

LESSON 6.1

98-365 Windows Server Administration Fundamentals

# Identify Steps in the Startup Process

## Lesson Overview

In this lesson, you will learn:

- System startup process
- Power-on self-test (POST)
- Boot process
- System boot files
- System boot options

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# Anticipatory Set

- Describe the Windows® startup process.

## System Startup Process

- (POST) phase
- Initial startup phase—CMOS contains boot order and finds a boot device
- Boot loader phase—loads startup files from the boot partition
- Detect and configure hardware phase—collects information about installed hardware
- Kernel loading phase—Windows kernel is loaded
- Logon phase—the Windows subsystem starts winlogon.exe



## Power-On Self-Test (POST)

- As soon as you turn on a computer, it processes the instructions contained in the basic input/output system (BIOS).
- The first set of startup instructions is the power-on self-test (POST). The POST is responsible for the following system and diagnostic functions:

Performs initial hardware checks, such as determining the amount of memory present

Verifies that the devices needed to start an operating system, such as a hard disk, are present

Retrieves system configuration settings from nonvolatile complementary metal-oxide semiconductor (CMOS) memory, which is located on the motherboard

## **Boot Process**

- Loads the operating system code into computer memory
- The BIOS (basic input /output system) initializes the computer hardware and loads the operating system, completes hardware setup, and produces a fully functional operating system.
- The process can occur from a direct attached disk, over a local area network, or from networked storage.
- The most common approach is from a disk. The server BIOS locates the SCSI adapter BIOS, which contains the instructions that allow the server to determine which of the disks is the boot device.
- Master boot record (MBR) is the first sector of the first hard disk; a physically small but critical element in the startup process on x64 and x86-based computer. When a computer is booted, it processes a series of self-tests and then reads the MBR. The MBR contains instructions that locate the disk's system (startup).

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## System Boot Files

- Boot Configuration Data (BCD) Store defines how the boot menu is configured. The store is a namespace container for BCD objects and elements that hold the information that is required to load Windows or run other boot applications. Physically, a BCD store is a binary file in the registry hive format.

```
Administrator: Command Prompt
Microsoft Windows [Version 6.1.7600]
Copyright (c) 2009 Microsoft Corporation. All rights reserved.

C:\Users\Administrator>bcdedit

Windows Boot Manager
-----
identifier          {bootmgr}
device              partition=\Device\HarddiskVolume1
description          Windows Boot Manager
locale              en-US
inherit              {globalsettings}
default              {current}
resumeobject        {bfea97d2-74b8-11df-8e0b-cd398159c0b0}
displayorder         {current}
toolsdisplayorder    {memdiag}
timeout              30

Windows Boot Loader
-----
identifier           {current}
device               partition=C:
path                 \Windows\system32\winload.exe
description           Windows Server 2008 R2
locale               en-US
inherit               {bootloadersettings}
recoverysequence     {bfea97d4-74b8-11df-8e0b-cd398159c0b0}
recoveryenabled       Yes
osdevice              partition=C:
systemroot            \Windows
resumeobject         {bfea97d2-74b8-11df-8e0b-cd398159c0b0}
nx                   OptOut

C:\Users\Administrator>
```



## System Boot Files (continued)

- BCD was created to provide an improved mechanism for describing boot configuration data.
- You can modify the BCD Store by using the following tools:
  - Startup and recovery
  - System configuration utility (msconfig.exe)
  - BCD WMI provider
  - BCDEdit.exe
- Winload.exe is Windows operating system boot loader, which loads the operating system kernel. Formerly known as NTLDR in Windows Server 2003®.



## System Boot Options

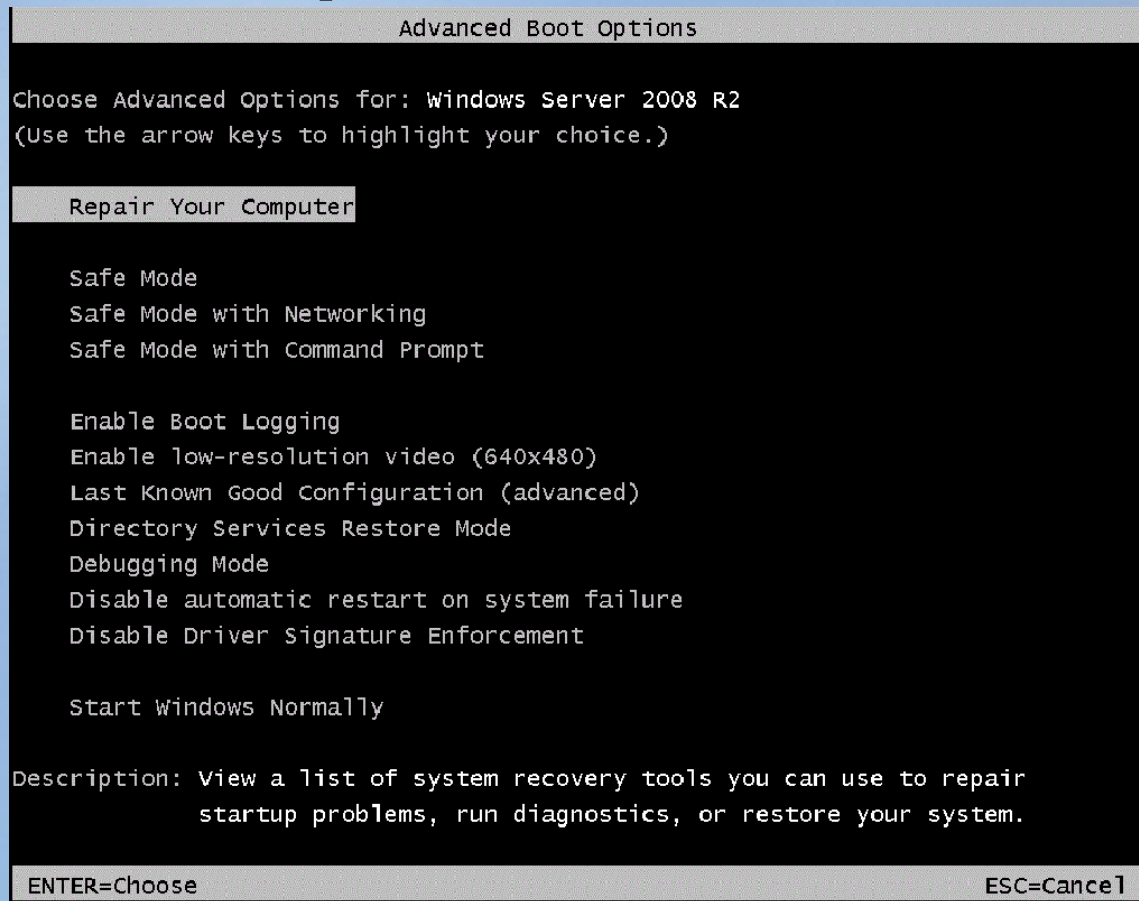
- Safe Mode starts Windows with a limited set of files and drivers. Startup programs do not run in safe mode, and only the basic drivers needed to start Windows are installed.
  - Safe mode is useful for troubleshooting problems with programs and drivers that might not start correctly.
- To start your computer in safe mode:
  1. Remove all floppy disks, CDs, and DVDs and restart the computer.
  2. On a computer with a single operating system installed, press and hold the F8 key as your computer restarts.
  3. On the Advanced Boot Options screen, use the arrow keys to highlight the safe mode option you want, and then press Enter.
  4. Log on with a user account that has administrator rights.

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# System Boot Options (continued)

## F8 Advanced Boot Options

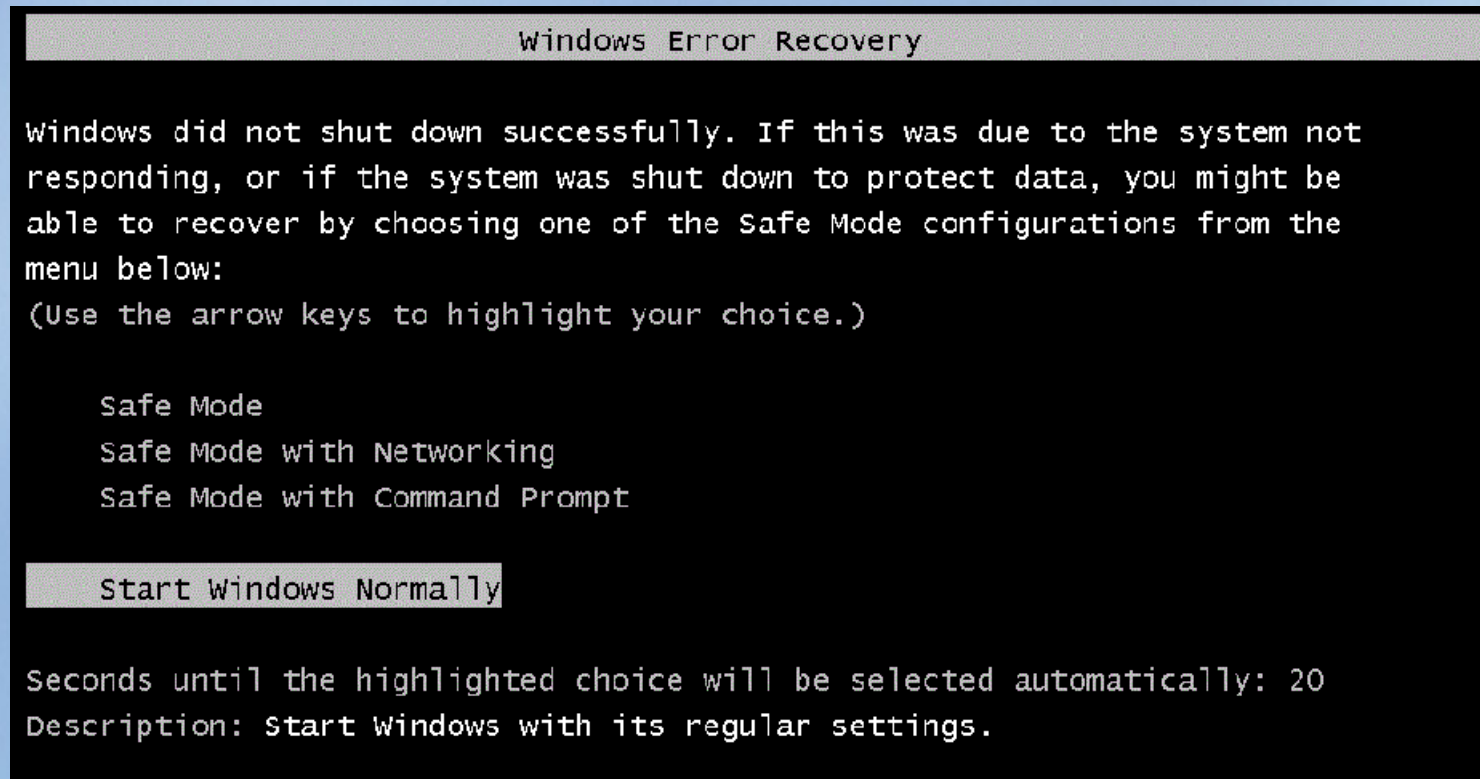


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# System Boot Options (continued)

## Safe Mode





## Lesson Review

- What is POST responsible for?
- What phase in the Windows startup process loads Windows boot files?
- What key should be pressed when you want to boot into safe mode?