



# Basic Operating Systems

## Chapter 14





# This presentation covers:

- > Staying Current
- > Basic Operating Systems Overview
- > Command Prompts



# Qualities of a Good Technician

“Soft skills” as they are known across many industries are essential



# Staying Current

Benefits of staying current include:

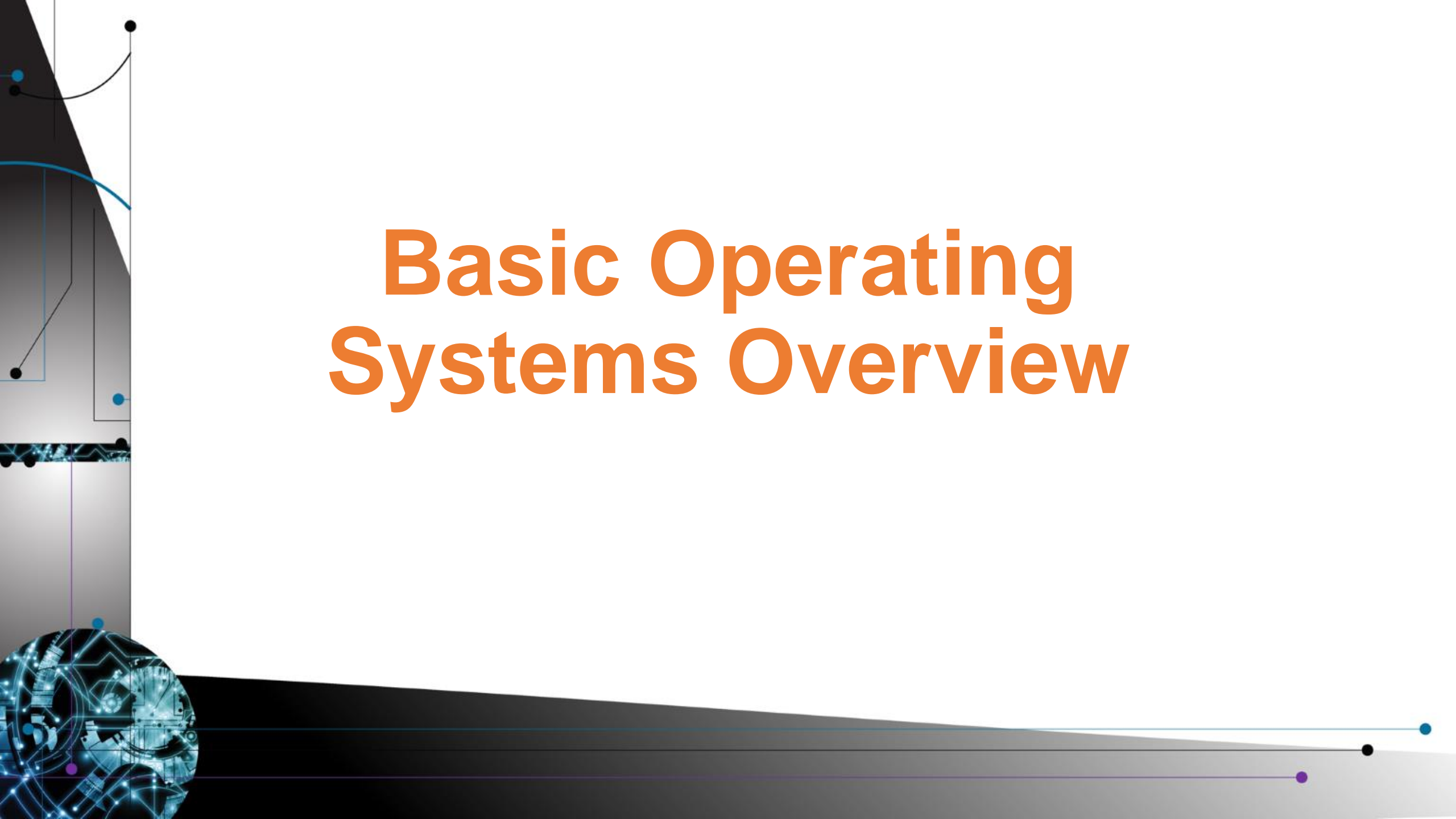
- > (1) understanding and troubleshooting the latest technologies
- > (2) recommending upgrades or solutions to customers
- > (3) saving time troubleshooting (and time is money)
- > (4) being someone considered for a promotion

# Staying Current

A variety of methods to stay current include:

- > Subscribe to a magazine or an online magazine
- > Subscribe to a news list that gives you an update in your email
- > Join or attend association meetings
- > Register for and attend a seminar
- > Attend an online webinar
- > Take a class
- > Read books
- > Talk to your department peers and supervisor

# Basic Operating Systems Overview



# Basic Operating Systems

- > Computers require software to operate
- > An operating system (OS) is software that coordinates the interaction between hardware and any software applications and the interaction between a user and the computer
- > An operating system can be a graphical user interface (GUI) or a command line interface, or both
- > It is responsible for handling file and disk management



# Popular Operating Systems

- > Microsoft Windows
- > Apple macOS
- > Linux
- > Chrome OS
- > Android (mobile)
- > Apple iOS (mobile)



# 32- vs 64-bit Operating Systems

**TABLE 14.1** 32-bit and 64-bit Windows

32-bit Windows	64-bit Windows
32-bit or 64-bit processor	64-bit processor
4 GB <b>RAM limitation</b> (that is, the operating system can view no more even if more RAM is installed)	Up to 2,048 GB RAM supported, depending on the version of Windows used
32 bits processed at a time	64 bits processed at a time
32-bit drivers required	64-bit device drivers required, and they must be digitally signed
32-bit applications and some support for older 16-bit applications	32- or 64-bit application support; 16-bit application support using the Program Compatibility Wizard or downloading and using Windows XP Mode in Windows 7; use the Program Compatibility Troubleshooter to help with running older applications
Use of DEP (Data Execution Prevention), which prevents a specific type of security attack by using both hardware and software technology	"Always-on" DEP support for 64-bit processes
N/A	Protection for the operating system kernel (the core of the operating system) Better support for multiple processors

# Windows 7 Editions

**TABLE 14.2** Windows 7, 8, 8.1, and 10 editions

Windows edition	Description
Starter: Windows 7	A 32-bit-only version used with low-cost computers and with tablets.
Home: Windows 10	Designed for home use for PCs and tablets; it is the new equivalent to Windows 7 and Windows Vista Home editions.
Home Basic: Windows 7	Used to surf the Internet and do basic computing. Comes with Internet Explorer, Windows Media Player, Windows Movie Maker, and Windows Mail. CDs can be created, but not DVDs. It does not allow connecting to a network domain (but can join a HomeGroup home network created from a Windows 7 or higher computer); it does not support EFS encryption or provide the full Aero user experience. Windows 7 Home Basic is sold only in certain areas.
Home Premium: Windows 7	More robust than Home Basic, includes the Aero GUI interface, DVD creation, ability to create/join a HomeGroup (Windows 7 and higher, but removed starting with Windows 10 version 1803) home network, and other tools for media creation and editing.

# Windows 10 Editions

**TABLE 14.2** Windows 7, 8, 8.1, and 10 editions

Pro: Windows 10	The equivalent of Windows Professional in prior versions.
Enterprise: Windows 7, 8, 8.1, and 10	Designed for corporate environments where multimedia editing and creation are used; supports BitLocker drive encryption and provides multilingual support. Not sold through retail centers but to corporate and educational institutions using bulk licensing.
Ultimate: Windows 7	Contains all the Enterprise features, including support for multiple processors, but includes some extras that are downloadable from Microsoft. These include fun utilities and work-related tools, such as the Windows BitLocker Drive Preparation Tool, AppLocker to prevent unwanted corporate applications, and DirectAccess for connecting to the corporate network without a VPN (virtual private network).
Education: Windows 10	Provides everything offered in the Enterprise version of Windows 10 but is designed for use by schools and universities.
Mobile: Windows 10	Supports mobile device encryption, mobile device management, and side-loading of apps. This mobile operating system grew from the Windows Phone operating system and works on smartphones, phablets, and tablets.
Mobile Enterprise: Windows 10	Has all the features of Windows Mobile and additionally supports Windows Update for Business and Current Branch for Business features.

# End-of-Life Concerns

- > Serious consequences if an operating system or application has reached its end of life
  - > Security threats
  - > Software incompatibility
  - > Compliance issues
  - > Operating costs
  - > Performance and reliability



# Update Concerns

- > Potential problems when upgrading or updating an OS
  - > Minimum or recommended hardware
  - > Setup errors or freezes
  - > Drivers – not all devices have a driver for the latest OS
  - > Application incompatibilities
  - > Data loss – backup, backup, backup

# Compatibility Concerns

- > 32-bit application can work on 32- or 64-bit OS
- > 64-bit application works **ONLY** on a 64-bit OS
- > 32-bit hardware (bus and CPU) requires 32-bit OS
- > 64-bit hardware (bus and CPU) can have 32- or 64-bit OS
- > Forward or upward compatibility should be able to work on later versions
- > Backward compatibility – app can process data from older software
- > Apps are written for a specific OS

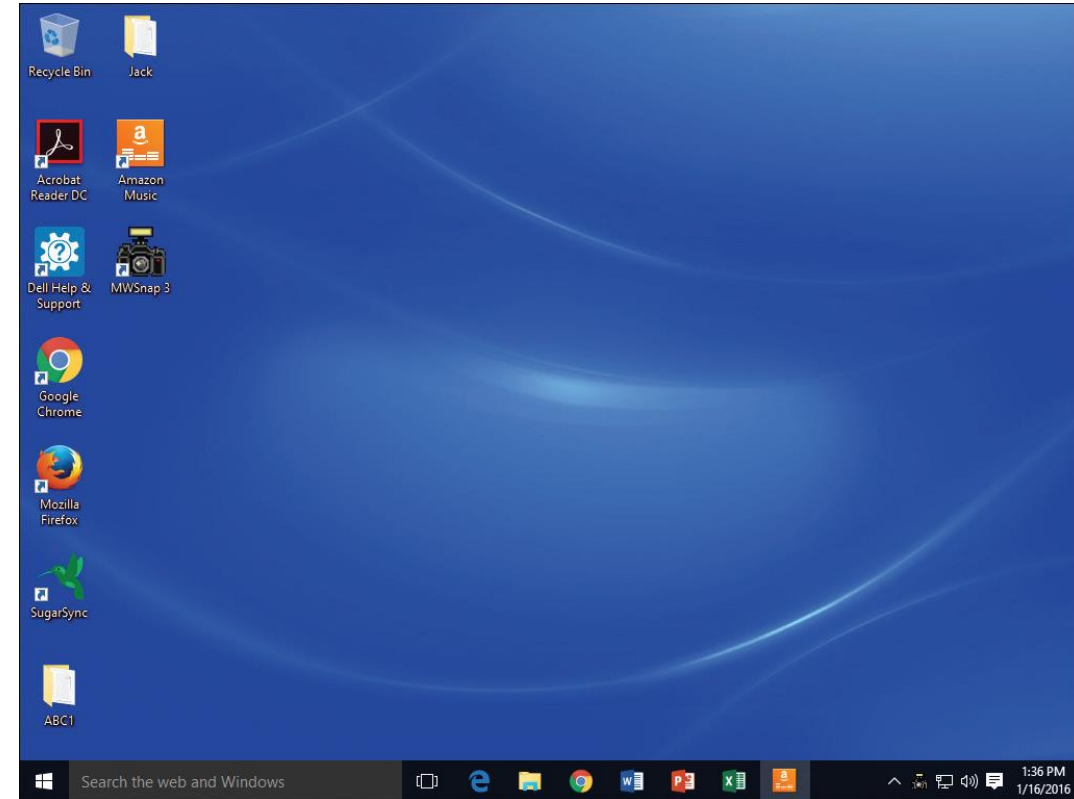
# Corporate Needs

- > Type of network connectivity
  - > Workgroup – small company
  - > Domain – large company that might use Active Directory (AD) and require domain access
- > Bit Locker – drive encryption
- > Media Center – entertainment and not part of Windows 10
- > BranchCache – stores frequently accessed content
- > EFS (Encrypting File System) – encrypt folders or files



# Windows Desktop/Start Screen

- > User is presented with a logon screen
  - > A user ID and password or PIN is entered as part of the operating system installation process and used thereafter
- > When in the Windows environment, the desktop appears
  - > The desktop is the area on the screen of a GUI environment in which all work is performed in Windows
  - > The desktop contains icons (pictures that provide access to various devices, files, etc.)



# Shortcuts and Tiles

- > A shortcut represents a path (a location on a drive) to a file, folder, or program
  - > A link (pointer) to where the file or application resides on a disk
  - > Tiles in the Windows 8/8.1 or 10 tablet mode represent a shortcut
  - > On the traditional desktop, a shortcut has a small arrow in the left corner
- > When a shortcut icon is double-clicked, Windows knows where to find the specific file the icon represents by the associated path

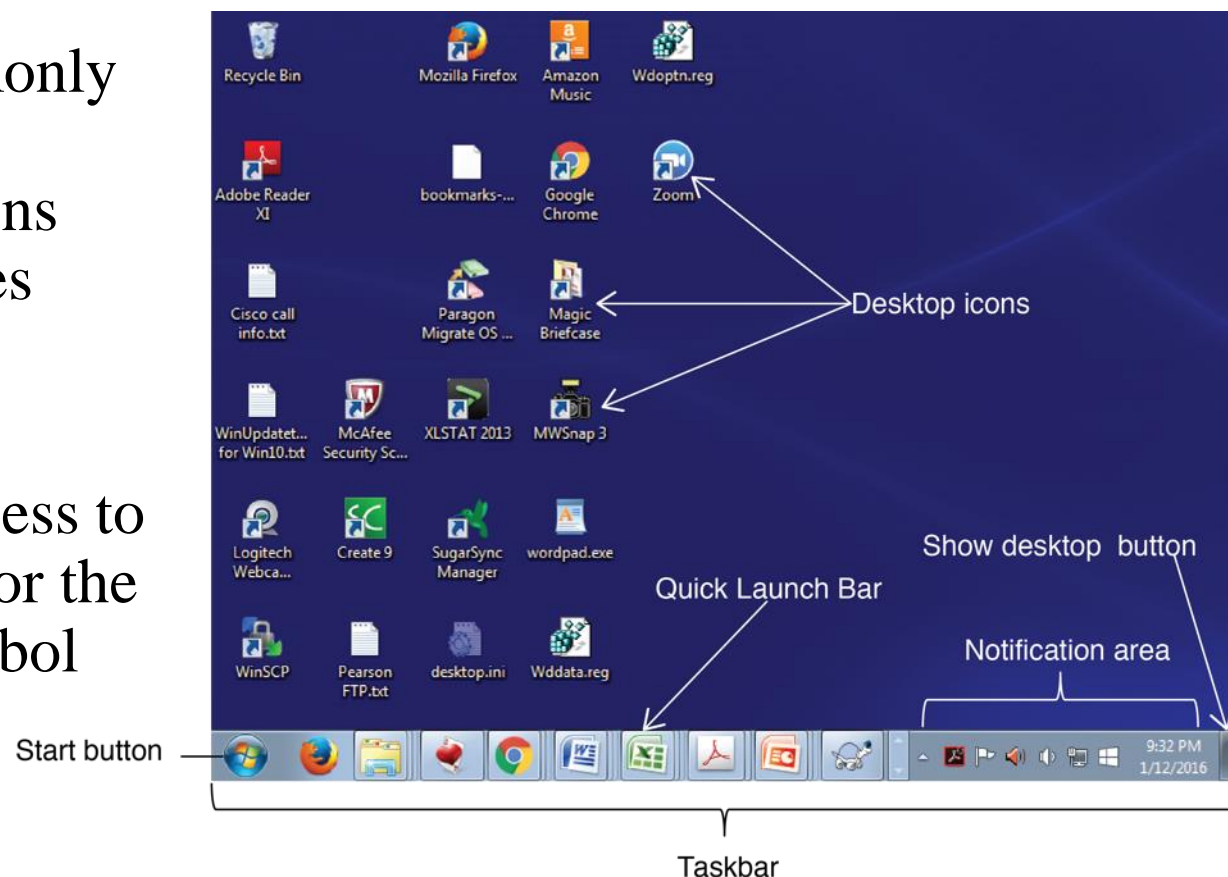


# Common Windows desktop icons or tiles

- > Documents: Maps to a folder located on the hard drive that is the default storage location for files
- > Computer/This PC: Accesses hardware, software, and files
- > Network: Accesses network resources, such as computers, printers, scanners, fax machines, and files
- > Recycle Bin: Holds files and folders that have been deleted
- > Internet Explorer/Edge: Starts the Microsoft browser used to access the internet

# Windows Desktop Components

- > The taskbar is the bar that commonly runs across the bottom of the traditional desktop and holds icons that represent applications or files currently loaded into computer memory
- > It also holds icons that allow access to system utilities such as a clock for the date and time and a speaker symbol for access to volume control.





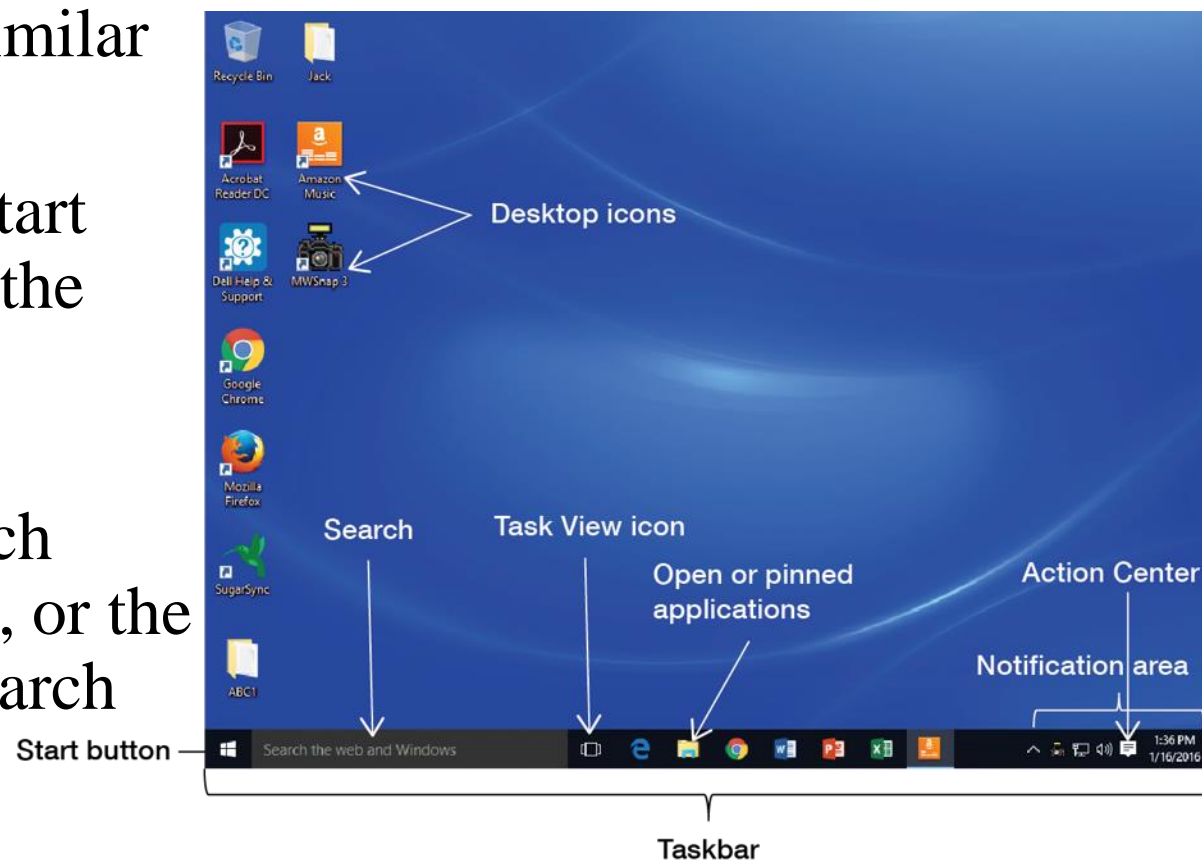
# Windows 8 Desktop/Start Screen Components

The Windows Start screen (the desktop replacement that uses tiles instead of icons) can be used on Windows 8 and 10 desktop computers as well as mobile devices.

- > Account Settings: Shows the person/account currently logged on; can be used to change users, change the account picture, lock the screen, or sign out
- > Power Options: Used to shut down the device, put the device in sleep mode, or restart it
- > Search: Same as the Search charm; used to share content with other people using specific apps that support this feature
- > Apple Arrow: Used to access all the app tiles
  - > Click the up arrow at the bottom of the screen to return to the Start screen

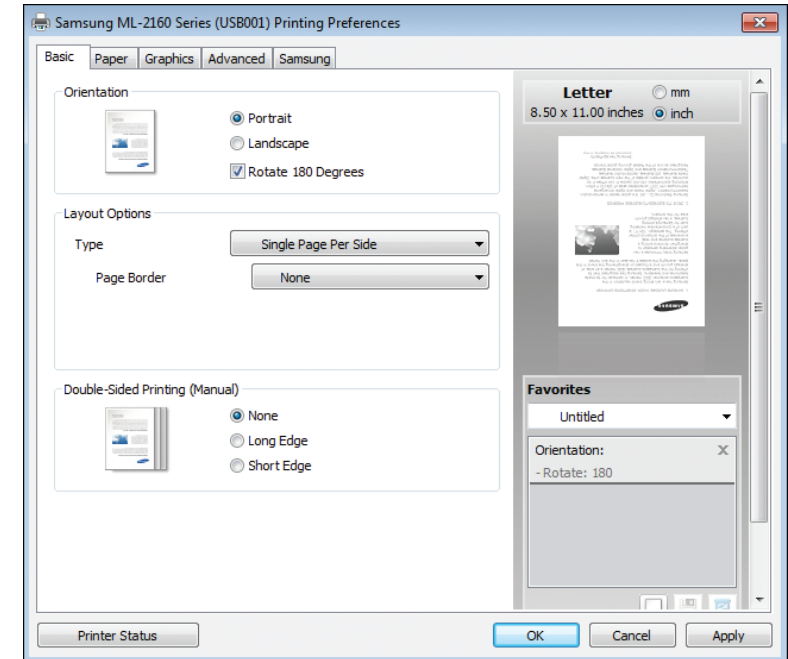
# Windows 10 Desktop Components

- > Windows 10 desktop can look similar to the Windows 7 desktop
- > Can also use the Windows 8.1 Start screen look or a combination of the two
- > Search function is built in to the taskbar and can appear as a search icon, the Cortana search textbox, or the Search the web and Windows search textbox



# Interactions Within a Window

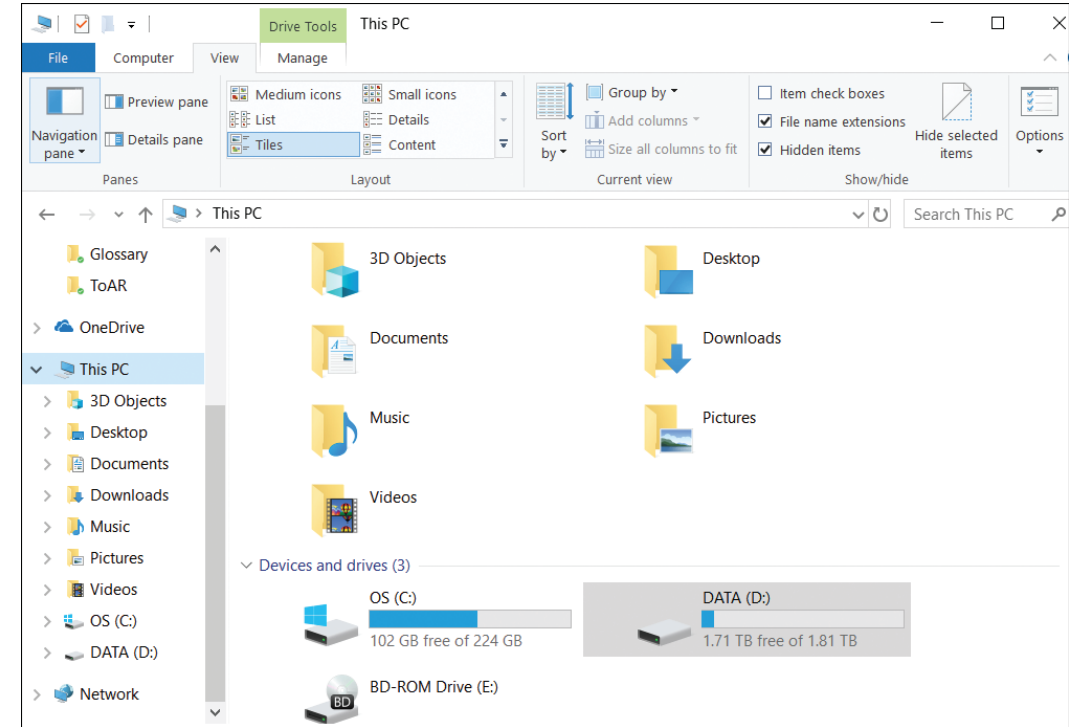
- > A window is a normal part of the Windows environment and common options can appear within a window
- > Interactions with the Windows operating system are through a dialog box
  - > A dialog box is used within the operating system and with Windows applications to allow configuration and operating system preferences
  - > The most common features found in a dialog box are a checkbox, a textbox, tabs, a drop-down menu, a Close button, an OK button, a Cancel button, and an Apply button





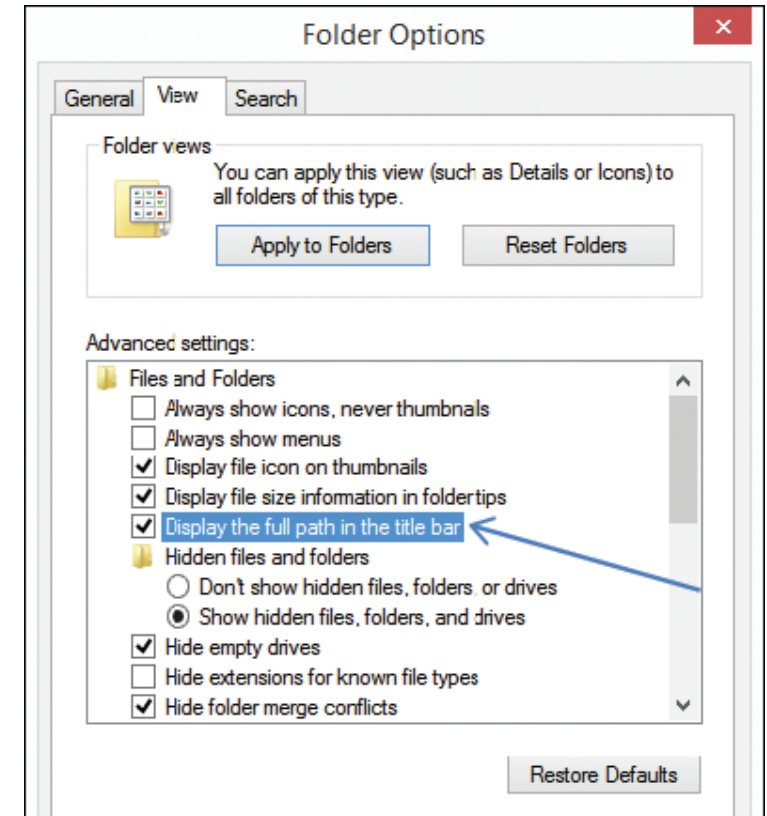
# Managing Windows Files and Folders

- > Technicians often create, delete, and move files and folders
- > Do these tasks quickly and without error
- > Each drive in a computer is represented by a drive letter followed by a colon
  - > For example, the first hard drive partition is represented by C:. The optical drive, flash drive, and any external drives are each represented by a drive letter followed by a colon
- > Windows Explorer (Windows 7) or File Explorer (Windows 8/10) is used to manage files and folders



# Folder Options

- > General tab - controls how folders are opened, clicks are handled, and privacy options
- > View tab – What is seen within Windows Explorer/File Explorer
- > Search tab – search options









# Searches and Indexing

Perform a search the following ways:

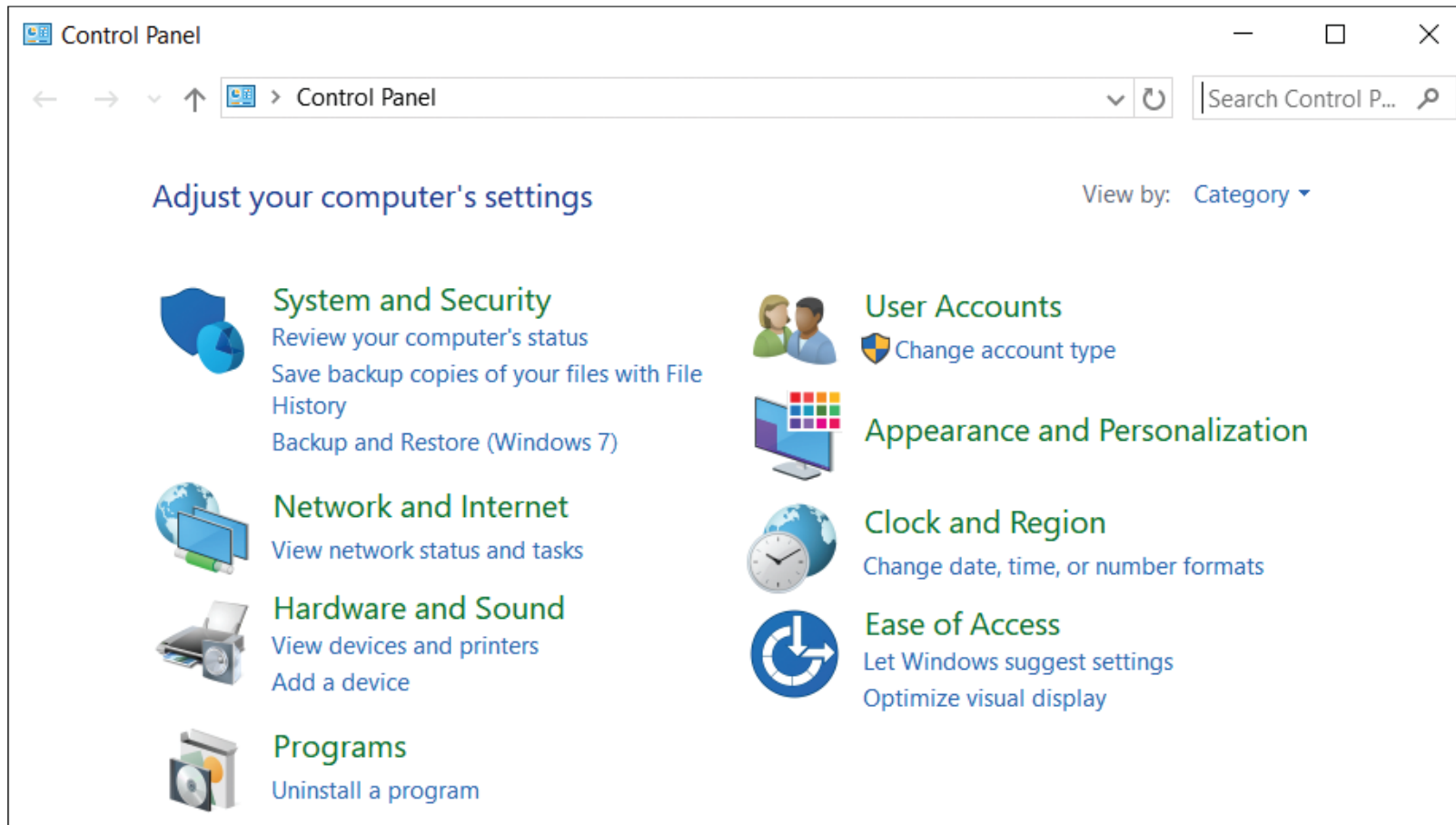
- > Windows Explorer/File Explorer: Type a filename or phrase within the search textbox
- > Windows 7: Search programs and files textbox in the Start button menu
- > Windows 8: An alternative to File Explorer is to use the Search charm
- > Windows 10: Search using the textbox on the taskbar or the Cortana search feature
- > The Folder Options window also has a Search tab that has some technical significance

# Attributes, Compression, & Encryption

	The read-only attribute marks a file or folder so that it cannot be changed.
	The hidden attribute marks a file or folder so that it is not visible through Computer or Explorer unless you change the default view.
	Some applications use the archive attribute to control which files or folders are backed up.
	The system attribute is placed on certain files used to boot Windows.

	<b>Compression</b> involves compacting a file or folder to take less disk space. Right-click on a file/folder to be compressed > <i>Properties</i> > <i>General</i> tab > <i>Advanced</i> > <i>Compress contents to save disk space</i> or <i>Compress</i> checkbox > <i>OK</i> .
	<b>Encryption</b> secures data from unauthorized users using an encryption feature called <b>EFS</b> (encrypting file system). Right-click on a file/folder to be encrypted > <i>Properties</i> > <i>General</i> tab > <i>Advanced</i> > <i>Encrypt contents to secure data</i> checkbox > <i>OK</i> .

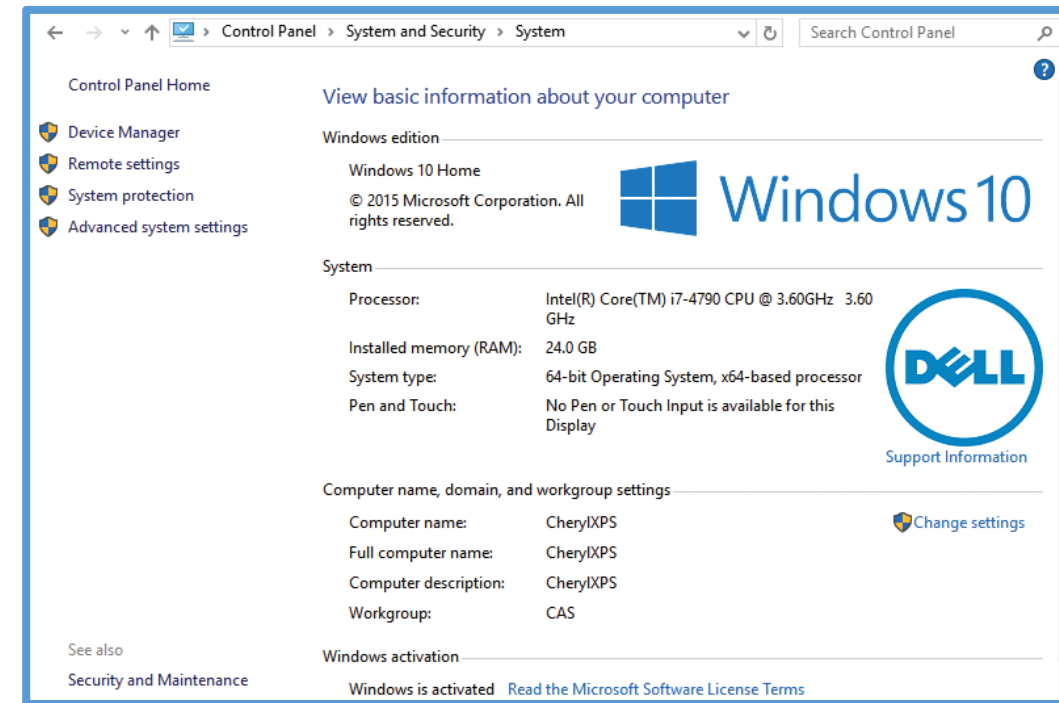
# Windows Control Panels





# Determining the Windows Version

- > The System Control Panel is an important panel for technicians
- > Used to determine the amount of RAM installed, processor installed, and Windows version
- > Access the same Control Panel by using *Windows Explorer (7)/File Explorer (8/10)* > right-click or tap and briefly hold *Computer (7)/This PC (8/10)* > *Properties*



Windows 10 System Control Panel

# Windows Registry

- > Every software and hardware configuration is stored in a database called the registry
- > The registry contains such things as folder and file property settings, port configuration, application preferences, and user profiles
- > A user profile contains specific configuration settings such as the specific applications to which the user has access, desktop settings, and the user's network configuration for each person who has an account on the computer
- > The registry loads into RAM (memory) during the boot process
- > View or edit the registry using the **regedit** or **regedt32** command.



# Backing Up Data

- > Common storage is cloud storage, data stored in a remote location
- > Examples include:
  - > Google Drive
  - > OneDrive from Microsoft
  - > iCloud from Apple
  - > DropBox
  - > SugarSync
- > Windows 7 and 10 allow backing up the entire system and files/folders using the Windows 7 Backup and Restore or the Windows 10 Backup and Restore (Windows 7) Control Panel

# Backing Up Data and Boot Options

- > Windows 8 and 10 use File History, which saves files that are contained in the libraries (and you can create new libraries), contacts, desktop files, and favorites to external media or a network storage location
- > Storage Spaces is another solution for backing up data
- > Windows Recovery Environment (WinRE) is used when Windows does not boot and other tools and startup options do not solve a problem
- > For Advanced Boot Options using the following process:
  - > In Windows 8, access *Settings* > *Advanced startup options* > locate the *Advanced startup* section, and select the *Restart now* button.
  - > In Windows 10, access *Settings* > *Update & Security* > *Recovery* > locate the *Advanced startup* section, and select the *Restart now* button.



# Computer Terms

**Refer to the glossary terms at the end of the textbook chapter. Review Chapter 14 and become familiar with the terms.**

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to support instruction of  
**The Complete CompTIA A+  
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