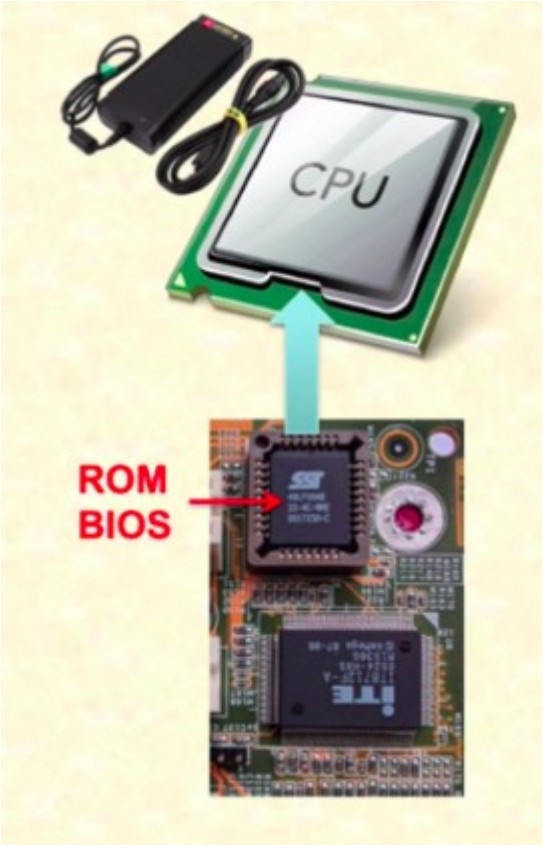
Booting an Operating System

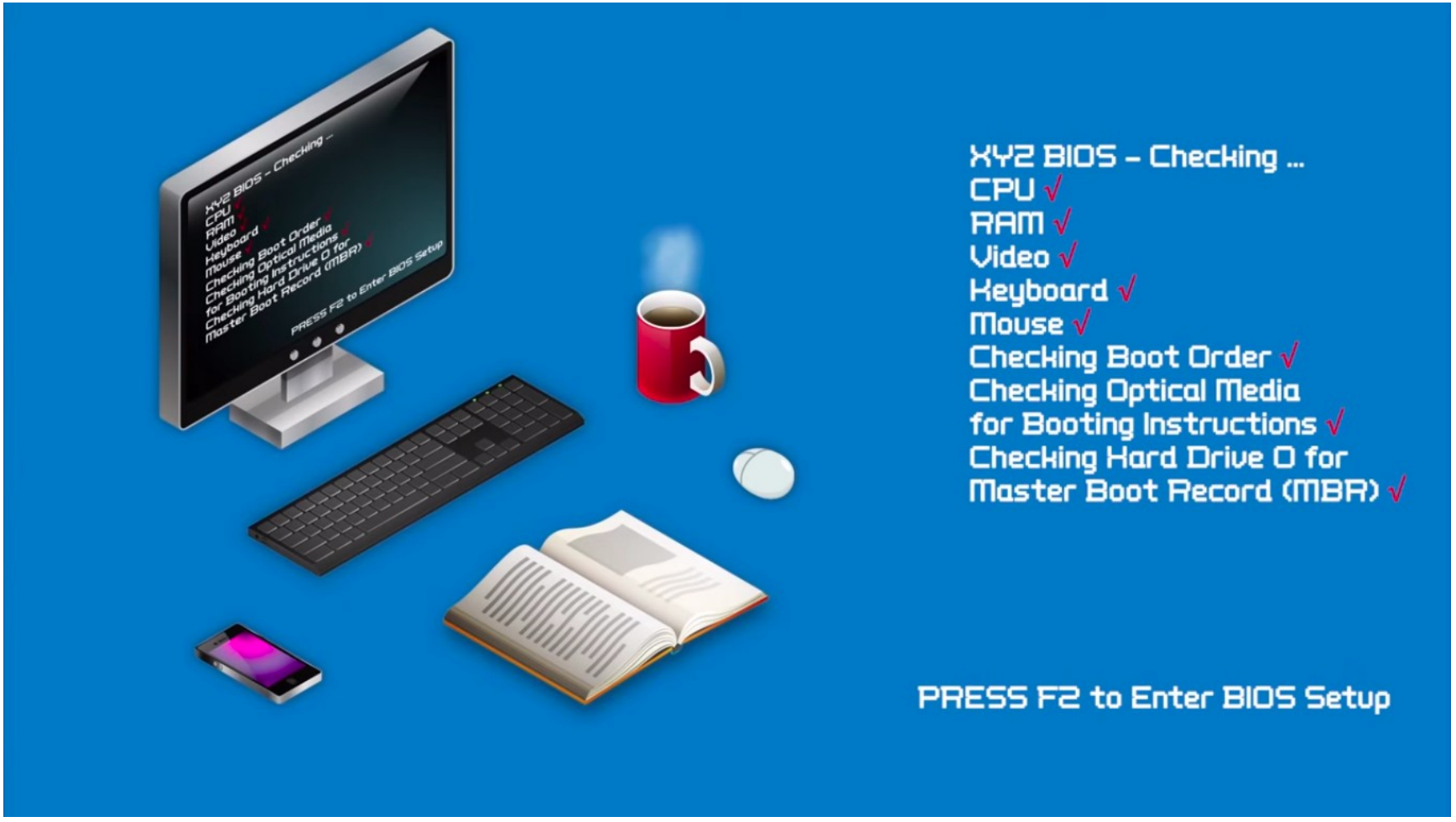
Process of Loading and Initializing Operating System

Need for Non Volatile Memory (Flash)

- CPU is active
- Mother board is powered on
- Firmware present in ROM
  - BIOS (Basic Input and Output System)
  - First Program run by CPU
  - POST
    - Runs Diagnostics and Build Inventory



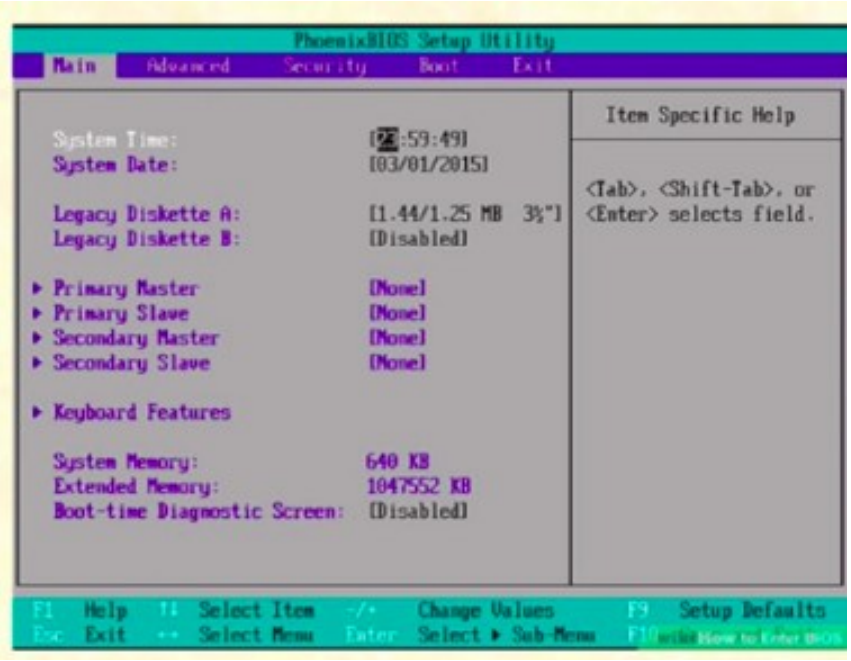
POST – Power On Self Test



BIOS Setup

User Interface

- Configure H/W on Computer
- Select Storage Device from where OS to be loaded



BIOS - MBR – Boot Loader

- Loads Master Boot Record (MBR)
  - First Sector from HDD / USB
  - 512 bytes from MBR to RAM
- BIOS Execute
  - Exceute the first instruction loaded from MBR
  - Machine code understood by processor
- Boot loader
  - Present in MBR,
  - S/W loads OS
  - Each OS has its own boot loader
    - Grub (Linux)

The MBR is always at Cylinder 0, Head 0, Sector 1 or 0,0,1.
It points to the Boot Sector.
Once the MBR is found,
the control is passed to the POST to the Operating System referenced in the MBR.

OS Initialization

- Boot Loader loads OS into Memory
- OS Runs
- Performs Initialization
  - Initialize the Memory, Devices
  - Load Additional software to control devices (Device driver)
  - Set up the OS library files that Software depend on
- Startup the Shell
  - Display the login prompt

Boot Sequence