Introduction

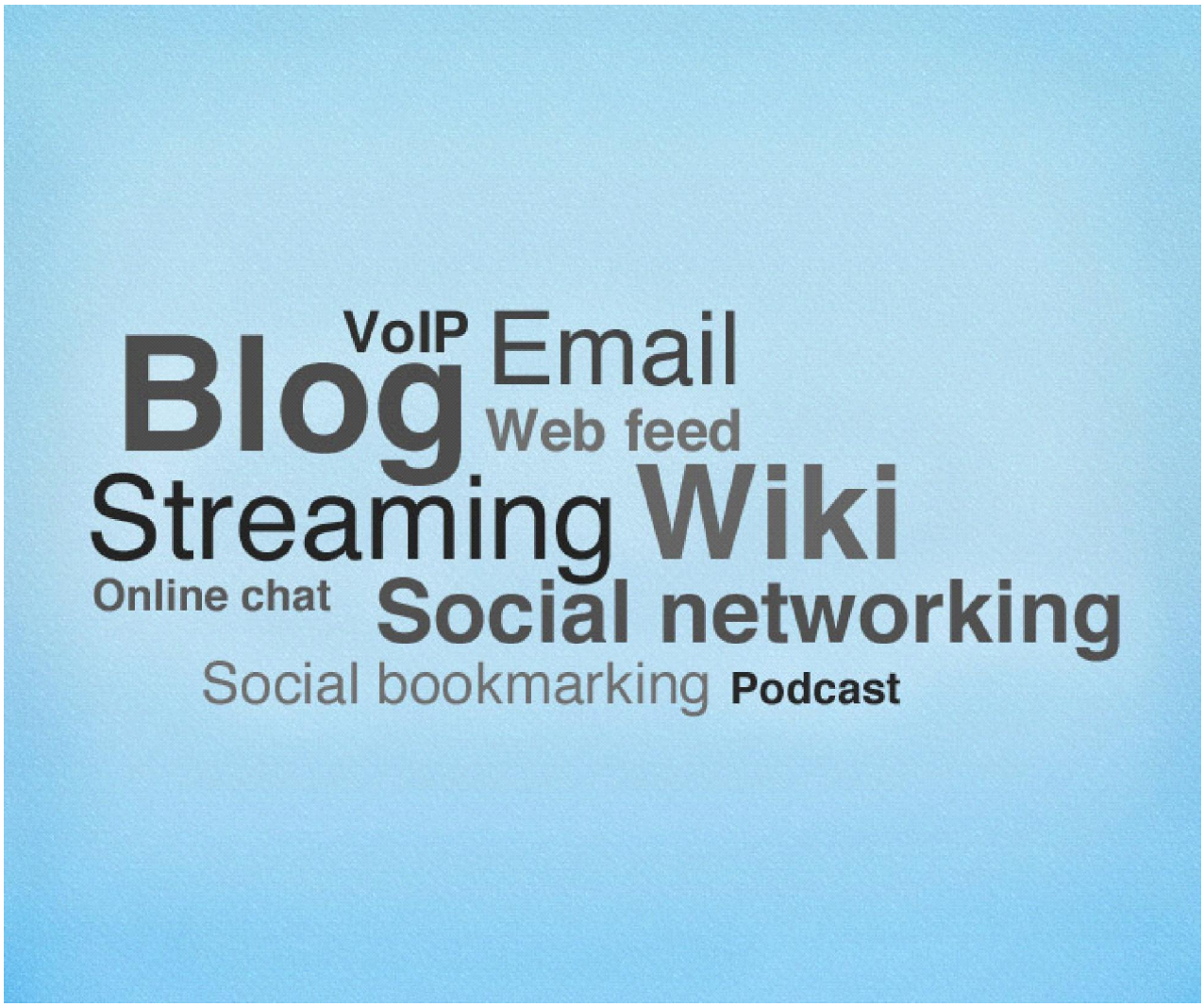
It's no secret that more and more the internet is becoming an integral part of our everyday lives. But if you are new to the online experience, it may be a bit overwhelming. You may be wondering, **"What exactly is the internet, and how does it work?"**

In this lesson, we will give a **brief overview** of the internet, and we will talk about some fundamental concepts such as **networks**, **servers**, and **clients**.

The Internet Today

In the early days, most people just used the internet to search for information. Today's internet is a constantly evolving tool, that not only contains an amazing variety of information, but also provides **new ways of accessing, interacting and connecting with people and content.** As a result, new terms are constantly appearing as new technologies are introduced.

Click the buttons in the interactive below to learn about **a few common terms** that you might encounter online.

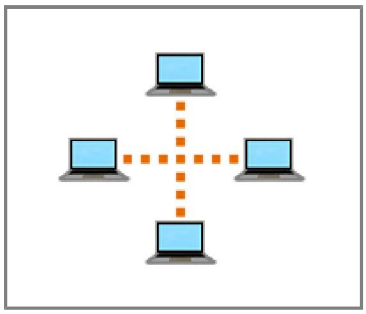


What is the Internet?

The internet is the largest **computer network** in the world, connecting millions of computers. A **network** is a group of two or more computer systems linked together.

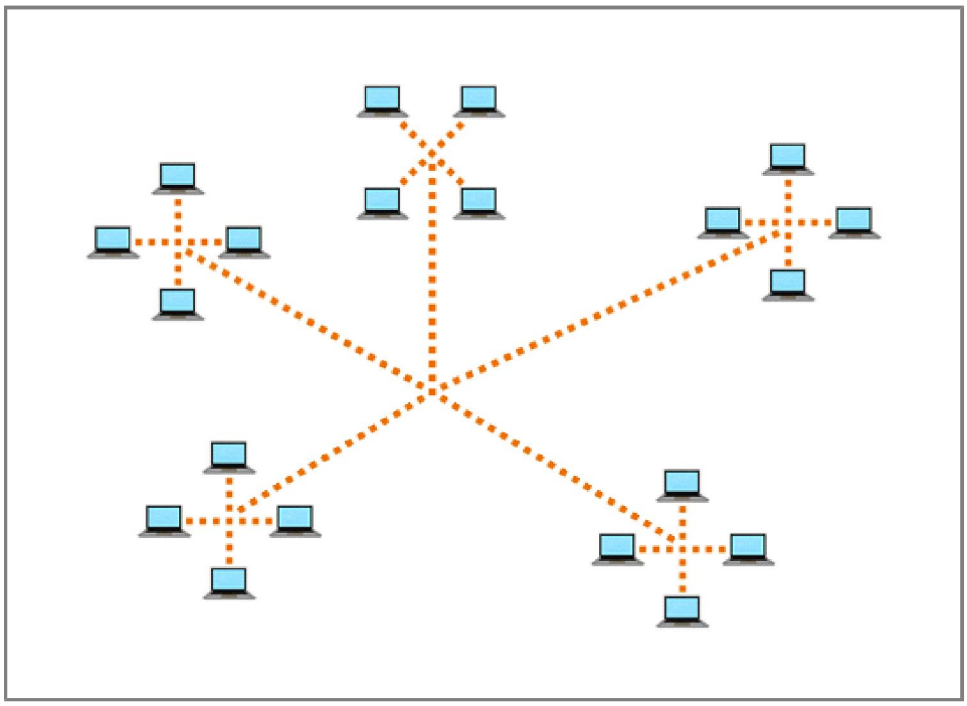
There are two main types of computer networks:

- **Local Area Network (LAN)**: A LAN is two or more connected computers sharing certain resources in a relatively small geographic location, often in the same building. Examples include home networks and office networks.



A Local Area Network (LAN)

- **Wide Area Network (WAN)**: A WAN typically consists of two or more LANs. The computers are farther apart and are linked by telephone lines, dedicated telephone lines, or radio waves. The **internet** is the largest Wide Area Network (WAN) in existence.



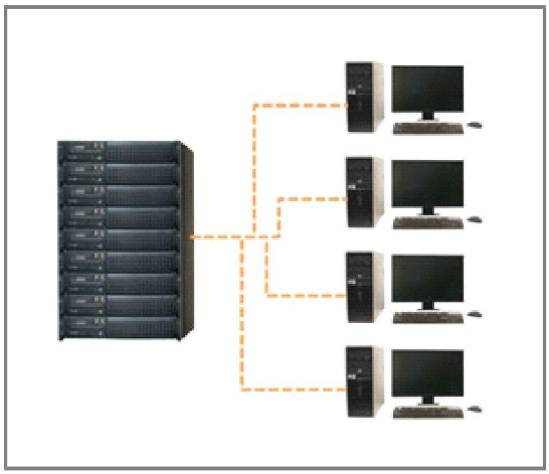
A Wide Area Network (WAN)

Servers and Clients

You may have heard someone say something like "The server is down" or "We're having problems with the e-mail server." A **server** is a computer that "serves" many different computers in a network by **running specialized software** and **storing information.** For example, web pages are stored on servers.

When you access a web page, your computer is acting as a **client.** A client runs familiar software such as **web browsers** or **email software**, and it communicates with the server to get the information it requires.

In order for your browser to display a web page, it **requests** the data from the server where the page is stored. The server processes the request, then sends the data to your browser, where it is displayed.



A server with multiple clients

In **peer-to-peer** (P2P) networks, each computer acts as **both a server and a client.** Examples of P2P software include Skype and BitTorrent.

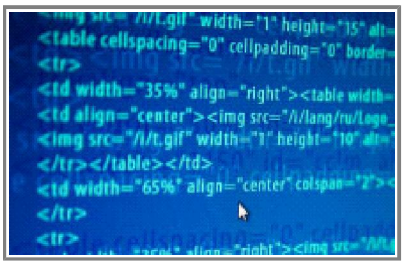
The World Wide Web (WWW)

When most people think of the internet, the first thing they think about is the **World Wide Web.** Nowadays, the terms "internet" and "World Wide Web" are often used interchangeably—but they're actually not the same thing.

- The **internet** is the **physical network** of computers all over the world.
- The **World Wide Web** is a **virtual network** of **web sites** connected by **hyperlinks** (or **"links"**). Web sites are stored on **servers** on the internet, so the World Wide Web is a part of the internet.

HTML

The backbone of the World Wide Web is made of **HTML files**, which are specially-formatted documents that can contain links, as well as images and other media. All **web browsers** can read HTML files.



HTML code

URL

To get to a web page, you can type the **URL (Uniform Resource Locator)** in a browser. The URL, also known as the **web address**, tells the browser exactly where to find the page. However, most of the time, people get to a web page by following a **link** from a different page or by searching for the page with a **search engine**.

An example of a URL

The World Wide Web was created in 1989 by **Tim Berners-Lee**, a software engineer. Before then, computers could communicate over the internet, but there were no web pages.

Did you know?

- The foundation of the internet began in 1969, when the US Department of Defense created **ARPAnet**, a project to allow military personnel to communicate with each other in an emergency.
- By 2012, the number of internet users worldwide reached **2.4 billion**—about one third of the world's population.
- To store all of the information on the internet, you would need over **1 billion DVDs** or **200 million Blu-ray discs**.

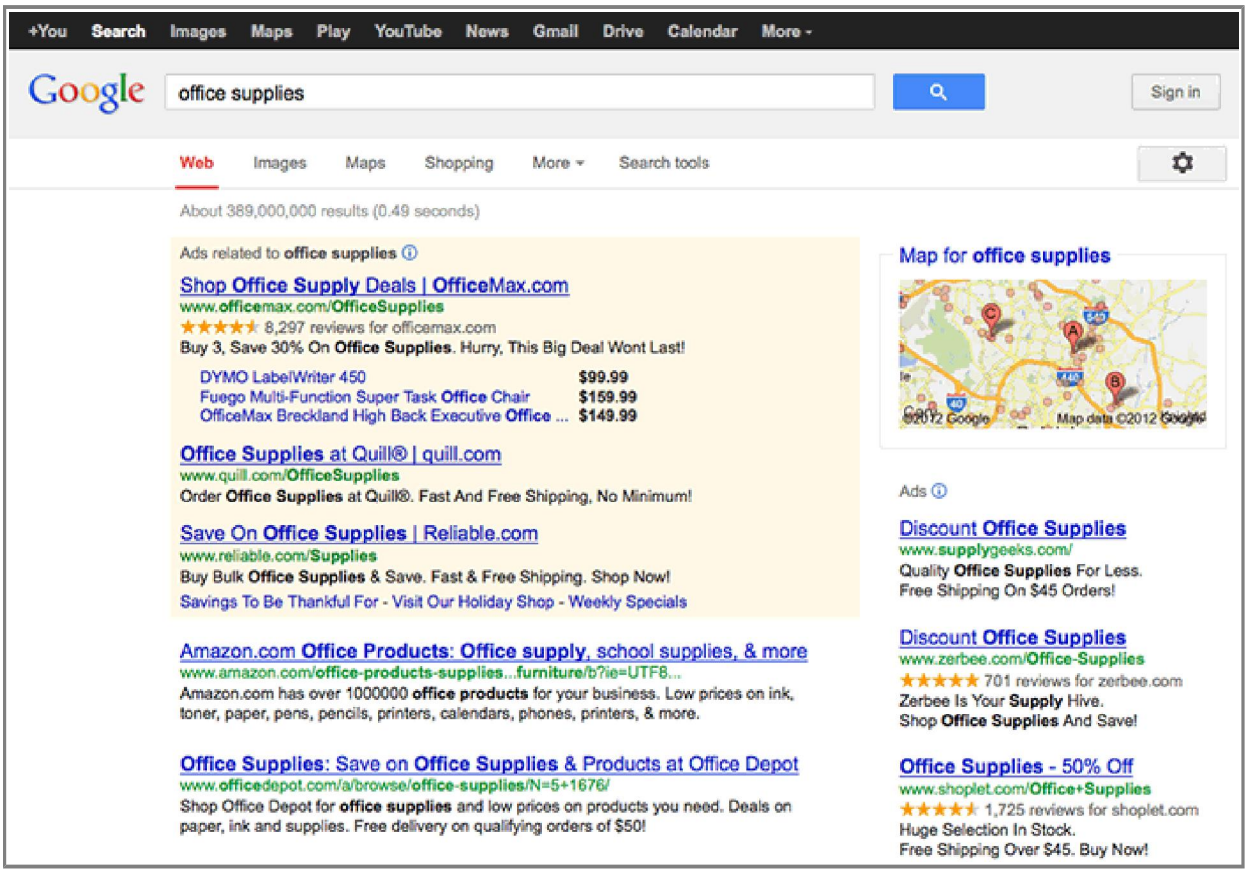
Introduction

As the internet has grown, it has developed into a multifaceted tool with a vast range of uses. It's now easy to **keep in touch with friends**, publish your own **articles**, or even watch your favorite **TV shows** using the internet.

In this lesson, we'll talk about some of the ways the Internet is used today, including **blogs**, **social networking**, **instant messaging**, **VoIP**, and **media.**

Finding Information Online

The most common way to find information online is with a **search engine.** All you have to do is type in a few words, and the search engine will give you a list of results that you can click on. There are many different search engines that you can use, but **Google** is the most popular one.



Using Google to search the web

Intelligent Personal Assistants

If you're using a mobile device, there are some situations where it's not convenient to type a search into a search engine. Instead, you can simply **talk** to your device's **intelligent personal assistant.** One example is **Siri**, which comes pre-installed on the **iPhone 4S** and the **iPhone 5**.

Asking Siri a question

With Siri, you can ask a question like **"What's the weather today?"** or **"Are there any Thai restaurants nearby?"** Siri will then try to give you an answer. You can also use Siri to do other things on your device such as setting up reminders. For example, you could say, **"Remind me to go to the dentist on Thursday."**

For more information, you can go to Apple's Learn more about Siri page.

Using the Internet to Communicate

The internet isn't just about finding information. It's also about connecting with friends, family, and people you've never met before. Today, there are many different ways to communicate online, including **social networking**, **chat**, **VoIP**, and **blogging**.

Social Networking

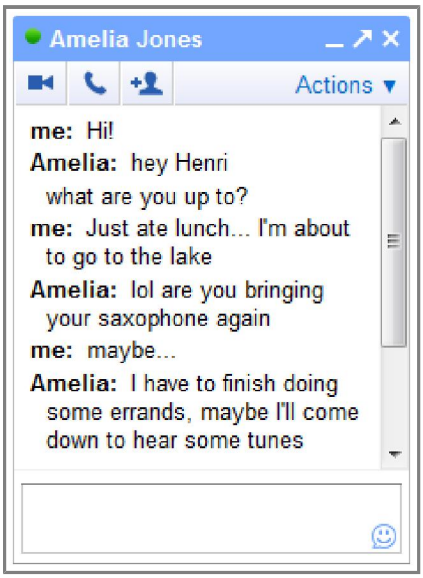
Social networking has become one of the main ways people keep in touch. Below are a few of the most popular social networking sites:

- **Facebook** is used by about **one billion people**. If you have family or friends that live far away, you can use Facebook to keep up with their lives. You can also share things you've found online that interest you.
- **Twitter** lets you share brief messages (or **"tweets"**) with the entire world, or with just your circle of friends. By following people with similar interests, you can discover new things that you wouldn't have found otherwise.
- **LinkedIn** is a site that you can use for **business networking**. It allows you to connect with other people in your field and find out about new job opportunities.

A Facebook News Feed

Chat and Instant Messaging

Chat and **instant messaging** programs allow you to have conversations with your friends or just write them a quick note. Two examples are **Yahoo! Messenger** and **Microsoft Messenger.** Some sites, such as **Gmail** and **Facebook**, allow you to chat within your browser.



A conversation using Gmail's built-in chat

VoIP

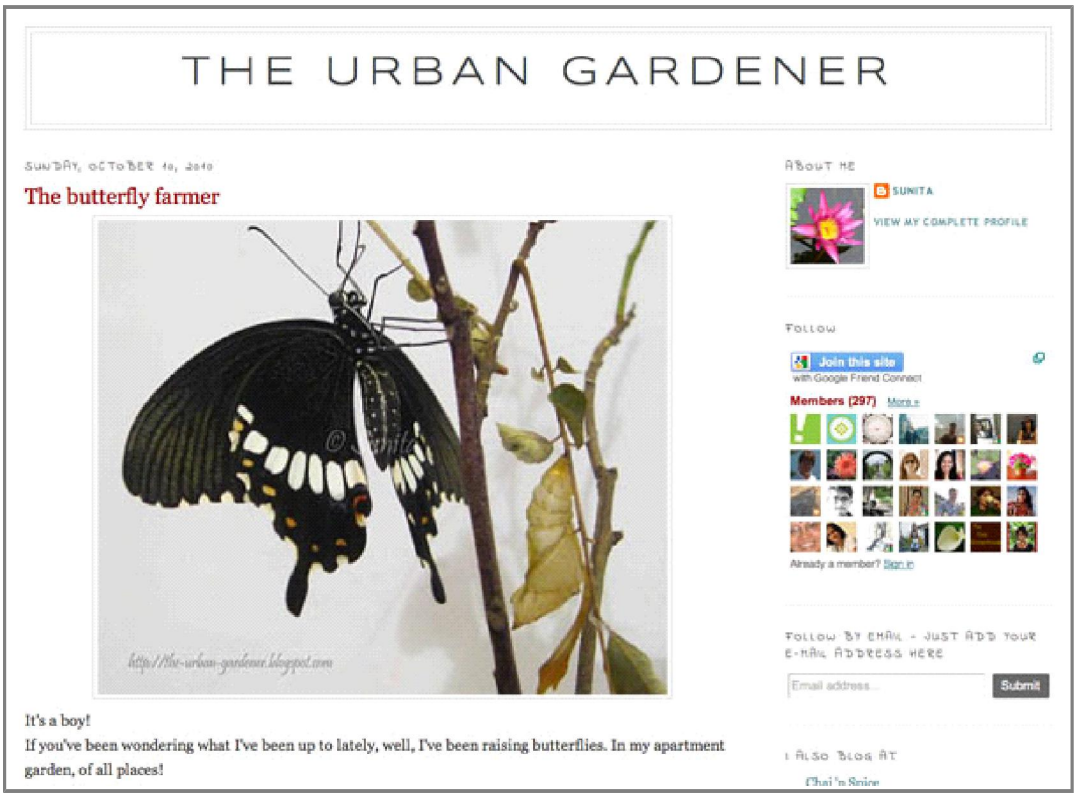
VoIP (Voice over Internet Protocol), allows you to have **telephone service** through your internet connection. Some services also let you do **video conferencing**, such as **Skype** and **Facebook Video Calling.** Many of these services are free or very inexpensive, and some people use them as a replacement for a landline, or just to save minutes on their mobile phones.

Using a video conferencing program

Blogs

Today, the average user has the ability to shape the web by **adding** to it. If you have knowledge or interests that you're passionate about, you can **create your own blog** and share your thoughts with the world.

There are many sites like blogger.com and wordpress.com that let you create a blog for free. You don't need any web design experience—most of the technical stuff has already been created for you, and you can choose a pre-designed template that has the look and feel that you want.



An example of a blog

To learn more about communicating online, check out our Beyond Email tutorial.

Media on the Internet

TV, **radio**, and the **internet** used to be completely separate things, but that's no longer true with today's technology. You can now watch TV shows on your computer, and you can connect to the internet on many TVs and DVD/Blu-ray players. In addition, you can listen to online radio from all over the world, thus granting you greater access to a more diverse range of media.

iTunes radio

Streaming Media

TV and radio on the internet are examples of **streaming media**, which means the media **downloads while it's**

playing so you don't have to wait for it to download first.

Not all media is streaming. If you've ever bought music on the iTunes store, you probably had to wait for it to download before you could listen to it.

Media Players and Embedded Media

Media is often **embedded** in a web page, which means that it plays within the web browser. Other times, you'll use a separate program called a **media player** to play it. Examples include **Windows Media Player** and **iTunes**. An **iPod** contains built-in media player software that can play various types of files.

Windows Media Player

Online Media on Your TV

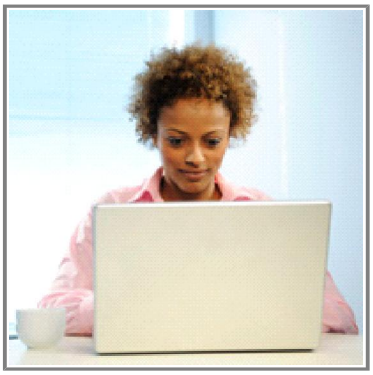
You can now access online TV shows, movies, and music on your TV. Many newer TVs are able to connect to an existing internet connection. If yours doesn't have this feature built-in, you can buy a separate **digital media receiver**, which is a small device that connects to your TV. Apple TV and Roku are two examples of digital media receivers. Many game consoles, such as the Xbox 360 and PlayStation 3, can also be used to access online content.

Browsing movies with Apple TV

Using the Internet in the Future

The internet is **always changing**, and the ways in which we access it will also continue to change. Current trends will become more common and integrated into our everyday lives. In addition, we'll see many technologies and devices in the future that will allow us to use the internet in **new** and **exciting** ways.

Introduction



So you're interested in getting an internet connection in your home, or maybe you'd just like to upgrade to a faster service. There are a lot of factors to consider, such as **how much speed** you need and **where you live**.

In this lesson, we'll talk about **bandwidth**, different types of **internet service**, **wireless internet (Wi-Fi)**, **home networking**, and **mobile phone internet access**.

How Do I Connect to the Internet?

Once you've set up your computer, you'll probably want to get **internet access** so that you can send and receive email, browse the web, watch movies, and more. Before you can access the internet, there are three things that you need: **internet service**, a **modem**, and a **web browser**.

Watch the video to learn about connecting to the internet.

Watch the video (3:38). ***Need help?***

Choosing an Internet Service

Which Service is Best for Me?

It all depends on **where you live** and **how much speed** you need. **Internet Service Providers** usually offer different levels of speed based on your needs. If you're mainly using the internet for **e-mail** and **social networking**, a slower connection might be all you need, but if you want to download a lot of **music** or watch **streaming movies**, you'll want a faster connection. You'll need to do some research to find out what the options are in your area.

Types of Internet Service

Review the following interactive to see a few of the more well-known types of internet service.

Choosing an Internet Service Provider

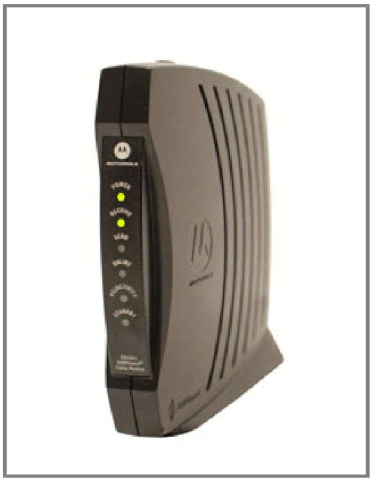
Once you have decided which **type of internet access** you are interested in, you can determine which **ISPs** are available in your area that offer the type of internet access you want. Then, you will need to purchase internet service from one of the available ISPs. Talk to friends, family members, and neighbors to see what ISP they use. Below are some things to consider as you research ISPs:

- Speed
- Price
- Ease of Installation
- Service Record
- Technical Support
- Contract Terms

Although **dial-up** has traditionally been the **cheapest** option, many ISPs have raised dial-up prices to be the **same as broadband.** This is intended to encourage people to switch over to broadband. Generally, you should only use dial-up if it's the only option available.

Hardware Needed

Modem



A DSL modem

Once you have your computer, you really don't need much additional hardware to connect to the internet. The primary piece of hardware you need is a **modem**.

The type of internet access you choose will determine what type of modem you need. **Dial-up** access uses a **telephone modem, DSL** service uses a **DSL modem**, **cable** access uses a **cable modem**, and **satellite** service uses a **satellite adapter.** Your ISP may give you a modem (often for a fee) when you sign a contract with them, which helps to ensure that you have the **right kind** of modem. However, if you would prefer to shop for a **better** or **cheaper** modem, then you can choose to buy one separately.

Router

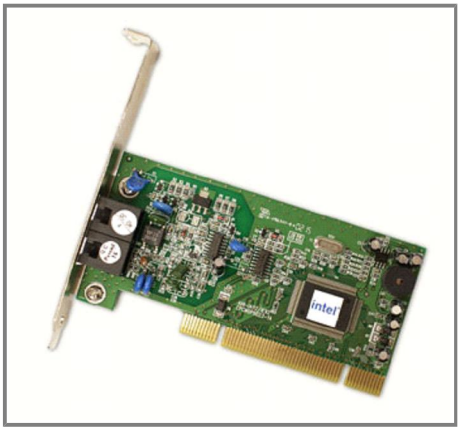
A **router** is a hardware device that allows you to connect **several computers** and **other devices** to a single internet connection, which is known as a **home network.** Many routers are **wireless**, allowing you to easily create a **wireless network**.

You **don't necessarily need to buy a router** to connect to the internet. It's possible to connect your computer directly to your modem using an Ethernet cable. Also, many modems now include a **built-in router**, so you have the option of creating a network without having to buy more hardware.

Most routers also act as a **hardware firewall**, which helps prevent people from gaining access to your computer through the internet.

A wireless router

Network Card



A network card

A **network card** is a piece of **hardware** that allows computers to communicate over a computer network. Most newer computers have a network card built into the motherboard, so it probably is not something you will need to purchase. The network card will either have an **Ethernet** port, a **wireless** connection, or **both**.

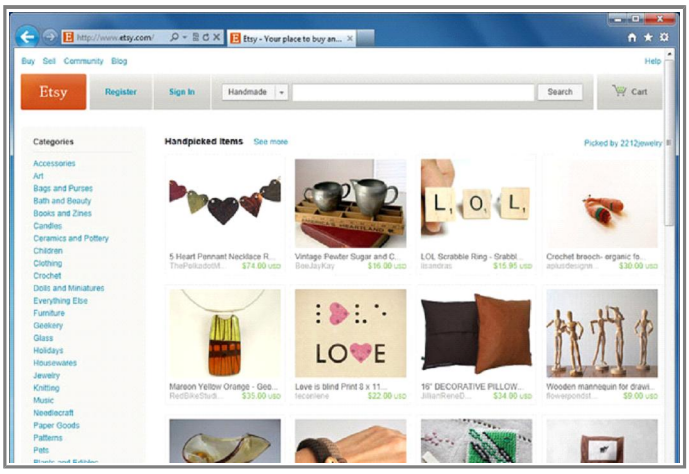
If you have a **laptop** with a wireless connection, you can access the internet at any place that offers a **Wi-Fi** connection. Many **restaurants**, **coffee shops**, **bookstores**, **hotels** and other businesses offer free Wi-Fi. In addition, many cities provide free Wi-Fi in public areas such as **parks** and **downtown areas**.

Web Browsers

A **web browser** is the tool that you use to access the **World Wide Web.** The browser's main job is to **display web pages.** It also lets you create **Bookmarks** (sometimes called **Favorites**) for sites you like, so that you can easily find them again later.

The **World Wide Web** is a **virtual network** of **web sites** connected by **hyperlinks** (or **"links"**). Web sites are stored on **servers** on the internet, so the World Wide Web is a part of the internet.

Your computer probably came with a browser **pre-installed**. **PCs** come with Internet Explorer, and **Macs** come with Safari. If you prefer to use a different browser, you can download Firefox, Google Chrome, or Opera. All of these browsers are **free**.



Internet Explorer

Setting Up Your Internet Connection

Once you have chosen an **ISP** and purchased the appropriate **modem**, you can use the instructions provided by your ISP (or included with the modem) to set up your internet connection. Depending on what type of service you have, your ISP may need to **send a technician to your house** in order to turn the connection on.

After you have everything set up, you can open your **web browser** and begin using the internet. If you have any problems with your internet connection, you can call your ISP's **tech support** number.

Opening Internet Explorer

Internet on Mobile Devices

With tablet computers and mobile phones, it's possible to have full internet access, allowing you to **check your e-mail** and **browse the Web** away from home. To do this, you'll need a **data plan**, which adds an additional monthly fee to your mobile phone bill. Data plans are also available for **laptops** and **e-readers** such as the Kindle.

Using mobile internet

Just like regular cell phone service, it's important to choose a provider that has **good coverage in your area**. You may want to ask your friends, family, or coworkers which provider they use.

With some devices, such as the iPad, you can choose not to buy a data plan, and you'll still be able to access the internet whenever you are connected to a **Wi-Fi** network. If you set up a **home wireless network**, your device can automatically connect to it whenever you're at home. Also, many restaurants, libraries, and downtown areas offer free Wi-Fi.

Mobile data plans are often referred to as **3G**, which means it's the **third generation** of wireless standards. Many companies now provide **4G (fourth generation)** data services, which allow you to have **broadband** speeds on your mobile device.

Home Networking

If you have multiple computers at home and want to use all of them to access the internet, you'll probably want to create a **home network**. In a home network, all of your devices connect to your **router**, which is connected to the **modem**. That means everyone in your family can use the internet **at the same time**, and you don't have to purchase a separate internet service for each computer.

How is a Home Network Used?

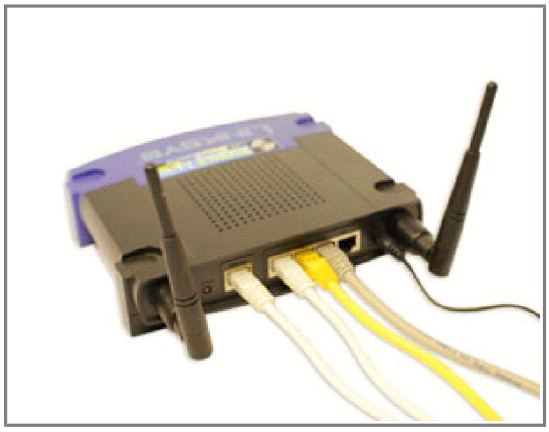
Using multiple computers on a home network

Each computer on a network doesn't just connect to the internet - it also connects to the **other computers and devices** on the network. That means you can easily **share files** with other computers. Some programs even let you **stream music and movies** from one computer to another. One example of this is the **Home Sharing** feature in **iTunes**. These types of features are easy to set up, but it's up to you whether you want to use them.

Home networks aren't just for families! Even if you live alone, you may have multiple devices that can connect to a network. Many **phones**, **printers**, **mp3 players**, **video game consoles**, and **Digital Video Recorders (DVRs)** are equipped with wireless cards and often require very little setup to connect them to your home network.

Wireless Security

A home network can be **wired** (using Ethernet cables) or **wireless** (using Wi-Fi). It may also be a **mixture** of the two, with some devices connecting with Ethernet and others connecting wirelessly. Wireless is generally more convenient; however, you'll need to think about **wireless security.** Below are some important security terms that you'll need to know:



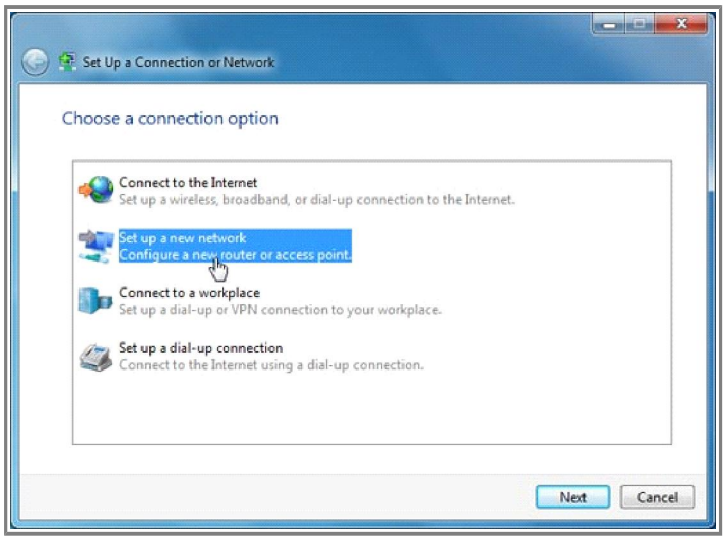
A router with Ethernet cables attached

- **SSID:** A **service set identifier**, commonly called the SSID, is the **name** of a wireless network. You should change the default SSID to something unique that you'll remember. You may not want to use your actual name, but you can use a hobby or other interest (for example, **rockclimbing1**).
- **Encryption password:** An encryption password is a **series of characters** that is used to control access to the network. For even greater security, some people use a **passphrase**, which is longer (and therefore more secure) than a password. You should choose a password or passphrase that's easy for you to remember, but hard for other people to guess.
- **Encryption:** Encryption prevents unauthorized people from reading the data that is transmitted over your wireless network. The data is **coded** into an unreadable form, and it can only be **decoded** by a computer that has the correct **password** (or passphrase). The most common types of encryption for wireless networks are **WPA (Wi-Fi Protected Access)** and **WPA2**.

Although it's possible to create a wireless network that doesn't have a password, it is **very risky**. You should always create a password or passphrase to protect it from unauthorized access.

Setting Up a Home Network

Before you set up your home network, you'll need to have a **working internet connection.** The exact process of creating a network will vary depending on what type of computer you have, as well as what type of internet service you have. You should use the instructions provided by your **ISP** (or the ones included with your **router**) when setting up your network. The following steps will give you an idea of what to expect:



Setting up a network

1. If you have a separate **router**, connect it to the **modem**, and make sure it has power through the power adapter. If you have a combined router/modem, you won't have to do this.
2. Connect all non-wireless devices to your router using **Ethernet** cables. You may also need to connect your **computer** to the router until setup is complete, even if your computer has a wireless card.
3. From your computer, you will need to create the **SSID** and **password** (or passphrase) for your router. You now have a **wireless network** that you can begin connecting wireless devices to.
4. On each **wireless device**, you will need to go to your network settings and select the name (SSID) of the network that you just created. You will then be prompted to type in your password.

At this point, your home network setup is complete. If your network isn't working, the instructions from your **ISP** should include some troubleshooting tips. You can also call your ISP's **tech support** number if you're still having trouble.

To learn how to safely use a wireless network, check out Wireless and Mobile Device Safety in our Internet Safety tutorial.