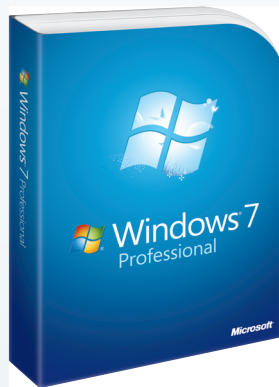


VISUAL SUMMARY

System Software

SYSTEM SOFTWARE



System software works with end users, application programs, and computer hardware to handle many details relating to computer operations.

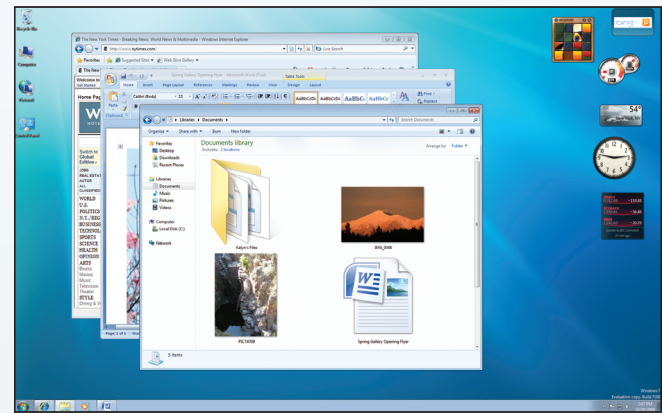
Not a single program but a collection or system of programs, these programs handle hundreds of technical details with little or no user intervention.

Four kinds of systems programs are operating systems, utilities, device drivers, and language translators.

- **Operating systems** coordinate resources, provide an interface between users and the computer, and run programs.
- **Utilities** perform specific tasks related to managing computer resources.
- **Device drivers** allow particular input or output devices to communicate with the rest of the computer system.
- **Language translators** convert programming instructions written by programmers into a language that computers can understand and process.



OPERATING SYSTEMS



Operating systems (software environments, software platforms) handle technical details.

Functions

Functions include managing resources, providing a user interface (most operating systems use a graphical user interface, or GUI), and running applications. **Multitasking** allows switching between different applications stored in memory; current programs run in foreground; other programs run in background.

Features

Booting starts (cold) or restarts (warm) a computer system. The **desktop** provides access to computer resources. Common features include icons, pointers, windows, menus, tabs, dialog boxes, Help, and gesture control. Data and programs are stored in a system of files and folders.

Categories

Three categories of operating systems are

- **Embedded**—used with handheld computers; operating system stored within device.
- **Network (NOS)**—controls and coordinates networked computers; located on the network server.
- **Stand-alone (desktop)**—controls a single computer; located on the hard disk.

Operating systems are often called **software environments** or **software platforms**.

To effectively use computers, competent end users need to understand the functionality of system software, including operating systems, utility programs, and device drivers.

MOBILE OPERATING SYSTEMS

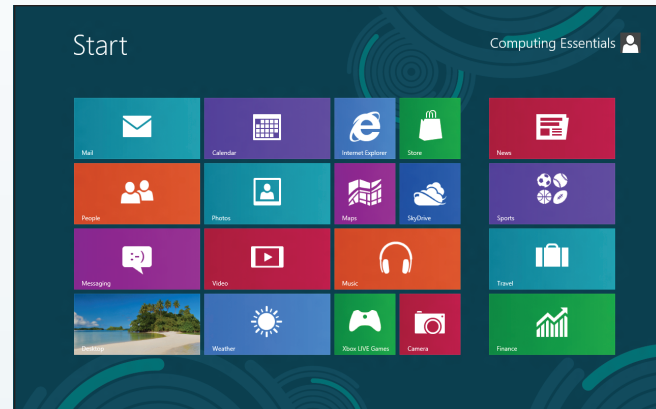


Mobile operating systems (mobile OS) are embedded in every smartphone and tablet. These systems are less complicated and more specialized for wireless communication than desktop operating systems.

Some of the best known are BlackBerry, iOS (iPhone OS), Android, Windows Phone, and WebOS.

- **Android** was originally developed by Android Inc. and later purchased by Google. It is a widely used mobile OS.
- **BlackBerry OS (RIM OS)** originated in Canada. It was designed as the platform for BlackBerry handheld computers.
- **iOS (iPhone OS)** was developed by Apple to support iPhone, iPod Touch, and iPad.
- **WebOS** was developed by Palm, Inc., and later purchased by HP. It has evolved into the operating system for many of HP's mobile devices.
- **Windows Phone 8** was introduced in 2012 by Microsoft to support a variety of mobile devices, including smartphones. It can run many powerful programs designed for laptop and desktop computers.

DESKTOP OPERATING SYSTEMS



Windows

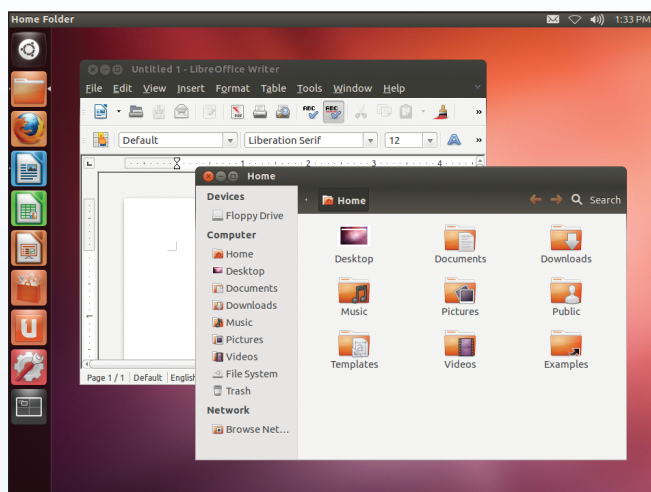
Windows, the most widely used operating system, is designed to run with many different microprocessors. The two recent versions are **Windows 7** and **Windows 8**. Windows 8 offers an interface very similar to the Windows Phone interface; supports desktops, notebooks, and tablets; uses a start screen and tiles; and provides support for gestures, cloud integration, and apps. **Windows RT**, a version of Windows 8, is designed to run with ARM tablets.

Mac OS

Mac OS, an innovative, powerful, easy-to-use operating system, runs on Macintosh computers. The two most recent versions are **Lion** and **Mountain Lion**. Mountain Lion's interface is very similar to the interfaces on Apple's smartphone and tablets. It is designed for Apple's desktops and laptops. Lion's functionality is similar to Windows 8 but generally considered easier to use.



DESKTOP OPERATING SYSTEMS

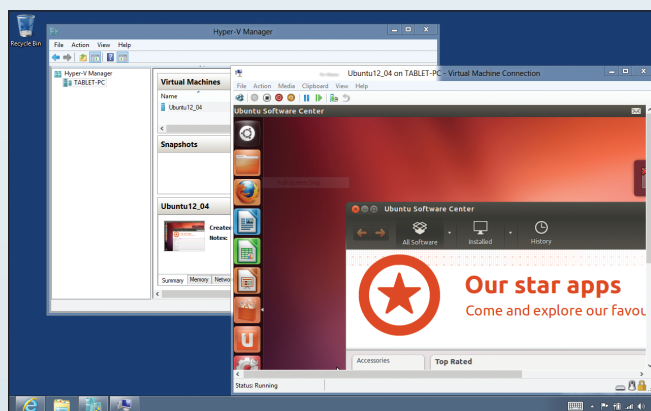


UNIX and Linux

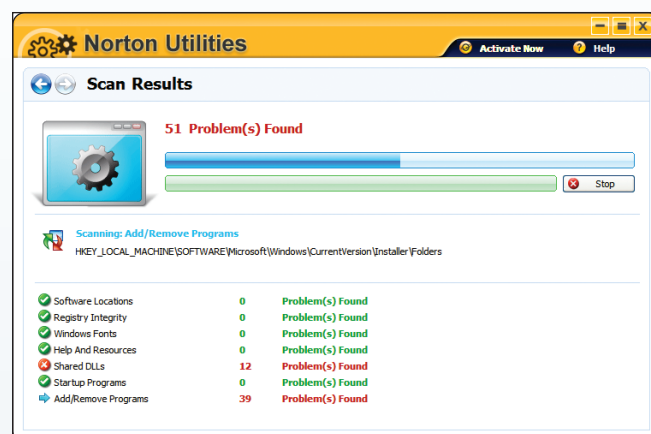
UNIX was originally designed to run on minicomputers in network environments. Now, it is widely used by servers on the web, mainframe computers, and very powerful microcomputers. There are many different versions of UNIX. One version, Linux, a popular and powerful alternative to the Windows operating system, is open source software. Google's Chrome OS is based on Linux and designed for netbooks and other mobile devices. Chrome OS focuses on Internet connectivity and cloud computing.

Virtualization

Virtualization allows a single physical computer to support multiple operating systems. Using a special program (virtualization software) allows the single physical computer to operate as two or more separate and independent computers known as **virtual machines**. Host operating systems run on the physical machine. Guest operating systems operate on virtual machines. Microsoft's Hyper-V creates and runs virtual machines.



UTILITIES



Utilities make computing easier. The most essential are troubleshooting (diagnostic), antivirus, backup, and file compression.

Windows Utilities

Windows operating systems are accompanied by several utility programs, including **Backup and Restore**, **Disk Cleanup**, and **Disk Defragmenter** (eliminates unnecessary fragments; tracks are concentric rings; sectors are wedge-shaped).

Utility Suites

Utility suites combine several programs into one package. Computer viruses are dangerous programs.

DEVICE DRIVERS

Device drivers (drivers) allow communication between hardware devices. Add a Device Wizard gives step-by-step guidance to install printer drivers. **Windows Update** automates the process of updating device drivers.

CAREERS IN IT

Computer support specialists provide technical support to customers and other users. Degrees in computer science or information systems are preferred plus good analytical and communication skills. Salary range is \$31,000 to \$58,000.

KEY TERMS

- Add a Device Wizard (110)
- Android (100)
- antivirus program (104)
- background (98)
- Backup and Restore (104)
- backup program (104)
- BlackBerry OS (100)
- booting (98)
- Chrome OS (103)
- cold boot (98)
- computer support specialist (111)
- desktop (98)
- desktop operating system (99)
- device driver (96, 109)
- diagnostic program (104)
- dialog box (99)
- Disk Cleanup (107)
- Disk Defragmenter (108)
- driver (109)
- embedded operating system (99)
- file (99)
- file compression program (104)
- folder (99)
- foreground (98)
- fragmented (108)
- gesture control (99)
- graphical user interface (GUI) (97)
- guest operating system (103)
- Help (99)
- host operating system (103)
- Hyper-V (103)
- icon (98)
- iOS (100)
- iPhone OS (100)
- language translator (96)
- Launchpad (102)
- Linux (102)
- Mac OS (102)
- Mac OS X (102)
- menu (99)
- Mission Control (102)
- mobile operating system (100)
- mobile OS (100)
- multitasking (98)
- network operating system (NOS) (99)
- network server (99)
- open source (103)
- operating system (96, 97)
- OS X Lion (102)
- OS X Mountain Lion (102)
- pointer (98)
- RIM OS (100)
- sector (108)
- software environment (99)
- software platform (99)
- stand-alone operating system (99)
- start screen (101)
- system software (96)
- tab (99)
- tile (101)
- track (108)
- troubleshooting program (104)
- UNIX (102)
- user interface (97)
- utilities (96, 104)
- utility suite (109)
- virtual machine (103)
- virtualization (103)
- virtualization software (103)
- virus (109)
- warm boot (98)
- WebOS (100)
- window (99)
- Windows (101)
- Windows 7 (101)
- Windows 8 (101)
- Windows Phone 8 (100)
- Windows RT (101)
- Windows Update (110)

To test your knowledge of these key terms with animated flash cards, visit our website at www.computing2014.com and enter the keyword [terms4](#). Or use the free *Computing Essentials 2014* app.

MULTIPLE CHOICE

Circle the correct answer.

1. What type of software works with users, application software, and computer hardware to handle the majority of technical details?
 - a. application
 - b. desktop
 - c. Linux
 - d. system
2. The programs that convert programming instructions written by programmers into a language that computers understand and process are language:
 - a. converters
 - b. linguists
 - c. managers
 - d. translators
3. The ability to switch between different applications stored in memory is called:
 - a. diversion
 - b. multitasking
 - c. operational interference
 - d. programming
4. Graphic representation for a program, type of file, or function:
 - a. app
 - b. icon
 - c. image
 - d. software
5. This operating system feature is controlled by a mouse and changes shape depending on its current function.
 - a. dialog box
 - b. menu
 - c. mouse
 - d. pointer
6. The operating system based on Linux, designed for Netbook computers, and focused on Internet connectivity through cloud computing:
 - a. Chrome
 - b. Mac
 - c. UNIX
 - d. Windows
7. The mobile operating system developed by Apple and originally called iPhone OS:
 - a. Android
 - b. BlackBerry OS
 - c. iOS
 - d. Mac OS
8. A utility program that makes copies of files to be used in case the originals are lost or damaged:
 - a. Backup and Restore
 - b. Disk Cleanup
 - c. Disk Defragmenter
 - d. Compactor
9. A troubleshooting utility that identifies and eliminates nonessential files, frees up valuable disk space, and improves system performance:
 - a. Backup and Restore
 - b. Disk Cleanup
 - c. Disk Defragmenter
 - d. Compactor
10. Windows makes it easy to update drivers with Windows:
 - a. Backup
 - b. Restore
 - c. Driver
 - d. Update

For an interactive multiple-choice practice test, visit our website at www.computing2014.com and enter the keyword **multiple4**. Or use the free *Computing Essentials 2014* app.

MATCHING

Match each numbered item with the most closely related lettered item. Write your answers in the spaces provided.

- | | |
|-------------------|--|
| a. Android | ___ 1. Programs that perform specific tasks related to managing computer resources. |
| b. antivirus | ___ 2. Restarting a running computer without turning off the power. |
| c. driver | ___ 3. Type of operating system that controls and coordinates networked computers. |
| d. fragmented | ___ 4. An operating system is often referred to as the software environment or software ___. |
| e. Launchpad | ___ 5. OS X Lion feature to display and provide direct access to applications. |
| f. NOS | ___ 6. A type of software that allows a single physical computer to operate as though it were two or more separate and independent computers. |
| g. platform | ___ 7. Mobile operating system that is owned by Google and is widely used in many smartphones. |
| h. utilities | ___ 8. Type of program that guards computer systems from viruses and other damaging programs. |
| i. virtualization | ___ 9. If a file cannot be saved on a single track, it has to be ___. |
| j. warm boot | ___ 10. Program that works with the operating system to allow communication between a device and the rest of a computer system is called a device ___. |

For an interactive matching practice test, visit our website at www.computing2014.com and enter the keyword **matching4**. Or use the free *Computing Essentials 2014* app.

OPEN-ENDED

On a separate sheet of paper, respond to each question or statement.

1. Describe system software. Discuss each of the four types of system programs.
2. Define operating systems. Describe the basic features and the three categories of operating systems.
3. What are mobile operating systems? Describe the leading mobile operating systems.
4. What are desktop operating systems? Compare Windows, Mac OS, Linux, and Chrome OS. Discuss virtualization.
5. Discuss utilities. What are the most essential utilities? What is a utility suite?
6. Explain the role of device drivers. Discuss Add a Device Wizard and Windows Update.