

Internet, Routers, Modems and You.

Internet: what is the internet?

The Internet is a worldwide collection of computer networks, cooperating with each other to exchange data using a common software standard. Through telephone wires and satellite links, Internet users can share information in a variety of forms. The size, scope and design of the Internet allows users to:

- connect easily through ordinary personal computers and local phone numbers;
- exchange electronic mail (E-mail) with friends and colleagues with accounts on the Internet;
- post information for others to access, and update it frequently;
- access multimedia information that includes sound, photographic images and even video; and
- access diverse perspectives from around the world.

An additional attribute of the Internet is that it lacks a central authority—in other words, there is no "Internet, Inc." that controls the Internet. Beyond the various governing boards that work to establish policies and standards, the Internet is bound by few rules and answers to no single organization.

Very simply, the following picture provides a basic overview of a computer and the components used to connect to the internet.

Computer-----→Router-----→Modem--→ISP

In this example the PC is connected via a wire (Ethernet cable) to a Router. The Router is connected via a cable to the modem and the modem is connected to the ISP (Internet service provider) via cable (as in cable TV), or telephone wire (as in DSL) or a Ethernet cable. Additionally, the PC can be connected to the Router via a wireless (radio) connection.

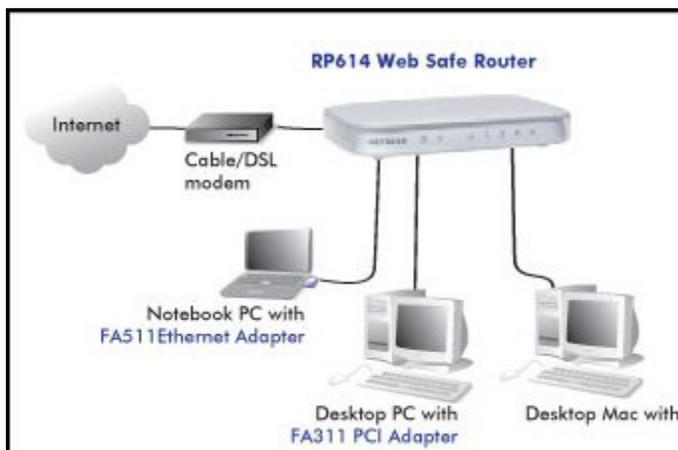
Router: A [router](#) is a [device](#) that forwards data [packets](#) along [networks](#). A [router](#) is connected to at least two networks, commonly two [LANs](#) or [WANs](#) or a LAN and its [ISP's](#) network. [Routers](#) are located at [gateways](#), the places where two or more networks connect, and are the critical device that keeps data flowing between networks and keeps the networks connected to the Internet.

When data is sent between locations on one network or from one network to a second network the data is always seen and directed to the correct location by the router. The router accomplishes this by using [headers](#) and forwarding tables to determine the best path for forwarding the data packets, and they also use [protocols](#) such as [ICMP](#) to communicate with each other and configure the best route between any two hosts.

The Internet itself is a global [network](#) connecting millions of [computers](#) and smaller networks — so you can see how crucial the role of a router is to our way of communicating and computing.

Why Would I Need a Router?

For most home users, they may want to set-up a [LAN](#) (local Area Network) or [WLAN](#) (wireless LAN) and connect all computers to the [Internet](#) without having to pay a full broadband subscription service to their [ISP](#) for each computer on the network. In many instances, an ISP will allow you to use a router and connect multiple computers to a single Internet connection and pay a nominal fee for each additional computer sharing the connection. This is when home users will want to look at smaller routers, often called broadband routers that enable two or more computers to share an Internet connection. Within a business or [organization](#), you may need to connect multiple computers to the Internet, but also want to connect multiple private networks — and these are the types of functions a router is designed for.



Wired and Wireless Routers

Wireless broadband routers look much the same as a wired router, with the obvious exception of the antenna on top, and the lack of cable running from the PCs to the router when it is all set up. Creating a wireless network adds a bit more security concerns as opposed to wired networks, but wireless broadband routers do have extra levels of embedded security.

Along with the features found in wired routers, wireless routers also provide features relevant to **wireless security** such as Wi-Fi Protected Access ([WPA](#)) and wireless [MAC address](#) filtering. Additionally, most wireless routers can be configured for "invisible mode" so that your wireless network cannot be scanned by outside wireless clients. Wireless routers will often include ports for Ethernet connections as well. For those unfamiliar with [WiFi](#) and how it works, it is important to note that choosing a wireless router may mean you need to beef up your Wi-Fi knowledge-base. After a wireless network is established, you may possibly need to spend more time on monitoring and security than one would with a wired LAN.

Wired and wireless routers and the resulting network can claim pros and cons over each other, but they are somewhat equal overall in terms of function and performance. Both wired and wireless routers have high reliability and reasonably good security (without adding additional products). However —and this bears repeating — as we mentioned you may need to **invest** time in learning more about wireless security. Generally, going wired will be cheaper overall, but setting up the router and cabling in the computers is a bit more difficult than setting up the wireless network. Of course, mobility on a wired system is very limited while wireless offers outstanding mobility features.

Configuring Router Ports: The best things to do in configuring your router ports for port forwarding is to let an IT professional or the Router Manufacture do it. Certain ports like, ports 5060 TCP and UDP need to be “opened” to allow the “Dolphin Software” a door through your router to the internet.

MODEMS: Cable and DSL

Cable modems are primarily used to deliver [broadband Internet access](#) in the form of [cable Internet](#), taking advantage of the high [bandwidth](#) of a HFC and RFoG network..

With the advent of [Voice over Internet Protocol](#) (VoIP) telephony, cable modems have been extended to provide telephone service. Some companies which offer cable TV service also offer VoIP phone, allowing customers who purchase cable TV to eliminate their [plain old telephone service](#) (POTS). Because many telephone companies do not offer [naked DSL](#) (DSL service without [POTS](#) line service), [VoIP](#) use is higher amongst cable modem users. Any high-speed Internet service subscriber can use [VoIP](#) telephony by subscribing to a third-party service (e.g., [Skype](#)), the problem is that doing so, you need to turn on your computer to use the telephone, while cable modems have a port to connect the phone directly, without using a computer. However, there are also stand-alone VoIP systems available that connect directly to a broadband router (e.g., [Vonage](#)).

Many cable operators offer their own VoIP service, based on [PacketCable](#). PacketCable allows [multiple system operators](#) (MSOs) to offer both high-speed Internet and VoIP through the same cable [transmission system](#). PacketCable service has a significant technical advantage over third-party providers in that voice packets are given guaranteed [quality of service](#) across their entire transmission path, so call quality can be assured.

TROUBLESHOOTING VOIP:

Ping is a [computer network](#) administration utility used to test the reachability of a [host](#) on an [Internet Protocol](#) (IP) network and to measure the [round-trip time](#) for messages sent from the originating host to a destination computer. The name comes from [active sonar](#) terminology.

Ping operates by sending [Internet Control Message Protocol](#) (ICMP) *echo request* [packets](#) to the target host and waiting for an ICMP response. In the process it measures the time from transmission to reception (*round-trip time*)^[1] and records any [packet loss](#). The results of the test are printed in the form of a statistical summary of the response packets received, including the minimum, maximum, and the [mean](#) round-trip times, and sometimes the [standard deviation](#) of the mean.

tracert is a [computer network](#) diagnostic tool for displaying the route (path) and measuring transit delays of [packets](#) across an [Internet Protocol](#) (IP). Trace route outputs the list of traversed routers in simple text format, together with timing information. Trace route is available on most operating systems.

PathPing is a network utility supplied in [Windows NT](#) and beyond that combines the functionality of [ping](#) with that of [tracert](#).

It provides details of the path between two [hosts](#) and Ping-like statistics for each node in the path based on samples taken over a time period, depending on how many nodes are between the start and end host.

The advantages of *PathPing* over **ping** and **tracert** are that each node is pinged as the result of a single command, and that the behavior of nodes is studied over an extended time period, rather than the default *ping* sample of four messages or default *tracert* single route trace.

Configuring Router ports and Port forwarding:

This website is extremely helpful for Configuring Routers and port forwarding. <http://portforward.com>