

# Introduction to Information Technology and Applications

# **Computer Maintenance, Security and Problem Solving**

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**Week 4**

# Objectives

- **At the end of this lesson, you will learn:**
  - ✓ How to maintain computers
  - ✓ Basic security terminology
  - ✓ How to protect your computer
  - ✓ How to resolve computer related problems

# Computer Maintenance

- Computer maintenance is set of services or procedures performed to keep a computer in good working, robust condition.
- A well-maintained computer
  - Performs faster
  - Runs more efficiently
  - Crashes less
- Maintaining your computer will save you money, time, and protect your data.

# Why maintenance is important?

- Your computer could stop working, you may be unable to access your digital photos, finances, and documents.
- Your computer could slow down, when a virus or spyware starts using up all of its memory, and uses your internet connection to send itself to all of your friends.



# Why maintenance is important?

- Spyware or viruses could reveal your personal information, such as your credit card numbers, along with anything you ever type into it.
- Worms or viruses could lead you to being unable to get to web sites or send email to your friends, if your computer becomes marked as a virus-carrier.
- If you're running a business, a compromise could cause you to reveal any data you have about your customers, thus potentially leading to you being the target of a charge.



# File Security

- File Security is a feature of your file system that:
  - Controls which users can access to which files.
  - Brings limitations on what users can do with files.
- For instance,
  - A file may be viewed by everyone but only certain specific people may change it.
  - A file may be secured so that only the owner may view it.
- You can use password to prevent other people from opening or modifying your file

# FILE SECURITY

*Encrypt and Set a Password to Open a Document/Workbook/Presentation*



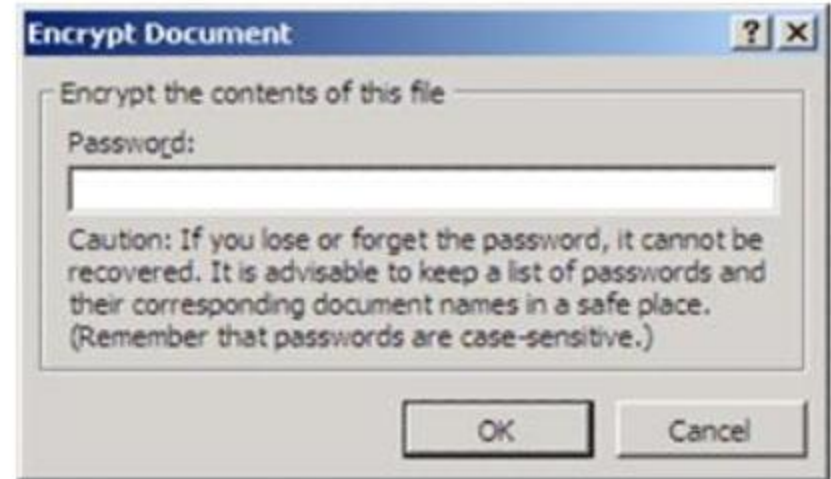
- Click the **Microsoft Office Button** , point to **Prepare**, and then click **Encrypt Document**.



# FILE SECURITY

## *Encrypt and Set a Password to Open a Document/Workbook/Presentation*

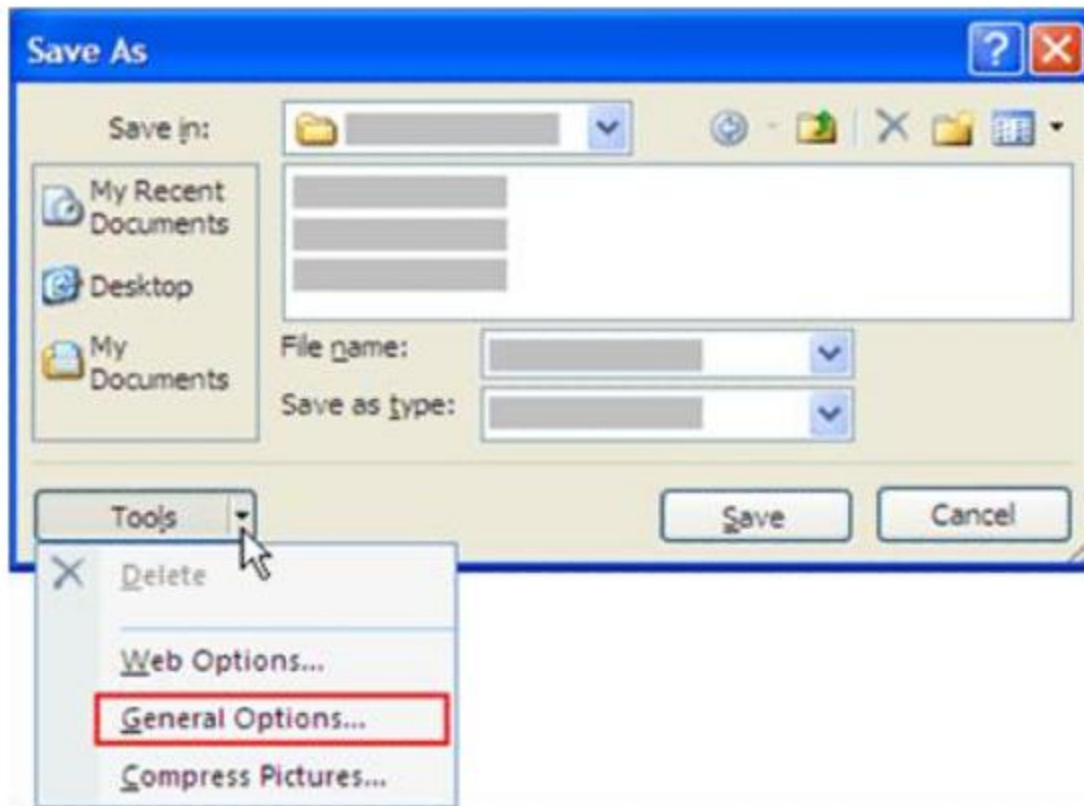
- In the **Encrypt Document** dialog box, in the **Password** box, type a password, and then click **OK**.
- In the **Confirm Password** dialog box, in the **Reenter password** box, type the password again, and then click **OK**.
- To activate password, **save the file**.



# FILE SECURITY

## *Set a Password to Modify a Document/Workbook/Presentation*

- To allow only authorized reviewers to modify your content:



- Click the **Microsoft Office Button** , and then click **Save As**.
- Click **Tools**, and then click **General Options**.

# FILE SECURITY

## Set a Password to Modify a Document/Workbook/Presentation



- If you want reviewers to enter a password before they can view the document, type a password in the **Password to open** box.
- If you want reviewers to enter a password before they can save changes to the document, type a password in the **Password to modify** box.

# FILE SECURITY

## Change a Password

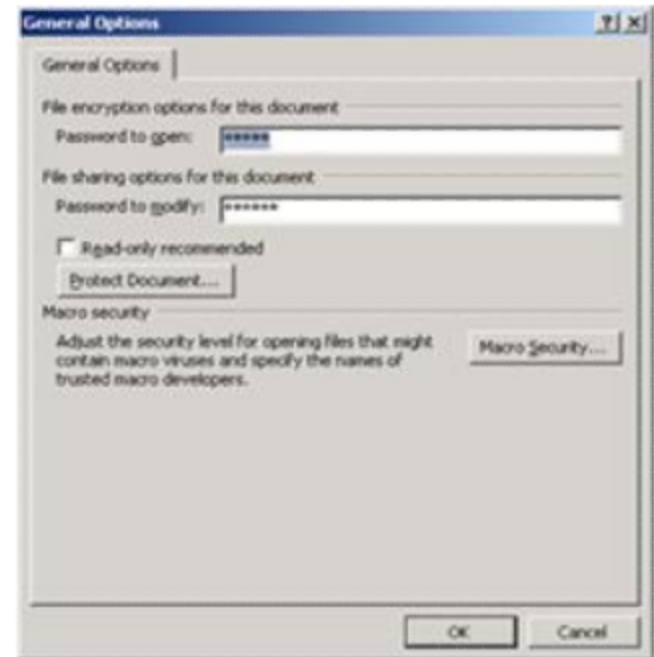
- Open the file using your open password or modify password
- Click the **Microsoft Office Button** , and then click **Save As**.
- Click **Tools**, and then click **General Options**.
- Select the existing password, and then type a new password.
- Click **OK**.
- When prompted, retype your password to confirm it, and then click **OK**.
- Click **Save**.
- If prompted, click **Yes** to replace the existing file.



# FILE SECURITY

## Remove a Password

- Follow the first three steps of changing a password to open **General Options** dialog box
- Select the password, and then press DELETE.
- Click **OK**.
- Click **Save**.
- If prompted, click **Yes** to replace the existing file.



**NOTE:** Use strong passwords that combine uppercase and lowercase letters, numbers, and symbols. Weak passwords don't mix these elements. A strong password: **Y6dh!et5**. A weak password: **House27**. Passwords should be 8 or more characters in length.



# Computer Security

- You need to protect your computer from harm if you;
  - connect the Internet.
  - allow other people to use your computer.
  - share files with others.



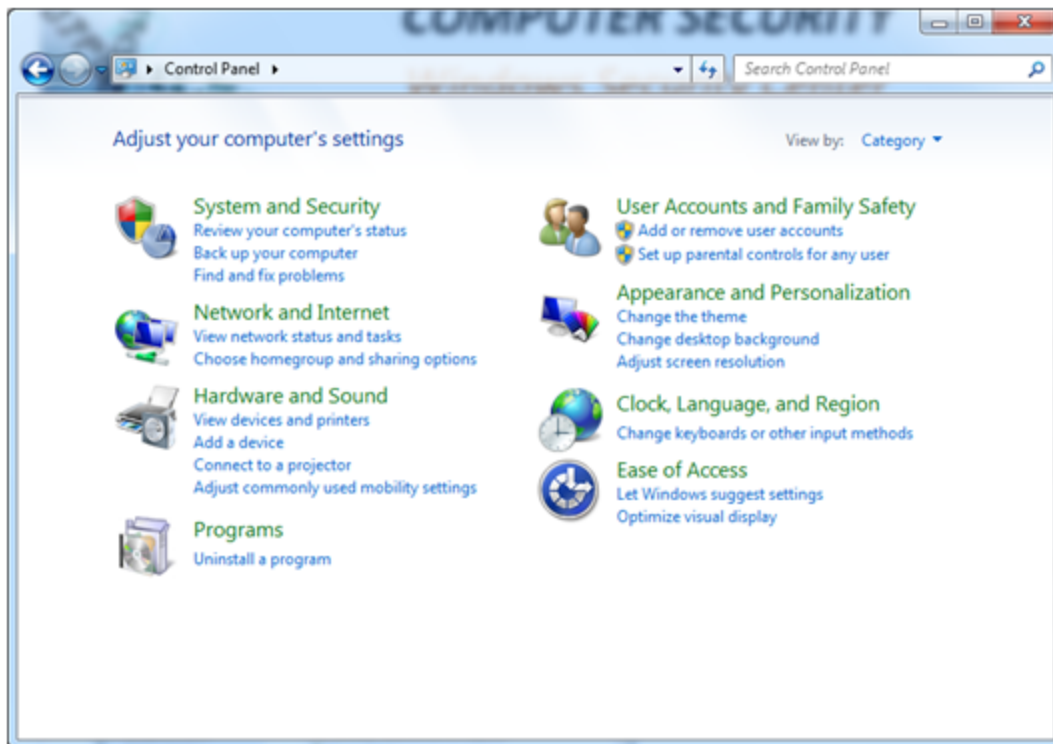
# Computer Security

- Computer criminals (hackers or crackers) can attack
  - Directly, by breaking into your computer through the Internet and stealing your personal information
  - Indirectly, by creating malware (MALicious softWARE)
- Malware is any software designed to cause damage to a single computer, server, or computer network, whether it's a virus, spyware, Trojan, etc.
- Fortunately, you can protect yourself by taking some simple precautions.

# COMPUTER SECURITY

## Windows Security Center

- Windows Security Center is your headquarters for computer security.
- It shows your computer's current security status and help you to make your computer more secure.



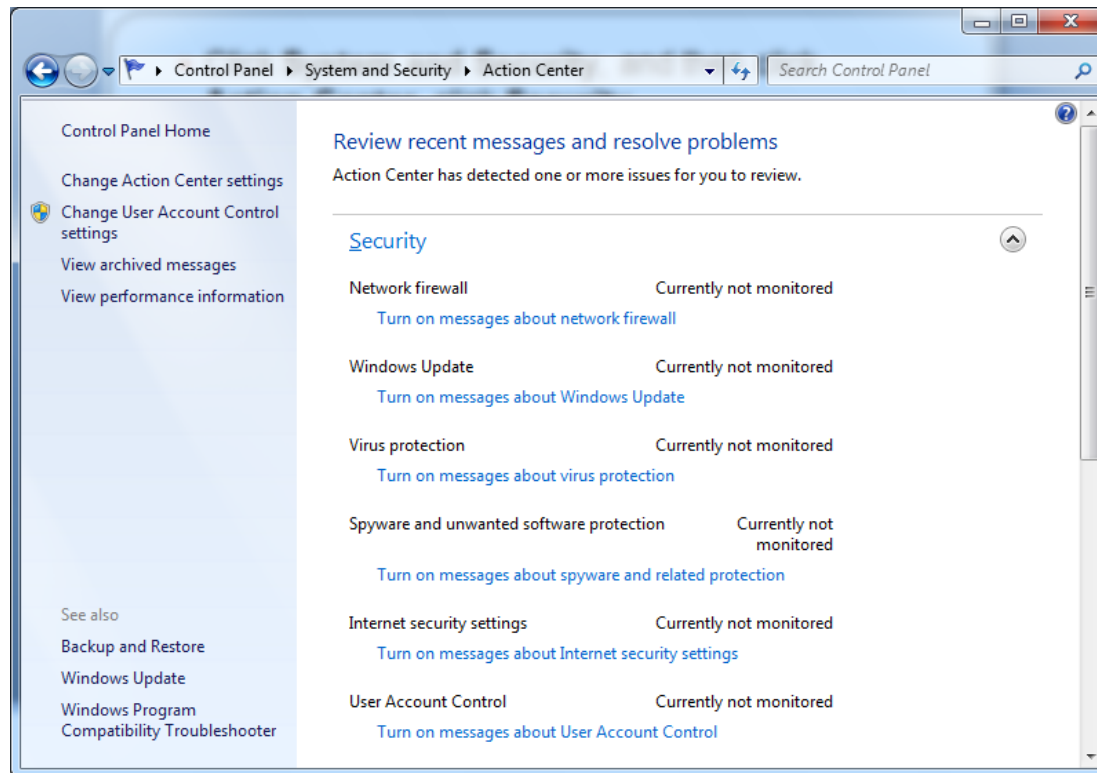
- To open it:
  - Click the **Microsoft Office Button** , and then click **Control Panel**.



- Click **System and Security**, and then click **Action Center**, click **Security**



- Security Center checks your computer for these security essentials:
  - Firewall
  - Automatic updating
  - Malware protection
  - Other security settings



# COMPUTER SECURITY

## *Viruses, Worms and Trojan Horses*

- Viruses, worms, and Trojan horses are malicious programs.
- They can
  - cause damage to your computer and to the information located in your computer.
  - slow down the Internet.
  - use your computer to spread themselves to others.
- The most common method used for spreading malicious programs is through e-mail attachment.



**IMPORTANT NOTE:** If you receive an e-mail with an attachment from someone you don't know, delete it immediately.

# COMPUTER SECURITY

## Viruses



- A **virus** is a piece of computer code that attaches itself to a program or file so it can spread from computer to computer.
- It infects as it travels.
- Viruses can damage your software, your hardware, and your files.
- A true virus **does not spread** without human action.
  - Sharing a file.
  - Sending an e-mail.

# COMPUTER SECURITY

## Viruses

- **Programs and documents:** programs and documents can be infected with viruses. When you share them with other users, by putting them on your network or intranet, or by sending them out, the infection can spread.
- **Email:** Email can include infected attachments. If you double-click on an infected attachment , you risk infecting your machine. Some emails even include malicious scripts that run as soon as you preview the mail or read the body.
- **The internet:** You may download programs or documents that are infected. Security vulnerabilities in your operating system can also allow viruses to infect your computer via the internet connection, without your having to do anything at all.
- **CDs and Floppies:** Floppy disks can have a virus in the boot sector. They can also hold infected programs or documents. CDs may also hold infected items.

# COMPUTER SECURITY

## Worms



- A **worm**, like a virus, is designed to **copy itself** from one computer to another, but it does so **automatically**.
  - Once a worm is in your system, it can travel alone.
  - Takes control of features on the computer that can transport files or information.
  - A great danger of worms is their ability to replicate in great volume.



# COMPUTER SECURITY

## Worms



- A worm could send out copies of itself to everyone listed in your e-mail address book.
- Those computers would then do the same, and so on.
- This causes a domino effect of heavy network traffic.
- They can also tunnel into your system and allow somebody else to take control of your computer remotely.
- Recent examples of worms included the **Sasser** worm and the **Blaster** worm.

# COMPUTER SECURITY

## Trojan Horses



- **Trojan horses** are computer programs that appear to be useful software, but instead they compromise your security and cause a lot of damage.
- A recent Trojan horse came in the form of an e-mail that includes attachments
  - Claimed to be Microsoft security updates
  - Turned out to be viruses that attempts to disable antivirus and firewall software.
  - Trojans create a **backdoor** on your computer that gives malicious users access to your system, possibly allowing confidential or personal information to be compromised.
  - Unlike viruses and worms, Trojans do not reproduce by infecting other files nor do they self-replicate.





# COMPUTER SECURITY

## *Trojan Horses*



- Trojan horses can also be included in software that you download for free.
- Never download software from a source that you don't trust.
- Trojans typically do one of two things:
  - They either destroy or modify data the moment they launch, such as erase a hard drive.
  - They attempt to ferret out and steal passwords, credit card numbers, and other such confidential information.

# COMPUTER SECURITY

## *Antivirus Software*

- Antivirus programs scan e-mail and other files on your computer for viruses, worms, and Trojan horses.



- Some security software compatible with Windows are **McAfee, Norton, AVG**, etc.
- Select an antivirus program with an automatic update capability.

# COMPUTER SECURITY

## *Antivirus Software*

- Free online virus (**Trend Micro™ HouseCall**, **Symantec**, and **F-Secure** ) scan tools allow you to check whether your computer has been infected by malwares.
- Unless you own an anti-virus program, you can only detect a virus when it displays its harmful effects.
  - The computer slows down abnormally.
  - Unexpected error messages appear while running Windows applications ("application error", "system fault", "missing files" etc.).
  - The computer may not respond to your commands.
  - DOS operating system opens randomly.
  - Files cannot be opened.
  - Abnormal audio/visual behaviors take effect.
  - The computer performs other unwanted operations.

# COMPUTER SECURITY

## Spywares

- **Spyware** secretly gathers user information through user's Internet connection without his or her knowledge, usually for advertising purposes.
- For example, spyware can
  - install unwanted toolbars, links, or favorites in your web browser.
  - change your default home page.
  - display pop-up ads frequently.
  - secretly collect sensitive information.



# **COMPUTER SECURITY**

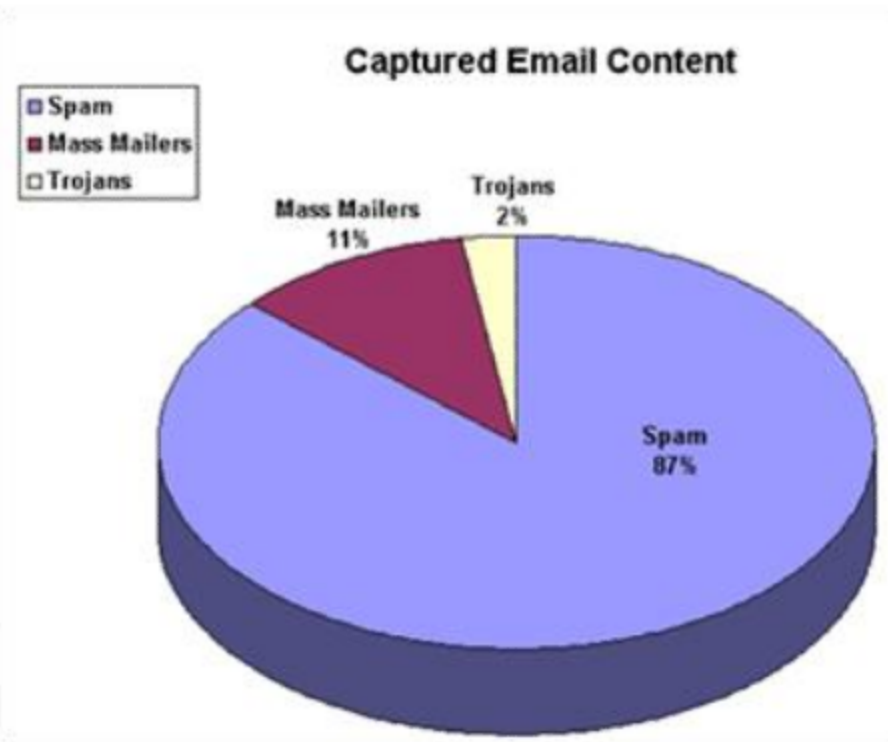
## *Protection from Spywares*

- To protect your computer from spyware, use an antispymware program.
- Windows Vista has a built-in antispymware program called Windows Defender, which is turned on by default.
  - Windows Defender alerts you when a spyware tries to install itself on your computer.
  - It also can scan your computer for existing spyware and then remove it.
- **Ad-Aware** and **Spyware Doctor** are two examples of antispymware programs that you can use.
- Because new spywares appear every day, antispymware programs must be regularly updated.
- For the highest level of protection, set Windows to install updates automatically.

# COMPUTER SECURITY

## Spam

- **Spam** is an unsolicited commercial e-mail (UCE).
- It is also known as junk e-mail.
- If you receive junk e-mail,
  - Do not click any links in the message.
  - Do not reply to it in any way and add the sender's e-mail address to the Blocked Senders list.



# COMPUTER SECURITY

## *Spam*

- An internet user should know that s/he can not receive a cash reward for forwarding messages.



# COMPUTER SECURITY

## Hoax

- A **computer virus hoax** is a false email message warning the recipient of a virus that is going around.
- You can recognize a hoax by searching some keywords in the message.
  - A request to "send this to everyone you know" or some variant of that statement. No real warning message from a credible source will tell you to send this to everyone you know.
  - Technical sounding language.
  - Credibility by association such as Microsoft and IBM.



# COMPUTER SECURITY

## Hoax

- Virus hoaxes are reports of non-existent viruses. Usually they are emails which do some or all of the following:
  - Warn you that there is an undetectable, highly destructive new virus.
  - Ask you to avoid reading emails with a particular subject line , e.g. Join the Crew or Budweiser Frogs
  - Claim that the warnings was issued by a major software company, internet provider or government agency, e.g. IBM, Microsoft, AOL or the FCC.
  - Claim that a new virus can do something improbable, e.g. The ***moment of silence*** hoax says that “no program needs to be exchanged for a new computer to be infected.”

# COMPUTER SECURITY

## Phishing

- “Phishing” is a form of Internet fraud that aims to steal valuable information such as credit cards, user IDs and passwords.

- **Citibank**

E-mail claims your [Citibank](#) ATM/Debit card PIN must be updated due to “a large number of identity theft attempts.”

- **eBay**

E-mail claims auction site [eBay](#) is sending out suspension notices via e-mail and asking customers to verify their account information.

E-mail claims auction site [eBay](#) is sending out notices requesting that users update their account information.

- **FDIC**

E-mail claims the [FDIC](#) insurance on your bank account has been cancelled by the Department of Homeland Security for violations of the Patriot Act.

- **IRS**

E-mail pretends to be the [IRS](#) sending out e-mails directing taxpayers to a web form to use to obtain tax refunds.

# COMPUTER SECURITY

## Firewalls

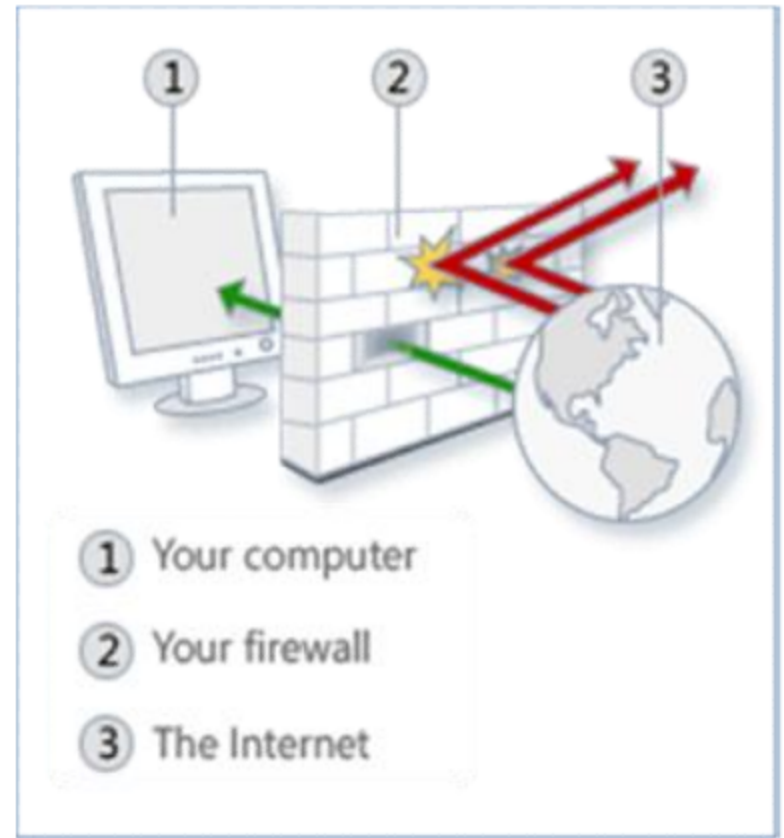


- A firewall is a software or hardware that checks information coming from the Internet or a network and then either turns it away or allows it to pass through to your computer, depending on your firewall settings.
- In this way, a firewall helps prevent hackers and malicious software from gaining access to your computer.
- Windows Firewall is built into Windows and is turned on automatically.

# COMPUTER SECURITY

## Firewalls

- If you run a program such as an instant messaging program or a multiplayer network game that needs to receive information from the Internet or a network,
  - The firewall asks if you want to block or unblock (allow) the connection.
  - If you choose to unblock the connection, Windows Firewall creates an exception
  - The firewall won't bother you when that program needs to receive information in the future.



# **COMPUTER SECURITY**

## *Internet Frauds*

- You can guard yourself while you are buying something via Internet by paying attention to general Internet fraud tips
  - Use a secure browser
  - Shop with companies you know
  - Keep your password(s) private
  - Do not use a password that you use for other aspects of your life, such as your school login.
  - Pay by credit or charge card
  - Keep a record of purchase order and confirmation number
  - Keep personal information private
  - Look for an online privacy policy

# COMPUTER SECURITY

## *Internet Frauds*

- Let's visit that web site for a secure online shopping!

<http://safecomputing.osu.edu/shopping.html>



# **OPTIMIZATION**

## *Disk Defragmentation*

- As you save, change, or delete files, both the file and the hard disk itself become fragmented, and your computer slows down as it has to look in many different places to open a file.
- **Disk Defragmenter** is a tool that rearranges the data on your hard disk and reunites fragmented files so your computer can run more efficiently.
- In Windows Vista, Defragmenter runs on a schedule so you don't have to remember to run it.

# **OPTIMIZATION**

## *Disk Cleanup*

- Use Disk Cleanup if you want to;
  - reduce the number of unnecessary files on your hard disk.
  - free up disk space.
  - help your computer run faster.
- To open Disk Cleanup click the Start button → All Programs, → Accessories → System Tools → Disk Cleanup



# **OPTIMIZATION**

## *ScanDisk*

- You can solve some computer problems and improve the performance of your computer by making sure that your hard disk has no errors.
- You have to run ScanDisk.
- Right-click the hard disk drive that you want to check, and then click Properties, Click the Tools tab, and then, under Error-checking, click Check Now.

## ***BASIC STEPS FOR TROUBLESHOOTING***

- When you have a problem with your PC, firstly you should ask the proper question related to it and check whether the cause of the problem is among the list.
- You can also find answers from different resources to fix the problems you have, especially if you don't know what to check;
  - Windows Help Troubleshooting options.
  - Discussion groups such as Google Groups.
  - Search engines such as Google.

# ***BASIC STEPS FOR TROUBLESHOOTING***

## ***Problem: PC Freeze***

- If your PC freezes up on you and you want to try to continue working, here are some steps to follow:
  - Press the **Ctrl, Alt** and **Delete** Keys on your keyboard at the same time and choose the **Task Manager** button, this will bring up the Windows Task Manager.
  - On the **Applications Tab** look for the **Status** of the program, if it says 'Not Responding' highlight that application and choose **End Task**. Choose **End Task** again when prompted.
  - Or you can try to **Switch To** a different task.
  - If this doesn't help, try restarting your computer by choosing the **Ctrl, Alt, Delete** keys again and choose the **Shutdown** button then choose **Restart**.

# ***BASIC STEPS FOR TROUBLESHOOTING***

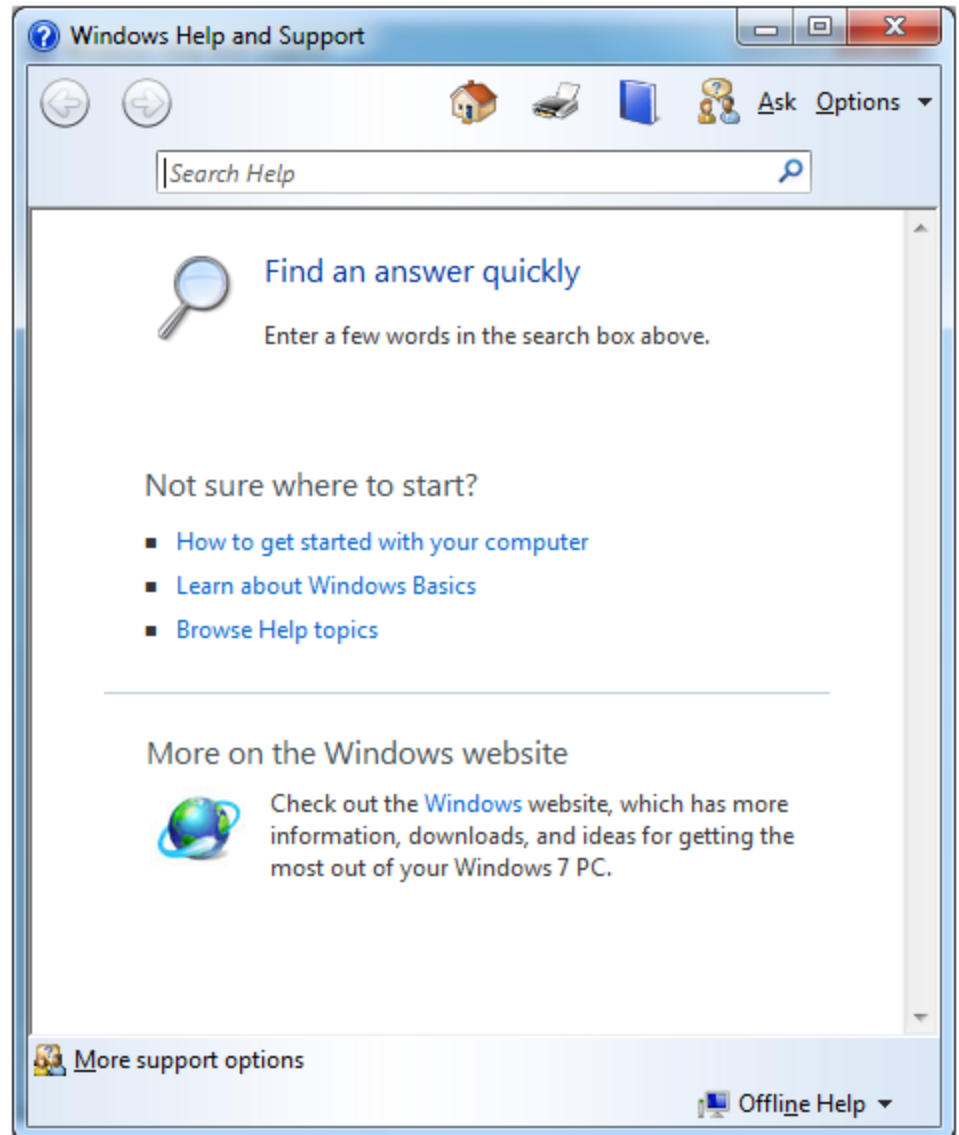
## *Problem: Equipment Failure*

- There are certain basic steps you can try when your hardware isn't working:
  - Is the power for the unit on?
  - Is the power surge strip powered on?
  - Are all cables tightly plugged in?
  - Try to power off and reboot all components (computer, router, printer, etc...)
  - Try to swap in an identical part (i.e. if the keyboard doesn't work try connecting a different keyboard to see if it works.)

# BASIC STEPS FOR TROUBLESHOOTING

## Windows Help and Support Center

- You can use Windows Help and Support Center to fix your problems
  - by entering one or more keywords that describe your problem
  - by choosing Troubleshooting option to see titles categorized according to specific types of problems.



# BASIC STEPS FOR TROUBLESHOOTING

## Discussion Groups

- You can also find answer to your problem by using discussion groups such as **Google Groups** .
- Google groups is a free service from Google where groups of people have discussions about common interests.
- URL address of the google groups is <http://groups.google.com>.
- You can make search here to find a discussion group that is related with your subject.



Question?