

# What is Boot Sector?

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Boot sectors exist on an internal hard drive, where the operating system such as Windows is installed, as well as on storage devices that you don't even need to boot, but instead keep personal data, like external hard drive, floppy disk or other USB devices.

## Learn about Boot Sector

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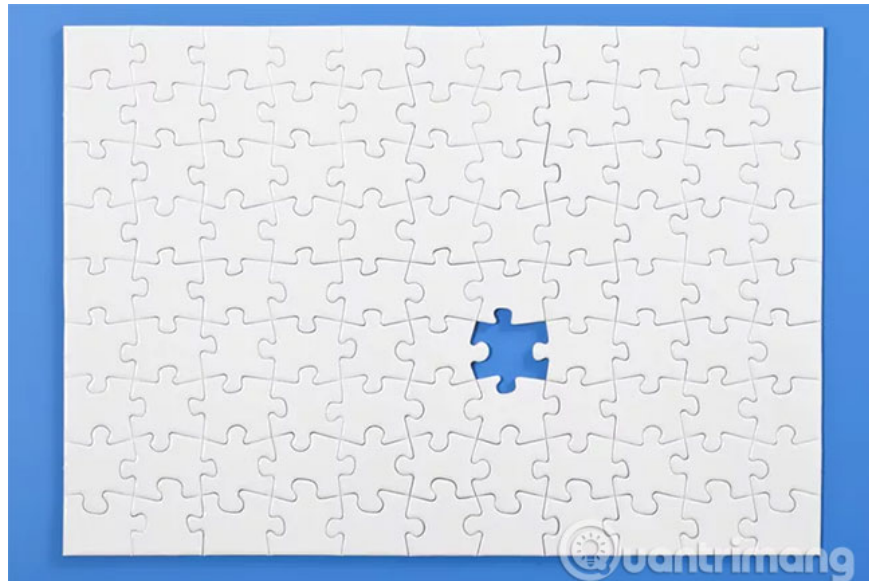
## How is boot sector used?

When a computer turns on, the first thing that happens is that the BIOS will search for what it needs to boot the operating system. The first position the BIOS will find is the first sector of each storage device connected to the computer.

Suppose you have a hard drive in your computer. This means you have a hard drive with a boot sector. That specific sector of the hard drive can contain one of two things: **Master Boot Record (MBR)** or **Volume Boot Record (VBR)**.

MBR is the first sector of any formatted hard drive. Since the BIOS looks at the first sector to understand how to start, it will load MBR into memory. After the MBR data is loaded, the active partition can be found so that the computer knows the location of the operating system.

If a hard drive has multiple partitions, VBR is the first sector in each partition. VBR is also the first sector of a device that is not partitioned at all.



## Error in boot sector

A sector must have a very specific disk signature, in order for the BIOS to be considered a boot sector. The disk signature of boot sector is **0x55AA** and is contained in its last two information bytes.

If the disk signature is corrupted or somehow changed, it is likely that the BIOS will not be able to find the boot sector, and therefore, will not be able to load the necessary instructions to find and boot the system. operating.

Any of the following error messages may indicate a corrupted boot sector:

1. Invalid partition table
2. Could not find BOOTMGR
3. BOOTMGR is missing
4. Missing operating system
5. Setup has determined that your file system is corrupted
6. A disk reading error occurred
7. NTLDR is missing
8. Error loading operating system

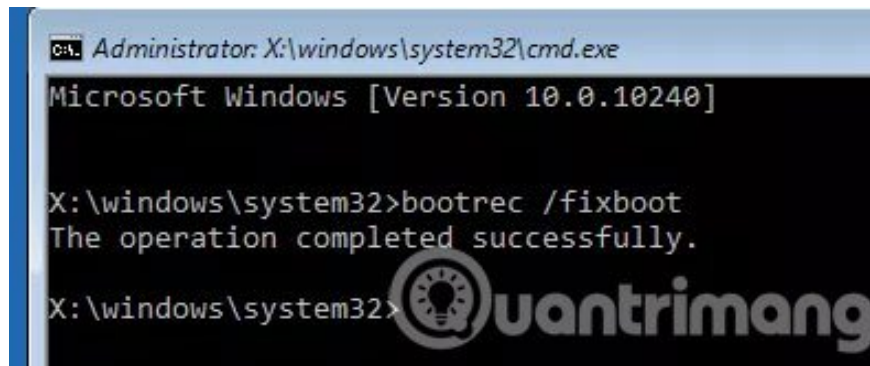
Although these errors often indicate problems related to boot sectors, the cause may stem from another reason, and there will be corresponding solutions to overcome. Be sure to follow any specific troubleshooting tips you can find on **TipsMake.com** or somewhere on the Internet.

## How to fix boot sector error

If you find that the boot sector error may be the cause of the problems you encounter, format the hard drive and then reinstall Windows from scratch, it is a "classic" fix for these types of problems.

Fortunately, there are other processes, better set up, and anyone can follow to fix bugs related to boot sectors, without having to delete the entire computer.

To repair a corrupted boot sector in Windows 10, 8, 7 or Vista, follow the following detailed instructions to burn a new partition sector to the Windows system partition:



```
C:\> Administrator: X:\windows\system32\cmd.exe
Microsoft Windows [Version 10.0.10240]

X:\windows\system32>bootrec /fixboot
The operation completed successfully.

X:\windows\system32>
```

1. Go to **Advanced Startup Options** (Windows 10 & 8) or **System Recovery Options** (Windows 7 & Vista).
2. Open **Command Prompt**.

**Note** : Command Prompt, available from the **Advanced Startup Options** and **System Recovery Options** menus, is similar to the menu available in Windows and works very similarly between operating systems.

3. At the prompt, enter the **bootrec** command as shown below and then press Enter :

```
bootrec /fixboot
```

The **bootrec** command will write a new boot sector partition to the current system partition. Any configuration problems or problems with the boot partition boot may be corrected.

4. You will see the following message at the command line:

```
The operation completed successfully.
```

Then a cursor will blink at the prompt.

5. Restart the computer with **Ctrl + Alt + Del** or manually via reset button or power button.

Assuming that boot partitioning is the only problem, Windows will boot normally immediately. If not, continue troubleshooting any specific problems that prevent Windows from starting normally.

**Important note** : Depending on how you start **Advanced Startup Options** or **System Recovery Options** , you may need to remove the disk or flash drive before rebooting.

Boot sector errors can also occur in Windows XP but the error correction process will be very different. On Windows XP, do the following:



You need to enter the Windows XP Recovery Console. The Recovery Console is an advanced diagnostic mode of Windows XP, with special tools that allow you to burn a new partition sector to the Windows XP system partition.

Here's how to get into the Recovery Console and write a new boot sector partition to fix a corrupted or unstable boot sector in Windows XP.

1. Boot the computer from the Windows XP CD by inserting a CD and pressing any key when you see the message **Press any key to boot from CD** .
2. Wait for Windows XP to start the setup process. Do not press the function key even if you are prompted to do so.
3. Press R when you see the **Windows XP Professional Setup screen** to enter the Recovery Console.
4. Select Windows installation. Maybe you only have a single installation.
5. Enter admin password.
6. When you reach the command line, enter the following command, then press Enter .

```
fixboot
```

7. The **fixboot** utility writes a new boot sector partition to the current system partition. This fixes any possible boot sector partition boot, and undo any partition boot configuration that may cause problems.
8. Remove the Windows XP CD, type **exit**, then press Enter to restart the PC.

Assuming that the boot partition is corrupted or unstable, the only problem you encounter, Windows XP will boot normally.

One of the formal processes, approved by Microsoft above, is a better option in most cases, but there are some third-party tools that can rebuild boot sectors, if you want to try one. among them. Refer to the article: 10 free partitioning tools for more details.

There are also some hard drive testing tools that can recover data from bad sectors. This may be a way to fix the boot sector error, but readers can focus on the ideas I mentioned in this article, before paying for a certain tool.

## Virus boot sector

In addition to the risk of failure due to some hardware problems or errors, the boot sector may also be attacked by malware.

Malware creators like to focus their attention on boot sectors because their code starts automatically and is sometimes unprotected, before the operating system starts!

If you think you may have been infected with a boot sector virus, you should scan the malware for the entire system, including the boot sector. See the article on how to scan and repair computers infected with viruses or malware, if you are not sure what to do.

Many boot sector viruses will prevent your computer from starting in any way, making it impossible to scan for malware from within Windows. In these cases, you need a virus scanner capable of booting. **TipsMake.com** has a list of free bootable antivirus tools that you can choose to solve this particularly annoying problem.

Some motherboards have active BIOS software to prevent boot sectors from being modified, which is useful in preventing malware from making changes to boot sectors. However, this feature may be disabled by default. Besides, there are partitioning tools and disk encryption programs that are helpful in this regard.

## More information about boot sector

Boot sector is created when you format the device for the first time. This means that if the device is not formatted and has not used the file system, it cannot be considered a boot sector.

There is only one boot sector for each storage device. Even if a hard drive has multiple partitions or is running multiple operating systems, there is only one boot sector for the entire drive.

Premium software such as Active @ Partition Recovery (reference link: <https://www.partition-recovery.com/index.html>) can backup and restore boot sector information in case you encounter problems. Other advanced applications are likely to find another boot sector on the drive that can be used to rebuild a broken boot sector.

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