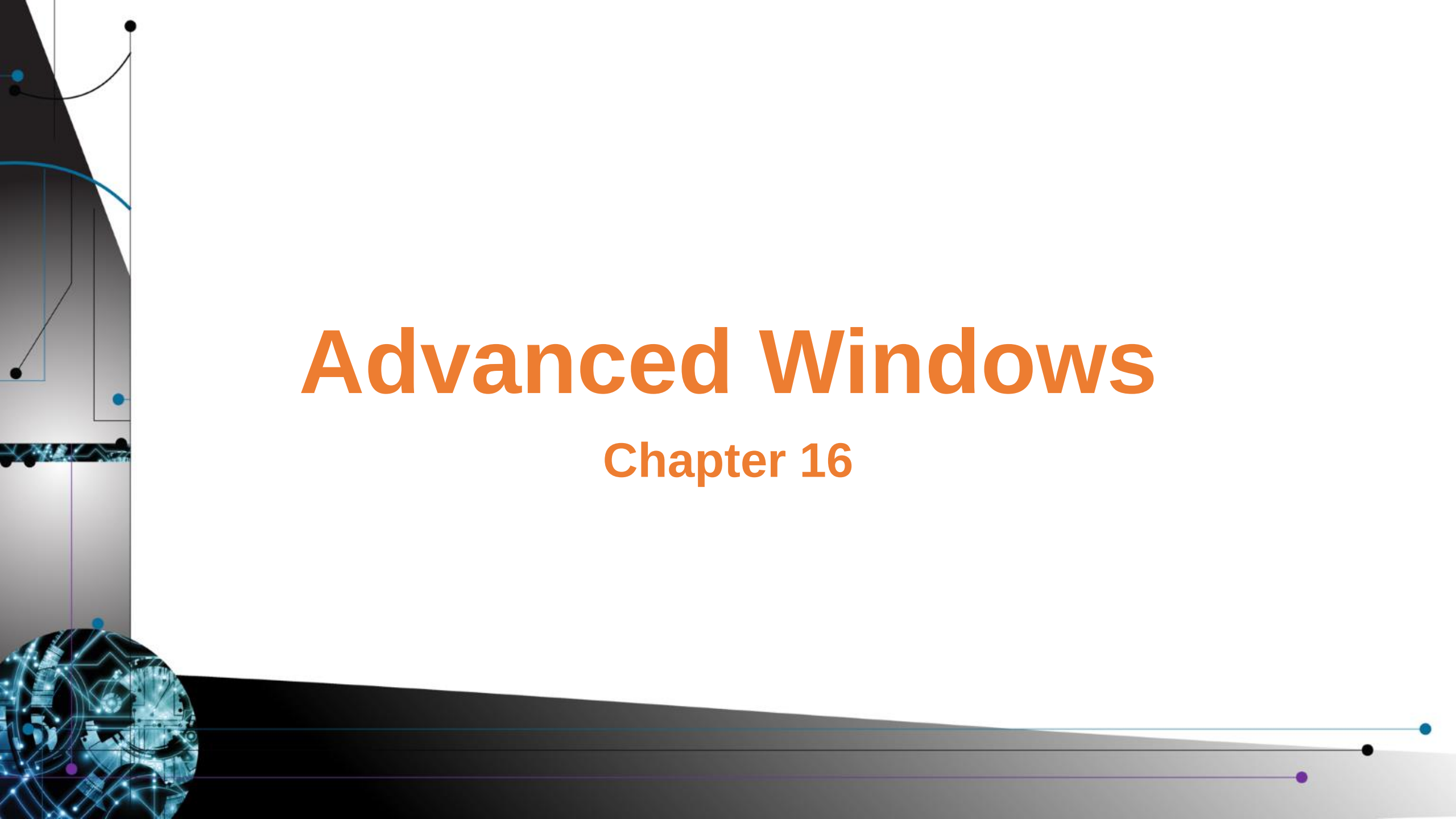


Advanced Windows

Chapter 16

This presentation covers:

- Avoiding Burnout
- Windows 7/8/10 Installation
- Configuring Windows
- System Tools

Qualities of a Good Technician

"Soft skills" as they are known across many industries are essential

Avoiding Burnout

- Burnout—commonly caused by too much work and stress—is a mental state that can also affect emotional and physical capabilities
- Technicians should monitor their own attitude and mental state constantly and watch for warning signs associated with burnout:
  - Overreaction to common situations
  - Constant tiredness
  - Reduced productivity
  - Poor attitude
  - Lack of patience with customers or peers
  - Feeling of a loss of control
  - Use of food, drink, or drugs as coping mechanisms

Windows 7/8/10 Installation

Preinstallation of Windows

- Windows can be installed from either a central location using a network or locally using an optical disc or external drive
- The operating system is a complex piece of software that is critical to all hardware and other software working
- It is important to follow these steps before installing Windows:
  - Step 1. Decide whether the installation will be an upgrade or a clean install and which version of the operating system is to be loaded. Take into account software application compatibility.
  - Step 2. Decide whether the computer will have more than one operating system installed.

Preinstallation of Windows, cont'd

- Step 3. Plan the partition/volume size and select the file system.
- Step 4. Determine whether or not the hardware is compatible.
- Step 5. Obtain any drivers, upgrades, or hardware replacements.
- Step 6. Back up any data files.
- Step 7. Scan for viruses, and then disable the virus protection during the installation process.
- Step 8. Temporarily disable any power management or disk management tools.

Types of Installation

- Unattended – uses a script or answer file
- In-place upgrade – upgrades an existing operating system to Windows 7, 8, or 10; use Windows upgrade advisor first
- Clean install – no operating system is on the computer when you start; use the Easy Transfer or User State Migration Tool (USMT) to migrate data
- Repair installation – used when Windows does not work properly
- Multiboot – 2 or more operating systems are installed – install the oldest one first
- Remote network install – uses PXE boot to load an image from a server or network share; takes network bandwidth

Types of Installation (cont.)

- Image deployment – burn boot image to optical media or external drive then use to install
- Recovery partition (factory recovery partition) – optional partition from some manufacturers that has the operating system and whatever apps that came with the system
- Refresh – Reinstalls Windows and keeps any saved files, apps, and settings you have
- Restore – Brings Windows back to a previous state such as a time before an update was applied

Program Compatibility

- Can use compatibility mode for older apps
  - Right-click on app executable file > *Properties* > *Compatibility* tab > enable *Run this program in compatibility mode for* > select the specific operating system the software was designed to use > select any of the other options needed for the particular app > *Apply* > *OK*
- Use Virtual XP Mode in Windows 7
- Use virtualization (another chapter) and have multiple operating systems

Partition Types

TABLE 16.3 Windows partition types

Partition type	Description
Basic disk	The most common type of partition that can contain primary partitions, extended partitions, and logical drives. Each primary partition and logical drive must be formatted for a specific file system.
Primary partition	A partition that can hold an operating system. If the operating system is used to boot the system, it must be a primary partition that is configured as an active partition. A primary partition is assigned a drive letter and formatted for a specific file system.
Extended partition	A type of partition that allows hard drive subdivisions called **logical partitions**. Each logical partition (also called logical drive) is assigned a drive letter and formatted for a specific file system. Can only be used with basic disks.

Partition Types (cont.)

TABLE 16.3 Windows partition types

Partition type	Description
MBR (master boot record partition table)	The traditional type of partition that uses primary and extended partitions.
Dynamic disk	A more advanced type of disk volume that supports simple, spanned, striped, and RAID drive configuration.
GPT (GUID partition table)	A more advanced type of partition that requires a UEFI BIOS and allows partition sizes larger than 2 TB, improved protection of the partition table, and more partitions.
Swap partition	The Linux equivalent of a Windows paging file. Paging uses hard drive space as RAM so that programs that exceed the size of available physical memory can operate.

File Systems

TABLE 16.4 File system types

File system type	Description
Compact Disk File System (**CDFS**)	A file system for optical media.
FAT	Also called FAT16. Used with all versions of Windows. 2 GB partition limitation with old operating systems. 4 GB partition limitation with XP and higher versions of Windows.
FAT32	Supported with all versions of Windows. Commonly used with removable flash drives. Supports drives up to 2 TB. Can recognize volumes greater than 32 GB.
exFAT	Commonly called FAT64. A file system made for removable media (such as flash drives and SD cards) that extends drive size support up to 64 ZB in theory, although 512 TB is the recommended max. Made for copying large files such as disk images and media files. Supported by all versions of Windows.

File Systems (cont.)

TABLE 16.4 File system types

File system type	Description
NTFS	Used with Windows 7, 8, and 10. Supports drives up to 16 EB (16 exabytes, which equals 16 billion gigabytes) but in practice is only 16 TB. Supports file compression and file security (encryption). NTFS allows faster file access and uses hard drive space more efficiently. Supports individual file compression and has the best Windows file security.
Hierarchical File System (**HFS**)	Used with Apple computers that have been upgraded to HFS+ and then later upgraded to Apple File System (APFS) in 2017.
Network File System (**NFS**)	An open source file system developed by Sun Microsystems that is found in Linux-based systems. Allows access to remote files over a network.
ext3	Also known as third extended file system. Used in Linux-based operating systems, it is a journaling file system, which means it tracks changes in case the operating system crashes, allowing it to be restarted without reloading.
ext4	An update to ext3 to allow for larger volumes and file sizes in Linux-based operating systems.

Hardware Requirements

TABLE 16.5 Windows 7/8/8.1/10 hardware requirements

Component	Minimum
Processor	1 GHz
RAM	1 GB (32-bit)/2 GB (64-bit)
Graphics	Support for DirectX9 or higher with 1.0 WDDM driver
Hard drive space	16 GB (32-bit)/20 GB (64-bit)

Network Types

TABLE 16.6 Network types

Network type	Description
Workgroup	You can configure Windows 7 for this type, but file and print sharing are not automatically enabled as they are with a Windows HomeGroup. Note that Windows HomeGroup is removed starting with Windows 10 version 1803, but you can still share files and folders across a small network.
HomeGroup	Normally created in a Windows 7, 8, 8.1, or 10 home or small business environment that automatically turns on file and print sharing. Note that computers with Windows 7 Starter or Home Basic can join a HomeGroup but not start one. All Windows 7 and higher operating systems can join the HomeGroup. Starting with version 1803, Windows 10 no longer supports HomeGroup as a network choice, but you can still share files and folders across a small network.
Domain	A corporate environment in which users authenticate with a centralized user ID and password. Whatever machine the user goes to, the user ID and password would be the same if the computer has been configured to be on the domain.

Troubleshooting an Installation

- No boot device available – Access BIOS/UEFI and change the boot order
- Incompatible hardware drivers – get the appropriate driver for the OS
- Incompatible apps – upgrade or don’t install
- Minimum hardware requirements not met
- A virus is present – remove and reinstall OS
- Antivirus software is installed and active – disable and reinstall OS, then reactivate antivirus software

Troubleshooting an Installation

- NTLDR is missing – try the installation again and if it fails, remove any nonessential hardware and USB-attached devices and then try again
- Freezes on boot up – Boot to Safe Mode and check for driver issues
- Check the setuperr.log for setup installation errors.
- Check the setupact.log for actions performed during the install
- Check the setupapi.app.log for application installation information

Windows Updates

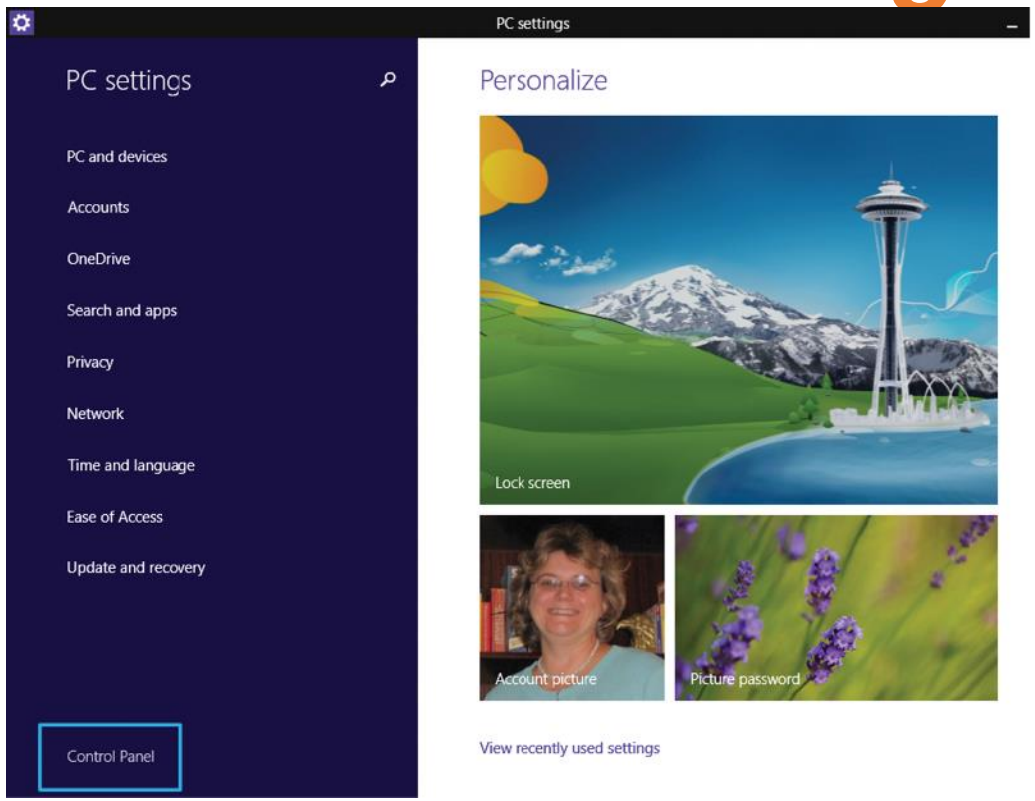
- To configure Windows 7 or 8 for automatic updates, locate the *System* Control Panel > *Automatic Updates* tab. Windows 10 by default does automatic updates, but Microsoft is rethinking that policy at the time of press
- Access Windows Update settings for 7 is from the *Start* button > *All Programs* > *Windows Update* > *Change Settings*
- Access Windows Update settings for Windows 8, access the *System and Security* Control Panel > *Windows Update* > *Change Settings*
- Access Windows Update settings for Windows 10 access *Settings* > select *Update and Security*
- Two options are available: (1) Use recommended settings and (2) install important updates only
- The recommended settings option automatically updates and installs updates classified as Important and Recommended

Configuring Windows

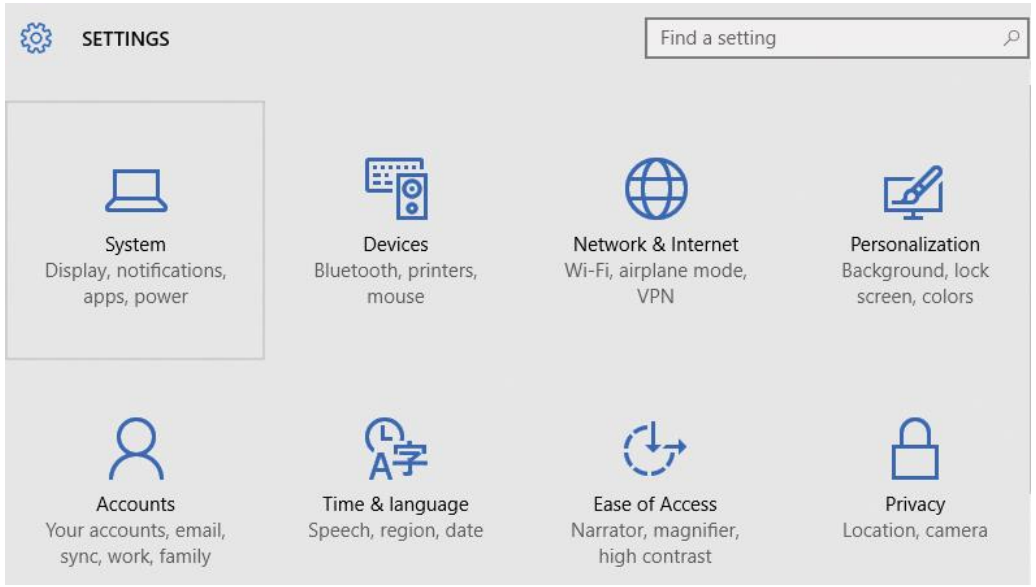
Configuring Windows Overview

- A Control Panel, one of the most common windows used, is a method for configuring various components
- Each Control Panel icon represents a Windows utility that customizes a particular part of the Windows environment
- The number of Control Panels displayed depends on the type of computer and the components contained within the computer
- Windows has two Control Panel views: Classic and Category

Windows Settings



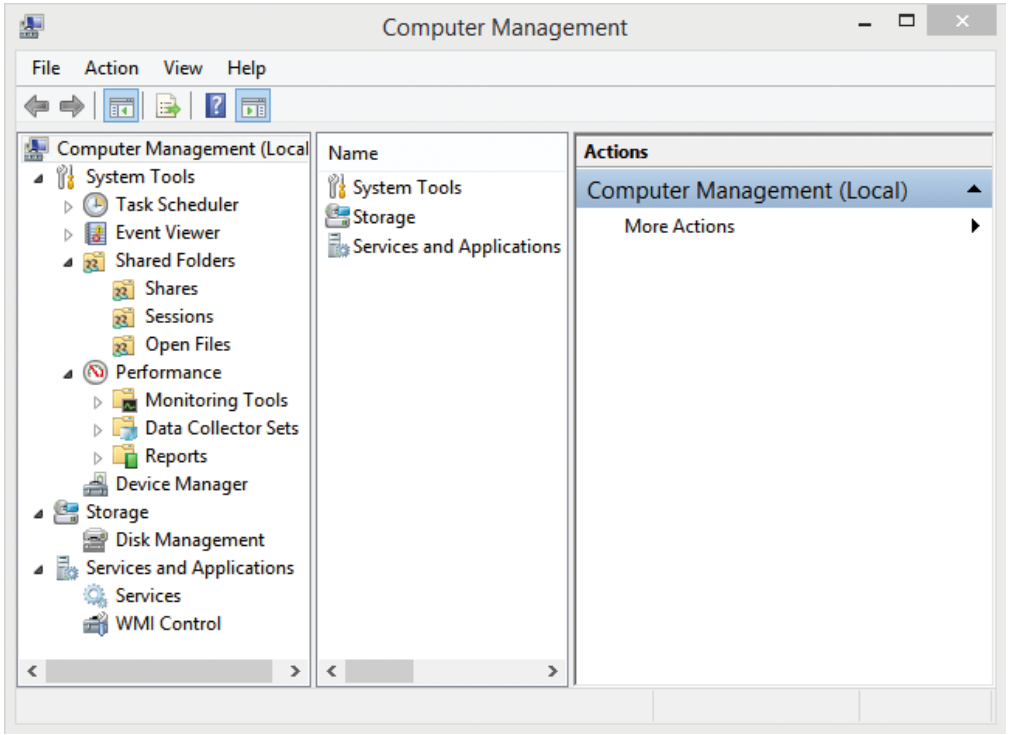
Windows 8.1 PC Settings



Windows 10 PC Settings

Computer Management Console

- The Microsoft Management console (Computer Management console) holds snap-ins, which are tools that are used to maintain a computer
- To access the console, use the *System and Security* Control Panel to select *Administrative Tools* > double-click or double-tap *Computer Management*. You can start the Microsoft Management console and open a saved console using the `mmc path\filename.msc` command



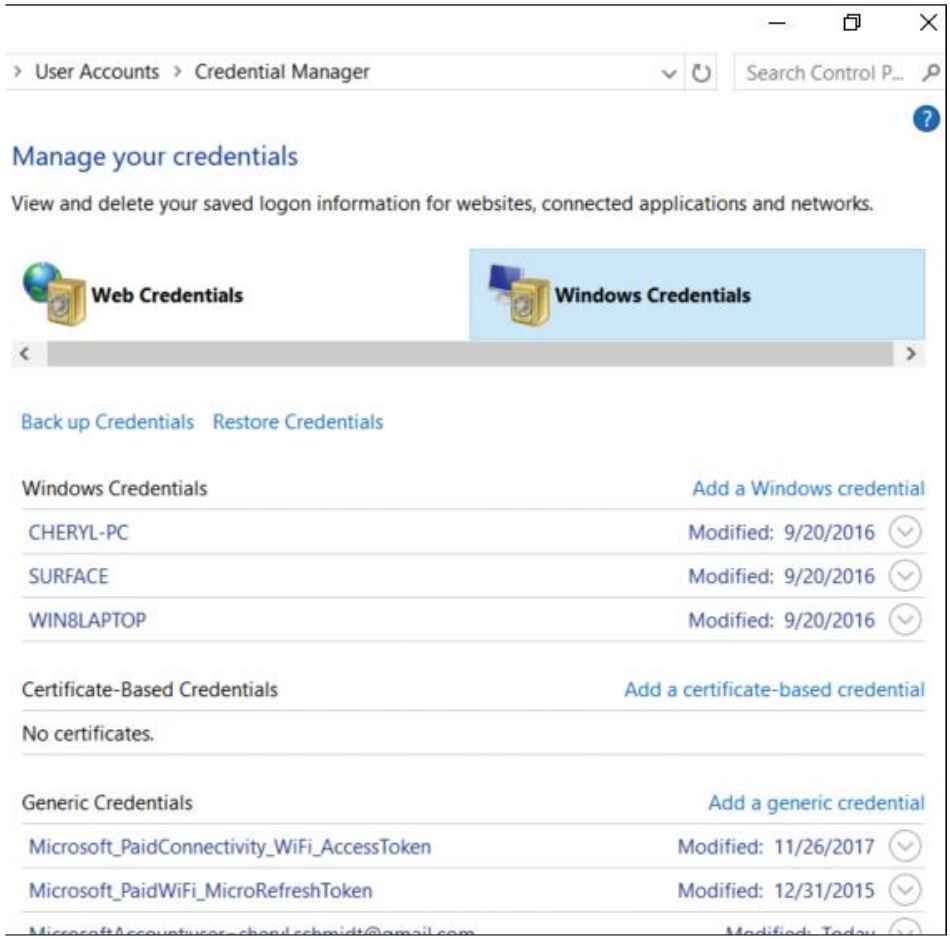
System Tools

System Tools

- **Task Scheduler** (taskschd.msc) enables you to plan and execute apps, scripts, and utilities on a regular basis
- **Event Viewer** is a Windows tool used to monitor various events in your computer such as when a driver or service does not start properly
- The **Shared Folders** tool is used to view shares, sessions, and open files
- The **Local Users and Groups tool** is only available in Windows Professional/Pro versions; it is used to create and manage accounts for those who use the computer or computer resources from a remote network computer

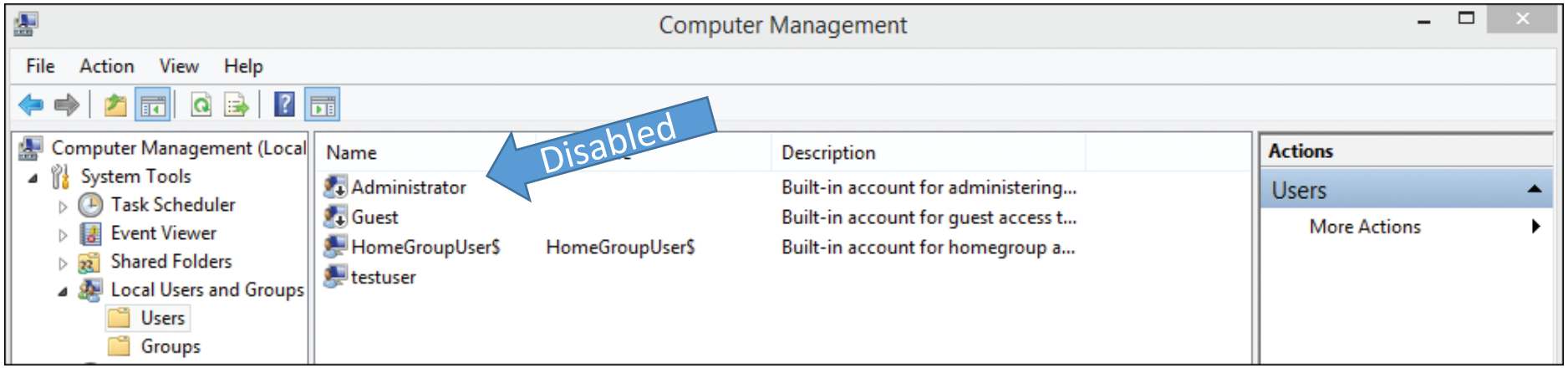
Credential Manager

- Used to store Windows login credentials
- Types of credentials
  - Windows credentials – username and password
  - Certificate-based credentials – corporate networks and used with smart cards
  - Generic credentials – apps and some websites
  - Web credentials – Windows 8/10 specific web sites
- Saving credentials can be a security risk – should back them up
- Windows 7 – User Accounts and Family Safety Control Panel
- Windows 8/10 – User Accounts Control Panel



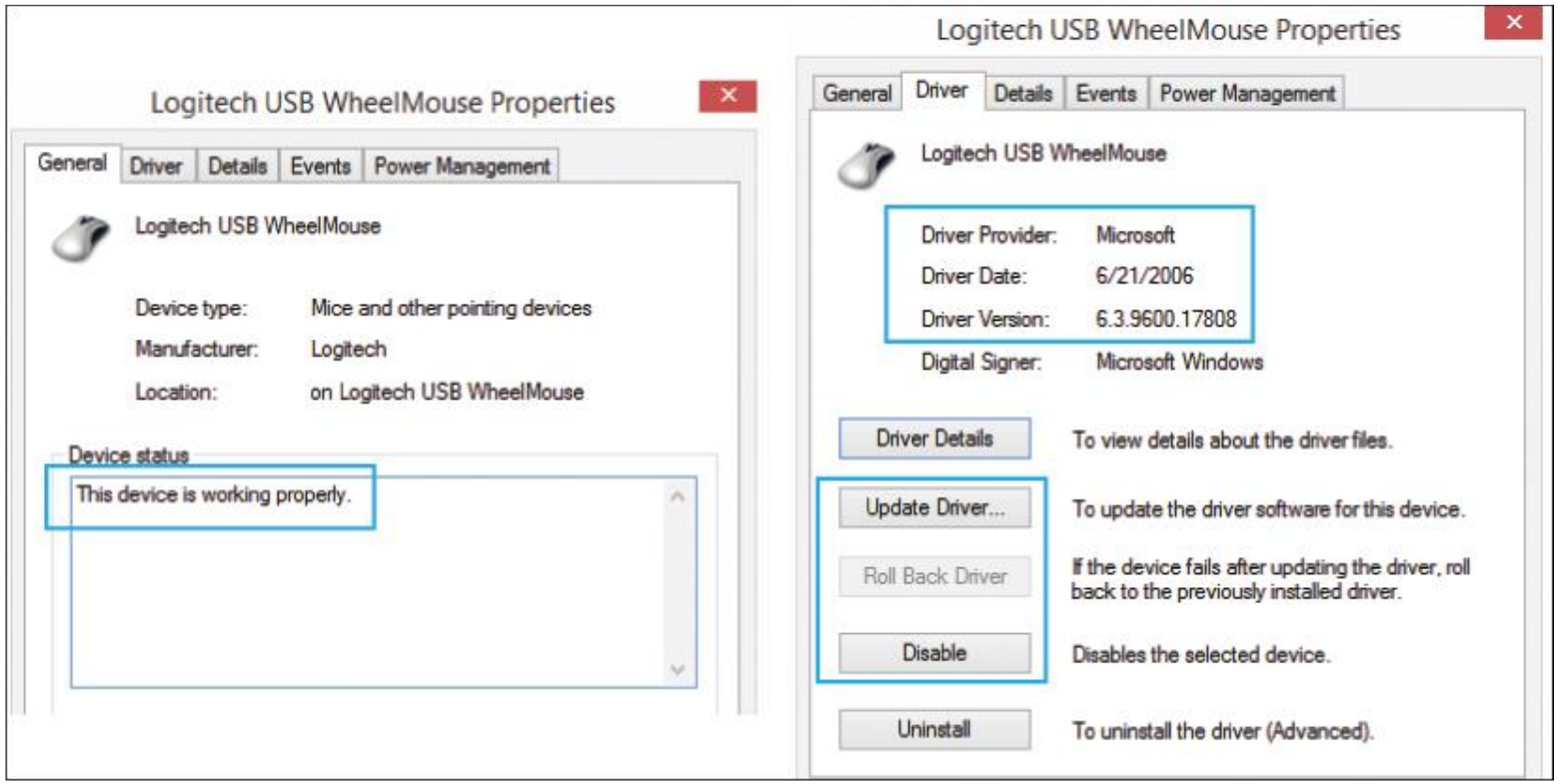
Local Users and Groups

- Only in Windows Professional or Pro versions and used to manage accounts for those who use the computer
- Contrast with domain or global users managed from a network server
- A down arrow on the icon means the account is disabled.



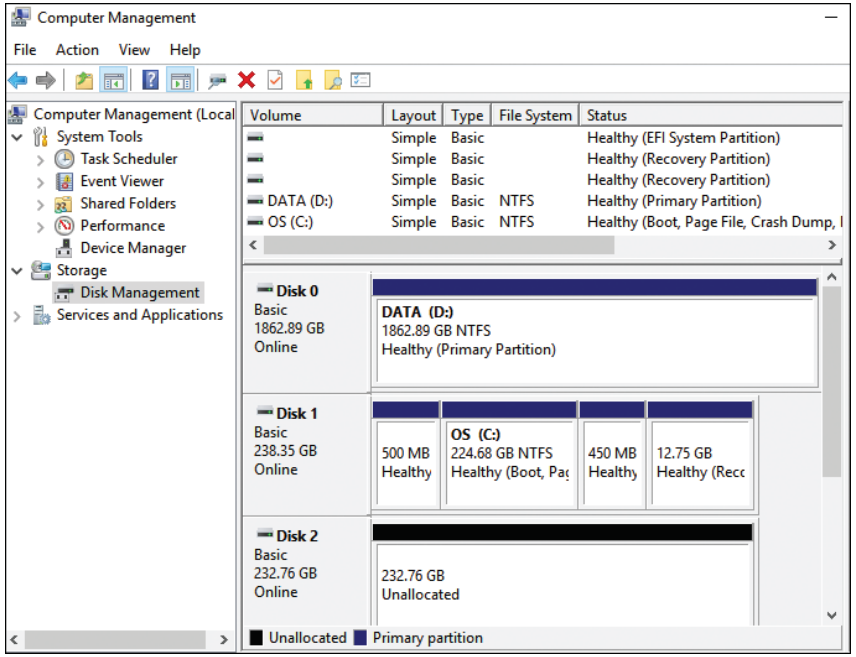
Device Manager

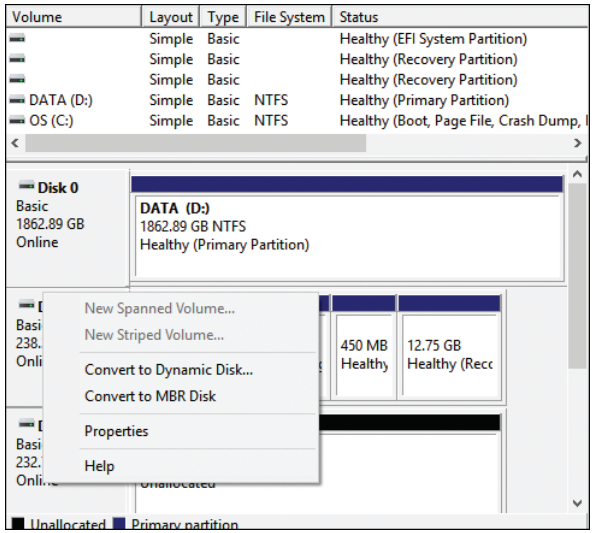
> Used to view and control hardware including viewing drivers



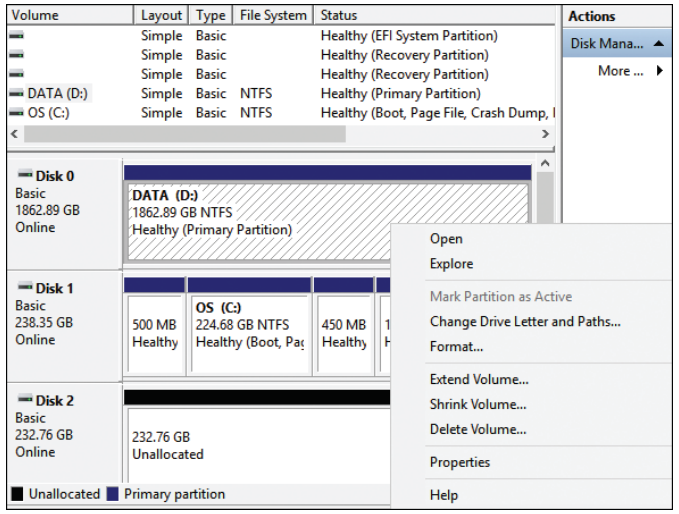
Disk Management

> Used to view and control hardware including viewing drivers





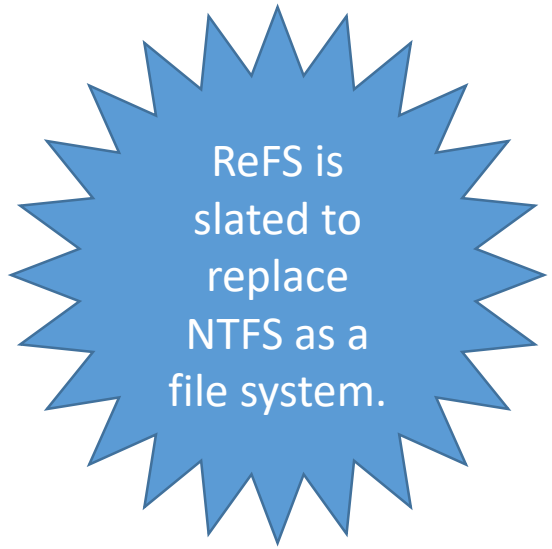
Right-click on far left disk name (Disk 1)



Right-click on a particular partition (D:)

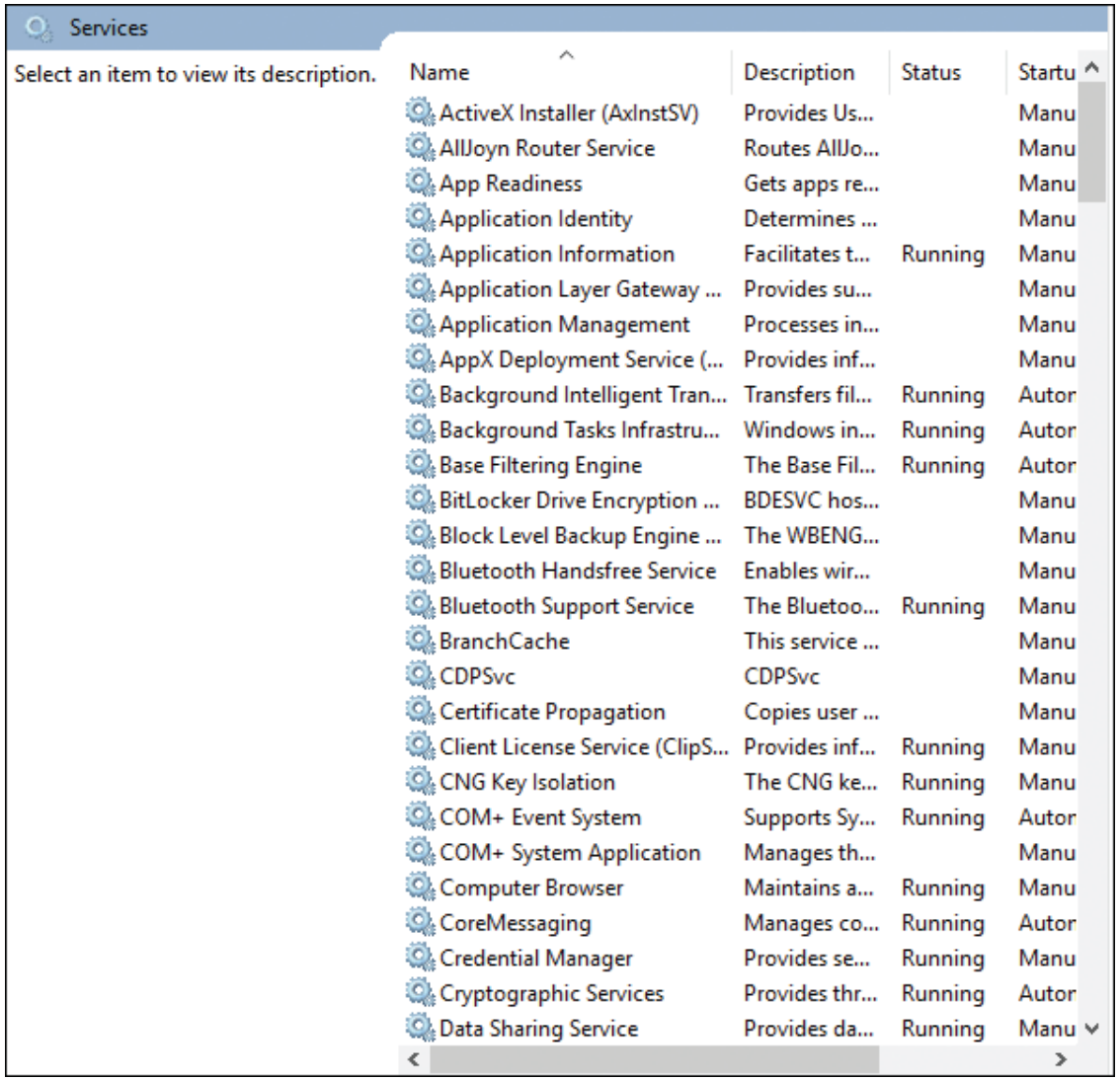
Disk Maintenance

- Disk Cleanup tool – what files could be deleted
- Error Checking tool – Windows 7 (because Windows 8/10 fix disk errors immediately) – Checks drive for file system errors, bad drive sectors, and lost clusters (like the command `chkdsk` does)
- Optimize and Defragment tool – places files in contiguous (one after another) clusters.



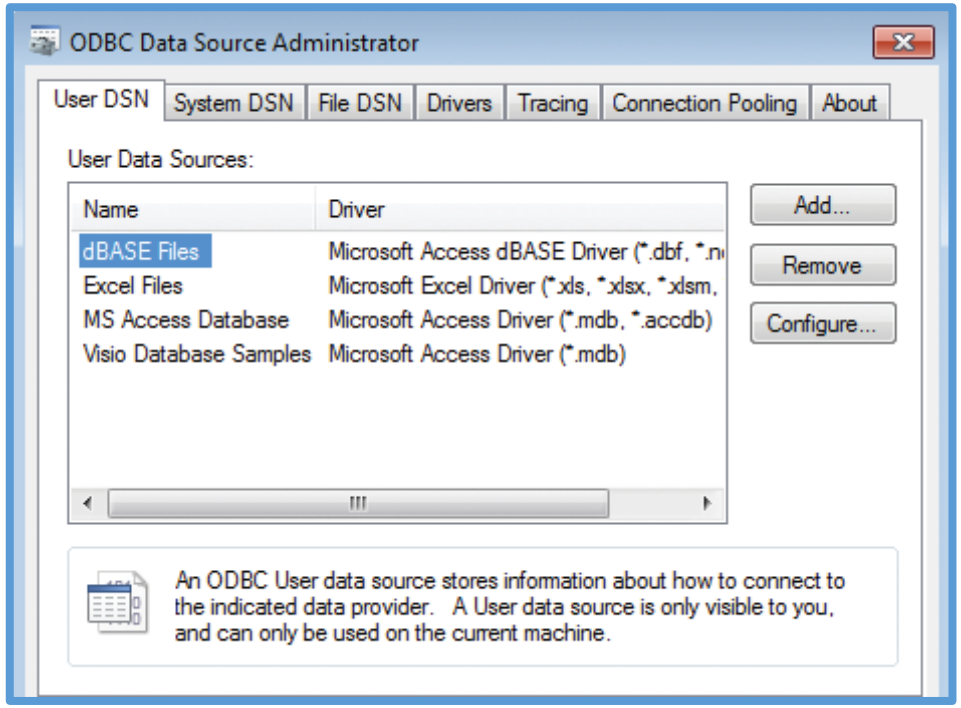
Services

- Software that can be started, stopped, paused, resumed, or disabled by an administrator
  - Can be started automatically as part of the boot process or delayed start so the computer boots faster



Data Sources (ODBC)

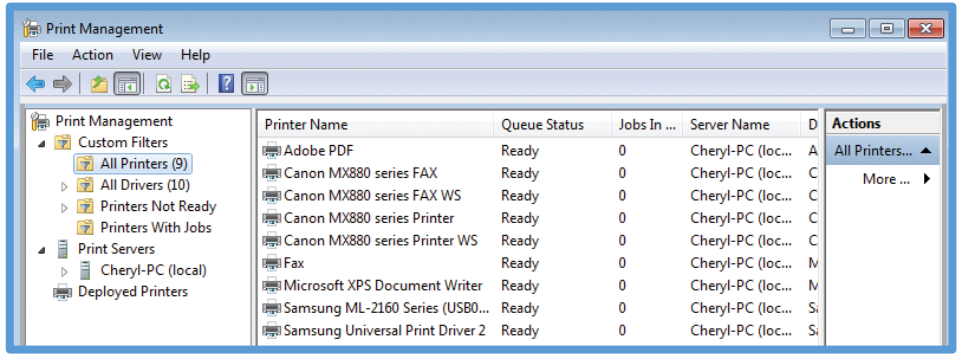
- Open database connectivity (ODBC) is a programming interface that enables applications to access data from a database
- Access the Data Sources (ODBC) Control Panel by searching for the *Administrative Tools* Control Panel > double-click or double-tap on *Data Sources (ODBC)*



Data Sources (ODBC) Control Panel

Print Management Console

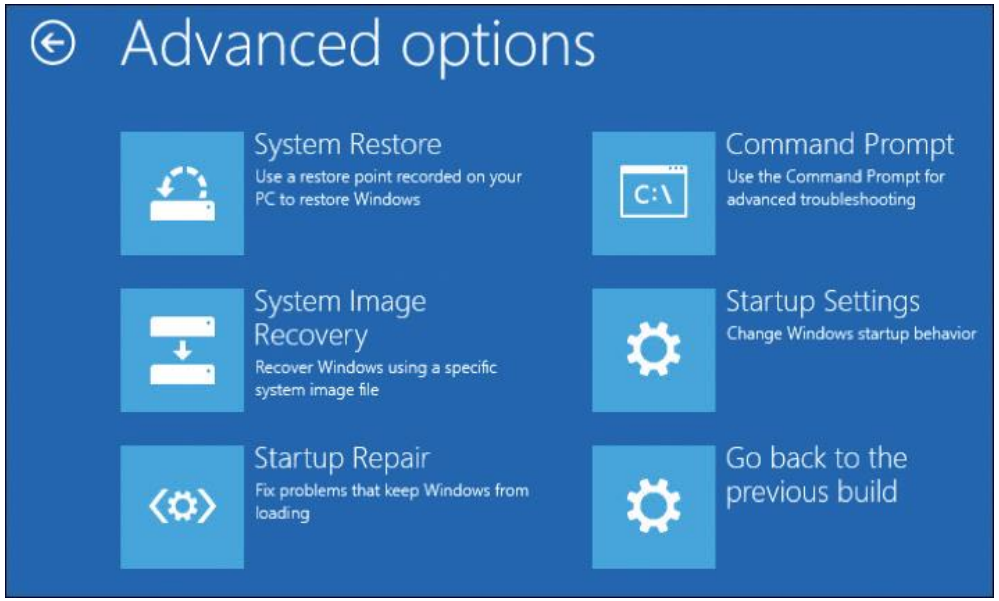
- The Print Management console is used to manage printers on Windows 7, 8, and 10 Pro and higher versions
- Access the console by one of the following methods:
  - Access the *System and Security* Control Panel > select *Administrative Tools* > double-click or double-tap *Printer Management*.
  - Use the `printmanagement.msc` command



Print Management Console

Recovery Console

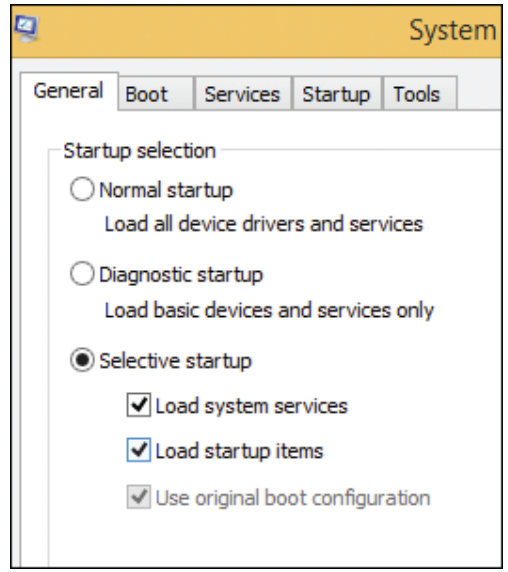
- Press F8 as the computer is booting
- Use a Windows disc
- Windows Recovery Option tools
  - System Restore
  - System Image Recovery
  - Startup Repair
  - Command Prompt
  - Startup Settings
  - Go Back to the Previous Build
  - Windows Memory Diagnostics

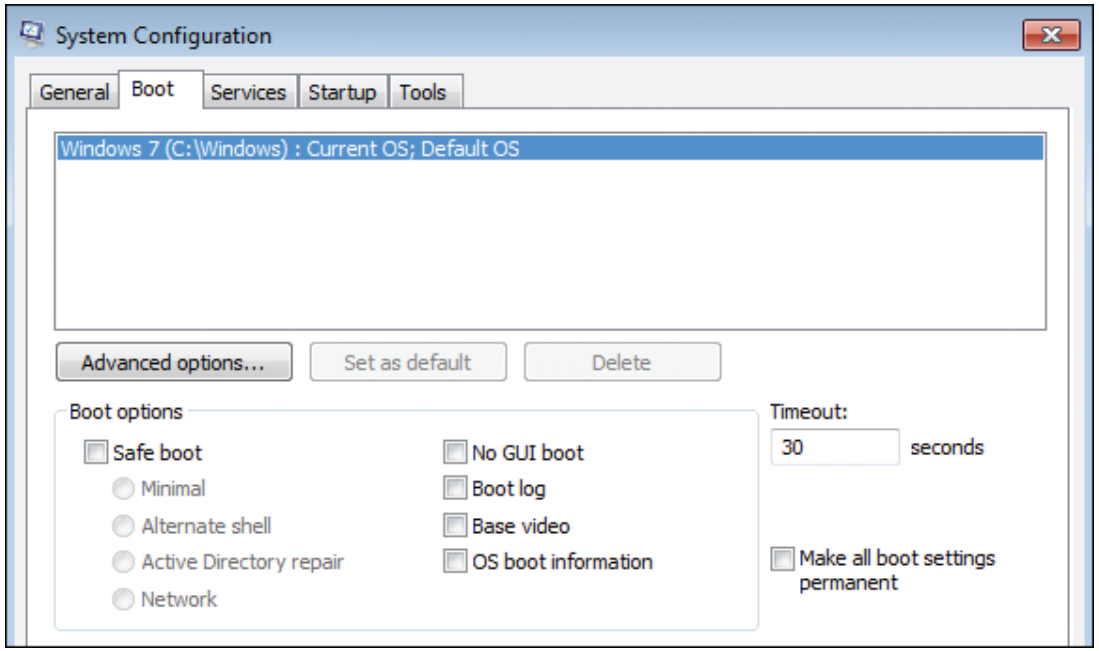


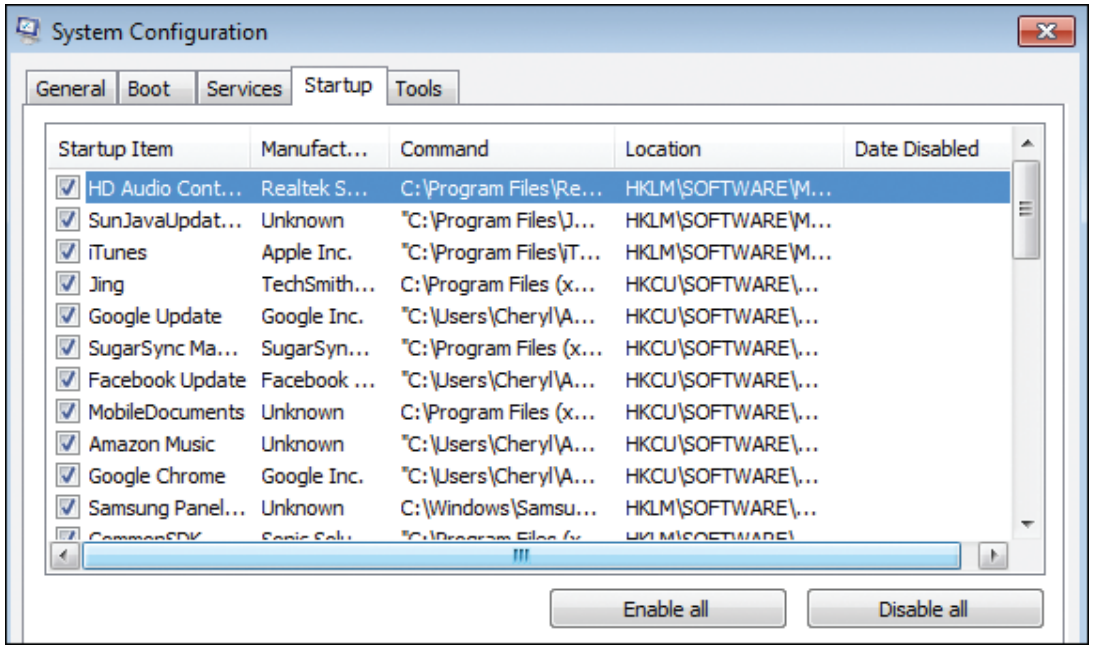
Windows 10 Advanced Options

System Configuration Utility (msconfig)

> Used to troubleshoot startup problems

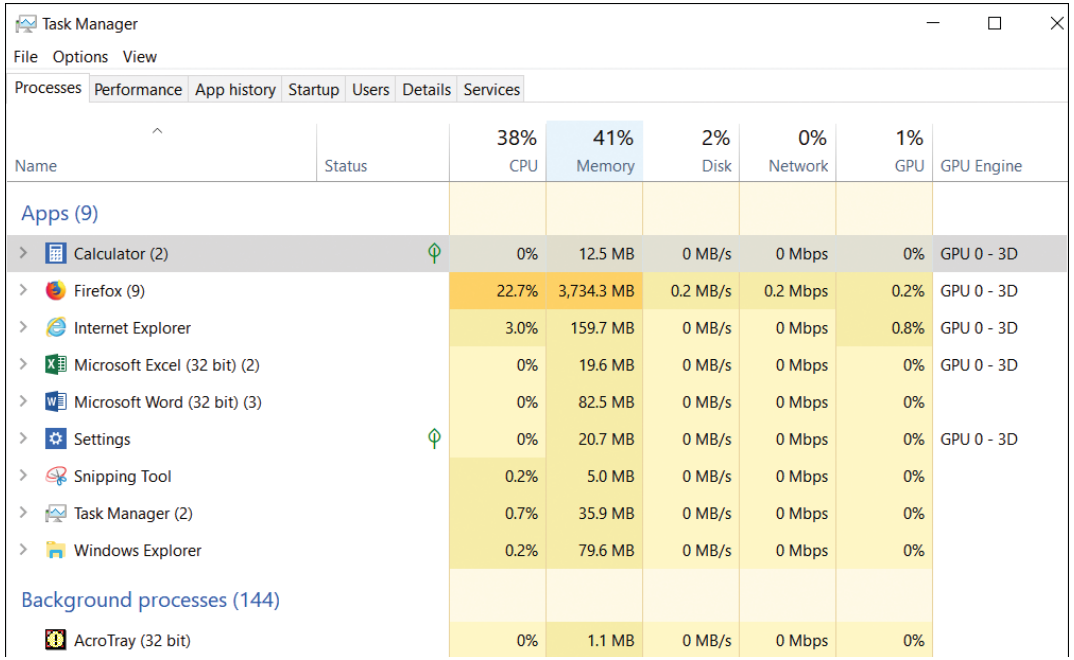


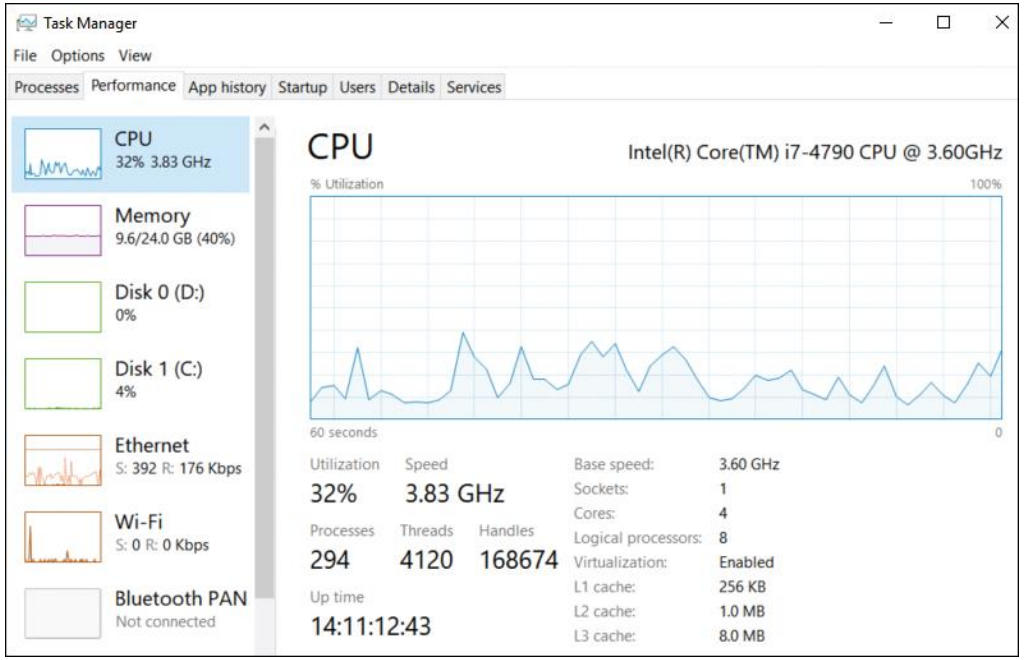




Task Manager

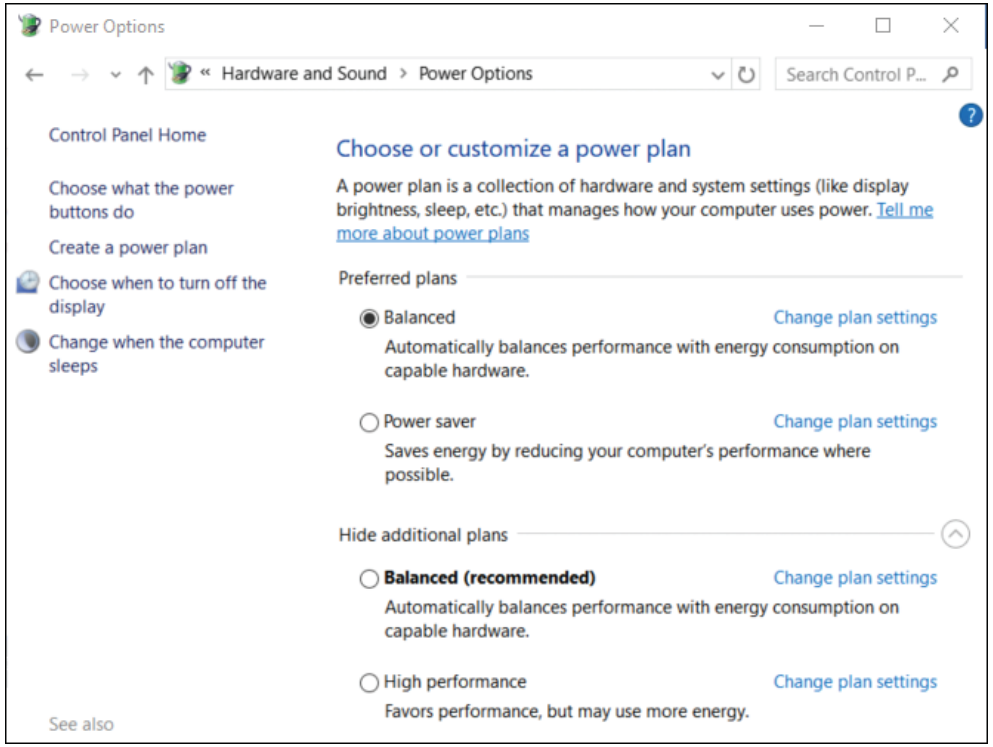
> Used to view system performance and when an application crashes





Power Options

> Can use one of Windows plans or a custom one



Supporting Computers Remotely

- Remote Assistance – asks the users permission
- Remote Desktop (`mstsc` command) – takes over the remote computer
  - Must be on the network
  - Must have ports 3389 and 80 open on firewall
  - Must know the remote computer name
  - Must have a user account with a password on the remote PC

Computer Terms

Refer to the glossary terms at the end of the textbook chapter. Review Chapter 16 and become familiar with the terms.

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to support instruction of

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