Network Bottlenecks: Taming the Beast

As more companies move to Web-based applications, IT adopts WAN optimization tools to overcome network performance issues

In an ever-more-complex business environment, IT professionals are making simplicity their mantra. Servers and desktops are being virtualized, storage is being consolidated and software, data and systems infrastructure are being centralized and, in some cases, moved to the cloud. Outsourcing, cloud computing, Software as a Service, and virtualization all are practical options in an IT organization’s frantic efforts to improve the end-user experience and lessen the costs and headaches associated with the sprawling infrastructure, both inside and outside the physical enterprise.

For several years, the idea of adopting Web-enabled applications that can be centrally managed has fit neatly into this mosaic. Companies have moved more and more of their architecture to a Web paradigm, including Web-based applications for everything from personal productivity suites to a company’s most mission-critical applications. The benefits are more than theoretical: organizations are saving money on infrastructure, licensing fees and support; improving organizational agility, and freeing up their increasingly scarce IT staff resources to work on transformational projects rather than on systems administration.

But there’s a troubling enigma in this trend. As organizations accelerate their use of Web-enabled applications, it has put huge pressure on their network infrastructure to deliver critical information traffic in a timely fashion for demanding users. Growing data volumes, especially rich-media files, are creating more and more performance bottlenecks. At best, these bottlenecks are reducing business productivity; at worst, they are restricting access to data, applications and network resources, effectively strangling the infrastructure and undermining the very benefits of simplicity, agility and cost efficiency Web-based applications are supposed to deliver. And IT managers don’t want to be told that the answer is simply to buy more bandwidth; they already know how that recommendation will be received in the corner office.
In fact, a recent TechTarget study of more than 200 IT decision-makers in North America sheds stark light on this problem:

- To a significant degree, use of Web-enabled applications will rise in the coming year, resulting in even more pressure on network infrastructure.
- Most organizations already are struggling with network performance bottlenecks as a result of the move to Web-based applications.
- The vast majority have undertaken virtualization, data center consolidation and, to a lesser extend, cloud computing and outsourcing, each increasing stress on the network.
- User complaints are far more likely to have increased than decreased during the migration to a Web-enabled applications model.
- A strong majority of companies have had to spend extra money to alleviate network performance problems.

This study dives into this issue to uncover its causes, its implications for businesses, and the various steps IT organizations are taking to wrestle this problem to the ground.

**IT Seeks New Ways to Optimize Network Performance for Web-Enabled Apps**

Network performance bottlenecks have undeniably impacted IT organizations’ ability to gain the full measure of anticipated benefits from a centralized infrastructure and Web-accessible applications, according to a recent market research survey from Tech Target. Based on responses from 208 IT decision-makers, the survey notes that organizations are scrambling to introduce solutions for the heightened problems of network performance and applications availability due to moving to some form of Software as a Service or cloud-based applications model.

It’s not a surprise to learn that organizations have been migrating to Web-based applications for some time. What is interesting to note, however, is that when it comes to SaaS and the cloud, IT organizations clearly are moving beyond productivity suites and email. The study notes that, more and more often, business-critical enterprise applications are moving to some sort of “off-premise” model.

### Deployment of Web-based Apps

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<tr>
<th>Application</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>Collaboration tools</td>
<td>53%</td>
</tr>
<tr>
<td>BI/data warehouse</td>
<td>34%</td>
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<tr>
<td>Financial</td>
<td>29%</td>
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<tr>
<td>Personal productivity</td>
<td>29%</td>
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<tr>
<td>Real-time video</td>
<td>27%</td>
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<tr>
<td>Sales force automation</td>
<td>22%</td>
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<td>ERP</td>
<td>19%</td>
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Already, more than one-half of the respondents say their organizations have migrated important collaboration tools like Microsoft’s SharePoint application to the Web, and more than a third have done so with key enabling tools such as business intelligence and data warehousing. Additionally, core financial applications are finding their way into a cloud or SaaS model. And, even traditional enterprise applications such as Enterprise Resource Planning (ERP) and sales-force automation are being transitioned to Web environments, according to the survey.

The report also notes a new sense of urgency among IT organizations to solve this problem—or at least tame the beast of network bottlenecks—in large part because moving to Web-based applications is going to accelerate in the coming 12 months. According to Jeff Kaplan, managing director of THINKstrategies Inc., a research and consulting firm that tracks Software-as-a-Service and cloud computing, the pressure of challenging economic conditions and IT’s desire to reduce architectural complexity are combining to move information assets to the Web. “It’s a trend that has been building for some time, and it will continue because it’s a more economical model and it takes pressure off already-stressed IT organizations,” said Kaplan.

Kaplan’s predictions are borne out by the research data, which indicates that the already-popular use of Web-based applications is poised for even more growth in the coming year. According to the study, more than three-quarters (78 percent) of the respondents already have adopted Web-based applications, with an additional 10 percent that have yet to embrace the Web applications model expecting to do so in the next year.

So, with adoption of Web-based applications now commonplace, and clearly set for even further adoption in the coming year, the challenge for IT organizations has shifted. Instead of worrying about the cost of purchasing, the responsibility for deploying, and the complexity of managing enterprise applications, IT now is forced to contend with one of the often-ignored challenges of Web-based applications: network performance degradation. To some degree, this problem has caught many IT people unaware of the magnitude of its impact on their organizations’ business stakeholders. As more and more of an organization’s business-critical data has been created and stored on the Web, the seemingly simple process of pulling that information down from the cloud and sharing it throughout the organization has required more and more network resources.
Very often, this is business-critical and time-sensitive data (purchase orders, inventory lookup, pricing, customer records, payroll information) that need to be accessed often and in real time, so performance degradation has a significant, negative impact on how business activities are carried out.

For instance, survey respondents point out that they are encountering an increasing amount of user complaints related to the move to Web-based applications, starting first and foremost with network performance bottlenecks. Other problems encountered by IT organizations certainly can be interpreted as derivatives of network performance issues, such as poor user experience, loss of productivity and lack of applications availability.

Clearly, network performance problems are far and away the most significant issue survey respondents say they have to deal with as a result of moving to Web-based applications. Additionally, more than one in three respondents indicate they hear about poor user experience, and about one-quarter also say their users are experiencing a drop in productivity and a lack of applications availability.

Finally, IT decision-makers say they are incurring additional costs in order to resolve network performance problems. Nearly one-quarter of the respondents say they have had to spend more money either frequently or often, and almost 70 percent say they’ve incurred extra costs at least occasionally as a result of that move.

So, with network performance certainly a legitimate and growing concern for companies moving to a Web-based application model, the challenge for IT organizations is clear: What do they do about it? More and more often, IT professionals are turning to wide-area network (WAN) optimization tools to provide greater bandwidth, improved performance, increased intelligence and flexibility, heightened security and an enhanced user experience.

For IT organizations, the issue goes far beyond just getting “fatter pipes,” notes Kaplan of THINKstrategies. “A bigger network isn’t the answer,” he says. “The network has to be smarter, with the intelligence necessary to properly route different kinds of traffic and to manage that
traffic from a cloud or managed service provider, via the Web.” Kaplan adds that new WAN optimization tools are designed for efficiency and flexibility. “It’s a little bit like urban planning,” he notes. “Some urban planners put in more highways to deal with traffic problems, but when it wasn’t done the proper way, it actually added to congestion.”

Market-watchers agree. Matthias Machowinski, directing analyst for enterprise voice and data at Infonetics Research, noted in a recent report that “by deploying WAN optimization appliances, organization can keep operational costs in check, or reduce them outright. . . . In addition, there is a soft ROI (return on investment) resulting from increased employee productivity when applications become more responsive.” Some technology suppliers had attempted to bridge the performance gap created by limitations of traditional network infrastructure in light of heightened traffic volume and complexity by adding WAN optimization features into their routers. But analyst firm Gartner Inc. points out that those solutions were often little more than “lightweight versions” without the necessary, performance-enhancing features of dedicated WAN optimization solutions.

In fact, nearly one-half of the survey respondents say they have deployed network optimization tools as a way to deal with performance bottlenecks caused by Web-enabled applications. That was the second-highest response among IT professionals, following only “increased bandwidth between locations such as data centers and branch offices.” Those two were far and away the most-taken steps by the respondents in their attempts to overcome network performance bottlenecks.

As mentioned by Gartner and other analysts, network optimization tools have evolved dramatically in recent years, combining such features as predictive load-balancing and improved network security with improved ease of use and better price points. As a result, worldwide sales of WAN optimization appliances will exceed $1.5 billion by 2013, up from less than $1 billion in 2009, according to Infonetics. Market-watchers also point out that the industry trend toward use of wireless devices on the network’s edge (notebooks, PDAs, smart phones and tablets, for instance) will continue to put even more pressure on network performance as those users seek access to Web-enabled applications, as will workers in branch offices and those working from home offices or other virtual facilities. This is likely to spur even greater demand for WAN optimization tools.
Summary

Web-based applications are a fact of life for IT organizations across all industries, geographies and company sizes. The benefits of fast deployment, leaner infrastructure requirements, cost efficiencies and simplified management make it an extremely attractive way to implement new applications and keep IT staff focused on projects closer to the business goals and objectives.

But as application data expands on both internal and external infrastructure, pressures on network performance to accelerate traffic to users at all points along the network continually mount. Add to that the mandate for instantaneous, uninterrupted and ultra-reliable access because of business requirements, compliance and security threats, and IT organizations are increasingly looking for ways to improve network performance for Web-enabled applications.

WAN optimization tools are becoming increasingly popular as a method to provide not only improved bandwidth and faster, more consistent access, but to help IT organizations take full advantage of the benefits of Web-based applications without degrading user productivity due to performance bottlenecks. Demand for these solutions is on the rise, and appears likely to accelerate as more and more enterprise applications move to the cloud or are deployed in a Software as a Service model.

About Blue Coat

Blue Coat Systems is a leading provider of Web security and WAN optimization solutions. Blue Coat offers solutions that provide the visibility, acceleration and security required to optimize and secure the flow of information to any user, on any network, anywhere. This application intelligence enables enterprises to tightly align network investments with business requirements, speed decision making and secure business applications for long-term competitive advantage. Blue Coat also offers service provider solutions for managed security and WAN optimization, as well as carrier-grade caching solutions to save on bandwidth and enhance the end-user Web experience. For additional information, please visit www.bluecoat.com.

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