# Four Steps to High Performance WAN and Internet

## Visibility and Control are Key to an Effective WAN Performance Strategy

Problems with application and network performance on the WAN and Internet links are caused by many and varied issues – congestion, latency, protocol design, sudden bursts of disruptive traffic – all contribute. New factors make the calculus even more complicated: social networking, BYOD, cloud applications, growing video content, even IPv6 traffic growing in the shadows.

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It's tempting to respond to these problems by jumping to a single set of technologies that fix certain aspects of performance. We recommend, instead, that you take advantage of Symantec expertise and technology to take the four simple steps described in this paper:

- **Review Your Network** – Here we focus on understanding the goals of your enterprise as they relate to the WAN and the internet. What are your core applications? What projects are planned? What issues have you seen?

- **Assess Network Conditions** – This step zeroes in on the nature of your WAN and Internet traffic. How much bandwidth is consumed by what types of applications? How are core applications performing? This assessment will measure bandwidth consumption at the application and content level, identifying your biggest consumers.

- **Shape Network Performance** – A couple of simple steps using Symantec technology can often solve acute performance and capacity issues. An example is the containment of disruptive application traffic, including social networking video and other recreational web browsing, as well as backup and Anti-Virus (AV) updates.

- **Report ROI and Opportunities** – With technology from Symantec, you can help IT management and Line-of-Business owners understand alignment of expenditures with business. Show which applications and content are consuming your WAN service budget. Demonstrate the impact of shaping policies – which often reclaim 30-50% of bandwidth from recreational traffic – to provide a simple ROI. Finally, show the mix of traffic and potential savings from acceleration technologies to help rationalize budget and next steps. Overall, you show that you have understanding and control of the myriad of issues that confront delivery of applications over the WAN.

## Step One: Survey Your Network

Focusing on the current design and state of your network is a critical starting exercise. It helps to outline the constraints and requirements for the assessment exercise. How many sites do you connect? Are you using MPLS with different service classes? Do you use the WAN to backhaul recreational traffic between remote sites and a central Internet drop? The structure of your network dictates how traffic flows and gives insight into potential performance issues.

Understanding the core application set is also important. Typically there is a very broad mix of applications in the network, with varying performance characteristics. Their value to the enterprise, and their priorities, vary greatly. You need to identify those that are especially important to your enterprise and those that are suffering from performance issues.

First, identify important applications to ensure that your assessment configuration will break them out:

- **Core applications** – We define these as the most important to the core operation of the enterprise. Examples: ERP, CRM, finance, process control (manufacturing), credit processing and inventory (retail), patient records and imaging (health care), or customer transaction records and trading (finance).

- **Unified communications** – Interactive voice and video conferencing and enterprise IM are typically very latency sensitive. They need adequate bandwidth to perform properly. Examples: voice and video conferencing systems from Polycom, Cisco and Avaya, as well as UC apps such as Microsoft Lync.

- **Server and storage consolidation data applications** – They include file services, storage, backup, disaster recovery, software update distribution, and network services (DNS, DHCP, and Auth). Whether it's Microsoft file access, NetApp, or EqualLogic synchronization traffic, this traffic can take up large amounts of bandwidth – and still be constrained by bulky underlying recreation or social networking traffic.

- **Enterprise live or on-demand video streaming** – These are among the fastest-growing kinds of applications on the network because enterprises are now leveraging video for training and communications. They may be using internal video servers, cloud-based learning management systems (LMS) or even Enterprise YouTube, which are among the most bandwidth-greedy applications on the network. A typical single stream is between 1-2Mbps.

- **Web traffic** – This literally covers the world outside the enterprise. The internet is the most dynamic part of the network, covering a vast array of applications and traffic types. It also take more than network level intelligence to differentiate; everything works on port 90/443.

  › Cloud-SaaS applications – Amazon, Salesforce.com, Taleo, Microsoft Office 365, video LMS...the list goes on.

  › VPN access – for remote users accessing corporate applications and data from the outside. This can require segmenting bandwidth to control usage.

  › Enterprise web presence – for organizations that host their own web servers.

  › Enterprise-consumer web traffic – enterprise use of sites for consumer or recreation purposes. Examples: enterprise social networking sites and YouTube channels.

  › General web access – literally everything else: kitten videos on YouTube, heavy gaming and video traffic on Facebook and other social networking sites, sports coverage, news, personal banking – you name it. It often takes a huge share of overall bandwidth.

## Step Two:
## Assess Network Conditions

In Step One, we identified environmental and applications issues that you're aware of. Here we focus on seeing how those priorities match with what's happening on the network, and identify issues that you may NOT know about. Here are the issues that we commonly see in this step:

- **Pervasive use of internet video and gaming applications** – from YouTube to Facebook video, sporting sites and hobby sites.

- **P2P and music streaming services** – aggressive applications that clog bandwidth and create troublesome congestion.

- **Impact of BYOD** – With more smartphones and tablets on the network, OS updates and content downloads are starting to have a major impact on bandwidth consumption.

- **Disruptive backup, data synchronization or AV updates** – While these are clearly enterprise applications, their aggressive nature can lead to sudden spikes in bandwidth usage. These spikes can crowd out more-sensitive applications, creating acute performance problems for end users.

- **At-risk content** – If your web security solution can't keep up with rapidly moving web threats or if your content filtering policies are out of date, we'll identify it.

### Why an Assessment

A Symantec network assessment will give you both a high-level view and details about the amount of traffic on the network. The Symantec PacketShaper classification engine automatically identifies 700+ applications, and analyzes tens of millions of websites in 84 categories. All this intelligence is rolled into seven high-level groupings based on the Model Class Tree.

The Step Two outcome is the Assessment Report. The assessment will measure and show bandwidth consumption at the application and content level, identifying your biggest consumers.

It's also a good idea to harvest the following information sets from the Symantec device when the assessment has been completed:

- Presence of at-risk traffic on the network. This may not be called out in the assessment report if sufficient traffic is not generated. Here, however, small amounts of traffic can indicate a major issue. As we evolve the assessment report, this will become a standard part of it.

- Response times of key applications (identified in Step One). If you've broken out key applications, the Response Time Management statistics can give you a baseline performance of Total Delay for these applications and break out Network Delay and Server Delay. VOIP quality measures include jitter, latency, loss and MOS.
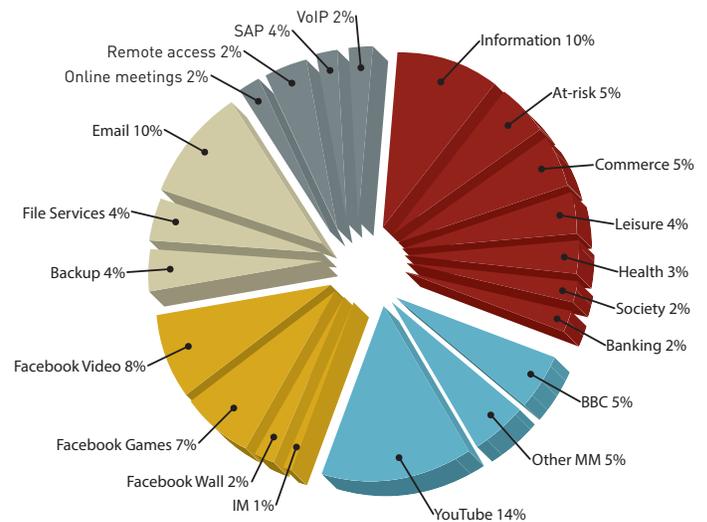


- Bandwidth amount and consumption by multimedia applications or by bulk data servers (typical report shown here). This is especially important to identify if acceleration technologies – video optimization or compression and caching – can give you significant savings.

## Step 3:
## Shape Network Performance

Once you have the assessment report, it's a very short path to fixing some acute performance issues. IT decision-makers must ensure the proper allocation of network resources based on business priorities. By establishing a clear set of policies, you can demonstrate compliant usage and make the most of network resources. Smart choices when provisioning those resources will take into account the impact of recreational and malicious traffic, ensuring availability and performance of your critical applications and blockading infected hosts.

Sudden spikes in usage can disrupt key business applications without warning, making it difficult to plan ahead. But wise provisioning can guarantee that critical applications get the bandwidth they need when they need it – and ensure business continuity. Symantec technology enables you to set policies that strike a balance between business imperatives and Internet use. You can avoid business disruptions from music and video downloads and web browsing without denying access. Allocate a percentage of bandwidth to high-priority applications at all times to ensure availability during spikes without wasting resources.
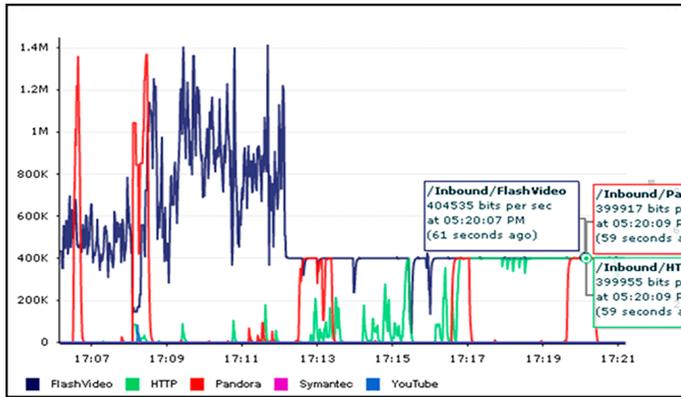
In this graph we see a spike in YouTube traffic that consumes most of a T-1 link, disrupting other applications. A shaping policy is implemented, capping the traffic and restoring performance for key applications.

## The power of intelligent shaping

While you have Symantec PacketShaper in your network, you can identify disruptive traffic flows and apply shaping partitions to them. Disruptive applications, whether pervasive internet video and gaming, P2P, streaming services, content downloads from BYOD, disruptive data backup or AV update, demonstrate the power of application-level shaping.

- Isolate the application in the real-time graphing view
- Create a partition – 400 kbps
- Apply shaping policy
- Instantly see/capture results in a graph

## At-Risk content

If you see data breach or other at-risk traffic, your web security tools are not protecting you from harmful traffic. Request an evaluation of Blue Coat ProxySG web security, available as an on-premise appliance or the SaaS-based Symantec Cloud Service.

## Shaping strategy examples

| EXAMPLE | COMMON ISSUE | SHAPING IMPACT |
|---------|--------------|----------------|
| Recreational web browsing and multimedia traffic | Takes up too much of total bandwidth – often as much as 30-60%. | Shape – Create a partition to contain these to 20% of link, burstable to 40% at low priority.<br>ROI – Reclaim 20%-40% of bandwidth.<br>NOTE: This is highly optimizable traffic with specific on-demand caching and live stream-splitting for video. |
| Disruptive data applications (backup, AV updates) | Spikes in large data transfer jobs starve other applications of bandwidth. | Shape – Create a partition to contain these to 20% of link, burstable to 40% at medium priority.<br>ROI – Restore operation of mission-critical applications.<br>NOTE: this is highly optimizable traffic; see next section. |
| Core Apps: Transactions | Latency sensitive transactional applications are starved of bandwidth. | Reserve 20% of bandwidth with a partition, burstable at highest priority.<br>ROI – Restores performance of mission critical applications, delays potential bandwidth service upgrades. |
| Core Apps: VDI | Sessions from a user in a remote office, involving applications like file transfers and video, disrupt other users' interactive applications. | Use dynamic sub-partitions to fairly allocate bandwidth for each user.<br>ROI – Restores performance of mission critical applications, delays potential bandwidth service upgrades. |
| Internet VOIP and video conferencing | When voice and video conferencing is used over the internet, MPLS quality-of-service (QoS) can't be used. | Per-session or per-call bandwidth (varies by codec type) can be implemented.<br>ROI – Leveraging internet connectivity typically lowers cost structures and extends the reach of those applications outside the enterprise. |

# Step 4: Report ROI and Opportunities

Now that you've documented the environment and done an assessment of actual traffic mixes, you're in a much better position to provide recommendations. You may also have identified some acute performance issues that shaping will fix, which adds to the credibility of your plans. That lays the groundwork for this last step – reporting on the ROI of shaping as well as identifying other opportunities for WAN Optimization:

## Report on Conditions and ROI

Two big issues in managing WAN/Internet service budgets: You typically need more, but don't have insight into what's consuming your bandwidth. With the assessment and Symantec shaping technology in hand, you can demonstrate how budgets are being consumed today – and how shaping policies can impact bandwidth.

When you show that shaping policies often reclaim 30-50 percent of bandwidth from recreational traffic, ROI is simple and obvious. You can then show the mix of traffic and potential savings from acceleration technologies to help rationalize budget and next steps. Overall, you're showing that you have understanding and control of the myriad issues that confront delivery of applications over the WAN.

a. Report on bandwidth budget consumption – Showing what applications and content consume your WAN service budget (before shaping) helps IT management understand alignment of expenditures with the business. If more bandwidth is needed, managers now can make the case more effectively.

b. Calculation of shaping ROI

1. Reclaiming bandwidth from recreational traffic: If recreation and multimedia were consuming 50 percent of bandwidth, and shaping can contain that to 20 percent, ROI is approximately 30 percent of WAN expenditures. Of course, percentages will vary with conditions, but this is often the simplest ROI to calculate.

2. Reduction in trouble tickets and shorter MTTR: Estimate complaint reduction from improved performance and MTTR reduction from improved visibility. How quickly can you spot and rectify performance issues now?

3. Assure mission-critical applications: Calculate a performance insurance premium compared with the annual costs of the most important applications.

## Identify Opportunities for Acceleration and Bandwidth Reduction

Symantec WAN optimization technologies are very useful for accelerating performance of key applications and reducing the bandwidth required for large data-intensive applications. Centralized file access is one example of how very data-intensive applications, often with poorly designed protocols, perform poorly over the WAN. Protocol acceleration and data reduction technologies dramatically accelerate end user performance while drastically reducing bandwidth requirements. Enterprise video is another example of applications that are challenging to deliver because of the sheer amount of bandwidth they require. On-demand video caching and live streaming technologies can magnify bandwidth significantly and make it possible to deliver enterprise video on existing WAN links.

Here is an overview of key applications and initiatives and how
Symantec technologies can improve performance:

| APPLICATION PROBLEM OR IT INITIATIVE | KEY BENEFITS SYMANTEC DELIVERS |
|---|---|
| **Unknown Performance Issues on WAN**: Periodic and chronic performance issues with key business applications, usually caused by full utilized WANs | • Symantec gives you a real-time view into all applications and web content on the network and how much bandwidth is being consumed by each, as well as track end user performance<br>• Allows you to track budget expenditures, troubleshoot applications in real time<br>• Immediately resolve issues with advanced quality-of-service (QoS) and reclaim 20-40% of bandwidth from recreational use |
| **Email (consolidation)**: performance problems (from protocol latency) and increase bandwidth costs from consolidation forcing evaluation of WAN Optimization | • MAPI or HTTPS protocol acceleration, including encrypted MAPI and SSL, plus object/byte caching reducing bandwidth up to 50-90% |
| **Files (consolidation)**: Performance problems (from protocol latency) and increase bandwidth costs from consolidation forcing evaluation of WAN optimization (acceleration and caching) | • Byte and object caching and protocol optimization for CIFS and SMBv1/v2 reduces WAN communication and latency; eliminates redundant data over the WAN<br>• Symantec WAN optimization accelerates file access by 3-300x while reducing bandwidth up to 99% |
| **Storage and Backup (consolidation, disaster recovery)**: inability for branches and data centers to complete backup and data mirroring jobs within designated window over WAN | • ProxySG WAN Optimization byte caching, compression and protocol optimization reduces replication/backup data over the WAN by 50-90%<br>• ProxySG WAN Optimization enables business continuity and disaster recovery (DR) by accelerating backup and data mirroring data movement over the WAN by up to 200x |
| **Remote workers (DR, pandemic planning)**: remote users suffer slow applications when working from road or home; often this is a planned strategy for dealing with site disasters or pandemics | • Faster road warriors and home workers – Symantec accelerates file access, email and key business apps<br>• Accelerate access to file shares, email and key business applications, educe bandwidth with caching and compression<br>• Protect remote workers from malware with optional Symantec WebFilter powered by Symantec Global Intelligence Network |
| **ERP, CRM and Business Apps**: SAP, Oracle and other systems not performing to expectations. Usually delivered over HTTP/SSL | • Object Caching (HTTP), compression and protocol optimization reduces data across the WAN and cross WAN communication and latency<br>• ProxySG WAN Optimization enables centralized consolidated deployments of enterprise applications<br>• Symantec WAN optimization reducing bandwidth 40-90% and accelerates ERP 2-95x thereby reducing user complaints and increasing employee productivity |
| **Cloud Applications / SaaS**: Externally delivered business applications can have performance issues, especially when dealing with large queries or document management (e.g. data sheets in Salesforce.com) | • ProxySG Asymmetric WAN Optimization accelerates delivery of external SaaS applications with-out the deployment of an appliance/VA on cloud infrastructure or routing of traffic through the data center. Accelerate cloud-based applications 15-25x and reduce bandwidth.<br>• PacketShaper helps provide visibility and QoS for Cloud apps to ensure performance and user productivity. Set partitions to guarantee bandwidth for key SaaS applications, VPN traffic and more. |
| **Enterprise Video** - Companies struggling to deliver video training, video communications and marketing: Networks aren't built for delivery of those applications; forces failure of initiative or need to spend $500k-$2M on additional bandwidth for video networks | • ProxySG WAN Optimization splits a single live video stream from internet into multiple streams; object caching (video) enables successful corporate video initiatives and reduces the impact of recreational video floods<br>• Dramatically multiply bandwidth: create 10x, 100x and 1000x WAN bandwidth gains (50 sites, 21 users each =1000x). Offloads data center media servers by 75-90%<br>• Enable corporate video initiatives with no network upgrade |
| **Social Networking / Recreational traffic, bandwidth contention**: troubleshooting of disruption of mission critical apps; takes 30-60% of WAN bandwidth | • PacketShaper finds recreational traffic and via policy-based categorization controls it – fixing performance of key applications and reclaiming bandwidth<br>• ProxySG WAN Optimization optimizes web and video traffic thereby reducing penalty of recreational traffic<br>• Gain control over recreation use and sudden floods with QoS throttling policies |
| **IP Telephony or Video Conferencing**: traffic over a converged Wide Area Network experience quality problems and are unable to ade-quately monitor and troubleshoot performance issues | • Visibility and QoS assures performance of voice and video conferencing on the WAN. Ensure proper amount of bandwidth for VoIP and video apps.<br>• Track and monitor voice and video quality<br>• Increase network capacity to fit more calls and applications |
| **Internet Traffic Management** can be burden on network resources and impact application performance | • Visibility into user activity and QoS enables IT to manage the incoming and on-going performance of Internet traffic to ensure performance of important applications and/or user productivity |

# Harnessing the Power of Visibility and Control

Today every enterprise has to find a way to meet soaring bandwidth
demands while holding down expenditures. Demonstrating
how effectively visibility and control can power performance
and contain costs will help IT decision-makers understand how
budget can be aligned with enterprise objectives. Symantec can
help you through the four steps that enable you to do this.

# Appendix A:
# Pre-Discovery Worksheet

Use this worksheet as a primer to establish the conditions and
objectives you want to achieve with your network assessment:

| AREA | QUESTIONS TO CONSIDER | YOUR INPUT |
|---|---|---|
| **Network Design and Purpose - WAN** | • What type of service? Meshed MPLS? Is internet access backhauled?<br>• Do remote sites have Internet connections? Do these VPN back to corporate data center or do they have direct internet access? Have you considered direct branch internet?<br>• How many sites? Data center vs. remote office? What is the typical mix of capacities per remote site and at the core?<br>• What are the annual costs for the overall WAN? Per site? | |
| **Network Design and Purpose – Central Internet** | • How many Internet drops do you have? Where and why?<br>• Do you host your own corporate web servers? What type of VPN access do you have? Do you leverage cloud/SaaS applications or have a requirement to connect to external partners?<br>• Have you evaluated remote site direct internet access? | |
| **Known Performance Issues** | • Do you have any specific performance issues that you're confronting right now?<br>• Are all applications performing to expectations?<br>• Is bandwidth adequate? What is peak usage? Do you need more? | |
| **Core Applications** | • What are the applications that impact the core operations of the enterprise? CRM? ERP? Specific transactional applications?<br>• Are there sub-processes in these applications that are particularly important to you or suspected of performance issues?<br>• Are you leveraging VDI? Citrix, VMware, MSFT? What are your plans for that technology over the next two years?<br>• What performance issues cause particular pain to the networking group? | |
| **Unified Communications – Interactive Voice and Video Conferencing, Enterprise IM** | • Do you use voice over IP? Video conferencing or telepresence? What vendor?<br>• Do you use a discrete MPLS tagging and marketing for voice and video? Any performance issues?<br>• Do you use VoIP and video conferencing over the Internet?<br>• What about enterprise IM or unified communications? Do you expect an increase in desktop video conferencing? | |
| **Server and Storage Consolidation Data Applications** | • Do you have centralized file access? Microsoft file shares, SharePoint, Intranet or other type? Is it a web front end?<br>• What AV software do you use? What is the frequency of updates, do you use caches or other methods to distribute?<br>• What sort of storage architecture do you have? Do you keep storage arrays at remote sites? What vendor?<br>• What backup and DR packages do you run? What is the frequency of data changes and synch? Backup windows?<br>• What performance issues cause particular pain to networking group? | |
| **Enterprise Live or On-Demand Video Streaming** | • Do you currently use live or on-demand video for training, communications or other Enterprise purposes?<br>• Do you have plans to roll out video or expand use?<br>• Is video content delivered from corporate data centers or from cloud-based providers? | |
| **Web Traffic** | • Cloud-SaaS applications: Does your enterprise leverage cloud-based applications? What are the key ones?<br>• VPN access: what types of VPNs are in use? Are there ever performance issues?<br>• Enterprise web presence: Does the enterprise host its own web presence? Is it on the same link as the other web-bound traffic? Any performance concerns?<br>• Enterprise-consumer web traffic: Do you use social networking or have your own YouTube channel? Is any other consumer web traffic part of your enterprise communications, marketing, or other activities?<br>• General web access – What is blocked by content filtering? Do you think you should contain certain parts of recreational traffic like social networking gaming or video? | |
| **Recent and Upcoming Initiatives** | • Are you planning rollout of new or significantly changed core apps?<br>• Does the enterprise have plans to leverage on-demand or live streaming video for training, communications or other purposes?<br>• Are you evaluating or using cloud-based applications?<br>• Do you leverage room-based video conferencing or telepresence?<br>• What unified communications do you use?<br>• How do you leverage social networking? | |

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