

How Cisco IT Introduces New Services Quickly and Safely

Early testing by volunteer users helps Cisco deploy new network services faster and gain productivity benefits sooner.

EXECUTIVE SUMMARY	
CHALLENGE	<ul style="list-style-type: none"> Give selected users early access to new Cisco products and network services Avoid risk of installing prerelease products on the production network Deliver cost-effective user support for the new services network
SOLUTION	<ul style="list-style-type: none"> Deploy the independent ACE network while leveraging some production network resources, and connecting to the production network Coordinate deployment of new products and services with the production network Support ACE users separately and mostly with self-help resources
RESULTS	<ul style="list-style-type: none"> Users gain the productivity benefits of new network services sooner ACE and production network teams make collaborative decisions that benefit both networks Production network teams learn from ACE deployment and support, and can more easily keep the production network up-to-date
LESSONS LEARNED	<ul style="list-style-type: none"> Limit the number of users to a manageable level (which will grow over time) and offer self-support resources to reduce support costs Create protections for the production network Set clear user expectations about feature differences on the testing and production networks Select new user technologies based on user feedback
NEXT STEPS	<ul style="list-style-type: none"> Continue testing new Cisco products and network services

Background

Most IT organizations struggle to meet two opposing demands. One demand is from employees who want to increase their productivity by using the latest IT technologies and services, even before they are fully tested and supported. The other demand is from business: a requirement for a highly reliable set of basic IT services with high levels of support.

Cisco IT is no different, and has struggled for years to support both demands from its employees and from the business. The requirements for Cisco IT production services emphasize reliability, high levels of support, and cost control. These basic business requirements have forced Cisco IT to standardize on limited sets of services as well as stable and proven production code levels that are also scalable, manageable, and well understood by the network engineers. However, Cisco IT has found it difficult to maintain this standardization while also supporting the latest products features and new, pre-production code versions demanded by users on the same network.

To address this limitation, in 2006 Cisco IT created the Advanced Cisco Experience (ACE) network. The purpose of the ACE network is to introduce new, advanced services and products to a small, select group of users before those services are deployed on the production network. Cisco salespeople initially wanted the ACE network to provide them with early releases of Cisco® Unified Communications (UC) products, so they could experience the user benefits and explain them firsthand to customers. Over time the ACE network has evolved to providing select employees with more services, newer services, significantly improving user productivity. Examples of these services include new releases of Cisco video and collaboration products as well as security and data

center and cloud services. Most of these products are later deployed on the Cisco IT production network.

The ACE network also gives Cisco employees, and Cisco IT, a way to test products that would not be deployed on the Cisco production network. For example, Cisco products designed for smaller business as well as cloud

services and certain mobile devices are supported for demonstration purposes in the safe environment of the ACE network. Cisco IT is able to provide feedback to Cisco product developers about the use, benefits and drawbacks of these products in a real-world environment, enabling developers to improve products before customers can access them.

Cisco IT provides engineering product development teams with a large number of “Alpha” environments to trial and test new pre-release products within their own team. These teams can then experience issues, fix issues, and experience the next product release again and again until they are satisfied with the product’s stability and feature capability. However, these “Alpha” environments don’t provide the large, real-world user environment that would test every possible use case, and product scalability as a whole. With its focus on introducing new services, the ACE user base of several thousand employees has also proved very useful feedback to Cisco product development teams. They get a safe environment for field-testing their products in a large, global, and representative enterprise as well as creative feedback from Cisco employees. Once deployed on the ACE network, Cisco salespeople are able to experience, learn from, and demonstrate these new Cisco products to customers in an actual work environment.

“ The ACE team is able to quickly deploy and implement new technologies, which provides a test bed and lessons learned to the Cisco IT team.”

— Ben Irving, IT Manager, Strategic Innovations, Cisco

The ACE network has proved valuable to Cisco IT activities by providing a safe and limited environment to test network designs and product configurations, develop deployment tools, and build and fine-tune support procedures before a new service is deployed in the production network. The lessons learned by Cisco IT from this testing have greatly accelerated the deployment of new technologies into the production network, while maintaining that network’s basic business requirements of stability, effective support, and cost-effectiveness.

Challenge

“Any enterprise faces IT challenges related to pre-deployment planning and testing, and they often need to a separate network for this reason,” says Gregg Campbell, a Cisco systems engineer. “Our customers want a way to test new products and features, so they can verify their business value before deployment and learn how to better promote user adoption of these features once they are available on the production network.”

In 2006, Cisco IT was in a similar situation and decided to build ACE as a separate network for introducing new services. The ACE team faced the following challenges:

- Design the ACE network in a way that it allows communication with and can use resources on the production network when appropriate, without affecting the security, availability or functionality of any production network services.
- Fund operations of the ACE network without drawing from the production network budget.
- Define the right size for the network: Support scalability, yet keep a reasonable limit on the number of ACE network users. This meant creating a process for approving users and setting realistic expectations for the level of network experience and support they would receive. Over time the definition of the “right size” has stretched: initially starting with under 2000 employees, the number of ACE users has grown to over 10,000. But in the beginning it was a good idea to start small.
- Provide user support that is focused and economical – largely self-service – through resources that are

separate from the Cisco internal help desk and technical support groups.

- Support and secure a second independent network inside Cisco.

Solution

Today the ACE network supports a broad range of Cisco products and technologies for UC, video, and collaboration. The specific product versions and services deployed in the ACE network change frequently, based on their availability and Cisco IT deployment plans. Table 1 shows a representative list of Cisco products deployed in the ACE network as of mid 2014. Since the ACE program is interested in staying ahead of the production deployment curve, this list of products will change significantly one year to the next.

Table 1. Example Cisco Products Deployed as ACE Network Services

Video and Meetings	IM, Softphone and Phones	Custom, Demo Applications
Cisco TelePresence TC 7.1.2	Jabber for Windows, Jabber for Mac (10.5)	Mobile Café X Custom Apps
Cisco TelePresence SX10, SX 20	Click to Call (8.0)	Jabber Guest Click to X
Cisco TelePresence MX200, MX300G2	Cisco UCM 10.5	Cisco Unified Communications Integration with various endpoints
Cisco Cloud Meeting Room Solution	IPv6 support	UCCX (10)
Media Experience Engine (MXE)	Single / Unified Inbox	Singlewire InformaCast (8.5) with Cisco UCM (10.5)
WebEx Services 29.6	Unity Connection 10	Attendant Console (10.5)
WebEx Meetings for Android (5.0), iPhone & iPad (6.0), and Windows (2.1)	DX-80	
	Video Greeting	

Network Design

The ACE network has global coverage, with operations that are parallel and complementary to the Cisco production network. ACE network users are primarily Cisco sales representatives, with some users from the Cisco IT, information security, data center, and other departments that need a network for predeployment planning and testing. Initially serving 2000 Cisco salespeople in the Americas region, the ACE network today serves 10,000 Cisco users worldwide.

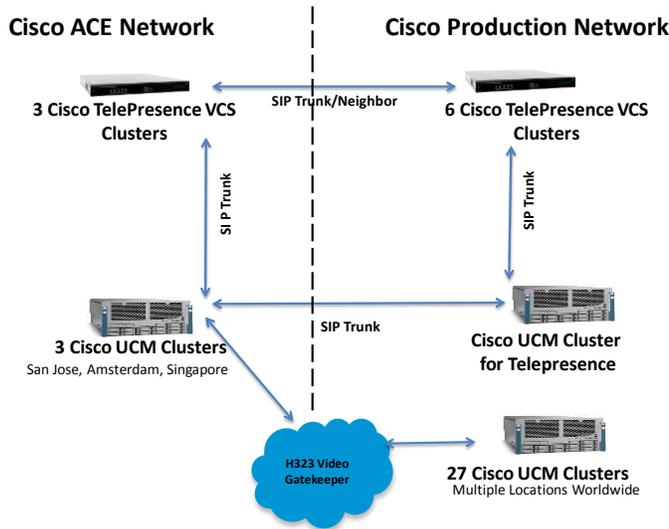
To create the ACE infrastructure, Cisco IT uses some infrastructure elements and resources on the production network while also maintaining some elements and resources separately:

- Separate: Inbound public switched telephone network (PSTN) trunks, voice gateways, and three Cisco Unified Communications Manager (UCM) clusters for voice calls.
- Separate: Cisco TelePresence VCS for internal video calls. For video calls to external companies, the ACE network links to the gatekeeper and the Cisco VCSE on the production network.
- Common: PSTN access, call forwarding, and the dial plan for calls that cross Cisco UCM clusters.
- Common: Microsoft Exchange and Active Directory (AD) servers for email and calendaring, and user directory and access control services. ACE products such as Cisco UCM, Cisco Unified Presence, and Cisco Unity synchronize with the production AD servers each night. ACE users can wait for ACE to synch with AD or can use a “synch password” command to speed up the process.
- Common: Cisco WebEx cloud conferencing services.

“We still rely on the production network at the physical layer, which means we don’t need to build everything for a completely separate network,” says Pradeep Musugu, senior member of the technical staff, Cisco IT. “Instead, we can connect to the production network as needed using SIP trunks, inter-cluster trunks for the Cisco UCM systems, or direct gatekeeper connections.”

For each new service that will be offered on the ACE network, the decision must be made to use the current IT production service or build a separate ACE service. Factors in this decision include the cost, time, and effort required to build a separate service vs. the potential benefit of service flexibility if it is separate from the production network.

Figure 1. Relationship Between the Cisco ACE and Production Networks



The ACE team also leverages the production IT teams for deploying products in remote locations around the world. The teams regularly collaborate to share information such as information security standards, the latest VPN and QoS policies and configurations, and more. This close collaboration is essential for ACE operations, because sometimes changes in the production network can affect the ACE network.

Cisco product development teams also create small lab networks for testing purposes, which are separate from the ACE and production networks. However, the ACE network plays an important role between these lab networks and the production network, providing a more geographically representative, enterprise-scale, stable pre-production network than what is available in labs. The ACE network also shields the production environment from the disruptions that could occur if the lab networks were able to connect directly.

The ACE team gets numerous requests from users for new services in the ACE portfolio. Decisions about which products or services to support on the ACE network are made by a central client steering committee, with representatives from the ACE team and the Cisco IT production team responsible for designing UC and video services on the Cisco network. This committee reviews requests from users as well as Cisco product development plans to identify which products and features should be deployed on the ACE and production networks.

The committee selects new ACE products according to whether they:

- Are significantly different from currently available services
- Will improve employee productivity
- Can be integrated into the current ACE and production network environment.

If a proposed product meets these criteria, it is assigned a priority, and the ACE architects create a roadmap and design for eventual deployment on the ACE network. If the IT production network architects believe the new product can add value to Cisco employees without disrupting other production services, it is prioritized to go

directly into production.

Funding

Cooperation with the production team means that Cisco IT has maintained relatively low staffing levels for managing and supporting the ACE network, even with a growing number of users and services (see Table 2).

Table 2. ACE Network Scope and Staffing Levels

2006 ACE Network Statistics	2014 ACE Network Statistics
ACE team: 5 engineers, 5 analysts, and 1 program manager 2000 users in the Americas (181 users per team member) 3 global clusters of Cisco UC infrastructure	ACE team: 12 Engineers, 14 Analysts, 22 Application Developers, 9 Project Managers, 1 Analyst Lead, 1 Program Manager, and 1 Architect Lead 10,158+ users globally (169 users per team member) AMER: 7527 ENEA: 1306 APJC: 1141 Pilot: 184 Expanded product portfolio to include video, mobility, collaboration, and application development Cisco UC infrastructure: 3 global clusters of Cisco UC infrastructure and a Pilot cluster in AMER

Cisco Sales, the group with the highest user demand, funded the initial start-up costs for ACE in 2006. At that point, the first ACE user group was set at 2000 people. Today the costs for ACE network equipment, infrastructure, and support are covered by an annual, internal budget charge of US\$700 per user. A department or group must pay for a minimum of 10 users, but also has a maximum number of permitted ACE users in order to control network growth.

The user fee covers the additional cost of providing the ACE network services and user support, above and beyond the cost of the production network. An intentional decision was made for the internal Cisco IT production helpdesk to not support ACE network users. Instead, users can access FAQ documents on a variety of ACE network products and services, ask a question in an online discussion forum, or submit a trouble ticket for problem resolution by a separate support team for the ACE network.

Right Size for the User Base

The ACE network was initially designed to help Cisco salespeople access and demonstrate the latest Cisco voice products and features, and to help Cisco IT improve the service quality and accelerate service delivery on the production network. In 2004, the ACE network user base began with 2000 employees; in 2011 there were more than 6000 users, and by 2014, over 10,000 users. Demand remains high, despite the many warnings in email and on the support wiki that ACE services are not always as reliable as production services, do not always interoperate with other enterprise software tools, and have more limited support than services in the production network. Prospective ACE users must apply for approval of the monthly charge from their managers before they are placed on a waiting list for network access.

The Cisco IT ACE team continues to try to limit growth in the user base in order to maintain platform flexibility and the ability to continue upgrading to new service versions and features. The right size for ACE is set by agreement between the ACE team and the Cisco IT architects who are responsible for production network stability. As the ACE network has proved its scalability, not only in architecture but in support capabilities, this “right size” number has been allowed to grow.

Regional sales teams restrict membership in ACE to those salespeople who are focused on selling advanced Cisco technologies. Initially these members were unified communications and collaboration sales engineers, but as the ACE network scope has increased, members now include security and data center sales representatives. Groups in Cisco IT, engineering and product development, human resources and other departments limit the

number of users who are approved for ACE membership based on the annual cost. In all cases, the ACE team reserves the right to limit the total number of ACE members in any year.

User Support

Although the ACE team has developed its own case system for user support, ACE users can access support via the standard Cisco IT trouble-ticket system. ACE users may request support for troubleshooting particularly difficult problems. ACE engineers handle these problems directly, because production IT support staff are not yet trained to handle the ACE network services. When these new services are deployed on the production network, the Cisco IT support staff received any FAQ and support process documents developed by the ACE engineers during service testing.

“ Self-service support has been a big factor in making the ACE program successful.”

— Pradeep Musugu, senior member of the technical staff, Cisco IT

The ACE team must keep its support overhead low while giving more than 10,000 users access to new and unfamiliar services. One critical gain for ACE users, and for Cisco, has been the development of self-provisioning tools for these new services.

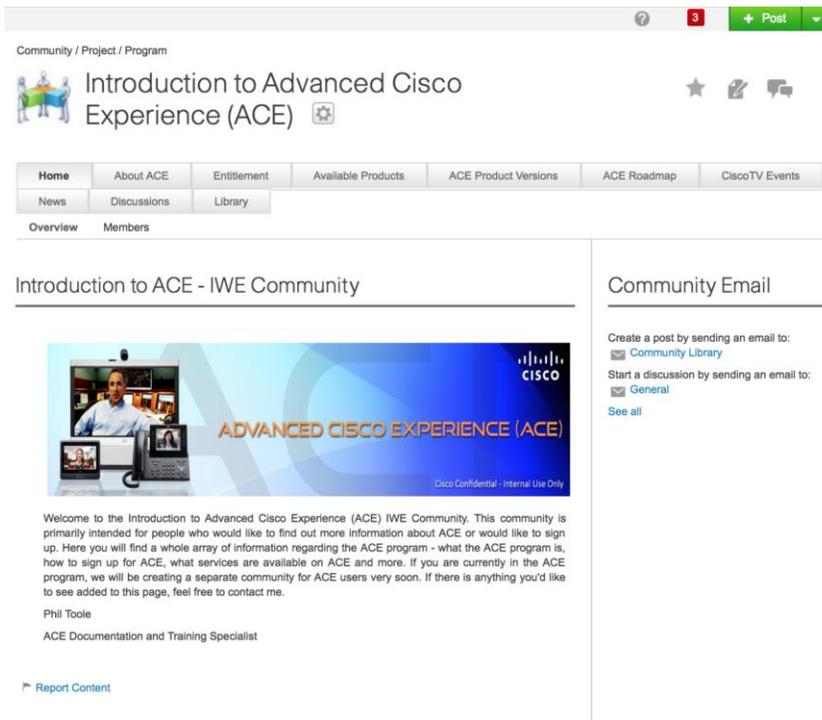
Most help desk calls for new network services are related to a few common questions related to setup such as logging in, establishing a new user configuration, and customizing basic service features. The ACE team builds online scripts for posting on the internal ACE web site and on the internal Cisco Integrated Workforce Experience (IWE) social sharing site. These scripts guide new users through the service choices they must make, then the script uses common product APIs to provision each user's service. The scripts help users be more productive, and reduce the overall ACE support burden, although at a cost. Building the scripts initially required part of a development engineer's time, and now consumes the time of five full-time ACE engineers. However, this cost is offset by the benefit of reduced support demand that Cisco IT gains when later using these automated provisioning tools in the production network.

Most ACE support is handled by self-service, using the wiki, discussion forum, and other features on the Cisco IWE site. (Figure 2). The information available on IWE includes an overview of each new ACE product, both quick-start and detailed setup instructions, release notes, recorded training sessions on ACE network services, and a discussion forum for users to share their problems and solutions. ACE engineers and users create FAQs and provide answers for other discussion forum questions related to each product and to ACE services in general.

Using Cisco WebEx, the ACE team also provides scheduled and on-demand user training for each new service or product, broadcasting them globally using Cisco TV and recording them for playback on Cisco Show and Share. Other training sessions are delivered as needed to address topics requested by users or topics identified by the ACE team from questions in the discussion forums and help desk.

Behind the scenes, the ACE engineers also provide appropriate support for the Cisco production network infrastructure. Because they regularly work with a product's Alpha test teams, the ACE engineers learn about known bugs, fixes, and critical patches in new releases. The ACE team shares this information with the production IT engineers, who in turn use it to decide which product versions will be considered for installation on the production network. IT service managers also make use of the ACE setup guides, and IT operations managers make use of the ACE support FAQs to make deploying and supporting new tools much easier in the production network.

Figure 2. Main ACE Network Information Page on the Cisco IWE Community



How Cisco IT Benefits from the ACE Network

Essential to successful coexistence of the ACE and production networks is cooperation and regular communication between their management teams.

“The ACE team is able to quickly deploy and implement new technologies, which provides a test bed and lessons learned to the Cisco IT team. Both teams have worked closely together on projects such as implementing video endpoints, SIP trunking, cross-cluster extension mobility, and a next-generation dial plan across our separate Cisco UCM clusters,” says Ben Irving, Cisco IT manager, Strategic Innovations.

“For the products and features that will be deployed on both networks, we need to be sure they’ll interoperate to avoid a deployment that could disrupt the communication between the two networks,” says Jon Heaton, UC design manager, Cisco IT. “Also, we want to make sure that a new feature isn’t deployed on the production network before it is deployed on the ACE network. These principles help to avoid the scenario where one team may plan a deployment that could create a significant disruption for the other.”

“For the Cisco IT planning team, the testing activity conducted on the ACE network also acts as a preproduction certification process for new software releases,” says Heaton. “ACE users are more tolerant of outages, which lets the ACE team test code that is less stable than would be tolerated on the production network.”

Cisco product development groups and Cisco customers also benefit from the ACE program. Deploying the latest products and code to a large population provides Cisco with valuable feedback, which results in better and more stable products. Additionally, the ACE team can deploy products internally that Cisco IT would never consider for production use at Cisco. “Some products are targeted at customers that are not like Cisco, whether they are in certain vertical industries or are smaller business customers. The ACE network can test these products as part of a much broader product portfolio than production IT,” says Heaton. This breadth of product testing on the ACE network gives the Cisco product development teams valuable feedback from internal users on a broader range of

products than would be available on the Cisco IT production network.

Cisco employees as a whole benefit from the cooperation between the ACE and production teams because it results in much faster deployment of new services in production. And Cisco IT encourages ACE users to share experiences with their colleagues as a way to promote adoption of new network services once they are available on the production network.

Results

For Cisco IT, testing and user participation on the ACE network produce several types of positive results.

Cost-effective design for a testing network. By using production network resources as much as possible, Cisco IT is able to reduce the costs and work involved in building and maintaining ACE as a testing network.

Faster time to deployment. New products, services, and features can be deployed on the production network in a shorter time frame because of the experience gained on the ACE network. In some cases, ACE testing activity identifies a more efficient deployment design for a service than what was originally envisioned by the Cisco IT team. In the beginning, production IT services were often two years behind ACE deployments; today production IT services are about three to six months behind ACE service availability.

Faster deployment also means users are able to capture the productivity benefits of new network services sooner. "Rollout of new products and services on the Cisco network happens faster because of employee pressure as they see colleagues using features on ACE that aren't yet available on the production network," says Jedd Williams, senior director for sales strategy and systems engineering in Cisco IT.

Demonstrate use of the latest corporate products. Cisco salespeople gain a tremendous benefit from being able to use, experience, share, and demonstrate new Cisco products. For the past three years, over 80 percent of users surveyed reported that they were able to use ACE to demonstrate more products to more customers, which had a positive impact on their ability to sell these products.

Deployment guidelines. Comments and questions from ACE network users help Cisco IT with production planning and identify training and communications needs. Over 20 percent of ACE users surveyed reported that they had submitted new product or feature requests through the ACE website. FAQ documents, created by the ACE team for Cisco IT engineers, also help to improve the production deployment processes.

Collaborative development of new management tools. The ACE team sometimes needs to create or customize management tools to support a new product or software release. In some cases, those tools can transition to the management operations for the production network. In other cases, Cisco IT develops management tools for the production network that can be used by the ACE team.

Positive user experience and productivity gains. Among ACE network users, 93 percent report a positive or outstanding overall experience with the network. For the ACE support services, 81 percent of users gave a positive or outstanding rating to their experience. Perhaps most significantly, 91 percent of ACE users would not want to move back to the production network. In addition, the ACE team surveys users on a regular basis about the value of these new tools in the enterprise. ACE users provide feedback about the productivity increases they have gained from using the pre-production network services. Cisco IT can, in turn, share this product benefit data with Sales and with customers.

Lessons Learned

The Cisco IT and ACE teams have learned several lessons from their joint and separate work on the testing and production networks.

Find the right users. The dynamic and early-release nature of a testing network makes it important to find the right types of users. These users are employees who want the latest technology and are willing to volunteer for testing new services and features, even if their operation is less than perfect. Self-reliance, patience, and a willingness to experiment are important traits for these users.

Limit the number of users. “We kept the number of users intentionally small while we were building and troubleshooting the ACE network, and we have added users only gradually since then in order to maintain the network’s stability,” says Williams. “We want to be sure that only users who really need it are on the ACE network. If we add too many users, then it becomes like a second production network because we start to be concerned about avoiding the potential negative impact if something goes wrong.”

Offer users self-support resources. “Self-service support has been a big factor in making the ACE program successful,” says Musugu. “Our users have strong technical knowledge and want to be able to do things themselves. They don’t want to have to open a support case and wait perhaps days for a response if it is a low-priority problem.” However, self-support may cause user confusion about where to obtain help. Among ACE users, only 40 percent first called the ACE support team instead of the internal help desk for the production network.

Offer user training. Although users may be willing to accept a less polished network experience and to be more self-reliant with their support, this does not mean they can go without training resources. Slides and audio recordings from quarterly virtual training sessions are available on demand for ACE users.

Consider network differences. Both users and IT staff need to recognize that necessary differences may arise in service levels, feature release schedules, prerequisite versions, or other incompatibilities between the testing and production networks. For IT staff, managing these differences requires clear and regular communications about upcoming changes planned for both the testing and production networks. This communication is especially important for setting accurate expectations among users.

Create protections for the production network. To protect the production network from disruption by the ACE network, the teams apply two measures. First, the ACE team does not make changes to the ACE network without notifying and involving Cisco IT. Second, if the ACE team needs a change on the production network, the team must submit a formal request for review and approval in the standard Cisco IT change-request process.

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Next Steps

Cisco will continue to use the ACE network for preproduction testing of the company’s new products and network services.

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

The Cisco on Cisco blog contains helpful posts on unified communications topics: <http://blogs.cisco.com/ciscoit/>

Note

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