CISCO WHITE PAPER

# THE ART OF Application-Centric Networking

## Leveraging the network for optimized, controlled application delivery

**TRENDS SUCH AS** Bring Your Own Device (BYOD), virtualization and cloud are rendering application deployment and delivery more challenging than ever for IT departments. Applications have moved further away from the employees who rely on them, introducing the potential for latency, security and availability issues. Still, these trends can't be ignored. Employees want to access applications anytime, from anywhere, on any device; and they expect the same level of performance and reliability that they're used to in the office. At the same time, enterprises are eager to gain the cost and management benefits of centralizing applications in the data center or cloud.

Bottom line: IT departments need to deliver. They need to find a way to ensure optimal application delivery to keep employees productive and the business agile—or put the company's ability to innovate, compete and contain costs at risk.

### PUTTING THE NETWORK TO THE TEST

What's required is a new, holistic approach that leverages the network as the best control point for managing application deployment and delivery, offering pervasive visibility, granular control and optimization at Layer 7. By expanding the role of the router to provide application-centric networking, routing is no longer simply about delivering packets; it's about giving IT visibility into and control over the applications that run the business.

"The job of the network is to efficiently deliver applications from anywhere so people can collaborate and communicate," says Raakhee Mistry, senior marketing manager with Cisco. "BYOD, virtualization and cloud place additional demands on the network and raised expectations for the networking team, which is not just measured on packet delivery anymore. The expectations are now for the network to deliver a high-quality overall application experience."

Leveraging the network for application delivery makes sense. Because all application traffic is already going through the router, adding capabilities to enable IT to optimize, control and manage applications is a more streamlined solution. That's compared to the alternative approach that requires additional devices, probes or bandwidth upgrades that drive up cost and complexity. With tightly integrated Layer 7 features that bring this application intelligence to routers, the network becomes the driver that simplifies application delivery, improves agility and increases employee productivity. Therefore, network administrators can deliver on performance requirements while keeping costs down and application administrators can start to consider what the network can do for them.

"Customers are faced with major challenges presented to them by these complex computing trends, and so they need to think about a holistic and integrated solution," says Mistry. "We believe leveraging the router at the WAN aggregation point to provide application routing services is really the right way to find better success with application delivery. Understanding how applications will perform and being able to monitor and troubleshoot them quickly so IT can minimize downtime, that's important. To achieve this, people need to look at

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routing a little differently -- the standard of what routers should offer has been upleveled."

## THE NEW STANDARD IN ROUTING

With this application-aware network approach, routers are enhanced to ensure high-quality application deployment and delivery, offering the following benefits:

- **Improved end-user application experience** by addressing application-specific performance requirements by application type (VDI, video, etc.), tuning the network for specific application protocols, validating application response times, and mitigating the often-disruptive effects of WAN latency;
- **Enhanced productivity** by providing a direct view into LAN and WAN traffic, enabling the network to make the best decisions to prioritize and optimize traffic. This ensures that mission-critical applications gain priority over other traffic without excessive bandwidth costs, and latency-sensitive applications receive the required bandwidth allocation to improve the end-user experience;
- **Reduced operational costs** through lower bandwidth consumption while also delaying or eliminating increased recurring bandwidth costs. By offloading non-business critical traffic onto lower cost business-class broadband connections, IT can ensure that the most important applications are receiving the benefit of high-performance connections. And by combining multiple services in a single-box solution, both capital and recurring expenses for branch IT infrastructure are reduced;
- **Simplified IT management** by providing granular visibility and control at the application level for capacity planning, application prioritization and troubleshooting pervasively across the network;
- **Enhanced enterprise agility** by enabling an intelligent network that quickly adapts to changing business, application and user requirements; for example, allowing business applications to be migrated or updated without affecting the application performance for the end user;
- **Secure, optimized access to cloud applications** by enabling enterprises to directly connect branch offices to the cloud while maintaining consistent application policy and optimization. This delivers better application performance to branch offices without compromising security;
- **Accelerated BYOD adoption** by providing security, visibility and optimization of applications on mobile devices. Network administrators need a way to manage BYOD traffic that's traveling across a wireless encrypted tunnel – carrying all kinds of content, including video – and ensure the same application policies are applied.

## INTRODUCING CISCO INTEGRATED SERVICES ROUTER WITH APPLICATION EXPERIENCE

Cisco is improving application performance to branch offices with the Cisco Integrated Services Router Generation 2 with Application Experience (ISR-AX), which provides a powerful suite of application routing services including granular visibility, control and optimization. Cisco ISR-AX simplifies application delivery to branch offices that are deployed from anywhere, resulting greater business agility and employee productivity at the lowest TCO. The solution provides rich application-level information from the network to third-party application-aware network performance management tools and allows customers to integrate application routing services for up to 35 percent lower capital investment than a standalone WAN Optimization appliance. It offers IT a cost effective, easy to use branch office platform to support an application-aware network and confidently host business critical applications anywhere with an optimal experience.

With Cisco ISR-AX, IT has a central control point that allows them to meet user expectations at scale. That means giving employees the high-performance application experience they need to get their jobs done and drive the business forward.

## CONCLUSION

Moving applications further away from employees and running them across WAN connections has implications in regard to performance, reliability and manageability. And with the emergence of technologies such as Virtual Desktop Infrastructure (VDI) that require every key stroke a user enters to traverse the WAN, application response times can be seriously impacted. Nonetheless, such trends represent the way that business is moving, and IT needs to be able to deliver top-quality application service and performance regardless.

Application-centric networking solves the application challenges facing IT departments, helping them maintain visibility into and control over applications regardless of where they reside or are accessed from. This approach helps IT achieve its application requirements while containing costs and reducing complexity.

SUPPLEMENT

# Gain Control of BYOD Impact on Application Performance

**ACCORDING TO DIMENSIONAL RESEARCH***, 80 percent of workers bring personal devices to work, and of those that do, 87 percent use them for work related activities. While businesses supporting the bring your own device (BYOD) trend can greatly improve productivity and mobility, their IT teams will also experience a higher load of traffic on their network that can negatively impact mission-critical application performance and lower productivity.

BYOD has changed the primary access for network connectivity, and as a result has affected traffic flows across the network. Think about this use case: Sarah comes to work, turns on her corporate laptop, and launches her email client. While she's walking to her staff meeting, she grabs her iPad, and begins scanning her email to check for urgent messages. While she's in her meeting, her phone alerts her of an urgent email.

This scenario happens every day with thousands of employees—for email, web traffic, virtual desktop infrastructure (VDI), and many other applications. The issue is that traffic is run over the wired and wireless network, and because BYOD technology is tunneled, traditional networks are unable to see applications, apply consistent policies, and optimize the traffic. As a result, Sarah's use of three devices can increase WAN consumption of bandwidth by two to three times.

The bigger problem for IT will be the non-business-critical traffic BYOD will generate on the network (e.g., iCloud, Facebook updates, Netflix streaming). Because the wireless traffic is encrypted, IT will not be able to tell the difference between applications like Citrix VDI and YouTube, which will also increase the load on the network and slow down business operations.

## ENFORCING CONSISTENT WIRED AND WIRELESS POLICY AND OPTIMIZATION

While IT administrators may not be able to control the devices themselves, they can control the traffic to and from these systems, and ensure that an optimized solution with full application visibility is in place to address performance concerns. The Cisco® ISR-AX solution provides IT administrators with the two major components in addressing these challenges.

The first component is Cisco Application Visibility and Control (AVC), allowing IT to see more than 1000 applications running within the wireless tunnel, differentiating between applications and applying policies consistently. The second is WAN optimization—using Cisco Wide Area Application Services (WAAS)—that accelerates applications and optimizes traffic on both the wired and wireless networks.

Cisco has redefined the role of the router with Cisco ISR-AX, which currently offers the industry's only Layer 2 through 7 router with both network and application services. Cisco ISR-AX provides a comprehensive approach for ensuring application performance, wherever applications may be hosted, regardless of transport and the devices that run the application. With Cisco ISR-AX, IT can run applications faster, reduce bandwidth costs and latency by more than 50 percent, and simplify IT with probeless visibility network wide.

- **To read more about this BYOD predicament and the Cisco solution read this white paper.**
- **Find out how Quintiles, a global biopharmaceutical with headquarters in North Carolina, has successfully rolled out BYOD to thousands of end users.**

* Dimensional Research, "Consumerization of IT: A Survey of IT Professionals," Dell KACE 2011

SUPPLEMENT

# Accelerate Application Delivery from the Cloud

**THE ADOPTION OF CLOUD-BASED** computing and applications promises to improve the agility, efficiency, and cost effectiveness of IT operations required to provision, scale, and deliver applications to the enterprise. However, as with other new technology trends, delivering applications from the cloud to the remote sites creates additional challenges in application performance, availability, and security.

Enterprise IT departments continue to invest in technologies that generate cost savings while making their business applications more agile and available. These initiatives, such as consolidation of branch-office servers and virtualization of data-center servers, are increasingly being adopted by the enterprise; however, they have not been without consequences.

Adoption of cloud architectures requires enterprise IT departments to move resources such as applications, compute, and storage to the public or private cloud. As enterprises make these changes, compute resources may be migrated first to a private cloud hosted in corporate or outsourced data centers. While branch-office server consolidation projects reduce the server footprint, they can result in a poor end-user experience and increased bandwidth utilization. This is because applications traverse a WAN link with higher latency and packet loss and lower bandwidth than they traverse a LAN link.

Other organizations may use public clouds directly, which requires more WAN hops than with prior designs to deliver applications to branch users. A cloud networking report from Metzler & Associates indicates 90 percent of organizations backhaul SaaS applications through the data center to before reaching the end user at the branch office. **Thus, traditional problems of WAN latency, packet loss, and bandwidth limitations for centralized application delivery continue to exist and may even be magnified.

## IMPROVE CLOUD-BASED APPLICATION AVAILABILITY, PERFORMANCE, AND SECURITY

To address the challenge of application delivery from the cloud, Cisco ISR-AX with WAN optimization (Cisco WAAS) offers an integrated solution that can enable organizations to achieve the significant cost savings of cloud architectures while improving availability and security. Cisco ISR-AX provides acceleration and optimization of applications, increasing performance, improving disaster recovery, and securing application traffic. With ISR-AX, IT can deliver superior application response times for end users using public SaaS applications such as Salesforce.com, Cisco WebEx®, Microsoft 365, as well as enterprise applications in the private cloud, including Microsoft Exchange and Citrix VDI. The optimization benefits of Cisco ISR-AX with WAAS also help IT to defer WAN bandwidth upgrades. By deploying Cisco ISR-AX, organizations can achieve cost savings promised by the cloud architectures, while overcoming IT challenges and meeting data-compliance goals.

- **To read more about how to address the application delivery challenges of public and private cloud deployment scenarios and Cisco solutions read this white paper.**
- **Learn how Sparrow Hospital and Health System in Michigan was able to successfully roll out a centralized Electronic Medical System and guarantee application performance.**

** Cloud Networking Report, Part 3: The Wide Area Network (WAN), Ashton Metzler & Associates, November 2011

## ADDITIONAL RESOURCES

- **Cisco ISR-AX website**
- **Cisco IT Case Study**
- **Cisco WAAS WAN Optimization for Centralized Email Services white paper**
- **Cisco WAAS Optimized for Citrix XenDesktop white paper**