

# HEAD-TO-HEAD

IT organizations today are plagued with a plethora of challenges as they try to keep pace with the demands of business. With businesses today running on applications, these challenges are making application delivery a major priority for CIOs around the world. With the remote workforce growing exponentially and branch offices popping up all over the globe, the challenge of delivering applications quickly and effectively while keeping costs down has put enterprises in a serious dilemma.

SCOTT CRAWFORD, Senior Analyst at EMA, and WES WASSON, Vice President of Worldwide Marketing for Citrix Systems, go head-to-head to discuss the application delivery challenges that the new enterprise is faced with, and what can be done to alleviate the stress. In this exclusive interview, Scott and Wes talk about the present situation and give organizations advice on how to make strategic investments to solve the problems surrounding application delivery.

**Studies show that up to 70 percent of all application projects experience major problems with slow performance, poor security, or unexpected cost overruns. What can CIOs do to avoid these application delivery challenges?**

**SC:** Basically, they all revolve around recognizing the reality of application development and delivery. Applications may begin being simple in concept and can rather quickly become very complex in implementation. You can see how many moving parts there are to modern applications today. First of all, applications are broken out among several categories – standard desktop apps, client-server apps, web apps, etc. – so the term “application” covers a wide range of territory. Secondly, applications may begin with a simple or elegant concept, but when you begin stitching the pieces together, you start to find out just how complex application integration can become.

For example, web apps have a medium that they must be delivered over; they typically include a web server platform (applications delivered via the web itself) and back-end resources that must be integrated; and when it comes to processes that are managed by these applications, they must be automated and typically rely on transaction management. So, there are a number of moving parts just in dealing with web applications.

Even with desktop or client-server applications, if you just factor in the maintenance and management challenge – maintaining scores of desktops and all of their applications – you start to see just how complex even these applications can be. The core issue is that IT management needs to recognize the real scope of applications that they plan to deliver and manage. If they don't measure that carefully, they will, in many cases, find that the cost of developing, implementing, or deploying applications is far beyond anticipation because they don't take all of the moving parts – including the process of managing applications – into consideration.

Up until the last few years, we traditionally thought that just having high performance networking would speed everything up – improve the bandwidth and everything else will improve. However, this view failed to take into consideration the dynamics of application components. For example, one of our most significant concerns today is application security, and developers historically have not been trained primarily to be security experts (nor can this reasonably be expected of them as a whole). Tools are emerging that will help developers as well as IT operations and security staff to overcome these challenges.

**WW:** CIOs today need a strategy for application delivery today in the same way they needed distinct new strategies for distributed computing in the 1980s and networking in the 1990s. Application delivery refers to the process of getting mission-critical business applications from their source in the corporate datacenter out to users in the fastest, most secure, most cost-effective way possible. With enterprises of all sizes running their business on applications today, addressing this issue from a strategic standpoint has never been more critical if CIOs want IT to enable business objectives rather than being an obstacle.

Application delivery infrastructure refers to the distributed infrastructure components companies deploy along the line-of-sight between datacenters and end-users to ensure the successful, reliable delivery of any application to any user in any location. An end-to-end application delivery strategy will typically start with infrastructure products that are deployed in the datacenter, directly in front of applications. These solutions will include technologies like virtualization, optimization, and streaming, all of which are designed to move application traffic over the network in the most effective way possible. Next, a comprehensive application delivery strategy will include products designed to give users easy, secure access to their applications. Third, it will include solutions that optimize the wide area network, accelerating all applications for branch office workers.



SCOTT CRAWFORD



WES WASSON

**Scott Crawford**, Senior Analyst at EMA, has over 15 years experience in the IT industry. His expertise includes security architecture and policy, software development, and systems architecture and administration. Prior to joining EMA, Scott was the first Information Security Officer for the International Data Centre of the Comprehensive Nuclear-Test-Ban Treaty Organization.

**Wes Wasson** is VP of Worldwide Marketing for Citrix Systems, responsible for leading all aspects of the company's global product, technical, and corporate marketing strategy. The former Sun Microsystems and Network Associates executive brings an extensive track record of success, with nearly 20 years of experience in the application, networking, and security infrastructure markets.

Finally, an end-to-end application delivery strategy will include solutions to monitor the application experience from the perspective of the end-user.

**Is it important for CIOs to start thinking of “application delivery infrastructure” as a distinct area of strategic investment?**

**SC:** Yes; the main reason is because the way applications are integrated – including their comprehensive delivery architecture – it needs to be seen as a comprehensive effort. CIOs need to look at all the moving parts in order to deliver the quality of experience that application consumers accept.

**WW:** Absolutely. If you're like most mid- to large-sized companies today, your business runs on applications. From email and ERM, to custom web applications and packaged vertical solutions, your success depends on ensuring that these applications meet their business goals in a world where all the variables are in a constant state of change. Globalization, mobility, offshoring, and e-commerce are moving users further away from headquarters, while datacenter consolidation and regulatory pressures are making applications less accessible to users. The dizzying array of new application architectures, like Web 2.0 and SOA, add to the overall complexity; and all the while, shrinking IT budget growth means your margin for error is razor thin.

Relying on traditional networking, security, and management solutions to deliver applications in today's world has a predictable outcome: application performance goes down; management costs and complexity go up; and security risks become extremely difficult to contain. If the infrastructure you rely on to deliver those applications to end-users wasn't designed with modern application realities in mind, you end up massively over-provisioning, adding too many servers, buying too much bandwidth, and refreshing PCs on an increasingly short lifecycle just to keep up with growing application requirements. And in most cases, you still end up

with applications that have poor performance, weak security, and are far too complex and costly to manage. Worse yet, you find that IT is increasingly becoming a roadblock to business.

That's why CIOs in many leading companies today are thinking of application delivery infrastructure as one of their top strategic investment areas. Rather than continuing to rely on traditional networking, security, and management vendors to solve these problems, they are looking at how their existing infrastructure adds value to applications. They are putting a premium on new infrastructure solutions that complement what they already have and make it easy to deliver any app to any user with the best performance, highest security, and lowest cost.

**Since most applications are delivered over networks, should companies look to their existing networking vendors to add application intelligence into the underlying network?**

**SC:** That validation should be based on the level of expertise and credibility of the specific vendor in application delivery and application delivery infrastructure. You need to be looking at your primary requirements for application delivery – what does the delivery of a particular application require in terms of resources and the ability to deal with changing demands? Organizations should take a step back from vendor-specific questions and instead look more specifically at the requirements of the application itself. This should lead organizations to a fairly short – but growing – list of vendors that actually have real expertise in these areas.

**WW:** It may sound attractive at first glance to look to your traditional networking vendors to solve these problems, especially since your applications are delivered over these same networks. Most experts, however, believe this is the wrong approach. The primary role of your traditional networking vendor is to ensure a fast, ubiquitous, always-on network. Trying to address application-layer problems down in the transport network is extremely complex and can

easily create more problems than it solves, especially if the network service is inadvertently disrupted as a result.

Application delivery problems are far better addressed by infrastructure solutions that work with your existing network but are completely focused on adding value to applications. To provide this value, they must have full visibility into all application traffic and each user scenario, something that is virtually impossible to do down in the transport network. A complete application delivery strategy will also include ways to improve the delivery of Windows-based applications and desktops, requiring application virtualization and streaming technology that has little to do with the underlying network.

An equally important consideration as you select strategic partners for application delivery is to evaluate where the real expertise of the vendor lies. Traditional networking vendors tend to be steeped in their understanding of how to make transport networks fast and reliable. They know wiring closets inside-and-out and can provide great advice on core networking issues. And if you're like most companies, this is exactly where you want them focused. Most networking vendors have little expertise, however, in the technical or business aspects of delivering applications, so turning to them for best practices guidance or technology solutions in these areas is generally not advisable.

#### **What role should virtualization play in delivering applications with the best performance, security, and cost savings?**

**SC:** There are a number of ways to look at virtualization. "Virtualization" is a term that can be applied to so many different things in many different ways and in many different approaches to the technology of virtualization itself. It might be worthwhile to step back and take a look at the pain points that motivate enterprises to embrace virtualization alternatives to conventional application delivery. The ability to virtualize the delivery of conventional client-server applications through delivery of the client experience via the network, rather than through local execution – remote presentation, in other words – is one way to deal with client-server application delivery issues such as the cost of distributed client maintenance or maintaining secure and reliable client configuration, while preserving the value of these applications. This raises a consideration of the security issues involved in managing applications. If current patch levels are not well maintained, for example, many common applications will be exposed to a range of threats that are constantly changing.

All of these risks tend to target the vulnerabilities of the locally executing environment. Applications in these environments can be maintained in a secure manner, with configuration controls that help assure application availability as well as configuration risks. But when the costs and risks of doing so across a distributed enterprise are weighed in, businesses may want to consider alternatives such as virtualized application delivery that centralizes these aspects of application management. Many organizations have found application virtualization valuable for helping to meet requirements from regulatory compliance

to enabling the mobile workforce with minimal cost – and risk – impact.

**WW:** Virtualization may be one of most overused and potentially confusing terms in the industry today. Most of the time when the press talks about virtualization, they are referring to separating the physical from the logical in the datacenter, virtualizing things like storage, servers, disks, and machines. While this approach can have a positive impact on the economics of running an efficient datacenter, it generally has little impact on the delivery of business applications over the network to end-users.

In the application delivery context, the most notable use of virtualization technology is for the delivery of Windows-based applications over the network. The traditional approach to deploying Windows applications is to install each individual Windows client on each user's PC, then try to manage and maintain all of these applications in a distributed fashion. Unfortunately, this model quickly creates problems with cost and complexity that grow exponentially as applications and users are added or changed in any way.

A far better solution for delivering Windows applications is to install all the clients one time in the datacenter, and virtualize their delivery over the network so that the only elements crossing the wire are pixels, mouse movements, and keystrokes. This approach dramatically improves the cost and complexity of managing Windows applications without compromising the end-user experience in any way. It also provides the ultimate model for data security since no data leaves the datacenter. An adjacent technology known as application streaming can be used in a similar fashion to stream Windows desktop applications to end-users on-demand, similar to how you might stream an audio or video file. Our Citrix Presentation Server product line is a good example of a solution that uses virtualization and streaming technologies to deliver Windows applications.

#### **What is the impact of the web on application delivery?**

**SC:** The web really has had an enormous impact on application delivery. There are two highly important values of the web: 1) it has made it possible to deploy a ubiquitous, universal client that is highly flexible; and 2) it leverages an equally flexible medium to communicate information to that client – HTML is arguably the most adaptable information communications medium that we have today. These capabilities have revolutionized information delivery and the cost of application distribution and maintenance, particularly for client-server applications.

However, web technologies can no longer be deployed without taking into consideration their impact on the delivery infrastructure and delivery architecture, and the resulting impact on the expected level of end-user experience. Again, an in-depth consideration of all the moving parts and the impact of all those moving parts on the end-user's experience is critical.

**WW:** Web protocols are extremely "chatty," creating massive increases in the volume of application traffic. They also tend to carry far richer content than client-server

applications, and because the browser is ubiquitous, web apps are often delivered to users around the globe – both internal and external – that the application owner doesn't control. The combination of these factors often creates huge problems with performance, especially for remote users. At the same time, the cost of web servers in the datacenter can easily spiral out of control as servers are asked to do all sorts of tasks, like encryption and network connection management, that they were never designed to handle. In addition, web applications are generally far easier to exploit than traditional client-server apps, opening up many new data security risks. The combination of these factors can dramatically slow down application performance, drive up the cost of web servers and network bandwidth, and increase the risk of data loss and regulatory compliance problems.

To address these issues, companies need to look to integrated application networking products that go beyond traditional load balancing to incorporate advanced technologies like compression, caching, protocol optimization, and application firewall security. Solutions like our Citrix NetScaler product line use this approach to optimize and secure the flow of web applications over the network, significantly improving the performance, security, and cost of web application delivery.

#### **Does WAN optimization play a role in end-to-end application delivery?**

**SC:** If you want to break application delivery via a network into three primary domains, they are: 1) the point of origin; 2) the point of consumption; and 3) the network. There has been a lot of focus on optimizing resources on the delivery end – primarily focused on the data center – but the consumption side of the equation poses significant issues all its own. Poorly optimized networking throughout the application network can lead to bottlenecks that may diminish the positive effect of front-end optimization. Without optimizing the consumption side of the application environment, the level of experience may be lacking what may be expected from the deployment of datacenter resource optimization alone. In many cases, both are really necessary to deliver the expected quality and experience. Throughout the network, application-specific optimization should be seriously considered wherever simplistic bandwidth over-provisioning alone may not touch issues such as application-specific protocol optimization, which many of today's expanding range of applications require to make the most of available resources.

**WW:** Absolutely. With the combination of user mobility, globalization, and outsourcing, more than 55 percent of all employees at mid- to large-sized enterprises now access all of their applications from branch offices. Traditional networks and routers were never designed to deliver the kind of application traffic they are expected to handle today, especially as we consolidate datacenters and start pushing applications like voice and video over the network. WAN optimization products address this problem by automatically optimizing all application traffic over the wide area network. This approach can dramatically improve application performance and can reduce bandwidth requirements by

as much as 75 percent. Our Citrix WANScaler product line is a good example of a solution in this space.

While traditional routers may add some optimization technologies over time, we believe WAN optimization requires deep application-layer intimacy and is much more closely associated with an application delivery infrastructure than with the underlying network plumbing.

One key factor to keep in mind when evaluating WAN optimization solutions is how easy they are to deploy and manage. Most products on the market today require you to modify your existing network and can obscure network visibility, breaking the tools your network analysis teams rely on. Unless you are willing to make these compromises, you should place a high premium on solutions that are entirely transparent and can be easily dropped into your existing environment without changing the network or applications. You should also look for solutions that can automatically optimize the diverse variety of application traffic flowing through them and do not require retuning every time a new application is rolled out.

#### **How important is it for companies to consider secure application access technologies like SSL VPNs as part of their overall application delivery strategy?**

**SC:** Application delivery today implies delivery in most cases via public networks. This exposes not only application functionality to exploit, but also the information communicated via the network. The protection afforded by virtual private networking has therefore become an integral aspect of application delivery, because the technology of SSL VPN is itself native to application networking, and grew directly out of it. With the evolution of applications, however – and the wide variety of content communicated by applications today – it is becoming increasingly important to integrate SSL VPN functionality in ways that are most adaptable to a range of application requirements and demands, and which help rather than hinder application networking to deliver its primary value: high performance and availability, delivering a high quality end-user experience.

**WW:** Making it easy for users to securely access their applications from any location is an important part of application delivery. Unlike traditional virtual private network (VPN) solutions, SSL VPNs are typically easy to install and are designed to provide application-layer access to the exact application resources each user needs. Citrix Access Gateway is a good example of a product in this category.

When evaluating SSL VPNs as part of an end-to-end application delivery strategy, companies should look for solutions that offer "application intelligent" configuration options. These policies allow IT to go beyond simple access, determining which actions a user can perform in each application based on their unique access scenario. A user accessing a corporate application from his/her work computer, for example, might be able to use all application functions, while that same user connecting in from an untrusted location might be able to view the application but not save or print.