Introduction

In this module, you learn about another operating system for desktops and laptops other than Windows: macOS. As you will see, understanding Windows gives you a solid foundation to approach learning and supporting other operating systems, including macOS. IT technicians are expected to be familiar with a variety of operating systems and operating environments. This module and the module "Linux and Scripting" equip you with the skills you will need to work in those environments.

20-1 Getting to Know the macOS Desktop

Core 2 Objective

- 1.10

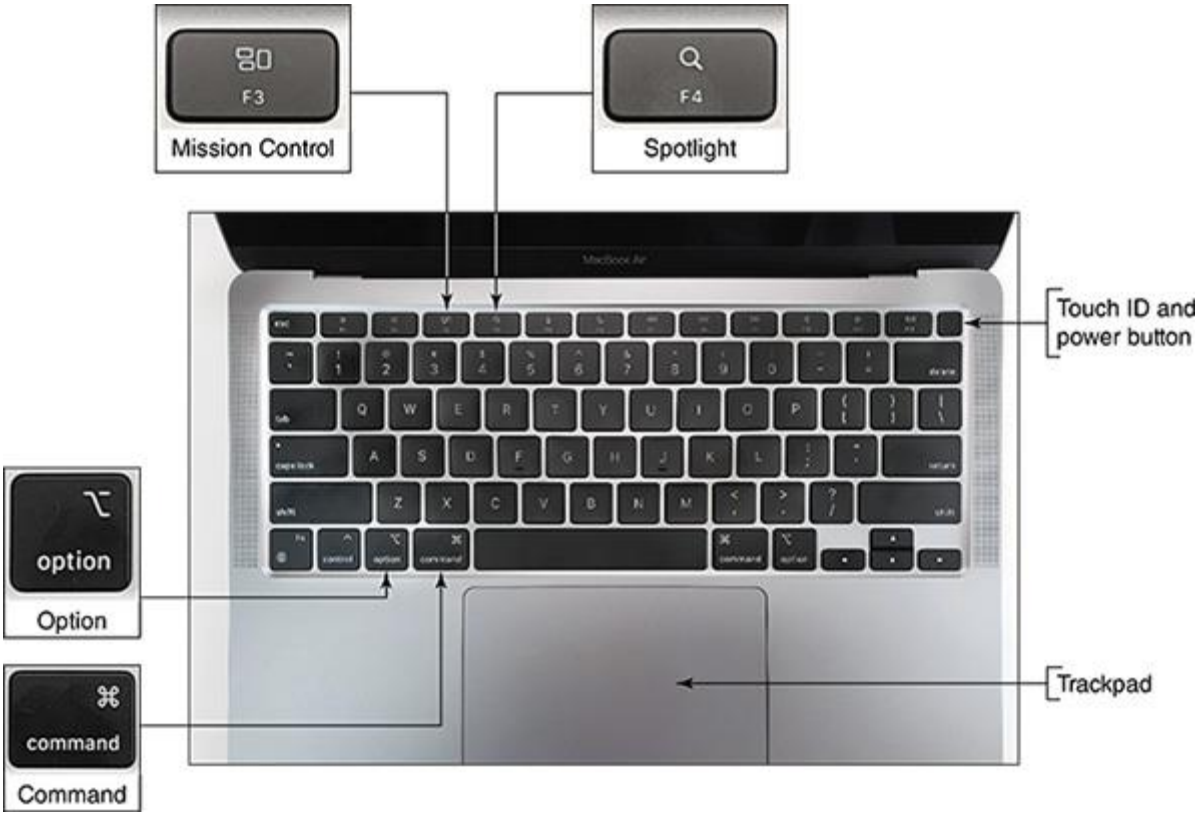
Identify common features and tools of the macOS/desktop OS.

macOS, previously called Mac OS X, is a proprietary operating system that is only available for Macintosh computers by Apple Inc. (apple.com). Like Linux, macOS is built on a UNIX foundation and has been evolving and improving since its original release in 1984. (UNIX is a popular OS used to control networks and to support server applications available on the Internet.) At the time of this writing, macOS Monterey was just released, and some users are converting to it from the last release, macOS Big Sur.

The Mac keyboard has some special keys. See Figure 20-1. However, don't depend on these special keys because a customer might have a regular keyboard connected via a USB port. The touch pad on a Mac laptop is called the trackpad, and it is a touch pad on steroids; you can use multiple fingers and actions called **gestures**, which you learn about as you read through this section of the module. Some newer MacBooks have Touch ID as a biometric scanner for fingerprints included on the keyboard as seen in Figure 20-1.

Figure 20-1

Special keys on a Mac keyboard



Now let's get to know the macOS interface, including the desktop with its dock and Apple menu, Finder, Launchpad, System Preferences, Spotlight, Mission Control, multiple desktops, iCloud Drive, Keychain, Screen Sharing, Remote Disc, and Terminal.

The macOS desktop, with its major components labeled, is shown in Figure 20-2. The **Finder** application, which can help you find applications and data files, is open and active. Because Finder is the currently active application, the menu bar for the Finder window is displayed at the top of the screen. The Finder menu bar provides drop-down menus that contain options for working with applications, files, and the interface.

Figure 20-2

The macOS desktop with a Finder window showing the Applications pane

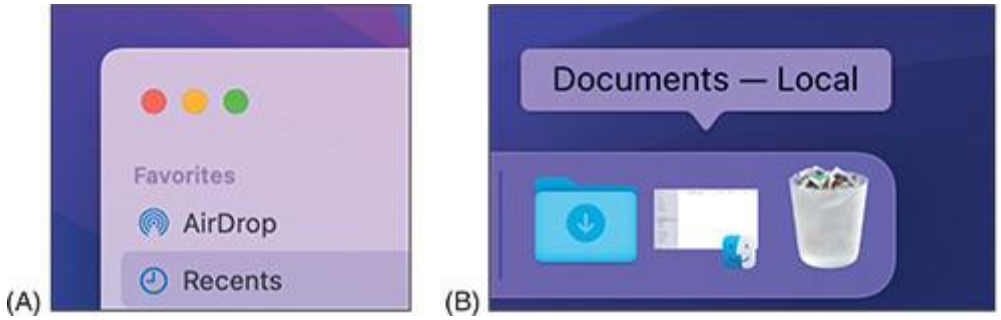
Source: Apple Inc.

By default, the **dock** appears at the bottom of the desktop. It contains shortcut icons to access frequently used applications. To open an application from its icon in the dock, click it once. The icons in the dock that represent open applications have a small black or white dot underneath them. The macOS desktop can also include shortcuts that provide quick access to files, folders, and applications.

When a window is open, three circles in the upper-left corner (see Figure 20-3A) provide options for manipulating the window. The red circle closes the window, the yellow circle minimizes the window to the dock in the lower-right corner of the screen (see Figure 20-3B), and the green circle maximizes the window to full-screen size. To exit full-screen mode, move your pointer to the top of the screen. When the circle icons appear, click the green circle.

Figure 20-3

(A) Close, minimize, or expand a window; (B) this Finder window has been minimized, but the app is still running and its window is easily accessible in the dock

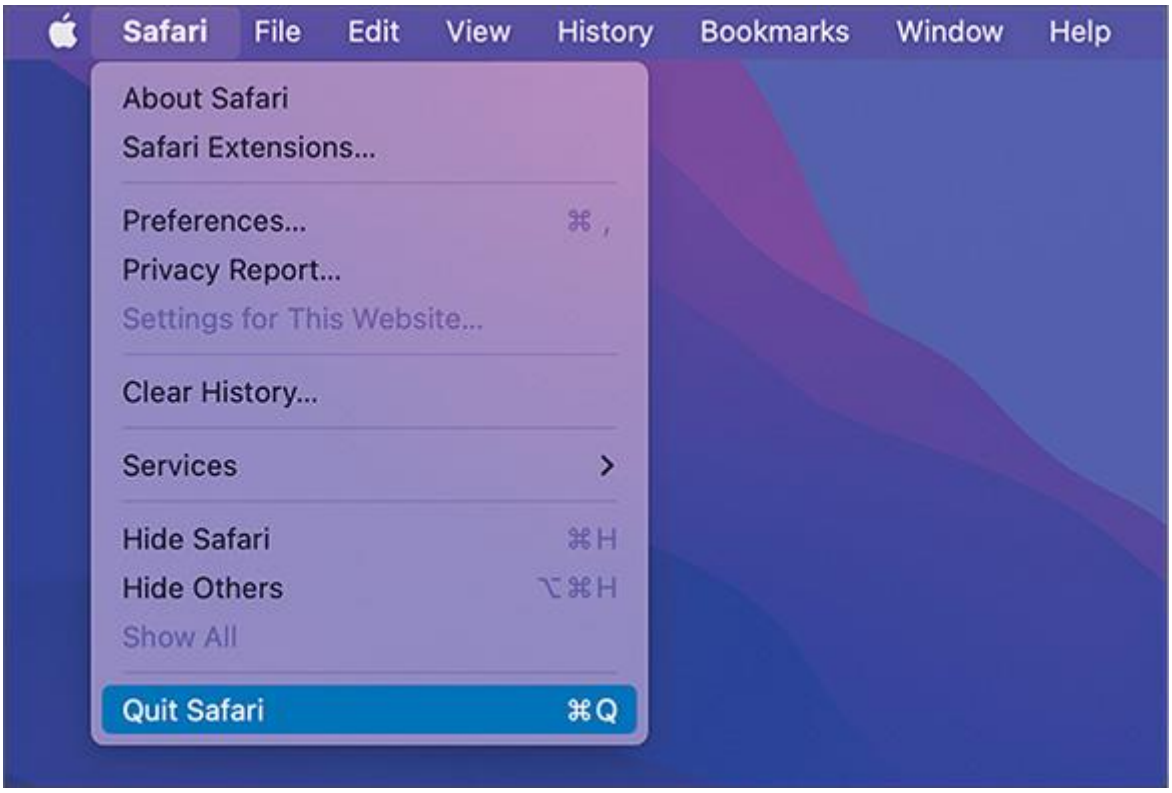


Source: Apple Inc.

Closing an app's window does not close the app. To quit an app that is active, click the name of the app in the menu bar, and click **Quit** at the bottom of the drop-down menu. See Figure 20-4.

Figure 20-4

To close an app, select Quit in the app's menu



0-1a Finder

Core 2 Objective

- 1.10

Identify common features and tools of the macOS/desktop OS.

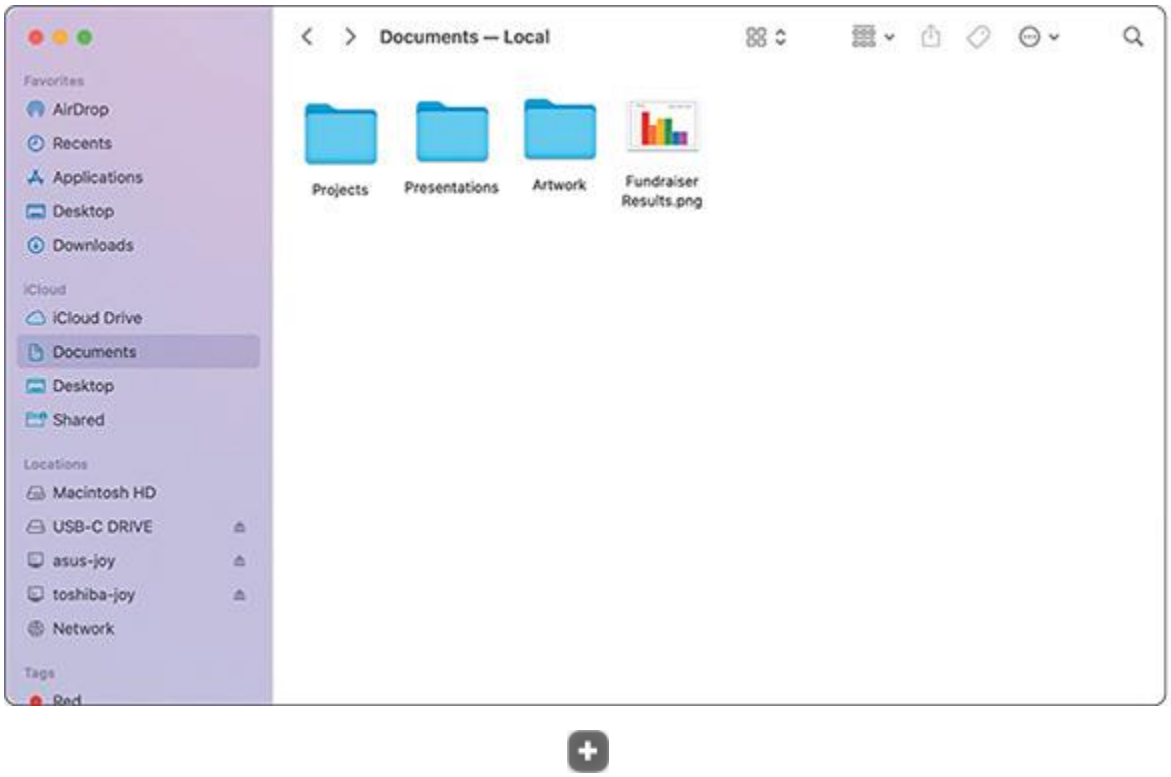
The Finder window, shown earlier in Figure 20-2 and again in Figure 20-5, functions something like File Explorer in Windows; use it to find and access files, applications, and macOS utility programs. To open the Finder window,

click it in the dock. Note that the Finder is always running; you can close the Finder window, but you can't end the Finder utility. Here are useful things you can do with Finder:

- **Files and folders.** To open files and folders, click **Documents** or some other storage location, such as iCloud Drive or Downloads. Double-click a folder to drill down into it, and double-click a document file to open it. You can drag and drop a file or folder into and out of a folder or location window.
- **Applications.** To open an app, click **Applications** in the sidebar, scroll to the app, and click it. You can also open apps from Launchpad.
- **macOS utilities.** macOS offers several utility programs that are accessed from the Finder window. Click **Applications**, scroll down to the **Utilities** folder, and click it. See Figure 20-6. You learn to use several of these utilities later in this module.
- **Locations.** As shown on the left side of Figure 20-6, available locations are the Mac, the internal hard drive (Macintosh HD), a USB drive, Remote Disc, and the network. Drill down into any of these locations to see available resources. When you drill down into Network, you see network devices and their shared resources.
- **Finder menu bar.** To use the Finder menu bar to list devices and other resources, click **Go** in the Finder menu bar, and click **Computer**. The Computer window shows all locations and storage devices, and you can drill down into them. To control what appears in the Finder sidebar or on the desktop, click **Finder** in the menu bar, and then click **Preferences**.
- **Tags.** Tags are used to assign a tag or color to a file or folder to make it easier to find later. For example, you can secondary-click a file, and use the shortcut menu to assign it a blue tag. (A **secondary-click** is a tap of the trackpad with two fingers.) Later, click the blue tag in the left column of Finder to see all items with blue tags.

Figure 20-5

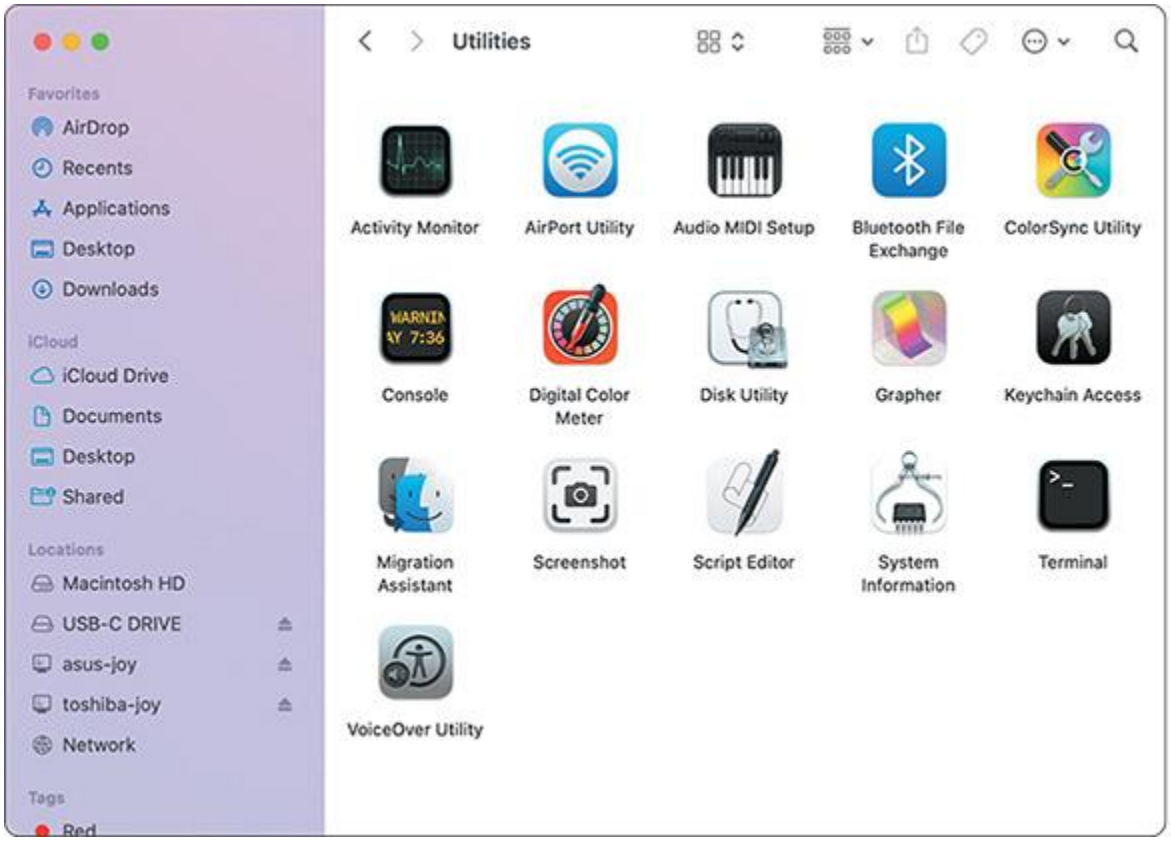
The Finder window showing the Documents folder contents



Source: Apple Inc.

Figure 20-6

Utilities to support a Mac are in the Utilities folder under Applications in the Finder window



Source: Apple Inc.

Note 1

If you use an app, such as GarageBand, frequently, you can add it to the dock or desktop. In Finder, click **Applications**, and then click and drag the app's icon to the dock or desktop. To remove an icon from the dock or desktop, click and drag the icon to the Trash icon.

20-1b Launchpad

Core 2 Objective

- 1.10

  Identify common features and tools of the macOS/desktop OS.

Launchpad (see Figure 20-7), which is somewhat similar to a combination of the Windows Start menu and Programs and Features window, shows all apps installed on the computer. Use one of these methods to open Launchpad:

- **Use the dock.** Click the Launchpad icon in the dock.
- **Use a gesture.** Pinch with three fingers and your thumb on the trackpad.
- **Use a key.** Press the Launchpad key at the top of the Mac keyboard.

Figure 20-7

View all installed apps in Launchpad; when more apps are installed, Launchpad creates additional screens to the side

Source: Apple Inc.

In the Launchpad window shown in Figure 20-7, notice the two dots above the dock, which indicate that Launchpad requires two screens to show all installed apps. Swipe left or right with two fingers to move through the screens.

Here are some tips on how to use Launchpad:

- Click an app to open it, which also closes Launchpad.
- To uninstall an app, press and hold the **Option (⌥)** key, which causes the app icons to jiggle. Click an **X** on an icon to uninstall its app. You can also rearrange jiggling icons, similar to the way you can work with icons on an iPad and iPhone. Release the Option key when you're done.
- To close Launchpad and return to the desktop, use a pinch gesture with three fingers and your thumb spread apart.

20-1c Apple Menu

Core 2 Objective

- 1.10

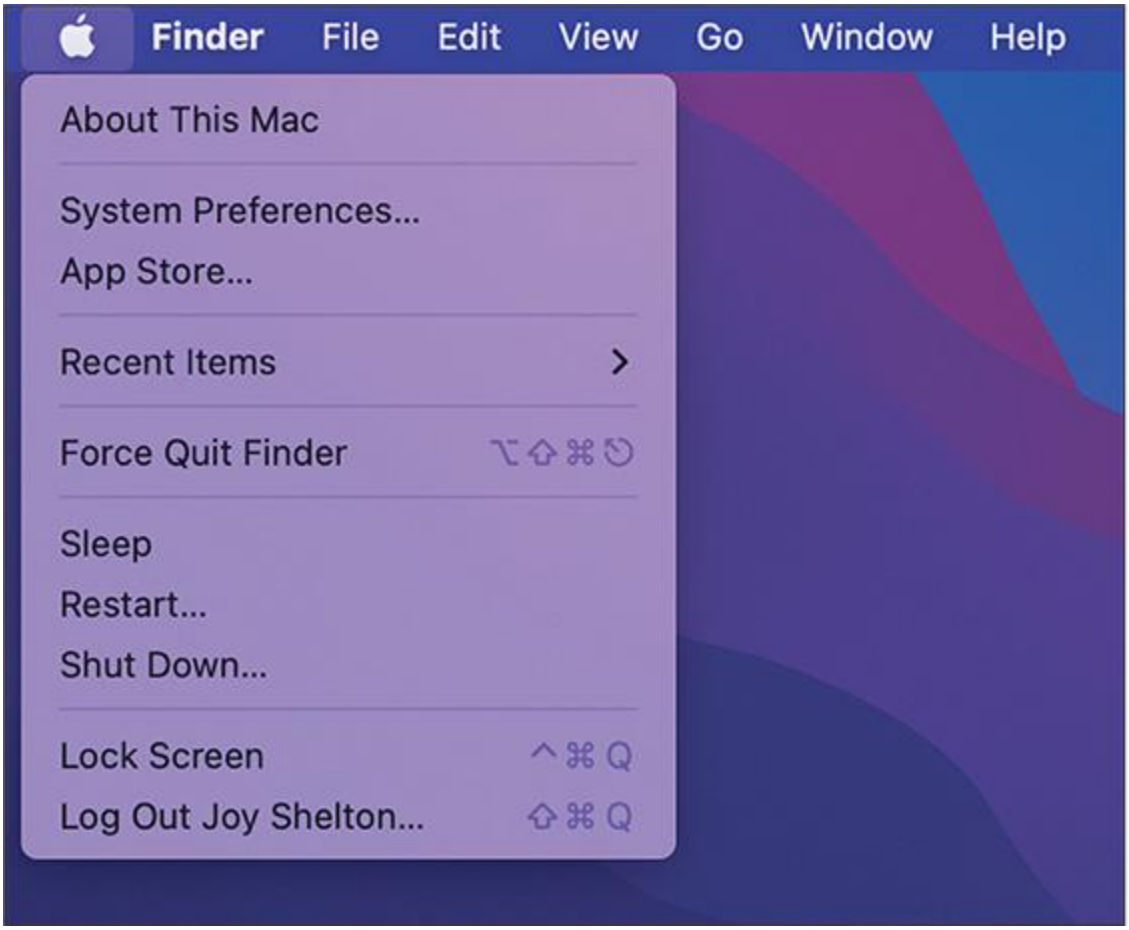
Identify common features and tools of the macOS/desktop OS.

The menu at the top of the macOS screen changes with each application that is active—except for the Apple icon, which is always shown at the far left of the menu bar. The **Apple menu** (see Figure 20-8) opens when you click the

Apple icon. Use the Apple menu to put the computer to sleep, log out, restart, or shut down the system.

Figure 20-8

The Apple menu is always available no matter which application is active

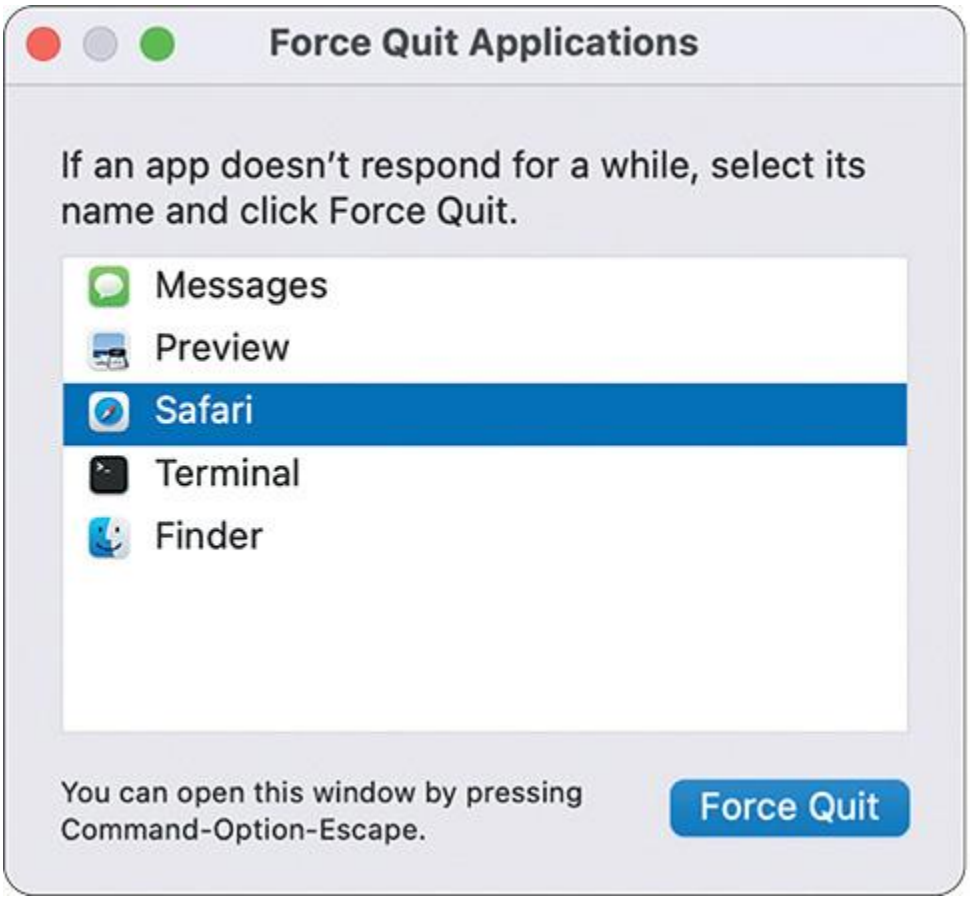


Source: Apple Inc.

The Apple menu also provides access to system information, system preferences, the App Store, recent items, and the Force Quit option. Similar to ending a task from Task Manager in Windows, you can **force quit** an app by clicking **Force Quit**. In the Force Quit Applications window (see Figure 20-9), select the app, and click **Force Quit**. The application closes. You can also access the Force Quit Applications window by pressing **Command (⌘)+Option+Esc**.

Figure 20-9

Force Quit can be used to close an app that is not responding



20-1d System Preferences

Core 2 Objective

- 1.10

Identify common features and tools of the macOS/desktop OS.

The **System Preferences** window is used to change and customize macOS settings and is similar to the Settings app in Windows. It can be opened from the Apple menu (refer back to Figure 20-8) or from the System Preferences icon in the dock (see Figure 20-10). The System Preferences window is shown in Figure 20-11.

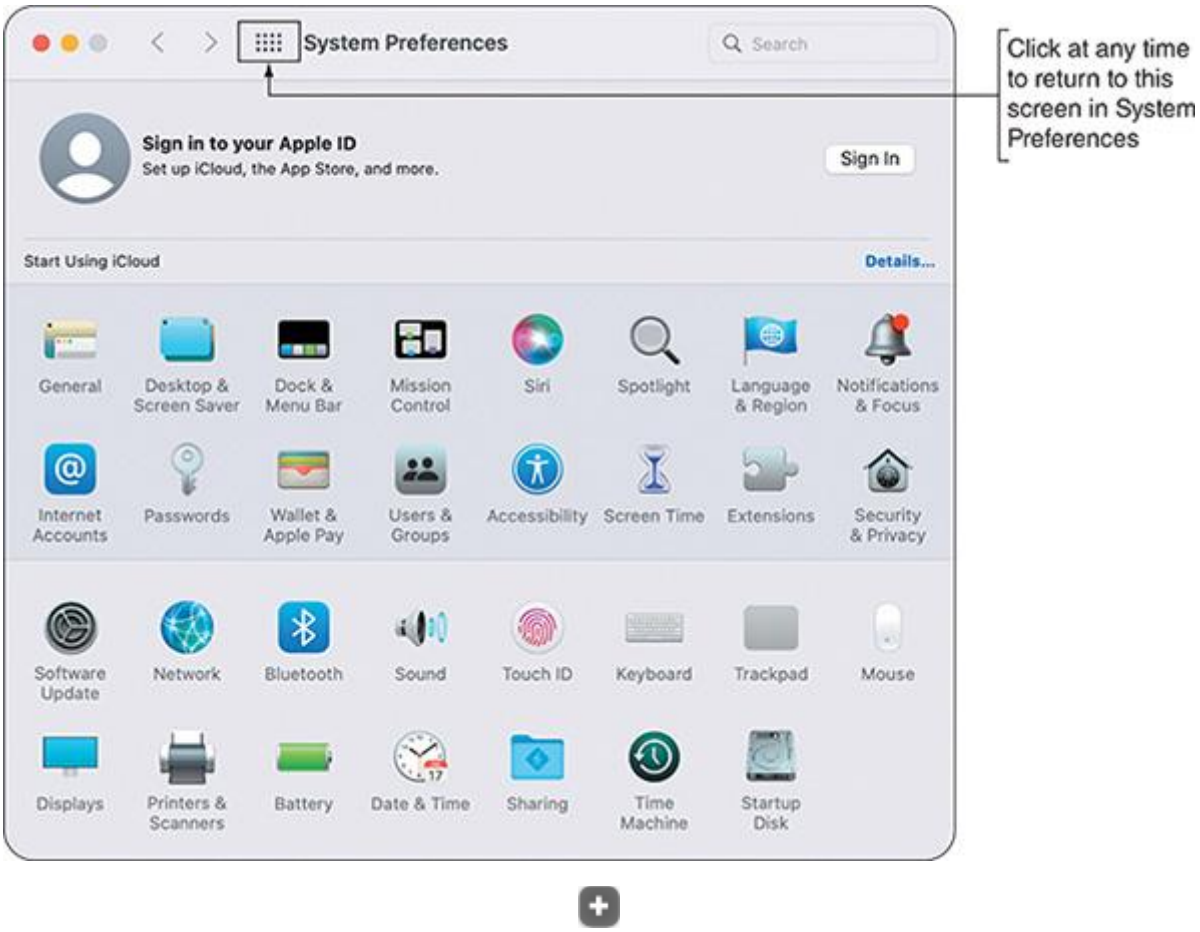
Figure 20-10

The System Preferences icon in the dock shows the app is open

Source: Apple Inc.

Figure 20-11

The System Preferences window is used to customize the macOS interface



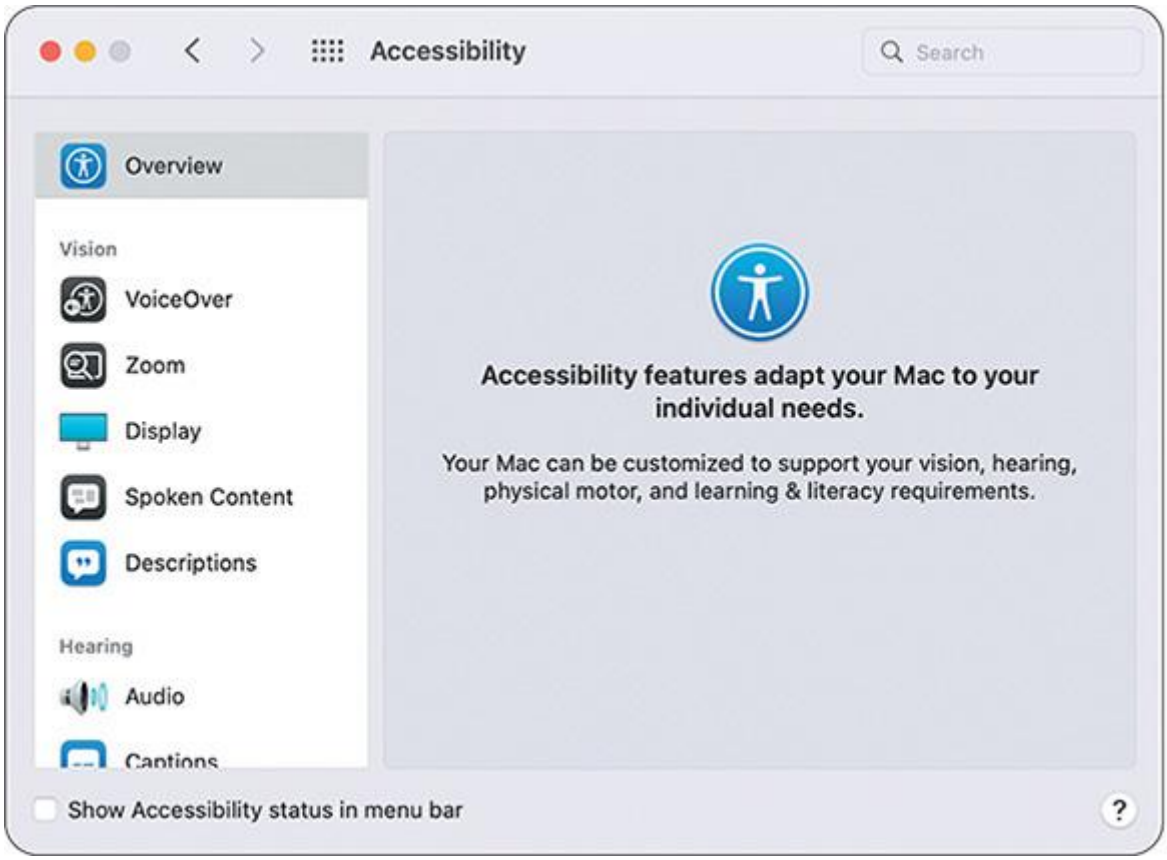
Source: Apple Inc.

Click an icon in System Preferences to change settings for that tool, feature, or app. Here are a few important tools in System Preferences you might use as an IT technician:

- **Trackpad.** Click Trackpad to adjust trackpad gestures.
- **Displays.** Set resolution, brightness, and color profile.
- **Accessibility.** Configure customizations to adapt to individual needs, as seen in Figure 20-12.

Figure 20-12

Accessibility features available in macOS can be customized in System Preferences



Source: Apple Inc.

- **iCloud.** Click **Apple ID**, and select **iCloud** in the left pane. Set up an iCloud account on this computer, choose what content to sync to iCloud and iCloud Drive, and adjust account details.
- **Time Machine.** Use Time Machine to configure backups.
- **Users & Groups.** Add and remove users and change login items for a user.
- **Sharing.** Share the Mac's screen, files, and printers, and allow remote login and management of the computer.
- **Network.** Change network settings, including TCP/IP settings for Bluetooth, Wi-Fi, and Ethernet connections. (For Mac laptops, Ethernet connections are often made via the multipurpose Thunderbolt port using a Thunderbolt to Gigabit Ethernet adapter.)
- **Security & Privacy.** Set options for general security, FileVault, firewall, and privacy. **FileVault** secures the data on the hard disk using encryption. Note that data will be lost if you forget the login password or lose the recovery key to access encrypted data. The privacy tab shows which apps have requested access to certain apps, data, or hardware.
- **Printers & Scanners.** Add, remove, and configure printers and printer-sharing preferences. You can also view and edit the printer queue here.

- **Spotlight.** Change settings for Spotlight, the macOS search utility. You can control where Spotlight searches and its keyboard shortcuts.

Exam Tip

The A+ Core 2 exam expects you to know about the these tools in System Preferences: Displays, Network, Printers & Scanners, Security & Privacy, Accessibility, and Time Machine.

20-1e Control Center

Core 2 Objective

- 1.10

Identify common features and tools of the macOS/desktop OS.

Introduced with Big Sur, the control center is shown in Figure 20-13. The control center offers a convenient location for accessing commonly used settings, such as Wi-Fi, Bluetooth, AirDrop, Focus, keyboard brightness, screen mirroring, display brightness, sound volume, and music track control.

Figure 20-13

The Control Center gathers frequently accessed settings into one location

20-1fSpotlight

Core 2 Objective

- 1.10

Identify common features and tools of the macOS/desktop OS.

If you're having a problem locating a file or folder, **Spotlight** can search for it. To open Spotlight, click the search icon on the right side of the menu bar or press **Command** (⌘)+**spacebar**. In the Spotlight Search box (see Figure 20-14), type the name of the file, folder, or text you want to find. For example, if you type **Projects**, Spotlight lists a folder named Projects as the Top Hit (see Figure 20-15).

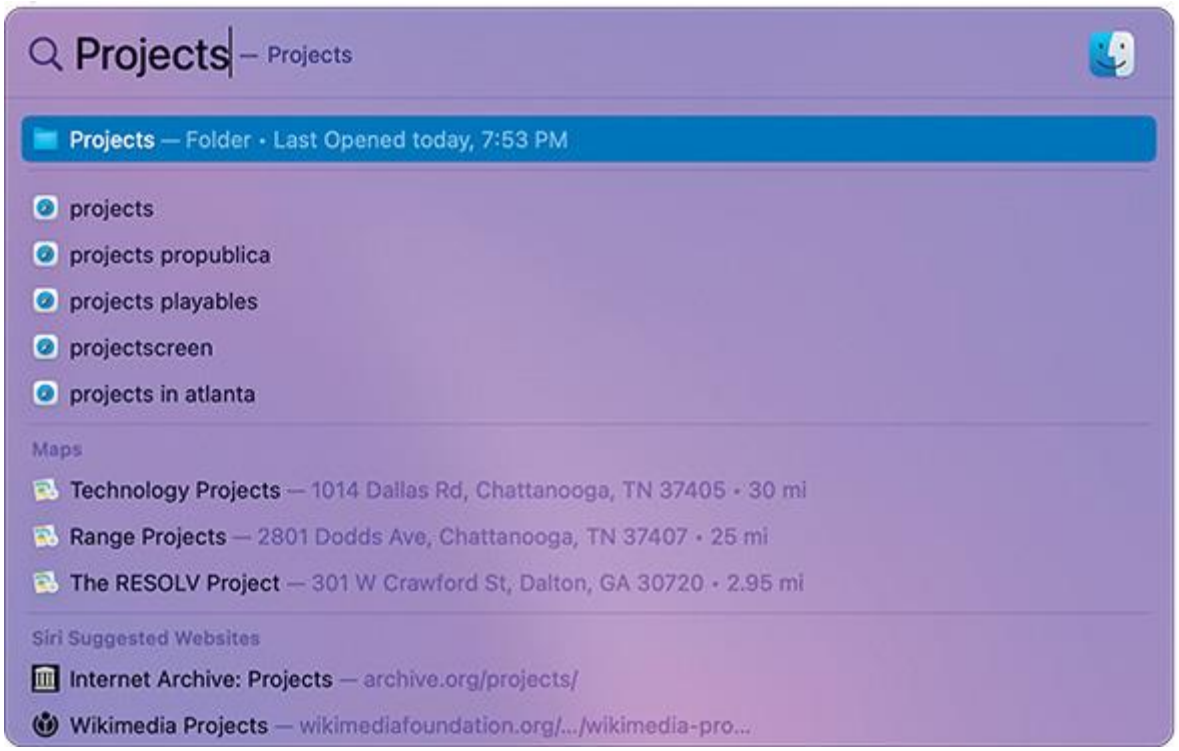
Figure 20-14

Spotlight searches the local computer and online resources

Source: Apple Inc.

Figure 20-15

Use Spotlight to search for files and folders



Source: Apple Inc.

Note 2

When you no longer need a file or folder, drag its icon to the Trash icon until the Trash is highlighted, and release the icon. When an item is in the Trash, you can recover it:
Click **Trash** to open it and drag an item in the Trash to another location. To empty the trash, click **Finder** in the menu bar, and click **Empty Trash**.

20-1g Mission Control and Multiple Desktops

Core 2 Objective

- 1.10

Identify common features and tools of the macOS/desktop OS.

Mission Control gives you a quick view of all open windows and desktops and lets you switch among them. The macOS includes a feature called **multiple desktops**—which, as its name indicates, is several desktop screens, each with its own collection of open windows. Suppose you're working with several windows for a school project, and you have a few more windows open for a project at work. You can place the school project windows on one desktop, called a **Space**, and place the work project windows on a separate desktop or Space.

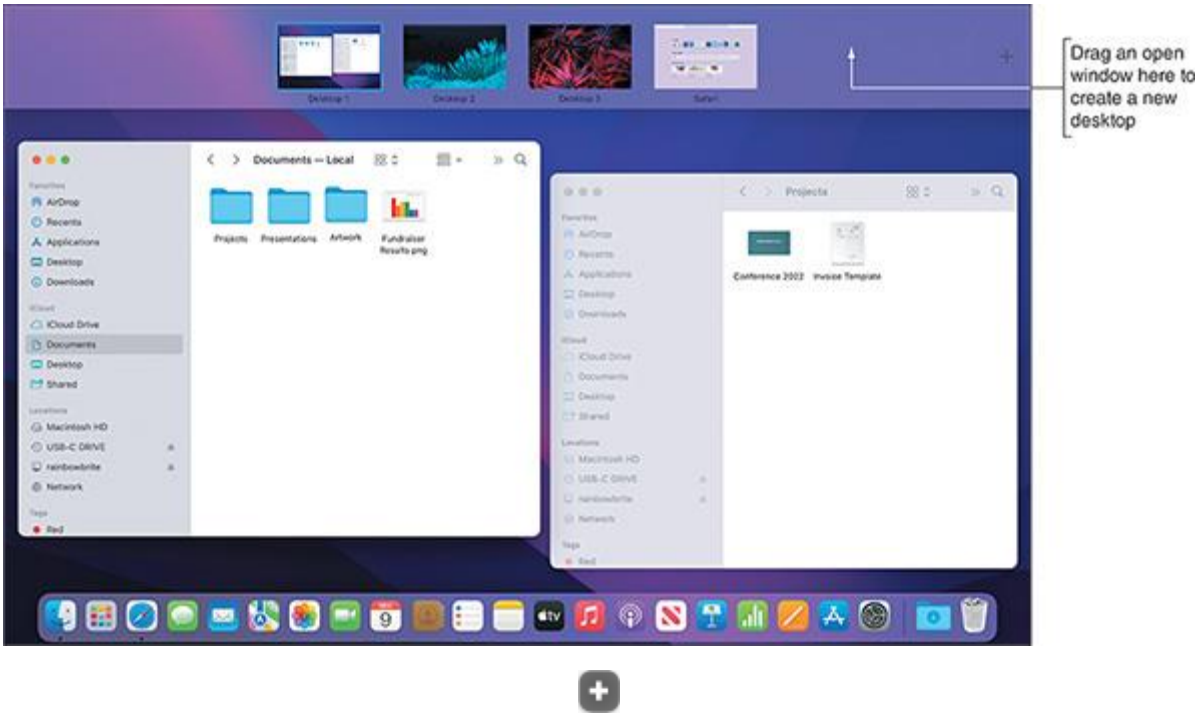
To accomplish this, first open Mission Control using one of these methods:

- Press the **Mission Control (F3)** key.
- Click **Mission Control** in the Launchpad window.
- Swipe up with three or four fingers on your trackpad.
- Press **Control+up arrow**.

A Mission Control window is shown in Figure 20-16. Three desktops have been created on the system, as you can see in the Spaces bar at the top of the window. Also, when an app is in full-screen mode, it acts as a separate Space and shows up in the Spaces bar along with desktops. To create a new desktop, drag an open window into the Spaces bar or click + on the right side of the Spaces bar. To delete a desktop, hover over it in the Spaces bar and click the X. Desktop configurations apply to each user and remain in place even when the computer is rebooted.

Figure 20-16

Mission Control allows you to create multiple desktops to contain windows



Source: Apple Inc.

Here are a few more tips about multiple desktops:

- **Move among desktops.** To move among desktops already created as you work, swipe left or right with three fingers or press **Control+left arrow** or **Control+right arrow**.
- **Organize desktops.** To help keep your desktops organized, it helps to customize each desktop with a different wallpaper. Go to a desktop and secondary-click. In the menu that appears on the desktop background, click **Change Desktop Background** (see Figure 20-17A). The Desktop & Screen Saver window opens. (This window is one of the tools in System Preferences.) Select your wallpaper and close the window. Wallpaper settings in other existing desktops won't be affected.

Figure 20-17

(A) Set a different background for each desktop, and (B) assign different apps in the dock of each desktop

Source: Apple Inc.

Note 3

If the desktop background you choose isn't available on your computer yet, click the Cloud Download icon to make that background available.

- **Organize apps in desktops.** To help keep your apps organized, you can assign an app to a specific desktop. Go to that desktop, and secondary-click the app's icon in the dock (see Figure 20-17B). Select **Options**, and then click **This Desktop**. Later, when you open the app, the selected desktop will appear with the app's open window.

20-1h iCloud and iCloud Drive

Core 2 Objective

- 1.10

Identify common features and tools of the macOS/desktop OS.

Looking back at the Finder window shown earlier in Figure 20-5, notice that iCloud Drive is listed in the sidebar along with other storage locations such as Desktop, Documents, and Downloads. When a user signs in to macOS for the first time, they are given the opportunity to set up iCloud with their Apple ID, or the setup can be done later in System Preferences. In System Preferences, you can also control which apps store their data in iCloud (see Figure 20-18).

Figure 20-18

Choose what content to sync with iCloud

Source: Apple Inc.

To open iCloud Drive, click it in the Finder window. Drag and drop files in and out of the iCloud Drive window. The contents are synced with any iPhone, iPad, or Windows desktop that has the iCloud Drive app installed, or with another device that is set up with your Apple ID. (On iPhone and iPad, recall that you can manage iCloud Drive using the Files app.) You can also access your iCloud content, including iCloud Drive, from any device with a browser by going to icloud.com and signing in with your Apple ID.

20-1i Keychain

Core 2 Objective

- 1.10

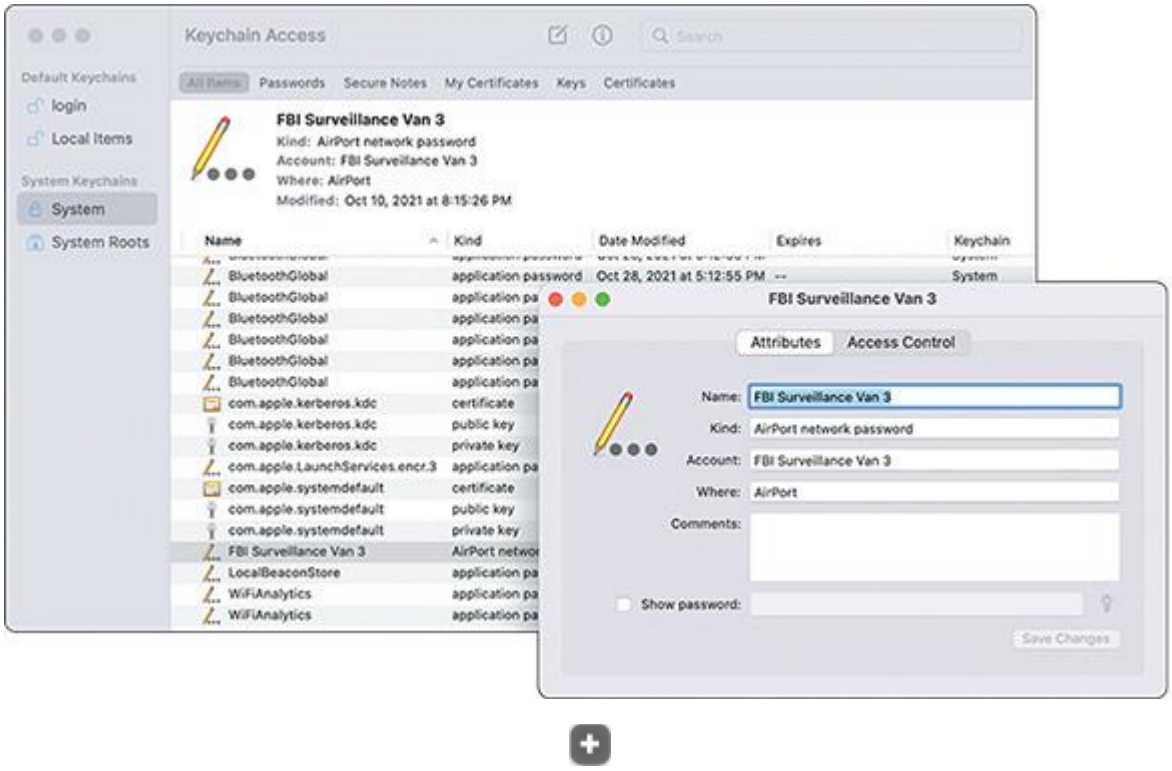
Identify common features and tools of the macOS/desktop OS.

Keychain is the macOS built-in password manager. To open Keychain, go to the Finder window, drill down into the **Applications** list, and then

click **Utilities** (refer back to Figure 20-6). Double-click **Keychain Access** app. From the Keychain Access window (see the left side of Figure 20-19), you can view, edit, and remove accounts for applications, websites, and servers. You can also manage personal accounts that you've added, such as credit card and bank accounts.

Figure 20-19

The data stored in Keychain is encrypted



Source: Apple Inc.

If you have problems with Keychain, you can delete all saved passwords and restore from backup. In the **Keychain Access** menu, click **Preferences**. In the Preferences dialog box, click **Reset My Default Keychains**. Login and Local Items keychains are created, and they are empty. If you have Time Machine backups, try to restore the keychains from backup to recover lost passwords.

20-1j Screen Sharing

Core 2 Objective

- 1.10

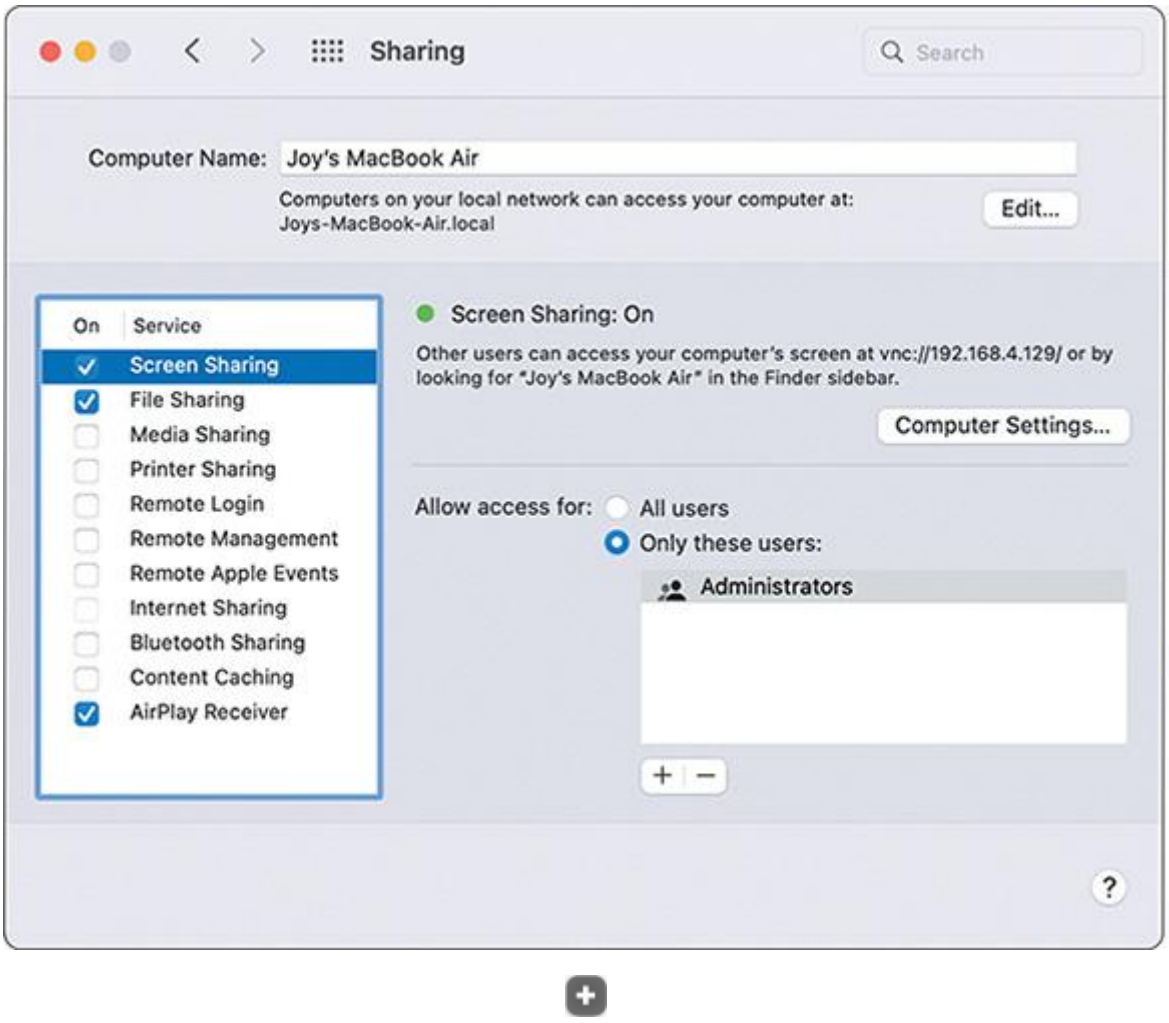
Identify common features and tools of the macOS/desktop OS.

In System Preferences, click **Sharing** to open the Sharing window, where you can set up file and folder sharing on the network, printer sharing,

remote access, and screen sharing. **Screen Sharing** works like Remote Desktop in Windows. In the Sharing window (see Figure 20-20), turn on Screen Sharing, and set it up to allow all users or only certain users that you add.

Figure 20-20

Screen Sharing makes it easier to collaborate on projects or to help other users with their computers



Source: Apple Inc.

To use screen sharing, a user of another Mac on the network should be able to see your shared Mac in their Finder window in the Locations group. They can click your computer, and then click **Share Screen**. They then have the opportunity to sign in to your computer with a user name and password recognized by your computer. Using screen sharing, they can move files and folders between the two computers.

Note 4

Screen Sharing uses incoming port 5900. To access a Mac from the Internet, set up port forwarding on your router to allow incoming traffic on port 5900.

> How secure is macOS screen sharing? Some of the content moved between computers is encrypted and some is not, and you must open an incoming port on your router. Therefore, macOS screen sharing is not as secure as other types of remote access software. Also, as you'll recall from the module "Network Security and Troubleshooting," third-party remote access apps that use a browser are considered more secure than OS tools that open ports for incoming traffic initiated from the Internet. Two examples of apps that use browsers and provide encrypted communication are join.me (join.me) and Zoom (zoom.us).

20-1k Remote Disc

Core 2 Objective

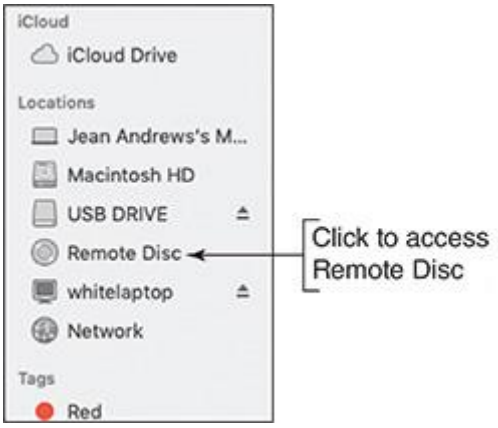
- 1.10

Identify common features and tools of the macOS/desktop OS.

For Macs that have macOS Mojave 10.14 or earlier, Remote Disc is an option for accessing an optical drive on another computer. If your Mac has an optical drive, the Sharing window includes the option DVD or CD Sharing. This feature, called **Remote Disc**, gives other Mac computers on the network access to the computer's optical drive. After you turn on DVD or CD Sharing on a Mac that has an optical drive, go to the Mac that doesn't have an optical drive and open **Finder**. In Finder, click **Remote Disc** in the sidebar under Locations (see Figure 20-21). Apple has retired this feature and no longer supports Remote Disc on macOS Catalina 10.15 and newer.

Figure 20-21

In older macOS systems, access shared optical drives in the Locations area of Finder



Source: Apple Inc.

Note 5

You can enable remote disc sharing on a Windows computer to be used with an older Mac. To share a Windows computer's optical drive with Macs on your network, download and install **DVD or CD Sharing Update 1.0 for Windows**, which is available at support.apple.com/kb/DL112?locale=en_US.

20-1l Terminal

Core 2 Objective

- 1.10

Identify common features and tools of the macOS/desktop OS.

Terminal in macOS is similar to a command prompt window in Windows, except Terminal uses UNIX commands because macOS is based on UNIX. To open Terminal, open **Finder**, click **Applications**, double-click the **Utilities** folder, and double-click **Terminal**. The Terminal window opens, as shown in Figure 20-22. Many of the Linux commands you learn about in the module "Linux and Scripting" work in the macOS Terminal.

Figure 20-22

Terminal in macOS uses most of the same commands as Linux

20-1m Summary of Gestures and Keystrokes

Core 2 Objective

- 1.10

Identify common features and tools of the macOS/desktop OS.

We finish up this section of the module with Table 20-1, which lists shortcuts and gestures you might find helpful when supporting a Mac. You've already learned to use several of these.

Table 20-1

Useful Keystrokes, Substitute Keys, and Gestures

Keystrokes, Substitute Keys, and Gestures	Description
Keystrokes	
Command+X	Cut the selected item.
Command+C	Copy the selected item.
Command+V	Paste the selected item.
Command+A	Select all items.
Option+Command+Esc	Force quit an app.
Command+spacebar	Open Spotlight.
Shift+Command+5	Take a screenshot of the entire screen or part of the screen. By default, screenshots are saved to the desktop.
Substitute keys when using a regular keyboard instead of a Mac keyboard	
Command key	The Windows logo key or Control key is the substitute.
Option key	The Alt key is the substitute.
Gestures (gesture actions can be changed in the trackpad app's System Preferences)	
Secondary-click	Tap the trackpad with two fingers.
Swipe	Swipe left or right with three fingers to move among desktops. On a keyboard, press Control+right arrow and Control+left arrow.
Scroll	Swipe up or down with two fingers.
Zoom	Pinch in or out with two fingers.
Pinch	Pinch in with three fingers and thumb to show Launchpad. Do a spread-apart pinch with three fingers and thumb to return to the desktop. If you are already on the desktop, a spread-apart pinch pushes all open windows to the edges to clear the desktop.

Exam Tip

The A+ Core 2 exam expects you to know about these macOS features: Mission Control, Keychain, Spotlight, iCloud, Finder, Remote Disk, FileVault, and the App Store.

20-2 Maintaining and Supporting macOS

Core 2 Objectives

- 1.8

  Explain common OS types and their purposes.

- 1.10

  Identify common features and tools of the macOS/desktop OS.

In addition to working with files and applications, you also need to know how to support and maintain macOS, including performing updates, backups, and hard drive maintenance. This section will give you a good foundation for these skills. To dig deeper into how to support a Mac, search the documentation on the Apple website (support.apple.com).

Caution

Many Apple computers are covered by an Apple Care warranty, which provides excellent coverage for Macs. Always be absolutely certain that a Mac is not covered by Apple Care before opening the case or doing anything else that might void the warranty.

20-2a macOS Directory Structures

Core 2 Objectives

- 1.8

  Explain common OS types and their purposes.

- 1.10

  Identify common features and tools of the macOS/desktop OS.

First let's learn some of the basics of macOS directory structures. Here are the file systems macOS supports:

- APFS (Apple File System) is the default file system for SSDs and can also be used for magnetic hard drives. APFS allocates free space as needed for each volume on the drive. APFS uses the GUID (also called GPT) partitioning system.
- The FAT32 and exFAT file systems are supported for compatibility with Windows and Linux.

Note 6

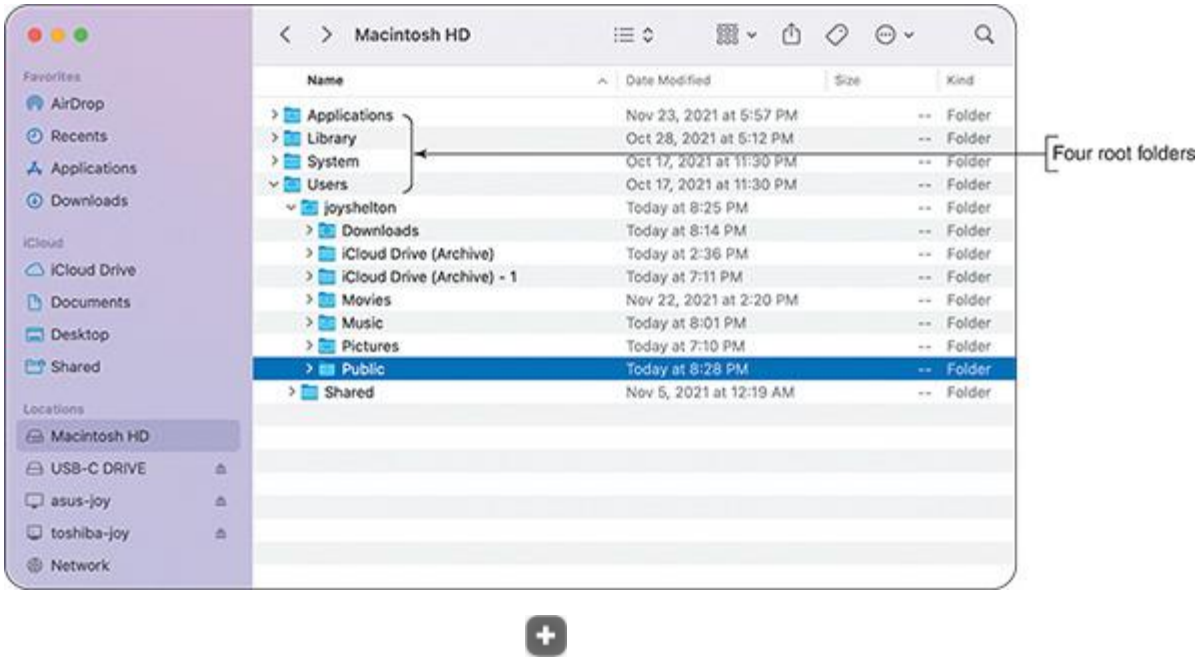
Windows cannot read from storage devices that are using the APFS file system unless third-party drivers are installed in Windows.

You need to be familiar with the directory structure in macOS. Here are some tips:

- To see the directory structure, click **Go** on the Finder menu bar, and then click **Computer**. In the Finder window, click the hard drive, which is labeled Macintosh HD in most systems. In Figure 20-23, you can see the four folders at the root level. (Other folders in the root are hidden.) User data is in the Users folder.

Figure 20-23

Folders visible in the root of the hard drive

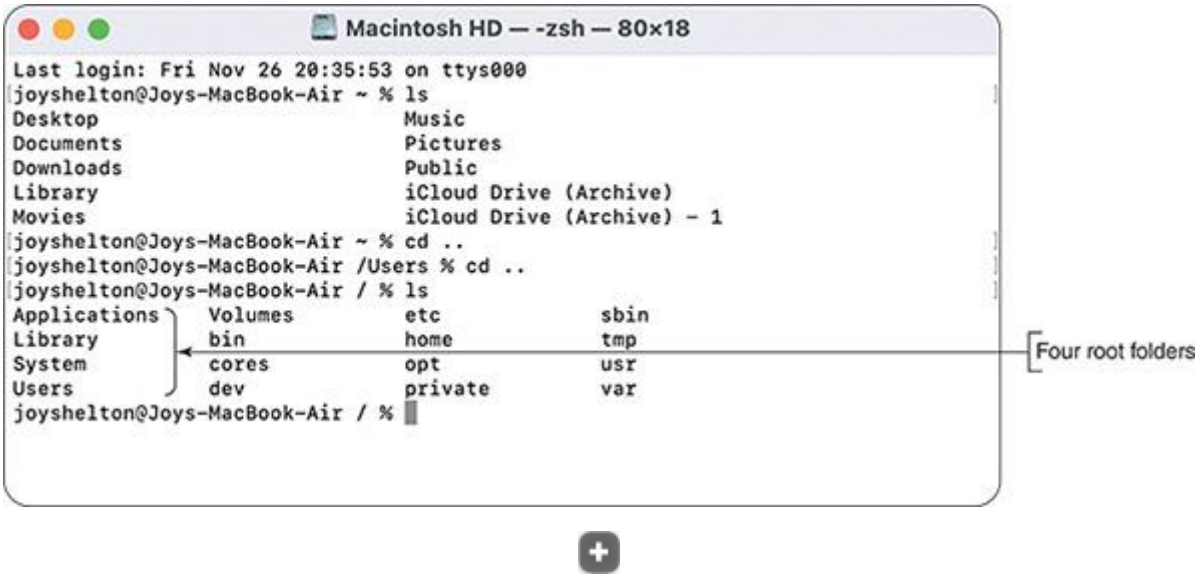


Source: Apple Inc.

- You can also browse the directory structure using the Terminal and Linux commands. In **Finder**, open **Applications**, open **Utilities**, and double-click **Terminal**. All commands, as well as file and directory names, are case sensitive. Use the cd command to move through the directory structure and the ls command to list files and directories. For example, Figure 20-24 shows the root directory of the Macintosh HD. Compare Figure 20-23 with Figure 20-24, and notice that some folders that appear in the Terminal window are hidden in the Finder window. You learn more about these directories later in this module.

Figure 20-24

Contents of the root directory on a Mac hard drive



Source: Apple Inc.

File Types

Three common file types you might encounter while supporting macOS are the following:

- **DMG.** A **DMG file** (.dmg) is a disk image file, similar to an ISO file used in Windows. DMG files can be used for delivering software. DMG files appear as a virtual disk drive on macOS. When you double-click a DMG file, the virtual disk is mounted to macOS, and you can then access the files inside it.
- **PKG.** A **PKG file** (.pkg) is a package file, similar to a setup.exe file used in Windows. A PKG file contains installer files used for software installations. A PKG file is often compressed like a ZIP file, which is used in Windows. After an installation is complete, the PKG file can be deleted.
- **APP.** An **APP file** (.app) is an application file, similar to a .exe file used in Windows to run an application.

Exam Tip

The A+ Core 2 exam expects you to be able to identify .dmg, .pkg, and .app files. Remember that file names are case sensitive in macOS.

20-2b Installing Apps

Core 2 Objective

- 1.10

Identify common features and tools of the macOS/desktop OS.

Recall from the module "Mobile Device Security" that Apple streamlines installing apps in Apple devices through its App Store. The **App Store** is a central location where you can find, install, support, and update apps. macOS

allows for apps to be installed from trusted sources, such as a developer's website, but the most reliable method to install a new app is through the App Store. If you must download an app from a trusted website, always make sure you're choosing the file that is made for macOS and not Windows or Linux.

Applying Concepts

Install and Uninstall Apps in macOS

- **Est. Time:** 30 minutes
- **Core 2 Objective:** 1.10

Follow these steps to install an app from the App Store:

1. 1
   Open the **App Store**.
2. 2
   Browse or search for the app you want to install. As an example, search for **Adobe Lightroom**, an app used to manage and edit photos. Click the app name to view the app's ratings, description, and reviews.
3. 3
   Click **Get**, then **Install**. If required, provide your Apple ID and password to continue with the installation.
4. 4
   When the installation is complete, in the App Store click **Open** to open Adobe Lightroom.

Uninstalling an app is just as easy. Follow these steps to uninstall an app that was installed by the App Store:

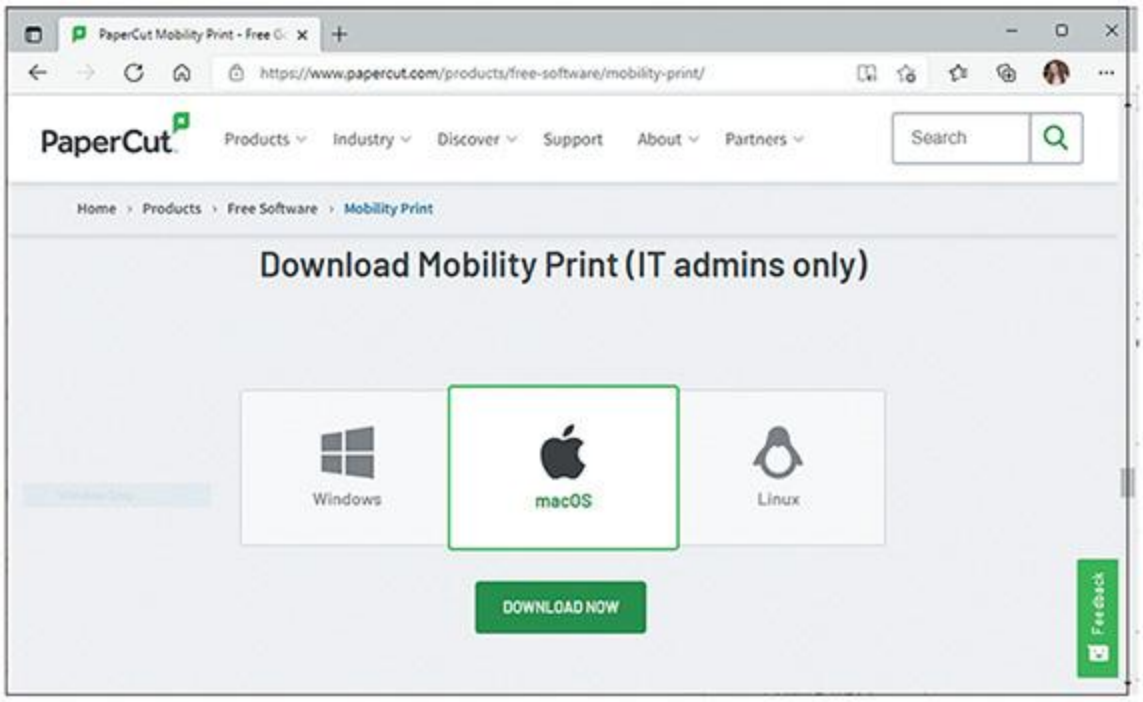
1. 1
   Open **Launchpad**, and find the icon for the app you want to uninstall. In this case, let's uninstall Adobe Lightroom, which we just installed.
2. 2
   Press and hold the **Option** key or the app icon until the apps jiggle.
3. 3
   Click the **Delete** key, or the **X** in the corner of the app icon. Then click **Delete**. The app is uninstalled.

To install an app from a trusted website, do the following steps:

Browse to the trusted website to download the file. For example, go to papercut.com/products/free-software/mobility-print/#downloadSection, and download the PaperCut Mobility Print app for macOS, seen in Figure 20-25.

Figure 20-25

Select the macOS download from trusted sources



Source: Papercutz

1. 4
   Open the **DMG file** in the Downloads folder in Finder.

2. 5
   Double-click the **PKG file** to start the installation, and click **Install**. Follow the on-screen instructions to complete the installation.

If an app was installed without using the App Store, you must use Finder to uninstall it. Follow these steps to uninstall an app:

1. 1
   Open **Finder** and click **Applications** in the left pane.

2. 2
   Find the app you want to uninstall—for example, **PaperCut Mobility Print**. Drag and drop the app icon to **Trash** in the dock.

3. 3
   Provide your credentials to allow the uninstallation.

4. 4
   Empty **Trash**.

20-2c Managed Apple IDs

Core 2 Objective

- 1.10

Identify common features and tools of the macOS/desktop OS.

Recall from the module "Installing Windows" that you can sign in to Windows using a local account, a Microsoft account (possibly for Azure), or an AD network ID. Remember that an AD network ID or a Microsoft account can be used to join a domain. The same applies to macOS. You can sign in to a Mac using a local account, an Apple ID, a Managed Apple ID, or an AD network ID. A Managed Apple ID and an AD network ID are used to join a domain. For personal accounts, use a local account or an Apple ID. The Apple ID creates continuity among Apple devices—as a Microsoft account does across Windows devices.

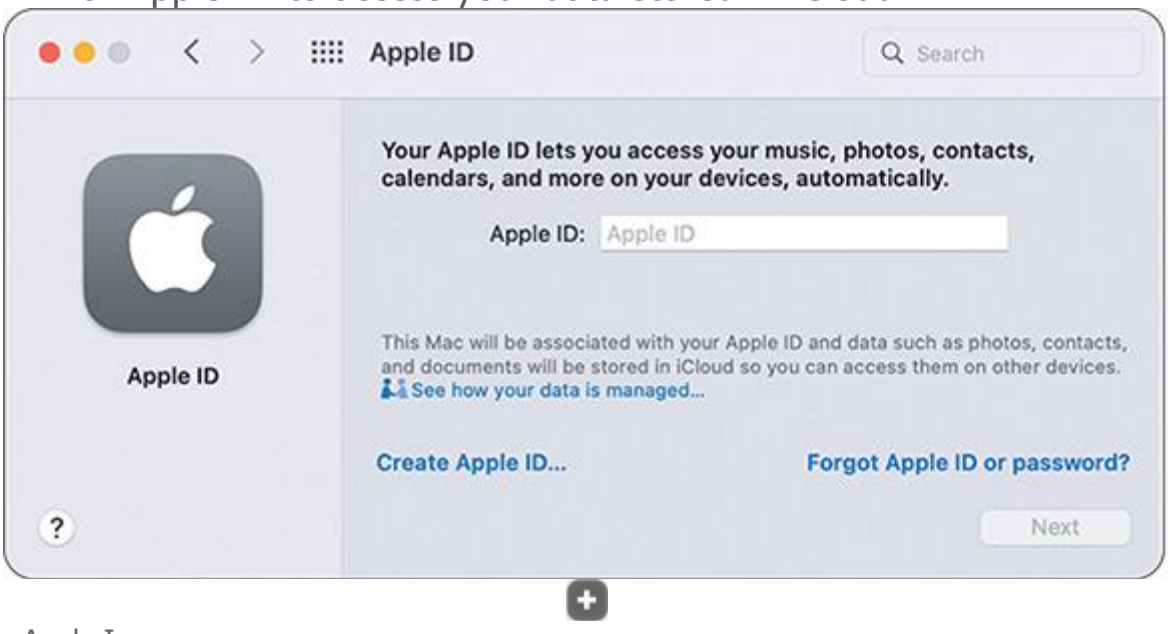
If a user has already connected their iCloud account, then they have signed in with their Apple ID. If they have not, then they can set up their Apple ID in System Preferences. Follow these steps with an sign in with an Apple ID:

1. 1
   Open **System Preferences**. Click **Sign In**.

2. 2
   As shown Figure 20-26, you can sign in with your Apple ID if you already have one, or you can create an Apple ID if necessary. If you don't remember your password, click **Forgot Apple ID or password?** to look up your Apple ID or reset your password.

Figure 20-26

Sign in with Apple ID to access your data stored in iCloud



Source: Apple Inc.

3. 3
   When you sign in, you may be prompted to enter the password for your local account or to verify a passcode sent to a trusted device, such as a mobile phone.

   To sign in using a Managed Apple ID, which must be an email address, simply use the Managed Apple ID credentials provided by your administrator. Upon signing in the first time, you will be prompted to change the password. The administrator of the Managed Apple IDs through Apple Business Manager is able to put restrictions on the Apple devices by assigning role privileges. Apple Business Manager is accessed through an Apple website (business.apple.com).

Note 7

To review the role privileges that can be set in Apple Business Manager, visit the Apple support website: support.apple.com/guide/apple-business-manager/role-privileges-axm97dd59159.

Apple Business Manager must be connected to a verified domain service, such as Azure AD, which can offer more control on restrictions based on the capabilities of the domain service you are using. When using Azure AD, the Azure AD credentials can be used as Managed Apple ID credentials.

20-3Update macOS and Drivers

Core 2 Objective

- 1.10

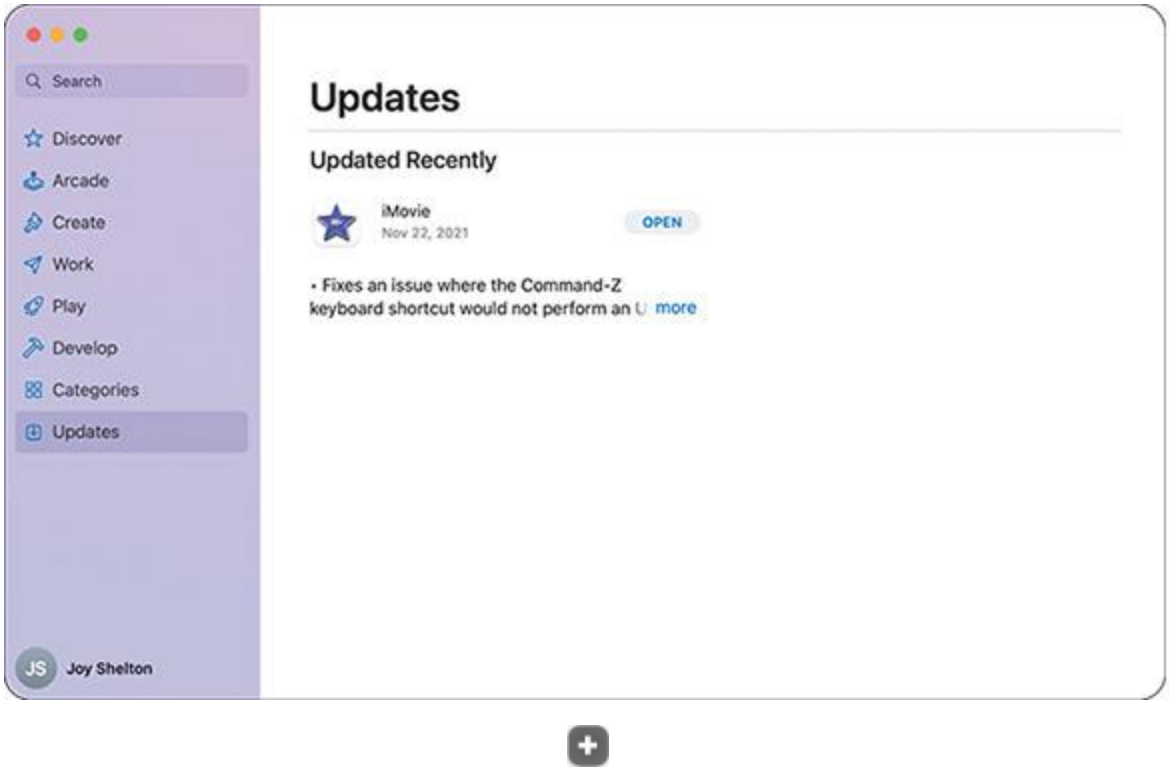
Identify common features and tools of the macOS/desktop OS.

Just like Windows, macOS needs regular updates. Updates often address zero-day vulnerabilities, which makes these updates important to maintaining a healthy system. However, sometimes the updates themselves introduce bugs, which is why many Mac experts advise against setting macOS updates to install automatically. Instead, wait a few days after a macOS update is released before manually installing the update; this gives you a chance to see if the update introduces any significant issues. These updates also include any firmware updates available.

You can access macOS updates in System Preferences. To manually update macOS, open **System Preferences**, then click **Software Update** in the left pane. Figure 20-27 shows a recently updated app. Any available OS updates will be shown near the top of the screen.

Figure 20-27

The Updates window shows recently installed updates and needed updates when available



Source: Apple Inc.

Updates for apps are found in the App Store. To manually update apps, click the **App Store** icon in the dock, and then click **Updates** in the left pane. Any apps that need updates are listed in the Updates window.

Note 8

Printer, scanner, and graphics driver updates are usually included in macOS updates. Other devices that require drivers, if not included in macOS, can be downloaded from the manufacturer's website and installed. These drivers will not be updated through macOS updates. If any problems are encountered with these devices, you'll need to check the manufacturer's website for updates.

To change the settings for automatic updates, open **System Preferences**, and click **Software Update**. The OS checks for and reports available updates. For automatic updates, check **Automatically keep my Mac up to date**. To change detailed update settings, click **Advanced** (see Figure 20-28). Here is an explanation of each option:

- **Check for updates.** Automatically check for updates.
- **Download new updates when available.** Download available updates without installing them.
- **Install macOS updates.** Install all updates to the operating system without first requiring user approval.
- **Install app updates from the App Store.** Install all updates to App Store applications without first requiring user approval.

- **Install system data files and security updates.** Install critical system patches that address known vulnerabilities.

Figure 20-28

Manage how automatic updates are handled

Source: Apple Inc.

Note 9

Although Macs are not attacked by malware as often as Windows systems are, it's still important to protect a Mac by installing and maintaining anti-malware software. Products to consider are Avast Free Mac Security (avast.com), Sophos Home Premium for Mac (sophos.com), and Trend Micro Antivirus for Mac (trendmicro.com/mac).

20-3a Back Up and Restore with Time Machine

Core 2 Objective

- 1.10

Identify common features and tools of the macOS/desktop OS.

Like iOS mobile devices, Mac computers can use iCloud Drive to store files and folders in the cloud and sync this content across all of your devices. Unlike the mobile devices you learned about in the module "Supporting Mobile Devices," Mac computers cannot be fully backed up using iCloud. For this purpose, macOS includes **Time Machine**, which is a built-in backup utility that automatically backs up user-created data, applications, and the entire macOS system. You can back up to the following:

- A USB or Thunderbolt external hard drive or a USB flash drive
- Another Mac on the local network

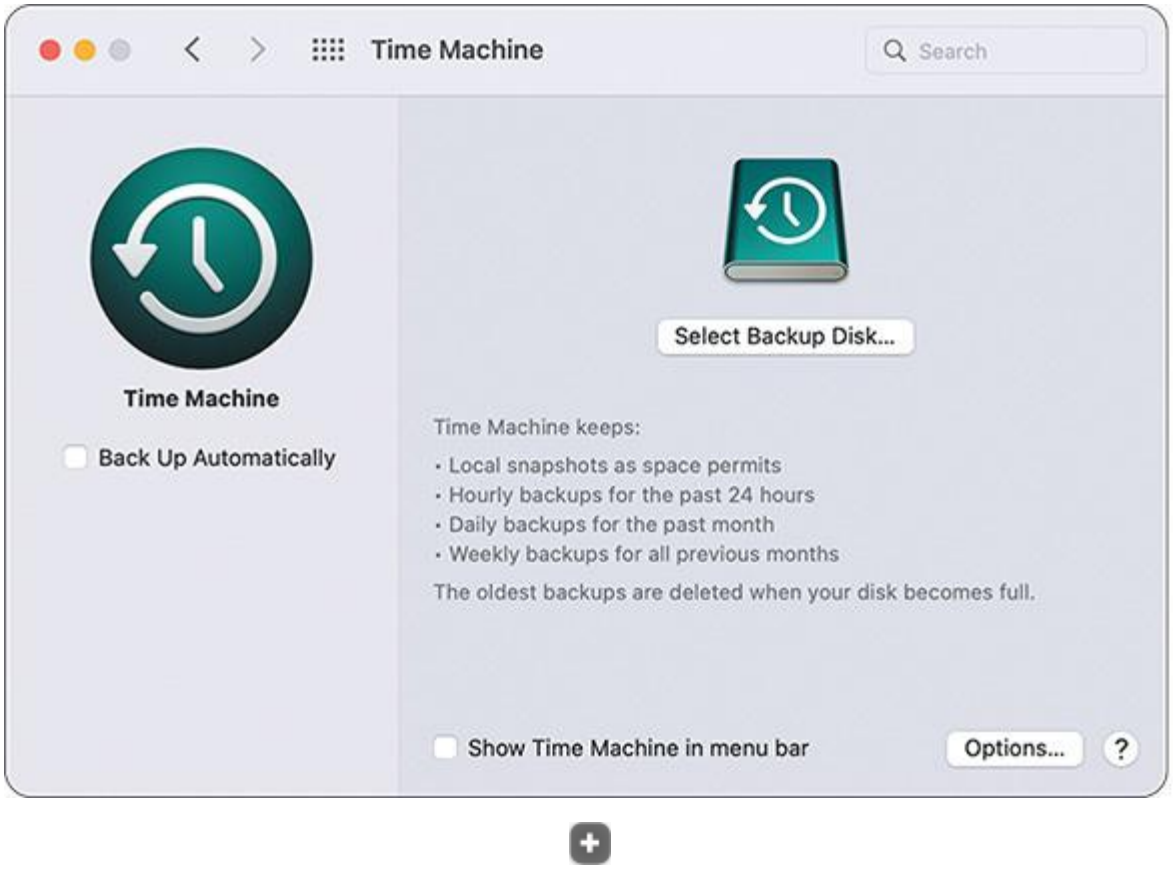
- Network-attached storage (NAS) devices that support Time Machine

After Time Machine is set up, backups are updated in the background. Depending on the space available on the backup drive, Time Machine keeps hourly backups for 24 hours, daily backups for a month, and weekly backups until the disk is full. The oldest backups are deleted to make space for new backups. You can also set up multiple backup schedules for more than one backup device.

To set up Time Machine in macOS, open **System Preferences**, and click **Time Machine**. The Time Machine window appears, as shown in Figure 20-29.

Figure 20-29

Configure Time Machine backups



Source: Apple Inc.

Follow the on-screen directions to select a backup disk and configure backup options. Note that everything already on the disk will be erased. The original backup will be at least 20 GB, includes the entire macOS volume, and takes some time to complete.

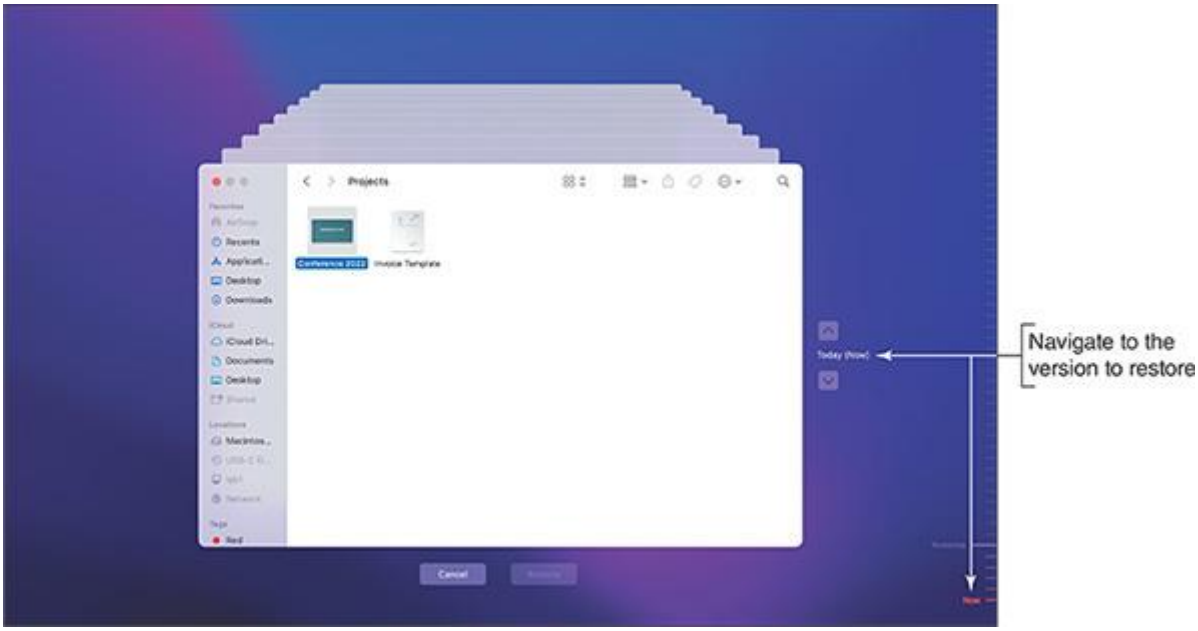
Note 10

When your Mac is not connected to the backup disk, Time Machine stores backup copies, called local **snapshots**, of created, modified, or deleted files on the hard drive. When you reconnect the computer to the backup disk, the local snapshots are copied to the backup disk. Local snapshots stay on the hard drive as long as they don't take up too much space, and they can be restored from the hard drive if needed. Time Machine saves one snapshot each day and one weekly snapshot for each week the backup disk is disconnected.

> You can use the backups to recover files, folders, or the entire macOS volume. To recover a file or folder from Time Machine, open **Finder**. In the **Applications** group, double-click **Time Machine**. The timeline and available backups in Finder appear (see Figure 20-30). Use the Finder window to locate the file or folder. Then go back through time to find the version of the file or folder you want to restore. To move through time, you can use the timeline on the right, the arrow buttons, or click a Finder window in the stack of available windows. Select the item, and click **Restore**.

Figure 20-30

Locate an item, and then go back through time to find the version to restore



Source: Apple Inc.

> Later in this module, you learn how to use Time Machine to restore the entire macOS **startup disk**, which is the volume on which macOS is installed.

20-3b Drive Maintenance Tools

Core 2 Objective

- 1.10

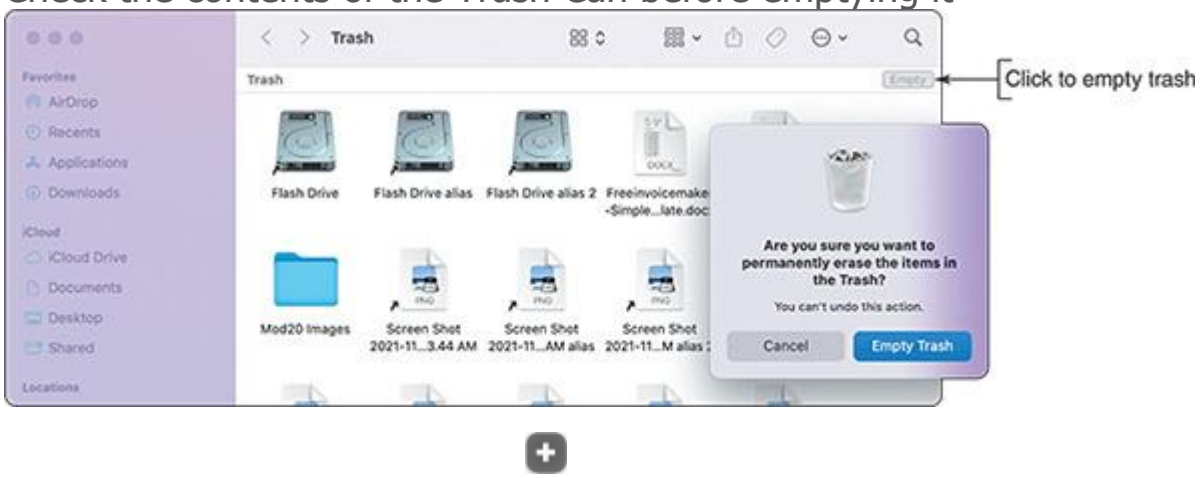
Identify common features and tools of the macOS/desktop OS.

Hard drives in Mac computers require very little maintenance. However, performing a few simple tasks on a regular basis can help keep things running smoothly:

- **Empty the trash.** To empty the Trash, click the **Trash** icon in the dock. Trash contents appear in a Finder window (see Figure 20-31). Click **Empty**, and then click **Empty Trash** in the warning box. Items are permanently deleted.

Figure 20-31

Check the contents of the Trash Can before emptying it

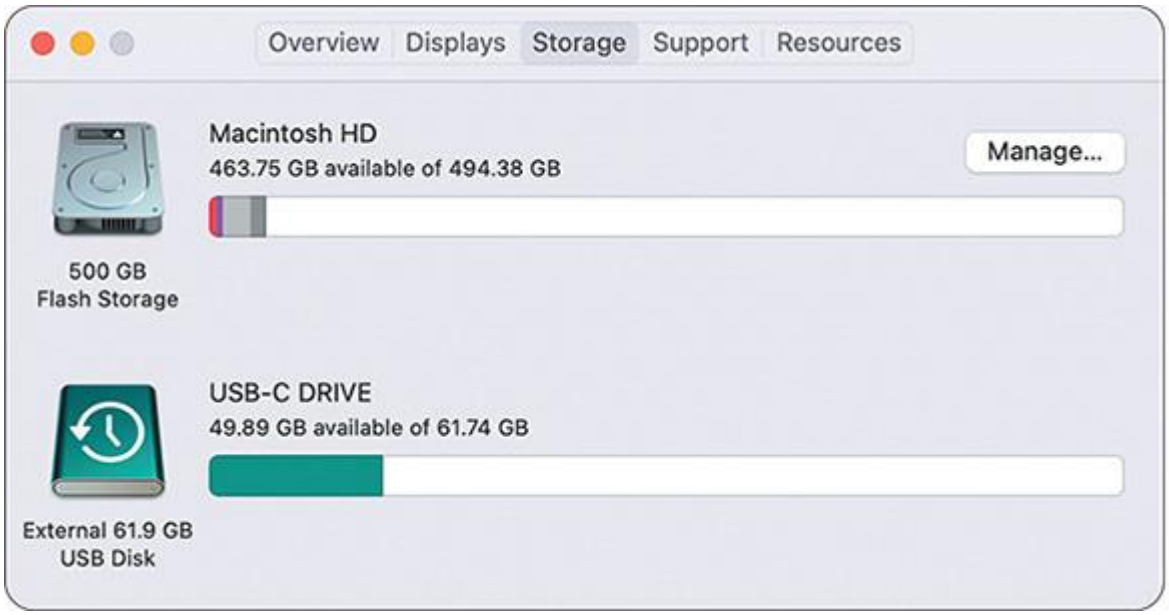


Source: Apple Inc.

- **Free up space.** Maintain at least 15%–20% free space on the hard drive for optimal performance. To see how much free space is available on the drive, open the Apple menu, click **About This Mac**, and then click the **Storage** tab, as shown in Figure 20-32.

Figure 20-32

Maintain at least 15% free space on the hard drive

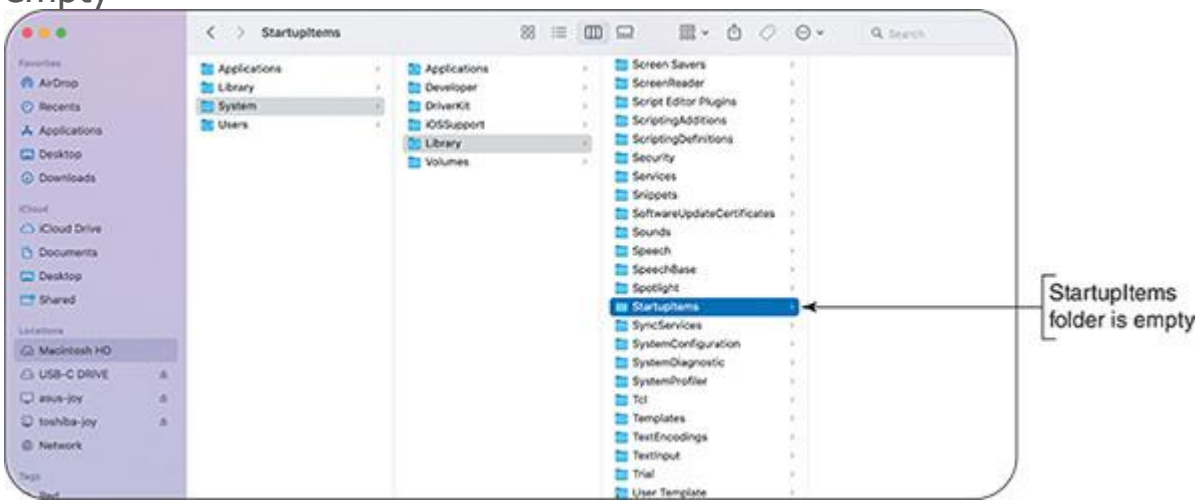


Source: Apple Inc.

- **Install updates.** Regularly check for and install macOS and app updates, which you learned to do earlier in this module.
- **Verify no startup items.** Programs that automatically launch at startup are called **startup items**, and programs that automatically launch after a user logs in are called **login items**. Apple discourages the use of startup items because they slow down the startup process, and items in the startup folder might be malware. You can verify that the system doesn't have startup items by looking in two directories that can contain them: /Library/StartupItems and /System/Library/StartupItems (see Figure 20-33).

Figure 20-33

For best performance, the StartupItems folder should remain empty

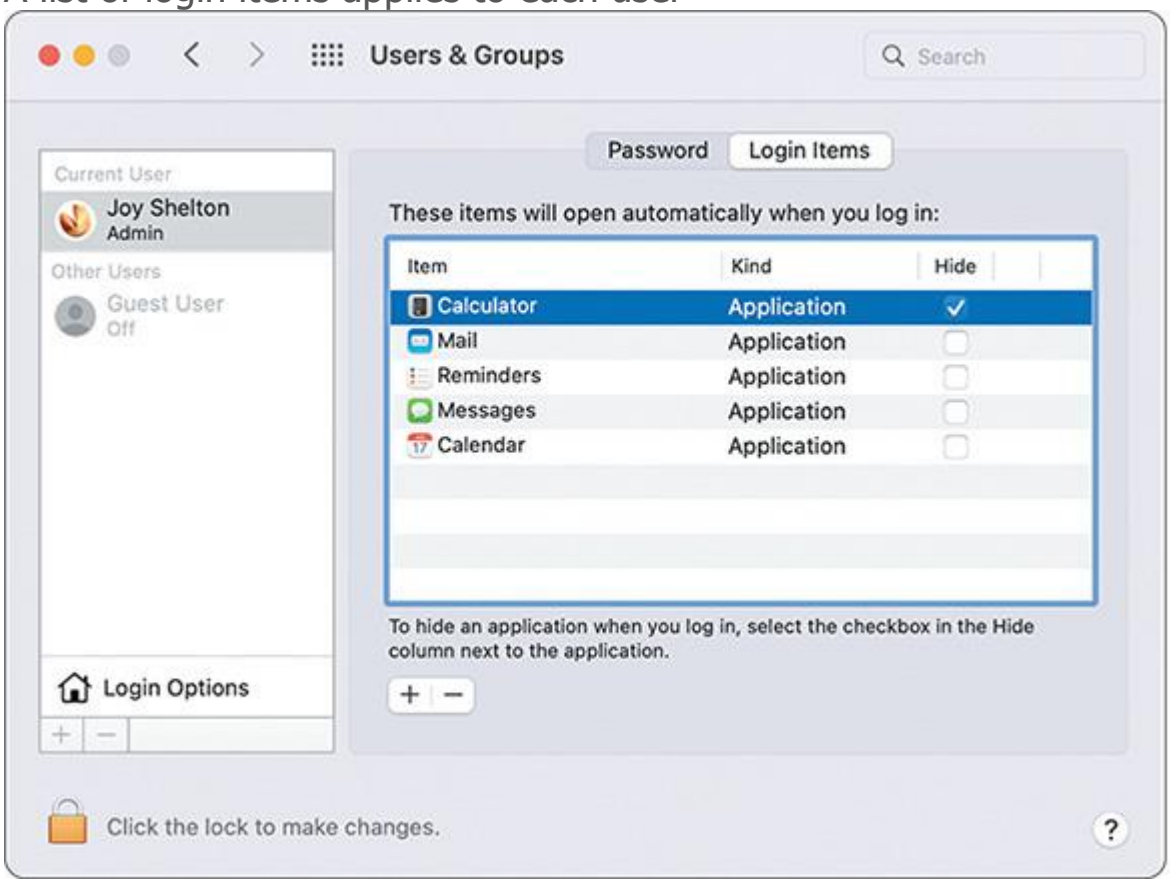


Source: Apple Inc.

- **Remove login items.** Launching too many programs at login slows down the boot process and uses up valuable RAM. To adjust login items, open **System Preferences**, and click **Users & Groups**. Select a user account in the sidebar, and then click the **Login Items** tab (see Figure 20-34). Use the + and − buttons at the bottom of the items list to add or remove login items.

Figure 20-34

A list of login items applies to each user



Source: Apple Inc.

- **Restart the computer.** Power-cycle the computer at least once a week. A quick way to do so is to click **Restart** in the Apple menu (refer back to Figure 20-8).
- **Uninstall unneeded apps.** Uninstall apps you no longer need. Apps obtained from the App Store can be uninstalled using Launchpad. For apps installed from other sources besides the App Store, locate the app in Finder, and drag the app to the Trash. Empty the trash to complete the uninstall.

20-3c Repairs Using the Disk Utility App

Core 2 Objective

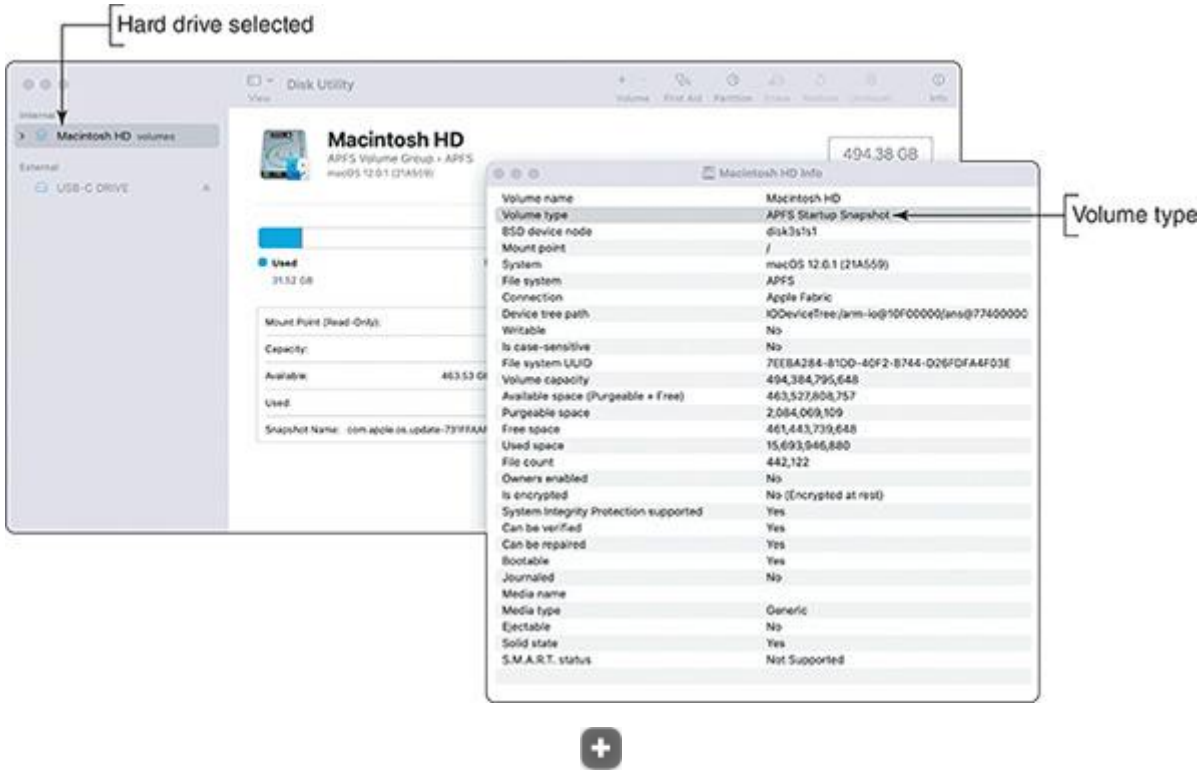
- 1.10

Identify common features and tools of the macOS/desktop OS.

The Disk Utility app can be used to repair file system errors and hard drive corruptions. To open Disk Utility, open **Finder**, and navigate to the **Utilities** folder. Double-click **Disk Utility**. In the sidebar, select **Macintosh HD** (see Figure 20-35), and click **Info** in the menu bar to view information about the drive. In the Info window shown on the right side of Figure 20-35, you can see the drive is using the APFS file system.

Figure 20-35

Manage drives from the Disk Utility app



Source: Apple Inc.

You can use **First Aid** in Disk Utility to scan the hard drive for file system errors and repair them. In Disk Utility, select the drive in the sidebar, click **First Aid**, and click **Run** in the dialog box that appears. A warning box reports that apps will not respond while the drive is repaired.

Click **Continue**. The process can take some time. Click **Done** when it completes.

Note 11

If you plug in an external hard drive and macOS does not recognize the drive, you can use Disk Utility to fix the problem. In the Disk Utility window, select the drive, and click **Mount**. If the mount does not work, click **First Aid** and then try to mount the drive again. When you mount a drive, it can be viewed by the OS, the drive is listed in the sidebar of the Finder window, and its icon appears on the desktop.

Exam Tip

The A+ Core 2 exam expects you to know how to repair a hard drive using the Disk Utility.

20-4 Troubleshooting macOS Startup

Core 2 Objective

- 1.10

Identify common features and tools of the macOS/desktop OS.

When you have problems with macOS startup, use the options discussed in this section of the module to diagnose and fix the problems. These options are summarized in Table 20-2. Turn on the Mac and press certain keys at startup to launch tools or boot from other media. Release the keys as soon as you see the Apple logo.

Table 20-2

Keys to Press to Access Mac Startup Options

Keys to Press as a Mac Boots	Tools Launched
Press and hold the power button, then hold down the **Shift** key while clicking **Continue in Safe Mode**. or Hold down the **Shift** key during boot.	Boots into Safe Mode
Press and hold the power button, then hold down the **Shift** key while clicking **Always Use**. or Hold down the **Option** key during boot.	Displays the Startup Manager so you can choose to boot from different media (for example, the external hard drive, USB flash drive, or network locations)
Press and hold the power button, then press and hold the **Command+D** keys.	Launches Apple Diagnostics to perform tests on hardware

Keys to Press as a Mac Boots	Tools Launched
or Hold down the **D** key during boot.	
Press and hold the power button, then select **Options**, and click **Continue**. or Hold down the **Command+R** keys during boot.	Launches macOS Recovery to reinstall macOS from a Time Machine backup or the Internet

Note 12

To review more startup options, visit the Apple website (support.apple.com/en-us/HT201255).

Note 13

Many of these same steps can also help when troubleshooting kernel panics. A **kernel panic** is similar to a BSOD in Windows. It might be caused by something simple, such as a crashed app or a network communication issue, or it might result from a corrupted macOS installation. macOS restarts automatically when experiencing a kernel panic. If the kernel panic continues to prompt restarts, macOS will stop trying and shut down the computer after five attempts.

20-4aSafe Mode

Core 2 Objective

- 1.10

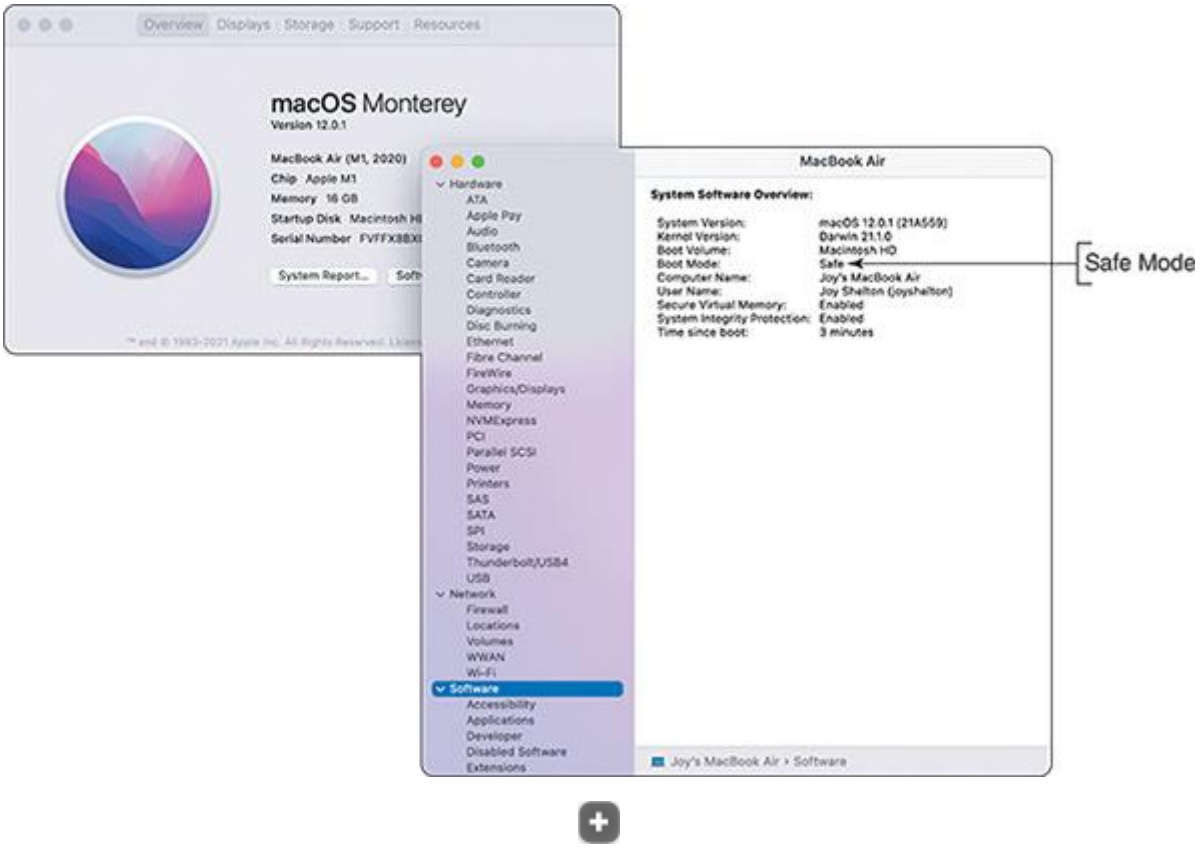
Identify common features and tools of the macOS/desktop OS.

Starting the computer in Safe Mode can solve problems when the computer won't start due to file system errors or corrupted startup or login items. Safe Mode in macOS loads essential kernel components, prevents startup items and login items from launching, and loads a minimum of user processes. It also verifies the startup disk and repairs any file system errors it finds.

To boot into Safe Mode, press and hold the power button, and then hold down the **Shift** key while clicking **Continue in Safe Mode**. Or if your Mac uses an Intel processor, hold down the **Shift** key as a Mac starts up. To verify that the computer booted into Safe Mode, open **System Report** under About This Mac. In the Software group, look for Boot Mode, which should report Safe (see Figure 20-36).

Figure 20-36

Boot Mode indicates the computer is booted into Safe Mode



Source: Apple Inc.

Do these things in Safe Mode:

- When Safe Mode starts, it automatically attempts to fix many problems. Restart the computer normally, and see whether the problem is solved.
- Delete startup and login items that you suspect are causing a problem.

20-4bmacOS Recovery

Core 2 Objective

- 1.10

Identify common features and tools of the macOS/desktop OS.

Using the macOS Recovery tools, you can reinstall macOS from a Time Machine backup or from the Internet. You can also erase the hard drive before you perform the image recovery. Press and hold the power button, then select **Options**, and click **Continue**, or turn on the Mac and press and hold **Command**+**R** until you see the Apple logo. macOS Recovery launches and you see the macOS Utilities menu (see Figure 20-37).

Figure 20-37

Boot into macOS Recovery to reinstall macOS

Source: Apple Inc.

After you select an option, click **Continue**. Here are the options you'll see:

- **Restore from Time Machine.** Plug in the external hard drive that holds the Time Machine backup, then select this option, and follow the on-screen directions.
- **Reinstall macOS.** The latest macOS that was installed on the computer is downloaded from the Internet and reinstalled. As you follow the on-screen directions, the computer will reboot several times. If errors occur during the process, try erasing the hard drive and reinstalling again. After the new installation of macOS boots up, any data backed up with Time Machine can be restored.
- **Disk Utility.** If you need to erase the hard drive (for example, before you give away a Mac), select **Disk Utility**, and follow the on-screen directions.

Note 14

Suppose you are attempting to reinstall macOS from the Internet and you are not able to get an Internet connection through Wi-Fi or Ethernet. In this situation, you can use another Mac to create a bootable installation device and use it to reinstall macOS. This bootable device is

created using commands in the Terminal window and is not covered in this text. The commands and process can be found at support.apple.com/en-us/HT201372.

20-5a Module Summary

Getting to Know the macOS Desktop

- macOS is used only for Macintosh computers by Apple Inc. Like Linux, macOS is built on a UNIX foundation.
- The dock appears at the bottom of the desktop on a Mac. The icons in the dock that represent open applications have a small black circle underneath them.
- Important macOS tools used to manage and support a Mac include Finder, Launchpad, the Apple menu, System Preferences, Control Center, Spotlight, Mission Control, Keychain, Screen Sharing, Terminal, and gestures on a trackpad.
- For IT technicians, the most important tools in System Preferences are accessed through Time Machine, Users & Groups, and Sharing. Screen Sharing, one of the Sharing tools, works like Remote Desktop in Windows.

Maintaining and Supporting macOS

- Common file types used for installing and using apps include DMG, PKG, and APP.
- Install and uninstall most apps using the App Store. Trusted websites can be used to download apps, too.
- Use a Managed Apple ID to restrict permissions for use with organizations.

Update macOS and Drivers

- macOS updates often address zero-day vulnerabilities, which makes these updates important for maintaining a healthy system.
- Time Machine is a built-in backup utility that automatically backs up user-created data, applications, and system files to an external hard drive that's attached either directly to the computer or through the local network.
- First Aid in Disk Utility can scan and repair file system errors on a hard drive.

Troubleshooting macOS Startup

- Tools to fix macOS startup problems include Safe Mode and macOS Recovery.

20-5c Thinking Critically

These questions are designed to prepare you for the critical thinking required for the A+ exams and may use information from other modules and the web.

1. Why is the scrollbar typically hidden from view in macOS?
2. Which app manages multiple desktop screens in macOS?
3. Which app provides tools for customizing the macOS interface?

4. A scanner connected to your Mac is giving you problems, and you suspect corrupted device drivers. What should you do first? Second?

    1. Download and install drivers from the scanner manufacturer.
    2. Back up the macOS startup disk using Time Machine.
    3. Update macOS.
    4. Uninstall the scanner and install it again.

5. How often does Time Machine create new backups, and how long are these backups kept?
6. Your macOS installation is corrupted, and you want to boot from an external Thunderbolt hard drive to repair the installation. Which key(s) do you hold down at startup to boot from the external hard drive if you have an Intel-based Mac?

    1. D key
    2. Command+R keys
    3. Shift key
    4. Option key

7. What Apple file type is similar to an ISO file used in Windows?
8. You work on a help desk, and you receive a call from a user who needs help on their MacBook. What feature does macOS include that allows you to assist the user without having to travel to their location?
9. What solution does Apple offer to assign permissions to user accounts in an organization?
10. What file system does macOS support in order to be compatible with Windows?

20-5dHands-On Projects

Hands-On Project 20-1

Practicing Using the macOS Desktop

- **Est. Time:** 30 minutes
- **Core 2 Objective:** 1.10

If you're not used to a Mac, the macOS desktop might feel strange compared with Windows, but with a little practice, you'll find all of the essential functions right at your fingertips. Complete the following steps to explore the macOS desktop:

1. 1
   Confirm that you have a Wi-Fi connection. Look for the Wi-Fi icon in the upper-right corner of the screen. If there is no connection, the icon will have a slash through it (see Figure 20-38). Click the Wi-Fi icon, turn on Wi-Fi if it's not on already, and connect to the network.

   Figure 20-38

Click the switch button to turn on Wi-Fi, or click Open Network Preferences to set other options

Source: Apple Inc.

2. 2

Install an app from the App Store. Click the App Store icon in the dock; sign in if necessary. Select a free app and install it. A good one to try is Evernote. After installation is complete, leave the App Store window open. Use Finder to open the app.

3. 3

See all open windows with Mission Control. On a laptop, swipe up with three fingers to open Mission Control. On a desktop, open **Mission Control** by pressing **Control+up arrow** or the **Mission Control** key. Click a window to go to that window on the desktop.

4. 4

Uninstall the app you installed. Close all open windows on the desktop. If you installed the Evernote app, you might need to use the Evernote menu on the menu bar to close it. Next, open Launchpad. On a laptop, use a trackpad gesture; on a desktop, click **Launchpad** in the dock. In Launchpad, locate the icon for the app you installed. Press and hold the icon. All the icons jiggle. Some apps, such as Mission Control, are embedded in macOS and cannot be uninstalled; apps that can be uninstalled have an X on the upper-left corner of the icon (see Figure 20-39). Click the **X** on the app you want to uninstall, and then click **Delete** in the message bubble that appears, as shown in the figure. Click an open space on the screen to make the icons stop jiggling. Click the open space again to return to the desktop.

Figure 20-39

Use Launchpad to uninstall an app

Source: Apple Inc.

Hands-On Project 20-2

Practicing macOS Commands

- **Est. Time:** 30 minutes
- **Core 2 Objective:** 1.10

Practice using the commands listed in Table 20-3 in Terminal.

Table 20-3

Practice Using Commands in Terminal

Task	Command	Description
1	`ls -l`	Lists files and directories in the current directory; in macOS, a directory is treated more like a file than it is in a Windows directory
2	`pwd`	Displays the full path to the current directory; when you first log in to a system, that directory is /home/*username*
3	`mkdir mydir`	Creates a directory named mydir; the directory is created in the current directory
4	`cd mydir`	Goes to the directory you just created in the /home/*username* directory
5	`touch myfile`	Creates a blank file named myfile in the current directory
6	`ls`	Lists the current directory's contents
7	`cd ..`	Moves up one level in the directory tree
8	`cd /etc`	Changes the directory to the /etc directory, where text files are kept for configuring installed programs

Task	Command	Description
9	`ls`	Lists the contents of the /etc directory
10	`cd /home`	Changes the directory to the /home directory
11	`ping 127.0.0.1`	Pings the loopback address; pinging continues until you stop it by pressing Control+C
12	`ifconfig`	Displays TCP/IP configuration data
13	`man ifconfig`	Displays the page from the System Manager's Manual about the ifconfig command; press Q to exit
14	`df`	Displays free space on the hard drive and the file system used

Do research online, and answer the following questions about closing the macOS Terminal window:

1. What does the exit command do in the macOS Terminal window?
2. How can you adjust Terminal settings so that the exit command closes the Terminal window if the shell exited cleanly?
3. What keyboard shortcut can you use instead to close the Terminal window?

Note 15

Even if you don't have a Mac computer to use, you can still research the answers to the preceding questions. The information is readily available online.

Hands-On Project 20-3

Killing a Process in macOS

- **Est. Time:** 30 minutes
- **Core 2 Objective:** 1.10

macOS Terminal is a powerful tool and can be used to kill a hung process or to kill a process you suspect to be malware. First, try to use Force Quit to end the process. If that doesn't work, use Terminal to end the process. Follow these general directions to practice this skill:

1. 1
   Once again, install the Evernote app, but don't launch it.

2. 2
   Open **Terminal**. Run the following command to list all running processes (the x option displays all processes, even those not started in this shell or user interface): `ps x`

3. 3
   Leave Terminal open. Launch the **Evernote** app. Return to the Terminal window, and list all running processes again. What are the Evernote app process IDs? Of the two process IDs, which one represents the application itself, and which one represents a login item?

4. 4
   The pgrep command combines the functionality of ps and grep. The grep command searches for text within a file. Do research online to find the Apple "man page," or manual page, for pgrep. What do the –f and –l options do?

5. 5
   Confirm the Evernote app's process IDs with the command **`pgrep -f -l Evernote`**. (Be sure to capitalize the E in Evernote.) Do the process IDs match the information you found earlier?

6. 6
   Use Terminal to kill the Evernote app (not the login item).

7. 7
   Return to the macOS desktop and uninstall Evernote.

20-5eReal Problems, Real Solutions

Real Problem 20-1

Sharing a Folder to the Network from a Mac Computer and Mapping the Drive on a Windows Computer

- **Est. Time:** 30 minutes
- **Core 2 Objective:** 1.10

In the module "Securing and Sharing Windows Resources," you shared a folder on the network and mapped a network drive. These tasks can also be done in macOS, which makes it easier to share files between computers of various operating systems. Complete the following steps to set up a network share from a Mac computer:

1. 1
   Create a folder to share. Use Finder to create a subfolder in the Documents folder, and name the new folder **Meeting Minutes**.

2. 2
   Set sharing options. Open **System Preferences** and click **Sharing**. Select **File Sharing** in the sidebar, and make sure it's turned on. Click the **Options** button, and make sure that *Share files and folders using SMB* is checked. Under Windows File Sharing, check the box to turn on file sharing for your macOS user account with Windows computers. Enter your macOS user account password if necessary, and click **OK**. Click **Done**.

3. 3
   Share the folder. Under Shared Folders, click the + button below the Shared Folders list, and then navigate to **Documents**. Double-click the **Meeting Minutes** folder, which should then be added to the Shared Folders list. Click **Meeting Minutes** to select it.

Under Users, make sure the **Everyone** group is set to **Read Only**. Return to the System Preferences main window.

4. 4

   Enable shared folders for the guest account. Click **Users & Groups**. Click the lock icon in the lower-left corner of the window so you can make changes to user settings, and sign in. Click the **Guest User** account in the sidebar. Check **Allow guest users to connect to shared folders**, and return to the main System Preferences window. Also check **Allow guests to log into this computer**.

5. 5

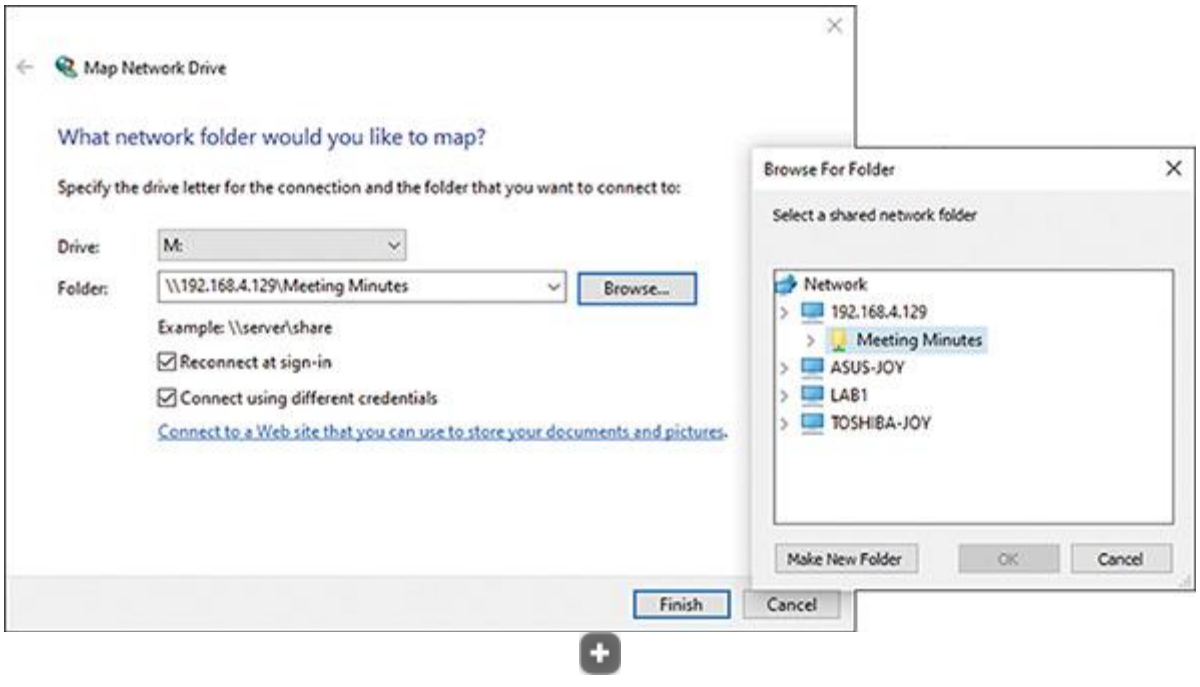
   Set a static IP address. In System Preferences, click **Network** and then click **Advanced**. Click the **TCP/IP** tab. Configure the IPv4 address with a manual address as directed by your instructor. Click **OK**.

6. 6

   Map the network share on a Windows computer. On your Windows 10 computer, open **File Explorer**, right-click **This PC**, and click **Map network drive** on the Computer ribbon. (For Windows 11, at the top of the Explorer window, click the … *See more* icon, and select **Map network drive**.) In the **Map Network Drive** dialog box, enter the Mac's IP address and the name of the shared folder, as shown in Figure 20-40, adjusting the specific details to your situation. Check *Connect using different credentials*, and then click **Finish**. When asked for a user name and password, enter **Guest** for the user name, and leave the password blank. Explorer should open a new window that shows the mapped drive.

Figure 20-40

Folder information includes the IP address of the remote computer and the folder name



7. 7

Check the network share. Create a file on the Mac computer, and save it to the shared folder. Does it appear in the mapped network drive on the Windows computer? If not, troubleshoot and fix the problem. Create a file on the Windows computer and save it to the shared folder. What message did you get when you tried to create a new file?

Real Problem 20-2

Exploring Accessibility Features

- **Est. Time:** 30 minutes
- **Core 2 Objective:** 1.10

Your company has hired a new employee who needs assistance while using their Mac. The employee has requested Voice Control to be enabled on their Mac. You've not yet taken the time to explore these features, so you decide you need to invest the time so you can fully support the technical needs of the new employee. Do the following to explore Voice Control.

1. 1
   In **System Preferences**, go to **Accessibility**, and enable **Voice Control**. This may take a moment.

2. 2
   Once Voice Control is enabled, speak the following commands:

   1. Show commands
   2. Open Safari
   3. Go to www.google.com
   4. Search now
   5. Dictation mode
   6. Mac voice commands
   7. Command mode
   8. Search now
   9. Quit Safari
   10. Open Pages
   11. Click New document
   12. Show grid
   13. [Say the number where you want to click.]
   14. Click Create
   15. Dictation mode
   16. Voice command is helpful
   17. Command mode
   18. Quit Pages
   19. Click Delete
   20. Go to sleep

Were you able to comfortably navigate the Mac? How did this experience help you better support others with all abilities or disabilities?

In a macOS dock which icon will display all currently open apps?

Mission Control

The Time Machine will still crate backups once each day and once a week while not connected. What are these called?

Snapshots

Which choice identifies the utility that opens a command line interface in the macOS?

Terminal

Which of the choices are required to create an Apple ID?

All (unique username, password, internet connection)

What launches when you hold down the Shift key at startup?

Safe Mode

List the details and sizes of all files and directories in your current directory. ls -l

Display your current directory. Pwd

Create a new directory in your current location and name it mydir. Mkdir mydir

Change your present working directory to the mydir location. Cd mydir

Create a file named myfile in your current directory. Touch myfile

Simple directory listing. ls

Move up one level in the directory tree. Cd ..

Move to your system's etc directory using the absolute path. The command is cd /etc.

Move to the home directory. Cd /home

Display the tcp/ip configuration. Ifconfig

Display the filesystem and free space on your disk. Df

Close the terminal. Exit

What file path was necessary when you created your new myfile in the lab?

None

What was the result when you entered the touch myfile command?

All of these (no observable output, new blank file was created in the pwd, no error reported)

What command did you use to see the myfile file you created?

None of these (touch, cd /, df myfile)

What does the / represent in the command cd /etc?

Root directory

Which os is the macOS terminal based on?

Unix

Lab20-1 MacOS Tools and Features

What Windows computers, you're also going to encounter what Linux computers that you're going to support. And now making itself on the scene coming on very strongly is going to also be mac OS computers as well. So yes, you have to know more than just the very fact that they are actually computers out there today.

Wes Bryan is going to kind of tell us through, take us through here the idea of what 90 professionals might need to get used to.

Sure, and what we're going to do Ronnie in this episode is we're going to just look at the desktop interface and we're going to talk.

A little bit about some of the features and some of the tools that are available inside of the operating system.

Alright, so in that instance here, I know that myself coming from a Windows background and going into the realm of Mac. It was a little bit more challenging than I thought it would be because I've already been using Windows computers.

For a good long time and switching over, I was kind of challenged a bit, I tell you, Ronnie, the same thing with me. I'm a Windows guy and Mac was my driving computer for about three years but I remember first making that Jump over and finding out like for instance.

Let's go ahead and just kind of talk a little bit about the desktop environment here while we're here, we'll talk about it right? So here on the desktop we're going to, we, have our basic interface with the menu bar at the top and the dock and we'll talk about these coming up in the body, the dock at the bottom.

Ronnie I think one of the biggest things for me, I'm going to launch up file finder, which is their file and folder management utility. The big thing for me here Ronnie, interestingly enough was that your clothes, your minimize and maximize options were on the left hand side versus the right hand side.

So that took a lot to get a lot of getting used to for me as well so I am with you but let's talk a little bit more about that menu bar. And again, I want you to know that finders kind of like the file Explorer of the Apple world if you will, it is what allows us to view you find files.

Find our applications if you will and really be able to search through our Mac OS now, speaking a little bit more about this menu bar. Let me go ahead and kind of scroll in here and make you see it a little bit better because I want to look at this apple icon and this Apple icon is very, very important.

We can get information about our Mac, including things like software and hardware reports here too. We can do things like force quit we can do things like, restarting our computer shutting our computer down which is very important. We could even launch the app store from here all really good but what I want to look at is the system preferences.

The system preferences if you are just getting started out, this is kind of like your control panel. Your Windows settings interface that we see in Windows 10 and there are some areas that you should be aware of right? So we have generalized configurations for instance like our, what do we want our theme to be?

How do we want the menu bar to appear how do we want scrolling to appear? And again we can get a little bit more specific in the menu, the dock and menu bar and we can control exactly how that looks as well. Other things in here we have searched theory, we have the spotlight search spotlight search is a very, very good way to just find anything on your within your operating system.

And you can even use a command shortcut, our command space bar shortcut and I could say, hey, help me to find, let's say disk utility right? And then I could just hit enter and it would launch up the disk utility so spotlight search is a great way to find things on your computer.

Then we have users and groups, we have privacy settings here notification settings we can modify our displays, make some adjustments on our displays as well as doing things like our printers and scanners. You can see our startup disks and some of the input devices so system preferences is a very, very good way to manage your systems.

Now if we continue along across the top of the menu bar, there's some other options here too. On the right hand side you're going to notice that there is this area likewise and this area gives you some one click access to a couple of things that again I kind of want you to be aware of this.

First one is screen sharing, they call it screen mirroring inside of your Mac operating system and this allows me to take my desktop and basically mirror. It or share it to the locations of these devices if you will over the network that appear in this location, I can also modify my network connections right here as well as get to the spotlight search too.

You can see spotlight search right there all I got to do is hit that little magnifying glass as well as time and date all up here on the menu bar. Now moving down our desktop environment here, we also have what's known as the dock and the dock is a great thing to do to view apps that are currently open.

Notice the little dot right here underneath the icon that lets me know that the application is is open. I can change these the icons within the doc if I want, I can actually remove them from the dock if I want to as well. And the doc is configurable you can, for instance, if you hover over this little line here, you can adjust the size of the dock to.

Then you have recently used applications will show up in this location as well as your downloads and your trash can over here on the far right hand side. So Ronnie a little bit about the desktop, remember things like screen sharing remember your system preferences that's going to be important.

And as well as things like spotlight just keep in mind that when it comes to the dock, your doc is your one of your primary application launchers right from the desktop.

All these are actually great things that help us to customize the way that the user would actually use that computer, to the benefit of what they actually would normally end up doing.

So West besides that idea then of moving from the menu bar into the doctor, what other features do we actually want to take a look at? There is something like mission control right?

Yes mission control is a great way that what you can do is you can view the active desktop spaces and the some of the applications that are open.

So for instance, let me show you so if I open up system preferences and let's say maybe I don't know, let's open up finder right? If I do a three fingered swipe to the top, you're going to notice that? Well I only got one active desktop, but if I wanted to I could create another desktop and then I can actually drag that application to that desktop space.

And then if I wanted to I could switch over between what the active desktops that we have. I could also if I wanted to I could delete a desktop if I say yeah, what, I don't really think I want that one anymore. I delete that desktop and it moves this application back to a single space but Ronnie, it's interesting.

One of the things that I've kind of been doing and I haven't really been talking about is you might notice that what I'm doing here is kind of doing. I said three finger swipe for the mission control then then you might see here that I'm doing something like this where I'm doing a two fingered swipe and I'm holding the control button down.

What is that? What's going on? Right, well those are actually called gestures and gestures are a way that you can interact with a multi touch system whether it be a multi touch input device, something like my trackpad. Remember that if you're talking about in IOS, remember you're going to have your iPhone, you're going to have your iPad, that's a multi touch system.

Well, gestures are a way that you can interact with that multi type interface, and you can sometimes enhance your productivity. You can make things a little bit easier you can see some of the various gestures here and they show you I really like this, they actually show you what they do and they show you how to use them.

I would encourage you to be aware of, just and I would know what they are and why we would have them,. Why we would interact with them now at the end of the day, this is all the desktop Ronnie. But what's so interesting is let's not scare you here, but just like we've seen in windows, just like we've seen in Lenox.

Sometimes you need to get away from the gooey and you need to drop down to a command line interface with the command line interface that it's cli if you will, that's inside of our Mac OS is terminal here. And I've got it open beforehand, remember your spotlight search and I know that's a little small, I'll adjust that.

Remember your spotlight search to you could type terminal and then you could just hit enter and if. I do a command shift plus this allows me to increase the font size rather than having to modify the properties real quick. And again, it's no different than something like a Windows command prompt, text based input, text based output remember it is Mac OS without the graphical user interface.

Yeah, this type of terminal is something that we are going to probably need to be familiar with as we actually continue to work with across multiple systems here. So don't think that you're just limited by one actually notice that maybe it's some of the commands that you actually learn from Linux might.

Also end up being able to run here as well to help you to actually find the things that you need to alright, so once we get through with that. Helping the end use route to actually be able to adjust and make it feel comfortable is absolutely key to a support professional.

But there's other management features we need to take a look at so what are some of those?

Yeah, Ronnie, just like Windows today Microsoft, really pushing for cloud based account to log into right through their Microsoft account. Well here in our Mac OS we have, what's known as iCloud we can actually kind of see that here if I open up our system preferences here, and I kind of scroll in a little bit you're going to see that?

Yes, I'm connected to iCloud but that's through what's known as my Apple I D and your Apple I D. When you long in iCloud allows you to do a lot of things including like setting up payment for the app store. As well as synchronizing this these type of settings, saving it up to the cloud based storage, right?

SAS based storage and then if you need to, if let's say you reinstall your operating system or even if you buy a new Mac and you can connect to iCloud and you can pull all of that information down. So very, very important now another one Ronnie that I kind of open but I didn't really talk about was that disk utility.

Disk utility is great for managing the storage devices that are internal to this machine or the ones that are attached like removable media. You can see that I have an internal SSD in here and it's 250 gigs and I have a one terabyte data backup that's. On one of the fusion drives here and I could see that right here and I can manage and maintain them if I needed to.

Another thing that we have as well is if you have it turned on, you can also do full drive encryption and that's through something known as file vault. File vault is to Mac OS what bit locker is to the Windows operating system and if I go thank you for this one to run.

If I go into system preferences and I go to privacy and security and then we look at file vault here. This tab notice it says it secures your data on your disk by encrypting it's contents automatically alright but there is some warnings that it has here. So I would definitely pay attention to the warnings because it does talk about if you lose the password or you lose the recovery key.

Which is no different than in bit locker, guess what, you lose access to your information so it is important to maintain a backup of those keys in is just so you don't lock yourself out of your machine. A couple other ones I want

to mention Ronnie sometimes you might want to run a Windows system on an intel based mac OS and you can do that through something known as boot camp.

Now it's called out in the exam objectives as boot camp and just know that it's called boot camp assistant in the operating system. Again, these are just minor variations, but it is something that we want you to, we want you to see what your end users. If you're supporting, what would they see in the operating system if you had to support them.

And boot camp is a great way to, you can actually virtualize and you can run Windows side by side if you will with a mac operating system already present. And one of the great things is that partitions a couple of a portion of your hard drive off and rather than a virtualization system.

Where you can run both operating systems simultaneously, this allows you to restart your machine and boot into a Windows operating system. So it's more like a dual boot than it is really running them side by side I know, I said side by side basically, I mean on the same machine, it's more of a dual boot implementation.

There's one that unfortunately I can't demonstrate here but I do want to make mention of and that's called remote disc that's one of the last of the utilities that I want you to be aware of. Remote disc is a way that if you have more than one mac operating system connected to a network and one of those machines has an optical disc, you can actually over the network, you can use that optical disk.

However, these are becoming a thing of the past in fact, I'm sitting next to Ronnie Ronnie's got a MacBook Pro and he doesn't even have an optical drive. So it's one of those things that optical drives are kind of becoming more of a legacy thing but it is a functionality that's in the operating system and it is something that I would be aware of.

My final note is if you are installing software on your Mac OS, there are a couple of file extensions that I want you to be aware of. I want you to be aware of a dot DMG, which is something known as a disk image file it's much like an E x c on windows or an M S I file on Windows that allows you to install software.

There's another software that's in here and Ronnie, honestly, I don't know if I've download, let me go to my applications folder and see if we can find that. So let me go to applications I think yes okay, so here's one alright there's also a dot app file and that is another installer file here in the Mac operating system.

And when you go to upgrade, like for instance, I'm stalling on my upgrade to the newest operating system. This is actually a dot app file that allows the, the Mac OS installer to reach out to Apple's servers and pull down the Monterey image and install it on the machine.

So those are another that's another file keep in mind that this is a BSD derivative under the hood so you also have the traditional package files dot p k G files. Those are three files when it comes to supporting and installing software that should you should be aware of for the exam.

It's kind of neat here when it comes down to the way that Mac actually ends, allows you to install the software relatively similar to the way. That we would actually see inside of windows a lot of times where you're simply double clicking and following the instructions that fall through.

But when it comes to uninstalling it really is as simple as actually clicking out of the application folder and dragging it all the way into your trash bin. And that will also uninstall that so it's kind of neat in how it actually does information like that as well that will also go ahead and wrap it up for this particular episode.

In File Finder, where would you find the Close, Minimize, and Maximize options?

- Top
- Bottom
- Left-hand side

- Right-hand side

Which of the following tools can you use to search for things on your MAC computer?

- Spotlight Search
- Options Search
- All Search
- Tool Search

Which of the following is the purpose of Mission Control?

- It allows you to close down your system
- It allows you to view all your open windows and applications and switch between them
- It allows you to view how many Apple devices you have connected to your network
- It allows you to mirror your screen with another Apple device

Which of the following does Disk Utility allow you to manage?

- Documents that you have saved onto the machine
- Users who have access to the machine
- Storage devices that are internal to the machine
- External peripherals

Which of the following tools can you use to complete full drive encryption?

- MacVault
- SystemVault
- FileVault
- FolderVault

A scanner connected to your Mac is giving you problems, and you suspect corrupted device drivers. What should you do first?

- a. Back up the macOS startup disk using Time Machine.
- b. Uninstall the scanner and install it again.
- c. Download and install drivers from the scanner manufacturer.
- d. Update macOS.

Your macOS installation is corrupted, and you want to boot from an external Thunderbolt hard drive to repair the installation. Which key(s) do you hold down at startup to boot from the external hard drive if you have an Intel-based Mac?

- a. Command1R keys
- b. D key
- c. Shift key
- d. Option key

Why is the scrollbar typically hidden from view in macOS?

In an attempt to streamline the user interface, Apple's Safari browser for the Mac has scroll bars that can disappear from view if you are not actively scrolling through a web page.

Which app manages multiple desktop screens in macOS?

Mission Control

Which app provides tools for customizing the macOS interface?

System Preferences

How often does Time Machine create new backups?

Time Machine keeps **hourly** backups for 24 hours, daily backups for a month, and weekly backups until the disk is full. The oldest backups are deleted to make space for new backups. You can also set up multiple backup schedules for more than one backup device.

What Apple file type is similar to an ISO file used in Windows?

A DMG file (.dmg) is a disk image file

You work on a help desk, and you receive a call from a user who needs help on their MacBook. What feature does macOS include that allows you to assist the user without having to travel to their location?

Screen Sharing

What solution does Apple offer to assign permissions to user accounts in an organization?

Managed Apple ID

What file system does macOS support in order to be compatible with Windows?

MS-DOS (FAT) and ExFAT: File systems that are compatible with Windows.