



Transforming Media Production with Digital Workflows



Reap the Rewards of Digital Workflows

Media outlets and platforms continue to proliferate, driving demand for more content than ever before. Broadcasters and programmers that can meet this demand, that can transform from basic media providers into true “cross-platform” brands, will emerge as the leaders in the evolving media landscape, and reap the rewards. To get there, however, these companies need a very different operating model. A more collaborative business model needs to be defined, with the ability to extend content to functional areas across the company and to a wide ecosystem of external production companies, outsourcers, and business partners. A new kind of media production workflow, delivered by a new generation of digital workflow tools, is key to this transition.

One of the biggest barriers to accomplishing this transition is the traditional workflow on which producers, broadcasters, and programmers have relied. Media workflows, from content ingest to play-out and every step in between, have historically been based on self-contained production systems, with video content transported and managed via physical tapes. Even when media companies adopt digital file-based systems in some areas (such as post-production or newsroom processes), these systems are usually managed as independent “silos,” supported by dedicated servers and networks. The result: a production workflow that is fragmented, fraught with delays and duplicated efforts, and poorly equipped to meet the demands of multiplatform distribution. Too often, conventional media workflows are characterized by:

- **Slow linear production processes:** When production teams rely on physical videotapes, production proceeds in a slow, serial manner. For example, graphics and sound teams cannot begin work until editors in earlier stages of post-production complete their work and send along the physical videotape. Other areas of the media company (i.e., legal, standards and practices, online distribution, etc.) cannot even begin doing their jobs until much later, when the cost of having to go back and make changes is much higher.
- **Constant need to reingest video:** When each stage of production runs its own isolated (and often proprietary) technology platform, video footage must be reingested again and again for each new production system.
- **Expensive and inefficient video archiving:** A reliance on physical videotapes means that media companies must maintain vast tape libraries to store archives and stock footage. These archives consume huge amounts of space on media company campuses, as well as significant resources for power, maintenance, and management. Acquiring and copying tapes in such an environment is also a slow, manual process. And, there is always the concern of tapes being lost, damaged, or degrading with age.

All these challenges add time and costs to media production workflows. Even more importantly, they present real barriers to a broadcaster or content provider’s ability to innovate, collaborate, and bring new revenue-generating services to fruition.

Building Next-Generation Medianets

A medianet is an all-IP Next-Generation Network (IP NGN) optimized for rich media. Ultimately, a medianet allows broadcasters and service providers to create 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, and all the way to the customer's screen. By embracing this medianet approach, broadcasters and service providers can:

- **Transform video production and distribution** by enabling stakeholders throughout the media production and distribution value chain to interact and collaborate in new ways, and create more dynamic media experiences
- **Build a media-aware IP NGN** that aligns media production with other IT functions, provides ample capacity for real-time high-definition (HD) media services, and helps ensure nonstop operation
- **Virtualize resources** through every phase of the media value chain to drive down capital and operational expenses
- **Monetize media more effectively**, with the ability to produce and distribute content for any device or platform, and rapidly introduce new services

By adopting an IP-based digital workflow platform, media and entertainment companies can:

- **Improve agility:** An end-to-end digital workflow breaks down the barriers between production teams and business units, and lets everyone share a common technology infrastructure and a single file-based storage system. Users can instantly access the content that they need, no matter where they are. Different production teams can work on content at the same time, and collaborate with stakeholders across the media value chain.

- **Reduce capital and operational expenses:** An IP-based digital workflow platform model provides a common technology and storage infrastructure to support all production processes, as well as all other business units in the company. By consolidating and virtualizing content, applications, and resources, media companies can reduce equipment costs, as well as ongoing power, cooling, and maintenance expenses.
- **Increase efficiency:** An IP-based digital workflow platform provides a powerful tool for optimizing complex production environments and eliminating slow, manual processes. For example, users anywhere in the company can access archived video footage instantly, instead of having to manually locate and ingest a physical videotape.
- **Help ensure exceptional availability and performance:** Working with the worldwide leader in networking technology and industry-leading production application partners, media companies can employ a technology platform that has been tested and certified for demanding real-time media environments with strict security, latency, and availability requirements



Implementing digital workflows requires an open, flexible, and interoperable infrastructure that can efficiently pool applications and resources.

- **Accelerate innovation:** Digital workflows link content production directly with ecosystem partners, new media distribution platforms, and customers, and reduce time to air. Media companies also gain the flexibility to distribute and monetize content and services in more ways. For example, by moving from a physical video archive to a digital one, broadcasters can make thousands of hours of stock footage available for sale online.
- **Continually adapt to changing business demands:** The Cisco Media Workflow Platform is based on intelligent virtualization innovations and open, standards-based technologies. As a result, media companies easily scale storage, capacity, and resources to suit whatever business needs may dictate, or whatever new opportunities arise.

Implementing digital workflows requires an open, flexible, and interoperable infrastructure that can efficiently pool applications and resources, and dynamically invoke the right processes at the right time, through each stage in the production workflow. However, building such an environment is a significant undertaking. From a technology perspective, it requires:

- Migrating production facilities to data center-based architecture, which drives demand for new data center capabilities and exponentially more storage and capacity
- New access networks that can provide 1 Gigabit per second (Gbps) and 10 Gbps to the desktop to support editing and management of HD video content
- Robust and intelligent network infrastructure that can extend content management capabilities beyond the small group of employees directly involved in media production to thousands of media professionals across the company, including editorial, marketing, legal, and other areas

Cisco is ideally suited to deliver the underlying infrastructure for evolving to universal digital workflows. Combining a Service-Oriented Infrastructure (SOI), innovative data center and network infrastructure solutions, and close partnerships with industry-leading media and broadcast application providers, Cisco can help media companies deploy end-to-end digital workflow solutions.

Building Blocks of the Cisco Media Workflow Platform

The Cisco Media Workflow Platform is an intelligent, video-optimized network and data center infrastructure that provides the foundation for an end-to-end digital media workflow. Based on an SOI and innovative network and data center technologies, the Cisco Media Workflow Platform breaks down application silos, eliminates unnecessary duplication of assets and processes, and provides the flexibility and performance that modern media services require.

The Cisco Media Workflow Platform is based on medianet-enabling technologies that support end-to-end digital workflow application architectures, and deliver high-quality, high-capacity video services in a cost-effective manner.

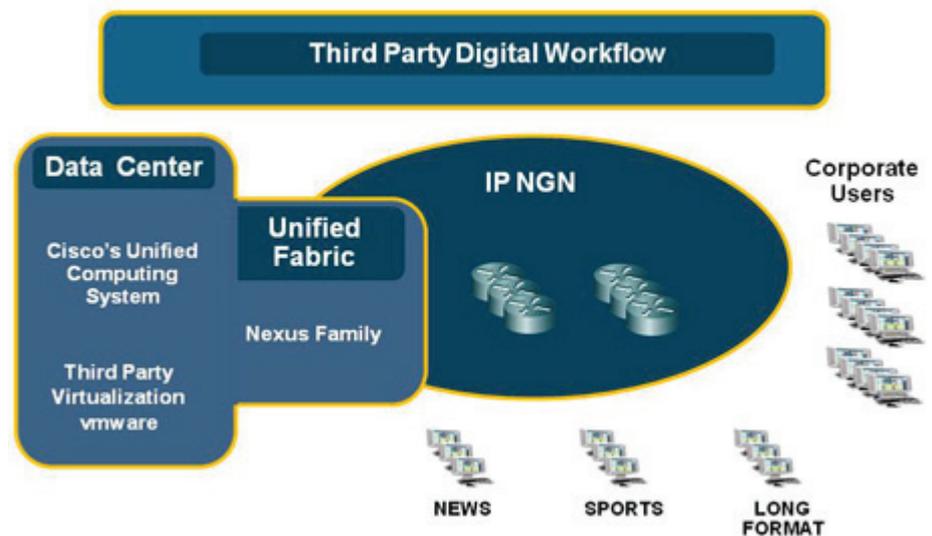


Figure 1 Cisco Media Data Center Platform - Delivering the Centralized Architecture

The Cisco Media Workflow Platform is inherently a data center-centric architecture. Fundamental to this model is the ability to virtualize and share computational, storage, and networking resources across different business units and applications while maintaining the appearance and functionality of physically separate systems, including upholding strict service-level agreements for performance and availability for each application. By providing these capabilities, the Cisco Media Workflow Platform enables dynamic provisioning of resources wherever and whenever they are needed, improving business efficiency, collaboration, and resource utilization, while lowering costs. It encompasses an SOI, Cisco Media Data Center innovations, a Cisco IP NGN, and industry-leading third-party production workflow applications.



Service-Oriented Infrastructure

An SOI 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. The SOI model helps broadcasters and programmers to:

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

Cisco Media Data Center

Underlying the SOI that powers a digital workflow is a highly flexible, high-performance data center infrastructure. Cisco Media Data Center technologies transform media infrastructure silos into pools of resources that can be dynamically aligned to meet diverse application and business needs. They 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. Cisco Media Data Center technologies include:

- **Unified Fabric with the Cisco Nexus Family:** Cisco's flagship data center switching platform, the Cisco Nexus Family, provides robust 10-Gigabit per second (Gbps), and in the future 40-Gbps and 100-Gbps solutions for demanding HD media production environments. Cisco Nexus platforms support a unified data center fabric, allowing both local networks and remote storage to be transparently linked over Ethernet. With a unified fabric, media companies can consolidate servers, storage architectures, and cabling, and substantially improve energy efficiency.

- **Cisco Unified Computing System:** The Cisco Unified Computing System consolidates network, server, storage, and virtualization resources into a single platform. The solution radically reduces equipment, power, cooling, and management costs, and lets media companies deliver exactly the right computing resources to all users, exactly when they need them.

- **Cisco MDS 9000 Series Multilayer Storage-Area Network (SAN) Switches:** Broadcasters and programmers may maintain several tiers of storage technologies for various media applications, presenting a variety of performance requirements and associated costs. The operational challenges of supporting such heterogeneous storage environments only grow as media companies adopt digital workflows, placing enormous new demands on storage capacity and performance. The Cisco MDS 9000 family of SAN switches provides a robust, high-capacity storage platform that consolidates multiple layers of network and storage intelligence into a single solution to simplify management and lower operational costs.

- **Industry-leading VMware Virtualization:** The Cisco Media Data Center is optimized to fully integrate with VMware software and services. As a result, media companies can take advantage of a proven platform for optimizing complex data center environments and effectively managing media resources on a massive scale.

IP Next-Generation Network

Cisco provides industry-leading routing and switching solutions for the entire media network. The Cisco IP NGN spans core, edge, and access solutions, and provides robust, highly available media and service delivery to support demanding real-time HD media environments. Cisco IP NGN solutions provide:

- Intelligent network that is both service- and application-aware to help ensure reliable, high-performance delivery of media and application services
- Innovative capabilities for helping ensure high quality of user experience such as Cisco Visual Quality Experience (VQE), which dynamically corrects packet errors over last-mile networks
- Multilayer end-to-end managed security, tailored to identify and eliminate the latest threats
- Open, highly scalable platform for accommodating constantly changing business and technology requirements

Robust Performance and Availability

The Cisco Media Workflow Platform model delivers all IT and media production services over a single, converged network infrastructure. To accomplish this, it supports strict security, latency, and availability requirements, and provides tools to segregate resources over a converged network. The Cisco Media Workflow Platform provides:

- Virtually lossless video production environment
- Minimal jitter, delay, and latency to help ensure that even demanding media-editing applications provide the expected user experience
- Support for all mission-critical applications in the enterprise
- Ample capacity (including 1 Gbps or 10 Gbps Ethernet to the desktop) to facilitate HD media and applications

Cisco incorporates a variety of unique, innovative features into the Cisco Media Workflow Platform to enable these capabilities and optimize the delivery of content and resources throughout the company. Technology innovations include:

- **Ample buffering and capacity:** Media-editing applications are fundamentally different from typical business applications, and pose unique challenges. Unlike conventional IT traffic, in which bit rates are relatively constant, media applications are extremely “bursty” and highly intolerant to delay, jitter, and packet loss. A delay of just 5 milliseconds produces noticeable degradation in performance, and delays of 10 milliseconds or more can render an editing application unusable. The Cisco Media Workflow Platform architecture is designed with high capacity throughout the network to support even the most demanding HD media services, as well as ample buffering to help ensure that unpredictable traffic bursts do not degrade the user experience.
- **Advanced traffic segmentation features:** To preserve the security and availability of media services traveling over a shared IP network, media companies need sophisticated tools to segment and protect media traffic. The Cisco Media Workflow Platform provides innovative capabilities to accommodate this requirement. The Cisco Nexus 7000 Series platform, for example, supports Virtual Device Context (VDC) features that let media companies segment a single physical switch into multiple virtual switches. Each VDC developed on a Cisco Nexus 7000 Series platform creates an independent hardware and software partition and an independent virtual control plane, allowing for complete segmentation of network traffic, as well as context-level fault isolation and management.

“In our vision, the network would be the platform for storytelling”... “Our biggest achievement is merging two very different worlds: the old broadcast world and the relatively new IP world. IP will be instrumental in helping us compete with major global media companies to produce relevant programs.”

-- Michael Kaaber Harrit, Chief Strategy Officer,
DR Technology

- **Strong security:** The Cisco Media Workflow Platform incorporates Cisco TrustSec, a powerful integrated security architecture designed for large, complex networks. Cisco TrustSec includes:
 - Admission control intelligence to help ensure that all devices and endpoints connecting to the network are known and authenticated
 - Robust encryption of all traffic, at 10-Gbps line rates
 - Security group access control lists that provide users with more flexibility and mobility, while remaining subject to strict security policies
- **High availability:** To support the stringent demands of media editing and production, the media network must provide high availability, and be designed so that any disruption to services is virtually undetectable to users. The Cisco Media Workflow Platform supports advanced high-availability features such as Cisco Virtual Switching System (VSS). Cisco VSS allows media companies to pool and manage multiple Cisco Catalyst® switches as a single resource, increasing LAN capacity, boosting nonstop communications, and simplifying operations.
- **WAN acceleration:** Delivering the required performance and availability on media company campuses is challenging enough. To provide the same level of service to remote company or partner facilities, broadcasters typically employ expensive networking services. Cisco Wide-Area Acceleration Services (WAAS) help media companies overcome the performance problems that can plague applications accessed over the WAN, while significantly reducing the amount of data that must be transferred over the link, increasing link utilization by four to 10 times. By maximizing the use of these expensive resources and optimizing network response times, media companies realize direct operational cost savings and increased production team productivity.

Media Workflow Platforms Proven Results: DR Byen

Why Invest Today?

The Cisco Media Workflow Platform offers a compelling vision for realizing new capabilities and efficiencies through digital workflows. It is not merely a vision, however. Real-world media companies have already undertaken this evolution and achieved real-world benefits. One example is Denmark's national broadcast corporation, DR.

Challenge:

Denmark's national broadcaster, DR, operates two television channels, dozens of radio stations, and a website that delivers streaming video to PCs and smartphones. The company wanted to increase the quantity and quality of its programming, improve productivity, and publish media on more platforms without increasing its budget.

Solution:

DR adopted an all-digital workflow for recording, editing, producing, and broadcasting all types of content, enabled by the Cisco Media Workflow Platform. DR's IP network replaced previously separate radio and television studio networks and became the platform for all broadcast and production applications, as well as telephony and wireless services for a 132,000-square-meter campus.

Results:

With the Cisco Media Workflow Platform, DR:

- Has doubled the number of hours of programming that it produces, without increasing the budget
- Supports 10,000 media production and business employees over a single network
- Empowers editors to work anywhere on campus, including over wireless networks
- Enables multiple users to work on the same media file simultaneously

Why Cisco?

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 dynamically delivering media and resources to the right people at precisely the right time, at all stages of the production process. Ultimately, it provides the platform for unleashing new innovation and media revenue models, and reducing operational costs.

End-to-End Solution

Cisco has invested significant resources into developing innovative digital workflow solutions for broadcasters and content producers. In addition to delivering the underlying technology and infrastructure for IP-based media workflows, Cisco continues to cultivate close partnerships with leading broadcast technology vendors and integrators, such as Avid and Sony, to deliver digital media workflow solutions that broadcasters can trust. Together, Cisco and its industry-leading partners will continue to help media and entertainment companies around the world:

- Enable unprecedented creativity and collaboration
- Provide the capacity, lossless performance, and nonstop availability to meet demanding real-time HD media production requirements
- Better manage complexity and scale
- Reduce the costs of building and operating media networks
- Boost service innovation and flexibility to unleash a new generation of media experiences

Cisco Capital

Financing with Cisco CapitalSM could provide you with access to an alternative source of funds to help you build your all-IP Next-Generation Network and stay competitive, while preserving valuable capital.

By creating innovative, flexible financing, Cisco Capital bridges the gap between technology requirements and budget availability. This may be to remove cash flow issues, allowing you to spread the cost of the purchase over a number of years. It could be to open up flexible repayment terms matching the costs to the benefits over time. Or it might be in the form of an operating lease, turning CapEx into OpEx.

For more information about the Cisco Media Workflow Platform, visit www.cisco.com/go/bc.



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