

# THE VALUE IN IMPLEMENTING IP TRAFFIC SHAPING SOLUTIONS

The increasing use of WAN connections for more and more applications is causing enterprises to consider how to maximise the use of the LAN/WAN link speed to accommodate this IP traffic proliferation. This paper discusses the benefits gained for businesses by the use of traffic shaping devices to analyse and control the use of the WAN link.

### **The need to implement traffic shaping**

The main business reason for implementing IP traffic shaping is to assure application performance issues across LAN/WAN links.

Traffic shaping allows the IT administrator to:

- » Implement control to manage available bandwidth - to target resources to regulate the flow of traffic in order to avoid congestion.
- » Ensure that IP traffic conforms to the policies established for it, or to implement policies where no policies are implemented.

On a contended business network, traffic shaping recovers the bandwidth from non-critical applications and allows the IT administrator to direct these important resources to business critical traffic. Delivering these network resources to business critical traffic is a dynamic process; the result is that the connection is quickened for priority applications.

Traffic shaping is implemented by a single device or by multiple devices that provide packet inspection functionality and allows the traffic to be categorised. Once categorised, control policies can be applied to give the traffic an appropriate level of prioritisation - in other words give it access to available bandwidth to ensure flows across the LAN/WAN link.

Advanced traffic shaping devices offer the end-user functionality that includes QoS and rate control including Layer 1- 7 filtering, compression, disk based compression, network transparency and operational simplicity. Advanced traffic shaping devices are multi-technique, multi-functional and simple to operate appliances.

### **Maximising WAN Performance**

Poor WAN performance is relatively easy to fix - some options that may be considered for resolving performance issues include:

- » Increase the connection size – this alone does not solve WAN problems;
- » Implement rigid policies to restrict the traffic traversing the link – this is difficult/impractical to implement;
- » Manage and control the link.

These options, discussed in more detail below, can only be effectively implemented if the true nature of the problem is known. This paper confirms that managing and controlling the link is the best option.

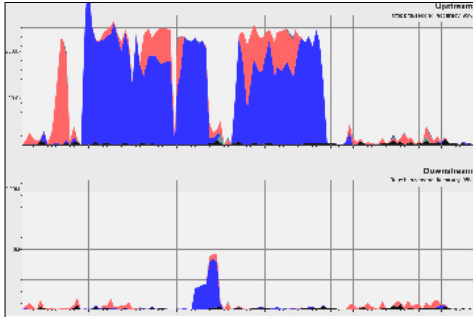
### **The effect of increasing the connection size**

Increasing the connection size (buying more bandwidth) sometimes offers a partial solution to the problem of poor application performance. Some applications transmit considerable bursts of traffic and cause upstream congestion. An effect of this upstream congestion manifests itself in delays to other upstream traffic such as SMB and RDP, and delays in TCP ACK packets. The net result is a poor WAN link.

As a simple example consider SMTP based applications and specifically a business critical email with a large attachment. Whilst the transmission of this email to its target over the Internet is important for the business, its transmission duration is not critical. Yet, once it is sent the email will consume the entire width of the link.

Increasing the link size does not wholly fix the problem. Although it may reduce the duration of the problem, the same email will still consume the full available bandwidth. In some instances more bandwidth may not help at all. Poor performance is often due to complex network characteristics

such as latency, distance between clients and host, IP flow control, type of data flowing.



Bandwidth is only one measure related to the connectivity of an organisation. It is still an expensive item and, although costs in many instances are falling, every bandwidth upgrade has a cost. The business should make an ROI comparison just as it would with any investment - even if the network service provider offers the upgrade free of charge. With every network upgrade there is the need to involve project management teams, business disruption costs, and the impact of the change to the system must be analysed.

**The effect of implementing rigid policies to restrict the traffic traversing the link.**

Manually applied policies may include restricting recreational emails, stopping browsing and blocking other bandwidth consuming traffic. Manual policies do not provide an adequate solution as they are:

- Time consuming to implement and monitor.
- Complicated as staff need to know and understand the policy.
- Difficult to implement – especially if only manually applied.
- Static and therefore cannot cure the problems that require dynamic control (e.g. as discussed earlier associated with mails, large attachments etc).

**The effect of managing and controlling the link**

The best solution is to manage and control the link by deploying traffic shaping technology to:

- Monitoring and analyse IP flows.
- Automate policies.
- Dynamically allocate and manage bandwidth.

- Provide layers of control (including filtering, AD Integration).

Implementing traffic shaping results in maximised network resource usage and subsequently minimises bandwidth costs. Any increase in the performance of the WAN offers value to the business – and a 5 to 10 fold increase in performance of the WAN link is the equivalent of a very large upgrade that any Telco operator would struggle to offer or compete with.

Additional benefits of the implementation of traffic shaping systems are that:

- Investments are protected – the device doesn't need to be removed when an upgrade occurs;
- Link optimisation ensures that the business always receives maximum benefit from the link (effective cost per Megabit per second).

**Traffic shaping is the solution**

Traffic shaping offers a competitive and full solution to WAN performance issues; market commentators (such as Gartner) have forecast that investment in WAN optimisation solutions will become the primary strategy for WAN upgrades for 75% of enterprises by 2008.

Performance issues with the network are summarised thus:

- Bandwidth upgrades increase costs yet fail to permanently increase performance.
- Surges from recreational traffic cause urgent, interactive applications to struggle.
- Enthusiasm for VoIP/Video conferencing fades when callers routinely face stutter during peak network usage.
- Intranet applications at a main data centre offer easy access but poor performance.
- ERP performance plummets whenever an employee syncs email at a branch office.