

## Speed Testing

### Overview

When customers choose how to access the Internet, what is important to them? For many, speed is a common concern. The faster, the better -- greater speed offers more value for their time and money. If expected speeds are not met, customer dissatisfaction is sure to follow.

But just how are customers checking their speeds? Are their methods accurate? We offer a definitive guide to speed checking services, pros and cons, fact versus fiction.

### Speed - What Does It Really Mean?

Speed and performance usually mean throughput.

Throughput is the amount of data transferred from one place to another or processed in a specified amount of time. It is affected by bandwidth (the data-carrying capacity of a network) as well as latency (the time it takes a packet to travel from one end to the other).

Most companies report peak throughput, such as up to 56K, rather than average throughput. However, no connection performs at 100 percent. Besides Internet traffic, there is the ever-present overhead of TCP/IP and ATM protocols. Since many customers do not understand these issues, their expectations are often unrealistically high.

### Service Choices -- Comparison of Technologies

The following comparison lists pros and cons of various broadband technologies. Understanding these differences is an important factor in understanding performance.

Technology	Pros	Cons
Radio (Clearwire)	<ul style="list-style-type: none"> <li>* Speed is independent of distance</li> <li>* Wireless coverage is independent of existing phone lines</li> <li>* Data security is good</li> </ul>	<ul style="list-style-type: none"> <li>* Requires a clear line of sight to base station</li> <li>* Shared bandwidth (managed)</li> </ul>
DSL	<ul style="list-style-type: none"> <li>* Dedicated bandwidth (up to first telephone switch) - quality of service is less variable</li> </ul>	<ul style="list-style-type: none"> <li>* Speed decreases with distance</li> <li>* Limited service area</li> <li>* Troubleshooting can be difficult</li> </ul>
Cable Modems	<ul style="list-style-type: none"> <li>* Relatively inexpensive</li> <li>* Good download speeds if few users on the system</li> </ul>	<ul style="list-style-type: none"> <li>* Shared bandwidth (unmanaged)</li> <li>* Cable TV infrastructure restricts uplink</li> <li>* Poor data security</li> </ul>
ISDN	<ul style="list-style-type: none"> <li>* Always on and faster than dial-up</li> </ul>	<ul style="list-style-type: none"> <li>* Price often not as competitive as others</li> <li>* Slower speed than others</li> </ul>
Dial-Up	<ul style="list-style-type: none"> <li>* Very inexpensive</li> <li>* Wide range of service/coverage</li> </ul>	<ul style="list-style-type: none"> <li>* Very slow and speed decreases with distance</li> <li>* Ties up voice phone line</li> </ul>

### Where Problems May Occur in Connections

The route between the customer and his or her requested service contains many sources of speed slowdowns. A connection is only as fast as its slowest link.

#### Customer's Computer

Some operating systems are not configured to take full advantage of broadband connections. Registry modifications can be made, but these are risky if one is not familiar with the

Registry. Please see the web address below for more information:

<http://www.speedguide.net>

#### Routers in LAN and Internet

Traffic and packet collisions can cause slowdowns. The number of computers on a customer's LAN, as well as the type of LAN connection (i.e., wireless vs. Ethernet cables), also can affect speed.

## Remote Server

Servers often handle thousands of requests per minute. For example, according to [www.dslreports.com/speed](http://www.dslreports.com/speed), Netscape's FTP server can send a 1.6 Mb file at a speed of 310kb per second, while Microsoft's FTP server can send a 5.0 Mb file at a rate of 67Kb per second. These speeds are significantly slower than many customers' high-speed connection.

## Download vs. Upload Speed

TCP/IP works on an acknowledgement scheme. On a fast downlink and a slow uplink, the data can be sent down quickly, but the slower uplink acknowledgements may impact the speed at which new downlink packets are sent. This is true for all asymmetric connections.

## Clearwire Radio Link

While interference is rare, occasionally it happens. Packet collisions on the customer network and system traffic are more likely causes of slowdowns.

## Speed Test Pros And Cons

The following four common types of speed tests are discussed below: FTP, web pages with speed tests, downloading web pages and watching the progress bar, and Qcheck.

**FTP** - File Transfer Protocol is one of the Internet protocols within the TCP/IP protocol suite. As part of the file transfer process, the program reports its speed.

**Pros:** This is an easy method which many customers understand. Since FTP is multi-platform, most computers can run this test.

**Cons:** Only FTP servers can be used as test points. FTP processing adds overhead to the transfer, thereby slowing actual throughput and causing a false slow reading.

**Web Speed Tests** - Many Web pages offer their own speed tests. You can try the following web speed tests:

[speedtest.mybc.com](http://speedtest.mybc.com)

[www.2wire.com/services/bandwidth.asp](http://www.2wire.com/services/bandwidth.asp)

[www.msn.zdnet.com/partners/msn/bandwidth/speedtest.htm](http://www.msn.zdnet.com/partners/msn/bandwidth/speedtest.htm)

[www.dslreports.com/stest](http://www.dslreports.com/stest)

**Pros:** This is another easy method and popular with users. Most computers have browsers able to accommodate this multi-platform test.

**Cons:** The route to the Web server may be long, and the server may be busy. With the limited number of test servers, you cannot test to arbitrary points. Browser version and type also can affect the test. The performance of the Web end-to-end is only as fast as the slowest point, and often slower than many customers' access speeds.

**Watching Browser Progress Bars** - Many customers download Web pages and watch the progress bar.

**Pros:** This is another easy method, often used regularly.

**Cons:** The amount of data transferred is usually small (tens of Kb), so results can be skewed by processing overhead. Data is buffered, further distorting results.

**Qcheck From NetIQ** - Qcheck, a free tool ([www.netiq.com/products/Network\\_Performance/Qcheck.asp](http://www.netiq.com/products/Network_Performance/Qcheck.asp)) which tests network performance, runs from one PC to any other PC with an endpoint, quickly identifying performance issues.

**Pros:** This easy method performs trace routing, remote performance testing, and it also measures round trip response time and throughput. Its endpoints are multi-platform.

**Cons:** Few customers use Qcheck. Additionally, it requires endpoints to be set up on both sides of the test, and the control panel element only runs on Windows.

## ✂ ----- Summary Information For Your Subscribers ----- ✂

Speed, or throughput, is a measure of how fast data can be transferred over your Internet connection. It is affected by latency (the time it takes for a packet of data to get from one end to the other), as well as network capacity.

Many factors affect speed. Your computer must be optimized to take advantage of high-speed connections. Traffic jams on routers and Web servers can cause data packets to be dropped and sent again. A slow upload speed may hinder data traveling on your download connection. Your connection is only as fast as the slowest link in the chain.

Testing speed with FTP downloads from remote servers, or watching the progress bars of Web page downloads do not always give accurate results, nor do they present the whole picture of your connection's performance.

Ask your ISP representative for more information on speed and your Internet connection.

### Additional Resources

[www.dslreports.com/speed](http://www.dslreports.com/speed)

[www.speedguide.net](http://www.speedguide.net)

[www.dslreports.com/stest](http://www.dslreports.com/stest)

<http://www.ehow.com/eHow/eHow/0,1053,13618,00.html?st=ask&cr=text&lp=ie>