



*4000ms isn't as long as it sounds ...*

## *Is your online service as good as it could be ?*

Businesses have never relied on IP networks as much as they do now. It's no longer just your website and your broadband that depend on these networks but more commonly your phonecalls too. In the fledgling days of the Internet we were most concerned with reliability but now, forced to address an ever-growing global audience, we realise that there's much more to online services.

There's at least one factor contributing to some of the world's best networks that might not be immediately obvious; namely, network reach. Consider having to send data the 'wrong way' round the world from Los Angeles to the UK via Russia, and the difference in speed if it travelled the 'right way' over a transatlantic link. Improving your network reach could just mean that you can hold off on that hardware upgrade for a bit longer.

Whether it be calling your telephone or buying from your website, with a broad network reach the likelihood of a visitor connecting to your online service quickly is greatly increased.

If your network has a presence that spans intelligently over key areas of the Internet it's of significant advantage because, amongst other things, data is generally far quicker once travelling on your network than when it's traversing third party networks.

To keep the less technical amongst us on our toes rather than referring to the 'speed' of the Internet, the measurement of data transfer is discussed in terms of delay or more accurately 'latency'.

Certain services like VoIP, telephone calls over the Internet, demand a maximum latency of about a quarter of a second, 250ms, before phone conversations begin to become unbearable. Thankfully however with a decent network reach it's possible to exchange traffic between Sydney, Australia and Edinburgh, Scotland in a staggering 160ms.

You may think that VoIP is the only speed-sensitive service - but if you take into account the time required to perform a DNS lookup (checking which network your website address points at), the several seconds involved in downloading a webpage and the impatient visitor who recently stated that they would not be returning to websites that took more than four seconds to appear - then every millisecond counts. (In November 2006 Akamai and JupiterResearch Identified '4 Seconds' as the New Threshold of Acceptability for Retail Web Page Response Times).



So how do we improve network reach ? Some may immediately think of 'peering'.

Peering arrangements aim to deliver data quicker by establishing direct links between ISPs (Internet Service Providers) in useful places on the Internet. ISPs are also keen to introduce peering to save on the costs associated with transporting this data via another ISP's network instead of their own (known as 'transit').

Peering at an Internet Exchange, a densely-networked meeting place, is usually 'public' and one ISP can peer with many others at relatively little cost per ISP.

A 'private' peering arrangement is where two ISPs agree to exchange data at a convenient meeting place, usually by connecting two routers together with a high capacity cable of some description. However even ISPs as large as the likes of British Telecom might find it difficult, both logistically and financially, to establish peering with every ISP at all of the ideal meeting places on the Internet.

One may think, only visitors from the UK view my website so why is this relevant ? It's easy to underestimate how important a geographically-diverse network is. It's possible to trim latency by around a third in the UK alone with a good network reach.

The most efficient way for an ISP to extend their network is by taking transit from a few other very carefully selected ISPs (the costs are not as prohibitive as those associated with building an international network from scratch). As no single ISP operates networks at the same density around the entirety of the Internet, you must, in essence, exploit each provider's specialist geographical area.



As well as the benefit of reducing latency, having a wider network available through multiple ISPs adds further layers of reliability; one self-healing aspect of BGP - the Border Gateway Protocol which knits the Internet's routers together - allows one ISP to withdraw their routes to and from your network, usually when they suffer some type of service failure, without disrupting the connectivity from your other ISPs.

You would also be wise to consider the network's 'contention' or in other words how many people you share a particular part of a network with. This could typically be anything from 50:1 for consumer broadband, 20:1 for business broadband and 1:1 for co-location networks.

For the purposes of exchanging data with a predominately UK audience it's important to firstly address your network reach at the main Internet Exchanges by taking on one or two providers that have centrality in the UK. After your local market's connectivity is sewn up, then looking at Europe, the US, the Middle East and the Balkans is a good start.

You could then bear key areas in mind such as your transatlantic links; a significant proportion of the Internet still resides in the US so, for example, some of your UK visitors may use US-based webmail.

Following this by confirming that your ISPs don't share the same cabling and that they have a low level of contention at these key areas you may then rest assured that you're achieving the highest quality of service.

By spending just a few moments to consider which network has the greatest reach you could improve your online service dramatically and, in all likelihood, find that there's no need to spend a penny more in doing so.

