[**What is BIOS?**](http://ecomputernotes.com/fundamental/introduction-to-computer/what-is-bios-basic-input-output-system)

A **BIOS**(**Basic Input**/**Output System**) Short for **ROM**is boot firmware program that a [computer](http://ecomputernotes.com/fundamental/introduction-to-computer/what-is-computer) uses to successfully start operating. The [BIOS](http://ecomputernotes.com/fundamental/introduction-to-computer/what-is-bios-basic-input-output-system) is located on a chip inside of the computer and is designed in a way that protects it from disk failure.

When you turn on a PC, the BIOS first conduct a basic hardware check, called a Power-On Self Test (POST), to determine whether all of the attachments are present and working. Then it loads the [operating system](http://ecomputernotes.com/fundamental/disk-operating-system/what-is-operating-system) into your computer's random access memory, or RAM. The BIOS also manages data flow between the computer's operating system and attached devices such as the hard disk, video card, keyboard, mouse, and [printer](http://ecomputernotes.com/fundamental/input-output-and-memory/what-is-a-printer-and-what-are-the-different-types-of-printers). The BIOS stores the date, the time, and your system configuration [information](http://ecomputernotes.com/fundamental/information-technology/what-do-you-mean-by-data-and-information) in a battery-powered, non-volatile memory chip, called a CMOS (Complementary Metal Oxide Semiconductor) after its manufacturing process.

# What Is the Purpose of BIOS?

# BIOS enables computers to perform certain operations as soon as they are turned on. The principal job of a computer's BIOS is to govern the early stages of the startup process, ensuring that the operating system is correctly loaded into memory. BIOS is vital to the operation of most modern computers, and knowing some facts about it could help you troubleshoot issues with your machine.

## POST

The first job of the BIOS after you switch your computer on is to perform the Power On Self Test. During the POST, the BIOS checks the computer's hardware in order to ensure that it is able to complete the startup process. If the POST is completed successfully, the system usually emits a beep. If the test fails, however, the system generally emits a series of beeps. You can use the number, duration and pattern of these beeps to identify the cause of the test failure.

## Startup

## With the POST completed, the BIOS then attempts to load the operating system through a program known as a bootstrap loader, which is designed to locate any available operating systems; if a legitimate OS is found, it is loaded into memory. BIOS drivers are also loaded at this point. These are programs designed to give the computer basic control over hardware devices such as mice, keyboards, network hardware and storage devices

## Security

The BIOS can also play a role in computer security. Most BIOS software versions have the option to password-protect the boot process, which means that you must enter a password before any BIOS activity can take place. With the BIOS performing virtually all of its functions during startup, this effectively password-protects the operation of the whole computer. However, resetting a lost BIOS password can be time-consuming and involve working on some of the computer's most sensitive components.

## Hardware

The BIOS software itself generally resides on a Read-Only Memory, or ROM, or a flash memory chip attached to your computer's motherboard. The location of the BIOS software on the chip is important, as it is the first software to take control of your computer when you turn it on. If the BIOS was not always located in the same place on the same chip, your computer's microprocessor would not know where to locate it, and the boot process could not take place.

**Booting Process**

Whenever you turn on your computer, the first thing you see is the BIOS software doing its thing. On many machines, the BIOS displays text describing things like the amount of memory installed in your computer, the type of hard disk and so on. It turns out that, during this boot sequence, the BIOS is doing a remarkable amount of work to get your computer ready to run. This section briefly describes some of those activities for a typical PC.

After checking the CMOS Setup and loading the interrupt handlers, the BIOS determines whether the video card is operational. Most video cards have a miniature BIOS of their own that initializes the memory and graphics processor on the card. If they do not, there is usually video driver information on another ROM on the motherboard that the BIOS can load.

Next, the BIOS checks to see if this is a **cold boot** or a **reboot**. It does this by checking the value at memory address 0000:0472. A value of 1234h indicates a reboot, and the BIOS skips the rest of POST. Anything else is considered a cold boot.

If it is a cold boot, the BIOS verifies RAM by performing a read/write test of each memory address. It checks the PS/2 ports or [USB ports](https://computer.howstuffworks.com/usb.htm) for a keyboard and a mouse. It looks for a **peripheral component interconnect**([PCI](https://computer.howstuffworks.com/pci.htm)) bus and, if it finds one, checks all the PCI cards. If the BIOS finds any errors during the POST, it will notify you by a series of beeps or a text message displayed on the screen. An error at this point is almost always a hardware problem.

The BIOS then displays some details about your system. This typically includes information about:

* The [processor](https://computer.howstuffworks.com/microprocessor.htm)
* The [floppy drive](https://computer.howstuffworks.com/floppy-disk-drive.htm) and [hard drive](https://computer.howstuffworks.com/hard-disk.htm)
* [Memory](https://computer.howstuffworks.com/computer-memory.htm)
* BIOS revision and date
* Display

Any special drivers, such as the ones for **small computer system interface** ([SCSI](https://computer.howstuffworks.com/scsi.htm)) adapters, are loaded from the adapter, and the BIOS displays the information. The BIOS then looks at the sequence of storage devices identified as **boot** devices in the CMOS Setup. "Boot" is short for "bootstrap," as in the old phrase, "Lift yourself up by your bootstraps." Boot refers to the process of launching the [operating system](https://computer.howstuffworks.com/operating-system.htm). The BIOS will try to initiate the boot sequence from the first device. If the BIOS does not find a device, it will try the next device in the list. If it does not find the proper files on a device, the startup process will halt. If you have ever left a disk  when you restarted your computer, you have probably seen this message.

The BIOS has tried to boot the computer off of the disk left in the drive. Since it did not find the correct system files, it could not continue. Of course, this is an easy fix. Simply pop out the disk and press a key to continue.