Inte 290 - Lesson 3

Introduction to Computer Usage and Document Design (Concordia University)

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Introduction to the Internet

What is the Internet?

The **Internet** is a large network of computer networks. It uses electronic communication to connect computers across the world so that they can share information. The Internet (and the name itself) comes from the idea of**inter**connected **net**works. So, no one really owns the Internet and no one really manages the Internet.

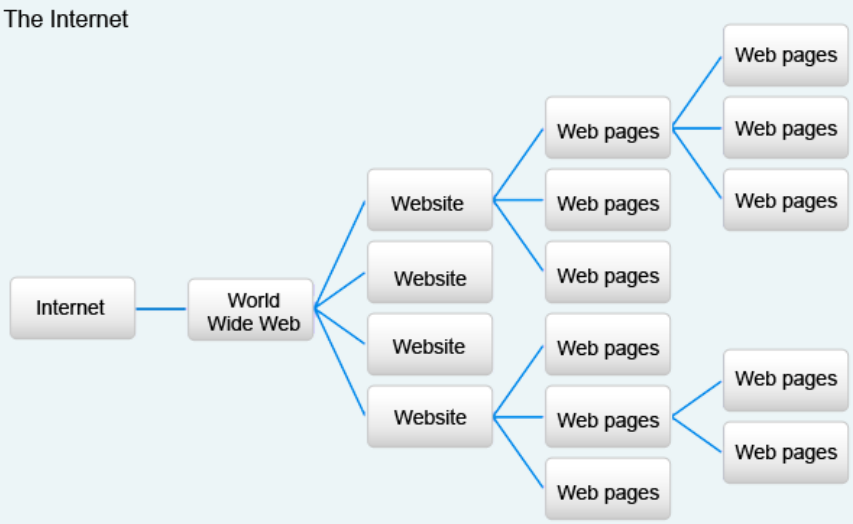
In 1958, the United States Department of Defense commissioned the development of a network of computers that could withstand nuclear attack. At this time, it was envisioned as a defense mechanism that would allow military communications to continue if normal communication lines were broken. Fast-forward to today, and realize that the Internet is a vast network comprised of computers that can communicate worldwide.

ARPA
The Internet was created in 1969 and based on research by the Advanced Research Projects Agency (ARPA), a branch of the U.S. Department of Defense. Later, it was developed into a broader network by a number of additional research projects.

The Internet is a way to stay connected with relatives or friends virtually anywhere in the world. It is also a way to search for information or research facts.

This Internet map displays all the networks that are interconnected with each other. The map keeps growing as our technology advances and more and more people and networks connect to the Internet.

What is the Internet? (cont'd)

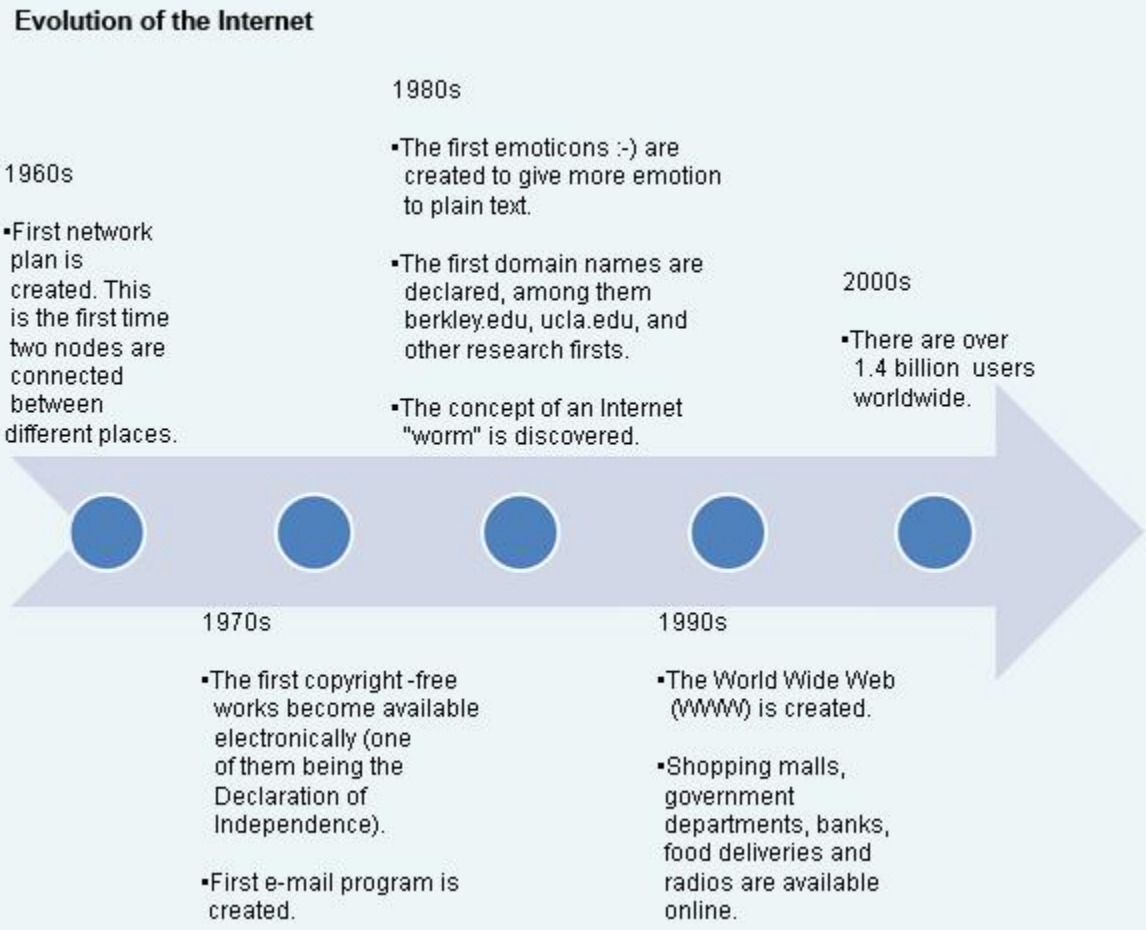


The **World Wide Web** (known as WWW or the Web) is a part of the Internet. **HyperText Transfer Protocol (HTTP**) is a set of rules that dictates how **Web pages** are formated and transmitted across the Web. A **Web server** is a computer that stores Web pages, has server software installed, is connected to the Internet and transmits data when requested.

A **website** is a collection of web pages. Websites are designed to display pages that include text, graphics, animation, sound, movies and links to other pages. The unique address for each Web page and Web resource is a **Uniform Resource Locator (URL)**. A**domain** is the name for the resources that make up a website. For example, www.econcordia.com is a domain. **HyperText Markup Language (HTML)** is a programming language used to create Web pages.

The Web became a part of the Internet in 1989. The number of pages available on the Web are numbered in the billions.

The Evolution of the Internet



Recent Internet Advances

The Internet has seen huge advances since the first two COMPUTERS were remotely linked. Now, you can even have normal VIDEO and audio conversations with friends and relatives around the world. You can watch movies and play games, and you can search for information on any topic you can think of. Stay

up to date by reading the most recent news, watching the most recent videos and listening to radio webcasts. The Internet alerts you to events happening around the world, right up to the minute!

Connect with friends and relatives using various Internet services, such as:

- CHAT (MSN, YIM, etc.)
- E-mail (Hotmail, Yahoo, Gmail, etc.)
- Audio Conference (Skype, MSN, Yahoo, etc.)
- Video and Audio (Skype, MSN, Yahoo, etc.)
- Blogs and social sites (Facebook, MySpace, etc.)

Research information

- Research newspapers and journals
- Research thousands of libraries ONLINE
- Gather online publications
- Gather upcoming online information

Internet = Interconnected Networks

- Networks are two or more connected computers, plus the various peripheral devices that are attached to them.
- Each object connected to a network, whether it is a computer or a peripheral device, is known as a node.
- Networks allow the computers to communicate and ultimately share information and resources.

Network Adapters

Each node (device or computer) in a network must have a network adapter. This is a device that allows the node to communicate with other nodes. They can be external (plugged into a USB port), but are usually internal and in the form of a **Network Interface Card (NIC)**, which fits into an expansion slot on a computer's motherboard.

Connections between nodes:

- Telephone wire (twisted pair cable)
- Coaxial cable
- Fiber-optic cable
- Wireless

Networks allow you to:

- Share peripherals (printers, scanners, and so on)
- Transfer information directly (without using external storage media such as CDs and flash

drives)

- Centralize information and reduce redundancy
- Connect to the Internet

Internet Connections

There are various way to connect to the Internet. A **dial-up connection** has a low transfer rate which means it has a slow connection. High-speed Intenet connections are also called**broadband**. Broadband OPTIONS include **DSL (Digital Subscriber Line)**, **cable** and **satellite**.

Internet Connections	
Dial-Up Modem	Up to 56 Kbps (Kilobytes per second) transfer rate
DSL (Digital Subscriber Line) Modem	Up to 1.5 Mbps (Megabytes per second)
Cable Modem	Variable transfer rate
Fiber Optic Internet	Up to 30 Mbps

Modems

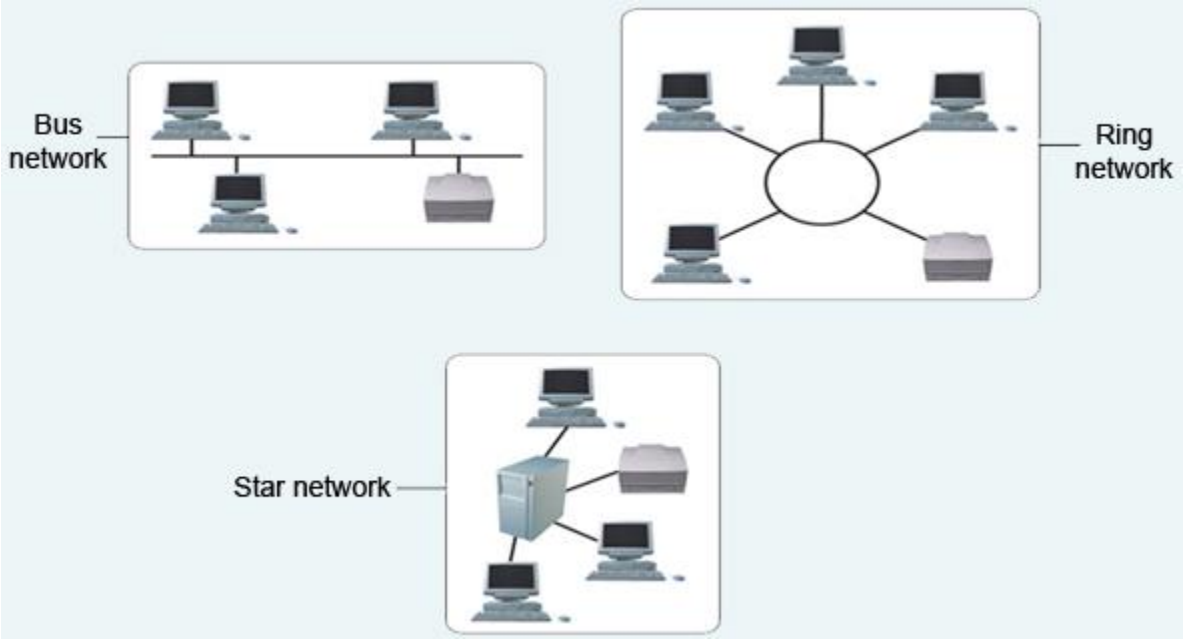
Modems are devices that allow your COMPUTER, which is digital, to understand analog signals coming through your phone line.

Routers and Switches

Routers handle the transfer of data from network to network. For instance, they are essential when connecting your home network to the Internet.

Switches work within a network. These devices make sure that data is transferred to the correct network node.

Topology

Topology


Topology	The physical shape of a network.
Bus or Linear	All nodes are connected in sequence on a SINGLE cable. Typical P2P network.
Ring	Nodes are connected in a circle.
Star	Each node connects to a central switch which re-transmits the data in the right direction.

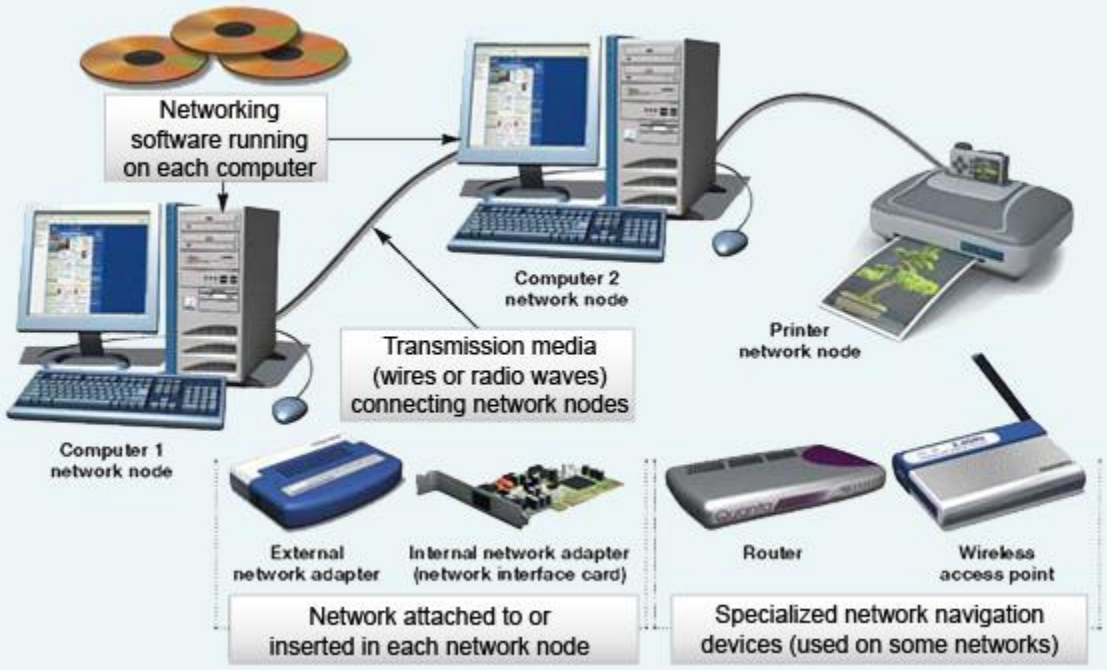
Networks

We know that the Internet is a huge network, but there are smaller networks that you may be familiar with. Networks can be differentiated by their size, their hierarchy and their topology. Ethernet is a specific network protocol that allows nodes to connect to each other. It is the standard for P2P networks.

Network Size (distance between nodes)	
LANs (Local Area Network)	Connects computers reasonably close together, as in the home, school computer lab or small office settings.
WANs (Wide Area Networks)	Multiple LANs connected. Connects computers over a larger geographic area, as in businesses or universities.
MANs (Metropolitan Area Networks)	Connects specific area networks, such as cities.

Network Hierarchy	
Peer-to-Peer (or P2P) Network	Every node in the network can communicate directly with every other node. Most home networks are this type.
Client-Server Network	The 'Server' computer acts like the central administrator for functions available to the 'Client' computers (such as printing). The Internet is a Client-Server network.

Network Components



Internet Service Providers

We now know what a network is, that the Internet is a large network, and what hardware we need to connect to this network. Is there anything else we need to know? Yes.

Internet Service Providers (ISP) are companies that provide Internet services to people. There are many companies in Canada, but major providers include:

- Bell (Sympatico)
- Videotron (in Quebec only)
- Rogers (rare in Quebec)
- Many other smaller companies

If you want to connect to the Internet at home, you will have to contact one of these companies either IN PERSON or by phone. They will set up your connection (using cables, a modem, and/or a router) to the Internet using their network.

The various ISP companies all have package plans that offer different Internet connection speeds (Dial-up, DSL, cable, and so on) and features. The speeds and features available often depend on where you live, and the choice you make will depend on how you intend to use the Internet. A lot of files uploading and downloading (especially music and VIDEO) will require higher speed (transfer rate).

What about Wireless Networks?

Wireless networks are becoming more and more popular. This is especially due to the increasing popularity of laptops and other portable devices. Wireless networks do not require your computer to be physically plugged into the Internet modem. Wireless networks use routers and a wireless network adapter (today, this is built in to all laptops).

Wireless networks work in the same way as regular wired networks except that once you connect to the Internet, your adapter connects to the router which in turn connects to an ISP. 802.11 standard is a method of communication used on wireless networks.

Hotspot

A **hotspot** is a place that has wireless access to the Internet. The most popular hotspots are airports, hotels, cafes, restaurants, libraries, bookstores and schools.

Most hotspots are not secure. This means that anybody can access them and therefore your computer may be vulnerable. Some hotspots have authentication enabled, meaning that you have to enter a username and password to access them. Most hotels, schools and libraries have this authentication and provide you with a username and password when asked.

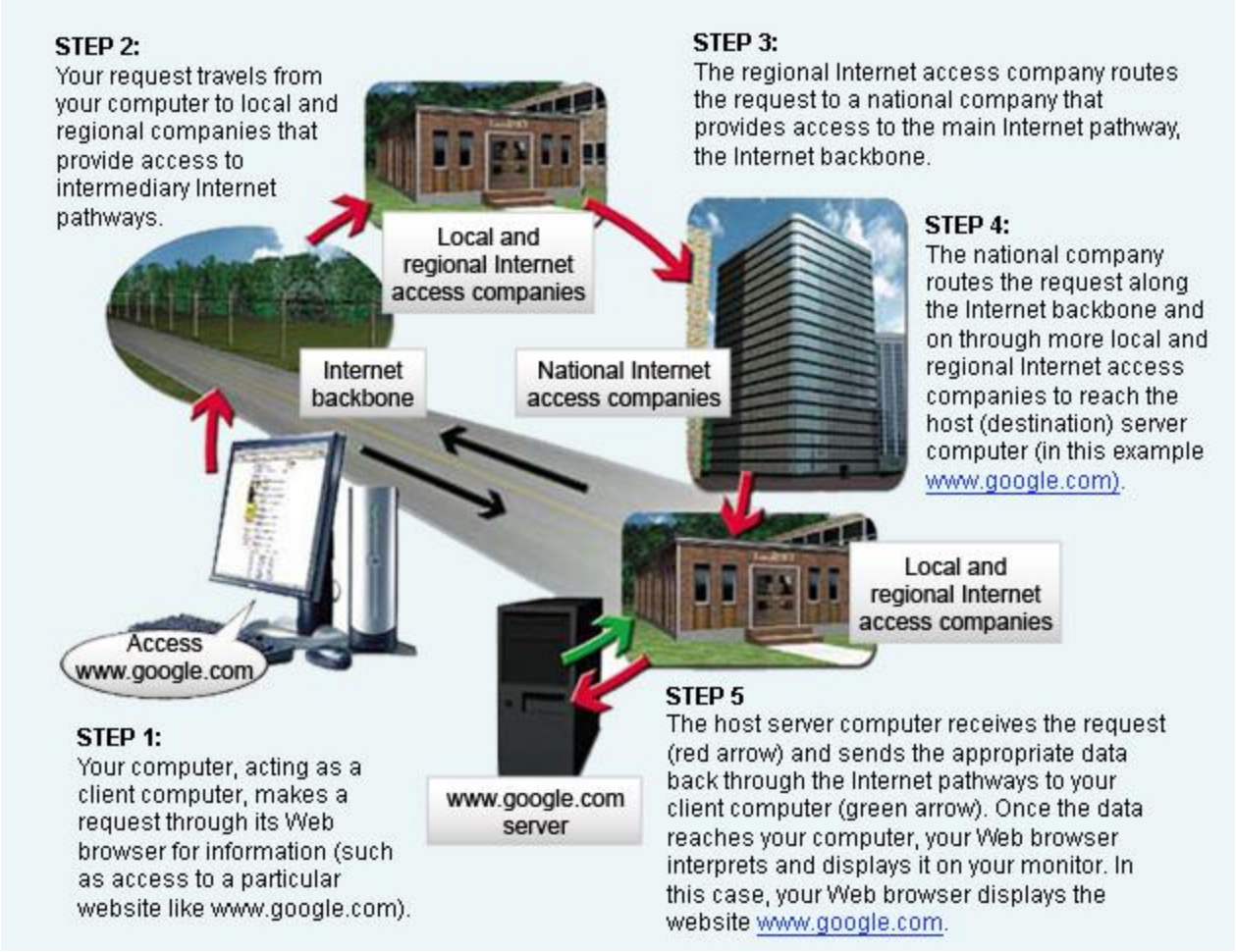
How Does it all Work?

We now have all the information we need. Let's turn to an example of how you connect your computer to the Internet.

Let's say you want to browse the following Web page: www.google.com.

What you need:

- A connection to the Internet using some sort of hardware (a modem or network card). A router will allow more than one computer to connect.
- An Internet browser such as Internet Explorer, Mozilla Firefox, or another browser (see later section). This software allows you to surf the Internet.



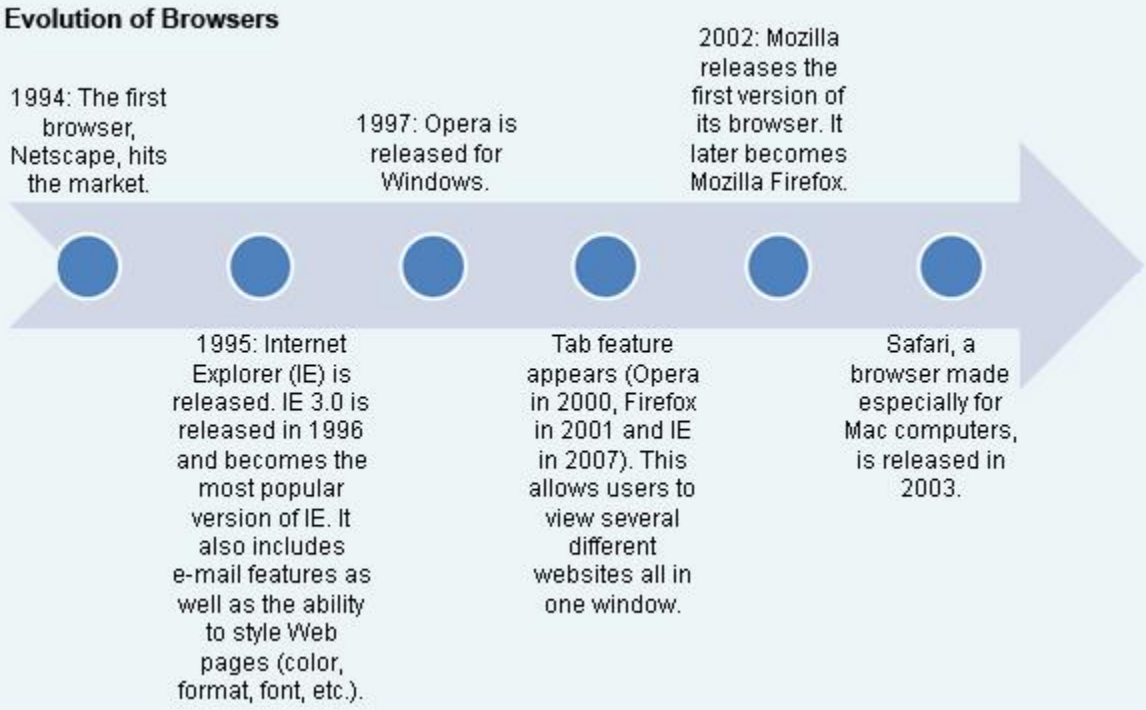
3. Once you have typed the address of the site you are looking for (Google) into your browser, your Modem (or Router) will connect to your Internet Service Provider (ISP) and send an Internet Protocol (IP) address. Each Web page has a unique IP address.
4. Your ISP will send the IP to Google's network server (a series of computers that store all their data).
5. Google will then send an IP packet (a series of IPs pointing to various Web pages and information) back to the ISP. In essence, this means that they are sending back the Web page you have requested.
6. Your ISP will send the IP packet to your modem (or router), and your Web browser will display the information. All of this usually happens in less than a few seconds (depending on your access speed)!

What is a Browser?

What is a Hyperlink?
A **hyperlink** is a reference (usually displayed in a different font, color, style or underlined) such as: www.econcordia.com. It "links" or references another document, Web page or website. A website usually has many hyperlinks that link all the Web pages together.

Example:
A personal website will usually have a home page that welcomes the audience to the website (and displays any upcoming news or events). Other pages such as a portfolio or 'About Me' page are accessed through hyperlinks.
Usually your mouse cursor (an arrow) will change to a hand icon when moved across a hyperlink.

A **browser** is an application that allows you to locate, view and navigate Web pages. There are several Web browsers available, but the most commonly used are Internet Explorer, Mozilla Firefox, Safari and Opera. Most Web browsers have extra features that allow you to set up your favorite websites, your home page and your privacy settings. Computers that you buy in a store usually come with Windows Vista (operating system) and **Internet Explorer 7**. Internet Explorer 7 now has Tabs. It allows you to view many websites in the same window. Different browsers can be downloaded from their developer sites, but most computers come with at least one browser already installed. Web browsers enable you to navigate the Web by clicking on hyperlinks.



Evolution of Browsers (cont'd)

The most popular browsers currently in use are Internet Explorer and Mozilla Firefox. The table below lists some common browsers and some similarities and differences which may influence your preference.

	Internet Explorer	*Mozilla Firefox*	*Opera*	*Safari*

Features	Optimized for Windows Operating System (since it's owned by Microsoft). IE's latest version uses tabs to differentiate between different websites all in one window. IE has small issues with security. IE has features for bookmarking favorite websites. It also gives you options to change privacy settings and trusted vs. non-trusted websites.	Firefox is open source and works on all platforms. It is owned by the public GNU license and components can be added to it, unlike IE. Firefox has better security features and is widely considered to have more protection. The 2001 version of Firefox has tabs and allows user to bookmark favorite sites and to set up options for privacy. Open source allows for add-ons (features).	Opera was an early player in the Web browser game. It has returned to the market and is growing fast. It was the first browser to have tabbed windows (2000). It works on all platforms. Opera is ery popular on cell phones because it uses shortcuts and has all of the same features as IE and Firefox. It is c onsidered highly secure, like Firefox.	Safari was the first Web browser made specifically for the Mac computer. It is the default browser that comes with a Mac as well as with iPods and iPhones (and most other i-devices). Safari can also be used on the Windows platform.
Website	Internet Explorer	Firefox	Opera	Safari