


Cisco Application and Content Networking System (ACNS) Software v4.1 Software Product Family: Enterprise Edition



Enterprises, government agencies, and schools are facing the challenges of WAN bandwidth congestion, delivering mission-critical Web applications with high quality and performance, and controlling access to unproductive Web content.

To overcome these challenges, Cisco provides a complete suite of content-networking products that offers a turnkey, highly available, and scalable solution for intranet, extranet, and Internet e-business applications. Together, Cisco's Content Networking products provide the industry's only end-to-end solution for:

- Efficient, reliable, and scalable content management, distribution, and delivery
- Storing and delivering content to users locally to avoid WAN congestion
- Intelligently routing requests to the best or closest edge node for delivery
- Transparent integration into the existing IP network infrastructure

These capabilities allow organizations to intelligently deliver many business-critical services at the network edge, including content acceleration, content filtering, content access management, corporate communications, e-learning, software and collateral distribution, point-of-sale (POS) advertising, kiosk video display, and more. Enterprises can deploy these services on their own or team with a Cisco Powered Network service provider for an outsourced model.

Cisco Enterprise Application and Content Networking System Software

Within Cisco's content-networking solutions portfolio, the Cisco Application and Content Networking System ACNS Software enables a variety of services that optimize delivery of Web applications and content from the network edge to ensure enhanced speed, availability, and performance for users. ACNS Software combines the technologies of transparent caching and enterprise content-delivery network (ECDN) for accelerated delivery of Web objects, files, and streaming media from a single intelligent edge appliance, the Cisco Content Engine (CE).

ACNS Software provides organizations with a turnkey solution that supports:

- *Multiple intelligent content services at the edge* for flexible and easy deployment
- *Unsurpassed network integration* for scalability, security, and reliability
- *Superior content distribution, routing, and management* for ease of management and control
- *Rich integration with key business applications* such as e-learning, content access management, and more, for a complete turnkey solution



In the enterprise environment, ACNS Software provides the foundation that enables the caching and ECDN solution components to work as a cohesive system:

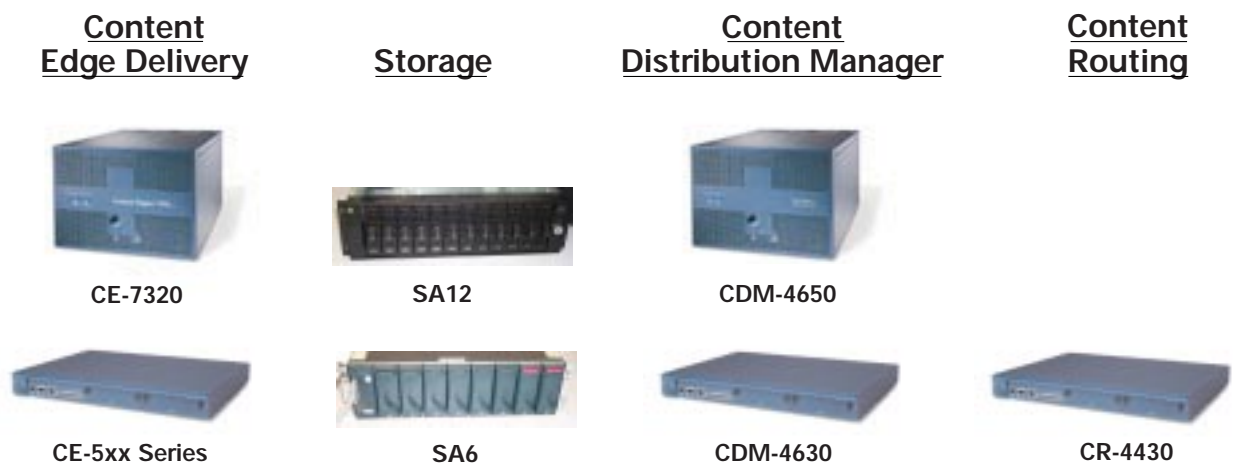
- Central distribution and management capabilities are provided by the Cisco Content Distribution Manager (CDM) appliance.
- Content routing capabilities are provided by either the CDM or the Cisco Content Router (CR) appliance.
- The CE provides content edge delivery. CEs use transparent caching technology to store content at the edge based on users' requests, and they use ECDN technology to prepopulate rich media or large files in the CEs ahead of users' requests.

To enable a turnkey "live" streaming solution, ACNS Software also interoperates with the Cisco IP/TV[®] 3400 Series appliances that support video capture, standards-based streaming media, program creation, synchronized content, and program scheduling.

In the data center, ACNS Software integrates with the Cisco 11000 Series Content Services Switch (CSS) and the Catalyst[®] 6500 Series Content Switch Module (CSM) to enable higher availability and redundancy. Furthermore, ACNS Software is tightly integrated with Cisco networking products and Cisco AVVID (Architecture for Voice, Video and Integrated Data) for optimal network performance.

By offering a complete solution, Cisco makes it easy for organizations to start with a simple service, such as content acceleration for WAN cost reduction, and then add e-learning or corporate communications and other more advanced services. Organizations can take a stepped approach, starting small and then scaling to higher capacity and availability. They can quickly deploy their business-critical Web applications with ease of management while preserving their infrastructure investment.

Figure 1 The Cisco Application and Content Networking System (ACNS) Software Product Family - Enterprise Edition





Cisco Content Engine: Multiple Intelligent Content Services at the Edge with Unsurpassed Network Integration

Cisco Content Engines (CEs) accelerate any Hypertext Transfer Protocol (HTTP)-deliverable and streaming media-type content by storing and delivering content close to end users on their local networks. The CE can reside in headquarters, branch offices, remote campuses, and international sites where WAN bandwidth is costly and scarce.

CEs combine the benefits of caching and content delivery in an appliance solution that features unsurpassed network integration for ease of management, deployment, and access management. By building on the intelligence in the network and tightly integrating with Cisco routers and switches, content engines make it easy for organizations to cost-effectively deploy rich-media applications without compromising the integrity of the network.

Cisco Storage Arrays (SAs) directly attach to CEs to increase storage capacity for content and enhance the performance of caching and streaming media for CEs.

ACNS Software Advanced Transparent Caching

Cisco pioneered the industry's first content-routing technology, the Web Cache Communication Protocol (WCCP). With WCCP, the router transparently redirects specified traffic to local CEs, reducing WAN bandwidth usage for maximized download performance and content availability. WCCP is an open protocol that is supported within Cisco IOS® Software in Cisco routers, and within ACNS Software in the CE. This technology enables the CEs to store and deliver content locally to users without requiring any changes to the existing network architecture, client browsers, or end servers.

Most Advanced Implementation of WCCP v2

- *Scalable clustering* enables each cache member to work in parallel, greatly improving scalability, redundancy, and availability. Up to 32 CEs can be clustered to scale for the desired capacity. “WCCP flow protection” prevents the breaking of existing flows when the WCCP cluster load distribution changes because of the addition/subtraction of a CE into or from a cluster. “WCCP slow start” prevents cluster destabilization when a new CE is added to a heavily loaded CE cluster.
- *Fault tolerance* enables dynamic fail-over to other CE cluster members if a CE fails. If all CEs in a cluster fail, the WCCP-enabled router dynamically turns off WCCP and forwards content traffic directly to the origin server. In addition, CEs support “WCCP multi-homing,” which allows a WCCP-enabled, Multigroup Hot Standby Router Protocol (MHSRP) router pair to share a CE cluster, creating a fully redundant caching system. If a router fails, existing Cisco IOS fault-tolerant and fail-safe mechanisms are applied. For example, a hot standby router could dynamically take over operations, redirecting Web requests to the cache cluster.
- *Fault prevention* for network or application-level problems can be achieved by CEs. “Overload bypass” prevents a CE from becoming a bottleneck when traffic loads exceed the capacity of a content engine. “Dynamic client bypass” prevents source IP authentication problems by selectively allowing clients to directly connect to origin servers.
- *Flexible caching policies/rules* are provided with the “rules template.” When a content request pattern match is triggered based on URL, HTTP headers, port number, or IP address, a corresponding action is taken, such as “no-cache,” refresh, redirect, HTTP header-field rewrite, object freshness control, selective cache, or upstream proxy selection policies.



Extensive Quality-of-Service Support

- *Type of service/differentiated service code point (ToS/DSCP) bits* allow differentiated network usage for business-critical applications. ACNS Software is unique in its ability to set the DSCP bits in ToS (supported in Cisco IOS routers) based upon cache hits and misses, URL, file type, and domain. Unlike other solutions that rely only on information supplied by routers such as source physical port, source IP, destination IP, and TCP port number, ACNS Software augments network-based QoS provisioning for traffic queuing, shaping, and engineering with a high level of granularity by intelligently “coloring” packets with content-based information. For example, organizations can prioritize mission-critical applications over less-productive Internet surfing.

ACNS Software Content Access Management

- *Content filtering*—ACNS Software, in conjunction with N2H2 Internet Filtering Protocol, Secure Computing SmartFilter™, or Websense® Enterprise Software enables administrators to block, monitor, and report on end users’ access to nonbusiness and objectionable content. This high-performance content access control results in increased productivity, lower bandwidth usage, and reduced legal liability.
- *Authentication* via Remote Access Dial-In User Service (RADIUS), Lightweight Directory Access Protocol (LDAP) v3, and Terminal Access Controller Access Control System Plus (TACACS+) provides user and administrative access control. There is also full end-to-end support for NT LAN Manager (NTLM) authentication to enable single NT network log-on for users to access protected Web objects within the NT domain. These authentication schemes are supported either in “bypass” mode where clients dynamically and transparently connect directly to the origin server instead of the CE or “authenticated-object-caching” mode where the CE delivers only an authenticated cached object if there is secure connection between the client and server.
- *Transaction logging* of HTTP cache transactions via Squid logs and Apache common logs provides Web usage information that can be turned into reports via commercial tools. Logs can be sanitized to protect client privacy. Streaming-media logs are also generated with World-Wide Web Consortium (W3C)—compliant logs for Windows Media and Real logs for Real Media. In a CDN deployment, the CDM can aggregate these logs from CEs for auditing and reporting by specified hosts.

ACNS Software Streaming-Media Support

- *Streaming Media formats* supported with ACNS Software on CEs include RealNetworks® Real-Time Transport Protocol/Real Time Streaming Protocol (RTP/RTSP), Microsoft® Windows Media Technology™ (WMT), Microsoft Media Server Protocol (MMS) and HTTP streaming delivery of Motion Picture Experts Group [MPEG] and Advanced Streaming Format [ASF].
- *Live, scheduled, and on-demand streaming* enables applications such as corporate communications, e-learning, and POS advertising. Video-on-demand (VOD) streaming allows users to view programs when they want and have VCR-like controls such as fast-forward, rewind, pause, and more. Live and scheduled streaming enables real-time broadcasts using IP multicast or stream splitting, enabling streaming across the existing network infrastructure while optimizing bandwidth usage whenever multicast is enabled.
- *The integrated video decoder card* on the CE audio-video (AV) model plays back MPEG files to National Television Standards Committee (NTSC) and Phase Alternating Line (PAL) analog displays, offering a new and cost-effective way to deliver advertising to retail sites, cafeterias, lobbies, and more. Playback is controlled from the CDM with a VCR-like Web-browser interface.
- *IP multicast support* uses Cisco IOS Software on Cisco routers to allow one stream to be propagated to many users over multiple network segments. This allows live and scheduled video programs to be scaled to a wide audience with low bandwidth usage.



- *Stream splitting* is supported for portions of the network that are not multicast enabled. ACNS Software supports stream splitting where unicast streams from origin servers are sent to “splitter” CEs, which in turn resend the stream by multicast or unicast to multiple connected users.
- *Stream proxy* allows CEs to cache streaming-media content and act as proxies to reduce congestion to the origin server. This mode is mainly used if content originates from an external source, such as the Internet, beyond the control of the Enterprise or organization. The CE can provide live stream splitting, IP multicast streaming, and VOD in this mode.
- *Stream server mode* allows the CE to deliver streaming-media content as if it is an origin server. This mode is mainly used if the Enterprise creates or controls its own content. Content is prepositioned in the CEs through the CDM. In this mode, CEs can provide live stream splitting, IP multicast streaming, and VOD.

Ease of Management

Cisco Content Engines are managed with a Cisco IOS Software-like command-line interface (CLI) for ease of configuration and problem diagnosis. They support the robust management features that are standard in Cisco IOS Software, including Telnet, Secure Shell Protocol (SSH), syslog, Simple Network Management Protocol (SNMP v3), TACACS+, Network Timing Protocol (NTP), and more. Standard Network Management packages (such as CiscoWorks 2000) that use SNMP will be able to manage CE using the SNMP MIBs. Each CE supports Web-based administration locally and through the CDM.

Cisco Content Distribution Manager and Cisco Content Router:
Superior Content Distribution, Routing, and Management

The *Cisco Content Distribution Manager (CDM)* provides central management and provisioning for the CDN and usually resides at the Corporate Headquarters Data Center. It also provides intelligent redirection of client requests to the most appropriate CE.

The *Cisco Content Router (CR)* provides intelligent routing as part of a high-availability solution with the CDM. It works with the CDM either as the primary content router to redirect a client's HTTP request to the best CE to deliver the content or as a secondary fail-over content router if the CDM is down or busy.

ACNS Software for Efficient Content Distribution

The Content Distribution Manager (CDM) with ACNS Software provides efficient and flexible ways to distribute content from a central location to CEs distributed in many locations at network edges.

Self-Organizing Distributed Architecture (SODA)

SODA is a patented Cisco technology that allows CEs to organize themselves into a sophisticated spanning-tree routing hierarchy to efficiently handle replication of published content, splitting of live content, and delivering both published and live content. This is especially useful to optimize the distribution of content in a nonmulticast-enabled network.

The CDM defines the network policies and then automatically stores the SODA network information, building routing tables for specific content. When a CE is added to the network, it automatically configures itself in the network based on the network topology and content requirements. The configuration is optimized around bandwidth, network congestion, geographical location, and its relationship to other nodes.

The CDM first replicates content to the first tier of CEs. In order to save bandwidth across the WAN or distant network, the CEs initiate subsequent redistributions to other CEs within their own subnets, allowing for faster replication. Bandwidth settings for file replication can also be adjusted based on time of day, allowing users to take advantage of available bandwidth during periods of light network traffic.

The SODA technology creates a fault-tolerant and self-healing network. The CDM and CEs monitor the current state of the network to automatically adjust to changing conditions. Changes are instantaneously detected by the content-routing mechanism in the CDM or CR, and routing tables are adjusted accordingly to prevent disruption of service.



Reliable Multicast Replication

ACNS Software supports the Digital Fountain™ Multicast Client in the CE for reliable, efficient file transfers and rich-media replications using satellite and multicast-enabled terrestrial infrastructures. Running ACNS Software on the CDM provides an integrated management interface to the Digital Fountain Multicast Server to configure and manage the replication. Reliable multicast transfers take advantage of the efficiency of multicast and reduce retransmissions due to packet loss, especially for large files. This results in shorter replication times and lower WAN transmission costs.

ACNS Software for Intelligent Content Routing

The CDM and CR make intelligent redirections based on the source-IP address of the client request and the content channel information in the URL. When content is imported into the CDM for distribution, a URL is created to point to the CDM or CR. The CDM or CR then directs the client to the best edge CE for fulfilling the request.

Content is organized into channels that are similar to file folders and can be targeted to specific CEs by geography, organizational unit, or any other logical category. Channels are sized and associated with CEs or groups of CEs via the CDM. The content-routing intelligence built into the CDM and CR analyzes the HTTP request and determines which CE is closest and available to the client's IP address and also determines if the CE has the requested content channel. If the CE has the correct content, the CDM or CR responds back to the client with an HTTP redirect to go fetch the content from that CE. A Cisco Content Services Switch (CSS) can be configured to fail over from the CDM to the CR to ensure high availability of HTTP redirections. HTTP redirection works through firewalls and Network Address Translations (NATs), preserving network security.

The key benefit of this system is that the redirections are precise so that CEs can be provisioned with different channels of content and the right content to serve their community of users, thereby optimizing local bandwidth, storage, and throughput capacity that the CEs serve.



Table 1

Key Features of ACNS Software version 4.1	
Concurrent Caching and CDN	
Transparent Caching <ul style="list-style-type: none">• All features of Cache v2.5.1 and 3.1.1:<ul style="list-style-type: none">– HTTP 1.0/1.1 Web caching, File Transfer Protocol (FTP) proxy, Secure HTTP (HTTPS) tunneling, Internet Cache Protocol (ICP), proxy mode– WCCP v2: redirection includes scalable clustering, fault tolerance (WCCP multihome router support), Catalyst 6500 hardware acceleration– Overload bypass for fault prevention– Dynamic client bypass, which prevents source IP authentication problems– Rules template for cache policies/rules– WCCP flow protection and WCCP slow start for scalable clusters– TCP tuning knobs– WCCP standby mode for easy maintenance• Web content preloading• ToS/DSCP set by cache hit or miss, URL, file type, domain to classify traffic using cache rules template	Enterprise Content Delivery Networks (ECDN) <ul style="list-style-type: none">• All features of ECDN v3.0.3:<ul style="list-style-type: none">– Enhanced scalability for higher number of CEs a CDM can support– SODA unicast spanning-tree distribution to preposition content in CEs - includes FTP distribution from CDM to CEs and specified IP addresses beyond– Digital Fountain (DF) reliable multicast replication: DF Multicast Client in CE for reliable IP multicast reception of files and rich media (up to 2 GB per file), DF Multicast Server Controlled and managed by the CDM– Channel-based distribution with bandwidth shaping and time of day control– HTTP redirection– High availability: multiple CRs and CDM can be front-ended by Cisco CSS for redundancy– HTTP delivery of static files for any file format, including PDF, Flash, Shockwave, and so on
Streaming-Media Support <ul style="list-style-type: none">• RealSystem v8 proxy: (additional license fee)<ul style="list-style-type: none">– Supports live-stream pull splitting (unicast in, multicast or unicast out)– Caches content and acts as VOD proxy to reduce congestion to the origin server– Certified by RealNetworks, Certified RealSystem Powered	Streaming-Media Support <ul style="list-style-type: none">• Concurrent streaming of Real, WMT, and HTTP• RealSystem v8 Server Subscriber: (additional license fee)<ul style="list-style-type: none">– RealNetworks RTP/RTSP delivery– Live-stream pull splitting (unicast in, multicast or unicast out)– Content pre-positioning for VOD streaming– Certified by RealNetworks, Certified RealSystem Powered• Microsoft WMT v4.0 Server and Proxy: (additional license fee)<ul style="list-style-type: none">– HTTP and Windows Media MMS delivery– Content pre-positioning for VOD streaming– Multicast Sourcing– Supports live-stream pull splitting including multicast or unicast into the CE and multicast or unicast out of CE to connected clients– Caches content and acts as VOD proxy to reduce congestion to the origin server– Certified by Microsoft
Content Access Management/Authentication <ul style="list-style-type: none">• Websense enterprise v4.3 client content filtering support on CE: requires separate Websense server from Websense• Secure Computing SmartFilter v3.0.2 server and client content filtering support: on-box CE solution that does not require separate SmartFilter server• N2H2 Internet Filtering Protocol v2.0 client content filtering support on CE: requires separate N2H2 server from N2H2• RADIUS, TACACS+ and LDAP v3 client support• Full NTLM authentication: NTLM object caching, NTLM pass-through and user authentication for WMT streaming	<ul style="list-style-type: none">• HTTP streaming delivery of MPEG and ASF• MPEG video display for retail kiosks:<ul style="list-style-type: none">– Integrated MPEG 1 and 2 decoders– NTSC/PAL TV output– Predefined play lists with multiple video clips and time-of-day setting, centrally managed by CDM– One video stream per Cisco CE 507/560 AV
Reverse Proxy Caching <ul style="list-style-type: none">• Same support as Cache v3.1.1	Upgrade from ACNS Software 4.0, Cache 2.5, Cache 3.1, and ECDN 3.0
Management <ul style="list-style-type: none">• Web GUI, SNMP v3 cache MIB, SSH v1, and Cisco IOS Software-like CLI for management• Transaction logging and log pushing• HTTP Cache transaction logs: Squid logs, Apache common logs• W3C - compliant common logs for WMT streaming• Real streaming logs	



Table 2

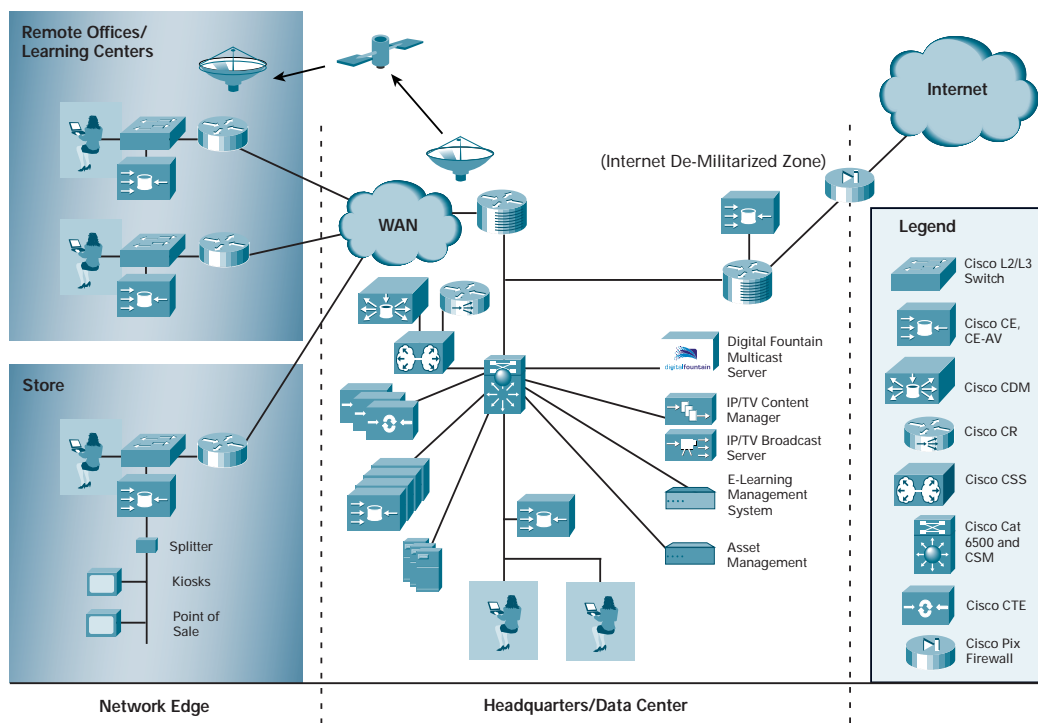
Deployment Scenarios		
Applications	Cisco Content-Networking Products (hardware)	Cisco Content-Networking Products (software)
Content Acceleration	CE, SA (option)	ACNS Software v4.1, RealSystem v8 Proxy (option), WMT Proxy (option)
Content Filtering	CE, SA (option)	ACNS Software v4.1 SmartFilter (option), Websense Server ¹ (option), N2H2 Server ² (option)
Corporate Communications and E-Learning (live)	CE, CDM, SA (option), CR + CSS (high-availability option), IP/TV 342X Broadcast Server (option), IP/TV 341X Control Server (option)	ACNS Software v4.1,WMT Server (option), RealSystem v8 Server (option)
Corporate Communications and E-Learning (on demand)	CE, CDM, SA (option), CR + CSS (high-availability option), Digital Fountain Multicast Server (satellite reliable multicast option), IP/TV 342x Broadcast Server (option)	ACNS Software v4.1, WMT Server (option), RealSystem v8 Server (option), DF Multicast Client (reliable multicast option)
Software and Collateral Distribution	CE, CDM, SA (option), CR + CSS (high-availability option), Digital Fountain Multicast Server (satellite reliable multicast option)	ACNS Software v4.1, Digital Fountain Multicast Client (reliable multicast option)
POS Advertising	CE-AV, CDM, SA (option), CR + CSS (high-availability option), Digital Fountain Multicast Server (satellite reliable multicast option)	ACNS Software v4.1, Digital Fountain Multicast Client (reliable multicast option)

1. Purchased from Websense

2. Purchased from N2H2



Figure 2 Common Deployment Scenarios for Enterprise Content Networking



Ordering Information

Where to Buy Cisco Products

Table 3 lists the part numbers for the ACNS Software products. Also visit http://www.cisco.com/public/ordering_info.shtml.

Table 3

ACNS Software Part Numbers	
Software Part Number	Descriptions
SF-507-ACNS-4.1-K9	Enterprise Application and Content Networking System Software v4.1 for Cisco CE-507
SF-560-ACNS-4.1-K9	Enterprise Application and Content-Networking System Software v4.1 for Cisco CE-560
SF-590-ACNS-4.1-K9	Enterprise Application and Content-Networking System Software v4.1 for Cisco CE-590
SF-7320-ACNS-4.1-K9	Enterprise Application and Content-Networking System Software v4.1 for Cisco CE-7320
SF-4630-ACNS-4.1-K9	Enterprise Application and Content-Networking System Software v4.1 for Cisco CDM-4630
SF-4650-ACNS-4.1-K9	Enterprise Application and Content-Networking System Software v4.1 for Cisco CDM-4650
SF-4430-ACNS-4.1-K9	Enterprise Application and Content-Networking System Software v4.1 for Cisco CR-4430
Value-Added Software Options	Descriptions



ACNS Software Part Numbers (Continued)	
SF-CE507-RNP-8.0	RealSystem v8 Proxy for Cisco CE-507
SF-CE560-RNP-8.0	RealSystem v8 Proxy for Cisco CE-560
SF-CE590-RNP-8.0	RealSystem v8 Proxy for Cisco CE-590
SF-CE7320-RNP-8.0	RealSystem v8 Proxy for Cisco CE-7320
SF-CE507-RSS-8.0	RealSystem v8 Server Subscriber for CE-507
SF-CE560-RSS-8.0	RealSystem v8 Server Subscriber for CE-560
SF-CE590-RSS-8.0	RealSystem v8 Server Subscriber for CE-590
SF-CE7320-RSS-8.0	RealSystem v8 Server Subscriber for CE-7320
SF-CE507-RCPS-8.0	Combined RealSystem v8 Proxy and Subscriber for CE-507
SF-CE560-RCPS-8.0	Combined RealSystem Real v8 Proxy and Subscriber for CE-560
SF-CE590-RCPS-8.0	Combined RealSystem v8 Proxy and Subscriber for CE-590
SF-CE7320-RCPS-8	Combined RealSystem v8 Proxy and Subscriber for CE-7320
SF-CE507-WMS-1.1	Microsoft Windows Media Server and Proxy v4 for Cisco CE-507
SF-CE560-WMS-1.1	Microsoft Windows Media Server and Proxy v4 for Cisco CE-560
SF-CE590-WMS-1.1	Microsoft Windows Media Server and Proxy v4 for Cisco CE-590
SF-CE7320-WMS-1.1	Microsoft Windows Media Server and Proxy v4 for Cisco CE-7320
SF-CE507-DFC-1.0	Digital Fountain Multicast Client for Cisco CE-507
SF-CE560-DFC-1.0	Digital Fountain Multicast Client for Cisco CE-560
SF-CE590-DFC-1.0	Digital Fountain Multicast Client for Cisco CE-590
SF-CE7320-DFC-1.0	Digital Fountain Multicast Client for Cisco CE-7320
SF-SMF12	Secure Computing SmartFilter 12 month subscription (pricing option by number of users)
SF-SMF24	Secure Computing SmartFilter 24 month subscription (pricing option by number of users)

Web Cache Communication Protocol Support

The Web Cache Communication Protocol (WCCP) is a free software feature in Cisco IOS Software that runs on the following Cisco platforms: Cisco 7x00, uBR72xx Universal Broadband Router, Cisco 6400 Node Route Processor (NRP), Catalyst 6x00 Multilayer Switch Feature Card (MSFC), Catalyst 5x00 Route Switch Module (RSM), Cisco AS 5800 Access Server, Cisco AS 5300, Cisco 4x00/M Cisco MC 3810 Multipoint Controller, and Cisco 3600, 2600, 2500, 1700, and 1600.

WCCPv2 is available in the following Cisco IOS releases: 12.2, 12.2(x)T, 12.1, 12.0(3+)T, 12.0(11+)S.

WCCPv1 is available in the following Cisco IOS releases: 12.2, 12.2(x)T, 12.1, 12.0, 12.0T, 12.0S, 11.1(18+)CC/CA, 11.2(13+)P.

Table 4 lists hardware platforms supported by the Cisco ACNS Software Family.



Table 4

Hardware Platforms Supported by Cisco ACNS Software Family	
Supported Hardware Platforms	Descriptions
CE-507	Entry-level edge delivery platform for small branch offices
CE-507AV-CDN	Cisco CE-507 plus composite baseband video and audio decoder (NTSC and PAL)
CE-560	Mid-range edge delivery platform for regional offices or larger branch offices
CE-560AV-CDN	Cisco CE-560 plus composite baseband video and audio decoder (NTSC and PAL)
CE-590	High-end data-center delivery platform
CE-590-DC	High-end data-center delivery platform, DC power
CE-7320	Ultra high-end large data-center or service-provider delivery platform
CE-7320-DC	Ultra high-end large data-center or service-provider delivery platform, DC power
CR-4430	Cisco Content Router for added redundancy to CDM
CDM-4630	Entry-level CDM for small enterprise deployments and departmental pilots
CDM-4650	High-end CDM for medium and large enterprise deployments
Expandable Storage Options ¹	Descriptions
SA6-OPT-AC	6-slot Cisco Storage Array, 6 SCSI-LVD disks, single AC power for Cisco CE-590, CE-560, and CDM-4630 ²
SA6-OPT-DC	6-slot Cisco Storage Array, 6 SCSI-LVD disks, single DC power for Cisco CE-590-DC
SA12-OPT-AC	12-slot Cisco Storage Array, 12 SCSI-LVD disks, dual AC power for Cisco CE-7320 and CDM-4650
Expandable Storage (standalone) ³	Descriptions
CE-DISK-18GB-507-X	Extra 18-GB Ultra2 SCSI disk drive for Cisco CE-507
SA6-SHF-6DISK-AC	6-slot Cisco Storage Array, 6 SCSI-LVD disks, single AC power for Cisco CE-590, CE-560, CDM-4630, and CDM-4650
SA6-SHF-6DISK-DC	6-slot Cisco Storage Array, 6 SCSI-LVD disks, single DC power for Cisco CE-590-DC
SA12-SHF-12DISK-AC	12-slot Cisco Storage Array, 12 SCSI-LVD disks, dual AC power for Cisco CE-7320 and CDM-4650
Third-Party Hardware and Software	Descriptions
DF-SRVR-4602	Digital Fountain Multicast Server with 2-Mbps output
DF-SRVR-4610	Digital Fountain Multicast Server with 10-Mbps output

1. Discounted bundled price when purchased with CE

2. Not configurable for CDM-4650 at purchase, but can be purchased standalone to work with CDM-4650

3. Purchased separately to enhance existing CEs



Hardware Specifications

Table 5 Hardware Specifications for Cisco Content Engine

Content Engines						
	CE-7320 (AC/DC)	CE-590 (AC/DC)	CE-560	CE-560AV-CDN	CE-507	CE 507AV-CDN
Network Sizing	Large Data Center or Service provider	Data Center	Regional Offices or Large Branch Offices		Small Branch Offices	
SDRAM	2 GB	1 GB	512 MB	512 MB	256 MB	256 MB
Maximum Storage	396 GB	180 GB	180 GB	144 GB	36 GB	18 GB
Internal Storage (Ultra2 SCSI)	(10) 18GB drives	(2) 36GB drives	(2) 36GB drives	(1) 36GB drives	(1-2) 18GB drive(s)	(1) 18GB drive(s)
External Storage Array support	Storage Array 12	Storage Array 6	Storage Array 6	Storage Array 6	No	No
Network Interfaces	(2) 1000BaseSX and (4) 10BaseT/100BaseTX	(1) 10BaseT/100BaseTX	(1) 10BaseT/100BaseTX	(1) 10BaseT/100BaseTX	(1) 10BaseT/100BaseTX	(1) 10BaseT/100BaseTX
Flash Memory	128 MB	16 MB	16 MB	16 MB	16 MB	16 MB
Integrated MPEG decoder	No	No	No	Yes	No	Yes
Power	(n+1) AC / (n+1) DC	AC / DC	AC	AC	AC	AC
Power and Current: AC						
Universal Input	100 to 240 VAC	100-127, 200-240 VAC	100-127, 200-240 VAC	100-127, 200-240 VAC	100-127, 200-240 VAC	100-127, 200-240 VAC
Frequency	47 to 63 Hz	50-60 Hz	50-60 Hz	50-60 Hz	50-60 Hz	50-60 Hz
Maximum power	320W each: 3 (n+1) power supplies	130W	130W	130W	130W	130W
Current	5A max each: 3 (n+1) power supplies	2A max	2A max	2A max	2A max	2A max
Power and Current: DC						
Universal Input	-40 to -60 VDC	-40 to -60 VDC	-40 to -60 VDC	-40 to -60 VDC	-40 to -60 VDC	-40 to -60 VDC
Maximum power	320W each: 3 (n+1) power supplies	130W	130W	130W	130W	130W
Current	14A each: 3 (n+1) power supplies	4.5 A	4.5 A	4.5 A	4.5 A	4.5 A
Operating Environment	CE 7320 (AC/DC)	CE 590 (AC/DC)	CE 560	CE 560	CE 507	CE 597 AV
Operational temperature	50° F to 95° F (10° C to 35° C)	32° F to 104° F (0° C to 40° C)				
Nonoperational temperature	-40° F to 149° F (-40° C to 65° C)	-13° F to 158° F (-25° C to 70° C)				
Humidity (noncondensing)	80%	95% RH, nonoperational				
Operational altitude	6,500 ft (2,000 m)	6,500 ft (2,000 m) at 104° F (40° C)				
Nonoperational altitude	35,000 ft (10,600 m)	15,000 ft (4,570 m) at 77° F (25° C)				
Operational shock	41 G, 2ms, Pulse	5G, 11ms duration, half sine shock pulse				
Non Operational shock	71 G, 2ms, Pulse	20G, 11ms duration, half sine shock pulse				
Operational vibration	0.25 G at 3 to 200 Hz	0.41 Grms from 3 to 500Hz with spectral break points of 0.0005G[squared]/Hz at 10Hz and 200Hz 5dB/octave roll off at each end.				
Non Operational vibration	0.5 G at 3 to 200 Hz	1.12 Grms from 3 - 500Hz with spectral break points of 0.0065 G[squared]/Hz at 10Hz and 100Hz 5dB/octave roll off at each end.				
Certification						
Safety	UL 1950; CSA-C22.2 No. 950, EN 60950, IEC 60950	UL 1950; CSA-C22.2 No. 950, EN 60950, IEC 60950				
EMC	FCC Part 15 Class A; EN55022 Class A; AS/NZS 3548 Class A; VCCI Class A; EN55024; EN61000-3-2; EN61000-3-3	FCC Part 15 Class A; EN55022 Class B; CISPR22 Class B; AS/NZS 3548 Class B; VCCI Class B; EN55024; EN61000-3-2; EN61000-3-3				



Table 6 Hardware Specifications for Cisco Content Router and Cisco Content Distribution Manager

	Content Router	Content Distribution Manager	
	CR-4430	CDM-4630	CDM-4650
Network Sizing		Departmental Pilots or Small Customer Premises Rollouts	Enterprise Customer Premises Rollouts
SDRAM	1 GB	256 MB	1 GB
Internal Storage (Ultra2 SCSI)	(2) 18GB drive(s)	(2) 36GB drives	(8) 18GB drives, Raid 5 Configuration
External Storage Array support	N/A	SA6	SA6, SA12
Network Interfaces	(2) 10BaseT/100BaseTX	(2) 10BaseT/100BaseTX	(2) 1000BaseSX and (4) 10BaseT/100BaseTX
Flash Memory	16 MB	16 MB	128 MB
Tape backup	No	No	Included
Power	AC	AC	(n+1) AC / (n+1) DC
Dimensions and Weight			
Rack Units	1 RU	1 RU	7 RU
Height	1.72 in. (43.7 mm)	1.72 in. (43.7 mm)	12.25 in. (30.5 cm)
Width	17.5 in. (444.5 mm)	17.5 in. (444.5 mm)	17.5 in. (44 cm)
Depth	14.1 in. (358.8 mm)	14.1 in. (358.8 mm)	28 in. (71.1 cm)
Weight	12.5 lb (5.7 kg)	12.5 lb (5.7 kg)	115 lb (52.2 kg)
Power and Current: AC			
Universal Input	100-127, 200-240 VAC	100-127, 200-240 VAC	100 to 240 VAC
Frequency	50-60 Hz	50-60 Hz	47 to 63 Hz
Maximum power	130W	130W	320W each: 3 (n+1) power supplies
Current	2A max	2A max	5A max each: 3 (n+1) power supplies
Power and Current: DC			
Universal Input	-40 to -60 VDC	-40 to -60 VDC	-40 to -60 VDC
Maximum power	130W	130W	320W each: 3 (n+1) power supplies
Current	4.5 A	4.5 A	14A each: 3 (n+1) power supplies
Operating Environment			
Operational temperature	32° F to 104° F (0° C to 40° C)		50° F to 95° F (10° C to 35° C)
Nonoperational temperature	-13° F to 158° F (-25° C to 70° C)		-40° F to 149° F (-40° C to 65° C)
Humidity (noncondensing)	95% RH, nonoperational		80%
Operational altitude	6,500 ft (2,000 m) at 104° F (40° C)		6,500 ft (2,000 m)
Nonoperational altitude	15,000 ft (4,570 m) at 77° F (25° C)		35,000 ft (10,600 m)
Operational shock	5G, 11ms duration, half sine shock pulse		41 G, 2ms, Pulse
Non Operational shock	20G, 11ms duration, half sine shock pulse		71 G, 2ms, Pulse
Operational vibration	0.41 Grms from 3 to 500Hz with spectral break points of 0.0005G[squared]/Hz at 10Hz and 200Hz 5dB/octave roll off		0.25 G at 3 to 200 Hz
Non Operational vibration	1.12 Grms from 3 - 500Hz with spectral break points of 0.0065 G[squared]/Hz at 10Hz and 100Hz 5dB/octave roll off		0.5 G at 3 to 200 Hz
Certification			
Safety	UL 1950; CSA-C22.2 No. 950, EN 60950, IEC 60950		UL 1950; CSA-C22.2 No. 950, EN 60950, IEC 60950
EMC	FCC Part 15 Class A; EN55022 Class B; CISPR22 Class B; AS/NZS 3548 Class B; VCCI Class B; EN55024; EN61000-3-2; EN61000-3-3		FCC Part 15 Class A; EN55022 Class A; AS/NZS 3548 Class A; VCCI Class A; EN55024; EN61000-3-2; EN61000-3-3



Table 7 Hardware Specifications for Cisco Storage Arrays

	Storage Array 12 (AC Only)	Storage Array 6 (DC)	Storage Array 6 (AC)
Disks (Ultra2 SCSI)	Twelve 18GB	Six 18 GB	Six 18 GB
Power Supplies	Two (n+1) AC power supplies	One or Two (n+1) DC power supplies	One or Two (n+1) AC power supplies
Cooling Fans	Three (n+1) cooling fans	Three (n+1) cooling fans	Three (n+1) cooling fans
SCSI LVD interfaces	(two) SCSI LVD interfaces	(two) SCSI LVD interfaces	(two) SCSI LVD interfaces
JBOD	Yes	Yes	Yes
Dimensions and Weight			
Rack Units	3RU	3RU	3RU
Height	5.25 in. (13.3 cm)	5.25 in. (133 mm)	5.25 in. (133 mm)
Width	17.55 in. (44.6 cm)	17.55 in. (446 mm)	17.55 in. (446 mm)
Depth	17.0 in. (43.2 cm)	15.0 in. (381 mm)	15.0 in. (381 mm)
Weight	75 lb (34 kg)	70.3 lb (31.9 kg)	70.3 lb (31.9 kg)
Power and Current: AC			
Universal Input	100 to 240 VAC	-	100 to 240 VAC
Frequency	50 to 60 Hz	-	50 to 60 Hz
Maximum Power	374W (518W peak) each	-	370W
Current	7.5A max @ 100 VAC each	-	5A max
Power and Current: DC			
Universal Input	-	(-40 to -60) VDC	-
Maximum Power	-	370W	-
Current	-	20 A	-
Operating Environment			
Operational temperature	10° C to 35° C	0° C to 40° C	0° C to 40° C
Nonoperational temperature	-40° C to 65° C	-5° C to 55° C	-5° C to 55° C
Humidity (noncondensing)	80%	90% RH, non-operational	90% RH, non-operational
Operational altitude	6,500 ft	6,500 ft (2,000 m)	6,500 ft (2,000 m)
Nonoperational altitude	35,000 ft	40,000 ft (12,192 m)	40,000 ft (12,192 m)
Operational shock	38 G, 2 msec, half-sine shock	1.5 G, 11 ms duration, half sine shock	1.5 G, 11 ms duration, half sine shock
Nonoperational shock	83 G, 2 msec, half-sine shock	40 G, 11 ms duration, half sine shock	40 G, 11 ms duration, half sine shock
Operational vibration	0.25 G at 3 to 200 Hz	5-500 Hz @ 0.25 G, sweep rate 0.5 octave/min	5-500 Hz @ 0.25 G, sweep rate 0.5 octave/min
Nonoperational vibration	0.5 G at 3 to 200 Hz	5-100 Hz @ 0.25 G, sweep rate 0.25 octave/min	5-100 Hz @ 0.25 G, sweep rate 0.25 octave/min
Certification			
Safety	EN 60950	EN 60950	EN 60950
EMC	EN55022 Class B; EN55024; EN61000-3-2; EN61000-3-3; CISPR22 Class B; AS/NZS 3548 Class B; VCCI Class B; CRF47 Part 15 Class B; BSMI; E-D900-00-5200	EN55022 Class B; EN 50082-1; ETS 300386; AS/NZS 3548 Class B; VCCI Class B	EN50082; EN55022 Class B; EN61000-3-2 Class A; EN61000-3-3;AS/NZS 3548 Class A; VCCI Class B; BSMI; E-D900-00-5201

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