TCP/IP, ISP, BROWSERS, HOME PAGES

Unit Overview

Have you ever wondered how your email messages get from your computer to your friend's computer so quickly? In this unit you will find out how your information travels in cyberspace.

What is the Internet?

The Internet is a *packet-switched network*, meaning that information is broken down into small data packets and sent individually over different routes at the same time. These data packets are reassembled at the receiving end.

In 1974, researchers invented the *Internet Protocol Suite*, *or Transmission Control Protocol/Internet Protocol (TCP/IP)*. TCP/IP created a set of rules that allowed computers to "*talk*" to each other sending information.

When you send information online, your computer uses TCP/IP. *TCP/IP* is standard Internet communications protocols that allow digital computers to communicate over long distances. TCP/IP ensures interconnected devices understand each other so that they can send information back and forth. *Transmission Control Protocol (TCP)* is the component that collects and reassembles the packets of data. It prepares information to be sent and received. The *Internet Protocol (IP)* is responsible for making sure the data packets are sent to the right destination.

The early inventors of the Internet discovered that data and information can be broken into smaller chunks, sent separately, and reassembled. These small chunks are called *data packets*. For *example*, when you send an email across the Internet, your message is broken down into data packets, sent to your recipient, and reassembled. These data packets are then labeled by the IP program on your computer. These labels show the Internet address of your friend's computer. TCP assigns a sequence number to the data packets before they leave your computer. The data packets then go out on the Internet using different paths.

Because some data packets take shorter routes than others, they arrive at your friend's computer at different times and in the wrong order. TCP tells your friend's computer how to reassemble the data packets in the correct order. This may seem like a long process, but it actually happens in milliseconds.

Another *example* would be watching a video on a website like *YouTube*. The video files are segmented into data packets that can be sent from multiple YouTube servers around the world.

The data is reassembled to form the video. You can then watch the video through your Web browser.

Internet Service Provider

An *Internet Service Provider (ISP)* is a company that provides Internet connections and services to individuals and organizations. In addition to providing access to the Internet, ISPs offer a wide variety of services. Some of the services may include software packages (such as browsers), e-mail accounts, and a personal website or home page. When choosing an ISP, you need to consider the following:

- The speed or bandwidth of the connection
- The cost of service and type of connection
- Availability of customer service and technical support

Everyone who has access to the Internet has an *Internet Service Provider (ISP)*.

To learn more about the internet connections, click on the links and/or the PDFs listed below:

Shopping for an ISP   PDF: Shopping for an ISP

List of ISPs   PDF: List of ISPs

What are the Types of Internet Connection Methods?

When you set up an account with an ISP, you must decide what type of connection is needed to access the Internet. Some common ways to connect to the Internet are through the use of a *telephone line, cable, satellite, microwave, and mobile wireless*. Home computers can connect to an ISP using a telephone line or cable connection. They can also access the Internet using mobile broadband services offered by cellular wireless providers. Local area networks are connected to an ISP through high-speed telephone lines or cable. A notebook computer with a Wi-Fi card can connect to a wireless access point or a hotspot. Cell phones, PDAs, and smartphones can connect to the internet using a wireless internet connection. The table below summarizes ISP and Internet connections.

Internet Connection Methods	
Dial-up	- Least expensive method of connecting - Connect via telephone line - Slowest connection speed and cannot make telephone calls while connected - Might be disconnected after set amount of time - Good for occasional Internet users who don't require speed - Requires user to log on to begin online session
ADSL	- High speed - Dedicated connection, so no busy signals - Always connected; no need to log on - No need for extra line for voice telephone calls - Allows user to be online and talk on the phone at the same time - Available only near telephone company central office
Cable	- High speed - Dedicated connection, so no busy signals - Always connected; no need to log on - Up to 70 times faster than dial-up connections - Available only where cable is offered - Slows down when too many neighbors are online
T1	- High speed - Faster than cable or DSL - Too expensive for individual users - Usually found in schools or large businesses
Satellite	- High speed - Available everywhere - Expensive equipment needed - Weather can interfere with signal - Potential lag time
Microwave	- High speed - Line of sight to tower required - Only available locally - Range must be within 35 miles of tower
Wi-Fi	- High speed - Wireless - Mobile Use - Limited availability - Must remain within 300 feet of receiver - Might experience interference from cordless phone or microwave oven - Requires Wi-Fi card
Mobile wireless	- High speed - Mobility - Risk of poor or no connectivity in some areas - Bandwidth usage restrictions - Cost

To learn more about the internet connections, click on the link and/or the PDF listed below:

Types of Internet Connections   PDF: Types of Internet Connections

The Beginnings of the Web Browser

The early Internet was not valuable to the common person. Information was text-based and extremely hard to find. The Internet was an obscure tool used mostly by scientists and researchers. **Marc Andreessen**, a computer science student from the University of Illinois, was fascinated by the World Wide Web concept that Dr. Tim Berners-Lee had developed. Andreessen had a dream that one day the Internet's information would be graphical and more accessible to the average person. Soon after Marc Andreessen saw what the new World Wide Web could do in 1992, he thought a graphical interface for the browser would let everyone use the Web. He and seven other student programmers at the University of Illinois wrote the world's first graphics Web browser, *Mosaic*, in 1992. By March 1993, Marc Andreessen and Eric Bina, two University of Illinois graduate students, created the ***Mosaic browser***. They were employed at the university's National Center for Supercomputing Applications (NCSA). All of our modern-day Web browsers are descendants of Anderson's *Mosaic*.

To learn more about Marc Andreessen, click on the links listed below:
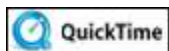
Wiring the World: A Human Face   PDF: Wiring the World: A Human Face

Marc of the Valley   PDF: Marc of the Valley

Web Browser

A ***Web browser*** is a software program that allow computers to find and view information on the Internet. This program on your computer allows you to access and view Web pages.

QuickTime Introduction and Browser Menu Bar (04:27)

The Microsoft Internet Explorer Browser

 Windows Internet Explorer is the most widely used browser for personal computers in home and business settings. The features within Internet Explorer make browsing the Web a breeze!

Exploring Other Browsers

Some other popular used browsers are *Opera, Firefox, Google Chrome, and Safari*. These Web browsers perform many of the same tasks, but each one has features that make it unique. While most people have a preference for one particular browser, you may find that different browsers are helpful when you perform different tasks. Businesses tend to use Internet Explorer, while graphic designers usually prefer Firefox. Open-source software plays a big role in today's Web browsers. "*Open source*" means that the "*source code*" of a software are made available to all. Anyone can look into the source code, see how it works, tweak it, and reuse it in other products or services. An internet user's browser choice depends on the tasks they want to accomplish online.

The Opera Browser

 The *Opera browser* is a free Web browser developed by Opera Software. This browser is a highly secure browser that protects against spyware and viruses that can infect your computer when browsing the Web. It has built-in e-mail, client and newsreader, and a chat client. Opera also supports voice commands, a great tool for users who have trouble using a keyboard or mouse!

The Firefox Browser

 The *Firefox browser* is a free open source Web browser created by American software company Mozilla Corporation. The open source software programming code is available to software users. The Firefox open source browser is known for the high level of security for conducting online banking or shopping transactions and for the protection against hackers.

The Google Chrome Browser

Google Chrome, developed by Google, presents a streamlined interface with page tabs on the title bar. The Google Chrome Address bar is used to both enter URLs and to act as the search text box for the default Google search engine. This browser also offers a stealth mode. In this mode, you can open an Incognito window and then browse the Web from the window without updating the browsing history. This provides an easy way to surf the Web in private.

The Safari Browser

The Safari browser is developed Inc. for the Windows operating system environment. This browser is known for fast page download times. This browser has a Top Sites feature in which the browser "*learns*" a user's browsing habits, presents clickable thumbnail images of a user's most visited pages on a new page tab.

You can download multiple browsers on your computer. Feel free to download one that you do not currently use and give it a try.

Home Page

The term *home page* is commonly used when referring to the Web. There are three general meanings.

- A *home page* is the main Web page that all the Web pages on a website are organized around and link back to. It is usually the first Web page that opens when you visit a website.

- A *home page* is also a Web page that a Web browser displays the first time you use it. The Web page is usually the main Web page of the company that installed or created the Web browser software. This is also referred to as *start page*.

- A home page is also the first page that opens when you start up your Web browser software. This type of *home page*, or *start page*, might be an HTML document stored on your computer or the main Web page of a favorite website. For *example*, if you are using a computer at school, the Web browser might be configured to display the main Web page for the school.

Your software is programmed to automatically open to a specific page, but you have the option of changing this page. Most people set their computer's Internet home page to some website that they use often.

Some companies offer personalized home pages at no charge. Set your computer's home page to Yahoo, and you'll be able to customize what appears each time you launch your Web browser. You can see current events, the weather, your email, sports scores, or whatever you choose to include on your home page. Yahoo employees spend hours each day looking for appropriate sites to give its users valuable information such as maps, yellow pages, people searches, and other tools.

You may want to set your computer's home page to the site that you use most often. Try this activity to change your computer's home page. The directions below will walk you through the steps for Internet Explorer or Firefox. If you are using a different browser, you will need to adjust the directions.

Internet Explorer	Firefox
1. Go to the menu bar at the top of your Internet screen. 2. Click the word Tools. Then click Internet Options. 3. Be sure that the General tab at the top of the screen is selected. 4. There should be a section labeled Home Page. There will be a URL already in the address bar. Just delete that address and type in the URL of the site you want for your own home page. Then click OK.	1. Go to the menu bar at the top of your Internet screen. 2. Click the word Tools. Then click Options. 3. Be sure that the Main tab at the top of the screen is selected. 4. There should be a section labeled Home Page. There will be a URL already in the address bar. Just delete that address and type in the URL of the site you want for your own home page. Then click OK.

When you get back to your regular browser window, click the Home button at the top of the page. This should take you to the website that is now your home page.

If these directions don't work for your browser, just go to the Help section of your browser software. Do a search for home page, and follow the directions that are given.

The Webmaster

A *webmaster* is the person who creates, organizes, and manages the website you are viewing on the Internet. Sometimes the webmaster is referred to as the web developer, architect, author, or administrator. In addition to creating the visual portion of the website, the webmaster may also be responsible for verifying that servers, hardware, and software are operating correctly. Larger sites may have more than one webmaster, dividing the responsibilities of the visual and hardware aspects of the site between two or more people.

The best webmasters have a working knowledge of HTML, PHP, CSS, Java, Flash, and other web-based languages and programs. Successful webmasters make respectable salaries, but may work long hours. Some of the webmaster's hours may be worked late at night or very early in the morning, as they want to make changes and perform updates when most Internet users are not online. Companies must choose their webmasters carefully, because this person is in charge of the company's online image. The webmaster may also have access to sensitive information about the company and its employees. Many webmasters also manage company email systems. This increases the need for a person who can be trusted to keep sensitive information confidential.