


Tapping Into Cisco Enterprise Content Delivery Networks for High-Impact, Cost-Effective Learning



In the 21st Century, the age of knowledge workers, people need to learn more than ever before. Knowledge and skills appropriate at a given time may not be highly valued even just a few years later. Unless individuals, companies, and countries constantly update their skills, they risk falling behind.

To keep up, companies are turning toward e-learning. E-learning enables them to:

- Reach audiences anytime, anywhere
- Centralize information
- Reduce costs
- Improve productivity and competitiveness

Yet, it is not without its own challenges. Companies are faced with figuring out how to move knowledge online while:

- Delivering rich, engaging content anytime, anywhere
- Managing learning objects
- Ensuring scalability
- Minimizing bandwidth costs
- Eliminating network congestion
- Integrating with other key learning applications

Overcoming Challenges with Content Delivery Networks

To overcome the online learning issues surrounding quality, network congestion, and integration, enterprises are turning to Cisco Enterprise Content Delivery Networks (ECDNs). As the core e-learning infrastructure, Cisco ECDNs make rich online learning a reality—live or on demand—to employees, partners, suppliers, and customers anywhere in the world. The ECDN does this by effectively setting up a global network of intelligent edge nodes that transparently route learner requests for content to the best source for delivery. The basic premise of the solution is to move high-bandwidth content as close as possible to the learner and begin enabling a highly interactive, engaging experience without being constrained by a “skinny” Internet connection. Content is streamed locally using available LAN bandwidth.



This intelligent routing and delivery works for mainstream Web content, as well as learning or communications content. For example, a company can “perpetuate” a new training module out at its branch offices for local availability. At the same time, the branch office can use the Cisco CDN to cache frequently requested Web content from portals such as Yahoo or MySmartForce, which frees up bandwidth for other applications in the office, such as email or transaction processing.

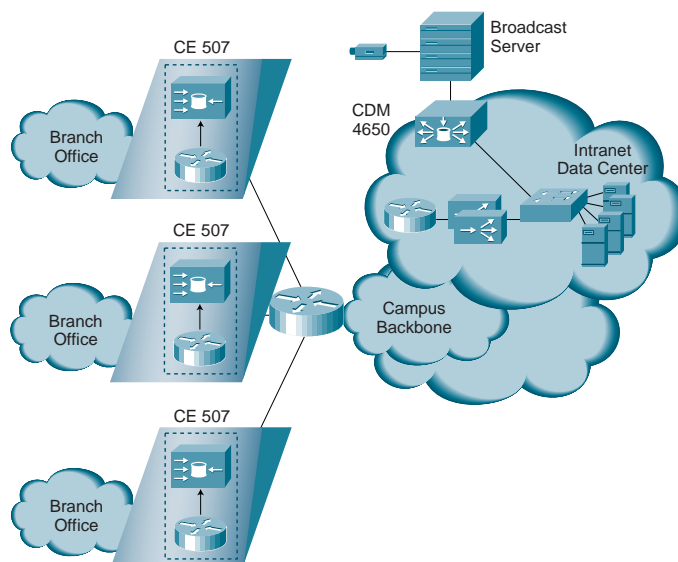
Cisco ECDNs also provide the capability for live broadcasts using either the Cisco IP/TV® Solution or a CDN with a RealG2 server, making it possible for corporate communications, marketing teams and trainers to get right to the desktop with high-quality, live information.

For “power” e-learning users, Cisco ECDNs can be integrated with the industry’s leading learning applications for end-to-end solutions that include content, testing and assessment, virtual classrooms, knowledge and learning management, publishing, and more.

A Closer Look at the Cisco ECDN Products

The Cisco ECDN solution consists of a Cisco Content Distribution Manager and one or many Cisco Content Engines, an IP/TV Broadcast Server and Control Server, or a combination of these products (Figure 1). The combined solution is a simple, yet powerful, way to broadcast live learning to corporate desktops, then capture them as video on demand, and distribute them to any branch office, where they can be accessed online anywhere, anytime.

The Cisco ECDN Solution



A description of each product follows:

Cisco Content Distribution Manager

At the heart of the Cisco CDN is the Cisco Content Distribution Manager (CDM), a Web browser-based administrative tool that provides complete control over the learning network. Through a graphical user interface, enterprises import, preview and “publish” rich media—including TV-quality video to any Cisco Content Engine, or edge node, worldwide. For each file, the CDM generates a thumbnail and URL specific to the content, which can then be embedded and accessed via a Web site or Learning Management System/portal.



A key feature for IT departments working with learning teams is the ability to tightly control bandwidth usage. The CDM enables administrators to set maximum bandwidth usage rates for distributing training to Cisco Content Engines, as well as for delivering content to desktops, kiosks or television monitors.

Cisco Content Engine

While the Cisco Content Distribution Manager is used to set bandwidth and delivery policies, the Cisco Content Engine is the remote “appliance-like” delivery node that streams content to the learner. This content can be “frequently-requested” Internet content from any Web site or rich pre-populated learning any communications. Enterprises can even use this edge node to manage Internet access by blocking certain Web sites or only enabling certain users for Internet privileges. A key benefit for IT teams that the Cisco Content Engine provides is the ability to be completely managed and controlled remotely. Additionally, it requires no new desktop software.

Cisco IP/TV Broadcast Server and Control Server

These IP/TV Broadcast Server and Control Server are based on a multicast technology that makes it possible for Human Resources, Corporate Communications, or even Sales & Marketing teams to deliver live TV-quality video to desktop PCs. The Cisco IP/TV Broadcast Server captures and streams live MPEG video programming. The Cisco IP/TV Control Server is the management component of the solution, which is used for scheduling and controlling video on the network.

Subject matter experts (SMEs) can present from any location equipped with a broadcast server and a camera, allowing them to reach far more learners and at a fraction of the cost of traditional classroom training. Employees access live sessions through a simple media player, and can easily tune into scheduled events through an intuitive online “TV guide”. Enterprises can also use the Cisco IP/TV Broadcast Server to record events as video on demand for later viewing.

For networks that are not multicast enabled, enterprises can alternatively use the RealG2 server embedded in each Cisco Content Engine to deliver a live broadcast. This solution offers the advantage of a plug-and-play “appliance” packaging for branch offices and reduced bandwidth usage. The Cisco Content Engine will pull in one live stream, which is then “split” on the network as a LAN multicast.

While the RealG2/Cisco Content Engine is a good interim solution for getting a higher-than-normal-quality stream to desktops, the Cisco IP/TV solution provides a number of key benefits for enterprises serious about high-quality broadcasts:

- Ease of managing and implementing Layer 2 and 3 multicast versus Layer 7 multicast—Companies can further leverage their investment in Cisco infrastructure by turning on the multicast features in the Cisco routers and switches, simplifying deployment.
- Video quality—Cisco IP/TV integrates quality of service (QoS) network features and uses highest quality codecs.
- Integrated live platform/turnkey solution—A complete solution for hosting live events including scheduling, event advertising, slide broadcast, and conversion to video on demand features.

Building an Integrated, End-to-End Learning Solution

For more sophisticated learning environments, enterprises will want to build an end to end solution that includes content, testing and assessment, virtual classrooms, knowledge and learning management, publishing, and more.

In order to help enterprises build standards-based, integrated solutions, Cisco and a team of leading learning providers have integrated their solutions, making it easier and less painful for organizations to be up and running with advanced technologies. The team of vendors includes Centra, Cisco, gForce, iXL, Ninth House Network, and Saba. Together, they are delivering a single integrated platform designed to enhance both formal and informal learning and communications across an enterprise.

By using Cisco ECDNs as the learning infrastructure, companies can take advantage of bandwidth controls, caching capabilities, and the addition of rich live and on-demand media to courseware. All of the content can be launched and tracked from a central learning management system. Each partner is described in the following sections

Centra

Centra provides tools to manage live and recorded events across the Web. An instructor can use these tools to deliver course material and manage the classroom experience of students located anywhere the Internet reaches. Web-based conferences, meetings, and live collaboration are easily added to the repertoire of tools supporting the organizational learning experience.

gForce

gForce is an integrated suite of Web-based e-learning production and delivery platform applications designed to facilitate the rapid transfer of knowledge from a company's experts to diverse and dispersed learner populations within a company or the extended enterprise. Using gForce's content creation, management, and personalized delivery functionality, customers can gain competitive advantages by increasing the speed, frequency, efficiency, and reusability of communications of mission-critical, time-sensitive information within and across functional areas.

IXL's Business to Employee Practice

iXL's Business to Employee (B2E) group provides consulting, customization, and implementation services and roadmaps for clients leveraging technologies that enhance employee productivity, increase employee effectiveness, and reduce corporate execution costs. Working together with ecosystem partners, iXL provides professional services that complement the best-practice solutions offered by this unprecedented, coordinated vendor approach to organizational e-learning and knowledge exchange.

Ninth House Network

Ninth House Network provides a fusion of technology and human creativity to deliver a desktop learning experience that is actually visceral. Ninth House Network's interactive programs engage employees to ensure they are able to apply what they have learned. To be successful, organizations must recruit and retain top talent, develop leadership, manage change, and improve customer satisfaction. Ninth House Network helps organizations meet these challenges with strategic business learning that inspires employees and gives them key skills for success.

Saba

Saba provides a learning management system (LMS) that delivers personalized instructional schedules for each participant in an organization. Saba also offers extensive management reporting on the progress of participants against their instructional schedule. In addition, Saba has a rich set of customized capabilities that allow it to support the largest organizations' needs including the ability to vend courses on the Web, manage multiple efforts across multiple divisions, and address issues that cross international borders.

E-Learning at Cisco Systems

Cisco is a strong advocate and user of e-learning systems across the organization because of the tremendous cost and flexibility benefits that online learning offers. Perhaps one of the best examples of how Cisco uses e-learning internally is the "Field E-Learning Connection," which provides new hire and experienced learning paths for the Cisco sales force and sales-support engineers. The learning material is in modules and is delivered through various methods including:

- Live broadcasts using Cisco IP/TV Broadcast Server and Control Server—Viewers tune into live events and ask questions using the "Question Manager."

- Video on demand—Viewers choose from a large library of video feeds on new products, technical information, sales programs, and so on. These training tools can be used whenever and wherever it is most convenient for the learner.
- Virtual classroom—A live, interactive Web-based event for collaborating with geographically dispersed learners. Anyone can attend or present from anywhere as long as they have a network connection and a browser. The scheduled delivery time is fixed. Presenters can poll the audience, receive questions, and leverage other network content. Audience members can chat or break into workgroups. Instructors can pull elements from other e-learning technologies using a browser.
- Interactive multimedia—Cisco Interactive Mentor is a simulation tool that serves as a technical troubleshooting resource for field engineers. It provides information on specific networking technologies with examples of how Cisco products are used. It includes interactive technology tutorials combining self-paced computer-based training, online communities, and instructor-led forums with simulated configuration and troubleshooting exercises. Advanced-level practice labs test internetworking knowledge. Access to this knowledge-transfer tool enables companies to update the knowledge of their IT personnel at minimal cost and maximum convenience.
- Virtual labs—Lab settings are an invaluable training tool by allowing people to “learn by doing.” Cisco Remote Labs allow learners to practice job skills such as conducting customer demonstrations, troubleshooting, and installing equipment over a network instead of physically traveling to a lab. Learners can choose the block of time that fits their schedule. They also can assess what types of additional training are needed before moving on to new topics or exams. They take only what’s needed. Each remote lab focuses on a specific skill, so learners are free to select one that best fits their needs.
- Management and assessment—These tools allow managers to identify skill gaps or competency deficits and match a reward system to skill development. Cisco Web-enabled training management systems will track and enroll students, manage course registration, schedule classes, and track students’ learning histories. With these tools, both the learner and the course developer are accountable. Learning only the materials that the learner needs means less redundancy, faster learning, and more time to be effective in the field.

Maximizing Returns

Results from Cisco’s field e-learning programs have been impressive. In less than one year since launch of the Field E-Learning Connection, more than 7500 employees have subscribed, and some 80% of sales and technical training materials are now Web-enabled and accessible in a variety of formats online.

Tom Kelly, Vice President of Internet Learning Solutions Group (ILSG) at Cisco, measures the impact of e-learning in business terms. “We’re focused on how we get salespeople better trained, customer service people better trained, technical assistance center people better trained, so that the company sees higher satisfaction with the customers, and faster adoption of new technology because salespeople and customers are better informed about the benefits and reasons,” he says. “The company benefits more. The business reason to implement e-learning solutions is to get more information out there sooner, to get more training skills and knowledge out there sooner.”

Summary

CDNs enable businesses, schools, and government agencies to improve learning, communications, and productivity by delivering any rich media on the Web simply and affordably. Enterprises are able to deliver any streaming formats: MPEG, RealG2, QuickTime, Windows Media, PDFs, PowerPoint presentations, IP videoconferences, Shockwave, Flash, applications, and more. In short, they make high-impact desktop learning across the enterprise a reality.

By using Cisco ECDNs as the learning infrastructure, enterprises can:

- Eliminate bandwidth bottlenecks
- Improve learner satisfaction and retention

- Centrally manage and distribute any live and on-demand content
- Easily extend knowledge to partners, suppliers, customers
- Integrate with leading learning applications

In addition to enabling pre-population of rich learning content at the branch offices, or edges, Cisco ECDNs also allow enterprises to take advantage of integrated caching technology. By caching content locally, enterprises can lower the cost of bandwidth, improve Internet speed and performance and manage Internet access.

Finally, Cisco ECDNs enable multiple opportunities across the organization:

- CEO—Live broadcasts to employees' desktops
- Finance, customer service—Richer knowledge available to solve problems, be more productive
- Sales and marketing—New medium for launching products, services; communicating with field
- Advertising—Controlled delivery of commercials, promotional content to branch TVs, and kiosks
- IT—Faster Internet access and management, particularly in branch offices



Corporate Headquarters
Cisco Systems, Inc.
170 West Tasman Drive
San Jose, CA 95134-1706
USA
www.cisco.com
Tel: 408 526-4000
800 553-NETS (6387)
Fax: 408 526-4100

European Headquarters
Cisco Systems Europe
11, Rue Camille Desmoulins
92782 Issy Les Moulineaux Cedex 9
France
www.cisco.com
Tel: 33 1 58 04 60 00
Fax: 33 1 58 04 61 00

Americas Headquarters
Cisco Systems, Inc.
170 West Tasman Drive
San Jose, CA 95134-1706
USA
www.cisco.com
Tel: 408 526-7660
Fax: 408 527-0883

Asia Pacific Headquarters
Cisco Systems Australia, Pty., Ltd
Level 17, 99 Walker Street
North Sydney
NSW 2059 Australia
www.cisco.com
Tel: +61 2 8448 7100
Fax: +61 2 9957 4350

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