



Cisco and Akamai Elevate the Customer Digital Experience

May 2014

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Introduction: Success in the Digital Era Relies on a Next-Generation Network

The term “perfect storm” is used to describe when several forces come together and create a large, single event that has transformative effects. A technology perfect storm took place in the 1990s when Internet services, low-cost home computers, browsers and affordable broadband all came together and created the Internet revolution. This revolution launched an entirely new economic model that sparked new ways of doing business, changed the way we work, and allowed us to blend our personal and professional lives. At first, these new ways of working were the exception. But the transformation to an Internet-based work style is now complete, and this style has become very much the norm. Businesses that embraced the Internet in its early days gained a significant advantage over their competitors; those that did not became irrelevant very quickly.

Today, we are on the precipice of another perfect storm (Exhibit 1)—this time, driving the industry from the Internet era into the mobile and cloud-computing era. This revolution reaches billions of mobile devices and, for the first time ever in history, the number of connected endpoints will exceed a 1-to-1 per-capita ratio.

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Exhibit 1: The Mobile and Cloud Computing Perfect Storm



Source: ZK Research, 2014

Influence and insight through social media

The shift to mobile and cloud computing is imperative for all company leaders because it facilitates the digitization of the business and advances new ways to enable employees and serve customers. To make this shift, IT leaders and line-of-business (LoB) owners must work as partners to maximize the return on investment of this new digital era.

Why must IT and LoB align? Mobile and cloud computing is a network-centric compute model. As organizations take advantage of mobile- and cloud-centric architectures, they will digitize all aspects of their businesses. This will disaggregate compute, applications, users and devices because content can be delivered from anywhere to anywhere, which creates new ways of conducting business and driving revenue.

Now more than ever, the network is becoming a strategic business asset that will maximize the opportunity created by the digital era. Infrastructure readiness will directly impact an organization's ability to succeed and build out its store, bank, school, clinic or enterprise of the future.

As businesses look to better leverage mobile and cloud computing as well as prepare the network, IT and LoB owners will need to overcome the following obstacles:

- **Finding new ways of doing business that create revenue opportunities:** With the consumerization of IT and the expectation of having network connectivity everywhere, business and IT leaders must work together to improve existing business processes and develop new ones to improve collaboration, customer service and overall productivity. For example, commercial banks can use video communications to promote new services with access to remote experts. Or hotels can use digital content to interact with guests and provide more personalized concierge services. Or retail stores might display high-resolution images on a digital sign or tablet to promote new offers based on RFID tags for merchandise in a customer's hands. The key is to be able to make these changes quickly, independent of the IT environment.
- **Improving the performance of networked applications:** The business environment is more competitive than ever, and slow applications mean lost revenue. A 2014 ZK Research study

found that every minute of network downtime equates to more than \$28,416 of lost revenue. Additionally, the same study revealed that on average, workers lose 14% of their productivity because of poor network performance. Slow networks mean slow applications, resulting in fewer sales transactions. Optimizing the performance of networked applications is a must.

- **Enabling network agility to quickly adapt to business needs:** Over the past decade, businesses have spent billions on technology to improve the agility of applications and computing tiers. Meanwhile, the network has lagged behind. Increased business agility is a top concern for LoB owners, and this goal can only be accomplished with better IT agility. However, IT is only as agile as the least agile component, so the entire network must become more agile.
- **Addressing IT budget challenges:** According to ZK Research, 83% of IT budgets is used to maintain the status quo today, up from 75% five years ago. Businesses want to accelerate innovation, projects and initiatives, but the network is a roadblock—partially due to the high cost of running the wide-area network (WAN). It's critical for businesses to find solutions that can economically address bandwidth needs and overcome latency issues to enable LAN-like performance over the WAN.

To date, IT leaders have taken many steps to meet the above challenges. However, the initiatives have often been implemented in isolation from business goals. IT must evolve to an agile infrastructure now to help the business stay competitive. Bandwidth demands are exploding and poor performance cannot be tolerated. Organizations will not be able to fully take advantage of mobile and cloud computing—the next era of IT—without the evolution of the underlying network.

One area where evolution is needed is the WAN. Today, many bottlenecks exist in the connections into branch offices. To help evolve the business environment, the infrastructure must adapt quickly. Businesses need to rethink their network strategy and evolve their WAN to become agile.

Section II: The Challenges with the Current Enterprise WAN

For most organizations, the current WAN architecture was implemented decades ago to deliver client/server computing and best effort Internet traffic. Cloud and mobile computing are the fastest growing application segments today, and they drive significantly different traffic patterns compared to the legacy (LAN-based client/server) compute model. The evolution of the business climate is introducing new demands that cannot be met by legacy WAN architectures that were built for a different era. As a result, many organizations face the following limitations:

- **Networks are not optimized for current applications.** Legacy networks are not optimized for multimedia and other real-time applications. Streaming video, conferencing and other types of multimedia applications are creating huge problems for network managers because they have limited visibility and new applications drive unprecedented levels of bandwidth.
- **Bandwidth is wasted.** In legacy networks, one of the biggest causes of wasted bandwidth is repetitive downloading of the same content over the WAN. For example, multiple users in the same location might need to download the same content across the WAN. Consequently, bandwidth is wasted as a single piece of content is transferred over the network multiple times. Historically, this wasn't a huge concern because the data being downloaded was small. Over time, the size of the content has grown significantly larger as organizations have come to rely on recorded video and media-rich content. This increases the amount of wasted bandwidth and hampers application performance.
- **The network is not agile.** Legacy networks were built to have a single primary network and a backup network in an "active-passive" configuration, where the backup network only becomes active when the primary network fails. A better model would have both links active at the same time, where traffic could be moved over the various networks as business policy dictates. This business agility cannot be achieved without network agility.
- **Enterprise WAN optimization is limited to the "private" network.** Network managers have good control over and visibility into the portion of the network that is behind the firewall. However, Internet traffic remains a blind spot. With the shift to cloud and mobile, it's critical that businesses

have better control and visibility all the way to public clouds.

The challenges associated with legacy networks are significant as companies look to migrate their IT strategies to the cloud and mobile platforms. Business and IT leaders must make WAN evolution a priority.

Section III: Cisco Intelligent WAN with Akamai Connect Helps Transform the Network

Extending Akamai's Intelligent Platform to the Enterprise Branch

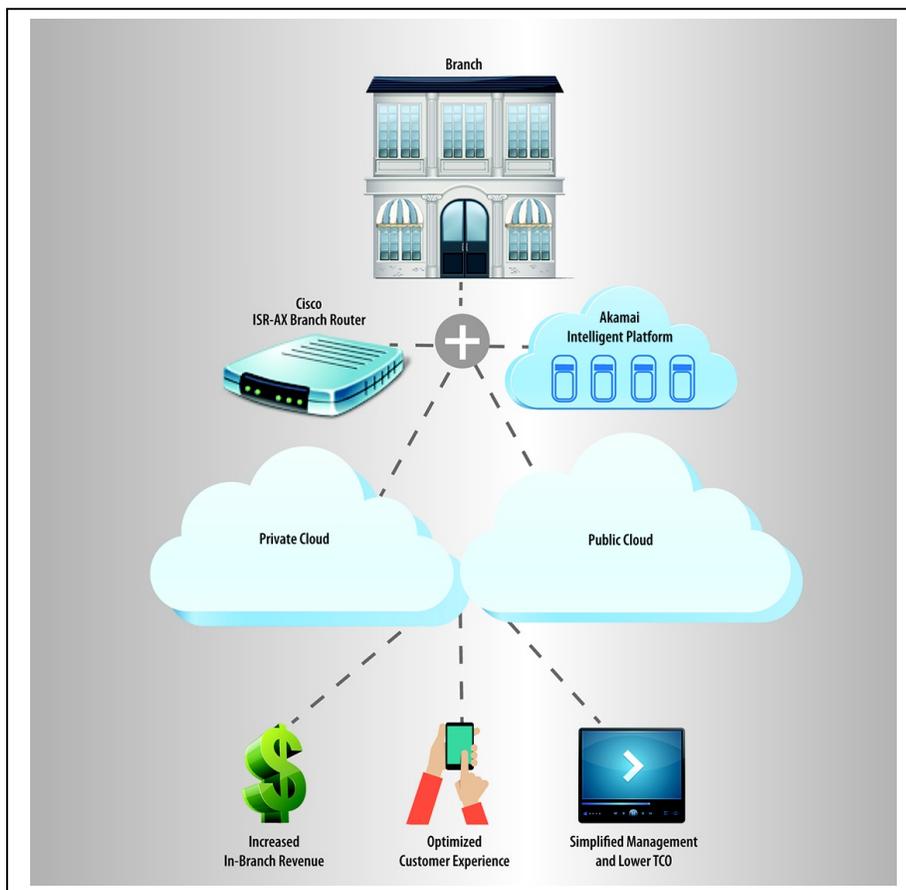
Cisco, the de facto standard and market leader in networking, has partnered with Akamai, which is the leading solution provider in web acceleration, content caching and Internet traffic engineering, to bring a unique WAN solution to customers.

Cisco Intelligent WAN (IWAN) with Akamai Connect is an integrated solution that provides best-in-class caching and optimization for rich content and web applications at the branch office. Cisco and Akamai are the dominant vendors in their respective markets. Consequently, a large portion of enterprise customers will be able to immediately implement these new services to improve application performance and deliver rich-media, high-definition content even over bandwidth-constrained networks.

Akamai's solutions revolve around their ability to widely distribute applications and content to reduce bandwidth needs and avoid congestion. The integrated solution extends the Akamai Intelligent Platform across the last mile from the Internet directly into the branch. Akamai's intelligent caching provides an optimized user experience while offloading bandwidth (Exhibit 2). The solution works across private clouds, the public cloud and the Akamai platform, and is enabled through the integration of industry-leading routing, security, caching and WAN optimization technologies on Cisco routers.

The joint solution builds on the advanced WAN optimization features in the Cisco ISR-AX branch router with the integration of Akamai's market-leading caching technology. Additionally, the solution will work over any type of network connection including MPLS, broadband Internet and cellular connectivity.

Exhibit 2: Cisco and Akamai Partner to Optimize the Digital Experience



Source: ZK Research, 2014

The main features of the solution include:

- **Connected cache for the Akamai platform:** The solution extends Akamai's Intelligent Platform into the branch, eliminating the bottlenecks web traffic encounters over the last mile. Historically, much of this traffic was not cacheable inside a branch, giving businesses no way to optimize it.
- **Transparent cache for private cloud and Internet traffic:** The solution leverages Akamai's high-performance HTTP object cache for web applications directly in the branch location to create LAN-like performance of Intranet applications. There are multiple levels of transparent caching, from standard to aggressive, to offload corporate WAN traffic.
- **Over-the-top cache for public cloud/Internet:** The solution uses high-performance object-level caching from Akamai, which caches content despite frequently changing URLs for the same object.

- **Content pre-positioning:** Any content with a URL can be pre-positioned inside the branch during non-peak hours to save bandwidth and improve performance during work hours.

The joint solution provides customers with numerous benefits including the following:

- **Increased in-branch revenue:** Cisco IWAN with Akamai Connect enables improved connected digital experiences. The caching and pre-positioning of content enables businesses to deliver optimized performance for a number of applications including point of commerce, on-demand training, product demonstrations, e-catalogs, social media and guest WiFi with little or no disruption to the WAN.
- **Optimized customer experience:** Customer engagements can be conducted at lightning-fast speed inside a branch office, retail store or any location, increasing overall satisfaction.
- **Simplified management and lower TCO:** The joint solution brings together the Cisco branch

infrastructure and the Akamai caching and cloud platform, allowing rich applications to be delivered over existing “thin pipes” and obviating the need for an expensive network upgrade.

This is the only solution that integrates the intelligence of the Akamai Intelligent Platform into the branch, accelerating the performance of web applications and rich media content across all devices, networks and clouds. Akamai Connect integrates easily into the customer’s WAN infrastructure on the ISR-AX with no additional hardware required, and provides a single point of management and control for traditional WAN optimization with advanced optimization and caching.

Section IV: Case Studies

The solution is applicable to all businesses that rely on the network to enable business processes at retail, branch and other types of remote locations. Given the rapid shift to mobile and cloud, this would include almost every vertical. The following case studies provide examples of the capabilities of the Cisco–Akamai joint solution.

Case Study 1: Global Luxury Retailer

A global luxury retail chain was looking to energize the in-store customer experience by implementing omni-channel and concierge services to redefine the future of shopping. A critical part of the plan was to implement a mobile-assisted selling strategy in which the store associates can leverage a point-of-commerce web app via a tablet.

To accomplish this, all employees were given a tablet so they can look up the inventory of any item—including its size, quantity and online availability—while consulting with customers in the store. Additionally, the application enables store representatives to locate a product in another store and order it for the customer through real-time management. All of the merchandise was RFID tagged to effectively “network-enable” the inventory.

The company improved the customer experience by adding a digital signage wall containing content that changes as customers move around the store. It also implemented line-breaking capabilities by allowing customers to check out from anywhere by using a mobile device.

Preserving brand image was paramount in the overall strategy. This required high-resolution imagery, which increased the bandwidth demands dramatically. Plus, maximum performance was mandatory to fulfill an optimal brand experience and maximize employee productivity.

The challenge for the retailer was that its network’s skinny pipes could no longer support this kind of real-time environment. Downloading high-resolution product images to the tablet took more than 70 seconds, which was unacceptable to meet the demands of the brand experience as well as the customer’s expectations (given that most end users will not tolerate a page load greater than 3 seconds).

The retailer used the Cisco–Akamai solution to solve these problems and enable its vision even under the constrained legacy network. The integrated Akamai caching capabilities enabled subsequent views of product images to be delivered locally from the branch, offloading 100% of the WAN bandwidth for these high-resolution images and loading the images in near-instant sub-second times.

In addition, rich HD digital signage content was pre-positioned to the branch during off-peak hours to avoid contention with business transaction traffic during business hours. This resulted in the uninterrupted delivery of rich billboard imagery without disrupting real-time operations. The Cisco–Akamai solution enabled the luxury store to offer an enhanced customer experience without having to upgrade its current network, saving millions.

Case Study 2: General Enterprise Use Case

Businesses are now using video for training and employee communications to improve employee productivity and skill development while minimizing cost. Video on demand (VoD) has become a common approach to this among many enterprises.

One of the main challenges with VoD is that the video saturates the existing links, impacting other transactional business traffic. Also, the videos become unusable in cases with longer latencies, defeating the initial business goal.

The Cisco–Akamai solution pre-positions heavy video files for VoD use cases to the branch office during off-peak times to enable video consumption at LAN speeds without affecting the WAN.

Case Study 3: U.S. School District

A leading school system was looking to change the way students learn by digitizing the classroom. The school system initiated an e-learning program in which students use tablets to access Pearson learning content. This enables teachers to leverage new educational tools and provide students with an immersive learning experience that integrates audio and visual content to enhance learning.

The challenge for the school district was that the limited WAN bandwidth could not support the delivery of high-quality video to all the student tablets because the constant downloads saturated the WAN.

The school district leveraged the Cisco–Akamai solution to offload text, audio, video, images and other content by caching the content or pre-positioning content that it knows will be needed. The school achieved 100% WAN offload after the initial download, which gives students near-instant access to an immersive electronic curriculum for improved learning.

Section V: Conclusion and Recommendations

Today, businesses are hamstrung and cannot innovate with next-generation web applications because of infrastructure limitations. This can significantly impair their ability to better engage customers, improve worker productivity and drive new sources of revenue. Business requirements will continue to change faster than legacy WANs can adapt. Adding bandwidth alone will not solve these issues. IT must rethink its WAN strategy to determine how to best meet business goals while using bandwidth-hampered networks.

Cisco and Akamai are delivering a best-in-class integrated branch networking, advanced caching and Internet traffic engineering product to help evolve the network into a strategic business asset. Transforming the WAN to support mobile and cloud initiatives must be at the top of every business leader and IT priority list. To help make this shift, ZK Research recommends the following:

- **Focus on processes that are mobile centric.** Organizations should consider what's possible when the limitations of the traditional network are removed, and look to interact with customers, partners and employees in new ways.
- **Focus on delivering the best user experience.** In this era of the mobilized, cloud-driven business, the user experience has become a key differentiator. Organizations that provide a superior user experience will deliver better customer service, have more productive employees and leapfrog competitors.
- **Invest in the network now.** Any organization that is even thinking about cloud and mobile computing should invest in the network today. Companies should have the foundation in place so they can transition to cloud and mobile

computing at the necessary time and speed. It's critical that companies choose an architecture that can enable the proper level of application optimization, intelligence and security to deliver the best user experience, rather than using one that is simply "good enough." When it comes to the network, a good enough network is no longer good enough.