Seneca

Introduction to Computer Software

Agenda

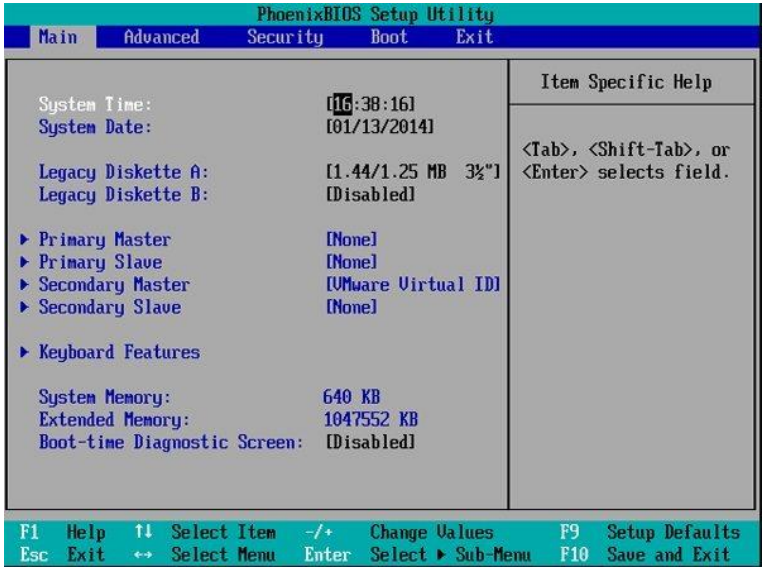
- Basic Input Output System
- Unified Extensible Firmware Interface
- Complementary Metal-Oxide-Semiconductor
- Power On Self Test
- Operating System
- Device Driver

Basic Input Output System

- Commonly known as “BIOS”.
- The BIOS identifies and configures computer hardware such as hard drives, CPU, memory, etc.
- This software (or firmware) is pre-installed on the motherboard.
- BIOS functions independent of any operating system installed.

Basic Input Output System: Setup Utility

- The BIOS key can be F2 / Del / Esc / F1 / F8 / F9 / F10 / F11 / F12
- For different brands of computer, the BIOS Key may be different. For instance, the BIOS key of Lenovo computer is F2, while that of HP computer is F10.



Unified Extensible Firmware Interface

- As known as “UEFI”.
- UEFI is a more modern solution, supporting larger hard drives, faster boot times, more security features, and graphics with mouse cursors.
- Supports more than 2.1 TB hard drives; up to 9.4 ZB (1 billion TB)
- Uses GPT partition scheme instead of MBR partition scheme.
- UEFI will replace BIOS on motherboards.

Complementary Metal-Oxide-Semiconductor

- Also known as “CMOS”.
- This computer chip is a RAM chip that stores information about the computer components and their settings.
- Since RAM is volatile, a CMOS battery is used to power the CMOS chip so the information is saved.
- If the battery runs out of power, the CMOS would lose the stored information.

CMOS Battery

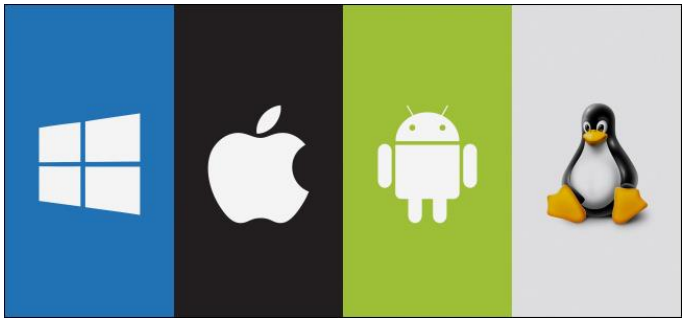
http://www.computerhope.com

Power On Self Test

- Commonly known as POST.
- During computer startup, the BIOS will initiate a POST.
- A Power On Self Test checks that basic system devices are present and working properly such as the processor, memory, storage devices, etc.
- Errors might come in the form of flashing LEDs, audible beeps, or error messages on the monitor.
- Error codes may vary from different manufacturers. The owner's manual is a useful guide to determine what the codes mean.
- If the POST is successful, the computer will attempt to boot an operating system.

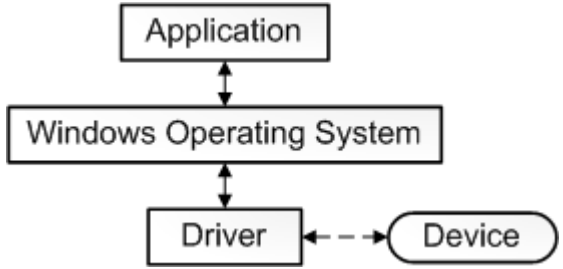
Operating System

- An operating system is the primary software that manages all the hardware and other software on a computer.
- Handles input and output devices.
- Operating systems use device drivers written by hardware creators to communicate with their device.
- Examples of operating systems: Microsoft Windows, Apple macOS, Google's Chrome OS, and Linux



Device Driver

- A device driver is a small piece of software that tells the operating system and other software how to communicate with a piece of hardware.
- This software is provided by the hardware manufacturer and may have the ability to install and update automatically.
- In Windows, “.SYS”, “.DLL” and “.EXE” files are device drivers.
- Virtual device driver (“.VXD”) are used in virtualization software which prevent guest operating system from accessing hardware directly.



Device Driver: System Information Activity

- How can you find information about the devices and their drivers?

Additional References

- CompTIA A+ 220-901: BIOS/UEFI Boot Sequence
- Power On Self Test
- A Dictionary of Computer Science: Device Driver