Discovering Computers

Technology in a World of Computers, Mobile Devices, and the Internet

Chapter 9

Operating Systems

Objectives Overview

Define an operating system

Describe the start-up process and shutdown options on computers and mobile devices

Explain how an operating system provides a user interface, manages programs, manages memory, and coordinates tasks

Describe how an operating system enables users to configure devices, establish an Internet connection, and monitor performance

Identify file management and other tools included with an operating system, along with ways to update operating system software

Objectives Overview

Explain how an operating system enables users to control a network or administer security

Summarize the features of several desktop operating systems

Briefly describe various server operating systems

Summarize the features and uses of several mobile operating systems

Operating Systems

- An **operating system** (**OS**) is a set of programs containing instructions that work together to coordinate all the activities among computer and mobile device hardware

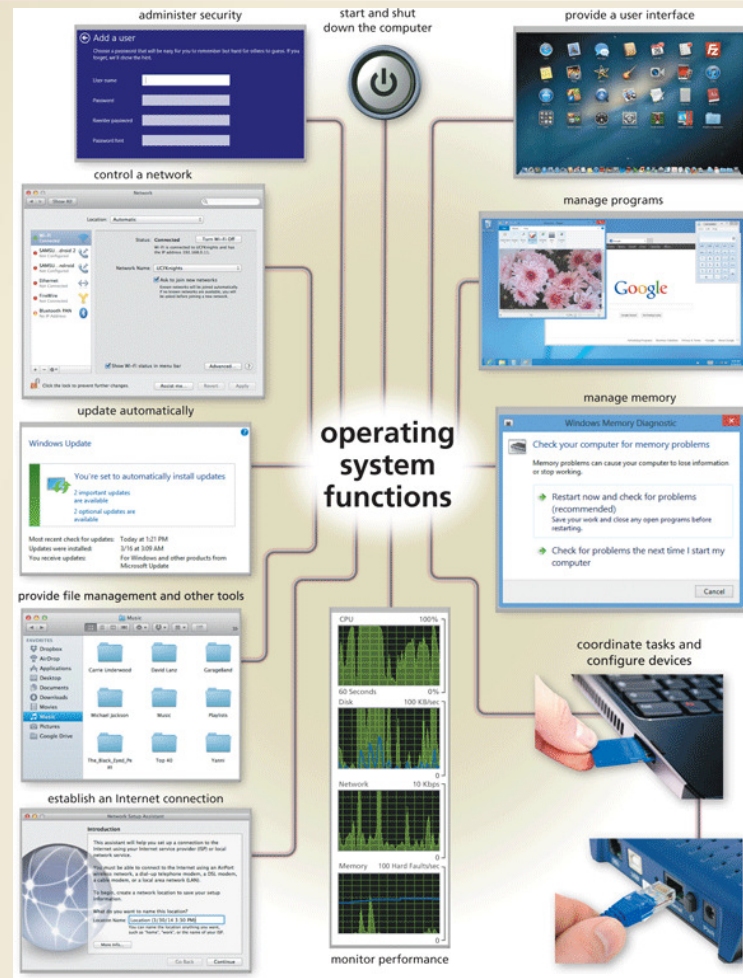|			
Start and shut down a computer or mobile device	Provide a user interface	Manage programs	Manage memory
Coordinate tasks	Configure devices	Establish an Internet connection	Monitor performance
Provide file management and other device or media-related tasks	Updating operating system software	Control a network	Administer security

Operating Systems

Operating System Functions

- Starting Computers and Mobile Devices
  - If a computer or mobile device is off, you press a power button to turn it on

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Figure 9-2

Operating System Functions

- An operating system includes various power options

Sleep mode saves any open documents running programs or apps to memory, turns off all unneeded functions, and then places the computer in a low-power state

Hibernate saves any open documents and running programs or apps to an internal hard drive before removing power from the computer or device

Operating System Functions

- A **user interface** (**UI**) controls how you enter data and instructions and how information is displayed on the screen

- With a graphical user interface (GUI), you interact with menus and visual images

Operating System Functions

- In a command-line interface, a user types commands represented by short keywords or abbreviations or presses special keys on the keyboard to enter data and instructions

Operating System Functions

- How an operating system handles programs directly affects your productivity

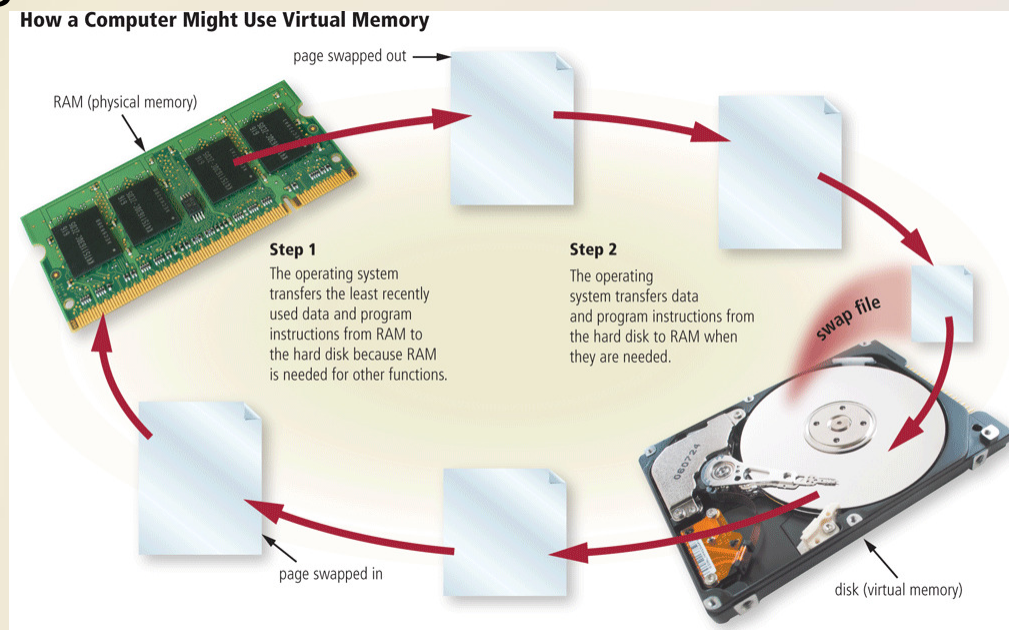| Single tasking and multitasking	Foreground and background	Single user and multiuser

Operating System Functions

background applications

icons indicate background and foreground apps running on computer
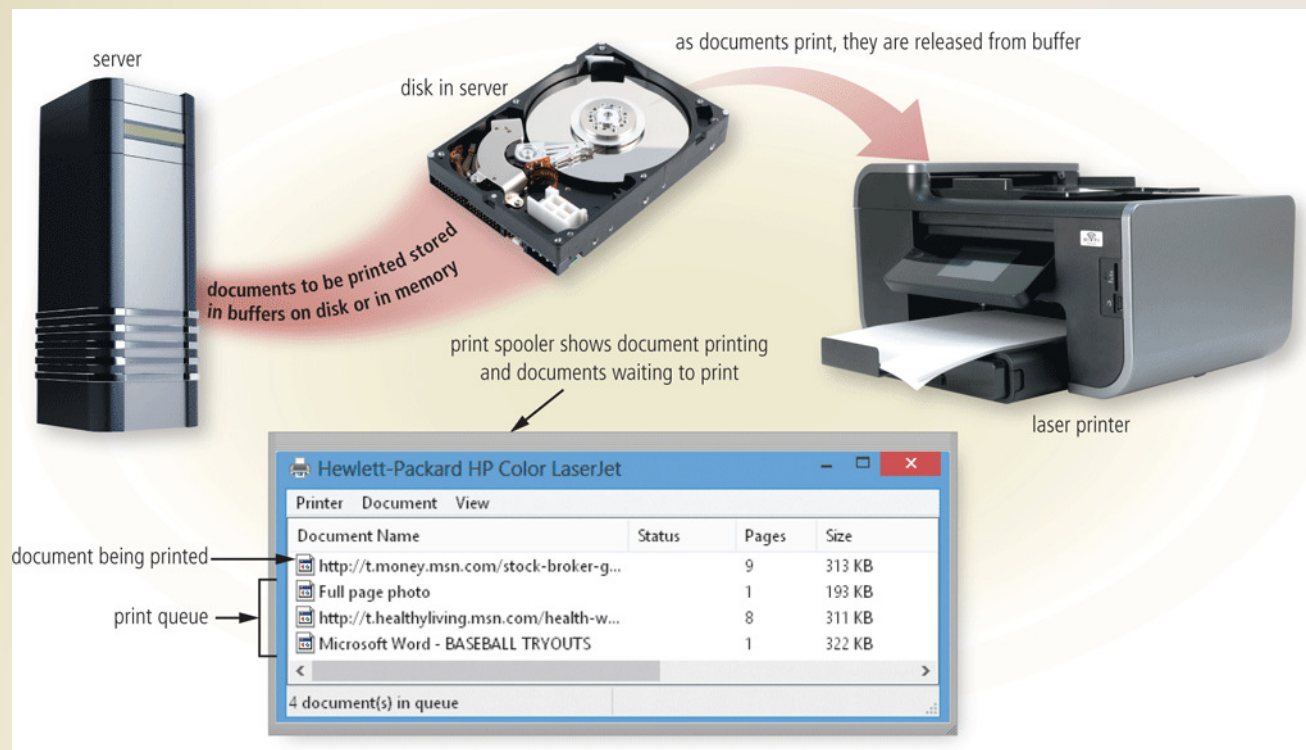
foreground application

Operating System Functions

- Memory management optimizes the use of the computer or device's internal memory

- **Virtual memory** is a portion of a storage medium functioning as additional RAM

How a Computer Might Use Virtual Memory

RAM (physical memory)

page swapped out

Step 1
The operating system transfers the least recently used data and program instructions from RAM to the hard disk because RAM is needed for other functions.

Step 2
The operating system transfers data and program instructions from the hard disk to RAM when they are needed.

swap file

page swapped in

disk (virtual memory)

Operating System Functions

- The operating system determines the order in which tasks are processed
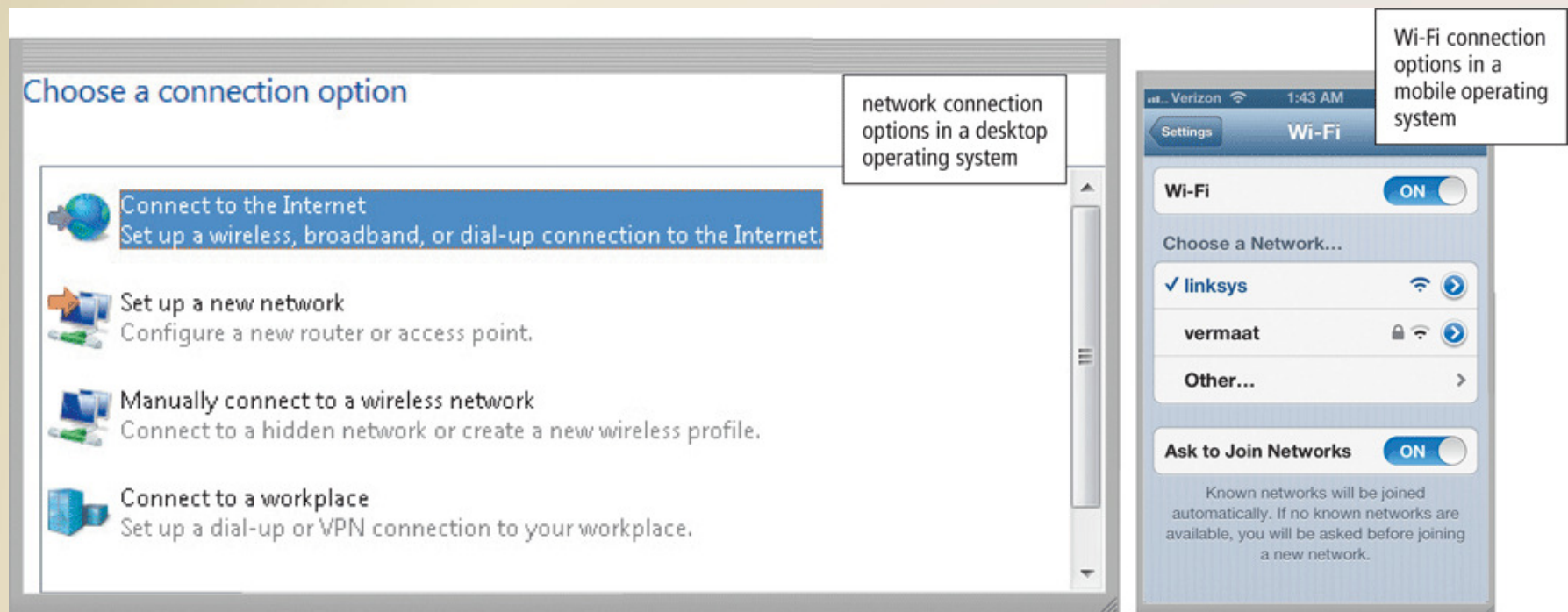
Operating System Functions

A **driver** is a small program that tells the operating system how to communicate with a specific device

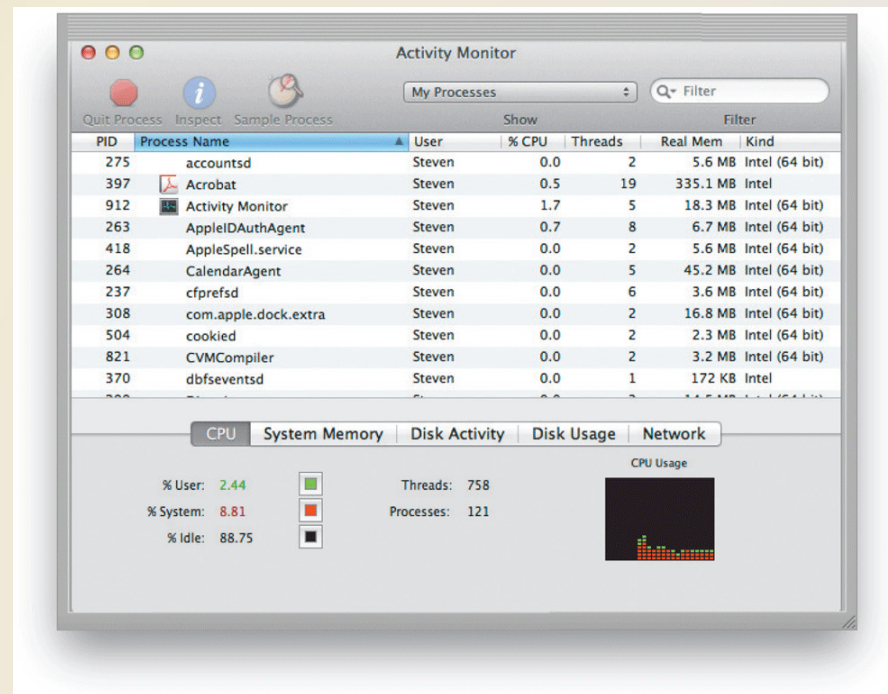Plug and Play automatically configures new devices as you install them

Operating System Functions

- Operating systems typically provide a means to establish Internet connections

Operating System Functions

- A **performance monitor** is a program that assesses and reports information about various computer resources and devices

Operating System Functions

- Operating systems often provide users with a variety of tools related to managing a computer, its devices, or its programs

File Manager	Search	Image Viewer	Uninstaller	Disk Cleanup
Disk Defragmenter	Screen Saver	File Compression	PC Maintenance	Backup and Restore

Operating System Functions

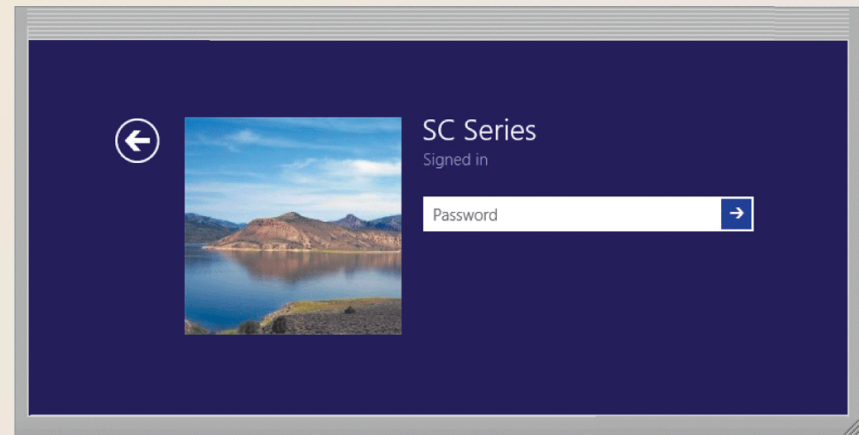- **Automatic update** automatically provides new features or corrections to the program

Operating System Functions

- Some operating systems are designed to work with a server on a network

- These multiuser operating systems allow multiple users to share a printer, Internet access, files, and programs

- A network administrator uses the server operating system to:

  - Add and remove users, computers, and other devices

  - Configure the network, install software and administer network security

Operating System Functions

- A user account enables a use to sign in to, or access resources on, a network or computer

  – A **user name**, or user ID, identifies a specific user

  – A **password** is a private combination of characters associated with the user name

SC Series
Signed in

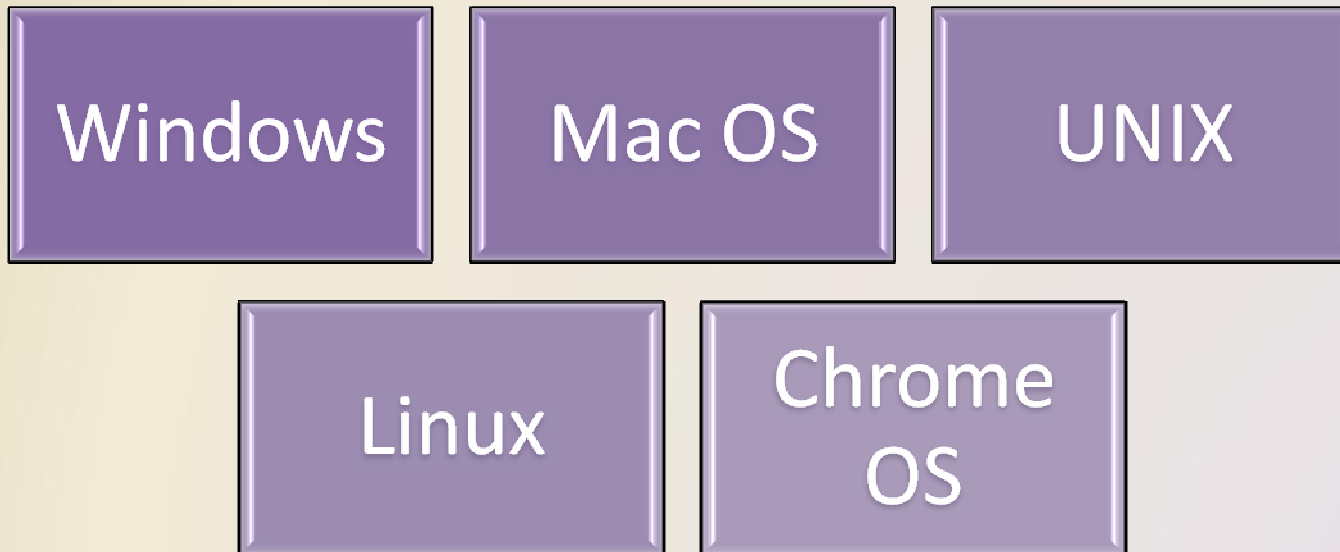Password

Types of Operating Systems

Table 9-2	Examples of Operating Systems by Category
Category	**Name**
Desktop	Windows
	OS X
	UNIX
	Linux
	Chrome OS
Server	Windows Server
	Mac OS X Server
	UNIX
	Linux
Mobile	Google Android
	Apple iOS
	Windows Phone

Desktop Operating Systems

- A **desktop operating system** is a complete operating system that works on desktops, laptops, and some tablets

Windows

Mac OS

UNIX

Linux

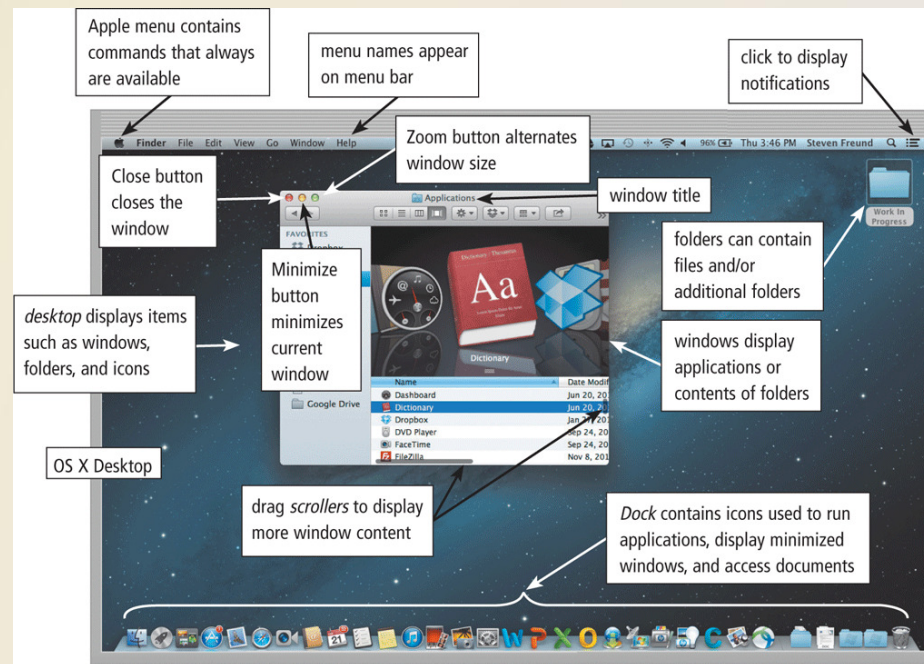Chrome OS

Desktop Operating Systems

- Windows 8 offers these features:
  – Start screen interface with tiles
  – Includes the desktop interface
  – Support for input via touch, mouse, and keyboard
  – Email app, calendar app, and browser included
  – Photos, files, and settings you can sync with SkyDrive
  – Enhanced security through an antivirus program, firewall, and automatic updates
  – Windows Store offers additional applications for purchase

Desktop Operating Systems
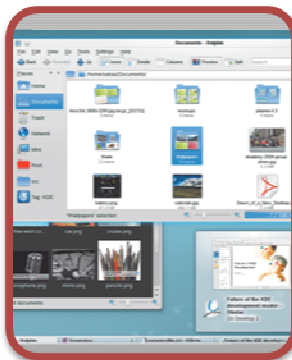
Desktop Operating Systems

- The Macintosh operating system has earned a reputation for its ease of use

- Latest version is **OS X**

Desktop Operating Systems

UNIX is a multitasking operating system developed in the early 1970s
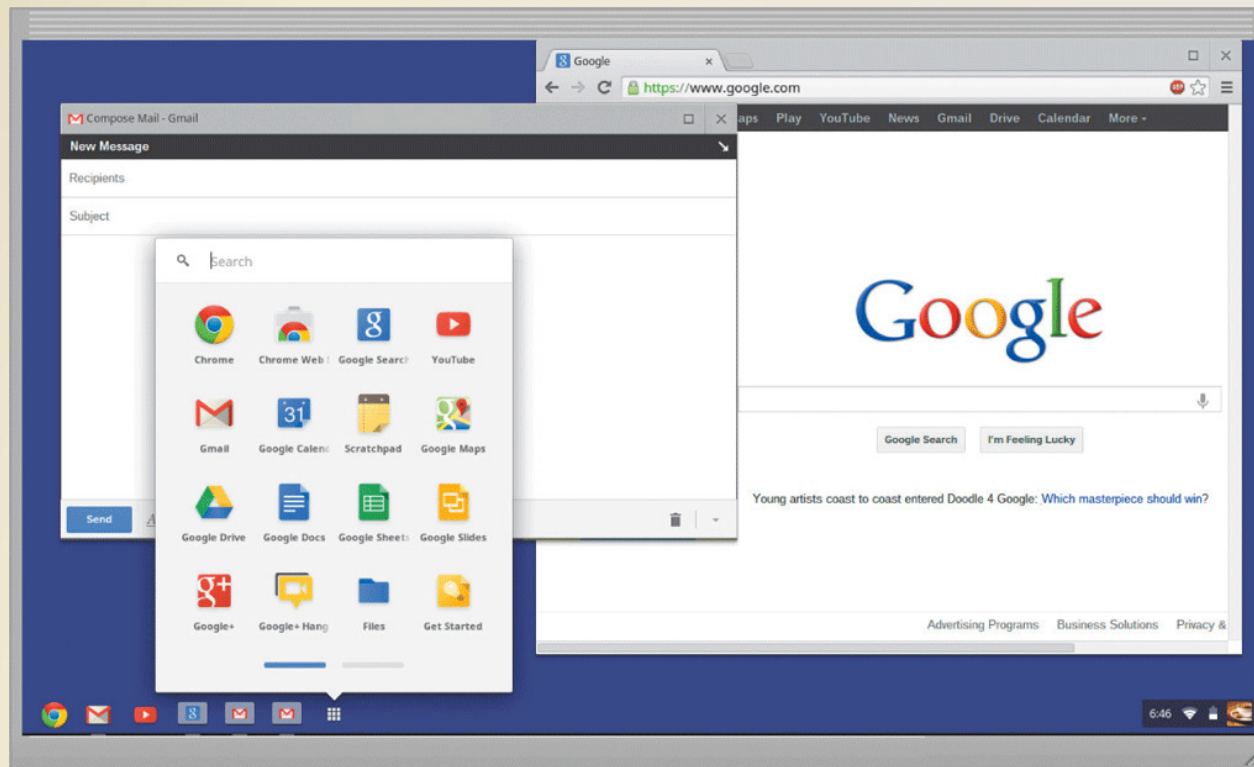
Linux is a popular, multitasking UNIX-based operating system

Desktop Operating Systems

- **Chrome OS** is a Linux-based operating system designed to work primarily with web apps

Server Operating Systems

Windows Server

OS X Server

UNIX

Linux

Mobile Operating Systems

- The operating system on mobile devices and many consumer electronics is called a **mobile operating system** and resides on firmware

Android   iOS   Windows Phone

Mobile Operating Systems

- **Android** is an open source, Linux-based mobile operating system designed by Google for smartphones and tablets

Android tablet

Android phone

Mobile Operating Systems

- **iOS**, developed by Apple, is a proprietary mobile operating system specifically made for Apple's mobile devices

iOS tablet

iOS phone

Mobile Operating Systems

- **Windows Phone**, developed by Microsoft, is a proprietary mobile operating system that runs on some smartphones

Summary

Functions common to most operating systems

Variety of desktop operating systems, server operating systems, and mobile operating systems

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Chapter 9

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Chapter 9 Complete