

Cisco Best Practices Guide



Preparing for Business Video Services Using Application and Content Networking Systems

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Introduction

The purpose of this paper is to provide step-by-step best practices to business managers who recognize the value of video-based learning and communications and are ready to build their business plans.

From seeking funding to measuring success, business managers will learn how industry-leading organizations such as Avnet, Fort Hays State University, Fremont County Schools, NCR, Reuters, U.S. Department of Veterans' Affairs, and Cisco Systems® built their own IP video networks for applications spanning education to executive communications.

This guide is not intended as a technical deployment guide. Rather, it is intended to provide business managers with the information they need to progress from planning to deploying to measuring return on investment (ROI).

What is the Cisco Business Video Solution?

Cisco® offers video-on-demand (VOD) and live broadcasting services based on two primary systems: Cisco Application and Content Networking System (ACNS) Software and Cisco IP/TV® solution. Cisco ACNS Software supports a number of mission-critical network services using a common infrastructure of network-integrated and dedicated appliances called content engines. Content engines are packaged as standalone network appliances or router-integrated network modules for Cisco 2600 Series routers, Cisco 3600 Series multiservice platforms, and Cisco 3700 Series multiservice access routers.

Running Cisco ACNS Software, content engines allow organizations to accelerate the delivery of rich media and Web applications, particularly at the edge of the network in the branch, where bandwidth is scarce.

By serving content closer to the end user, instead of traversing the WAN to deliver information, Cisco ACNS Software allows organizations to:

- Optimize WAN bandwidth usage—Reduce bandwidth required for Web-enabled applications and restrict bandwidth utilization to sanctioned business information and applications.

- Improve network security—Provide virus protection for branch and remote sites, employee Internet management to restrict access to objectionable Web content, compliance with important industry regulations.

- Accelerate business applications—Accelerate and enhance performance of mission-critical applications such as Siebel or intranet applications developed in-house using HTTP.

- Deliver business video services—Support MPEG, Windows Media Technologies, RealVideo, and QuickTime streaming video for employee training, real-time corporate communications, and customer relations.

- Provide rich point-of-sale services—Offer the ability to deliver video and interactive media to televisions and video walls.

Many organizations use Cisco ACNS Software in conjunction with the Cisco IP/TV solution, the Cisco live MPEG streaming solution. The Cisco IP/TV solution captures the live event and Cisco ACNS Software distributes it as a VOD to the remote site for later viewing (Figure 1).

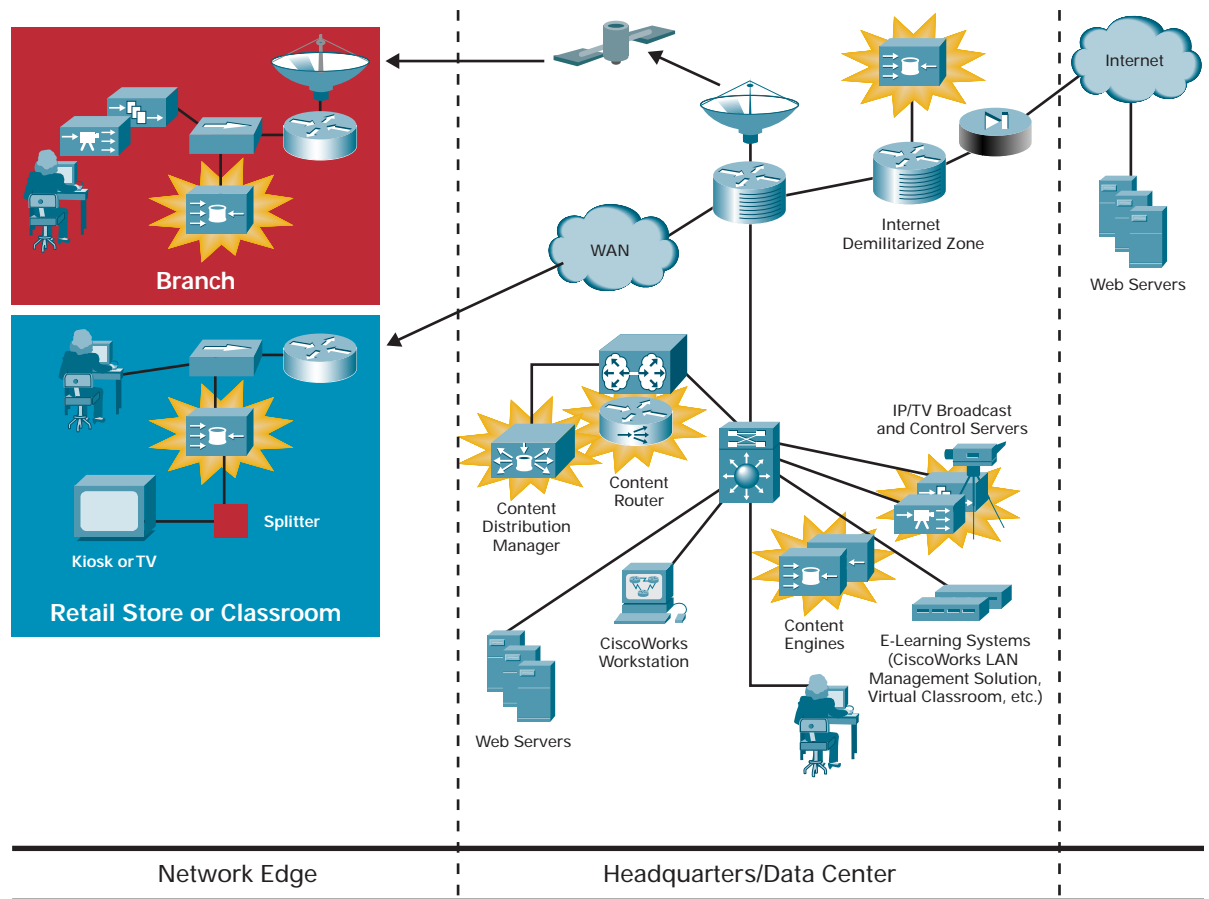
The Cisco IP/TV solution delivers multicast video, PowerPoint, and HTML for live, TV-quality training, communications, and other events.



Subject matter experts can present from any location equipped with a Cisco IP/TV broadcast server and camera, allowing them to reach more users at a fraction of the cost of traditional classroom training. End users “tune into” the event through an intuitive online “TV guide” and media player.

Both Cisco ACNS Software and the Cisco IP/TV solution can be used in conjunction with an IP set-top box for video delivery to standard National Television System Committee (NTSC) or Phase Alternating Line (PAL) plasma displays and video monitors, instead of to desktops.

Figure 1. Basic Cisco ACNS Software Deployment



Because the Cisco ACNS solution enables the deployment of many services from a common platform, internal teams can often take advantage of the same investment, consolidating management and service costs, while reaping additional ROI.



The virtual intimacy and proximity created through Internet video help headquarters-based and remote employees create a sense of connectedness in mission, purpose, and strategy .

Deciding to Implement a Cisco Video Solution

Making the Business Case

The first step to deploying a business video network is making the business case. While an organization may initially require a video application, it's important to consider the many services that Cisco solutions offer:

- Reduced infrastructure and training costs
- Increased application performance
- Increased information security
- Enhanced employee productivity and satisfaction
- Improved customer service
- Optimized WAN bandwidth

For example, the network security team may be considering deploying a separate server for content filtering. The application and server teams may be looking for a caching solution to eliminate latencies in new Web applications like Siebel or SAP. Because the Cisco ACNS solution enables the deployment of many services from a common platform, internal teams can often take advantage of the same investment, consolidating management and service costs, while reaping additional ROI.

Business Video for Learning and Communications

From a productivity and cost-savings perspective, e-communications, online learning, and distance learning are often the leading motivators behind deploying Cisco ACNS Software and the Cisco IP/TV solution.

E-communications enable strategic alignment between organizational priorities and the workforce through effective knowledge sharing. The virtual intimacy and proximity created through Internet video help headquarters-based and remote employees create a sense of connectedness in mission, purpose, and strategy. Using IP video, initiatives such as changes in human resource policies can be delivered concurrently, enterprise-wide to reduce the risk of widespread, often inaccurate rumors.

As Cisco and other industry leaders have proven, video-based online learning is one of the most effective ways to improve employee performance and skills development. Online training and communication saves time, reduces travel and other costs, and brings skills of specialized talent to larger numbers across the organization, regardless of location.

"The company anticipates annual savings of US \$3 to US \$5 million in bandwidth costs that would have been required without the Cisco ACNS solution."



"Using Cisco ACNS Software, a global communications company saved an estimated \$4 million on a new product launch, which paid for its technology investment and more."

Video for Learning

Deploying a business video solution for online learning drastically reduces, and can even eliminate, the need for off-site training. From a productivity standpoint, the benefits of employees not having to travel and spend a large amount of time out of the office may even outweigh the actual training benefits.

A major U.S. retailer wanted to improve the overall profitability of its stores by implementing a performance-improvement plan for its employees. The company was able to easily justify the cost of a Cisco ACNS solution without having to add additional WAN bandwidth to every store. The company estimates it will save US \$3 to US \$5 million annually in bandwidth costs. This was the basis of the business case presented to the senior management team.

As part of its business justification, a large chemical company proved that using Cisco ACNS Software to deliver online learning provides significant cost savings associated with travel and material production costs. The company projected the Cisco IP/TV Solution would enable them to reduce training costs by as much as 50 percent compared to traditional live training methods.

Using Cisco ACNS Software, a global communications company saved an estimated US \$4 million on a new product launch, which paid for its technology investment and more. IP video eliminated the cost of employee travel and remote training, and enabled the company's trainers to reach more students.

In fiscal year 2002, Cisco realized a US \$133 million financial benefit from its online learning solution, which includes the Cisco IP/TV solution and Cisco ACNS Software. In addition, the company was able to improve employee "time to competency" for new employees or job changers 40 percent faster than through classroom training.

One of the best examples of how online learning saved Cisco money is the ISO 9001 worldwide training and certification example. The company estimated that this initiative would take up to 90 days using traditional methods, and that taking trainers away from their daily responsibilities would cost the company approximately US \$1.4 million.

To offset these inefficiencies, Cisco developed several specific training curricula that addressed the complexities of training a large number of employees in the details of the ISO 9001 standard. The most popular and effective training method used streaming video, hypertext, and animation, all delivered via a PC browser. Cisco publicized the ISO 9001 training site by linking it to important, high-traffic internal web pages and through e-mail campaigns. The results were impressive. Cisco reduced ISO quality team-training time by 80 percent, which enabled the rollout of seven additional sites for ISO 9001 audits in a five-week period (versus the three months using the previous system). Training certification costs were reduced to just US \$16,000, and the results surpassed previous years, ranking Cisco number two among 500 other companies.

Avnet, one of the world's largest business-to-business (B2B) distributors of technology, uses its Cisco ACNS solution for learning and executive or corporate communications each business day. By bringing rich business video online, Avnet has been able to provide better and more in-depth knowledge sharing without taking sales and engineering employees out of the field for live training. In addition, the company has been able to avoid additional infrastructure costs, because it could use its existing network without upgrading WAN bandwidth.



The Cisco ACNS solution will save this company approximately US \$1 million annually by replacing applications that were previously used to deliver communications.

Online learning is also a critical application for schools and universities. Rich video content greatly enhances classroom training for kindergarten through grade 12, while distance learning, VOD, and Web-based courses at universities and colleges enable schools to reach a wider student population, expanding their use of professorial resources to increase overall enrollment revenues.

One way to enhance course curriculum is by producing and distributing videotaped lectures and programs; however, this can be both costly and time-consuming, and it doesn't provide the flexibility necessary to keep content fresh and relevant. Deploying a Cisco ACNS solution enables schools and universities to offer more sophisticated online learning, allowing them to continually enhance their curriculum with rich content, quickly and easily.

In 2000, Wyoming legislators mandated that a foreign language program be instituted for every kindergarten through high school student in the state. Because of budget constraints, Fremont County School District needed an alternative solution to hiring teachers. Online learning was the only viable option to deliver the new curriculum. The Cisco ACNS solution provided Fremont County School District considerable cost savings, including eliminating the need to pay for expensive WAN connections, as well as curriculum workbooks, materials, and the cost of expanding some of the facilities.

Fort Hays State University produced content locally or purchased hard-copy videos for its classroom programs, prior to deploying its Cisco ACNS solution. Every time a faculty member needed a video, a technician had to go to the classroom, make sure all the equipment was working, queue up the video on a VCR, and monitor its playback. To save on time and money, Fort Hays wanted faculty to have video control. The Cisco ACNS solution enabled Fort Hays to increase the quality of training and education, eliminate operating inefficiencies, and reduce costs associated with video production.

Video for Communications

In today's highly competitive and dynamic global economy, organizations realize that both audio and visual components of communications are no longer luxuries, but strategic tools for clearly conveying priorities and motivating employees in a timely, cost-effective manner. Yet, traditional videotape distribution minimizes the relevance of content. By the time a video is scripted, shot, produced, shipped, and played, the content is often already outdated and irrelevant. Satellite systems help with the delivery process, but are expensive to operate, and can't reach every remote location.

A large retail food chain is rolling out a new Web portal designed as its primary communications tool for all field employees. It wanted to improve portal performance without creating a need for additional costly bandwidth. The company anticipates that the Cisco ACNS solution will save approximately US \$1 million annually by replacing applications that were previously used to deliver communications.



Reuters, a U.K.-based provider of news, financial information, and technology solutions, wanted employees in New York to feel as “connected” as employees in its London headquarters. Led by the corporate communications department and a new chief executive, Reuters explored several solutions to provide consistent “fireside chats” and executive briefings no matter where employees were located. Reuters’ executives wanted the company’s intranet site to be the primary communications vehicle; however, the media communications and IT teams were concerned that rich media would spike Web traffic and increase network latencies, discouraging employees from using the system. The team decided to deploy a Cisco ACNS solution, which allowed them to easily deliver Web-based corporate messages without affecting WAN bandwidth or Web performance. Reuters estimates the investment in the Cisco ACNS solution will pay for itself with six months. The company also plans to use the solution for e-learning.

At Cisco, John Chambers and his executive staff regularly use video to deliver timely corporate information to employees worldwide. On average, Cisco hosts 40 to 50 live streaming video broadcasts with about 11,250 viewers per month—and creates 300 to 400 new VOD offerings per month, which are viewed approximately 89,000 times each month. By implementing business video solutions to meet important business objectives, Cisco saves millions of dollars every year. Recently, John Chambers hosted a two-hour live event for 33,000 employees worldwide, featuring multiple executive presenters. It was broadcast to employees via Cisco IP/TV technology and recorded for VOD viewing. Three thousand employees attended the event in person, 5000 watched the live Cisco IP/TV broadcast, and more than 21,000 employees viewed the VOD within two weeks of the broadcast. Overall, the event was viewed by over 90 percent of the Cisco employee population. When compared to alternative costs-audio and VHS tape (including dubbing, materials, and mailing)-Cisco found VOD to be significantly less costly per employee (Table 1).

Table 1 Cost Comparisons of Cisco CEO Employee Event

Method	Total Cost (U.S. dollars)	Cost per Employee (33,000 employees)
VOD	\$2000	\$.22
AUDIO	\$82,500	\$2.50
VHS	\$99,000	\$3.00

Once an organization has deployed an e-communications or online learning solution, it is essential to measure success, otherwise the training is for its own sake and not for the benefit of the individual or the organization.



Table 2 shows a variety of tangible and intangible metrics that can be developed to measure value.

Table 2 Examples of Metrics for Training Success

Tangible	Intangible
Elimination of travel costs	Positive impact on corporate culture and employee morale
Reduced training expenses	Consistent and timely communication
Decreased WAN costs via bandwidth savings	Faster response time and better end-user experience
Reduction in servers and lower IT overhead	More integrated and less complex architecture
Improved employee productivity	Better customer satisfaction

On the tangible side, organizations need only to add up the costs of travel (transportation, lodging, meals, etc.) for each trainee, multiplied by the number of training sessions needed. ROI can be measured for bandwidth, storage and media-server savings, increased performance, and decreased effort. Fewer training personnel are needed if sessions can be produced once and streamed live or rebroadcast. Finally, WAN costs can be reduced if Internet and intranet content can be cached locally.

In addition, organizations should ask and answer:

- Why are we investing in training?
- What business results do we expect from a knowledgeable and competent workforce?
- How can we be sure our workforce has the knowledge and skills the company needs today? What if the skill needs change as fast as the technology or the products and services?
- How can the organizational talent keep up with those changes?

Delivering Business Video to Kiosks or Television Monitors

For organizations that don't provide a laptop or desktop to every employee or student, delivery to television monitors plays an important role in education and communications. Many retail, transportation, banking, and education organizations deploy e-learning, e-communications, and streaming video services using Cisco ACNS Software and the Cisco IP/TV solution plus a set-top box. This allows them to deliver product and service information, advertising, and other information to end users right at the point of sale (POS) or service. In fact, retail organizations that have deployed POS and kiosk applications have off-loaded their service representatives and reduced the amount of time they spend with each customer, enhancing overall customer service in a retail store.

A major communications company uses Cisco ACNS Software with plasma screens, allowing customers to use touch-screen technology to obtain information about products and services. This "self-help application" enables customers to purchase products and services without interacting with a service representative, who, in turn, can maximize quality time with customers.

Municipal Credit Union (MCU) of New York deployed a Cisco ACNS solution to deliver product and service information to credit-union members while they are in the branch bank. The kiosk application enables the credit union to deliver MCU-specific commercials and information, as well as daily news, right at the point of sale. MCU believes the new solution will improve customer satisfaction.

Building the Project Planning Team

In the early planning stages, it is important to assemble a cross-functional team of both business and IT managers to create the project deployment plan.

Business managers define the business need for video, as well as policies such as who the target audience will be, which content-creation tools will be used, how often content will be refreshed, and important measurement criteria.

The IT team defines network readiness, bit-rate specifications, deployment schedules, network architecture, and day-to-day administration policies.

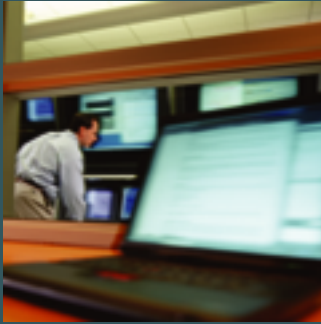
Senior staff should also be part of the deployment team to help minimize conflict and make sure programs support overall corporate strategies. The IT department should help synthesize policies that will affect day-to-day network operations, including performance and network bandwidth. Any trade-offs need to be agreed upon and documented, so rules are put in place to guide the program, should the stakeholders change.

Finally, although one business area may lead the initial solution investigation, such as corporate communications, it's important for project managers to include other departments that could benefit from caching or video in the planning phases. A cross-business-unit approach will help with funding enterprise-wide deployments and minimize management and capital costs.

In the early planning stages:

- Assemble a cross-functional team of business and IT managers
- Include personnel from different departments across the company for input
- Develop clear, well-defined policies and guidelines to avoid project delays and cost overruns
- Include senior staff to ensure compliance with company policies





Avnet's business and IT teams determined the best way to avoid the costs of adding WAN bandwidth was to implement a Cisco ACNS solution to deliver content via the LAN, instead of traversing the WAN-the most expensive part of the network.

Table 3 shows the typical needs of each of the stakeholder teams, which are important to understand.

Table 3 Stakeholder Team Needs

Business Managers' Objectives	Network Managers' Objectives
Increasing revenues and improving workforce productivity	Implementing a network-safe, efficient IP solution that is easy to administer
Dramatically reducing existing costs or inefficiencies associated with video delivery, training, and corporation communications	Improving network uptime and performance, ensuring quality of service for all users
Using existing budget and human resources more efficiently	Reducing or avoiding WAN upgrade costs
Extending delivery of strategic business applications to branch users	Efficiently delivering rich media using the existing network and staffing resources
Finding a vendor partner who can lend business application expertise	Finding a vendor partner who can lend network expertise

Initially, the technical department at Avnet would not allow training to be deployed on the company network because of the significant increase in bandwidth they estimated would be required to support it. With this stipulation in mind, Avnet's vice president of training searched for a solution that would allow him to deploy high-impact learning with minimal network impact.

Avnet's business and IT teams determined the best way to avoid the costs of adding WAN bandwidth was to implement a Cisco ACNS solution to deliver content via the LAN, instead of traversing the WAN-the most expensive part of the network.

The teams worked together to develop a business video plan to present to executive management, proving that Cisco ACNS Software would enable them to deliver comprehensive training sessions without compromising education quality or overloading the network. Executive management approved the Cisco ACNS solution and Avnet's training department funded the implementation.

At Cisco, both the IT and media-network business teams manage the video solution, which includes the infrastructure (Cisco ACNS Software, Cisco IP/TV solution) and several content-management and authoring applications. The Cisco media-network team manages content creation, and markets the solution internally, making the tools available to content creators across the company. The Cisco IT team owns and manages the infrastructure, and includes team representatives from all major functions (transport, systems administration, hosting, servers, etc.). Cisco IT and the Cisco media-network team work together to ensure the solution meets the needs of end users, and that the network is highly available and scalable.



- Outline full scope of business video project
- Put together a project plan
- Identify each phase of deployment from evaluation of resources to deployment to future requirements)

Scoping the Project

The video project plan identifies each phase of deployment—from evaluating internal resources, to testing and deployment, to future requirements. Following are the important categories to include in the project plan:

- Internal resource evaluation—Does your organization have the necessary design expertise and resources in-house or will you need to hire professional services and outside consultants to help deploy and maintain the solution?
- Funding—How will the project be funded? Can costs be shared across departments?
- Content creation, access, and refreshment—Do you have an internal production or media department to create content? Do you need to purchase copyrighted materials from an external source? How often should content be refreshed? What are the policies for user access?
- Pilots and testing—How will you pilot and test your video network before your formal rollout? Did you include product testing in your overall budget? How long will the pilot last and how many sites and users will be involved?
- Deployment and network readiness—Who will install new products on the network at each site? Will you provide support from a central site?
- Determining user needs—How will you market the new service to your employees? Will you factor in marketing as part of your deployment plan? Are end users equipped and ready to use the new service once it's deployed? Will employees have to be trained to use the new service?
- Future Requirements—Will other departments use the solution? How will you scale to meet the needs of more users? What other services will you offer?

- Evaluate internal resources
- Determine who “owns” deployment and maintenance
- Hire a third-party consultant to install and support solution if necessary
- Include cost of third-party services in original project plan



Evaluating Internal Resources

The first step in creating a video project plan is to evaluate internal resources and determine who “owns” the project, who will deploy it, and who will maintain it once it’s deployed.

Organizations must determine if they have the necessary design expertise and resources in-house or if they need to hire professional services and outside consultants. Money spent on third-party vendors can often accelerate the deployment and enable a faster ROI.

Many organizations prefer to hire third-party contractors who specialize in deploying IP video services, and who can help them implement solutions faster, because internal resources typically cannot devote 100 percent of their time to the project. Hiring a specialized contractor helps ensure that the project receives the appropriate amount of attention and resources to meet deployment deadlines.

Organizations can expect consulting fees and services to range between 7–10 percent of the Cisco ACNS hardware purchase price, which should be factored into the original costing plan.

The Department of Veteran Affairs (VA) often includes third-party contractors to support its IT group in new service deployments, because they’ve found contractors to be an efficient way to focus on important areas. In the case of video, the Department of VA hired IT Broadcasting through Northrop Grumman IT (NGIT) to help design and implement its solution. IT Broadcasting was instrumental in managing hardware integration and content development for the Department of VA e-learning project.

In its early planning stages, Cisco determined that the IT department could manage all major functions of the solution, so a third-party contractor was not necessary. Tight integration between Cisco business and IT departments ensures that employees can create and publish content effectively on the Cisco network.

Cisco produces 40–50 live events and 400–500 VODs per month with the following full-time employee (FTE) headcount (Table 4).

Table 4 Cisco Video and Live Productions

Category	Description of Tasks	Starting Requirements	Cisco Current Number of FTEs Required
Video production	“Lights, camera action” crew responsible for producing videos and company meetings	Outsource	8 FTE (partly outsourced)
Business infrastructure	Camera, operate business infrastructure (such as studio and program management), some content management tools development	2 FTE	8 FTE
IT infrastructure	Live and on-demand network, placeware tools, storage management, content management tools and application development	3 FTE	8–10 FTE 2 Network operators 1 Cisco ACNS Software 1 Storage 5–6 Content publishing, application development, and support

FTE support will vary for organizations depending upon the number of locations being supported, geographic disparity, and content policies.



FUNDING

- Who will fund the project?
- Share equipment cost and content development between IT and individual business units to ease deployment costs
- Seek co-funding opportunities in other groups that could benefit from Cisco ACNS services such as network security and Web application, acceleration, and video Content Creation and Refresh Guidelines
- Develop plan for content creation: will content be created in-house or purchased externally?
- Factor cost of content creation into original project plan
- Develop guidelines for content creation

Deployment Costs: Shared Funding

Because Cisco ACNS offers multiple services from the same software and hardware platform, it enables organizations to tap multiple areas for funding. Some organizations co-fund their Cisco ACNS environment with the Web application, store operations, and network security teams-or a combination of these groups. Many share the cost of new equipment and content development between IT and the individual business units, such as the training, marketing, and corporate communications groups.

When Reuters deployed its business video solution, the cost was shared between corporate communications and the technical architecture department. At the time, 50 percent of the company had access to the video network. After the initial installation was completed, other departments saw the benefits of the communications network and wanted to participate. Individual departments fund their own Cisco content engines to connect to the video network.

Content Creation and Refresh Guidelines

An important step in the deployment process is planning for how content will be acquired and how often it will be updated. Typically, organizations use a mix of internally created content for company-specific initiatives and third-party content for general soft-skills training and education.

Many organizations use the Cisco IP/TV solution as the content creation tool for video and Web events. Content can also be created using tools such as Helix Producer and Universal Server, IVT MediaPlatform Enterprise, Media Publisher, Microsoft Windows Media Producer, and Virage VS Publishing, to name a few. Some tools are based on standards, such as MPEG, while others feature proprietary standards, such as Windows Media Technologies. Wherever possible, Internet Streaming Media Alliance (ISMA) standards are recommended for ease of interoperability and integration.

Content deletion and refresh is just as important as content publishing. As a best practice, most e-learning and e-communications content has a one-year shelf life.

Reuters conducts one or two live video events per month, including briefings from its chief executive officer. Live events are more time-consuming to produce so they are prerecorded, formatted via Windows Media, and then broadcast "live" several times during the day in different global regions. "Playing live" means if viewers miss the first ten minutes, they cannot go back and see it. Reuters has its own library of content but also engages a third-party production studio to incorporate videos into Web pages and slides.

Avnet creates its own content on a quarterly basis, including company updates and other business communication materials. Each business group has its own developers who create the majority of the company's content using Windows Media Format (WMV files). Additionally, groups purchase off-the-shelf content such as business and office tools training materials from SkillSoft and Microsoft.

At Cisco, any employee can create video content. Most live streaming videos and VODs are produced at the on-campus television studio in San Jose, California. Content life is based on usage. If a VOD is viewed eight or more times over a 90-day period, it will remain on the network. If viewed fewer than eight times, the content will be removed and archived as audio on demand only.

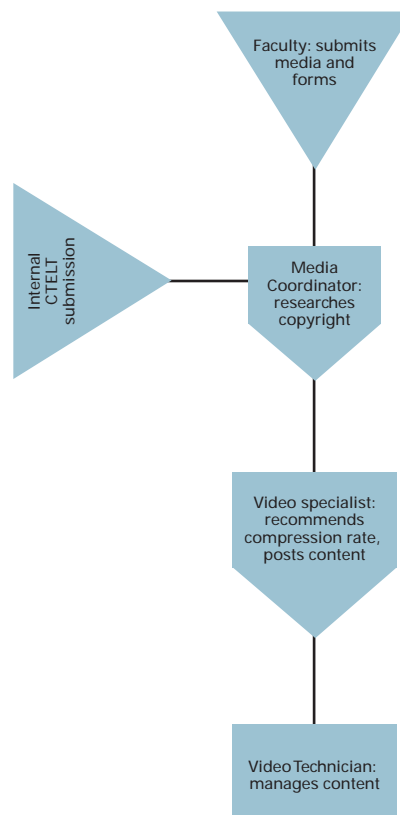
Fort Hays University produces content several ways. The university creates its own material using the RealNetworks format for Internet-based distance learning and MPEG-1 for on-campus streaming. The university also contracts with a local vendor to produce videos and purchase content from Public Broadcasting Service (PBS) and other educational institutions. All content is accessed and managed via the Web using standard browsers. Figure 2 shows an example of Fort Hays' workflow process.

Setting up a pilot enables organizations to:

- Test the application and content
- Determine network readiness
- Work out any problems prior to deployment
- Create a preinstallation plan for each location
- Ensure stability and scalability



Figure 2. Video Content Production at Fort Hays University Testing the Solution



Testing the Solution

Pilot and Testing

A standard best practice common across all IP video deployments is to build a test environment before deployment. In addition to enabling the IT and business teams to work out any network or content issues, the pilot also helps ensure the overall stability and scalability of the system.

Successful pilots mirror the production environment as closely as possible. There are two common scenarios:

1. Isolate specific branch offices as “test sites” and perform tests within the live network.
2. Build a mock test environment or lab and deploy on the live network once the pilot is complete.

During the pilot, the network should be exposed to as many scenarios as possible including over-subscription of traffic, failure of components, unauthorized access attempts, and full power-down failures and recoveries. Tests should be repeated to ensure consistent results. Organizations should then develop a pre-installation plan for each location based on lessons learned and installation requirements to simplify and accelerate deployment to remote sites.

Video pilots run a few weeks to several months in length, depending upon the scope of the project and size of deployment. The cost of the pilot should be factored into the initial business plan, and will vary depending upon the number of sites included. A general guideline is US \$3000 to US \$5000 per site for software and hardware.

The Department of Veteran Affairs performed a two-phased pilot when testing the Cisco ACNS solution. The first phase of the pilot lasted six months. Five regions were included in the pilot and the pilot was conducted in a working network, however, the regions were isolated. These five regions agreed to participate in the pilot because they wanted to influence policy decisions.



- Determine network readiness
- Outline needs of smaller sites with smaller links and slower connectivity
- Develop preinstallation plan for each location
- Develop planning guides which include site surveys and user documentation
- Consider implementing IP multicasting for efficient bandwidth utilization
- Pre-position content to smaller number of larger sites versus pushing content out to all sites automatically

During the first phase of the pilot, the Department of VA was able to determine infrastructure readiness, work out any issues, create an implementation and installation plan, and determine how long it would take to install the solution in each region. They created pre installation planning documents based on information derived during the pilot. The pre installation planning documents were given to each region prior to deployment. As a result of the pilot, the installation time for each region was reduced from six weeks to one week.

In phase two of the pilot, the Department of VA is currently testing the solution for a separate division. Because of the valuable experience and knowledge gained in phase one, the phase two testing period is greatly reduced from six months to only three.

During its pilot, Reuters' core team required each of the local LAN administrators to complete a survey, which was then reviewed by the deployment team. Performance testing, load testing, and encoding testing were also required. Through survey and testing, the appropriate video stream size for its Daily Briefing Video service was ascertained—in this case, 230 Kbps video, because most users wanted full screen, VCR or better quality. The testing also helped to identify other deployment issues, such as incorrect encoders, and media players and headphones that did not work properly.

After surveying LAN administrators, Reuters developed a template to ensure each site was standardized on applications and browsers, maximum file size for live streaming, refresh frequency, and troubleshooting procedures. Addressing these issues in the pilot stage eliminated potential problems on launch day.

Deployment and Network Readiness

Perhaps the most important prerequisite for effectively using streaming video as a standard communication vehicle is a solid network infrastructure. An end-to-end, IP network serves as the foundation for delivering high-quality video to users and storing media assets for easy search and retrieval.

Determining network readiness means verifying the business video solution will integrate with the existing network. Organizations must analyze and confirm the network has a comprehensive architecture appropriate for deploying a business video solution. Included in this architecture should be core servers, edge devices, and the capacity to support VOD, live streaming, content management tools, and collaboration and database-replication applications. Back-end policy-based management tools are also a must for directing how the solution integrates with the rest of the network.

As part of the network-readiness step, organizations should develop planning guides that include site surveys and user documentation (see Appendix 1 for an example of a site survey). In designing a business video infrastructure, it is important to remember that not all sites comprise a homogeneous network. While each site may be joined to a central backbone, the sites may not be able to use the same technologies, such as multicasting for live video.

Organizations should not make assumptions about WAN usage at each site—not all sites use the network in the same way. Instead, organizations must determine “normal” WAN link usage for each site and establish which sites are watching a lot of video and which are not. It does not make sense to pre-position or push the same content out to all sites automatically without conducting a usage survey first.

Although a multicast-enabled network is not required for video delivery, it is a valuable consideration. Multicast offers the benefits of delivering one stream on the network that viewers essentially “tune into,” rather than flooding the network with lots of unicast streams. Multicasting allows companies to easily and safely scale video to many users, while providing high quality of service.



Cisco has approximately 30 to 40 terabytes of video content on its intranet. Because many remote sites only watch five percent of this content, caching is the more attractive option for populating video to these sites. Pre-positioning content to a smaller number of larger sites-versus pushing content out to all sites automatically-allows Cisco to conserve disk space at hub sites and support higher-bit-rate files. The Cisco Media Network receives detailed statistical reports quarterly and disk space utilization reports weekly.

Internal Information Security

Information security is another important consideration, and organizations need to be prepared with policies that define who will be granted access to content, who will publish it, who will manage it, whether or not authentication will be used, and more.

Many of these security considerations are configurable directly in Cisco ACNS Software and Cisco IP/TV Software; others are configurable in the network as part of Cisco IOS[®] Software.

Information security was an important requirement in the DVA's video implementation. The solution had to comply with the organization's Cyber Security requirements. Furthermore, it had to allow for the creation of access controls and content-management roles.

At Cisco, once users have been authenticated on the network, they can upload, manage, and delete their own video content. The Cisco IT and media network teams select and view VODs randomly so they can monitor what type of content is being uploaded and enforce corporate policies and technical standards, when necessary.

End-User Requirements and Training

End-user requirements should also be included in the network-readiness plan. Are all desktops able to take advantage of the new technology or will they require upgrades? Can the desktops handle both video and audio? Do they have speakers or will users require headsets? What kind of player will users require?

In order for the business video solution to be successful, end users must be aware that it exists and understand how to use it. Internal announcements, publicity, and training for the new application should be included as part of the project plan. Many companies announce new business video services electronically using e-mail announcements or company intranets. Some companies use non-Web programs like flyers or giveaways. Each organization has to determine which method will work best with its employees and then develop a plan to announce the application once it is implemented.

Most companies find that an intuitive, Web-based business video solution negates the need for formal training. Cisco recommends, however, that companies produce and deliver a video or presentation that provides an overview of and introduction to the primary capabilities and benefits of the new system, as part of the application launch.



Conclusion

Cisco ACNS Software and the Cisco IP/TV solution enable organizations of all sizes and across all industries to take advantage of high-quality business video services for training, education, and communications using the IP network. Depending upon the scope of the project, the business video deployment can be a simple or sophisticated undertaking, requiring input and planning across multiple departments. By starting the deployment with a pilot system and implementing the solution in phases, organizations can effectively gauge network and workflow readiness. With the right mix of analysis, planning, testing, company-wide participation, and content, organizations can successfully use video as part of important product launches, compliancy training programs, corporate alignment plans, and more-without incurring unnecessary server and WAN bandwidth expenses.

In addition to business video, Cisco ACNS Software enables organizations to deliver a variety of mission-critical network services ranging from caching and content filtering to Web acceleration and e-learning. By deploying multiple services using the same infrastructure, organizations can use funding across multiple business units and realize compelling ROIs around network-bandwidth conservation, reduced travel costs, and the elimination of physical media distribution, while benefiting from increased workforce productivity, improved employee morale, faster time to market, and increased revenues.

To learn more about Cisco ACNS solutions, visit <http://www.cisco.com/go/content> and <http://www.cisco.com/go/e-learning>.



Table 5 Deploying Business Video Services-Step by Step

Steps	Actions
Step 1. Build the Project Planning Team	<ul style="list-style-type: none"> • Assemble a cross-functional team of business and IT managers Include personnel from different departments across the company • Develop clear, well-defined policies and guidelines to avoid project delays and cost overruns Include senior staff to ensure policy compliance
Step 2. Understand and Outline the Scope of the Project	<ul style="list-style-type: none"> • Outline full scope of business video project • Put together a project plan Identify each project phase from evaluation of resources to deployment to future requirements
Evaluate internal resources	<ul style="list-style-type: none"> • Determine if support staff can effectively design, deploy, and maintain business video solution • Hire third-party consultant to support solution, if necessary • Include third-party services in original project plan, if necessary • Determine who “owns” the video network, who will deploy it, and who will maintain it
Fund the project	<ul style="list-style-type: none"> • Which group or groups will fund the project? • Investigate if more than one Cisco ACNS service (network security, video, point of sale, Web application and acceleration) could be deployed and who would benefit outside of your business unit or group • Share equipment costs and content development between IT and individual business units to ease project deployment costs • Document project costs in overall project plan
Outline content creation and refresh guidelines	<ul style="list-style-type: none"> • Develop plan for content creation: will content be created in-house or purchased externally? • Factor cost of content creation into original project plan Will content be posted to the Web site? If so, how? • Develop guidelines, from content creation and publishing to maximize storage capacity, and keep content fresh
Step 3. Pilot and Testing	<ul style="list-style-type: none"> • Develop a pilot plan to test a sample configuration-factor 1–3 months from start to finish • Perform network evaluation to gauge performance and capabilities • Designate certain remote offices as pilot offices or set up “mock” branch labs • Create pilot end-user and IT feedback forms or hold regular feedback meetings
Ensure network readiness	<ul style="list-style-type: none"> • Use feedback and test results to confirm architecture and ability to integrate with existing network • Develop planning guides that include site surveys and user documentation • Finalize selection of streaming formats and bit rates
Prepare plan for deployment at branch and remote sites	<ul style="list-style-type: none"> • Develop pre-installation plan for each location • Outline needs of smaller sites with smaller links and slower connectivity • Determine normal WAN link usage for each site Establish which sites are watching a lot of video and which are not • Pre-position content to smaller number of larger sites versus pushing content out to all sites automatically
Determine user needs, train employees	<ul style="list-style-type: none"> • Assess desktop readiness for video (browser, player, audio) • Market your video initiative with internal announcements, publicity, and training



Table 6 Applications and Benefits

Cisco ACNS Software Applications and Services		Benefits
Web Application Acceleration		<ul style="list-style-type: none">• Extend information and applications to the branch• Optimize performance of existing LAN/WAN resources to reduce costs• Improve web application performance by reducing latencies• Enhance employee productivity
Business Video		<ul style="list-style-type: none">• Safely deliver live and on-demand streaming media using the IP network• Easily extend knowledge to remote users• Deliver consistent, high quality executive messages to every desktop• Reduce communications and training costs associated with travel and traditional classroom instruction• Improve time to competency, time to market and employee morale
Point of Service Video		<ul style="list-style-type: none">• Reduce demand on service representatives• Enhance customer service• Tailor and provide more timely promotional messaging• Increase revenues through advertising
Content Security		<ul style="list-style-type: none">• Immediate ROI through recaptured network bandwidth• Increased productivity• Reduced legal liability• Control of employee Web access and authentication for specific sites and content• Block malicious code like Code Red or Nimda



Appendix 1: Example Site Survey

Who is your network administrator?	
	Name
	Date (MM/DD/YYYY)
	Phone
	E-mail
Please indicate your browser and version.	
	List of browsers:
Any other browser data you wish to report?	
What operating system(s) are currently being used within your institution?	
	List of operating systems:
Which browser plug-ins do you have?	
What continent is your site located on or closest to?	
	List of continents:
Firewall and Network Address Translation (NAT) Information	
	Is there currently a firewall in place on your network?
	If so, what is the type and version of the firewall?
	Does the firewall use any "rotating" IP addressing or NAT?
	If so, how large is the pool of addresses from which to choose?
Ping and Traceroute Information	
	Provide an IP address of a device that can respond to external ping and traceroute messages:
Language Information	
	Please indicate what language(s) you use:
	Which language(s) would you prefer for the more-info content to be delivered in as it becomes available?
Electrical Service	
	Please indicate what electrical service you use:
	Example: 120 VAC and 60 cycles per minute U.S. standard alternating 110 VAC, 60-cycle current Non-U.S. 220 VAC, 50-cycle current, or other electric service



Appendix 1: Example Site Survey (Continued)

Which network topology in the case study best reflected your existing LAN environment?	
	Completely shared
	Switched core networks
	Switched at core layer and switched at distribution layer network
	Completely switched networks
	Layer 3 switched core networks
	Layer 3 switched core and distribution
	Layer networks
	None of the above
What is the existing intranet (LAN) bandwidth to the point of presence (POP)?	
	Shared standard ethernet (10 mbps)
	Shared fast ethernet (100 mbps)
	Switched standard ethernet (10 mbps)
	Switched fast ethernet (100 mbps)
	Gigabit ethernet (1000 mbps)
	Other
How fast is the Internet bandwidth connection that the content engine will be connected to at your site?	
	56 Kbps
	128 Kbps or ISDN
	500 Kbps
	1.5 Mbps or greater-T1, DSL, cable modem, other
I would install the content engine on a:	
	Public network
	DMZ (preferred)
	Private network behind a firewall
Does the network policy on the network in which the content engine is being installed allow outbound requests using port 80 (HTTP)?	
	Yes
	No



Appendix 1: Example Site Survey (Continued)

Web Server Asset
What is your local Web server hostname (DNS entry)?
What type of server is your local Web server?
Do you have a proxy server on your network?
What port is used to access your local Web server for internal network access? (For example, port 80.)
What port is used to access your local Web server for external network access? (For example, port 80.)
What is the inside (NAT) IP address of your local Web server?
What is the outside (NAT) IP address of your local Web server?
What is the internal subnet mask (netmask) used on your local Web server?
What is the external subnet mask (netmask) used on your local Web server?
What is the IP address or DNS entry of your primary name server?
What is the IP address or DNS entry of your secondary name server?
Content Engine Asset
What is your existing Cisco SMARTnet [®] support number for your content engine?
What is the estimated installation date of your content engine?
What is the content engine hostname?
What is the physical (MAC) address of the content engine?
What is the DNS entry for the content engine?
Will your content engine use static or dynamic addressing (DHCP)?
Does traffic from this content engine have to pass through a proxy server?
If traffic must pass through a proxy, what port is used for Internet access?
What is the inside (NAT) IP address of the content engine?
What is the outside (NAT) IP address of the content engine?
What is the default gateway for your content engine?
What is the internal subnet mask (netmask) for your content engine?
What is the external subnet mask (netmask) for your content engine?
What is the IP address or DNS entry of your primary name server?
What is the IP address or DNS entry of your secondary name server?
Indicate the maximum bandwidth that be allowed for replication between the content distribution manager and the local content engine in the following cases:
Peak network times (8 a.m.–8 p.m. local time)
Off-peak network times (8 p.m.–8 a.m. local time)
Please specify the optimum time of day or night for replication between the content distribution manager and the content engine to occur:
Time
a.m./p.m.



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