

Technology Handbook Module 3

Software

Key Terms

operating system

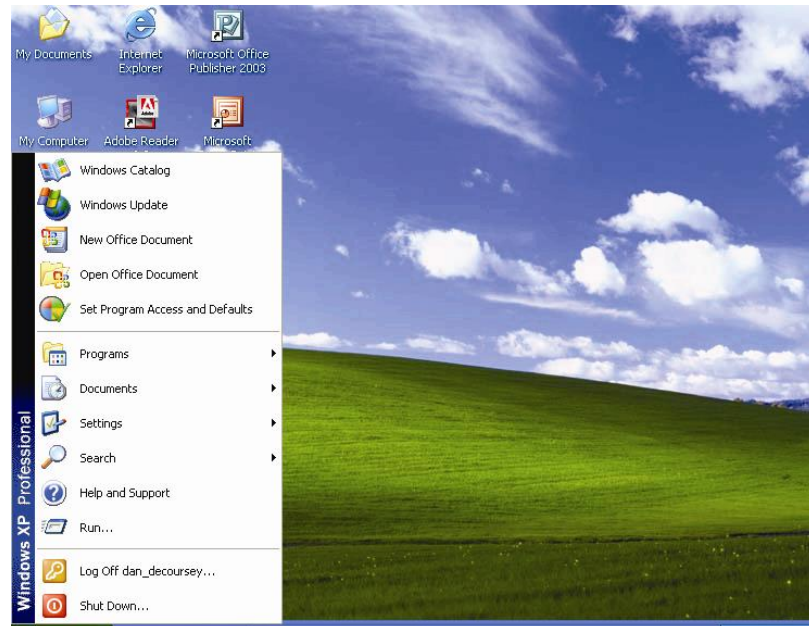
command

graphical user
interface (GUI)

Operating Systems

A computer's **operating system** is a program that runs the computer. It recognizes input from input devices, sends output to output devices, and saves data and information on the hard disk. A computer user controls the operating system with a **command**. A command tells the computer to perform a particular task.

Users of operating systems such as Linux and DOS need to type in commands to tell the computer what to do. More popular operating systems such as Windows and Macintosh use a **graphical user interface (GUI)**. A GUI uses images on a monitor to make an operating system easier to use. Instead of learning command words, a GUI user can choose from a list of options.



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TIP

The Linux operating system can be less user-friendly than the Microsoft Windows and Mac operating systems, but it is growing in popularity among computer savvy users.

There are three main types of operating systems.

- Personal operating systems (personal OS), which are designed for a single user. Personal OSs are used to operate technology such as personal computers, laptops, and PDAs.
- Multi-user operating systems (multi-user OS), which allow many people to use a central computer, such as a minicomputer or a mainframe computer. This operating system is often used by small- to medium-sized organizations.
- Network operating systems (network OS or NOS), which allow hundreds or even thousands of users to share information across a network. NOSs are used by large companies and government organizations.

The most common models of personal operating systems are discussed below:

The Microsoft Windows operating systems are the most popular operating systems for home computers. Most PCs and laptops come equipped with a version of Microsoft Windows, such as Windows XP or Windows Vista.

Mac OS is the operating system installed on Apple computers. Although Mac OS includes a graphical user interface that is similar to that of the Windows operating systems, Mac OS definitely looks and feels different than the Windows family of operating systems.

Linux is an open-source operating system, which means that it is free for anyone to use.

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PDAs have their own operating systems. Currently, the most popular operating systems for PDAs are Blackberry OS, Palm OS, and Pocket PC OS. All of these offer many of the same features, such as a datebook, an address book, e-mail, and Internet.



✓ Tech Check

Answer the questions on a separate piece of paper.

1. **Explain** Why are commands important?
2. **Predict** Why do you think operating systems with GUIs are more popular than those that use word commands?
3. **Describe** What is the difference between Windows OS and Mac OS?

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Key Terms

application
word processor
spreadsheet
presentation
database

Applications

Today, people use computers for everything from writing a letter to calculating a budget, but it is not a computer's operating system that does these things. The operating system only runs the computer. An **application** is the program that is designed for a particular type of task, like writing a letter or calculating a budget. Applications, however, will not work without an operating system.

Many types of applications serve different purposes. Four of the most common application types are word processors, spreadsheets, presentations, and databases. The table below explains each of these types.

Application Type	What does it do?	Example
Word Processor	A word processor produces text documents. You key words into the computer on a keyboard.	Microsoft Word WordPerfect Word Pro AppleWorks Word Processing
Spreadsheet	A spreadsheet is a table organized into rows and columns. You enter numbers in the table. The spreadsheet can do calculations with the numbers in the table.	Microsoft Excel Lotus 1-2-3 AppleWorks Spreadsheet

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TIP

Other common applications include Internet browsers, used for viewing Internet content; e-mail programs, used for sending and receiving mail electronically; and graphics programs, used to create images on the computer.

Application Type	What does it do?	Example
Presentation	A presentation is composed of slides that contain information and graphics. A presentation program helps you make a presentation look organized and eye-catching.	Microsoft PowerPoint Keynote AppleWorks Presentation
Database	A database is an organized way to store information so that it is easy for the computer to search the information. For instance, you might use a database to store your friends' names, phone numbers, and addresses so that you can easily look up a number or address using a friend's name.	Microsoft Access FileMaker AppleWorks Database



Tech Check

Answer the questions on a separate piece of paper.

- 1. Distinguish** How are operating systems and applications different?
- 2. Discuss** List three things you could use a word processor for.

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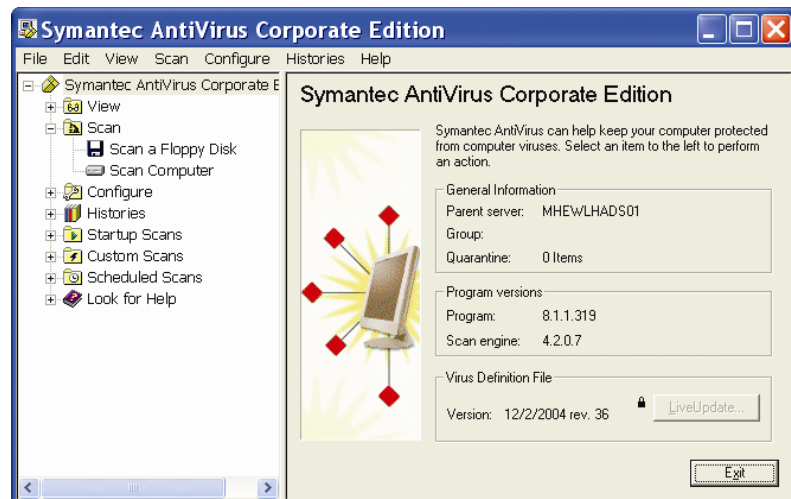
Key Terms

utility program
virus
firewall
encryption
file management

Utility Programs

A **utility program** is a program that performs a specific task within an operating system. Utility programs perform a variety of tasks, including security. Computer security is very important because there are more threats to computers than ever.

One of the most common threats is called a **virus**. A virus is an unwanted program running on a computer. A virus makes copies of itself and, in some cases, sends copies to other computers. Viruses can use up a computer's memory or harm the data stored on the computer.



An antivirus program detects and eliminates viruses before they can harm a computer. Good antivirus programs obtain new information about viruses from the Internet.

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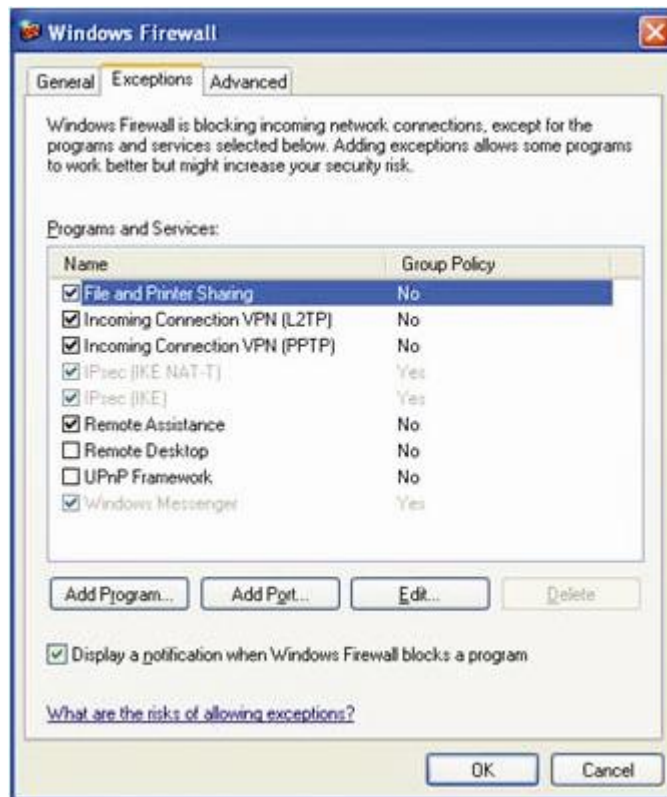
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TIP

The function of a firewall within a network is similar to the firewalls that are used in building construction, which were intended to contain and delay structural fire from spreading to adjacent structures.

Another threat is unwanted connections to or from the Internet. These connections can be from viruses or from other users who are attempting to gain control of another computer illegally. A **firewall** is a utility that protects computers against unwanted connections.



A firewall examines each piece of data that comes into a computer or leaves a computer. If the firewall detects a threat, it will block the data.

Some people have information stored on their computer that they do not want everyone to see. For instance, a company that has created a new invention might want to keep the plans secret until they can patent the invention. People can

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protect their information by using **encryption**, or putting data into a code.

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<a href="#"&#109;&#97;&#105;&#108;&#116;&#111;&#58;%65%6E%68%61%6E%63%65%72%40%68%63%70%64%2E%63%6F%6D">&#106;&#97;&#110;&#101;&#100;&#111;&#101;&#64;&#97;&#111;&#108;&#46;&#99;&#111;&#109;</a>
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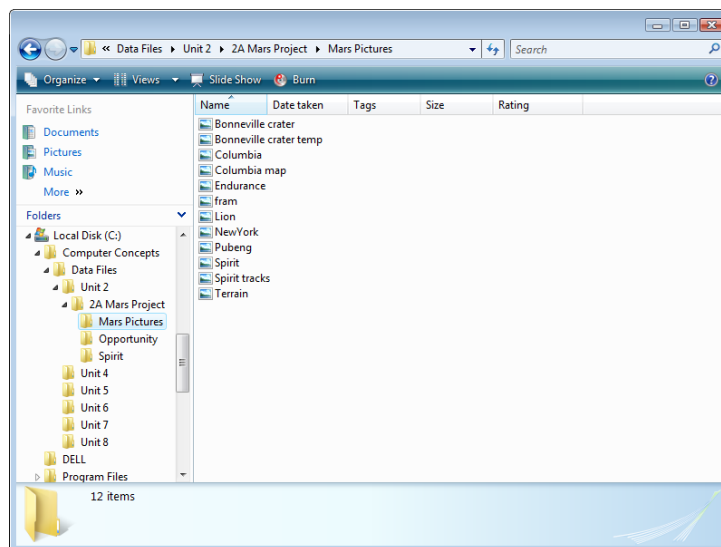
In order to view an encryption, a user must know the key. The key is a string of numbers without which the information will not make sense.

Utility programs accomplish a number of tasks aside from maintaining the security of a computer.

A **file management** utility organizes files and information so that they are easy to locate. The most common file system is called a hierarchical file system. Microsoft Vista's operating system hierarchical file system is shown here.

TIP

In a hierarchical file system, information is organized by categories, starting with broad categories that get more and more specific as files are opened.



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TIP

Some utility programs, such as Windows Media Player, allow a user to listen to music or watch movies on his or her computer.

Windows has a group of utilities that make computers easier for people with visual or mobility impairments to use. For instance, a person who cannot type can use the virtual keyboard to click the letters.



✓ Tech Check

Answer the questions on a separate piece of paper.

1. **Discuss** What are the benefits of antivirus programs?
2. **Construct** To create a hierarchical file system, think of your favorite pastime. It might be playing baseball or reading books. Make a list that describes your pastime. The first item on the list should be the broadest category to which your pastime belongs. Each new item should be more specific than the previous item and the final item should be your pastime.

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Key Terms

upgrading
troubleshooting

Upgrades and Installation Problems

Since software companies produce new versions of their applications every few years, many users choose to upgrade their application software. **Upgrading** is a process that updates software in order to add new features and fix problems such as bugs and compatibility with new hardware, operating systems, or other types of software.

Benefits of upgrading include access to better functionality and the ability to use new hardware and software.

Drawbacks could include incompatibility with older hardware and software, conflicts with existing programs, or getting used to new technology that ends up not being popular. You can install upgrade software from a floppy disk, CD-ROM, Internet download, or automatic online updates.

Stay informed to find out about the advantages or disadvantages of available upgrades by reading industry news or frequently visiting a manufacturer's Web site.

It is important to identify and understand common problems associated with installing and running applications. A few examples are defective or lost installation media, an installation program that will not start, an installation that stops before completion, an installed program that does not appear on the computer, an installed program that fails to work, an installed program that causes other programs to fail, files that cannot be read by the new application, or not being able to install or uninstall applications, sometimes prevented by an office or school system administrator.

Once you encounter a problem, there are several help options available. The first line of defense is the instruction manual that came with the software. It is important that you are

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TIP

If you are unable to solve the problem using the instruction manual, visit the manufacturer's Web site for any updates.

familiar with the material in the application manuals. You will save a lot of time by knowing where to find help in the application manuals. Often there is a “troubleshooting” section that can help you. **Troubleshooting** is the process of identifying and correcting problems.

Next, consider those around you who might be able to help. A school administrator or corporate IT professional, a friend, or a family member with experience using the software can try to help you solve the problem.



✓ Tech Check

Answer the questions on a separate piece of paper.

1. **Explain** What does “upgrading” mean?
2. **Discuss** Name one drawback to upgrading software.
3. **Summarize** What should you do if you encounter a problem installing software?

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Key Terms

virus
worms
spyware
adware
anti-virus
software

Viruses and Worms

Viruses and worms are computer programs that are intentionally designed to hurt or destroy computer systems, software, and individual files. There are thousands, if not millions, of these harmful programs roaming around on various networks and on the Internet.

A **virus** is a computer program that copies itself into other programs stored in a computer. It may only be annoying, causing your computer to slow down, or it may be very destructive, erasing important files or corrupting computer memory. **Worms** are a type of virus that copy themselves over and over again until they fill all of the storage space on a drive or network.

Spyware and adware are two examples of “sneaky viruses.” Spyware spies on what types of Web sites you visit and what software you use. **Adware** forces unwanted advertising onto your computer screen. Spyware and adware are not specifically designed to harm your computer, but they usually end up causing systems to slow down or even shut down.

Dangerous programs can enter a computer in many different ways. They can be hidden in infected files passed from computer to computer on disks, in e-mail attachments, or in Internet downloads. It is important to understand that a text file alone (.txt) cannot be infected. This is because text itself contains no programming. Other text-based files (e.g., .html or ASCII) can contain viruses, but it is the programming that becomes infected.

Fortunately, there are many ways to protect your computer from viruses and worms. Protecting your computer is as important as knowing how to use software applications.

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TIP

Norton, MacAfee, Net Zone, and Panda are just a few of the very popular brands of anti-virus software.

Anti-virus software is software that combats viruses. Especially with an Internet connection, anti-virus software can keep updated on a daily basis to prevent viruses from entering your computer.

Be very careful about what types of files are downloaded. Make sure you know what the file is and the source of the download. Always perform an anti-virus scan.

Never open e-mail attachments from somebody you do not know. Always scan incoming e-mail and attachments *before* they are opened.

Remember that staying informed of the latest virus threats and keeping anti-virus software up-to-date will help identify, isolate, and clean infected files.



✓ Tech Check

Answer the questions on a separate piece of paper.

- 1. Recall** What is a type of virus that copies itself until it completely fills up a computer's storage space?
- 2. Reproduce** What are two types of harmful programs that are not designed to harm your computer but can still cause serious problems?
- 3. Explain** What are two ways a virus can infect your computer?

Module 3 Assessment

Software

Key Term Review

Answer the following questions on a separate sheet of paper.

1. A(n) _____ is the program responsible for running a computer.
2. A(n) _____ uses images on a monitor to make an operating system easier to use.
3. _____ tell the computer what to do and allow the computer user to control the computer.
4. A program that runs “on top” of an operating system is called a(n) _____.
5. An application that uses values organized into rows and columns is a(n) _____.
6. A(n) _____ is an organized way to store information so that it is easy for the computer to search the information.
7. A(n) _____ is more efficient than a typewriter because you can correct mistakes on the screen before you print a document.
8. A(n) _____ is composed of slides that contain information and graphics.
9. _____ is the process of identifying and correcting problems.
10. _____ forces unwanted advertising onto your computer screen.
11. A(n) _____ is an unwanted program that can copy itself.
12. _____ is putting data into a code.
13. A program that performs a specific task within an operating system is called a(n) _____.
14. The hierarchical file system is one example of a(n) _____.
15. A(n) _____ protects computers against unwanted connections.

Module 3 Assessment

Software

Concept Review

Answer the following questions on a separate sheet of paper.

- 16.** Instead of learning command words, a GUI user can choose from a(n) _____.
- 17.** A word processor produces _____.
- 18.** A(n) _____ detects and eliminates viruses before they can harm a computer.
- 19.** In order to view an encryption, a user must know the _____.
- 20.** In a hierarchical file system, information is organized by _____.

Critical Thinking

Complete the following exercises to reinforce your understanding of the lesson.

- 21. Predict** Think of three types of businesses that you think use application software to help make business easier. Write down the type of business and then describe how an application could help that type of business.
- 22. Collect** Think of three school-related activities, such as keeping track of your homework, which you think might be easier with the help of a computer and a software application. Go online and try to locate an application that meets your needs. Try using search terms that combine the words “application” or “software” with the activity (sample search term: homework software).
- 23. Compare** Many people who run their own small office or home office use sophisticated application suites that allow them to create documents, spreadsheets, databases, and presentations. These suites help small business owners solve many of their own problems without the use of accountants, marketers, or designers and without a large financial investment. Research and compare the capabilities of three applications suites. Determine which suite you would prefer to use and explain why.