ◆ There are no stages in GRUB 2's design

BIOS (Basic Input/Output System)

- ➔ What is BIOS?
- ➔ What is a firmware?
- ➔ Where does BIOS reside?
- ➔ Why is BIOS important?
- ➔ Limitations of BIOS
- ➔ Alternative to BIOS

UEFI (Unified Extensible Firmware Interface)

➜ Use of UEFI?
➜ Benefits of UEFI over BIOS?
➜ Features of UEFI
   ◆ Can boot from disks with size more than 2TB. (Max. Size: 9.4ZB)
   ◆ CPU-independent architecture.
   ◆ CPU-independent drivers. (Reason: EFI Byte Code)
   ◆ Flexible pre-OS environment, including network capability.
   ◆ Secure Boot.
   ◆ Supports 32-bit and 64-bit mode.

Basic workflow of UEFI
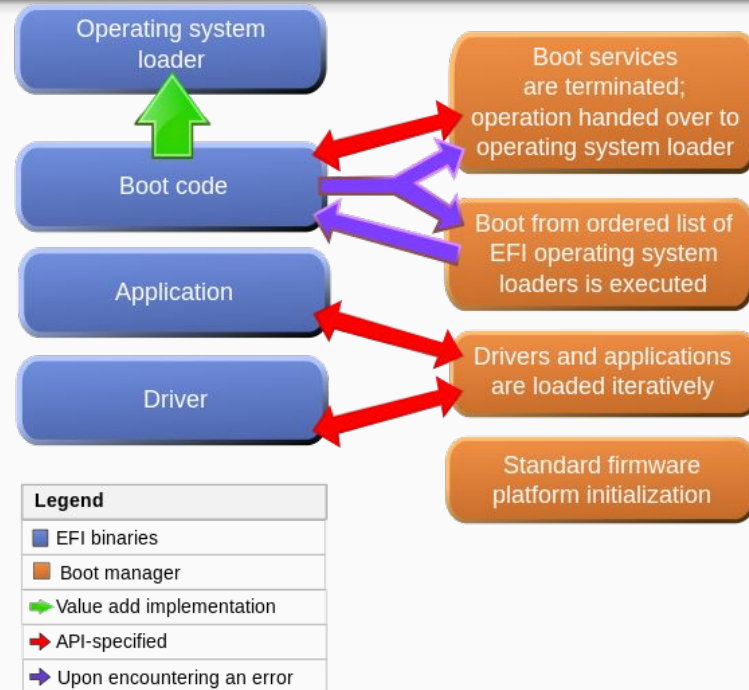
MBR (Master Boot Record)

➔ What is MBR?
➔ How is MBR loaded?
➔ Where does MBR reside? (ROM, RAM or any other memory)
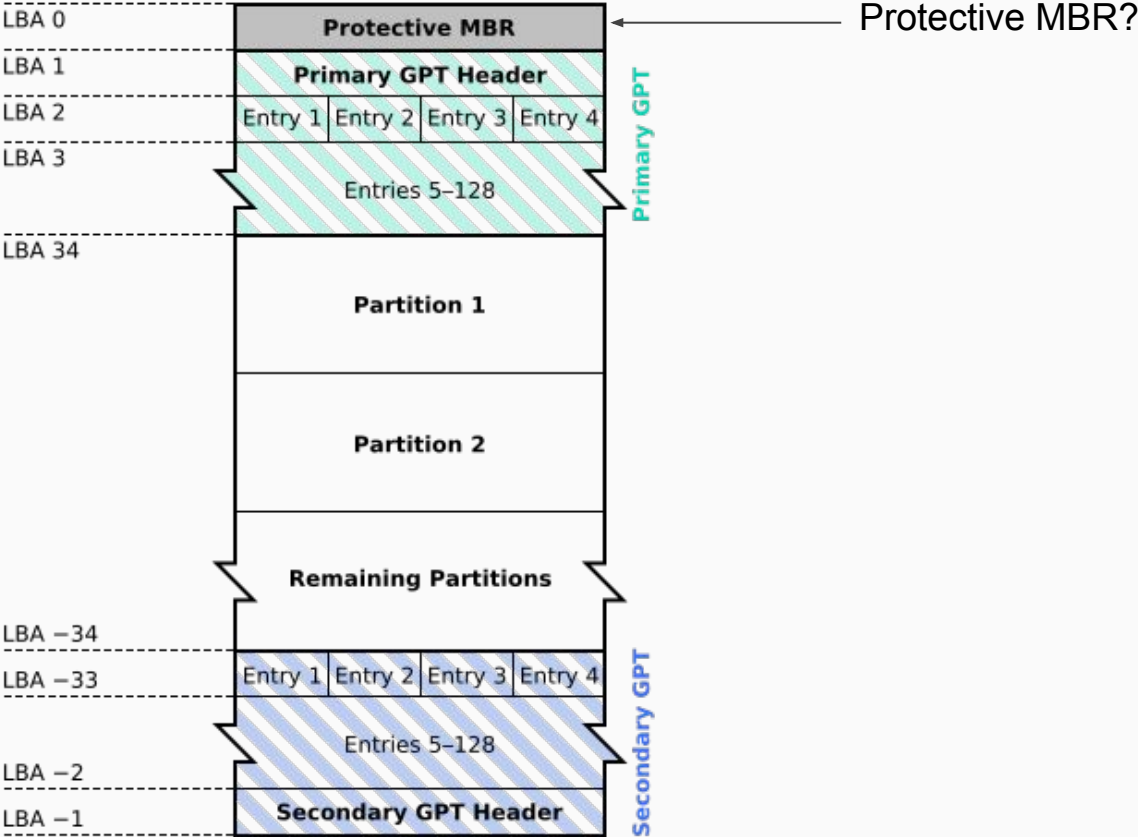➔ Limitations of MBR
➔ Alternative to MBR
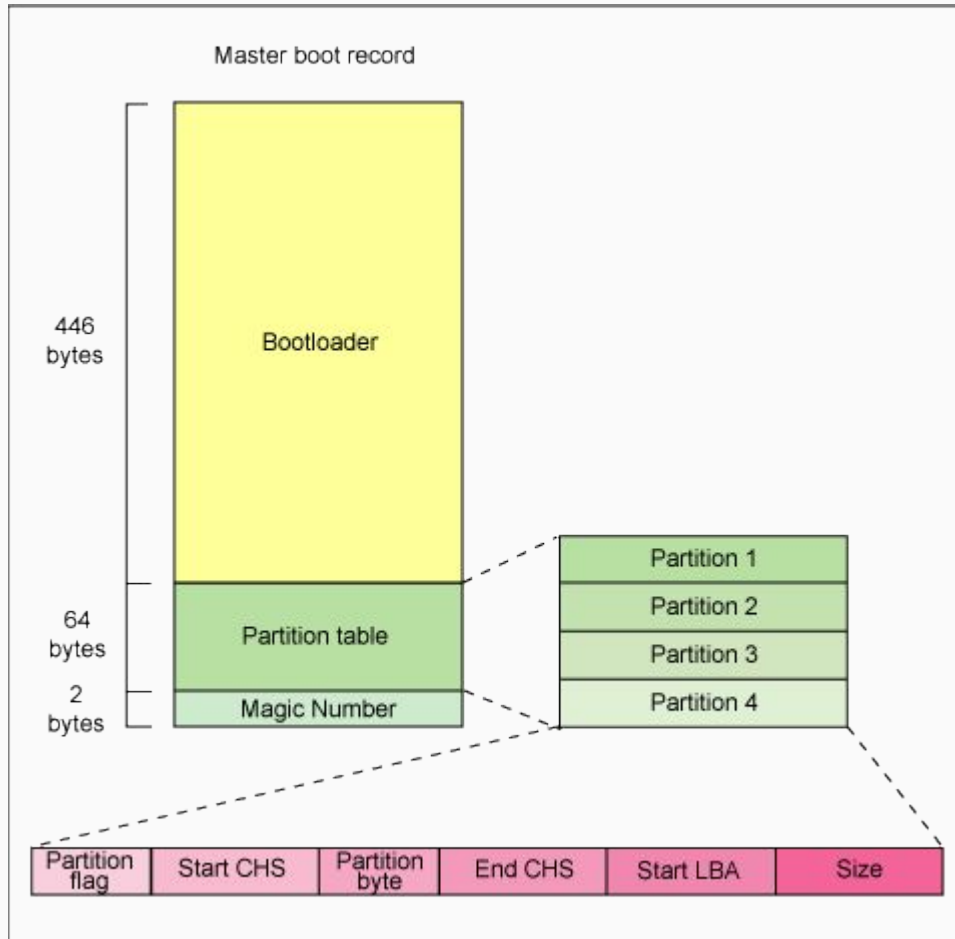
➔ CHS: Cylinder Head Sector

➔ Start CHS: CHS of first sector in partition.

➔ End CHS: CHS of last sector of the partition

➔ LBA: Logical Block Address

➔ Size: Number of sectors in partition

GPT (GUID Partition Table)

➜ What is GPT?
➜ Benefits of GPT over MBR
➜ BIOS-GPT?
  ◆ Bootloader must be "GPT-aware"
➜ GUID?
  ◆ Root partition (x86-64)　　4F68BCE3-E8CD-4DB1-96E7-FBCAF984B709

GUID Partition Table Scheme

LBA 0	**Protective MBR** ← Protective MBR?
LBA 1	**Primary GPT Header**
LBA 2	Entry 1 | Entry 2 | Entry 3 | Entry 4
LBA 3	Entries 5–128

Primary GPT

LBA 34	**Partition 1**
	Partition 2
	Remaining Partitions

LBA −34	
LBA −33	Entry 1 | Entry 2 | Entry 3 | Entry 4
	Entries 5–128
LBA −2	
LBA −1	**Secondary GPT Header**

Secondary GPT

Partition Style Comparison

MBR

- Supports up to 4 primary partitions, or 3 primary and an extended
- Supports volumes up to 2 terabytes
- Uses hidden sectors to store system information
- Replication and CRC are NOT features of MBR's partition table

GPT

- Supports up to 128 primary partitions
- Supports volumes up to 18 exabytes
- Uses partitions to store system information
- Replication and cyclical redundancy check (CRC) protection of the partition table for reliability

MBR or GPT?

➔ Open Command Prompt as Administrator
  ◆ *diskpart*
  ◆ *list disk*
➔ Press *windows key + R*
  ◆ *diskmgmt.msc*
  ◆ Right click on the disk you want to check and click on properties