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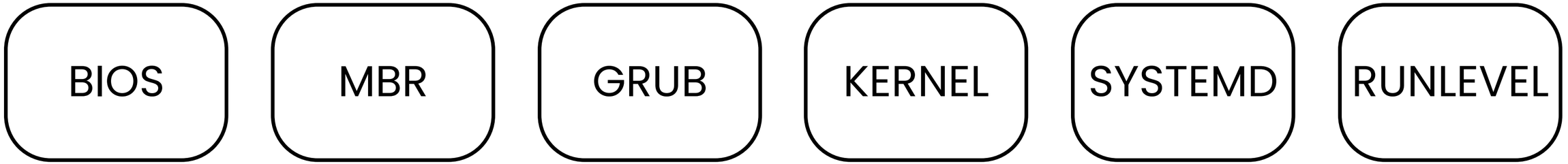
DISCLAIMER

UNDERSTANDING THE BOOT PROCESS

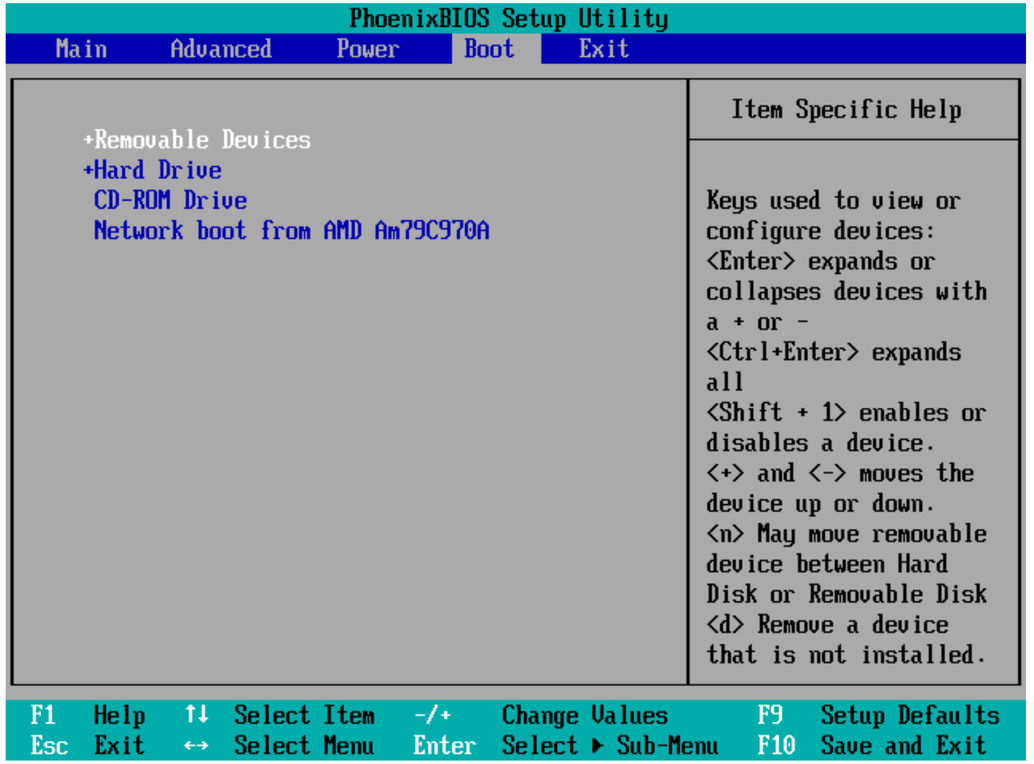
OVERVIEW OF THE BOOT PROCESS



BIOS

BASIC INPUT OUTPUT SYSTEM

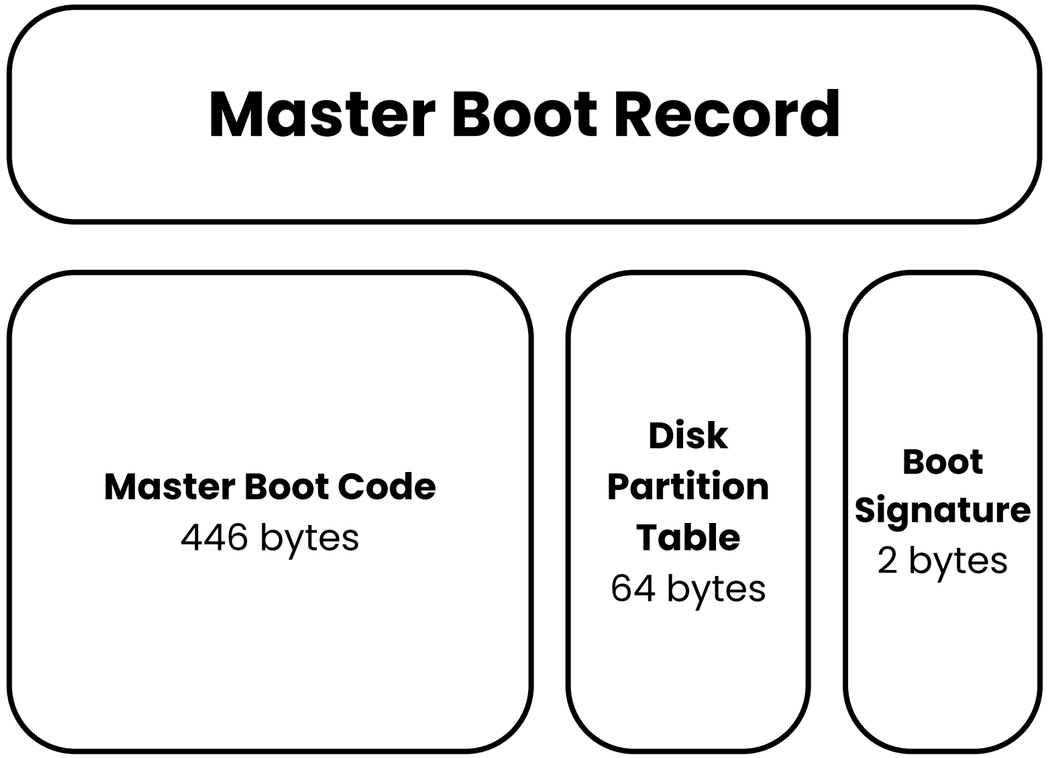
- Run from **ROM** and **INDEPENDENT** from the OS.
- Perform the **POST** (Power-on self-test).
- Searches, loads, and executes the MBR to boot the OS.



MBR

MASTER BOOT RECORD

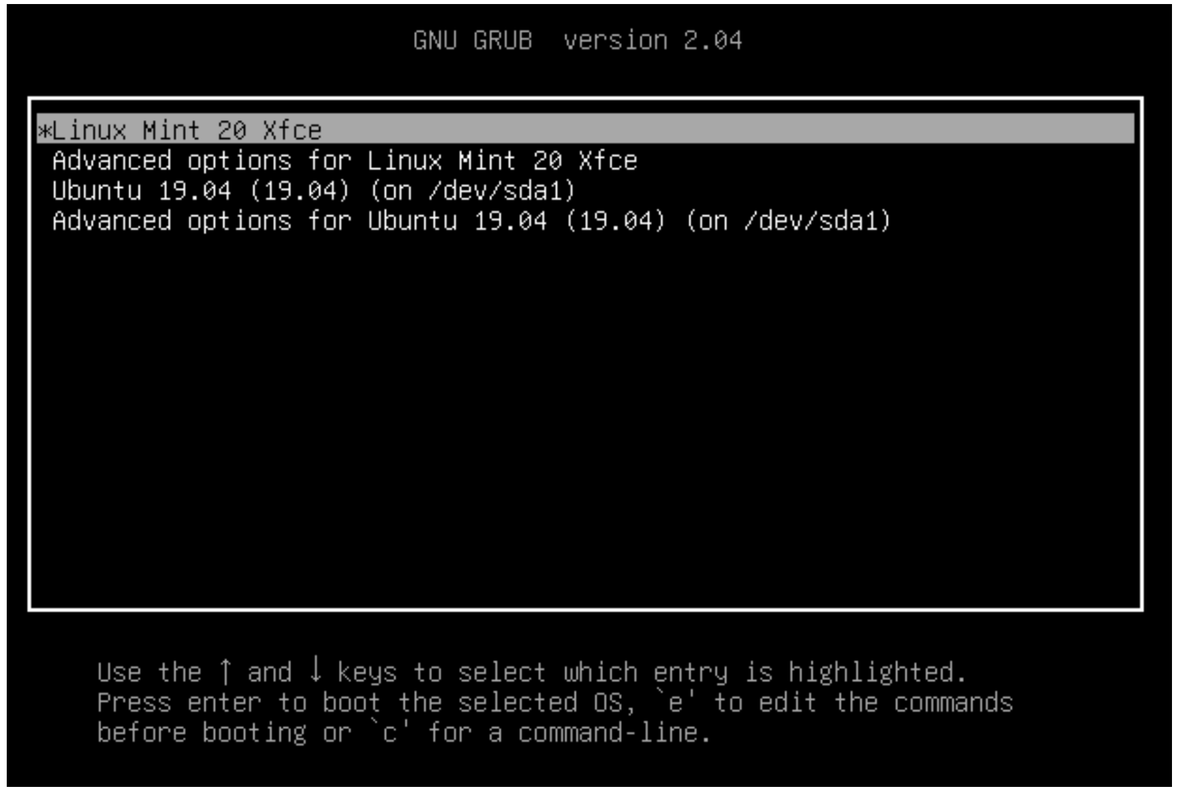
- Responsible for loading and executing the **boot loader**.
- Located in the **1st** sector of the boot device.
- Is **512 bytes** in size.
- Contains the **boot loader** program and informations about the disk partitions.



GRUB

GRAND UNIFIED BOOTLOADER

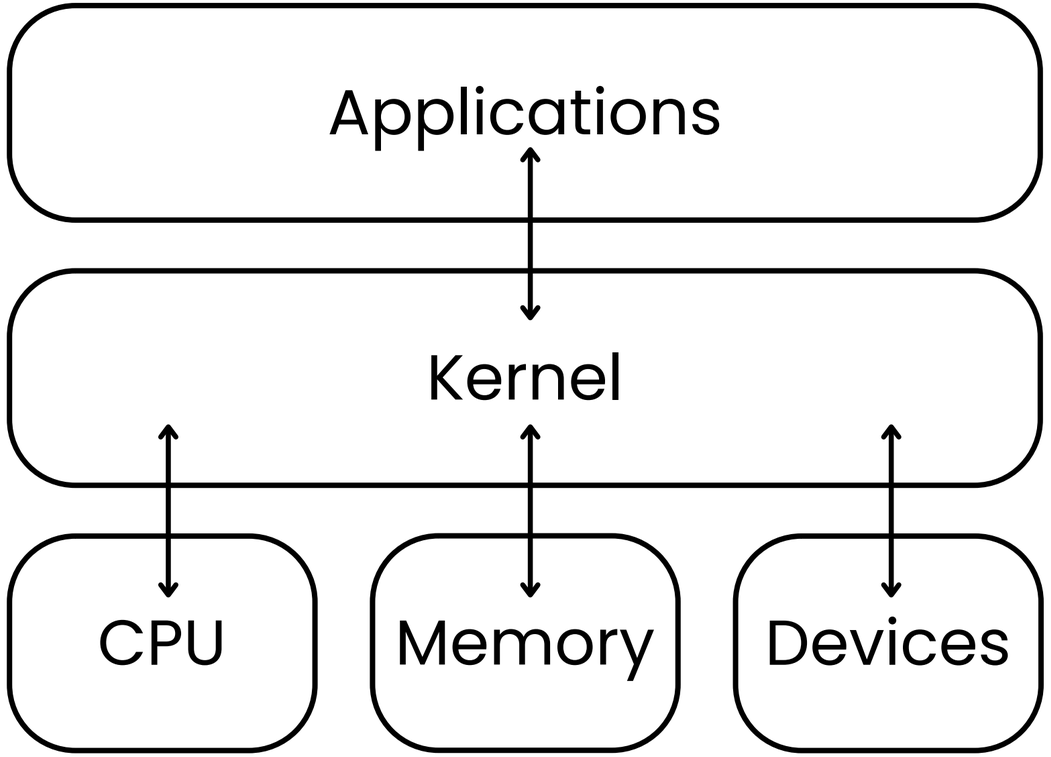
- **LILO** (Linux Loader) in old system.
- A splash screen with various functionalities.
- **GRUB** configuration file is located **/boot/grub/** by default.
- Insert the kernel into memory.



KERNEL

- **Core** of the OS and has **total** control over the computer resources.

- Follow predefined procedures:
  a. decompress itself in place (**vmlinuz** vs **vmlinux**).
  b. Mounts the root file system as specified in the **grub.conf**.
  c. run the **init process**.



SYSTEMD

PID 1

- The parent process initiated by the **kernel's init process**.
- Previously known as **SysVinit** process.

- Performs a range of tasks:
    a. probe all remaining hardware
    b. mount filesystems
    c. initiate and terminate services
    d. manage essential system processes like user login
    e. run a desktop environment

- Lastly, decide the **target** or **state** the linux system boots into.

RUNLEVEL

CURRENT STATE OF THE OS

- Defining which system services are running.
- Previously, **SysVinit** identified run levels by number.
- However, **.target files** now replace run levels in **Systemd**.

poweroff.target	run level 0	turn off (shut down) the computer
rescue.target	run level 1	initiate a rescue shell process
multi-user.target	run level 3	configure the system as a non-graphical (console) multi-user environment
graphical.target	run level 5	establish a graphical multi-user interface with network services
reboot.target	run level 6	restart the machine

RUNLEVEL

Let’s check our default target:

$ sudo systemctl get-default

```
10:25:17 dereck@dodoadmin-Inspiron-15-3511 ~ → sudo systemctl get-default
graphical.target
```

RUNLEVEL

To change boot target :

$ sudo systemctl set-default <target>

To change the target while the system runs.

$ sudo systemctl isolate <target>