

About Your Internet Connection Challenges

by

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There is a famous quote that states, “Nothing is certain except death and taxes. Ben Franklin missed another certainty – there will always be some type of complaint by someone. And this is certainly true when it comes to the Internet.

The Internet is in continual flux. That means that it is constantly changing and developing. Consider this, the first electronic digital computer (ENIAC) was built between 1943 and 1946 and filled an entire room. Today, high powered computers, smaller than a pocketbook are built in less than an hour.

The development of computer size, power, and applications has exponentially since ENIAC unveiling. In the 1960s, the concept of consumer based network computing was developed, and in 2006 “cloud computing” became part of our everyday life. Halfway between these two dates (1983) was the birth of the Internet as we know it.

Like many aspects of our lives, standardization was integrated into the computer and communications industry. Computers were now able to communicate with each other using a standard protocol referenced as TCP/IP (Transfer Control Protocol/Internet Protocol).

TCP/IP solves a lot of communication issues and also opened new technology opportunities. For the general public, what the meant was fast, low cost communications between individuals, businesses, and industry via what is now commonly called the INTERNET. However at the same time there are misconceptions about this communications venue.

The Oxford Dictionary defines Internet as:

“A global computer network providing a variety of information and communication facilities, consisting of interconnected networks using standardized communication protocols.”

The key word in this definition is “network” – a system of interconnected computers.

Just as there are different operating systems for computers (Mac, Windows, Linux), there are also different types of networks – LAN, PAN, MAN, WAN. Each of these four basic types of networks also has a “wireless” counterpart (WLNA, WPAN, WMAN, WWan). Use Google for the definitions of each type of network.

Each type of network has its own standards, speed, range, and application. Wired networks generally require the use of a network switch or hub. Wireless networks

require a “router” in order to communicate with other computers, networks or digital devices. The difference hub vs switch vs router is shown in the following chart.

Hub	transmits data from one device to another in form of binary bits	Wire or fiber optics
Switch	transmits data from one device to another in form of frames	Wire or fiber optics
Router	data from one network to another in form of packets	Radio frequencies



Wired Network



Wireless Network

Now let’s join together the computer(s) and networks for a better understanding.

Every computer has four components that determine the speed at which it will send and receive data. These are the processor, operating memory (RAM), hard drive, and operating system. Perhaps we can better understand these relationships if we compare the components to humans.

Computer	Function	Human
Operating system	Interfacing w/others	Language & Culture
Processor	Carries out commands	Nervous system
Operating memory	Performs calculations	Short-term memory
Hard drive	Storage	brain

The speed and ability of the components determines how fast data can be sent and received. Just as every human is different in its ability to function, so too are the different models of computers.

Networks can be thought of as translators. For example, if an American is traveling abroad in Italy and can only speak English, he may need a translator if the Italian does not know English. However if the Italian does know English, the translator just lets the conversation go on without interruption.

In a home or business environment, there may be Windows and Mac computers along with printers, television sets, and smart phones, all having different “language” (operating systems). A network switch, hub or router can be the “translator” allowing the various devices to talk to each other.

While we have a network of devices communicating together, we may need to connect to other networks. For example the Secretary of State can easily communicate with others in the State Department but may need to talk with his counterpart in another country. To do this, another translator is needed in addition to having a phone system capable of communicating with our phone system.

In the computer world, this device is called a “modem.” The function of a modem is similar to that of a router, switch, or hub. Instead of connecting computers and digital devices to each other, a modem connects networks together. Modems also connect networks to the Internet, generally through an ISP (Internet Service Provider).

For a modem to connect to other networks, modems or the Internet, just like routers, the connection can be hard wired, fiber optics, or radio waves. If radio waves are used, they can be beamed (broadcasted) to “cell” towers, buildings-to-buildings, and/or satellites.

So with all this great technology, why do we have Internet connection challenges? The two greatest complaints are not connecting to the website you want and speed.

Not connecting to the website

The first thing to do is to try connecting to another website, preferably a news website such as abc.com, cbs.com, etc. The reason for using such an address reduces the chances of typos because they are short.

If you can connect to one of these websites, then there is either: a problem with the original website, or a typo with the website’s address.

If you cannot connect to another website, the chances are that you do not have Internet connection either through your router/switch/hub, your modem or even your computer. The first step is to shut down your computer and restart it. If you still have problems then try rebooting your modem by disconnecting the power supply for at least 30 seconds. And if that doesn’t work, do the same with your router, switch or hub.

If you still cannot connect, contact your Internet Service Provider (ISP).

Speed

There are many factors affecting the speed of your Internet connection. Some of these factors you have some control over, others you do not.

Let's think of the Internet as a highway with streets branching off of it (websites). The more cars (users) that get on the highway, the slower they will go, especially during rush hour. Similarly if lots of cars get off the highway at a particular exit, traffic will slow down on that exit/street. In fact, traffic may be so backed up that it stops (slow connection) or if the road is blocked off for some reason (website turned off). There is really not much that you can do in these situations. You can opt for a larger highway (higher internet speed) and/or the website can enlarge the roadway for greater speed. But even with these improvements you may still not be able to drive fast.

Knowing your Internet connection speed is your first step in resolving speed issues. To determine this go to [speedtest.net](https://www.speedtest.net) and click the **GO** button. You need to do this at various times throughout the day for 3-5 days. What you are looking for:

- The time of day for your highest speed averages
- The time of day for your slowest speed averages.

Next you need to know is how you are connected to your modem. Connecting via Ethernet (hard wire) is generally faster than connecting via WiFi. If possible, try to make all of your devices Ethernet. This is not always possible since many hand-held and television devices require WiFi connection.

Make sure that you are using the most recent modem that your Internet Service Provider provides or recommends.

Similarly your router may need upgrading, especially if it is 2 year old or older. WiFi technology has significantly changed over the past couple of years. There is a new system called the home **mesh** network. A mesh network covers more area, is more powerful, has fewer dead spots, but does cost more than just a router. Most mesh systems are easy to set up in less than 15 minutes. This is a much better approach to networking than just a router, especially if you have digital devices throughout your home.

As mentioned, there are many factors that can cause Internet connection issues. The following websites, while sharing similar symptoms, also have symptoms and fixes that are not shared.

<https://www.pcmag.com/news/12-tips-to-troubleshoot-your-internet-connection>

<https://www.businesstechweekly.com/tech-insights/internet-keeps-dropping/>

<https://www.digitaltrends.com/computing/wi-fi-problems-and-solutions/>

There is one other possible fix that is rarely mentioned. If you use a cable service, check the cable box on the outside of your house. Make sure that it has a properly installed ground wire. If not, get that installed or fixed. If you do have a ground wire

and the earth around the wire is very dry, pour a bucket of water on the wire. After the water has soaked into the ground, check your speed again.

In closing, once you have achieved as much speed as possible with your devices, check your ISP bill. It's possible that you are not getting the speed or too much speed from the ISP. Contact your ISP and have them adjust your speed as needed. This will affect your bill.