



Lesson 8: Operating Systems

Computer Literacy Basics
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Objectives

Upon completion of this lesson, you should be able to:

- + Identify the purpose of an operating system
- + Identify different operating systems
- + Share files on different operating systems
- + Identify user rights
- + Troubleshoot common operating system problems

Vocabulary

- + Administrative rights
- + Administrator account
- + Driver
- + Embedded operating system
- + Emulation card
- + File system
- + Handheld operating system
- + Linux
- + Mac OS X
- + Operating system (OS)
- + Palm OS
- + System administrator
- + UNIX
- + Windows Embedded CE
- + Windows Phone

Types of Software

- + Application software
- + System software

Competencies

6670-51 - Perform basic operations in an operating system environment.

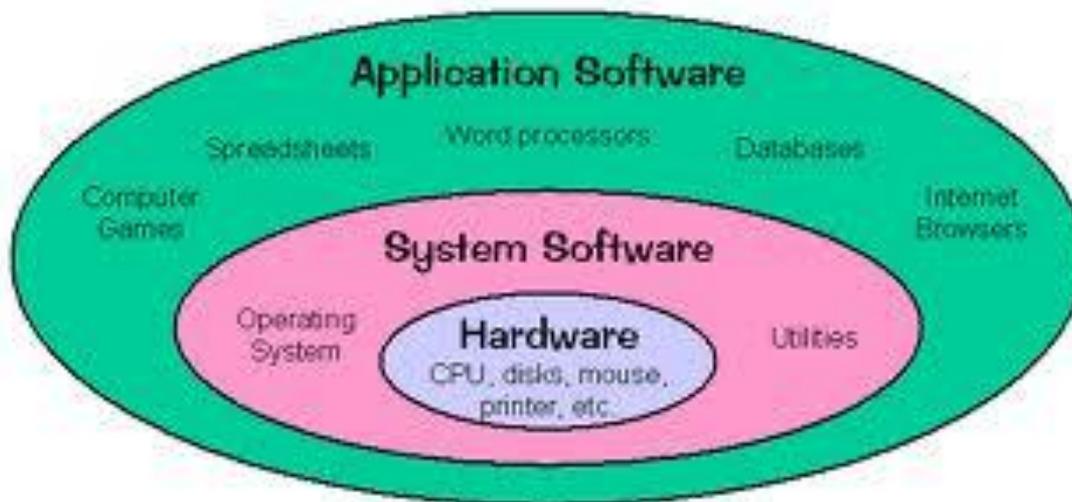
6670-53 - Describe the basic computer start-up sequence.

6670-54 - Compare and contrast the basic differences among operating systems.

6670-55 - Investigate basic issues affecting system purchase and upgrade decisions.

Introduction

There are two basic types of software: application software and system software. Fundamental concepts of applications were discussed in detail in lesson 7. This lesson focuses on system software and how it relates to the operating system and the utility programs that manage computer resources at a low level.



Identifying the Purpose of an Operating System

System software facilitates the use of a computer system.

An ***operating system (OS)*** is system software that enables the computer hardware to communicate and operate with the application software.

Without an operating system, a computer cannot function because the operating system manages and coordinates activities and resources of the computer.

We Service Many Different Operating Systems

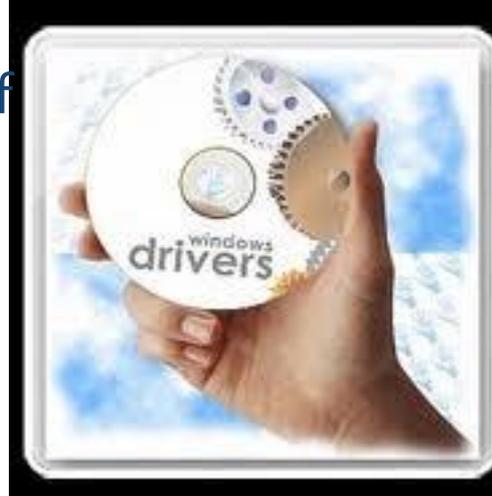


How operating system are used:

operating system perform jobs such as keeping track of files and directories, and controlling peripheral devices such as the printer, monitor, and keyboard.

Manufactures of peripheral devices, such as printers or monitors, provide programs called **drivers** that the operating system uses to communicate with various hardware devices.

Operating system also manage resources for application. It provides a consistent way for applications to communicate with hardware so you can print documents on many types of printers.



Cont. Uses of operating system:

Operating system help applications by performing system and file maintenance task.

Operating system is responsible for such system tasks as preparing the desktop, managing visual and audio effects, handling memory, and maintaining power settings.

Operating system controls access to files stored on disks and manages the amount of space the files can use.



File System



The way an operating system stores files on disk is called a ***file system***. The file system regulates the types of names and other attributes a file can have and organize the files into folders arranged in hierarch, where a main folder can contain subfolders that contain files.

The file system allows you to find and retrieve files you store on a computer by keeping track of the files you can save and where you save them.

The file system also identifies sections of a disk that are not being used.

Identifying Different Operating Systems

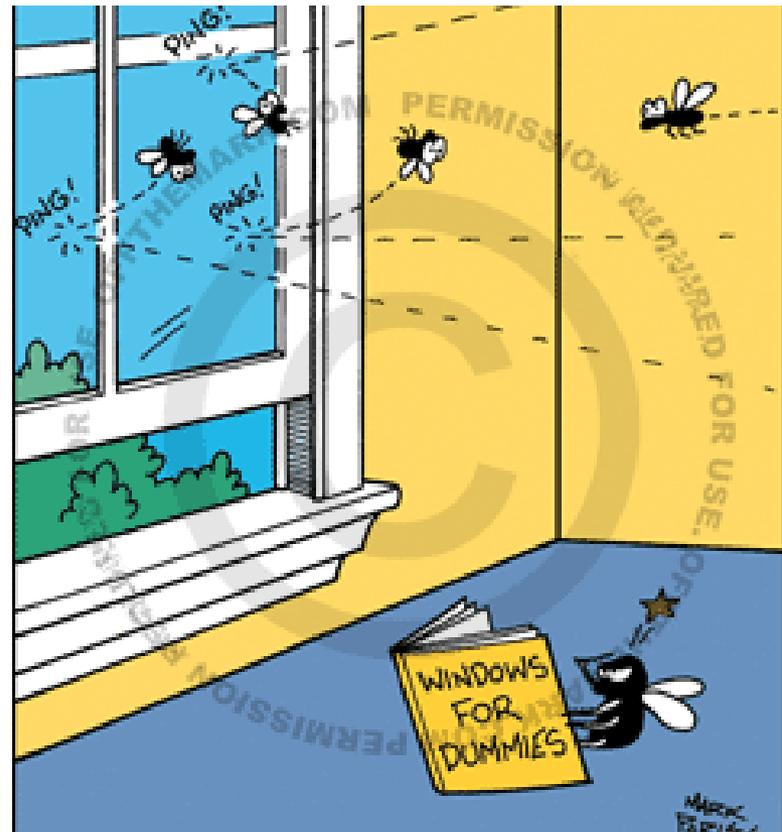
operating system provides an interface between the user or application program and the computer hardware.



Personal Computer operating system

Designed to work with one or more processors.

- + Windows – Intel processor
- + **Mac OS X**- Older version use Motorola processors, newer version use Intel processors
- + **UNIX** – used by scientist and programmers
 - + Developed by AT&T
 - + Multitasking portable operating system
 - + Command-line interface
 - + **Linux** and IBM's AIX are variations of UNIX



Mobile operating system

Also called *Handheld operating system* or *Embedded operating system* (resides on ROM chip)

These systems are smaller and generally less capable than desktop operating systems.

- + Smart phones
- + PDAs
- + Tablet computers
- + Mobile game players
- + Cameras
- + Personal Information Manager (PIM) – such as calendar and address book



Handheld and Embedded Operating systems

Operating system can be categorized by a number of characteristics:

- + Technology
- + Usage
- + Licensing



Popular handheld and embedded operating system:

Android – this is an open-source operating system for mobile devices such as smart phones and tablet computers, and is currently developed by Google. Android is based on a version of Linux.

Apple iOS – This operating system, originally called the iPhone operating system, is designed for mobile devices such as the iPhone, iPad, and iPod Touch. You interact with iOS using your fingertips to perform multitouch gestures. The main applications are designed for phone features, e-mail, Web browsing, and media playing.



Cont. Popular handheld:

BlackBerry – operating system runs on handheld devices supplied by Research in motion (RIM). In addition to phone capabilities, this system also provides services such as multitasking, instant messaging, PIM capabilities, and access to Bluetooth devices.

Embedded Linux – This is a scaled-down Linux operating system used in devices such as mobile phones, media players, PDAs, smart watches, and many other types of devices that require an embedded operating system.



Cont. Popular handheld:

Palm OS – a competing operating system to Windows Mobile (also called Garnet OS) runs on Palm handhelds and other third-party devices. Some of the more common built-in applications include and address book, calculator, calendar, contacts, and phone book tools. This operating system also includes handwriting-recognition software.

Symbian OS – is a multitasking operating system designed for smart phones. Some of the more popular features include the capability to send and receive e-mail messages and faxes, maintain contact list, and browse the Web.



Cont. Popular handheld:

Windows Embedded CE – a scaled-down version of Windows operating system. Designed for digital cameras, security robots, intelligent appliances, gaming devices, GPSs, media players, and set-up boxes.

Windows Phone – is a mobile operating system that runs on smart phones and other types of handheld computers. Originally called Windows Mobile, this operating system allows you to perform tasks such as accessing e-mail, recording and watching video, exchanging instant messages, reading an e-book, playing games, and managing finances.

Sharing Files on Different Operating Systems

In the classroom all the computers maybe the same, but students might have different types of computers at home.

These situations require the multiple systems be able to read disks and share files.



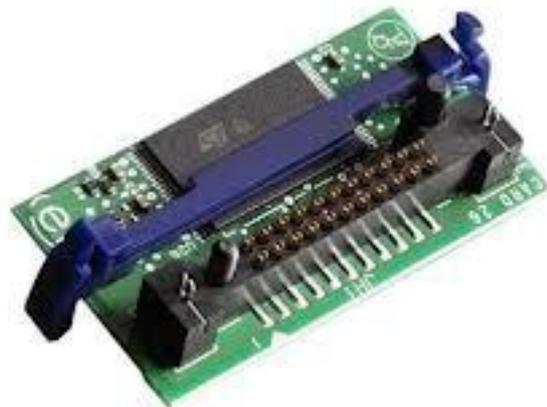
“Who needs a cake? My girl put this file in my Dropbox on the computer!”

Hardware and software solutions

Emulation card – these cards enable the computer to run a program that was designed for a different operating system.

Some file types are readable on different operating system.

- + Word-processing documents in basic text format (files with a .txt filename extension) – do not retain formatting
- + Rich Text Format (.rtf) – retains some formatting



Communicating on Internet

On the Internet files are regularly shared across operating system.

Desktop or laptop computers use an operating system such as Windows or Mac operating system.

Internet service provider most likely uses UNIX

If you connect through a school then you are using a network operating system.

Identifying User Rights

An operating system allows you to interact with a computer and take advantage of the computer's technology, but it also sets limitations to protect itself and the data on the computer.

The operating system grants permission allowing you to perform some tasks but preventing you from performing others.

The task you are allowed to perform are defined by your user rights.

The ***system administrator*** sets the user rights to protect the computer's security.



System Administrator

Is a user who has an *administrator account*, which is a local account or local security group.

The administrator account provides unrestricted access to make system-wide changes to the computer, including those that affect other users.



System administrator duties

Creating or deleting user accounts on the computer

Changing account names, pictures, passwords, and other data

Establishing security access level

Allocating storage space

Monitoring systems to prevent unauthorized access and attacks by malicious software

Administrator can grant ***Administrative rights*** to other users, allowing them to make specified types of changes.

Troubleshooting Common Operating System Problems

Incompatibility – application software and files need to be compatible with the computer's operating system.

File corruption – files can become corrupt as a result of power failure, turning off the computer without properly shutting it down, a virus, resource conflicts, outdated drivers, bad sectors or lost clusters on the hard drive, bad software installation and so on.

Disk Crashes – if your system is unstable, programs and even the operating system shut down unexpectedly and you receive error messages when you try to use the operating system and applications.

Summary

- + An operating system is system software that enables computer hardware to communicate and operate with the application software. Without an operating system, a computer would not function because the operating system manages and coordinates the activities and resources of the computer.
- + Operating systems provide a consistent way for applications to communicate with hardware without duplicating settings or learning details about the hardware. They also perform system and file maintenance tasks.

Cont. Summary

- + Windows, Mac OS X, and Linux are common operating systems for personal computers.
 - + **Linux** – UNIX-like system, a free and open source software
 - + **Mac OS X** – UNIX based GUI OS designed for Apple
 - + UNIX – multi-tasking, multi-user computer operating system
- + Handheld and embedded operating systems, also known as mobile operating systems, are similar in principle to operating systems such as Windows or Linux. These systems, however, are smaller and generally have fewer capabilities than desktop operating systems.

Cont. Summary

- + To share files across operating system platforms, you can use solutions involving hardware, software, and data. For example, saving data or work files in the Rich Text Format means that most other operating systems can read the file.
- + An operating system sets limitations to protect itself and the data on the computer. The operating system grants permission to you to perform some task but prevents you from performing others according to your user rights.

Cont. Summary

- + The system administrator has unrestricted access to make system-wide changes to the computer, including those that affect other users. Without administrative rights, you cannot make changes such as system modifications, installing software, or changing network settings.
- + Typical operating system problems include file incompatibility, file corruption, and disk crashes.

Students will...

- + Complete Lesson Review
- + Project 1 & 2
- + Online discovery
- + Job skills (with a partner)

Lesson Review



True/False

1. The system administrator generally has an administrator account.
2. Some file types are readable on more than one operating system.
3. Handheld computers do not contain an operating system
4. An operating system manages resources for applications
5. There are five basic types of software.

Multiple Choice

1. The way an operating system stores files on a disk is called a _____ system.
 - a. File
 - b. Recurring
 - c. Backup
 - d. disk

2. The Macintosh operating system is called_____
 - a. Vista
 - b. UNIX
 - c. Windows
 - d. Mac OS X

3. A(n) _____ card allows a computer to run a program that was designed for a different operating system.
 - a. Emulation
 - b. DOS
 - c. Replacement
 - d. Windows Phone

4. The tasks an operating system allows you to perform are defined by your _____.
 - a. Password
 - b. System administrator
 - c. Users rights
 - d. Users interface

5. The _____ operating system was developed by a group of programmers for AT&T.

- a. Apple Macintosh
- b. IBM PC
- c. UNIX
- d. Windows

Fill in the Blank

1. Older _____ computers contain a processor manufactured by Motorola.
2. Manufactures of peripheral devices such as printers or monitors provide programs called _____ that enable the operating system to communicate with hardware devices.
3. The UNIX operating system is considered a(n) _____, portable operating system.
4. Both the IBM AIX system and Linux operating systems are based on _____.
5. Handheld operating systems and embedded operating systems also are know as _____ operating systems.

Projects



Project 8-1

Continue on your Word Document. Label Project 1:

Windows Disk Cleanup utility helps you free space on your computer by deleting temporary and other unnecessary files from a driver. Complete the following:

1. Use Windows Help and Support and research this utility program. (click on start and look for help and support)
2. In a Microsoft Word, explain the purpose of this utility (paragraph 1) and provide an example of how you would access the program and then use it (paragraph 2).

Project 8-2

Complete the following:

1. Use your favorite search engine to research information about the BlackBerry Playbook.
2. Assume that you are going to purchase the Playbook and research its features, applications, and accessories.
3. Use Microsoft Word to prepare a minimum one-page over-view of the Playbook features, applications, and accessories and describe how you could apply these features for personal and business use.
 - + Header: name, date, and block
 - + You may use 1.5 spacing in your document
 - + Bullet point for Features, applications, and accessories is acceptable
 - + 1 Paragraph how you would use BlackBerry Playbook for “your” career

Project 3

Windows 8 is the most recent operating system developed for the PC, and Mac OS X is the most recent operating system developed for the Macintosh computer. Complete the following:

1. Use your favorite search engine to research information about one of the first operating systems developed for the PC. Also research one of the first operating systems developed for the Macintosh.
2. Use a presentation program to prepare a slide show on the early operating systems for the PC and Macintosh. Be sure to name the operating systems, list the system requirements, list the important features, and provide an illustration such as a screen shot, if possible.

Team Work Project – 2 people on a team

You and a team member have been given the responsibility for purchasing new computers for your company's front office. One team member wants to purchase Apple Macintosh computers with the latest version of the Mac OS X; another wants to purchase PCs with the latest version of Windows; and the two in team will also look at purchase PCs with the UNIX/Linux operating system. The manager has requested that your team do some research and present her with a report so that she can make the best choice. Your report should include the positives and negatives for each of these OS. Also include information on how these computers could interact if more than one type of computer was selected.

Critical Thinking

Assume you are a member of a team and your objective is to come up with three ideas on how the Windows 7 operating system can be improved. Provide an overview of your ideas and explain why they would make the operating system better and easier to use.

Online Discovery

Android is an open-source operating system for mobile devices such as smart phones. Google released Android under the Apache License, authored by the Apache Software Foundation. A software license sets the terms for using the software. For example, a software license usually defines how many copies of the software a user can make or install. Research the Apache License on at least two Web sites and then answer the following questions:

1. Is the Apache License free?
2. Does the Apache License let users modify the Android software?
3. In what programming language was the Android software
4. What relationship does the Apache License have with the GNU operating system?
5. Provide a brief overview of the information contained on the Web sites you researched. Include the Web site addresses where you located the information. (1 paragraph).

Job Skills

The Technology Careers sidebar in this lesson describe the job of a PC support specialist. Working as a PC support specialist is a good way to start a career in the computer field. However, this position requires a challenging blend of skills to be successful and earn promotions. With a partner or on your own, list the types of skills needed to be an excellent PC support specialist. Organize the skills into categories such as technical knowledge and communication skills. Which are the most important skills for this job? In which areas are your skills the strongest? Where do you need to improve? What parts of this job do you find attractive and why?

