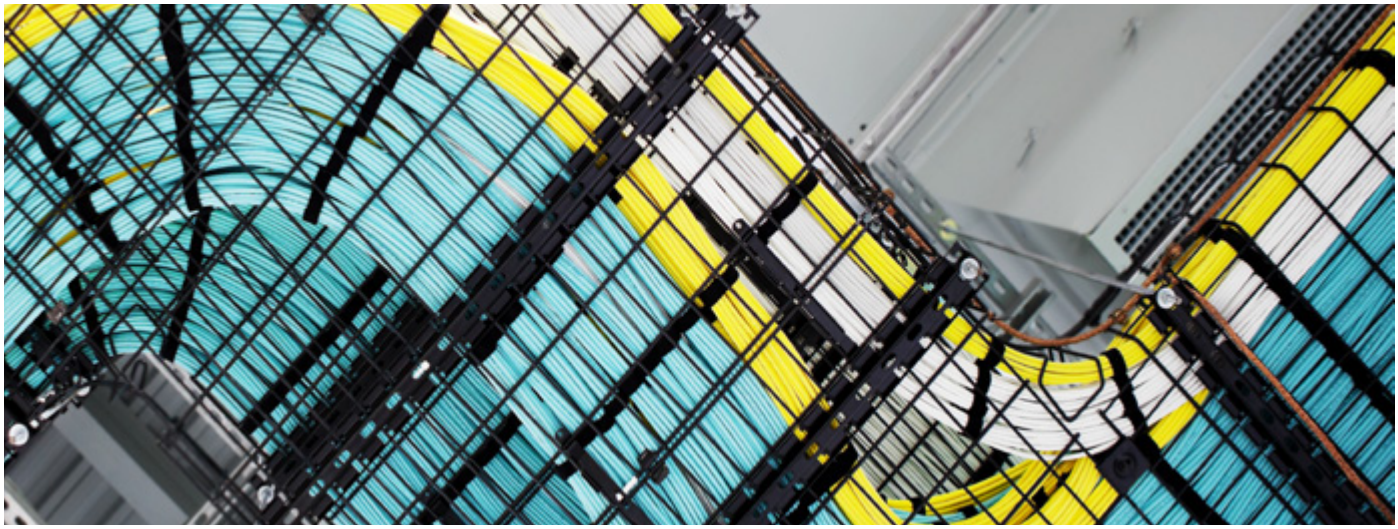
How Cisco IT Optimizes Network with Proactive Support Services

Case Study



Network Optimization Service helps Cisco IT establish priorities, save time, and more confidently introduce new IT solutions.

EXECUTIVE SUMMARY

Challenge:

- Maximize value of existing network investments by optimizing performance and availability
- Apply best practices to plan and manage network changes
- Prepare network for new technologies that help enable business transformation

Solution:

Engaged Cisco Services to provide Network Optimization Service, including:

- Technology audits
- Security policy compliance reports
- Advice on IPv6 migration
- Design review
- Software lifecycle management
- Network management support

Results:

- Gained visibility into all network devices, modules, and software to plan upgrades
- Relieved IT team of time-consuming correlation of reported issues and affected devices
- Mitigated risk with software certification and best practices advice

Background

The Cisco® Network Optimization Service is a proactive support service that helps organizations maximize the value of their network investments. These investments include wired and wireless networks, security infrastructure, and operational resources and processes. Businesses that subscribe to the service are assigned one or more experienced Cisco Services engineers to complement their internal team. Common motivations for using Network Optimization Service include preserving or improving the user experience as the network grows; troubleshooting and resolving issues affecting performance; increasing operational efficiency; and obtaining expert guidance to successfully manage changes such as migrating to IPv6, adopting cloud computing, and introducing Bring Your Own Device (BYOD) programs.

A recent third-party research study that interviewed current customers to measure potential business value of the service calculated the potential return on investment (ROI) at over 200 percent, with payback in less than one year.[1]

Challenge

At Cisco, the network is the platform for internal communications and collaboration, customer interactions, physical security, and more. Cisco IT continually works to make sure that employees can access applications and information from anywhere, using any device, over any network connection.

“Previously, Cisco IT had to devote significant resources to help make sure that the network delivered the needed availability and performance,” says Kieran Higgins,

[1] “The Total Economic Impact of Cisco Network Optimization Service,” a commissioned study conducted by Forrester Consulting on behalf of Cisco, January 2013. Total Economic Impact (TEI) is a standard methodology developed by Forrester Research, Inc. that captures and quantifies the voice of the customer relative to technology investments.

senior service planning manager for Cisco IT. This effort required the following activities:

- Periodically collecting inventory information from the company's nearly 12,000 routers and switches to help plan changes to hardware, software, and modules
- Evaluating different design approaches to select the one best suited to Cisco IT's unique business needs and network environment
- Certifying new switch and router hardware and software before introducing them into production

As the Cisco network grew, these activities took more and more time, diverting IT resources from more strategic projects. Sometimes the IT team did not have the resources to fully complete certification of new hardware or software before a deployment deadline, increasing the risk of downtime from an unknown issue.

"We wanted a trusted advisor to provide operational oversight, so that we could focus on business transformation," says Brian Christensen, senior director of IT network services for Cisco.

Solution

In late 2006, Cisco IT started an ongoing engagement with Cisco Services to deliver the Network Optimization Service. A team of Cisco Services engineers works with the Cisco IT team to provide proactive support and recommendations based on best practices learned from other global customers and support teams. The goal is to help make sure that the network provides the availability and performance to support Cisco business processes, provide a positive customer experience, and encourage adoption of new solutions such as Cisco TelePresence® and BYOD.

Cisco IT currently takes advantage of the Network Optimization Service for the following activities.

Ongoing Technology Audits

Cisco IT upgrades or updates network devices regularly, both to add new capabilities and to replace end-of-life equipment. Identifying priorities for the global fleet upgrade program requires an accurate and detailed inventory. Cisco IT uses the internally developed Enterprise Management (EMAN) software tool to conduct a monthly inventory of devices and their software version, but EMAN does not report the modules used in each device.

"In the past, we wrote scripts to retrieve module information and report it in the desired format," says John Moe, Cisco IT's roadmap owner for routing and switching. "But as our network grew, we could see that the manual approach would not scale to provide timely inventory data."

Now the Network Optimization Service team regularly provides a detailed inventory of all global network devices, the modules they contain, and the current software version, using Cisco Network Collector. The same tools check daily to confirm they can reach every device. "We refer to the inventory reports to see which devices have a software version that is nearing end-of-life or clashes with a particular application," says Peter Giliberti, Cisco IT manager. "Getting a snapshot of the state of the network, right down to the device level, enables us to quickly identify devices nearing end-of-life so we can establish smart priorities for upgrading, to mitigate risk." Moe adds, "The technology audit requires no incremental investment or training, and has freed up hundreds of man-hours annually."

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Jon Woolwine
Architect
Cisco IT

More quickly identifying the location of particular devices helps to avoid outages or degraded performance. For example, when Cisco IT determined that a platform had a memory leak, the reports identified all affected devices in the global enterprise. Cisco IT then quickly remediated the issue through Cisco Services' Remote Management Service. "Without Network Optimization Service, remediation would have had to wait until we correlated separate reports with inventory and end-of-life announcements," says Michael Anderson, senior network IT design manager for Cisco IT. "With the service, we're avoiding delays that could potentially disrupt the customer experience or productivity."

Security Policy Compliance

Detailed reports from the Network Optimization Service also help Cisco IT prevent outages related to security vulnerabilities. In 2012, for instance, Cisco Services security specialists delivered a comprehensive security evaluation of the Cisco internal network and customer-facing website. Cisco IT used the recommendations for switch, router, and firewall configurations as the basis of a next-generation architecture for www.cisco.com. The architecture makes the website more resilient, helping to make sure customers can reach Cisco to order products, get support, or find information they need to keep their networks and businesses running.

The Network Optimization Service also provides reports showing the location of all devices vulnerable to issues reported by the Cisco Product Security Incident Response Team (PSIRT). When a PSIRT alert identified a vulnerable firewall configuration, for example, the Cisco Services team quickly produced a report showing all affected devices. "If we didn't have the Network Optimization Service, identifying the affected devices would have required going through the inventory reports item by item to find vulnerable devices," says Henry Ku, IT architect at Cisco. As it was, Cisco IT gave the list to the Cisco Remote Management Service team, which promptly pushed out the configuration to help make sure that the external website remained available. "Remote Management Services can update the configuration on 500 devices in 20 minutes, while an engineer would take 30 minutes for just one device," Ku says. "They have also upgraded the code on 50 devices in just 30 minutes, while before we needed 2–4 hours for each device. This saved almost 150 hours."

Advice on IPv6 Migration

In late 2012, Cisco IT faced a crossroads in its global IPv6 migration program. As an early adopter, Cisco IT made decisions about IPv6 addressing before service providers had finalized their routing policies. "Later, we heard about rumored policy changes that might require us to readdress the entire network, a very large effort," says Jon Woolwine, Cisco IT architect.

Cisco IT consulted with Network Optimization Service experts on IPv6 routing, to gain an insider's perspective. "Within a month of engaging Cisco Services, we had a clear picture of the risk of an IPv6 routing policy change and its likelihood," Woolwine says. "The engagement helped us make a decision that avoided more than 2000 hours of work. And if policies do change, we'll be prepared because Cisco Services helped us brainstorm ways to mitigate risk without readdressing the entire network."

The engagement also helped Cisco IT confidently participate in World IPv6 Launch day on June 6, 2012, when the company made three customer-facing websites (including www.cisco.com) permanently accessible by IPv6. In the months preceding the widely publicized launch, Cisco IT needed to make sure the Cisco IOS® Software on Cisco Nexus® 7000 Switches and Cisco ASR 1000 Series

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Cisco IT Network Services

Aggregation Services Routers would provide the required features and quality. "We didn't have enough time to identify and test the optimal software on our own, but Network Optimization Service engineers augmented our team, enabling us to meet the deadline," Woolwine says.

Design Review, Including Advice on Industry Best Practices and Risk Analysis

Cisco IT constantly optimizes device configurations by referring to Network Optimization Service reports, highlighting configurations that deviate from best practices. Cisco Services gleans these best practices from other global customers that use the service. Other reports show technical support cases by region, helping Cisco IT identify the Cisco IOS Software versions to deploy in different parts of the production network. "The reports give us the confidence to deploy a new version globally," says Anderson.

Cisco IT also engages the Network Optimization Service team to evaluate design options for new deployments. "When we were deciding between two Cisco firewall solutions, our Network Optimization Service engineers modeled the two designs in their labs and tested performance in different failover scenarios to advise us," says Wilson Ng, IT engineer, Cisco. "From experience with other customers, they were also able to alert us to potential issues in our environment relating to routing protocols and timers."

Software Lifecycle Management

New code for the Cisco IOS Software used within Cisco is released up to four times a year. "Our Network Optimization Service team provides ongoing support for tracking the correct Cisco IOS versions," says Moe. "In the last 12 months, we engaged Cisco Services to test five trains and recommend one. Their knowledge of other companies' experience with different versions of the Cisco IOS Software saves us a lot of time in selecting the version that's best for our environment."

Illustrating the value of the service, the Network Optimization Service team knew that the multicast behavior in one Cisco IOS Software version that Cisco IT was considering would not work in the environment because of an unusual requirement. "Without the service, we would have spent 40 to 60 hours trying to find the issue, and then had to start the testing process all over again with another version," says Moe. "By proactively notifying us of potential issues, the Network Optimization Service reduces false starts. And in this case, it freed up the equivalent of full-time employee for one to one-and-one-half weeks."

Network Optimization Service engineers are currently advising Cisco IT on best practices for release management. "Today we're introducing more releases of Cisco IOS Software, more quickly, and our old processes are straining," says Pete Borley, Cisco IT network manager. "Our services team compared our release management methodology against other large enterprises to see how we might improve our processes." A related effort is to document acceptance criteria for pilots with new network devices. "To collect pilot data, we've been manually logging in to view hardware configuration or CPU utilization," says Ku. "Now Cisco Services is helping us automate the process so we can be more proactive."

Network Operational Support

When network issues occur, Cisco IT escalates them to the Cisco High-Touch Technical Support (HTTS) service. Concurrently, Cisco IT refers Priority-1 and Priority-2 implementation and operational issues to the Network Optimization Service team, for faster resolution. "From my perspective, the most important benefit of NOS is giving us an escalation path that we use in conjunction with HTTS,"

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Senior Service Planning Manager
Cisco IT

says Ku. "For high-priority issues, we involve Cisco Services in the discussions with HTTS. After the immediate problem is solved, we can work with our Network Optimization Service engineers to discover the root causes, helping to make sure it won't happen again."

Test and Validation

In the Cisco data center, Cisco Services professionals test new Cisco hardware and software before Cisco IT deploys it for production, as part of the Data Center Optimization Service. "Our data center team is very busy making the transition to next-generation data center technologies, and having our Cisco Services team test a new version of the NX-OS saves a lot of time," says Ng.

Results

Cisco Network Optimization Service has become an integral part of major IT programs, helping the company maximize the value of its existing network investments, plan and manage network changes, and get the network ready for new technologies that help enable business transformation.

Cisco IT has adopted numerous best practices that the services team has developed from its experience working with many customers. "Our operational metrics are the highest they have ever been, and we're enabling more innovative project endeavors than ever before," says Christensen. "The Network Optimization Service has helped us balance operational excellence and innovation."

Protection for Customer Experience and Internal Productivity

The highly detailed reports showing devices requiring updates or replacement help to reduce risk. "We depend on Network Optimization Service for network visibility, and without it, we'd have to rely on individual engineers' knowledge of the network," says Moe. "Doing that, we could easily miss one or more of dozens of DMZs or POPs with equipment nearing end of life, increasing the risk of degraded performance."

Adds Higgins, "Network Optimization Service is a very small investment to make sure we focus our budget on the most important upgrades in terms of business needs."

Time Savings for Cisco IT, Freeing Time for Innovation

Using the Network Optimization Service helps Cisco IT devote resources to strategic initiatives, such as unified access for wired and wireless networks, without neglecting operational basics. "If we didn't hire the resources to perform the certifications for new versions of Cisco IOS Software, it's very likely we would experience downtime, which has a high cost in terms of productivity and customer service," says Moe.

Illustrating the time savings, Cisco IT once asked the Cisco Services team to diagnose and fix an issue related to content switching. "Finding and certifying the fix internally would have required four to five weeks, because our resources wouldn't be able to work on it full time," Ng says. "Cisco Services completed the job in just two weeks. We saved time and potentially avoided more downtime by resolving the issue more quickly."

As another example, Cisco IT engineers previously spent five minutes auditing each device during pilots of new switches and routers, every day for three weeks. For a pilot with 30 devices, the time commitment amounted to 52.5 hours. "If the resources weren't available, we might not find out about a code issue until a user

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Cisco IT Network and Data Services

reported a problem, which is contrary to our philosophy to be proactive rather than reactive," Ku says. Now the Network Optimization Service team uses an automated tool to perform daily network audits during pilots, supplemented with alerts through Cisco Remote Management Service. Cisco IT took advantage of this service when it introduced Cisco Nexus Switches, Cisco ACE Application Control Engine modules, Cisco Catalyst® 4500 and 3750E Switches, Cisco Catalyst 6500 Switches with Virtual Switching Service, and Cisco ASR 1000 Series Aggregation Services Routers.

Trusted Advisor to Augment Internal Engineering Staff

The Network Optimization Service team collaborates with Cisco IT in weekly meetings. "When you're recommending a new direction for delivering IT services, Cisco leadership always asks, 'How confident are you?'" says Anderson. "It's become an expectation that the IT team seek the advice of Cisco Services." Ng adds, "It's a two-way collaboration. We like to try out new ideas with our team and receive validation on new approaches. In turn, they share our experiences with their other customers."

The contribution from Cisco Services is recognized at all levels of the Cisco IT organization. "Our Network Optimization Service engineers have become trusted advisors to our IT staff," says John Manville, vice president of IT network and data services, Cisco. "We count on their tools, best practices, and customer experiences to aid in our IT processes from architecture and design to operations."

Next Steps

The Network Optimization Service continually expands to include support and best practices for newly introduced Cisco solutions and technologies, and Cisco IT will take advantage of these new offerings. Cisco customers also benefit from Cisco IT's engagements with Network Optimization Service because Cisco Services can share Cisco IT's experiences and lessons learned.

For More Information

To read additional Cisco IT case studies on a variety of business solutions, visit Cisco on Cisco: Inside Cisco IT www.cisco.com/go/ciscoit.

For more information about Cisco Network Optimization Service, visit www.cisco.com/go/optimize.

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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