

Backgrounder

What To Look For In An Internet Service Provider Don't Judge By Speed Alone

[Notes: Journalists are invited to quote and use comment and information from the backgrounder below but all comments should be attributed to Gavin Johns, Managing Director, Epiteiro.]

Internet Service Providers are usually judged solely by the download speed of the connection they offer. However, the maximum theoretical speed advertised by Internet Service Providers (ISPs) may not indicate the actual service levels a consumer may experience. Other factors such as the reliability of the connection and traffic management policies combine to affect a consumer's overall experience.

Understanding Speed

Speed or Bandwidth is the rate at which data is downloaded *per second*. The download speeds that Internet Service Providers advertise are the “theoretical maximum” achievable in any given *moment*. In actuality, end-users can only achieve maximum speeds far lower than those publicised due to transmission losses as a result of distance from the local exchange. Epiteiro has found the average download speed achieved for UK customers subscribing to 8Mb/second connections is actually only 3.5Mb/second.

As ISPs typically share resources within a neighbourhood, the available bandwidth depends on the number of consumers simultaneously demanding service. Each ISP has its own policy as to how many subscribers it will allocate to a broadband connection, known as the *contention ratio*, before installing further architecture. Consequently some end users more than others suffer speed restrictions at peak periods of the day.

Upload speeds offered by ISPs are usually a fraction of the download speed due to the nature of how the internet works. During a typical browsing session, end users generally upload low-bandwidth instructions – like typing in a URL – hence ISPs allocate the majority of available bandwidth to downloading. However, having adequate upload and download speeds is critical in

VoIP phone calls that are two-way communications, or even when sending photographs and other file attachments in email.

Speed and Traffic Management

The most significant factor affecting the actual speed a consumer experiences is the traffic management policies of ISPs that are increasingly 'throttling back' allocated bandwidth for certain types of internet usage.

In businesses and homes where web browsing is the most important activity, the higher the *HTTP* download speeds provided by an ISP, the faster web pages will be presented to the viewer.

Downloading *P2P* music and video tracks - much larger than a web page - requires extensive and prolonged use of internet connections, which are typically installed as shared resources in neighbourhoods. Consequently, ISPs invoke *P2P* traffic management policies that ensure all consumers achieve some level of service, albeit much slower than advertised. As a result there is now some growing discontent with the traffic management practice amongst consumers.

Further, common 'speed tests' available may not reveal the true traffic management policies of an ISP as these tests typically check for lightweight *HTTP* downloads. Consequently end users need to understand how an ISP manages both *HTTP* and *P2P* traffic.

Delivering a reliable service

The reliability of an internet connection is crucial in the internet experience. What is the use, for example, of occasionally blisteringly fast connection speeds if the connection frequently fails or service levels dip? Reliability – known as *up time* considers an ISP's ability to maintain a connection at a target speed over a period of time.

Recent research published by the Office of National Statistics demonstrates that the vast majority of internet use is not bandwidth intensive, so fast download speeds are rarely required. In the Internet Access 2007 study, it was shown that most internet activity is based far more around day-to-day tasks, such as “finding information about goods and services” (86% of users) and “sending/receiving emails” (85%), than more bandwidth heavy tasks, such as “downloading software” (24%).

A recent survey asked sole traders and owners of small businesses what they found to be the most important factor when choosing an ISP – reliability comfortably beat speed and price as the most issued response.

Internet downtime can be very costly for businesses of all sizes, with the loss of a connection often causing a company’s activities to be reduced to a standstill. For many, speed is nice to have but reliability is imperative.

Providing Quality of Service

Beyond P2P file sharing, many internet users now take full advantage of newly developed IP technology that puts further demands on ISPs. The use of streaming media, video conferencing and internet telephony (VOIP) is widespread with twice the number of UK adults using VoIP in 2006 than in 2005. In order to get the best performance from these technologies, ISPs must provide to provide Quality of Service (QoS) on their internet connections. QoS considers all the aspects of internet traffic that affect an ISP’s ability to meet customer expectations

For example, when an ISP is unable to transfer data – otherwise known as “packets” - effectively, a video stream will suffer “lagging”, where a video can stop and start, or spend long periods “buffering” making the stream unwatchable.

There are a number of facets of Quality of Service that can affect multimedia performance for the end user, including the number of packets purposely discarded by a provider when there is too much traffic – the packet loss rate. When packets are lost the receiving application may ask for this

information to be retransmitted, possibly causing severe delays in the overall transmission, and adversely affecting the performance of online games, video streaming and VoIP telephony.

In addition, a packet can sometimes take a long time to reach its destination, known as *delay*. The data can get held up in queues, or takes a less direct route to avoid congestion. In some cases excessive delay can render an application, such as VoIP, unusable.

Further complicating VoIP and Video is the issue of “jitter” where packets arrive out of sequence requiring the end device – an IP Phone or computer - to take the time to arrange the packets in the correct order. Jitter can severely affect audio and video streaming performance as the end user experiences unwanted delays.

Pinging around the ‘net

The UK online computer game market is showing no signs of slowing, and the role of gamers as a client base is a major consideration for ISPs. Nearly half of the online population (48%) say they play online games.

Many gamers make the mistake of assuming that a faster broadband connection will improve their online multiplayer performance, yet this is often incorrect. Multiplayer games rely on server response time, or “latency”, rather than just how much extra data can be shovelled down the broadband pipe at any one time - an “up to” 8mb/second connection will not automatically give a better gaming performance than a 1mbps/second connection.

The measure of latency is known as the “ping time average,” calculated by measuring response times to information requests from providers. The faster the ping time, the more enjoyable and playable the gaming experience.

Internet Service Providers must provide high quality performance for all customer needs

Internet Service Providers are now able to test the connections they provide from the end user perspective. Epitiro's ISP-I™ (pronounced eye-spy) service allows ISPs to gauge the performance quality of their connections by measuring variables such as the number of connection failures, the Quality of Service provided, download and upload speeds, and average ping times.

Epitiro's customers can use this information to identify and diagnose network problems, compare themselves against their competitors and market their services to customers.

Internet users have a wide variety of needs and preferences, but increasingly advertised speed is not the most important issue when an Internet Service is judged. With the ISP-I™ service, ISPs can understand how different customers perceive their performance - whether they be most interested in online gaming, streaming technologies, heavy downloading, or simply web browsing and checking emails.

By identifying every aspect in the quality of the connection they provide, ISPs are able to keep all kinds of customers happy with their network performance, and retain more business.

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Notes to Editors

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About Epitiro

Epitiro offers a range of services to Internet Service Providers (ISPs) enabling them to benchmark customer performance across dial up, cable, broadband and wireless connections.

