CISCO™

Transforming the Video Experience with Medianet

INSIDE

See how the buildout of medianets—media-optimized IP networks—unleashes new capabilities and cost savings through every aspect of rich media production, contribution, distribution, and consumption, from the point of ingest all the way to the customer screens.

Video Changes Everything
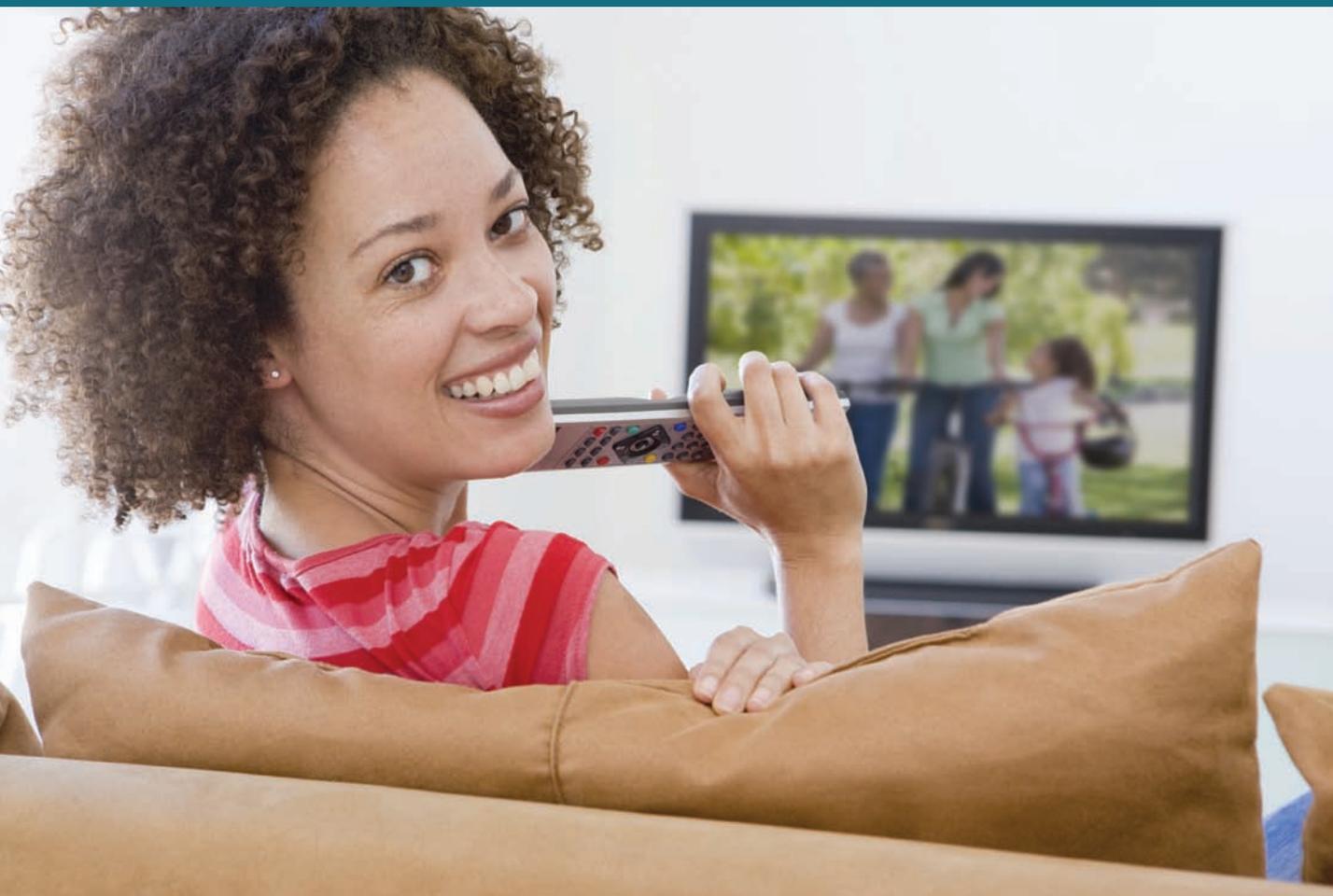
Yesterday, if you wanted to watch a show or broadcast event, that meant arranging your schedule to be in front of the TV at a certain time. Today, rich media services can come to you—wherever you are, through whatever device you're using at the moment. To make this "Connected Life" a reality, broadcasters and content providers are radically altering their operational and business models behind the scenes. They are evolving from basic TV service providers to multi-platform "experience providers," delivering entertainment and news in a more fluid and immersive environment than ever before. They can now provide:

- **Greater mobility by delivering content to multiple screens—TV, PC, and mobile device**
- **Superior quality including high-definition video**
- **Unprecedented interactivity with new ways to access, control, and share media experiences**

Already, broadcasters worldwide are delivering these new capabilities and services using Cisco® solutions, which encompass the IP network platform as well as advanced video encoder, decoder, and transcoder solutions. In this supplement, you will read how:

- **During its Olympics coverage, NBC used a Cisco IP network for transcontinental IP contribution from sports venues in Beijing to studios in New York**
- **Spain's Abertis Telecom reduced costs with a Cisco architecture combining satellite and terrestrial IP content delivery**
- **Denmark's DR adopted an all-digital workflow that helped to double the number of programming hours—with the same budget**

As the worldwide leader in networking, Cisco is transforming how people connect, communicate, and collaborate. Our IP video network solutions address the growing technical and business challenges that broadcasters and content providers face in the new media marketplace, and enable powerful new capabilities and efficiencies. For example, highly efficient encoding technology enables broadcasters to deliver high-quality standard-definition and high-definition video. Video assurance tools allow rapid identification and remediation

of issues before they affect the quality of the subscribers' experience. And Cisco Wide Area Application Services (WAAS) enable long-distance IP video contribution, avoiding travel time and expense.

Read on to learn how Cisco technology is helping broadcasters to move beyond digital video and IPTV to develop and deliver the integrated media services that are part of the Connected Life. ▪

Table of Contents

Cisco Navigates the "Any Time, Anywhere, Any Platform" Landscape

With increased competition and the erosion of network TV viewership due to audience fragmentation, it's become clear that traditional program and advertising distribution business models have to change.

However, as the demand for high-definition content and new types of interactive services continues to grow across all distribution platforms, content distributors face a number of challenges to ensure a satisfying end-user experience. What they have found is that the distribution platform as well as the way content is presented and consumed have become key differentiators.

That's because as digital video recording and file streaming technology has advanced, the consumer has become empowered to watch content when and where they want. For all types of Content Distribution Systems (CDS), being successful in today's highly competitive marketplace means supporting not only traditional television, but also the Internet and portable devices; provided as part of some type of video-on-demand (VOD) or real time streaming service.

The opportunity for CDSs and other media companies is to combine time-shifted live programming and live chat supplied by broadband connection to make the experience richer, while also being able to carry video, voice, and data on the same network. Studies show that video services are still the most compelling way to attract advertising dollars.

Cisco is currently developing solutions to meet these and other emerging needs at a time when customers need them most. The company's Media Satellite and Broadcast division offers a variety of end-to-end solutions—from ingest to media management and on to consumption—and is deeply involved in working with both CDSs and advertisers to develop the most effective advertising models that target multiple sectors of the audience simultaneously.

Video transport is key to this strategy and Cisco's CDS product portfolio is now at the heart of a number of different targeted advertising platforms that leverage Cisco's vast experience in media asset management and content repurposing.

Scalable, End-to-End Solutions

Cisco's product line is broken down into four main segments of the market: Production, Contribution, Distribution and Consumption. These products are highly scalable, so that unique customization to fit individual needs is fully supported.

For Production and Contribution, Cisco solutions are applicable for IP/terrestrial as well satellite networks. They include the D9094 HD/SD encoders that provide very high quality (4:2:0 and 4:2:2), low latency (as low

as 300 milliseconds) and high compression encoding using H.264 for real-time performance. The Cisco D9900 DCM (Digital Content Manager) MPEG video-processing platform provides ASI to IP conversion, transrating, PROMPEG COP3 Forward Error Correction, bandwidth clipping, and ad insertion features. Cisco also offers a professional HD/SD decoder (D9894) and an IP infrastructure and network and service management platform called ROSA.

The main company focus in the areas of Distribution and Consumption is ensuring that video quality remains as high as possible to meet the growing demand for HD content in all forms. Using the latest H.264 MPEG-4 HD encoders (model D9054), Cisco's engineers have achieved data rates as low as 5 Mbps, while still maintaining superior quality video results. (The current industry standard is about 8 Mbps before the artifacts become noticeable.) Meanwhile, the bandwidth savings are significant, allowing distributors to send multiple video streams over existing IP infrastructures (e.g. VDSL2 and ADSL2); delivering twice the channel capacity compared to MPEG-2 technology for comparable video quality.

Even after multiple passes of compression and last-mile packet wrapping, the "video quality experience" at the set top box does not suffer. In fact, several third-party field tests have confirmed that consumers preferred images compressed and distributed with Cisco products to competitive technology.

This quality and real-time performance are also critical to live broadcasts, where events are captured and presented live via remote transmission. Events like the Olympic Games and international coverage of the U.S. presidential inauguration in HD are good examples. Both events leveraged Cisco technology.

> **The Sky News coverage of the Obama inauguration represented the first time MPEG-4 compression technology had been used over the transatlantic Easynet Global IP network.**

Based on its experience working with all types of broadcasters, which all have unique requirements, Cisco recognizes the common goal of production quality and distribution efficiency. If your goal is to get content where it needs to go, whether for HDTV or two-way interactivity, taking advantage of proven solutions and an experienced team of experts that understand the value of "any time, anywhere," Cisco has the end-to-end technology and people to make it possible at reduced costs.

–Michael Grotticelli regularly reports on the professional video and broadcast technology industries. ∎

An End-to-End Medianet for Media, Satellite, and Broadcast Companies

The media and broadcast industry is undergoing profound transformation, but one change stands above all others: the rise of the consumer. In the past, video entertainment was effectively a one-way street, with programmers and broadcasters determining which content would air and when. Today, the consumer is king, demanding a richer, higher-quality media experience and more kinds of content than ever before. Consumers want the same interactivity, personalization, and mobility from their media entertainment that they have come to expect from the Internet. And they want the ability to access any type of content, whenever and wherever they choose, over a variety of devices and screens.

These changes present significant challenges for media companies, who must fundamentally change the way they create and distribute media content. However, they also present exciting opportunities to capitalize on a new generation of consumer media experiences and revenue models. Broadcasters and content providers that embrace creative new approaches to delivering media will be able to:

- **Drive down costs throughout content production and distribution processes**
- **Accelerate the delivery of new content to more consumers over more platforms**
- **Increase revenues through new advertising and business models**
- **Strengthen their brand among consumers**

Medianet is the Key

The best way to unleash a new generation of media experiences and revenue models is to embrace the "medianet": an intelligent network that is optimized end-to-end for the delivery of rich media experiences. In the traditional media model, most aspects of content production and distribution are independent applications with fragmented infrastructures, content formants, and processes. A medianet provides a single, scalable IP architecture that extends from the point of content ingest through every aspect of editing and production, across video contribution and distribution networks, all the way to the customer screen.

By taking this medianet approach, media companies can:

- **Transform the customer experience by delivering more content, mobility, personalization, and control**
- **Take advantage of an IP Next-Generation Network (NGN) to assure a high-quality customer experience end-to-end**
- **Virtualize content and applications through every phase of the media value chain to reduce capital and operational expenses**
- **Monetize content and advertising in new ways, across more platforms**

Content Production

When studios, programmers, and broadcasters move from tape-based production environments to IP networks and digital workflows, they unleash unprecedented collaboration and cost efficiencies. The medianet model allows content providers to:

- **Easily extend content to any business unit, partner, or customer device, anywhere in the world**
- **Reduce costs by consolidating and virtualizing media applications and infrastructures**
- **Accelerate the delivery of new content by breaking down application silos and linking production processes directly with distribution platforms and partners**
- **Increase revenues by repurposing content for multiple platforms and advertising models**

Content Contribution

Media companies worldwide are turning to IP-based video contribution networks that offer more flexibility and control than conventional contribution systems at a much lower cost. With IP contribution networks, media companies can:

- **Get new content on air and online more quickly**
- **Reliably deliver content to studios and distribution partners for a fraction of the cost of satellite contribution systems**
- **Deliver content anywhere with a single network that supports all services, video formats, and quality levels**

IP contribution networks also boost agility by allowing broadcasters to decouple the point of video ingest from physical editing and production facilities. During the 2008 Olympics, for example, NBC editors used an IP contribution network to work on events being recorded in Beijing from their home studios in the United States.

Content Distribution

A media-aware IP NGN is robust and resilient, and scales easily to enable the cost-effective delivery of content and services worldwide. IP distribution technologies help media companies:

- **Rapidly scale new content and services to national and global audiences**
- **Drive down costs by distributing content once for all affiliates and formats**
- **Preserve quality of the customer experience by retaining tight control over the way signals are received and manipulated**
- **Unlock new revenue streams by extending content and brand identity across multiple platforms**

Content Consumption— the End-User Experience

A medianet lets media companies boost the value of their content by enabling non-linear (on-demand) content consumption, targeted niche content, and delivery of rich media experiences across the TV, PC, and mobile device. Moving to digital content delivery also provides potentially lucrative opportunities for Web 2.0-type social networking and personalization capabilities. By linking consumers with content in new ways over more platforms, a medianet also supports new transaction-based and revenue-sharing business models. And, by delivering ads based on subscribers' unique demographics, profiles, and interests, content providers can benefit from much more targeted and lucrative advertising. ▪

For More Information

Cisco and its industry-leading partners offer deep expertise in IP networking, digital media technologies, video transport, and solutions for the customer home. Cisco can converge all of these solutions into a single, harmonious IP architecture that extends media-aware intelligence from end to end, helping content providers create and capitalize on a new generation of media experiences. To learn more, visit www.cisco.com/go/medianet

Building Blocks of the Media Value Chain
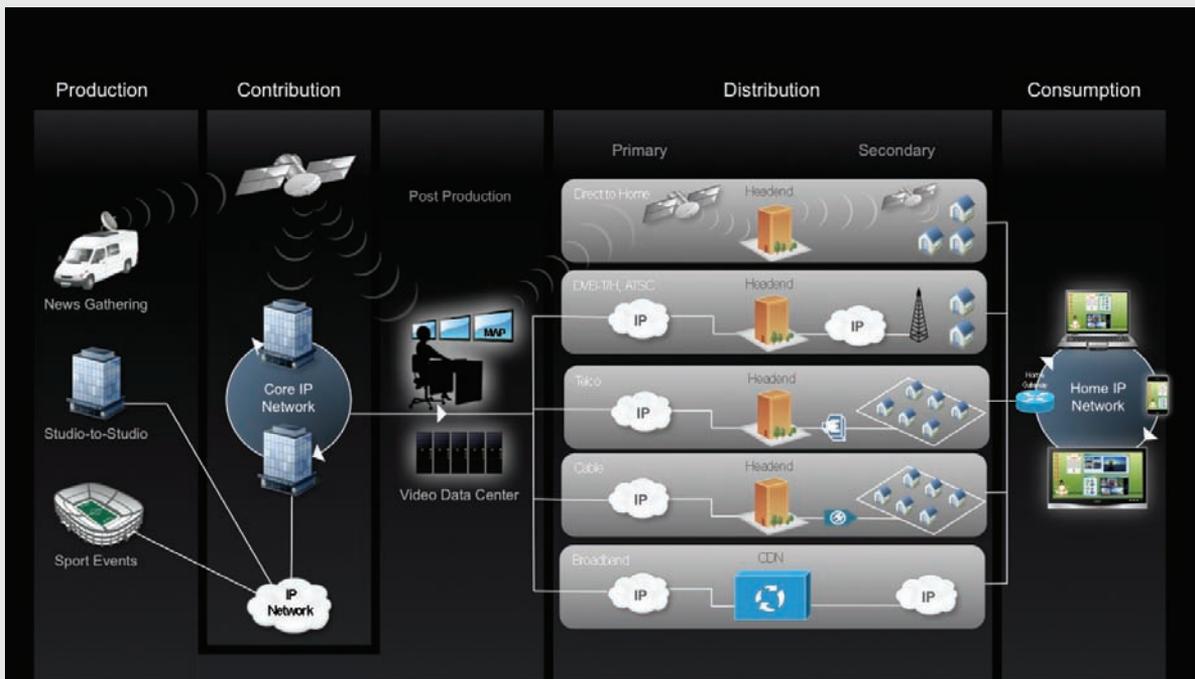
The Time Is Right for IP Video Contribution

Broadcasters know that a "video" signal is much more than just video. Delivering content in multiple video formats, with all of the auxiliary audio and data services needed to present the seamless experience of broadcast TV, is a complex task, especially in real-time TV environments. When video quality, network performance, and nonstop availability are critical, broadcasters and content producers need an extremely robust, resilient video contribution infrastructure.

Today, more media companies are turning to IP-based video contribution to take advantage of the inherent flexibility, control, and operational cost reductions of IP networks. As the worldwide leader in IP network technologies, Cisco can provide state-of-the-art video contribution solutions that deliver all of the advantages of IP with the quality, performance, and resiliency that real-time media services demand.

An Industry Evolution

Until recently, contribution networks were dominated by satellite and terrestrial ATM networks. Despite the compelling flexibility and cost efficiencies of IP, many media companies simply did not consider the technology ready to transport real-time video. As IP networks have evolved, however, IP has emerged as the video transport technology of choice. Today, major broadcasters worldwide are deploying IP-based transport networks, video encoder/decoders, and gateway technologies in real-time video environments.

The key reasons for this shift are:

Growth of HD Video

The accelerating introduction of HDTV in media markets places extraordinary new capacity demands on contribution infrastructures, as well as a need to deliver excellent video quality at higher resolutions. IP networks can provide the bandwidth, flexibility, and service control to support these and future services.

Demand for More Flexibility

Instead of employing rigid conventional contribution links tailored to the needs of a specific application, media companies are seeking more versatile infrastructures that can support a variety of services, formats, quality levels, and broadcast applications.

Need to Reduce Operational Expenses

By using affordable, widely available IP network equipment, broadcasters and content producers are delivering multiple services over a single network and reducing the cost of contribution links. In fact, many broadcasters moving from satellite-based contribution to IP have realized a return on investment (ROI) in two to three months.

Opportunity for Convergence

Instead of using dedicated contribution networks for each stage in the production process, IP provides a common platform to support all applications. This convergence (and its associated cost savings) occurs both in the network, which can now carry all types of services, and at network endpoints, where a single IP platform can often replace several dedicated switching technologies. Since broadcasters and content producers often already have IP infrastructures in place, upgrading these networks to support real-time TV services is also often less expensive than building or leasing new higher-capacity contribution links.

Opportunity to Enhance Competitiveness

IP contribution networks can have a profound impact on a media company's agility. After all, once content is within the IP domain, it can be delivered to anyone, anywhere, as needed. IP contribution networks allow broadcasters to decouple the point of video ingest from the physical editing and production facilities, and offer opportunities for new production workflows and radical operational efficiencies. During the 2008 Beijing Olympics, for example, NBC editors used an IP contribution network from Cisco to create broadcast highlights of events in China from their home studios in the United States, even as events were being recorded.

Cisco IP Contribution Leadership

While IP offers compelling advantages, broadcasters need contribution networks they can trust. They need proven IP solutions that deliver the performance, reliability, and end-to-end quality control intelligence that demanding real-time media services require. As the worldwide leader in IP networking, Cisco can create the ideal IP contribution solution.

Cisco IP contribution technologies include:

- **Robust IP routing and switching platforms that deliver up to 40 Gigabits per second**
- **Widely deployed multiservice optical transport platform in the world**
- **High-performance audio/video encoder, decoder, and IP gateway solutions to support major video formats and compression technologies, and virtually any combination of quality, latency, and bit rate**
- **Sophisticated management and control solutions**
- **Expert system integration services from partners with extensive experience implementing complex media infrastructures**

With a proven IP expertise and broad portfolio of IP, optical, and video technology solutions, Cisco can provide a complete IP contribution solution for media customers. ▪

Cisco IP Contribution Solution—An End-to-End Architecture
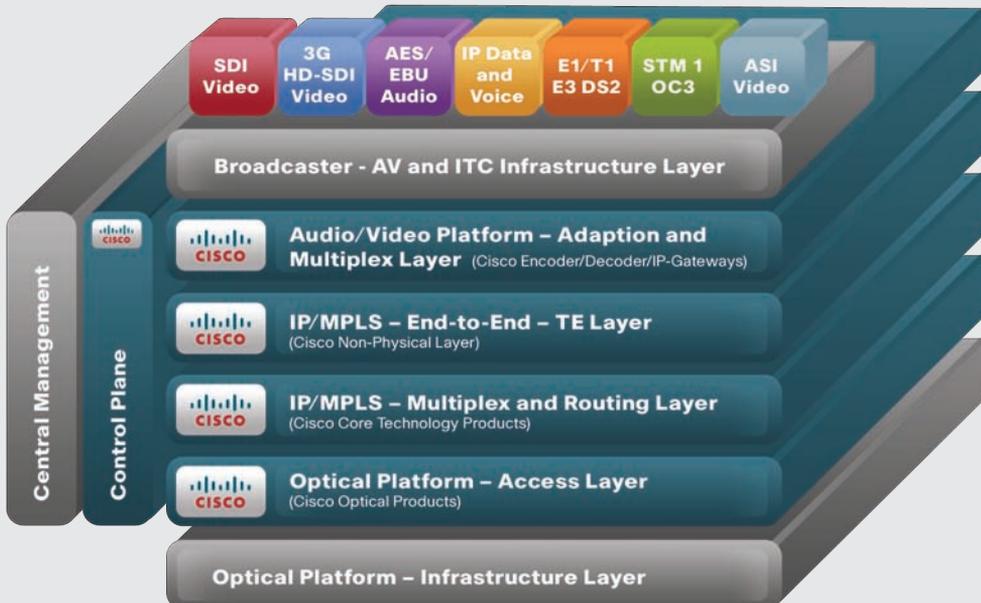
Cisco Enables NBC Coverage of Beijing Olympics

NBC Olympics' coverage of the 2008 Olympic Games set new records, with 3600 broadcast hours, or 212 hours a day. What's more, viewers could use their PCs and laptops to access 2200 hours of on-demand video, as well as 3000 hours of highlights, rewinds, and encores. And people on the go could watch video and view results on their smartphones.

Behind it all was an innovative long-distance, file-based workflow, based on a Cisco network solution.

High-Performance Transocean Link

To transfer video between Beijing and New York, NBC deployed three 150-Mbps OC-3 connections. A Cisco 12004 Router combined all three into one gigantic virtual pipe with 450-Mbps bandwidth. Cisco Quality of Service (QoS) technology enabled NBC to dedicate 400 Mbps to video content, giving it priority over other types of traffic sharing the same pipe.

Thanks to the high-performance network, shot selectors and editors could work from New York as if they were in China, saving NBC the time, costs, and carbon emissions of sending 300 to 400 employees to China.

Faster Shot Selection for an Excellent Viewer Experience

The file-based workflow worked as follows:

An application server in China digitized and ingested high-definition (HD) and standard-definition (SD) feeds and simultaneously created full-resolution HD files and low-resolution proxy files of all recordings. While still being recorded, the files were actively transferred to a storage system in Beijing. From there, a file transport engine transmitted only the low-resolution proxy files over the Cisco network to another active storage system in New York. With Cisco Wide Area Application Services (WAAS), files were available to editors and shot selectors in the United States as fast as if these personnel had been in China.

Shot selectors in New York edited the low-resolution files, and then sent the Edit Decision Lists (EDLs) to Beijing to request the desired SD and HD high-resolution footage for final production editing. ■

"With the Cisco network solution, we've achieved the Holy Grail of digital video, which is the ability to perform shot selections on low-resolution files and extract high-resolution material from those files even as they are being recorded," says Craig Lau, vice president of IT, NBC Olympics. In fact, employees could select shots and distribute them to affiliates even before the athletes finished their events.

Lau concludes, "Cisco is a trusted partner, and in the demanding IT environment for the Olympic Games, we depend on trusted relationships. We have absolute deadlines for when Olympics coverage begins and ends. Cisco technologies help us exceed expectations and meet our timetables in an unforgiving environment."

NBC Built a High-Performance Transocean Link to Transfer Video Between Beijing and New York
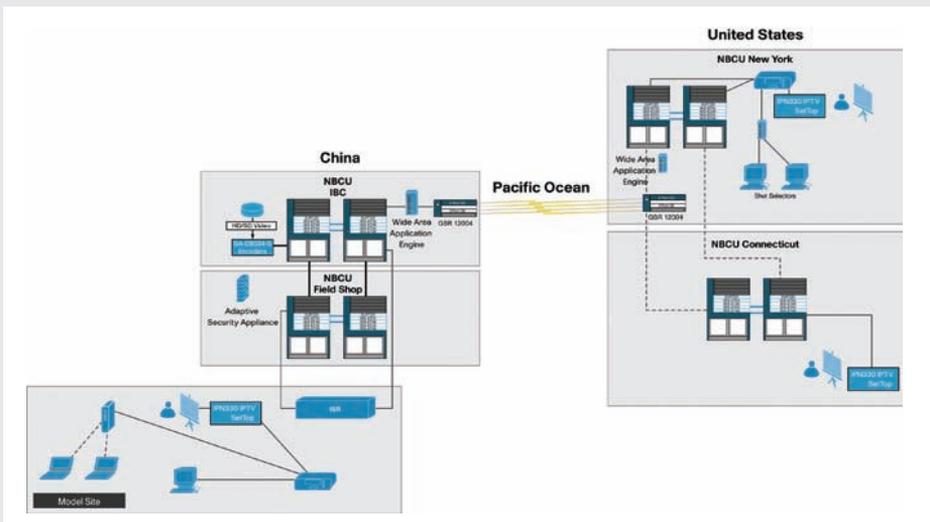
Broadcast Engineering Supplement/Cisco

A former chief technical officer (CTO) for Scientific Atlanta, a Cisco Company, Bob McIntyre designs systems based on the integrated end-to-end technology portfolio of Cisco's Service Provider Group that help service providers accelerate the launch of new revenue-generating applications on their networks.

Bob McIntyre
Chief Technology Officer
Cisco Service
Provider Group

McIntyre began his career at Scientific Atlanta in 1991 and has held significant leadership roles in the company's Transmission and Subscriber businesses. While leading the Subscriber business in 1996, his team designed the first real-time digital TV systems (using US $150,000 prototype encoders) and held the first digital TV field trials over a Hybrid Fiber Coax (HFC) infrastructure in 1997. He was named CTO at Scientific Atlanta in 1999.

Under his leadership, Cisco has remained focused on the transition to more and more HD content, and the evolution to alternative business models that support the consumption of non real-time video services on a variety of viewing devices.

What's the biggest challenge facing content distribution networks today and how will that change in the future?

Content owners are faced today with many challenges including the operating cost of the distribution networks, sometimes globally, the desired transition from satellite/cable-based distribution to hybrid satellite/IP based distribution, legacy issues with existing set-top deployments, and the transition to more and more HD content.

Customers are also challenged with the evolution to alternative business models that support the consumption of video in non real-time and on a multitude of viewing devices, from TVs, to PCs, to mobile devices.

Compression schemes continue to get better, enabling more HD content over ever-smaller bandwidth. How will this affect the industry going forward?

There are two things in play here. First, compression techniques continue to get better and better in both efficiency and video quality. Today's H.264 compression tools are light years more powerful then the MPEG-2 standards and will continue to see further enhancements.

Secondly, as more and more video is utilized for entertainment, communication, and collaboration on a global scale, we believe that people will continue to build infrastructures that support the utilization of video for these purposes.

How does a provider ensure quality to the end user while simultaneously conserving bandwidth?

Content owners and providers have a few sacred cows when it comes to competitive advantage: video quality and quality of service are two of those. As such, content owners, who place a lot of value in the image quality of their content and their brand, must select best-in-class distribution technologies to support error-free distribution.

Ultimately, however, they must make the trade-off decisions between video quality and bandwidth utilization while weighing the associated costs.

Is IP delivery the most efficient way to distribute content?

We at Cisco believe that IP is an extremely cost-effective means of distributing content, but we continue to offer a complete portfolio of products that provide hybrid IP/Satellite distribution capabilities. This proven technology helps content owners and services provides with the complex requirements of distributing their content on a global basis.

The key to our solutions is that we give the providers the tools to develop hybrid distribution models based upon quality, cost, and quality of service. Only hybrid systems can successfully optimize these issues on a global basis.

Cisco has been involved in a number of live events, such as last summer's Olympic Games for NBC. What value does Cisco bring to the production of events like these?

Cisco's comprehensive IP Contribution solution enabled the "first IP Olympics," according to NBC, and consisted of IP video networking that took advantage of both MPEG-2 and MPEG-4 compression. This helped bring content to air (and online) much faster than ever by separating the content ingest process in Beijing from the physical editing, which occurred in New York. This saved the network a significant amount of money by not having to send editors to China.

It also resulted in a very satisfying end-user experience because content was available from all of the venues on demand, compared to past Olympics when only the most popular events were shown during prime time hours. Leveraging the metadata used by the editors also facilitated a variety of advanced search functions and interactive features that were used by online consumers.

–Michael Grotticelli regularly reports on the professional video and broadcast technology industries. ∎

Media outlets and platforms continue to proliferate, driving demand for more content than ever before. Broadcasters and programmers that can meet this demand and extend their content and brand across multiple platforms will reap the rewards of this industry transition. To get there, however, media companies need to operate in very different ways than they do now. They need to enable a more collaborative business model, with the ability to extend content to people and functional areas across the company, and to a widening ecosystem of external production companies, outsourcers, and business partners. They need a new kind of media production workflow, delivered by a new generation of digital workflow tools.

The Cisco Media Workflow Platform is the foundation for a more collaborative and cost-effective digital workflow model. It provides a flexible and interoperable infrastructure for efficiently pooling applications and file-based video, and allows applications at all stages in the production process to communicate with each other and dynamically move media to the right people at precisely the right time.

A Better Workflow

Traditional media workflows are based on self-contained production systems, using video content that is transported and managed via physical tapes. Even when media companies adopt digital file-based media for some segments of the workflow (such as post-production or newsroom processes), these systems are usually managed as independent applications, supported by proprietary technologies with dedicated servers and infrastructures. The result: a production workflow that is fragmented, fraught with delays and costly replication of processes, and poorly equipped to meet the growing demands of multi-platform distribution.

The Cisco Media Workflow Platform provides the foundation for an end-to-end digital workflow that dynamically moves media through the production and distribution process, and supports company-wide collaboration. It breaks down application silos, eliminates unnecessary duplication of processes, and provides the flexibility and performance that production environments demand.

The Cisco Media Workflow Platform encompasses:

A Service-Oriented Architecture (SOA)

An SOA provides the framework for integrating applications and processes across large, diverse broadcast and production environments. It decouples workflow processes from dedicated applications and infrastructures, and allows content to be easily shared across business units and among ecosystem partners. An SOA model helps broadcasters and programmers to:

- **Effectively manage tape-less production environments**
- **Integrate media production with non-production business processes (such as marketing, legal, and resource management)**
- **Accelerate the introduction of content across new platforms**
- **Reduce costs by aligning production and IT functions within a single, converged infrastructure**

Cisco Data Center 3.0

Underlying the SOA that powers a digital workflow is a highly flexible, high-performance data center. Cisco Data Center 3.0 technologies transform media infrastructure silos into pools of resources that can be dynamically aligned to meet diverse application and business needs. These technologies support a centralized media data center that is more responsive, efficient, and resilient, and that can cost-effectively serve stakeholders throughout the media value chain.

IP Next-Generation Network

Content producers must provide real-time access to media applications and content for stakeholders both within and outside the company campus. They need a next-generation network that enables high performance and rock-solid availability regardless of where users are located. As the worldwide leader in IP network technologies, Cisco provides innovative LAN and WAN solutions that optimize the delivery of content and resources throughout the media ecosystem.

Complete Media Solutions

Production environments demand highly specialized applications. That's why broadcasters and programmers have traditionally chosen to work with proven media production systems, even at the cost of having to operate them as isolated infrastructures. With the Cisco Media Workflow Platform, broadcasters and programmers don't have to give up the production tools they trust to enable a company-wide digital workflow. Cisco is partnering with some of the largest, most respected media technology vendors in the world to deliver a solution that supports the most demanding production environments.

Together, Cisco and its industry-leading partners can deliver an end-to-end media workflow platform that:

- **Breaks down application silos to increase collaboration and responsiveness**
- **Reduces capital and operational expenses by consolidating and virtualizing media content and applications**
- **Provides exceptional availability and performance to meet demanding broadcast requirements**
- **Accelerates innovation by linking content production directly with media distribution platforms and partners** ▪
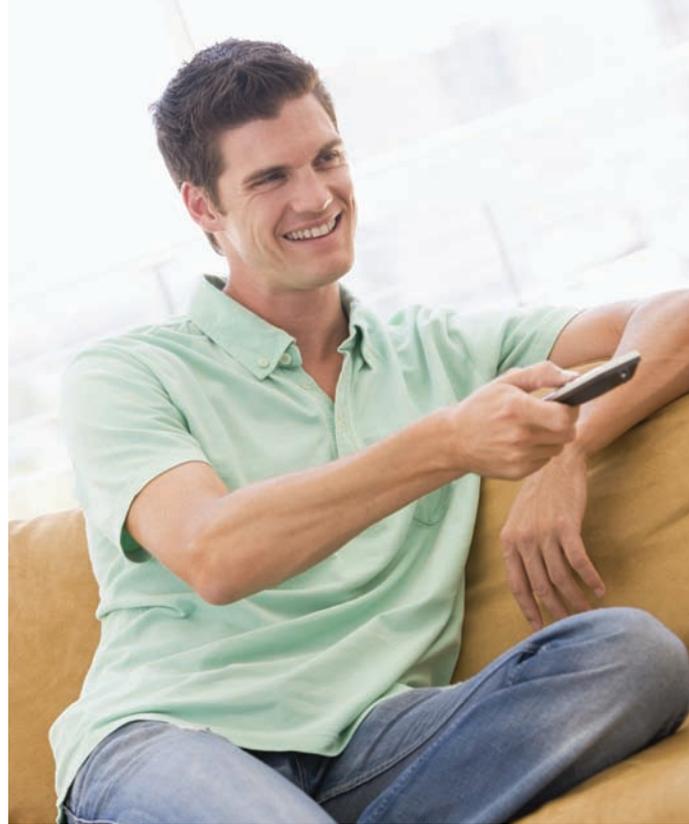
Connecting all Production Processes with the Cisco Media Workflow Platform
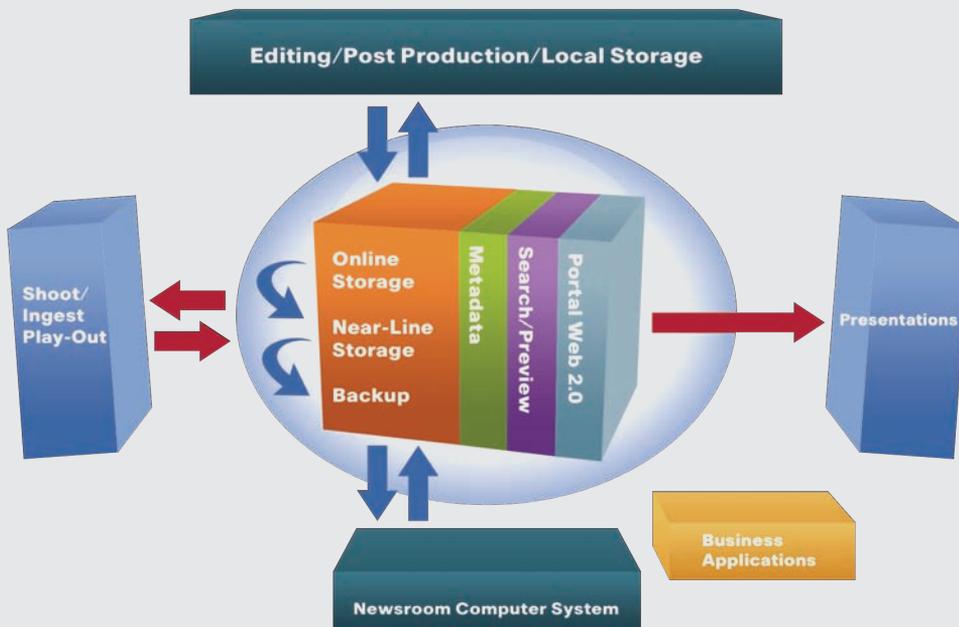
DR Increases Programming without Increasing Cost

DR, Denmark's national television and radio broadcaster, has doubled the number of programs it broadcasts without increasing costs. Its solution: an all-digital workflow for recording, editing, producing, and broadcasting all types of content, using a Cisco IP multiservice network.

Digital Workflow: A Way to do More with Less

To compete successfully with global media companies, DR urgently needed a way to do more with less. The broadcaster has a fixed budget based on the yearly US $400 license fee paid by each citizen who has a television or radio.

Adopting a digital workflow would solve the business challenge in two ways:

- **Reduce capital and operating expense by replacing multiple specialized networks with a single, reliable IP network**
- **Enable DR to repurpose the same content for different media. Rather than assigning separate TV, radio, and web journalists to cover the same story, DR could assign one journalist, store the content in digital format, and then customize the content as appropriate for the delivery channel.**

Consolidate Networks, Consolidate Buildings

The opportunity to adopt an all-digital workflow came when DR built a new 132,000-square-meter broadcasting house in Copenhagen. The building, known as DR Byen (Media City), consolidates the 12 facilities previously used for radio, television, and web broadcasting and a concert hall.

DR outfitted the new building with a three-tier Cisco network (access, distribution, and core) that performs the work of previously separate networks for radio and television recording studios, telephony, intercom, mixing consoles, and lighting control.

"Platform for Storytelling"

The new Cisco network, which DR calls a "platform for storytelling," is used for content production, content editing, broadcast, telephony, and wireless access.

DR's video editors now have unprecedented flexibility in how and where they work. They can work on high-resolution files from any wired desktop in the building, all of which provide a 1-Gbps connection. If they want to work wirelessly, they can edit low-resolution files, which require less bandwidth to access. The resulting Edit Decision Lists (EDLs), which contain text only, not the actual video, provide the instructions applied to the high-resolution video.

A server-based workflow enables multiple people to work on the same file simultaneously, increasing productivity.

Measurable Return on Investment

Since deploying its IP network, DR has doubled the numbers of hours of programming that it produces without increasing the budget, an accomplishment that the company attributes partly to technology. The broadcaster plans to further capitalize on its network investment by offering high-definition video. ■

DR uses a Multiservice Cisco Network as the Platform for Digital Editing, Telephony, Intercom, and Studio Lighting
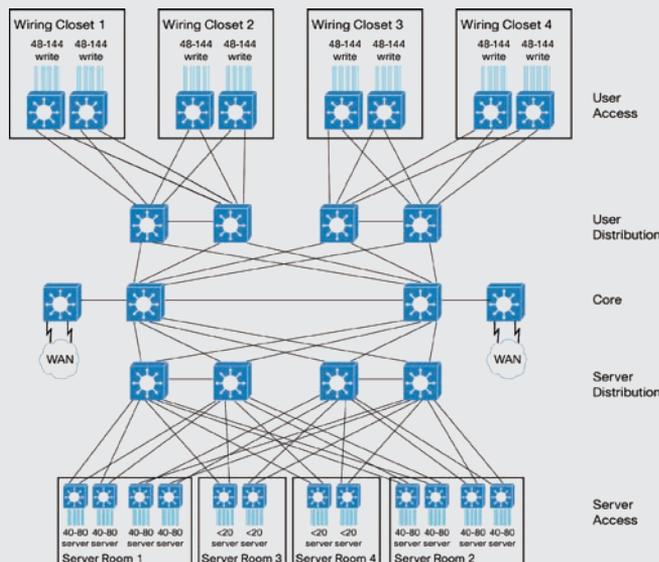
As the media landscape has evolved, primary distribution has become more complex and costly for content creators. To bring finished content into viewer homes, broadcasters and programmers must distribute to cable, satellite/direct-to-home (DTH), and IPTV head-ends, as well as conventional over-the-air (OTA) broadcast systems in hundreds of markets. In the United States alone, a programmer may need to reach several thousand affiliate locations, and deliver content that will be consumed in a variety of video formats ranging from standard definition (SD) to high definition (HD), and from analog to MPEG-2 and MPEG-4.

Cisco provides a comprehensive suite of primary distribution solutions to help content providers meet these unique challenges. Using scalable Cisco technologies, broadcasters and programmers can lower costs, control quality, and meet an ever-changing array of technical and business requirements.

The Changing Face of Video Distribution

Satellite has long been the most practical mechanism to distribute content to large numbers of affiliates. But, as the number of video formats and compression technologies has grown, it has become difficult to cost-effectively distribute content in all the required formats. The biggest culprit: high-definition video.

To compete for customers and advertising dollars, content providers are rushing to offer more HD content, but the quality and bandwidth demands of HD signals are substantial. New technologies such as MPEG-4 and DVB-S2 modulation are helping to make it less expensive to transmit higher-bandwidth signals. However, these innovations also create new complexity. Whereas a single SD signal might have sufficed a few years ago, today meeting the needs of all affiliates means delivering SD, HD, and analog versions, and often MPEG-2 and MPEG-4 as well. With satellite transponder costs as high as US $200,000 per month, primary distribution has become a significant cost burden.

Broadcasters and programmers need distribution technologies with the flexibility to meet the needs of a broad spectrum of affiliates. They need solutions that deliver the highest-quality video for the lowest cost, and that assure strong content protection and control throughout the distribution process.

Cisco Primary Distribution Solutions

Cisco provides a comprehensive primary distribution solution that gives broadcasters and programmers the ability to deliver any format required by affiliates and consumers, while minimizing transmission and operational costs. The centerpiece of this strategy is the ground-breaking Cisco D9858 Advanced Receiver Transcoder.

As demand for HD services grows each year, content owners need a solution that allows them to distribute content over the satellite once, with the highest quality and the lowest transmission bandwidth, and then enables satellite receives at affiliate locations to reformat that content to any resolution and compression standard required. The Cisco D9858 Advanced Receiver Transcoder provides this capability today. It can receive MPEG-4 HD compressed transport streams and output analog and MPEG-2 SD and HD versions of the incoming programming, and simultaneously pass through the original MPEG-4 content. This innovative technology lets programmers simplify their networks and reduce costs by providing content to their affiliates in all required formats with a single satellite transmission signal.

In addition to the D9858 Advanced Receiver Transcoder, Cisco offers a broad portfolio of MPEG-4 encoders, gateways, multiplexers, and integrated receiver/decoders (IRDs). In fact, more major HD MPEG-4 distribution systems worldwide use Cisco technology than any other provider. Cisco distribution technologies include:

- **Industry-leading encoders and IRDs to address all major video formats and compression technologies**
- **DVB-S2 modulation**
- **Robust content security with the PowerVu conditional access system**
- **Integrated and deployed systems using third-party conditional access systems**
- **Advanced uplink system control and decoder management with the PowerVu Network Management Center**

Cisco is also leading the way in other ground-breaking video distribution innovations, including:

Hybrid Satellite/IP Distribution

Cisco solutions support hybrid distribution networks via DVB-S/DVB-S2-enabled IRDs and can also deliver the signal via IP networks to some targeted markets. This gives programmers and broadcasters the flexibility to mass-distribute via satellite, while meeting requests for special quality or bit rates in specific markets.

Advanced Multiplexing and Splicing Capabilities

The Cisco Digital Content Manager (DCM) Model D9900 unlocks powerful new switching and splicing capabilities in distribution systems. The system allows content providers to retain much tighter control over the way signals are received and manipulated, and assure the highest-quality experience for their viewers.

Building on a tradition of leadership in video distribution, Cisco is helping content providers create versatile distribution systems that deliver the highest video quality and control, at the lowest cost, to all markets. ▪

Abertis Telecom Reduces Costs of Nationwide Television Network

Spain's leading telecommunications infrastructure and services provider, Abertis Telecom operates 3200 broadcasting and distribution sites serving more than 12 million homes, as well as a fleet of 24 satellites. The company earns a large portion of its revenue from national and regional broadcasting for television and radio and is also expanding into international markets.

Digital Switch-over: Converting Mandate to Opportunity

Abertis Telecom needed to comply with Spain's mandate to convert from analogue to digital broadcasting for terrestrial television by April 2010. The operator seized the opportunity to reduce the costs of both its satellite and ATM terrestrial networks. Passing on the savings to its broadcast customers would position Abertis Telecom to increase market share.

Nationwide Digital Video Broadcasting Transport Solution

In 2008, Abertis Telecom rolled out a nationwide Digital Video Broadcasting (DVB) transport solution, based on Cisco technology and services. "We like to work with vendors that have a global view and the capacity to advance the market," says Sergio Tortola, Technology Director, Abertis Telecom. "In addition, we like Cisco's approach and commitment to service."

The new architecture combines satellite and terrestrial IP to distribute signals to broadcast transmitter sites and content production centers throughout Spain. To increase bandwidth efficiency on its satellite network, Abertis Telecom deployed Cisco D9804 Multiple Transport Receivers, which support the DVB-S2 satellite modulation scheme. "Instead of using three transponders and six reception devices per site, we now need only two transponders and can receive all streams within a single unit," says Tortola. "As a result, we need fewer spare parts, have greater redundancy, and can offer better service-level agreements."

At the same time, Abertis upgraded its terrestrial distribution network from ATM to IP, using Cisco Asynchronous Serial Interface-to-IP (ASI-to-IP) gateways.

Lower Costs and Increased Market Share

Capital costs have decreased because a single Cisco multiple transport receiver can accept up to six multiplex transmissions, and content that previously required three transponders now requires just two. Operating expenses for the satellite network have decreased by 33 percent, from bandwidth optimization and in-band control. "We have transferred our cost savings to our customers in the form of lower prices, which helped us increase market share by 20 percent," says Tortola. What's more, global service-level agreements are better than ever.

Abertis Telecom is currently developing new services to be delivered over the Cisco network. Tortola concludes, "Being early to market with new solutions gives us a competitive advantage. A high degree of collaboration with Cisco has helped make this project a success." ▪

Abertis Telecom Distributes Multiple Transport Streams over Satellite
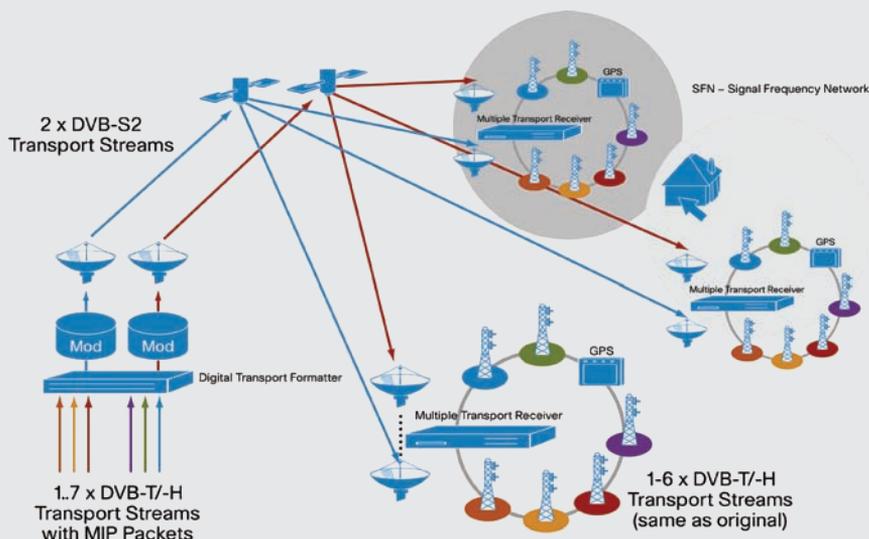
An End-to-End Platform for Video Transformation

Today's media landscape is undergoing massive disruption. The traditional linear broadcast value chain—in which content is created for a single channel and aggregated, packaged, and broadcast to millions of viewers—is changing before our eyes. These changes are being driven by:

- **The advent of the Internet as a distribution platform, which has rewritten the rules for accessing and interacting with video content**
- **Explosive growth in video channels, outlets, and content—including user-generated content**
- **Expansion of media to new platforms, including mobile phones and personal media devices**

Advertisers have been quick to recognize these changes and are investing more resources in non-linear and Internet-based platforms, and less in traditional linear broadcasters and content producers. Broadcasters and programmers that can adapt their business models to respond to these changes—that can transform from basic TV channels into true "cross-platform" brands—will emerge as the leaders in the evolving media landscape.

Navigating this transition will require new content production and distribution tools, and a new approach to consumers and partners throughout the media ecosystem. It's a daunting journey, but one that media companies don't have to undertake alone. With the broadest video portfolio in the industry and global leadership in IP technology, Cisco can provide solutions and expertise through every phase of the media broadcast chain.

End-to-End Expertise

The trends that are reshaping the media industry present new challenges, but also new ways to reach customers and enhance the broadcaster's or content producer's brand. To profit from these innovations, media companies need new technologies and processes that can address the growing number of video platforms and formats, connect stakeholders within and outside the company, and reduce costs at every stage in the media value chain. Cisco is ideally positioned to help media companies successfully meet these objectives.

Cisco's end-to-end portfolio of media and broadcast solutions encompass:

Production

Currently, most media companies rely on production systems that are managed as independent applications, supported by dedicated infrastructures and physical tapes. The result is a production workflow that is fragmented, fraught with delays and duplicated efforts, and poorly equipped to meet the demands of multi-platform distribution. Cisco provides the foundation for an end-to-end digital workflow that dynamically moves media through the production process, breaks down operational silos, and supports company-wide collaboration.

Contribution

The same innovative approaches that are transforming media production can also be applied to the delivery of video between studio locations and media partners. Cisco video contribution solutions deliver the performance and availability that real-time broadcast environments demand, while providing the flexibility, granular control, and substantial cost savings of IP networks.

Distribution and Consumption

To bring finished content into viewer homes, content providers must distribute to hundreds of operator head-ends and affiliate locations, and meet demands for diverse video formats, quality levels, and compression standards. They also need to be able to deliver content to consumers over multiple platforms and multiple screens (TV, PC, and mobile device), both in the home and on the go. Media companies need solutions that can meet these stringent demands and deliver the highest quality for the lowest cost. Cisco provides a comprehensive suite of distribution and content consumption solutions to help broadcasters and programmers lower costs, tightly control quality, and meet an ever-changing array of technical and business requirements.

Combining decades of Scientific Atlanta's expertise in video technology with Cisco's worldwide leadership in IP networking, Cisco can deliver the full spectrum of solutions to help broadcasters respond to the challenges of a changing media environment. ▪

Cisco's Intelligent Video Network Solutions—
Ready Today, Prepared for Tomorrow

Visit us at www.cisco.com/go/sp