Lesson 4: Managing Applications, Services, and Disks

# Learning Objectives

Students will learn to:

* Configure applications
* Manage Windows Store apps
* Understand services
* Use MSConfig
* Manage processes and applications with Task Manager
* Understand storage
* Encrypt and compress files and folders

# Objective Domain Skills

* Configuring applications 3.1
* Understanding services 3.4
* Configuring native applications and tools 1.3
* Understanding storage 5.2
* Understanding file systems 4.1
* Understanding encryption 4.3

# Lesson Summary — Lecture Notes

Lesson 4 helps students understand how to manage applications, services, folders, and libraries in Windows 10.

Begin the lecture by explaining that a software program (also known as an app) is a sequence of instructions written to perform a specified task for a computer. Today, most of these programs are installed as desktop apps or Windows Store apps. Desktop apps are traditional apps, such as Microsoft Word or Excel. The applications are installed using an .exe or .msi installer file, which is obtained from a DVD, over a network from a shared folder, or over the internet from the vendors’ websites.

Because Windows 10 follows the same architecture used in Windows Vista, Windows 7, and Windows 8/8.1, most applications written for Windows Vista, Windows 7, and Windows 8/8.1 will run on Windows 10. The few applications that do not run on Windows 10 are usually primarily security-class applications or applications that bypass the Windows application programming interface (API) to communicate with system hardware by performing low-level kernel calls. If an application does not run in Windows 10, not even under the application compatibility mode, you can try to run the application under a Hyper-V virtual machine, a RemoteApp, or App-V.

The Program Compatibility Troubleshooter is a wizard-based solution that users or administrators can use to automatically configure an executable file to use an appropriate Windows 10 compatibility mechanism. Thus, the troubleshooter is not a compatibility mechanism in itself; it is simply a method for applying other mechanisms.

Windows Store apps refers to a class of applications for Microsoft Windows devices including PCs, tablets, phones, Xbox One, Microsoft HoloLens, and the Internet of Things. They are typically distributed and updated through the Windows Store. Universal Windows Platform (UWP) apps are a special type of Windows Store apps that can be installed on multiple hardware platforms, such as a tablet that is running Windows 10 Pro, an Xbox One, or a Windows 10 Phone.

The Windows Storeprovides a central location for you to purchase and download Windows apps that run on Windows 8 and later operating systems. Windows Store apps do not run on Windows 7 or earlier versions of Windows. Windows Store apps tend to be smaller and faster than desktop apps.

Group Policy is a collection of settings (policies) stored in Active Directory on a Windows network. Active Directory is an infrastructure (directory) that stores information and objects. An object can be a file, a printer, a computer, a user account, or other entities. Objects in Active Directory are linked to Group Policy Objects (GPOs), which are used by administrators to control users and computers on a network and to deploy applications, software updates, and security. Group Policy affects users and computers contained in sites, domains, and organizational units.

Services run in the background on a Windows system to help the operating system run other programs. The Services console is the central management point of services in Windows 10. Windows uses services to handle requests for print spooling, file indexing, task scheduling, the Windows Firewall, and much more. Services run in the background, essentially helping the operating system work with other programs. Although services do not usually have user interfaces, you can manage services through the Microsoft Management Console (MMC) Services snap-in.

Next, you'll explain that MSConfig, also known as the System Configuration utility, lets you enable or disable startup services, set boot options such as booting into Safe Mode, access tools like Action Center and Event Viewer, and more. You’ll use this utility mainly to troubleshoot startup problems with Windows. Task Manager gives you a quick glance at performance and provides information about programs and processes running on your computer. A process is an instance of a program that is being executed.

Storage in Windows 10 refers to storing data as well as an operating system on disks. There are a number of different types of storage: internal, external, network, and cloud.

In Windows 10, a physical hard drive can be designated as a basic disk or a dynamic disk. Basic disks contain only simple volumes. Dynamic disks can contain simple, spanned, striped, and mirrored volumes.

The three primary types of file systems for Windows are FAT, FAT32, and NTFS. It’s best to use NTFS-formatted disks for Windows Vista through Windows 10 because NTFS handles small to very large hard disks, provides better security, and is the most reliable.

Encrypting files and folders protects them from unwanted access. Microsoft uses the Encrypting File System (EFS) to encrypt individual files and folders in Windows Vista through Windows 10. Encryption protects the contents of files and folders from unauthorized access. Compression is the process of decreasing the size of files or folders without affecting the files’ contents.

BitLocker Drive Encryption encrypts an entire fixed disk to prevent access by unauthorized users. BitLocker To Go protects removable drives, such as external flash drives. You can encrypt drives with BitLocker in Windows Professional, Enterprise, and Education editions only.

TAKE NOTE: In the OneNote portion of this course, we include a blank space between the backward slashes that indicate the beginning of a network path (\\) and a server address (such as server\share\folder), to prevent them from becoming live links. In actual usage, there would be no space after the slashes.

# Key Terms

**Active Directory** – An infrastructure (directory) that stores information and objects. An object can be a file, a printer, a computer, a user account, or other entities.

**app** – Also known as a software program, an app is a sequence of instructions written to perform a specified task for a computer. Today, most of these programs are installed as desktop apps or Windows Store apps.

**basic disk** – A disk that contains only simple volumes.

**BitLocker Drive Encryption** – Another method of protecting data stored on a fixed drive in a Windows computer. BitLocker encrypts the entire drive, rather than individual files and folders. The complementary BitLocker To Go protects data on removable data drives, such as an external flash drive.

**compression** – The process of decreasing the size of files or folders without affecting the files’ contents.

**desktop app** – A traditional app, such as Microsoft Word or Excel.

**dynamic disk** – A disk that can contain simple, spanned, striped, or mirrored volumes.

**encryption** – Protects the contents of files and folders from unauthorized access.

**encryption key** – When you mark a file for encryption, Windows generates a large, random number—a unique encryption key. The key is used to scramble the contents of the file. This encryption key is also encrypted with a personal file encryption certificate, which is stored in the Windows Certificate database. The file’s encryption key is stored along with the file.

**Extended File Allocation Table (exFAT)** – A Microsoft file system optimized for flash drives.

**External Serial Advanced Technology Attachment (eSATA)** – An external interface for SATA technologies.

**FAT** – A file system, no longer in popular use, with a maximum partition size of 2 gigabytes (GB) and a maximum file size of 2 GB.

**FAT32** – A file system with a maximum partition size of 32 gigabytes (GB) and a maximum file size of 4 GB.

**file system** – The overall structure your computer uses to name, store, and organize files and folders on a hard disk or partition.

**FireWire** – Also known as IEEE 1394, it's used for many different types of high-speed data transfers, including video, and serves the same purpose as USB.

**Group Policy** – A collection of settings (policies) stored in Active Directory on a Windows network.

**Group Policy Object (GPO)** – Used by administrators to control users and computers on a network and to deploy applications, software updates, and security.

**IEEE 1394** – Also known as FireWire, it's used for many different types of high-speed data transfers, including video, and serves the same purpose as USB.

**isochronous data transfer** – A constant data rate.

**Microsoft account** – Previously called Windows Live ID, a Microsoft account is a unique account that is the combination of an email address and a password that you use to sign in to services like Outlook.com, MSN.com, Hotmail.com, OneDrive, Windows Phone, or Xbox Live.

**mirrored volume** – A type of volume that duplicates data from one disk to a second disk for redundancy and fault tolerance; if one disk fails, data can be accessed from the second disk. Mirrored volumes require only two disks.

**multi-booting** – An environment in which two or more different operating systems are installed on a computer, enabling the user to choose which operating system starts upon system boot.

**NTFS** – The preferred file system; supports much larger hard disks and a higher level of reliability than FAT-based file systems. In addition, NTFS offers better security through permissions and encryption.

**partition**– A section of space on a physical disk that functions as if it were a separate disk.

**process** – An instance of a program that is being executed.

**Program Compatibility Troubleshooter** – A wizard-based solution that users or administrators can use to automatically configure an executable file to use an appropriate Windows 10 compatibility mechanism.

**Resilient File System (ReFS)** – An enhanced NTFS file system offering larger volume sizes and files. ReFS also offers greater resiliency, meaning better data verification, error correction, and scalability.

**service** – A service runs in the background on a Windows system to help the operating system run other programs. The Services console is the central management point of services in Windows 10.

**software program** – Also known as an app, a software program is a sequence of instructions written to perform a specified task for a computer. Today, most of these programs are installed as desktop apps or Windows Store apps.

**System Configuration utility (MSConfig)** – Enables you to enable or disable startup services, set boot options such as booting into Safe Mode, access tools like Action Center and Event Viewer, and more. You’ll use this utility mainly to troubleshoot startup problems with Windows.

**Task Manager** – Provides you with a quick glance at performance and provides information about programs and processes running on your computer.

**Universal serial bus (USB)** – A standard developed in the mid-1990s that defines cable connectors and protocols used to connect external devices to a computer.

**Universal Windows Platform (UWP)** – A special type of Windows Store app that can be installed on multiple hardware platforms, such as a tablet that is running Windows 10 Pro, an Xbox One, or a Windows 10 Phone.

**volume** – With dynamic disks, free space on a hard drive is divided into volumes instead of partitions. Dynamic disks are not limited by partition styles as are basic disks. You can configure dynamic disk volumes as simple, spanned, mirrored, striped, or RAID-5.

**Windows Store** – Provides a central location for you to purchase and download Windows apps that run on Windows 8 and later operating systems.

# Knowledge Assessment

## Multiple Choice

**Select the correct answer(s) for each of the following questions.**

1. Which of the following actions can be performed in Programs and Features in Control Panel?

a. Install an application

b. Uninstall an application

c. Encrypt an application’s files

d. Compress an application’s files

2. Which of the following actions can be performed using Group Policy? (Choose all that apply.)

a. Restrict user access to an application

b. Encrypt a user’s files

c. Update an application

d. Install applications from a network location

3. Which of the following locations is accessed to enter Safe Mode the next time the computer starts?

a. The General tab

b. The Boot tab

c. The Startup tab

d. Services console

4. In the System Configuration utility, which of the following tabs is accessed to start Performance Monitor?

a. General

b. Startup

c. Services

d. Tools

5. Which of the following represents the maximum disk size that NTFS can handle?

a. 32 GB

b. 256 GB

c. 32 TB

d. 256 TB

6. Which built-in account type used to run services has full access to a system?

a. Local Service account

b. Network Service account

c. Local System account

d. Root System account

7. Which of the following partitions or volumes can be created on a dynamic drive? (Choose all that apply.)

a. Striped partition

b. Striped volume

c. Simple volume

d. Spanned volume

e. Mirrored partitions

f. Striped partitions

8. In which of the following locations are EFS certificates stored?

a. EFS Certificate database

b. Windows Certificate database

c. Certificate library

d. Documents library

9. Which of the following is used to indicate that a folder is compressed?

a. Two small arrows pointing toward each other

b. A golden lock

c. 0s and 1s

d. A series of question marks

10. Which of the following is the name of the chip that BitLocker can use on some computers to protect BitLocker encryption keys?

a. Trusted Platform Module

b. Trusted Protection Module

c. Encryption Platform Module

d. Trusted Hard Drive Module

## Fill in the Blank

**Complete the following sentences by writing the correct word or words in the blanks provided.**

1. An application is a program that runs within the operating system and helps a user perform a specific task, such as word processing, appointment scheduling, or accounting.

2. Group Policy is a collection of settings (policies) stored in Active Directory on a Windows network.

3. Windows uses services to handle requests for print spooling, file indexing, task scheduling, the Windows Firewall, and much more.

4. MSConfig is used to enable or disable startup services, set boot options such as booting into Safe Mode, access tools like Action Center and Event Viewer, and more.

5. Most Windows Vista through Windows 10 users use the NTFS file system because it supports larger disks than FAT32 or FAT.

6. Group Policy can be used to assign (or publish) an application to all users or computers in a designated group.

7. A Microsoft account is a unique account that is the combination of an email address and a password that is used to sign in to services like Outlook.com, MSN.com, Hotmail.com, OneDrive, Windows Phone, or Xbox Live.

8. Windows uses Encrypting File System (EFS) to allow users to encrypt information on hard disks, external flash drives, CDs, DVDs, backup tapes, and other types of physical media.

9. Compression is the process of decreasing the size of files or folders without affecting the files’ contents.

10. BitLocker Drive Encryption encrypts an entire drive, rather than individual files and folders on a disk.

## True / False

**Circle T if the statement is true or F if the statement is false.**

**T F** 1. Use Programs and Features to install applications in Windows 10.

**T F** 2. Objects in Active Directory are linked to Group Policy Objects (GPOs).

**T F** 3. A Windows 10 system can have more than 100 services running at any one time.

**T F** 4. In System Configuration, the Tools tab enables you to enable or disable services.

**T F** 5. EFS and BitLocker Drive Encryption refer to the same thing.

# Business Case Scenarios

## Scenario 4-1: Providing Redundancy on a Client Computer

You provide support for a commercial bioengineering lab. Mizuki is a chemist at the lab, and she recently inherited a computer from the IT department that has two large hard disks and runs Windows 10 Enterprise. One hard disk provides ample disk space for her programs and data files, but she would like to use the other disk for redundancy to better protect her system and files. Describe your recommended solution.

On Mizuki’s computer, open Disk Management and create a mirrored volume with the two disks. Mirrored volumes store an exact copy of data from the first member of the mirrored volume to the second member. Because the data is written across both drives, Mizuki will get redundancy and fault tolerance.

## Scenario 4-2: Protecting Laptop Computers

Henry, a traveling salesperson at your company, left his laptop at the airport on his last trip and the laptop was never recovered. His new laptop arrived yesterday; you installed Windows 10 Enterprise and productivity applications and you also restored data from a backup. What should you do to the laptop to protect all programs and data on the computer in the event of loss or theft?

You should turn on BitLocker Drive Encryption on Henry’s new laptop. BitLocker will prevent unauthorized use of the system should the laptop be lost or stolen.

## Scenario 4-3: Uninstalling Local Software

Henry, a traveling salesperson at your company, left on an extended business trip to Asia. He has called to request that the voice transcription software be deleted from his computer. He doesn’t use the application and doesn’t want it taking up space. Describe how to help him remove the software on his own.

Advise Henry to close all open programs and windows, and then right-click Start and choose Control Panel. Then instruct him to click Programs > Programs and Features. Next, he should browse the list of programs, click the voice transcription program, and then click Uninstall on the toolbar. Henry should follow the prompts that display until the program is removed. He should restart the computer and then try using a few programs to ensure the uninstallation process did not affect any other programs.

## Scenario 4-4: Running a Windows 7 Application on Windows 10

You use an inventory application that ran on your Windows 7 computer, but it doesn't run on your new Windows 10 computer. Describe the various solutions available to you for getting this application to run on your Windows 10 computer.

You can run the Program Compatibility Troubleshooter and select Windows 10 to emulate a Windows 10 environment. You can also check to see if this application requires administrative access and you will need to determine if your account has administrator access to the new system. You should also look for updates for the software package and check the vendor website for additional information about running the application on Windows 10. If the application still does not run, you can consider installing client Hyper-V and run the application on a virtual machine running Windows 7.