# Cisco Application and Content Networking System Software Version 5.5

## Deliver Digital Media Effectively over Wide-Area Networks

*The Cisco Application and Content Networking System (ACNS) is a powerful digital media delivery solution that greatly reduces redundant digital media streaming traffic traversing a WAN from the data center to branch offices over satellite and terrestrial networks.*

With Cisco ACNS, organizations from the private or public sectors can deliver effective and large-scale corporate communications, on-demand training, and digital signage to remote and dispersed branch offices, schools, and stores, with high-quality and minimal impact on the network, while taking advantage of investments in converged IP WANs.

Cisco ACNS combines the technologies of transparent on-demand caching, scheduled prepositioning, and live digital broadcasting to minimize the impact over the WAN for the following types of streaming media-based applications:

- Corporate communications
- E-learning
- Digital signage

Cisco ACNS is a software product available on a range of hardware platforms, from the family of Cisco Wide Area Application Engine (WAE) Appliances to Cisco Content Engine Network Modules for the Cisco 2600, 2800, 3600, 3700, and 3800 Series Integrated Services Routers. The Cisco ACNS Content Distribution Manager (CDM) provides a flexible management system for efficient operation, automation, and central policy management of the media and content delivery network.

## Product Overview

Cisco ACNS offers a comprehensive set of streaming-media features that enable high-quality and long-playing digital videos to be streamed live and simultaneously to thousands of users and media players (for example, set-top boxes [STBs]) or accessed on demand at a later time.

By caching on-demand content or prepositioning frequently accessed content and then locally fulfilling content requests, Cisco ACNS eliminates subsequent requests for the same digital media content from needing to traverse WAN links from the data center to branch offices. When multiple users or any variety of media players simultaneously join a live streaming event, Cisco ACNS carries only one stream from the source and splits that stream at the remote branch office, offloading the streaming server and significantly eliminating redundant video traffic from the WAN.

The results include improved response times to access digital media content, reduced WAN usage and costs, and increased network scalability and capacity. Cisco ACNS also provides a flexible management system for efficient operation, automation, and central management of the digital media delivery network. Coupled with transparent request redirection using the Web Cache Communication Protocol (WCCP), this network infrastructure and delivery optimization is transparent to end users and servers.

Organizations that benefit from building a digital media delivery network for streaming-media applications using Cisco ACNS Software include:

- Financial and banking organizations
- Government institutions
- Health organizations
- Medium to large retail stores
- Corporations with largely distributed regional offices
- Schools and universities (education)
- Outsourced network service providers delivering managed services to enterprises

IT departments in these organizations are required to provide streaming-media services that satisfy the needs of the entire organization:

- The network infrastructure must be able to reliably deliver streaming-media applications and provide an optimal user experience to increase productivity.
- A significant return on investment (ROI) must be generated by providing timely and effective information to employees, who can be at the local corporate office, remote branch offices worldwide, or mobile.
  - For example, an e-learning video-on-demand (VoD) system deployed globally can reduce operational and training costs by reducing travel expenses and improving productivity, while at the same time increasing sales with timely dissemination of company or product information to sales or operations employees in the field.
- IT departments must quickly react to changing business needs by transparently scaling the network infrastructure to support more local and remote users and new applications.
- IT departments must keep the digital media delivery network secure and reliable.

| Enterprise |
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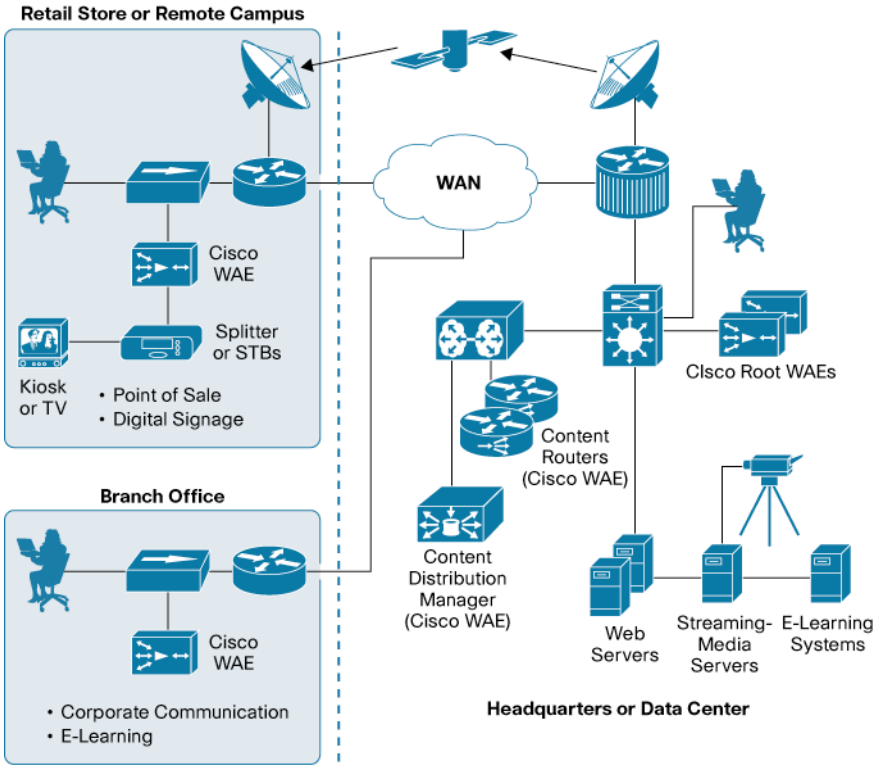
| • Enterprises can save operational and training costs, exponentially enhance companywide communications, and improve end-user experience and productivity by using Cisco ACNS for streaming media-based corporate communications and e-learning throughout the company.<br>• Cisco ACNS also minimizes employee and executive time loss and eliminates travel costs associated with onsite training. |
| **Retail** |
| • Retail stores can rely on Cisco ACNS to enable their digital signage applications to advertise products and news to consumers through large displays, point-of-sales kiosks, or video walls at hundreds of locations, allowing them to maximize their revenue source and accelerate the introduction of new products.<br>• Retail organizations would use the same digital media delivery infrastructure to improve employee productivity by delivering high-quality live scheduled video-streaming broadcasts or on-demand access to video-based training material for product promotions and corporate communications. |
| **Education** |
| • Schools and universities can offer classes and lessons on line to remote students, and deliver content purchased from external content providers specialized in educational content. |
| **Managed Service Provider for Enterprises** |
| • Managed service providers can create new business opportunities by providing live and on-demand streaming-media services to improve customer experience to enable corporate-wide live events and on-demand training. |

Cisco ACNS Software runs on the Cisco WAE hardware product family. When Cisco ACNS Software is installed, the Cisco WAE Appliance can perform one of the following roles (see Figure 1):

- **Content Engine**—Stores and serves content for client requests
- **Content Distribution Manager (CDM)**—Web-based application for central content distribution and policy management
- **Content Router (optional)**—Redirects client requests for content to the closest WAE

Cisco ACNS Software also runs on Cisco Content Engine Network Modules for Cisco 2600, 2800, 3600, 3700, and 3800 Series Routers. The industry's first and only router-integrated application platform for accelerating data center-based applications, the content engine network modules represent an opportunity for organizations using these routers for branch routing to add functions through a compact footprint that reduces operational costs and management complexity.

**Figure 1.** Primary Applications for Cisco ACNS Software




Cisco ACNS Software works with other Cisco management applications and content routing options such as:

- Cisco Digital Media System (DMS) for rich digital media creation, management, and access
- CiscoWorks software suite for network and device management
- WCCP embedded in routers and switches with Cisco IOS® Software; an alternative to content-router routing is to use an enterprise router that supports WCCP and is configured to intercept and route requests for content obtained through HTTP, Real Time Streaming Protocol (RTSP), etc.; WCCP detects client requests and routes the request to a WAE within the same network

### Integration with the Cisco DMS Solution

The Cisco DMS is an easy-to-use, comprehensive solution that enables organizations to effectively create, manage, and access compelling digital media. It comprises the Cisco Digital Media Manager (DMM), the Cisco Digital Media Encoders (DMEs), and a Cisco Video Portal. Cisco DMM manages and publishes digital media and provides tools for users to add and archive media, assign metadata and keywords, preview content and manage workflow, customize the video portal interface, and schedule instant and future deployments. Cisco DMS also includes the Cisco Video Portal Reporting Tool, a Web-based reporting tool for real-time reporting on content traffic. Cisco DMS integrates with Cisco ACNS to provide optimal digital deployment across the network.

For more information about the DMS product offering visit:
http://www.cisco.com/en/US/netsol/ns620/networking_solutions_package.html

### Key Benefits

Table 1 lists the benefits of Cisco ACNS.

**Table 1.** Benefits of Cisco ACNS

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|---|---|
| **Enhanced corporate communication and end-user productivity** | • Enables companywide information sharing through the use of video, recognized as the most effective way of communicating by increasing information retention<br>• Provides updates to remote employees faster and more effectively<br>• Enables companies to launch new products and services faster and globally with maximum efficiency<br>• Accelerates training of sales organizations dispersed across a nation or even the globe |
| **Reduced WAN bandwidth and optimized performance** | • Ensures optimal service levels for video versus other applications<br>• Minimizes the effect of video on WAN bandwidth requirements<br>• Eliminates the need for branch video storage and video servers<br>• Takes advantage of existing investments in IP networks and desktops for streaming-media delivery<br>• Minimizes effect on other applications |
| **Designed for large organizations** | • Offers state-of-the-art tiered architectural design and best scalability available in the industry<br>• Designed for enterprises based on experience with thousands of customer deployments<br>• Provides for transparent integration to digital media creation, Web-based e-learning applications, and management systems, such as Cisco DMS<br>• Backed by Cisco Advanced Services and support |
| **Typical ROI** | • **Delayed network upgrades**—Removing heavy video demands from the WAN can free current network capacity of space for a large organization.<br>• **Travel savings**—Employees no longer need to attend meetings and training seminars in person.<br>• **Lower media management costs**—Distribution is managed centrally and content freshness is automated.<br>• **Leverage existing converged IP networks**—Deliver multiple applications from common networks.<br>• **Reduced storage costs**—The amount of storage saved can add up to tens of terabytes. |

## Primary Features of Cisco ACNS Software

Table 2 lists the features of Cisco ACNS Software.

**Table 2.** Features of Cisco ACNS Software

| **Comprehensive Streaming-Media Support** | |
|---|---|
| • Concurrent streaming of Microsoft Windows Media Technology (WMT), RealNetworks, and Apple QuickTime/ MPEG4-compatible (Cisco Streaming Engine) streaming-media broadcast and on-demand content<br>• Digital media stream splitting as an alternative to IP Multicast enabled in the LAN or WAN for live broadcast and video on demand (VoD) through a multilayer hierarchy of Cisco ACNS nodes<br>• Single stream from source to the remote branch office per live broadcast or streamed digital media file, minimizing effect on the WAN<br>• Streaming bandwidth throttles, including restrictions based on the time of day for all streaming protocols<br>• Continuous digital media content replication (prepositioned) with network bandwidth policy scheduling<br>• Rule-based filtering for RTSP | |
| Microsoft WMT streaming service (additional license fee) | • Windows Media RTSP delivery over TCP or User Datagram Protocol (UDP), and Multimedia Message Service (MMS) over HTTP<br>• Content prepositioning for VoD streaming<br>• Variable bit-rate support<br>• Cisco WAE as a live-stream source (publishing point)<br>• Support for live-stream pull splitting, including multicast or unicast into the WAE and multicast or unicast out of the WAE to connected clients<br>• Server side playlist (SSPL) support for live broadcasts and VoD<br>• WMT upstream proxy bandwidth controls<br>• WMTv9 style Fast Start and Fast Cache support through RTSP and MMS over HTTP |

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| Cisco Streaming Engine (no additional license fee) | • VoD server for standards-based hinted MPEG-4, MPEG-2, MPEG-1, and QuickTime video over Real-Time Transport Protocol (RTP) or RTSP to Apple QuickTime-compatible players<br>• Live-stream pull splitting (unicast in) and push splitting (multicast or unicast in) with multicast and unicast out of WAE to connected clients<br>• Standards-based MPEG encoder interoperability—Compatible with ISO/IEC MPEG4 Advanced Simple AV Profile (ISMA v1.0) and ISO/IEC MPEG4 Advanced 2D level 1 as well as MPEG1 and MPEG2 profiles<br>• Third Generation Partnership Project (3GGP) streaming service providing uniform delivery of rich multimedia content over broadband mobile networks to multimedia-enabled cellular phones |
| RealNetworks Helix Universal Gateway (additional license fee) | • RealNetworks RTP and RTSP delivery over TCP or UDP<br>• Live-stream pull splitting (unicast in) and push splitting (multicast or unicast in) with multicast and unicast out of WAE to connected clients<br>• Encoder failover<br>• Content prepositioning for VoD streaming of RealNetworks format RTP and RTSP content<br>• Support for MMS and QuickTime with RTSP with manual configuration |
| MPEG video display for retail kiosks | • Predefined playlists with multiple video clips and time-of-day setting, centrally managed by Cisco CDM; multiple playlists per WAE<br>• One video stream per AV-decoder card option or WAE-integrated MPEG1 and -2 decoders, National Television Standards Committee (NTSC) and Phase Alternating Line (PAL) TV output<br>• STB interoperability—Playlists exported to STBs through program application programming interface (API); WAE as Trivial File Transfer Protocol (TFTP) server for STB software image and configuration files |
| **Powerful Streaming Automation** | |
| Live streaming redundancy | • Root content-engine failover and fallback<br>• Intermediate content-engine failover—Goes to parent WAE or fails over to other WAEs in the same location<br>• Client content-engine failover—Rolls over to unicast from multicast; includes next-click failover |
| **Digital Media Content Prepositioning and On-Demand Caching** | |
| Intelligent content prepositioning through content acquisition and distribution | • HTTP and HTTPS delivery of static files for any file format managed by the Cisco CDM for a large number of WAEs |
| Policy-based content distribution | • Bandwidth controls, day-of-week and time-of-day scheduling, replication status, and authentication |
| Content preloading | • Web content preloading through command-line interface (CLI) or local Web GUI<br>• Preload HTTP, FTP, and digital media files with URL list for a small number of WAEs |
| On-demand content caching | • Transparent (WCCPv2), nontransparent (browser proxy configuration), and Layer 4 redirection<br>• HTTP 1.0 and 1.1 Web caching, FTP-over-HTTP proxy, and HTTPS tunneling<br>• Internet Cache Protocol (ICP)<br>• Cache files served with HTTP 1.1 Chunked Encoding<br>• Rules template for cache policies and rules<br>• Type of service (ToS) and differentiated services code point (DSCP) set by cache hit or miss, URL, file type, or domain to classify traffic using cache-rules template<br>• IP spoofing that presents clients' IP addresses for easy tracking of users<br>• Split Domain Name System (DNS) that allows configuration of a WAE with multiple DNS servers based on domain name, such as intranet and Internet<br>• DNS caching, which allows the WAE to cache DNS entries to avoid multiple WAN accesses for DNS server resolution (proxy and WCCP mode) |
| **Pre-positioning and caching content via HTTPS** | |

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| Store content served through HTTPS (Secure Sockets Layer [SSL]) at branch offices | • SSL termination of SSL 2.0 and 3.0 and transport layer security 1.0 (TLS 1.0)<br>• Transparent (WCCP) or proxy configuration<br>• Demand-pull caching and prepositioning<br>• Back-end SSL support to origin server<br>• Secured import and storage of keys and certificates with certificate management GUI<br>• Support for all major certificate authorities for origin server certificates (such as Verisign and Entrust) for reverse-proxy SSL as well as enterprise self-issued certificates for forward-proxy SSL<br>• Support for maximum of 255 key pairs (keys and certificates)<br>• Support for bulk encryption: RC4, Digital Encryption Standard (DES), and Triple DES (3DES)<br>• Support for hash algorithms—Message Digest Algorithm 5 (MD5) and Secure Hash Algorithm 1 (SHA1) |
| **Superior Management** | |
| Scalable and automated content acquisition and distribution | • Content acquisition from origin servers by root WAEs for HTTP, HTTPS, FTP, and Common Internet File System (CIFS) (Windows file share)<br>• Easy-to-use GUI, which builds a list of files to acquire from the origin server<br>• Channel-based control with bandwidth-shaping, priority, scheduling, content expiration, and authentication policies<br>• Secured content distribution with HTTPS<br>• Hierarchical tree distribution for scalability and optimal performance<br>• Multicast replication option available (additional license fee) with intelligent on-demand carousels for retransmissions and hot-standby multicast sender failover |
| Multiple, flexible client request redirections | • Transparent edge intercept with advanced WCCPv2 includes scalable clustering (WCCP flow protection and WCCP slow start), fault tolerance (WCCP multihome router support), client bypass, TCP tuning knobs, and WCCP standby mode for easy maintenance.<br>• Nontransparent edge intercept with browser proxy configuration includes support for Platform Applicable Client (PAC) file delivery by WAEs.<br>• Content routing with DNS Intercept and HTTP Redirect uses the coverage zone file, to specify the client source-IP subnet and which WAEs serve that zone.<br>• Content-request routing is load-based.<br>• Dynamic proxy autoconfiguration uses coverage zone information to automatically generate custom PAC files at WAEs designated as PAC file servers to redirect client browsers to local WAEs. |
| Configuration and monitoring | • CLI similar to Cisco IOS Software for individual content-engine and Cisco CDM configuration management<br>• Interactive setup utility at the CLI and online Quick Start wizards available in the Cisco CDM GUI<br>• Integrated graphical alert system for proactive warning of problems with devices or content replication<br>• Remote device management—Role-based administration, device-group configuration, and autoregistration of devices from the Cisco CDM GUIExtended Simple Network Management Protocol (SNMP) Version 2 and Version 3 MIBs<br>• Local content-engine Web GUI, Secure Shell (SSH) Protocol Versions 1 and 2, and HTTPS and Telnet access<br>• CiscoWorks Resource Management Essentials (RME) Version 3.4 support of WAEs and Cisco CDM-CLI editor, inventory, netconfig, syslog analyzer, and device availability<br>• CiscoWorks CiscoView support of WAEs—A graphical SNMP-based device-management tool that provides real-time views of the content-engine operational status |
| Comprehensive industry-standard logging | • Transaction logging and log pushing with FTP; interoperates with reporting partners for customizable performance and activity reports<br>• HTTP cache transaction logs—Squid logs and World Wide Web Consortium (W3C)-compliant Apache common logs<br>• WMT proxy and server logs—Standard Windows Media Services Version 9 (WMSv9) format<br>• RealNetworks server and proxy logs—Standard RealNetworks format<br>• Configurable log formats—Refer headers and user-agent headers |
| Program import, export, and scheduling API | • Extensible Markup Language (XML)-based API to create, manage, and schedule programs<br>• Support for live and scheduled rebroadcast, multicast, and stream-splitting programs<br>• Support for Cisco Streaming Engine and WMT<br>• Ability to export playlists to STBs |

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| Manifest API | • XML-based API to manage prepositioning of video files for VoD serving by the WAEs, including bandwidth, content expiration, and user-authentication policies for acquisition, distribution, and stream serving<br>• Support for Cisco Streaming Engine, WMT, and RealNetworks protocols and file formats |

## Ordering Information

Table 3 lists the major system and value-added software options available. Note that all the software options must be ordered with their corresponding hardware platforms identified in the Cisco Wide Area Application Engine data sheet at: http://www.cisco.com/en/US/prod/collateral/contnetw/ps5680/ps6474/product_data_sheet0900aecd80329e39.html

To place an order, visit the Cisco Ordering Home Page and refer to Table 3.

**Table 3.** Part Numbers for Cisco ACNS Software Options

| Product Description | Part Number |
|---|---|
| **Software Options** | |
| ACNS Software v5.5 (SATA) | SF-ACNS-5.5-SA-K9 |
| ACNS Software v5.5 (SCSI) | SF-ACNS-5.5-SC-K9 |
| ACNS Software v5.5 (SAS) | SF-ACNS-5.5-SS-K9 |
| 100 Mbps to 250 Mbps upgrade WMS license | SF-WMS-100-250= |
| 250 Mbps to 500 Mbps upgrade WMS license | SF-WMS-250-500= |
| 500 Mbps to Unlimited upgrade WMS license | SF-WMS-500-UNLIM= |
| **Software Options—WMT Streaming Licenses** | |
| 100 Mbs Windows Media License for ACNS 5.5 or higher | SF-WMSLIC-100M |
| 250 Mbs Windows Media License for ACNS 5.5 or higher | SF-WMSLIC-250M |
| 500 Mbs Windows Media License for ACNS 5.5 or higher | SF-WMSLIC-500M |
| Unlimited Mbs Windows Media License for ACNS 5.5 or higher | SF-WMSLIC-UNLIM |
| **Software Options—Real Networks Streaming Licenses** | |
| RealSystem v9 proxy/server License for CE/WAE 732X Models | SF-CE-732X-RCPS |
| RealSystem v9 proxy/server License for CE/WAE 500 Series | SF-CE-51X-RCPS |
| RealSystem v9 proxy/server License for CE-56X and WAE-61X | SF-CE-56X-RCPS |
| **Software Options—Multicast** | |
| Multicast Client for ACNS 5 for CE/WAE 732X Models, option | SF-CE-732X-TL-5.0 |
| Multicast Client for ACNS 5, CE/WAE-51X and NM-CE-BP, option | SF-CE-51X-TL-5.0 |
| Multicast Client for ACNS 5 for CE-56X and WAE-61X, option | SF-CE-56X-TL-5.0 |

## Service and Support

Cisco offers a wide range of services programs to accelerate customer success. These innovative services programs are delivered through a unique combination of people, processes, tools, and partners, resulting in high levels of customer satisfaction. Cisco services help you protect your network investment, optimize network operations, and prepare your network for new applications to extend network intelligence and the power of your business. For more information about Cisco services, refer to Cisco Technical Support Services or Cisco Advanced Services.

## For More Information

For more information about the Cisco ACNS Software, visit http://www.cisco.com/en/US/products/sw/conntsw/ps491/index.html or contact your local Cisco account representative.

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