

## Reducing Cloud Application Bandwidth

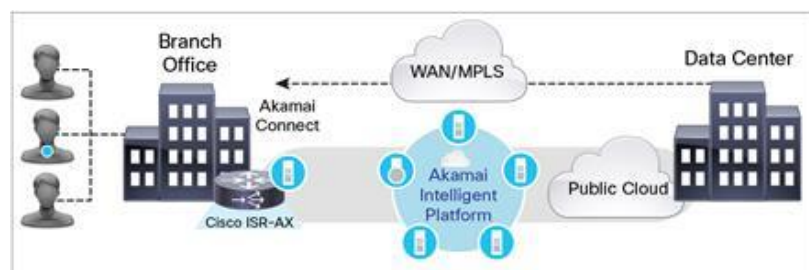
### What

Cisco® Wide-Area Application Services (WAAS) is a key component of the Cisco Intelligent WAN (IWAN) solution, which integrates a comprehensive set of WAN traffic control and security features into Cisco branch-office routers. Cisco IT has long used WAAS to optimize WAN bandwidth and improve performance for Cisco users when they access content-rich applications from remote offices. WAAS also helps us reduce the need to increase bandwidth on expensive long-distance circuits.

As of early 2016, we have implemented more than 600 WAAS devices in Cisco and selected partner offices and deployed 14 WAAS clusters globally in our data centers. To keep costs down, Cisco IT is running virtual WAAS on dual Cisco ISR 4451 Gateway Routers at branch offices. This virtualization didn't require deployment of any new physical infrastructure. It also uses less rack space and power at each site compared to our previous implementation of standalone WAAS appliances.

By using the Cisco Intelligent WAN with Akamai Connect solution with the Cisco WAAS capabilities, we have enhanced access to cloud applications by remote sites. This solution extends the Akamai Intelligent Platform™ directly into the branch router to reduce the bandwidth consumption of cloud applications (Figure 1).

**Figure 1.** Cisco Intelligent WAN with Akamai Connect Solution



Cisco WAAS provides content caching, compression, optimization, and de-duplication technologies. Akamai Connect provides intelligent caching services for off-net Internet traffic by placing frequently accessed content in local devices, either within the remote office or in a nearby cache managed by Akamai as part of its content delivery network. With the ability to enable disk encryption for cache devices, we reduce the potential security risk of distributing content in more places.

We also use this solution to streamline software downloads to Cisco-owned Windows and Apple Macintosh laptops as well as to employee mobile devices that are registered in our bring-your-own-device (BYOD) program. For example, many of our employees who have personal Apple devices use the Cisco wireless LAN to download operating system updates. The large size of the update files could significantly slow the Cisco network if they were downloaded individually for each user. Instead, by caching the data locally using the Cisco WAAS and Cisco Intelligent WAN with Akamai Connect solutions, we were able to serve 8000 users globally who downloaded the Apple iOS9 update while avoiding the need to send more than 8.5 TB of data over the Cisco network.

Updating the operating system image on Cisco employee laptops is another example of potentially high bandwidth consumption by the same content being sent to multiple users in the same timeframe. In one large Cisco office, we were able to cache up to 10GB of content for a Microsoft Windows image update, which reduced the time for the reimaging process from around 4 hours to 1.5 hours.

The solution also saves significant bandwidth for video streaming from the Internet and from our Cisco TV service. In this design, one live stream is sent over the Cisco network to the local Akamai caches. From there, Akamai Connect splits the video into multiple streams for access by users in the remote offices.

Management of the global Cisco WAAS and Akamai Connect deployments is performed by a very small team of four engineers. This team maintains and supports the associated devices, tests performance of new applications, and optimizes the overall solution operation.

## Why

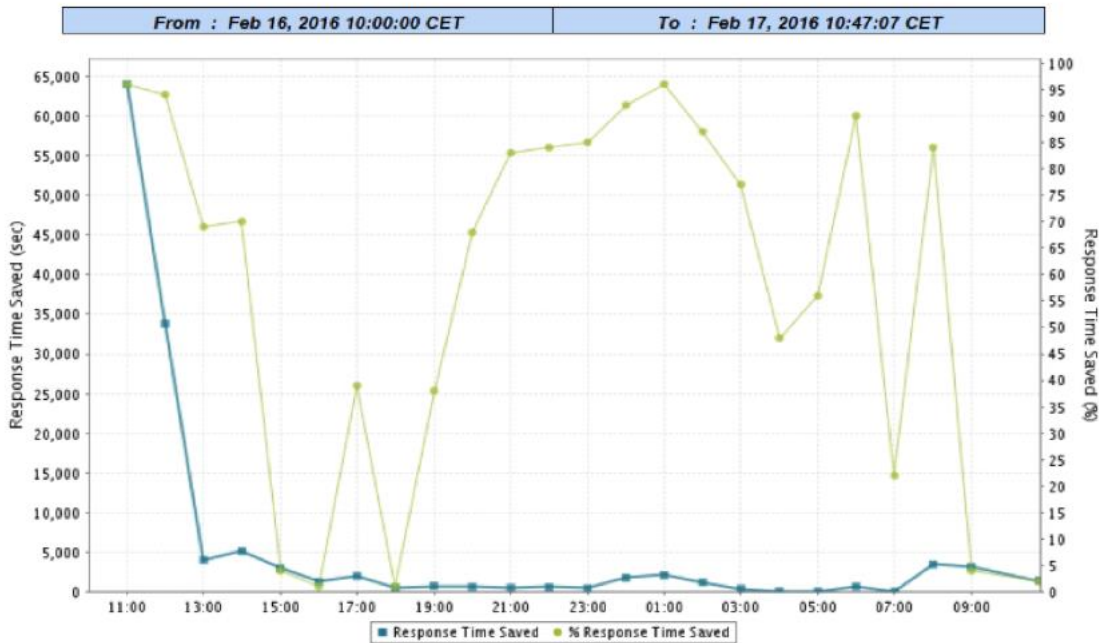
Growth in network traffic will mean a corresponding rise in costs, which can make up more than half of total IT network costs. The [Cisco Visual Networking Index report](#) predicts that global IP traffic will triple from 2014 to 2019, growing at a compound rate of 23 percent per year.

The Cisco Intelligent WAN with Akamai Connect solution adds to the cost savings and bandwidth efficiency benefits of our Cisco WAAS deployment. We estimate that these solutions help control network costs through reducing WAN circuit traffic [between 50 percent and 90 percent](#). In 2015 alone, Cisco IT's own traffic grew about 40 percent. The optimization and caching solutions also help us defer costly WAN bandwidth upgrades, even as Cisco users access more data and applications in the cloud.

Users experience overall higher performance from all network activity, especially faster application response and downloads of data files and video. We have seen declines in data traffic of 78 percent to 85 percent, which means file transfers are made in one-quarter of the time required for a non-optimized transfer.

Caching and vWAAS also enable significant improvements in network response time, depending on traffic type. Figure 2 shows a snapshot of traffic at the 2016 Cisco Live Berlin event, where vWAAS caching reduced HTTP traffic by about 90 percent. Response times were also improved up to 90 percent after local caching was turned on at 11:00 a.m.

**Figure 2.** Network Response Times with Cisco WAAS and Local Caching at Cisco Live Berlin 2016



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In summary, by using Cisco WAAS WAN Optimization and Akamai Connect for content caching, Cisco IT is helping to improve security in remote locations, the user application experience, and operational efficiency as well as to reduce costs associated with the corporate WAN.

## For More Information

[Cisco Intelligent WAN with Akamai](#)

[Cisco Wide-Area Application Services](#)

[Cisco Intelligent WAN](#)

Cisco Communities blog post: [Cisco WAAS & AKC Deployment Results at Cisco Live](#)

To read additional Cisco IT case studies about a variety of business solutions, visit [Cisco on Cisco: Inside Cisco IT](#).

## Note

This publication describes how Cisco has benefited from the deployment of its own products. Many factors may have contributed to the results and benefits described. Cisco does not guarantee comparable results elsewhere.

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