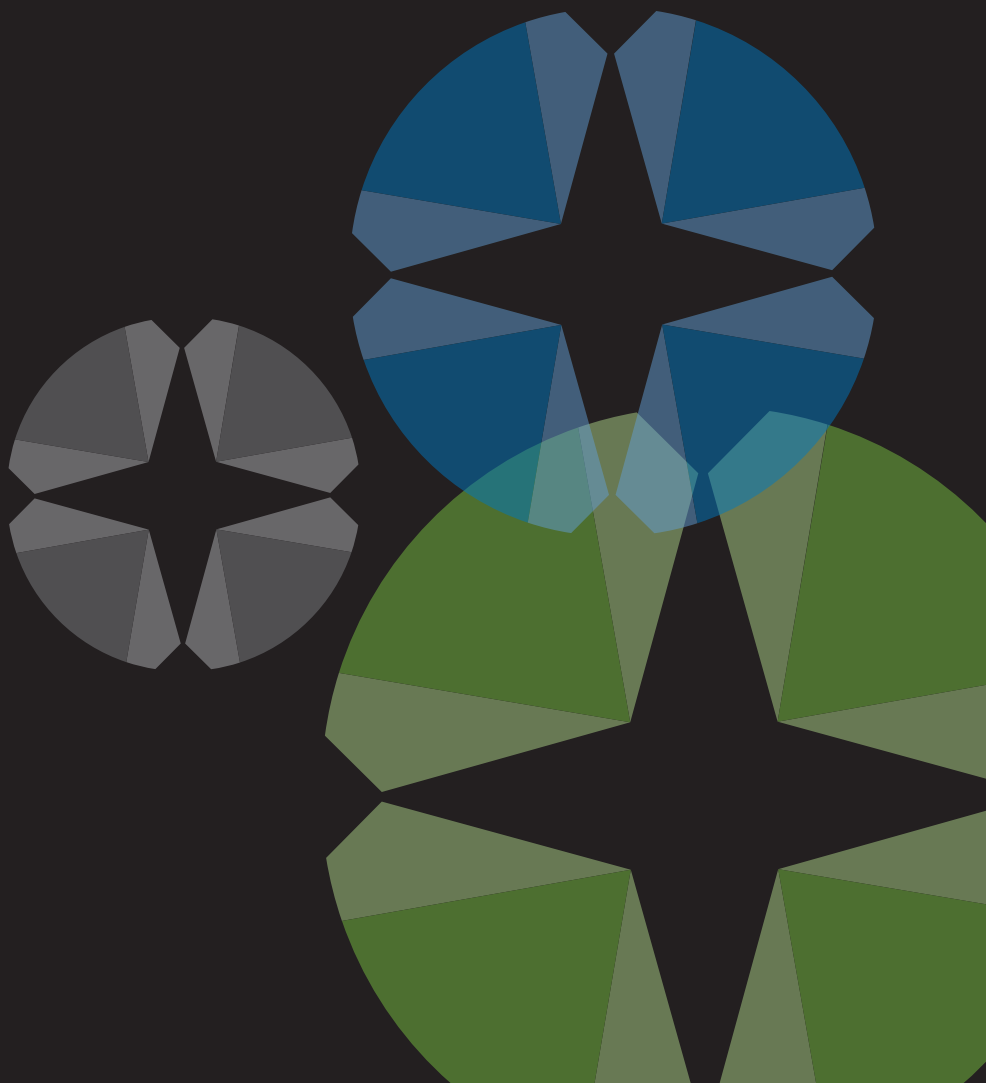




Real-time Network and Application Visibility

How to Take the Guesswork out of Managing Your Network and Applications



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"Business performance starts to decline when mission-critical applications reach the baseline of 5.1 seconds of response time delay."

Aberdeen Group,

"The Performance of Web Applications: Customers are Won or Lost in One Second",
November 2008

The Cost of Poor Application Performance:

1. Frequent hardware and bandwidth upgrades
2. Less productive employees
3. More IT helpdesk calls
4. Overburdened IT staff
5. Operational inefficiencies

Executive Summary

The network connects branch offices and remote employees to the data center where critical business applications are housed; it carries voice and data, drives day-to-day business operations and supports employees, partners and customers. In the educational setting, the network links college dormitories to the central library and delivers innovative e-Learning applications and multimedia content directly into classrooms.

Given the importance of the network and the applications it supports, it is surprising how few organizations possess the ability to monitor and report on network activity and application performance.

The size and complexity of today's wide area networks (WANs) makes it difficult for network managers and administrators to keep an eye on things. This blind spot can have far-reaching negative implications.

Bandwidth congestion and a sluggish network can cause critical applications like VoIP, enterprise resource planning (ERP) and customer relationship management (CRM) to slow to a crawl. When network issues are allowed to impede application performance, productivity suffers and the entire organization may be put at risk.

This white paper will show how Exinda, a provider of WAN optimization solutions, can help organizations more easily and effectively manage network resources and meet expectations for consistently fast access to applications. By implementing the Exinda WAN optimization appliance, organizations instantly gain deep visibility into network activity, traffic flows and bandwidth utilization.

With the ability to rapidly identify bottlenecks and determine why applications are performing poorly on the WAN, network managers can put insight into action by setting policies to control network traffic, optimize links and accelerate applications.

"Organizations are increasingly looking to be more proactive in managing application performance and their IT departments are being tasked with a new challenge: how to identify and resolve potential performance issues before they impact end-user productivity."

Aberdeen Group,
 "Application Performance Management: Getting IT on the C-Level Agenda",
 March 2009

Network Capacity Under Strain

An increasingly mobile workforce and a growing number of Web-based applications have placed pressure on network capacity, creating challenges for network managers responsible for delivering applications over the WAN. To add to these challenges, an ever-increasing number of recreational Internet applications such as social networking, peer-to-peer (P2P) file sharing and instant messaging (IM) are now competing with legitimate business applications for a finite amount of bandwidth.

IT consolidation places an additional strain on the network. In an effort to increase efficiencies and reduce costs, more and more organizations are centralizing business applications in the data center. In many cases, the branch offices host only a bare minimum of network and computing resources, making remote staff dependent on the link to the data center.

With the consolidated data center approach, transactions and data requests that previously would have been handled over the branch local area network (LAN) are now being processed over the WAN. This means that more network traffic is competing for the link between the data center and the branch office. Network congestion and application latency increase, as the data has further to travel between locations.

To further complicate matters, many applications running on the WAN today were originally designed for use on a LAN. These types of applications tend to require a lot of bandwidth and their performance can be seriously impacted by latency and network congestion.

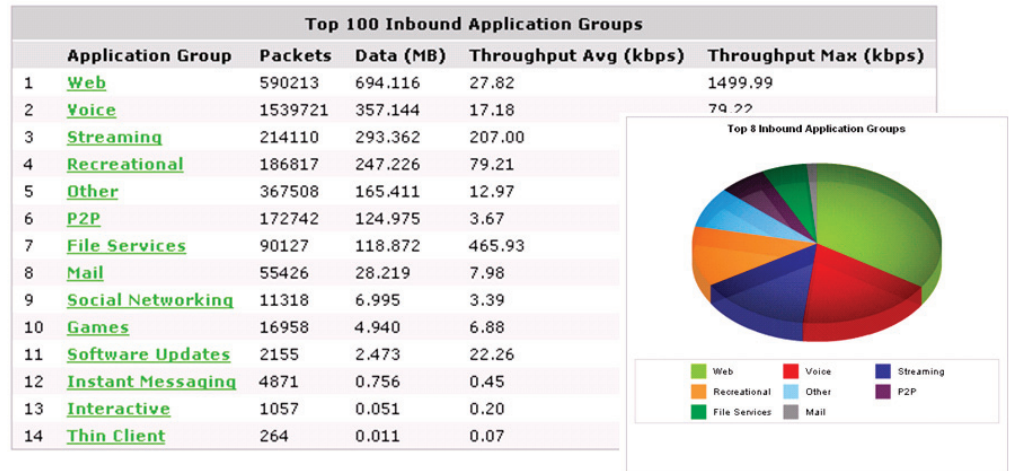


Figure 1: Non-business applications compete with legitimate applications for bandwidth, creating performance issues

What You Can't See Can Hurt You

It isn't hard to spot the telltale signs of a network under strain. When network capacity fails to meet demand, frustrated remote office staff or customers complain of slow response to Web-based applications and the Internet. File copy times increase and employees spend more time waiting and staring at the screen when trying to access applications such as customer relationship management (CRM). The clarity of voice communications may also be affected. In the worst case, transactions to the ERP system may fail to complete due to network issues, putting a serious kink in the value chain.

A sluggish network also affects critical IT operations. Common problems include slow backups and data corruption resulting from dropped packets. If the issue isn't resolved, business continuity and the availability of systems may be compromised. If customer-facing applications are impacted, performance issues can have an adverse effect on brand perception and customer loyalty.

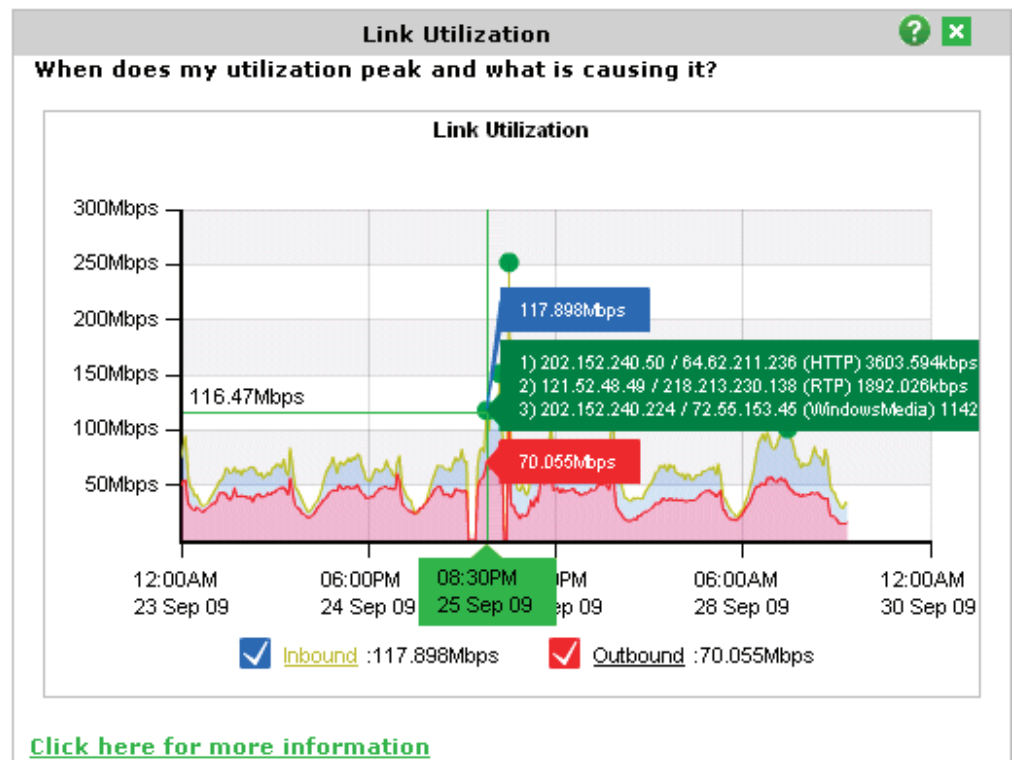


Figure 2: Network traffic bursts can create bandwidth congestion and packet loss

While the symptoms of a poorly performing network are easy to see, pinpointing the underlying causes of network issues is not nearly so straightforward. The size, complexity and dynamic nature of network traffic can make it difficult to identify bottlenecks or other issues. While IT staff may have some rudimentary tools in place to monitor the volume of network traffic, they rarely know precisely which applications or users are consuming the majority of their bandwidth.

Lacking visibility into network activity and application performance, IT has no means to identify network capacity issues before the help desk telephone rings. As a result, they are often left scrambling to deal with the issue without any idea of the root cause. Many organizations have no choice but to attempt to solve the problem by adding more bandwidth. Purchasing additional bandwidth may mask the worst symptoms of a poorly performing network for awhile, but without investing in visibility and quality of service (QoS), the same problems will eventually re-emerge – most likely sooner than later.

Only by putting a solution in place to monitor network activity and measure application response times can network managers and administrators hope to proactively address poor application performance before it impacts the end user. Simply put, you can't manage what you can't measure.

In the following sections, we'll look at how the Exinda WAN optimization solution can provide the deep visibility into WAN usage and performance that network managers and administrators need to keep critical applications running consistently.

Network and Application Visibility

When we talk about having visibility into the network and the applications that run on it, we are referring to a solution that combines real-time network visibility with sophisticated analysis and reporting to provide multiple cross-sectional views of the network. The benefit of deploying a visibility solution is a highly detailed multidimensional view of the network that can help IT identify bottlenecks and accurately diagnose performance issues. Visibility and reporting are also key components of traffic control, optimization and capacity planning activities.

Application visibility allows IT staff to visualize all traffic on the network at the application layer (Layer 7). Using an advanced application classification engine, the Exinda WAN optimization solution can identify and classify all peer-to-peer traffic, URLs, applications, Sip call information and more. At a glance, network managers and administrators can instantly see:

- Top applications for inbound traffic
- Outbound traffic by user
- Percentage of bandwidth being used by traffic type
- Top URLs in and out of Internet link

With the Exinda solution, IT staff can drill down to identify recreational traffic including evasive applications, and view bandwidth utilization down to the individual user level through integration with Microsoft Active Directory. Real-time monitoring and historical statistics help IT understand what applications are running on the network and how much bandwidth each application is consuming.

For example, Exinda can help you quantify how much bandwidth is being consumed by recreational applications. You can also visualize how traffic patterns on your network change throughout the day. This insight into peaks and valleys in traffic flow can help you develop more effective quality of service (QoS) and optimization policies that take time of day into account.

Application Response Measurement

One of the most important elements of visibility is application response measurement, which allows IT staff to objectively measure and quantify application performance from the end users' perspective.

By capturing metrics on how long end users are waiting for a given application to respond, application response measurement helps network managers fine-tune Quality of Service (QoS) policies and pinpoint whether an application performance issue is network or server related. Without these measurements, IT staffs have no clear way of knowing if application response times are improving or degrading. The ability to generate reports on application response times may also be critical for IT to obtain management buy-in for bandwidth upgrades or other network investments.

"The biggest goal scorer with Exinda is the visibility. I can see exactly which applications and users are consuming network resources and what impact they have on my application response times."

– Jonathan Aldred, Group IT Infrastructure Manager, R&R

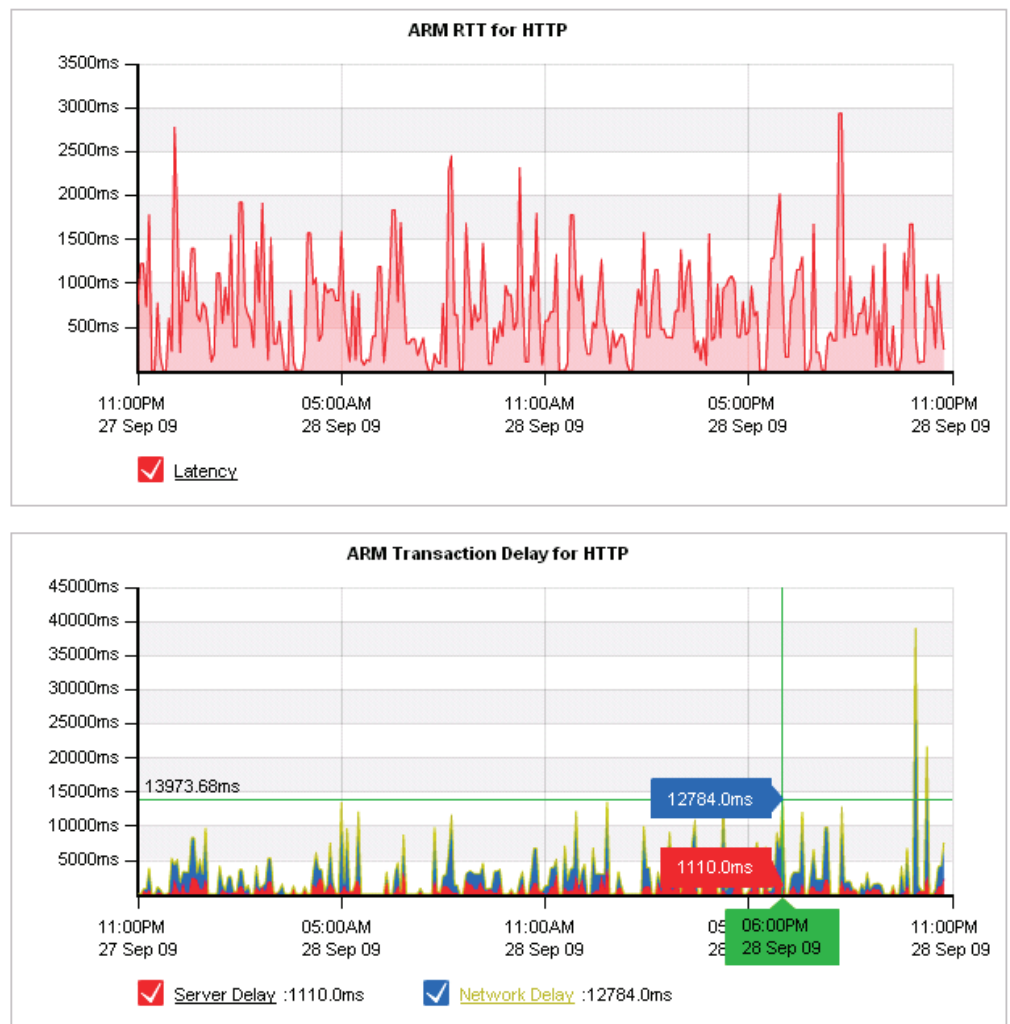


Figure 3: Application response time measurement allows administrators to determine how long end-users are waiting for their applications to respond. This information can be used to pinpoint if a problem is network or server related and to fine-tune QoS policies.

Equipped with this deep knowledge of network activity and usage, network managers can make informed decisions for setting effective policies, controlling traffic and optimizing network resources and application performance.

Many organizations have invested heavily in expensive and complex ERP and CRM applications that touch every facet of the business from sales and marketing to finance to manufacturing. Given the mission-critical nature of these enterprise applications, businesses simply can't afford to have their performance compromised by a sluggish and poorly optimized network. By enabling network administrators to measure and manage application response and take appropriate actions to optimize the network, the Exinda WAN optimization solution enables organizations to make the most of their significant investments in the ERP and CRM applications such as Salesforce, SAP, Oracle and PeopleSoft.

Application Response Measurement

The Exinda Web-based user interface provides a real-time dashboard with single pane of glass visibility into all network activity. Network administrators simply log in to the management interface to obtain a live view of network activity.

At a glance, administrators can identify performance issues as they are happening and rapidly troubleshoot the network. Alerts, warning and email notifications automatically inform administrators of configuration errors, NIC drops and transmit/receive errors.

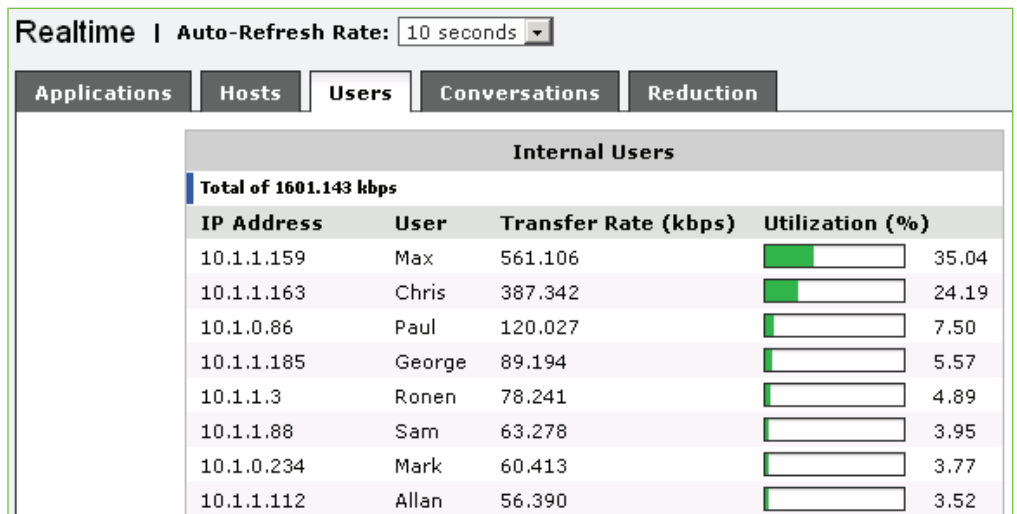


Figure 4: The Exinda real-time monitoring interface provides a live view of network activity including applications, hosts, users, conversations and data reduction.

Reporting

The Exinda appliance provides rich graphical reporting capabilities to help network managers and administrators keep track of network usage and effectively manage their bandwidth. With one click, managers and administrators can view summary reports of network activity or drill down for a more granular view in order to pinpoint areas of congestion on the network. IT staff can generate reports for a single office location, a country or region or network-wide reports that provide a global view.

For instance, an organization can run a report to summarize and categorize peer-to-peer (P2P) and other recreational Internet traffic in order to determine how much time and bandwidth is being spent on non-business activities.

The Exinda appliance can be configured to automatically generate and distribute reports via email to customers, users, business and technical managers and other stakeholders to keep them informed of key metrics that are important to the organization. Reports can be delivered in PDF format or in a format suitable for import into existing business intelligence applications for further analysis.

A library of pre-built report templates allows business and technical users to access the relevant information they need without IT staff having to spend time and effort building custom reports.

With Exinda, organizations can run historical reports to identify trends in network usage over time. Historical reporting provides invaluable information to support effective policy setting and capacity planning. Users can select custom reporting time frames to align with their business cycles. For example, a university or college can run reports on network usage by term or semester, while a commercial business can generate reports based on billing cycles or fiscal quarters. By running such a report, the business might identify the need to set policies to prioritize billing applications for the last two weeks of each quarter and allocate additional bandwidth to the finance department during this period.

Sample Application Visibility Report

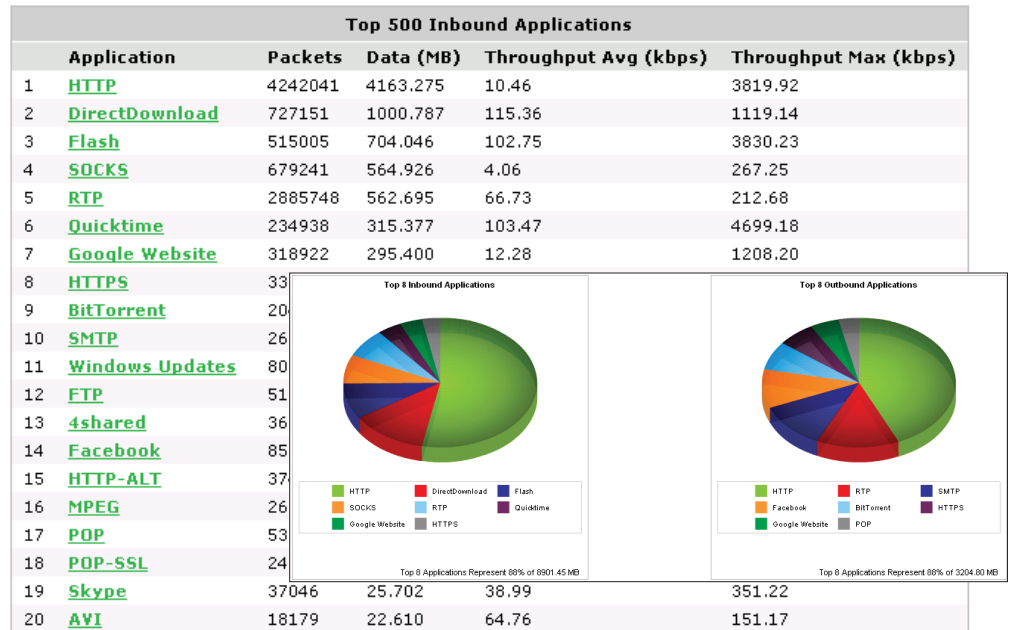


Figure 5: This graphic detail from a sample report lists out the top inbound and outbound applications on the network. Graphical reports can be automatically emailed in PDF format on a daily basis to key IT personnel or business executives.

The ability to quickly and easily generate historical reports allows managers to see how network usage has grown and changed over time. Equipped with this information, managers are better able to predict when you will need to purchase more bandwidth or upgrade their networking hardware. The reports generated by the Exinda appliance support highly effective capacity planning by enabling IT departments to budget for ongoing networking improvements and bandwidth upgrades.

In an economic climate where IT is often asked to do more with less, IT may need to cost-justify bandwidth investments to senior management. The ability to place an easy-to-read graphical report on the CIO or CFO's desk with data on rising bandwidth demands and the corresponding impact on application response times can help IT rapidly get the green light for strategic network improvements.

For organizations with large networks and multiple locations requiring the deployment of a number of Exinda appliances, Exinda's Service Delivery Point (SDP) enables consolidated reporting and visibility across the network. SDP is an intuitive Web-based global management interface that equips network managers and IT staff with critical information such as network utilization, top applications and top URLs accessed. With this information, network managers can control network policies enterprise-wide to fully optimize the network, regardless of the number of remote sites.

Getting Granular with Microsoft® Active Directory

For organizations with Microsoft environments, Exinda integrates with Microsoft Active Directory (AD) to provide an even more granular view of network activity and usage.

"Exinda's integration with Microsoft Active Directory lets us associate a username or user group to each and every data conversation on our network. This visibility empowers us to take appropriate actions to optimize our network, control traffic and ensure the performance of critical applications like VoIP and ERP."

– Jonathan Aldred, Group IT Infrastructure Manager, R&R

A core component of the Windows platform, The Active Directory service provides a logical grouping of users, computers and groups that allows administrators to manage the identities and relationships that comprise network environments. Using information stored in the central Active Directory database, administrators can manage user login authentication and authorization, assign policies and apply software updates and patches.

By exposing Microsoft Active directory user names in the Exinda real-time monitoring and reporting console, administrators can easily view and track network resource usage by AD group or individual user. Administrators can also utilize AD groups and user names in setting optimization policies, which provides much more precise bandwidth management.

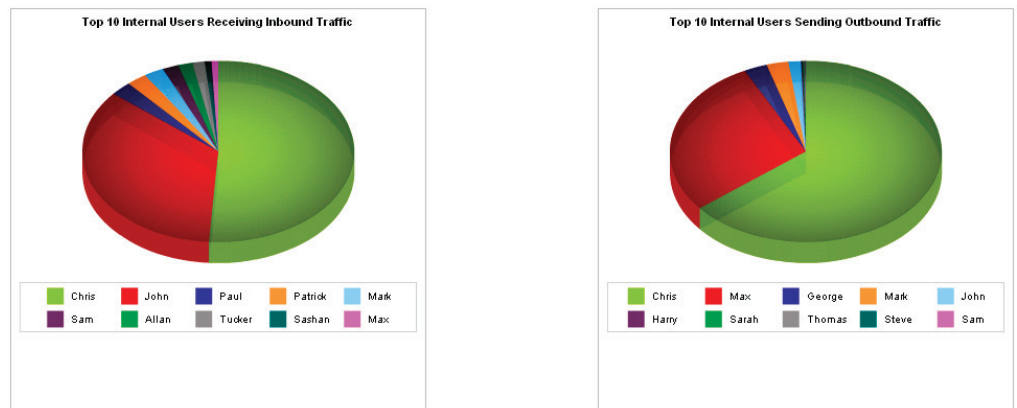


Figure 6: Microsoft Active Directory integration allows administrators to monitor network activity down to the user group or individual user level.

"We looked at several WAN optimization solutions and choose Exinda because of its superior visibility, control and optimization functionality, particularly with Active Directory integration. Other products that we considered would monitor usage and optimize applications by IP address. We use DHCP, making IP-centric WAN optimization products valueless because our users and network devices are assigned IP addresses dynamically."

– Jeff King, Systems Administrator, The Expo Group

Active Directory integration is nothing short of a revelation for network administrators who have previously had to make do with monitoring and reporting at the IP address level. The ability to view network activity by IP address is insufficient in today's dynamic DHCP environments because it doesn't tell you who did what on your network. In today's environments where IP addresses are no longer static and can be dynamically renewed, the ability to monitor network activity by AD user name allows administrators to track where users go and what they do online.

Equipped with this detailed information, administrators can quickly identify by name users who are using the network inappropriately or are consuming more than their fair share of bandwidth. This user-level visibility can be used to pinpoint excessive recreational Internet usage, for example.

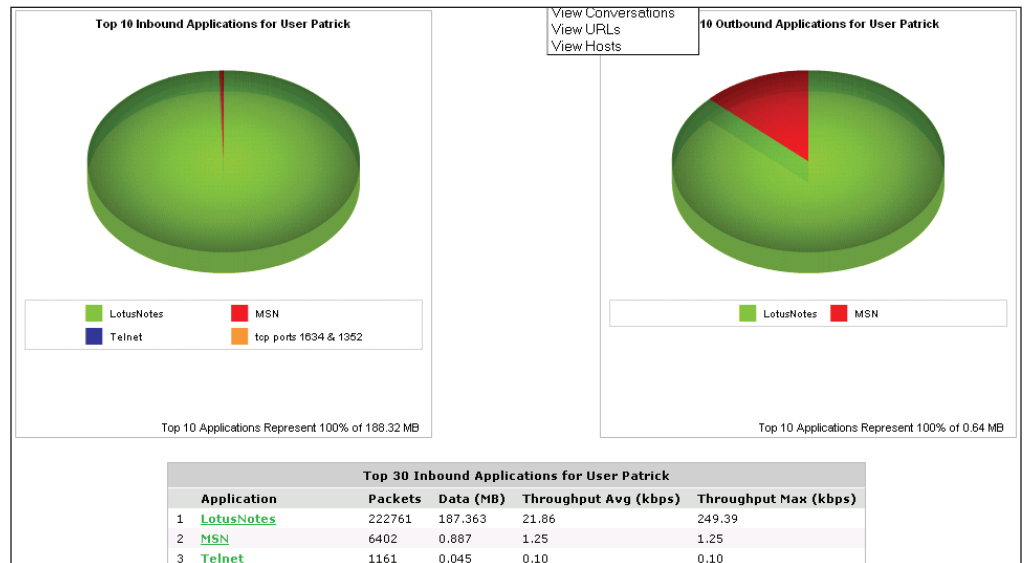


Figure 7: Administrators can drill down into the top inbound and outbound applications, conversations, URLs and hosts for any user on the network.

Exinda AD integration can also be used to show administrators which branch offices or departmental groups require more bandwidth, allowing organizations to apply policies to efficiently allocate bandwidth to the specific users, groups and sites that need it most for line-of-business activities.

Another area where Exinda AD integration saves administrators time and effort is permission management. Within most organizations, there are travelling managers and employees who regularly roam between different office locations and sites. Keeping track of roaming employees and ensuring that they can access the network and applications from whichever location that happen to be in on a given day often creates significant headaches for network administrators.

Exinda Active Directory integration helps administrators more quickly and easily manage Internet access permissions for managers and employees who routinely roam between sites between they no longer have to configure IP reservations for roaming users.

Application Identification

The Exinda appliance accurately identifies application traffic on your network through deep-level inspection, Layer 7 packet classification and behavior monitoring. Exinda's ability to view information on applications from Layer 2 through to the Layer 7 application layer means that it can accurately identify and classify all applications on the network – even so-called obfuscating applications that are purposefully designed to avoid detection and classification. For instance, Skype and other peer-to-peer applications often use port 80 for communication, a port traditional reserved for Web traffic. Other “port-hopping” applications will switch ports dynamically.

The Exinda solution's deep packet inspection goes even further by inspecting entire packets travelling across the network as part of a communication. As packets are exchanged between applications, deep packet inspection (DPI) looks not only at packet headers, but also looks inside the packet to examine its actual payload. DPI allows administrators to drill down and correlate hosts with application usage.

Some opponents to deep packet inspection argue that the technology constitutes a breach of privacy. They often make the analogy that inspecting a packet's contents is like opening and reading a letter that isn't addressed to you. This view is false and is based on an incomplete understanding of the technology.

While the Exinda appliance's DPI capability looks at the contents of a randomly selected number of packets, scanning for certain patterns that can help classify the application and protocol, it in no way “reads” or “understands” the communication content, nor does it retain or index the content of network packets. As such, the use of DPI does not interfere with online privacy.

Similarly, behavior monitoring looks for statistical indicators that can be used to identify various types of traffic – peer-to-peer file transfers or streaming media, for example – based on the distinctive pattern of their traffic flow. This deep visibility into network activity is essential for effective bandwidth management.

Summing Up

By deploying a real-time monitoring and reporting solution, organizations gain the ability to continually monitor, control and optimize their WAN to maximize application performance and make the most of network capacity. Equipped with a 360-degree view of the network and applications, organizations can turn insight into action by applying policies to control unwanted or aggressive traffic on the network, as well as prioritize bandwidth for the most critical business applications.

Providing real-time visibility into network activity and rich historical reporting and trend analysis, the Exinda WAN optimization appliance offers organizations an easy to implement and cost-effective solution for keeping track of the network. With Exinda, network managers and administrators can see and understand exactly what is happening across the WAN so they can detect recreational traffic, mis-configured or misbehaving services and users who are consuming more than their fair share of bandwidth.

For organizations that have spent considerable capital on Web-based applications, ERP or CRM solutions that are dependent on the network, the Exinda appliance is an essential solution for ensuring a maximum return on application investments. The Exinda solution can bring immediate benefits in application visibility and performance, as well as long-term strategic advantage in terms of capacity planning and network optimization.

About Exinda

Exinda is a global provider of WAN optimization and application acceleration products. Exinda has helped over 2,000 organizations worldwide reduce network operating costs and ensure consistent application performance over the WAN. The Exinda Unified Performance Management (UPM) solution encompasses application visibility, control, optimization and intelligent acceleration – all within a single network appliance that is affordable and easy to manage.

Founded in 2002, Exinda is headquartered in Boston, Massachusetts with regional offices in Canada and the United Kingdom. Research and Development is centralized in Melbourne, Australia.

To learn more about Exinda's award-winning solutions, contact your local reseller or visit www.exinda.com.



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