Introduction

Cisco Product Quick Reference Guide
For companies of all sizes

Welcome to the February 2009 edition of the Cisco Product Quick Reference Guide. This guide presents an overview of Cisco products, services, and solutions for every part of your business.

This portable and easy-to-use reference tool, summarizes information about many of Cisco's products and services sold through our channel partners. Inside the guide, you will find a wealth of current information, including brief overviews, important features, technical specifications, part numbers, and ordering information.

This guide is designed to help our partners, resellers, distributors, and sales account teams quickly learn about and sell Cisco products, services and solutions that are right for their customers. It's also ideal for end users, networking professionals, Cisco Networking Academy members, and those studying for Cisco certification who need a broad, high-level overview.

What's New in This Edition
Now you can find products even quicker by using the new built-in tabs. Also, you can easily find *NEW* Cisco products in the At a Glance section of each chapter. These new products include, but are not limited to: Cisco WebEx meeting applications, the Cisco CRS-1 Carrier Routing System, the Cisco Catalyst 2975 Series Switch, the Cisco Aironet 1140 Series Access Point, the Cisco Adaptive Wireless Intrusion Prevention System, the Cisco Unified Workspace, the Cisco Unified Messaging Gateway, Cisco Physical Security products, the Cisco Nexus 2000 and Nexus 1000v Series Switches, the Cisco TelePresence System 500 and TelePresence System 3200, the Cisco MXE 3000 Media Experience Engine, Cisco ONS 15310-MA SDH Platform, Cisco Video Surveillance cameras, and much more.

In addition, services information by technology has expanded and is included in each chapter. Cisco and our authorized partners offer services to help you with initial planning and design for new technology deployments, as well as protecting and extending your existing investments.

For More Information

When you register in the Document Center you will have access to PDF and HTML versions of the guide that you can download at no charge.
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Cisco’s Integrated Networks Approach to Business Solutions

With the breadth and scope of products and technologies detailed in this guide, it is obvious that Cisco has solutions for every area of a customer network. However, the power of Cisco is most evident when these products are delivered in an integrated network that, along with applications and services, delivers on today’s business imperatives. To guide our customers and partners in delivering integrated network systems and solutions, Cisco engineering teams have designed, tested, and documented systems and solutions that provide a baseline to ensure faster, more reliable and more predictable customer deployments.

These system and solutions enable customers to do the following:

- Deliver network agility by lowering the risk of deploying technology solutions
- Increase the speed of technology solution deployment
- Deploy a scalable, reliable, predictable foundation on which to build business value and lower the total cost of ownership
- Ease technology solution integration in the campus, branch, and data center with higher and consistent quality assurance of product and solution
- Improve ease and success of deploying business-critical applications when enabled by Cisco network architectures
- Use Cisco Advanced Services to customize a design to meet specific business requirements

The systems and solutions designs are organized around the following:

- Network architectures—Branch office or WAN, campus and data center
- Technologies—Unified communications, mobility, security, and video
- Industries—Financial services, healthcare, retail, and manufacturing

To access the available design guidance, refer to the following:

- **Enterprise systems and solutions**—Design zone is a consolidated resource for design guides, application deployment guides, white papers, videos, and other technical reference materials.
  For more information, visit [http://www.cisco.com/go/designzone](http://www.cisco.com/go/designzone).

- **Small and medium-sized business systems and solutions**—The SMB smart designs are validated commercial solutions designed primarily for partner success. They incorporate comprehensive solution implementation best practices in an easy-to-follow format to streamline the installation process, reduce deployment risk, and increase partner profitability.
  For more information, visit [http://www.cisco.com/go/partner/smartdesigns](http://www.cisco.com/go/partner/smartdesigns).

**Cisco Capital Financing**

As a wholly owned subsidiary of Cisco, Cisco Capital is in a unique position to provide end-users with more competitive and flexible financing for Cisco solutions.

We're able to take advantage of the strong resources of our parent company to provide customers with an alternative source of affordable funds while allowing them to get the technology needed now, while preserving capital and maximizing resources.

As a trusted business partner, Cisco Capital can help end-users obtain and maintain the right Cisco solution with the most effective acquisition strategy for their business.

For more information on financing with Cisco Capital, visit [www.cisco.com/go/ciscocapital](http://www.cisco.com/go/ciscocapital).
## Product Warranty Information

All Cisco hardware and software products are covered for a minimum of 90 days. Some products have longer coverage periods. All Cisco warranties apply to the Customer or Original Owner (the individual who purchased the product for their own use), also referred to as the End User.

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• Hardware Replacement: Cisco or its service center will use commercially reasonable efforts to ship a replacement part within ten (10) working days after receipt of the RMA request. Actual delivery times may vary depending on Customer location.  
• Software Warranty: Ninety (90) days  
• Warranty provides that the media on which the Software is furnished will be free of defects in materials and workmanship under normal use and that the Software substantially conforms to its published specifications.  
• Software is provided “AS IS” and in no event does Cisco warrant that the Software is error free or that Customer will be able to operate the Software without problems or interruptions.  
• Both hardware and software warranties commence from the date of shipment to customer (and in case of resale by a Cisco reseller commencing not more than ninety (90) days after original shipment by Cisco).  
• Warranty allows guest access only to Cisco.com |
| **Cisco 90-day Limited Hardware Warranty (78-5236-vvrr)** | • Warranty Duration: Ninety (90) days  
• Hardware Replacement: Cisco or its service center will use commercially reasonable efforts to ship a replacement part within ten (10) working days after receipt of the RMA request. Actual delivery times may vary depending on Customer location.  
• Both hardware and software warranties commence from the date of shipment to customer (and in case of resale by a Cisco reseller commencing not more than ninety (90) days after original shipment by Cisco)  
• Warranty allows guest access only to Cisco.com |
| **Cisco One-year Limited Hardware Warranty (78-10747-vvrr)** | • Warranty Duration: One (1) year  
• Hardware Replacement: Cisco or its service center will use commercially reasonable efforts to ship a replacement part within ten (10) working days after receipt of the RMA request. Actual delivery times may vary depending on Customer location.  
• Both hardware and software warranties commence from the date of shipment to customer (and in case of resale by a Cisco reseller commencing not more than ninety (90) days after original shipment by Cisco).  
• Warranty allows guest access only to Cisco.com |
| **Cisco Two-Year Limited Hardware Warranty (78-16341-vvrr)** | • Warranty Duration: Two (2) years  
• Hardware Replacement: Cisco or its service center will use commercially reasonable efforts to ship a replacement part within ten (10) working days after receipt of the RMA request. Actual delivery times may vary depending on Customer location.  
• Both hardware and software warranties commence from the date of shipment to customer (and in case of resale by a Cisco reseller commencing not more than ninety (90) days after original shipment by Cisco).  
• Warranty allows guest access only to Cisco.com |
| **Cisco Limited Lifetime Hardware Warranty (78-6310-vvrr)** | • Warranty Duration: As long as the original End User continues to own or use the Product provided that fan and power supply warranty is limited to five (5) years.  
• Hardware Replacement: Cisco or its service center will use commercially reasonable efforts to ship a replacement part within ten (10) working days after receipt of the RMA request. Actual delivery times may vary depending on Customer location.  
• Both hardware and software warranties commence from the date of shipment to customer (and in case of resale by a Cisco reseller commencing not more than ninety (90) days after original shipment by Cisco).  
• Warranty allows guest access only to Cisco.com |
| **Cisco End User Software License Agreement and Limited Software Warranty (78-3621-vvrr)** | • Warranty Duration: Ninety (90) days  
• Warranty provides that the media on which the Software is furnished will be free of defects in materials and workmanship under normal use and that the Software substantially conforms to its published specifications.  
• Software is provided “AS IS” and in no event does Cisco warrant that the Software is error free or that Customer will be able to operate the Software without problems or interruptions.  
• Both hardware and software warranties commence from the date of shipment to customer (and in case of resale by a Cisco reseller commencing not more than ninety (90) days after original shipment by Cisco).  
• The End User License Agreement grants to Customer a nonexclusive and nontransferable license to use for Customer’s internal business purposes the Software and the Documentation for which the Customer has paid the required license fees.  
• Warranty allows guest access only to Cisco.com |
For More Information
For more information about Cisco Hardware and Software Product Warranties, visit:

Partner and Customer Support

Pre- and Post-Sales Contact Information

Presales—Partner/Reseller Helpline
800 553-6287 / 408 526-7208
CiscoPartner.custhelp.com

Post-sales—Technical Assistance Center (TAC)
800 553-2447 (United States)
408 526-7299 (United States)
+32 2 704 5555 (Europe)
+61 8 846 741 (Australia)
+61 8 846 741 (Asia/Pacific)

Technical Support Email Addresses

English/Spanish tac@cisco.com
Hanzi (Chinese) chinese-tac@cisco.com
Kanji (Japanese) japan-tac@cisco.com
Hangul (Korean) korea-tac@cisco.com

Service Support Center (SSC)
ssc-support@cisco.com; www.cisco.com/public/ssc/
- Pre- and post-sales quoting assistance; Contract registration and access; Tool issues
and navigation; SCC/SMS/SMSS troubleshooting help; Contract Management Assistance;
SSC registration/virtual registration

Distributor SMARTnet Teams

Westcon-Comstor Group smartnetgroup@comstor.com; 800 955 9590 ext. 5142
D&H licensesdesk@dandh.com; 800 540-1001
ScanSource ciscoservice@scansource.com; 800 844-2439
Ingram Micro myciscoteam@ingrammicro.com; 800 406-8000 ext. 75471
Tech Data teamcisco@techdata.com; 800 237-8931 ext. 77776

1. "v" and "r" suffixes of the warranty document numbers represent the revision and version numbers respectively.
2. The Cisco Limited 5-Year Hardware and 5-Year Software Warranty is available only to qualified World Wide Service Providers which Cisco defines as owners and operators of the world's collection of voice oriented Public Switched Telephone Networks (PSTNs).
### Helpful Cisco Websites

#### Partner Resources
- **Register with Cisco.com**: Register to gain partner-level access to Cisco tools and information. [tools.cisco.com/RPF/register/register.do](tools.cisco.com/RPF/register/register.do)
- **Partner Central**: Explore the tools and resources that are available to Cisco partners. [www.cisco.com/web/partners/index.html](www.cisco.com/web/partners/index.html)
- **Customized Partner Intelligence Newsletter**: Subscribe to our partner newsletter featuring information that is most relevant to each individual partner company’s particular business and technology needs. [www.cisco.com/web/partners/news/index.html](www.cisco.com/web/partners/news/index.html)
- **Partner Self-Service**: Manage company data including profile information and access privileges. [tools.cisco.com/WWChannels/LOG/login.do](tools.cisco.com/WWChannels/LOG/login.do)
- **Partner Locator**: Locate a qualified channel partner identified on the basis of specific criteria. [tools.cisco.com/WWChannels/LOCATOR/jsp/partner_locator.jsp](tools.cisco.com/WWChannels/LOCATOR/jsp/partner_locator.jsp)
- **Distributor Locator**: Locate a Cisco distributor in any country. [tools.cisco.com/WWChannels/LOCATOR/jsp/distributor_locator.jsp](tools.cisco.com/WWChannels/LOCATOR/jsp/distributor_locator.jsp)
- **Channel Account Manager (CAM) Locator**: Search for a Channels Account Manager assigned to a specific partner. [tools.cisco.com/WWChannels/CAMLDC/jsp/cam_locator.jsp](tools.cisco.com/WWChannels/CAMLDC/jsp/cam_locator.jsp)
- **Partner Help Online—Direct FAQ access**: Find answers to some commonly asked questions or open a case. [ciscopartner.custhelp.com](ciscopartner.custhelp.com)
- **Cisco SMB Smart Designs**: SMB Smart Designs are Validated Commercial Solutions that incorporate comprehensive solution implementation best practices in an easy to follow format to streamline the installation process, reduce deployment risk, and increase partner profitability. [www.cisco.com/go/partner/smartdesigns](www.cisco.com/go/partner/smartdesigns)

#### Services and Support Resources
- **Cisco Services**: Find detailed information about the services you need to protect and grow your technology investment. [www.cisco.com/go/services](www.cisco.com/go/services)
- **Cisco Support Online**: Easily access online documentation, technical tools, and resources from Cisco Support Online. [www.cisco.com/go/support](www.cisco.com/go/support)
- **Cisco Service Finder**: Watch the right support service to the right product with the Cisco Service Finder. [www.cisco-servicefinder.com/](www.cisco-servicefinder.com/)
- **RMA Service Order Tools**: Access tools and resources to streamline your service and parts logistics inquiries. [tools.cisco.com/serviceengineertools/sovservlet/sovservlet/tools.do](tools.cisco.com/serviceengineertools/sovservlet/sovservlet/tools.do)
- **Cisco Support Wiki**: Share information and collaborate in real time with users around the globe. Find the most up-to-date information on Cisco products and services. [supportwiki.cisco.com](supportwiki.cisco.com)
- **Cisco Technical Services Newsletter**: Sign up for your free subscription to our monthly newsletter with current updates on technical documentation, field notices and security alerts, as well as technical articles written by Cisco engineers and technical tips from your peers. [www.cisco.com/gp/news](www.cisco.com/gp/news)
- **Cisco Networking Professionals Connection**: Join your fellow networking professionals to discuss and share information on Cisco products and solutions. [www.cisco.com/gp/netpro](www.cisco.com/gp/netpro)

#### Trainings and Other Resources
- **Training Resources**: Cisco offers training resources, career certifications and events to help you improve your skills and keep up with new technologies. [www.cisco.com/web/learning/index.html](www.cisco.com/web/learning/index.html)
- **Cisco Networking Academy**: Offers an opportunity to pursue IT curricula through online instructor-led training and hands-on lab exercises. [www.cisco.com/web/learning/netacad/index.html](www.cisco.com/web/learning/netacad/index.html)
- **Cisco Career Certifications**: The widely respected Cisco Career Certifications and Training programs bring valuable, measurable rewards to network professionals, their managers, and the organizations that employ them. [www.cisco.com/gp/learnnetspace](www.cisco.com/gp/learnnetspace)
- **Cisco Design Zone**: Consolidated resource for design guides, application deployment guides, white papers, videos, and other technical reference materials. [www.cisco.com/go/designzone](www.cisco.com/go/designzone)
- **Cisco Marketplace**: The one stop shop for Cisco merchandise, including Cisco collateral and product documentation, logo merchandise, Cisco Press books, and software. [www.cisco.com/go/marketplace](www.cisco.com/go/marketplace)
- **Cisco Press Bookstore**: The only authorized publisher of Cisco, giving you access to industry experts and educators. Provides networking, business, and certification titles for your unique learning needs. [www.cisco.com/go/marketplace](www.cisco.com/go/marketplace)
## Routing

### Routing At a Glance

<table>
<thead>
<tr>
<th>Product</th>
<th>Features</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>INTEGRATED SERVICES ROUTERS</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| Cisco 3800 Series Integrated Services Routers | Cisco 3800 Series Integrated Services Routers offer very high performance and densities with the ability to run concurrent data, security, voice, and advanced services at wire speeds up to T3/E3.  
- These routers offer high availability and resiliency with online insertion and removal (OIR); redundant system and inline power options are available.  
- High-speed HWICs free network-module slots for other services.  
- Wireless LAN controller modules are a component of the Cisco Unified Wireless Network. | 1-3 |
| Cisco 3200 Series Rugged Integrated Services Routers | These rugged, high-performance integrated services routers are designed for use in mobile and outdoor fixed environments to support voice, video, and data applications over Ethernet, serial, fiber (select 3270 models), and multiple types of wireless interfaces.  
- Rugged enclosures provide passive conduction cooling, alleviating the need for fans.  
- The Cisco 3200 Series enclosure systems support wired interfaces, including RJ-45, asynchronous serial, synchronous serial (Cisco 3270 only), and USB (Cisco 3270 only).  
- The routers are designed to industry-standard PC/104-plus design for embedding routing applications in custom enclosure designs.  
- The routers support enhanced security, quality of service (QoS), and mobility features using Cisco IOS Software.  
- The routers support IP telephony services using Cisco Unified Communications Manager Express (UCME). | 1-8 |
| Cisco 2800 Series Integrated Services Routers | Cisco 2800 Series Integrated Services Routers are optimized for the secure, wire-speed delivery of concurrent data, voice, and video services for small and medium-sized business (SMB) and enterprise branch routing. They offer the following benefits:  
- Superior performance with multiple services enabled for 1–6 T1/E1 links.  
- Advanced security features include Stateful Firewall, intrusion prevention system (IPS), VPN, and Cisco Network Admission Control (NAC).  
- Built-in encryption uses Digital Encryption Standard (DES), Triple DES (3DES), and Advanced Encryption Standard (AES).  
- WLAN controller modules are a component of the Cisco Unified Wireless Network. | 1-10 |
| Cisco 1800 Series Integrated Services Routers | Cisco 1800 Series Integrated Services Routers, in both modular and fixed architectures, offer a wide variety of LAN and WAN options. Network interfaces on the Cisco 1841 are field-upgradable for flexibility and to accommodate future technologies. These routers offer the following benefits:  
- Fixed-configuration models offer 10/100 Ethernet, symmetric DSL (ADSL) over ISDN, ADSL over basic telephone service, or G.SHDSL WAN interfaces with integrated ISDN Basic Rate Interface (BRI) (Cisco 1801, 1802, 1803, and 1812 models) or analog modem (Cisco 1811) backup interfaces.  
- Unified Communications and integrated wireless LAN 802.11b/g is available with Cisco 1861 model. | 1-13 |
| Cisco 800 Series Router | Integrated services routers allow small offices to operate secure concurrent services, including firewall, VPNs, and wireless LANs at broadband speeds.  
- Wireless support—Optional IEEE 802.11 b/g on Cisco 850 and 870 Series  
- Enhanced security features including Stateful Inspection Firewall and hardware-assisted encryption  
- Advanced features with threat defense capabilities, Intrusion Prevention System (IPS), and quality of service (QoS) for voice over IP (VoIP) (Cisco 870 Series)  
- Demilitarized zone (DMZ), dial backup, 6-out-of-band management (Cisco 870 Series)  
- Cisco Router and Security Device Manager (SDM) GUI tool for simple and advanced configuration | 1-20 |
| **SERVICE AGGREGATION/CORE ROUTERS** | | |
| Cisco 7600 Series Routers | Cisco 7600 Series Integrated Services Routers consolidate WAN, metropolitan-area network (MAN), and LAN in a single platform. They offer the following benefits:  
- High-volume aggregation of service-enabled Ethernet  
- Ideal for service provider edge, MAN, and quadruple-play (data, voice, video, and mobile) deployments and high-end enterprise solutions.  
- Support many Cisco Catalyst 6500 Series line cards and Cisco 7500 / 7200 port adapters  
- The routers support a broad range of advanced services modules, such as IP Security (IPSec) shared port adapter (SPA), distributed denial of service (DDoS), firewall services modules (FWSMs), application control engines (ACEs) (server load balancing), and Wireless Controller Modules. | 1-23 |
## Cisco 7300 Series Routers
- Cisco 7304—This network edge router delivers high-performance IP services at optical speeds for service providers and enterprise networks.
- Cisco 7301—This broadband and WAN edge router provides intelligent services, port-adapter modularity, high performance, investment protection, and scalability in a 1-rack unit (1RU) form factor.

## Cisco 7200 Series Routers
This optimized OC-3/Gigabit Ethernet WAN edge router provides intelligent services, high modularity, high performance, investment protection, and scalability in a small form factor.
- Choice of system processors (network processing engines [NPEs]) for up to 2-Mbps performance (Cisco 7201 comes with built-in NPE).
- Built-in Gigabit Ethernet connectivity—Copper or fiber (three ports on Cisco uBR7200 Series NPE-G2 Network Processing Engine or four ports on the Cisco 7201).

## Cisco ASR 1000 Series Aggregation Services Routers
Cisco ASR 1000 Series routers offer service providers and enterprises industry-leading performance, service capabilities, reliability, and efficiencies in a compact form factor. Using an innovative Cisco QuantumFlow processor, current and future services can be instantly turned on to operate at line rate without compromising network performance or availability.
- For enterprises—Provides secure WAN aggregation services, integrated threat defense services at the Private WAN or Internet edge, or can be used for managed CPE services.
- For service providers—Provides flexible, cost-effective delivery of sophisticated any-play consumer and business services.

## Cisco XR 12000 and 12000 Series Routers
The Cisco XR 12000 and 12000 Series Routers are service provider-class multiservice-edge routers that help customers transition toward a converged IP network infrastructure. These routers offer the following benefits:
- The routers support edge-optimized line cards, maximizing the value of line-rate edge applications with 10-G uplinks while sustaining line-rate performance.
- Up to nine chassis options are available, with new power supply and blower enhancements supporting a portfolio of shared port adapters (SPAs) and SPA interface processors (SIPs).
- The routers offer service-related enhancements (Layer 3 VPN [L3VPN], L2VPN, and quality of service [QoS]) that help ensure traffic differentiation while meeting the strictest customer service-level agreements.

## Cisco CRS-1 Carrier Routing System
The Cisco CRS-1 Carrier Routing System is the industry’s only carrier routing system offering continuous system operation, unprecedented service flexibility, and system longevity.
- Powered by Cisco IOS XR Software, it is designed for always-on operation while scaling system capacity up to 92 Tbps.
- The Cisco CRS-1 marks a new era in carrier IP communications by powering the foundation for Cisco IP Next-Generation Networks (IP NGNs) today while protecting investments for decades to come.

### SERVICES
Cisco Routing Services offers a robust portfolio that can help you align IT to the needs of the business, unify network-based services, and create a flexible architecture optimized for your organization.

### Product Ordering Website
To place an order or for more part numbers, visit [http://www.cisco.com/en/US/ordering/index.shtml](http://www.cisco.com/en/US/ordering/index.shtml). This chapter only provides a small subset of all part numbers available. See the URL listed in the “For More Information” section of each product to get a complete list of part numbers.

### Cisco Routers Port Matrix

<table>
<thead>
<tr>
<th>Service Aggregation/Core Routers</th>
<th>Integrated Services Routers</th>
</tr>
</thead>
<tbody>
<tr>
<td>3800 Series</td>
<td>3200 Series</td>
</tr>
<tr>
<td>2800 Series</td>
<td>1800 Series</td>
</tr>
<tr>
<td>800 Series</td>
<td>7600 Series</td>
</tr>
<tr>
<td>7304 Series</td>
<td>7200 Series</td>
</tr>
<tr>
<td>7301 Series</td>
<td>7200/7301 Series</td>
</tr>
<tr>
<td>ASR 1000 Series</td>
<td>12000 Series</td>
</tr>
<tr>
<td>CRS-1 System</td>
<td></td>
</tr>
</tbody>
</table>

| Fixed Ports Only                | X X |
| Fixed & Modular Ports           | X X X X X X X X X |
| Modular Ports Only              | X X X X X X X X X |

<table>
<thead>
<tr>
<th>LAN Ports</th>
<th>10-Mbps Ethernet</th>
<th>10-Mbps Ethernet (fiber)</th>
<th>100-Mbps Ethernet</th>
<th>100-Mbps Ethernet (fiber)</th>
<th>10/100-Mbps Ethernet</th>
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<tr>
<td></td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
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<td>X</td>
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<td>X</td>
</tr>
<tr>
<td>Port Type</td>
<td>3000 Series</td>
<td>2300 Series</td>
<td>2800 Series</td>
<td>1800 Series</td>
<td>8800 Series</td>
</tr>
<tr>
<td>-------------------</td>
<td>-------------</td>
<td>-------------</td>
<td>-------------</td>
<td>-------------</td>
<td>-------------</td>
</tr>
<tr>
<td>ADSL, ADSL 2+, G.SHDSL</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ADSL over ISDN</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>G.SHDSL</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ISDN</td>
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<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Voice Over IP (VoIP)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Analog Voice Interfaces</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Digital Voice Interfaces</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ISDN BRI/Digital Voice Interfaces</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Integrated Switching

### Chapter 1

Cisco Routers Port Matrix      1-3
<table>
<thead>
<tr>
<th>Router</th>
<th>Memory Type</th>
<th>Slots</th>
<th>Default Memory</th>
<th>Max Memory</th>
<th>Default Configuration (Notes)</th>
</tr>
</thead>
<tbody>
<tr>
<td>815</td>
<td>Flash/DRAM</td>
<td>1</td>
<td>32 MB</td>
<td>32 MB</td>
<td>64 MB On-board</td>
</tr>
<tr>
<td>851, 857</td>
<td>Flash/DRAM</td>
<td>1</td>
<td>20 MB</td>
<td>20 MB</td>
<td>32 MB On-board</td>
</tr>
<tr>
<td>871, 876, 877, 878</td>
<td>Flash/DRAM</td>
<td>1</td>
<td>24 MB or 28 MB</td>
<td>24 MB</td>
<td>32 MB or 28 MB On-board + 4MB or 8MB Mini Flash</td>
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<tr>
<td>1800 Series</td>
<td>Flash/DRAM</td>
<td>1</td>
<td>32 MB</td>
<td>32 MB</td>
<td>128 MB</td>
</tr>
<tr>
<td>2800 Series</td>
<td>DRAM (2821)</td>
<td>1</td>
<td>256 MB</td>
<td>256 MB</td>
<td>768 MB</td>
</tr>
<tr>
<td></td>
<td>DRAM (2821)</td>
<td>1</td>
<td>256 MB</td>
<td>256 MB</td>
<td>768 MB</td>
</tr>
<tr>
<td></td>
<td>DRAM (2851)</td>
<td>1</td>
<td>256 MB</td>
<td>256 MB</td>
<td>512 MB</td>
</tr>
<tr>
<td></td>
<td>Compact Flash (2801)</td>
<td>1</td>
<td>64 MB</td>
<td>64 MB</td>
<td>Single 64 MB Compact Flash default</td>
</tr>
<tr>
<td></td>
<td>Compact Flash (2811)</td>
<td>1</td>
<td>64 MB</td>
<td>64 MB</td>
<td>Single 64 MB Compact Flash default</td>
</tr>
</tbody>
</table>

1. Cisco 3271 Router only
2. Cisco 7201 Router only
3. Supported on the Cisco 2691 only
4. Cisco 1841 only
5. Cisco 1861 only
6. Except Cisco 1841
7. Cisco 2811, 2821, and 2851 only
8. Cisco 2821 and 2851 only
9. Supported on Cisco 2851 only
The Cisco 3800 Series Integrated Services Routers constitute the flagship platform in a portfolio of next-generation routers that integrate advanced technologies, adaptive services, wireless support, and secure enterprise communications. These new routers offer the performance and reliable packet delivery necessary to efficiently deliver mission-critical network capabilities, including real-time applications such as voice over IP (VoIP), business video, and collaborative communications. Architectural enhancements include embedded security processing, significant platform performance and memory improvements, and new high-density interface types.

### Ideal for Companies that Need These Features
- Cisco 3825 Integrated Services Router—Low density (up to 88 ports), integrated 10/100 switching, up to 360W Cisco Inline Power, or Power over Ethernet (PoE); Integrated onboard security acceleration for IP Security (IPSec) for improved IPSec performance and an integral part of Cisco Self-Defending Network, which facilitate network device protection, threat defense, secure connectivity, and endpoint protection and

### Cisco 3800 Series Integrated Services Routers

<table>
<thead>
<tr>
<th>Series</th>
<th>Flash (CFM)</th>
<th>DRAM</th>
</tr>
</thead>
<tbody>
<tr>
<td>3200</td>
<td>32 MB</td>
<td>32 MB</td>
</tr>
<tr>
<td>3250</td>
<td>32 MB</td>
<td>32 MB</td>
</tr>
<tr>
<td>3270</td>
<td>64 MB</td>
<td>64 MB</td>
</tr>
<tr>
<td>DRAM</td>
<td>128 MB</td>
<td>128 MB</td>
</tr>
<tr>
<td>3250</td>
<td>128 MB</td>
<td>128 MB</td>
</tr>
<tr>
<td>3270</td>
<td>256 MB</td>
<td>256 MB</td>
</tr>
<tr>
<td>3800</td>
<td>64 MB</td>
<td>256 MB</td>
</tr>
<tr>
<td>3200</td>
<td>256 MB</td>
<td>256 MB</td>
</tr>
<tr>
<td>3250</td>
<td>256 MB</td>
<td>256 MB</td>
</tr>
<tr>
<td>3270</td>
<td>256 MB</td>
<td>256 MB</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Series</th>
<th>Flash (External Compact Flash)</th>
<th>DRAM</th>
</tr>
</thead>
<tbody>
<tr>
<td>3200</td>
<td>16 MB</td>
<td>1 GB</td>
</tr>
<tr>
<td>3250</td>
<td>256 MB</td>
<td>512 MB</td>
</tr>
<tr>
<td>3270</td>
<td>256 MB</td>
<td>512 MB</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Series</th>
<th>Flash (CFM)</th>
<th>DRAM</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASR1000</td>
<td>4 GB</td>
<td>4 GB</td>
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<tr>
<td>RP1 DRAM</td>
<td>2 GB</td>
<td>4 GB</td>
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<tr>
<td>ESP DRAM</td>
<td>2 GB</td>
<td>1 GB</td>
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<tr>
<td>ESP0 DRAM</td>
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<tr>
<td>ESP20 DRAM</td>
<td>4 GB</td>
<td>4 GB</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Series</th>
<th>Flash (Compact Flash)</th>
<th>DRAM</th>
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</thead>
<tbody>
<tr>
<td>7200</td>
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<tr>
<td>7201</td>
<td>64 MB</td>
<td>256 MB</td>
</tr>
<tr>
<td>7301</td>
<td>64 MB</td>
<td>512 MB</td>
</tr>
<tr>
<td>DRAM</td>
<td>512 MB</td>
<td>1 GB</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Series</th>
<th>Flash (CFM)</th>
<th>DRAM</th>
</tr>
</thead>
<tbody>
<tr>
<td>7304 NPE-1</td>
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<td>256 MB</td>
</tr>
<tr>
<td>7304 NPE-2</td>
<td>256 MB</td>
<td>256 MB</td>
</tr>
<tr>
<td>7304 NPE-3</td>
<td>256 MB</td>
<td>256 MB</td>
</tr>
<tr>
<td>DRAM</td>
<td>1 GB</td>
<td>1 GB</td>
</tr>
<tr>
<td>7600</td>
<td>16 MB</td>
<td>512 MB</td>
</tr>
<tr>
<td>DRAM (MSFC2 or MSFC3)</td>
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</tr>
<tr>
<td>DRAM (Sup720-3B)</td>
<td>512 MB</td>
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<td>DRAM (Sup720-3BXL)</td>
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<td>DRAM (RP)</td>
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<td>DRAM (MSC)</td>
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<td>1 GB</td>
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<td>XR 12000/12000</td>
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<tr>
<td>12000</td>
<td>2 GB</td>
<td>4 GB</td>
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<tr>
<td>DRAM (Line Cards)</td>
<td>4 GB</td>
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</tr>
<tr>
<td>CRs-1</td>
<td>1 GB</td>
<td>4 GB</td>
</tr>
<tr>
<td>DRAM (PRP-2)</td>
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<td>4 GB</td>
</tr>
<tr>
<td>DRAM (MSC)</td>
<td>2 GB</td>
<td>2 GB</td>
</tr>
</tbody>
</table>

1. Advanced IP Services image includes 28MB flash.
Cisco 3800 Series Integrated Services Routers are ideal for medium- to large-sized branch offices and businesses that can support concurrent data, security, voice, and advanced services at wire speed up to one-half T3/E3 rates.

• Cisco 3845 Integrated Services Router—Same features as above plus higher availability and resiliency (such as redundant system and inline power, online-insertion-and-removable (OIR) components, and field-replaceable components such as the CPU motherboard and fan assembly). Cisco 3845 Integrated Services Routers are ideal for medium- to large-sized branch offices and businesses, providing very high performance and densities for concurrent data, security, voice, and advanced services with the ability to run at wire speed up to T3/E3.

Key Features

• Cisco IOS Firewall provides stateful, application-based filtering (context-based access control), per-user authentication and authorization, real-time alerts, a transparent firewall, and an IPv6 firewall.
• The Cisco 3845 Integrated Services Routers offer VPN services, including Data Encryption Standard (DES), Triple DES (3DES), and Advanced Encryption Standard (AES) 128, 192, and 256 cryptology support. They support embedded hardware-based VPN acceleration on the motherboard, and (optional) higher-performance AIM-based security acceleration with Layer 3 compression. The routers support up to 1800 tunnels with the VPN module. Cisco Easy VPN (remote and server), and Dynamic Multipoint VPN (DMVPN).
• The 3800 Series routers support Multiprotocol Label Switching (MPLS) VPNs. Specific provider-edge capabilities include Virtual Route Forwarding (VRF) firewall and VRF IP Security (IPsec).
• Onboard universal-serial-bus (USB) 11 port[s] offer future support for secure token and flash memory.
• More than 700 intrusion-prevention-system (IPS) signatures are supported in Cisco IOS Software, with the ability to load and enable selected IPS signatures. More than 1000 IPS signatures are available with the optional high-performance intrusion-detection-system (IDS) network module.
• Onboard URL filtering with an optional content-engine network module is provided. Local URL filtering occurs in Cisco IOS Software based on the external server.
• Cisco Router and Security Device Manager (SDM) comes standard on all Cisco 3800 Series Integrated Services Routers.
• Integrated IEEE 802.11 a/b/g standalone access-point high-speed WAN interface cards (HWICs) provide wireless support.
• Wireless LAN (WLAN) controller modules are a component of the Cisco Unified Wireless Network.
• The routers support IP phones through an optional integrated power supply with inline power. Standard 802.3af support derives from 360W of inline power.
• The routers offer analog voice support for up to 88 foreign-exchange-station (FXS) and 56 foreign-exchange-office (FXO) ports and digital voice support for up to 720 calls. The motherboard has 4 packet-voice-DSP-module (PVDM) slots. Finally, the routers support local conferencing and transcoding.
• Cisco Communications Manager Express software on these routers supports up to 240 phones; Cisco Survivable Remote Site Telephony (SRST) supports up to 720 phones.
• The routers have up to 120 mailboxes using a Cisco Unity Express network module.
• Voice interfaces support FXS, FXO, Direct Inward Dial (DID), Ear & Mouth (E&M), Centralized Automated Message Accounting (CAMA), Basic Rate Interface (BRI), T1, E1, J1, Primary Rate Interface (PRI), O.SIG, and channel associated signaling (CAS).

Specifications

<table>
<thead>
<tr>
<th>Feature</th>
<th>Cisco 3825</th>
<th>Cisco 3845</th>
</tr>
</thead>
<tbody>
<tr>
<td>Network Module Slots</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>Advanced Integration Module (AIM) Slots</td>
<td>2</td>
<td>Same As Cisco 3825</td>
</tr>
<tr>
<td>High speed WAN Interface Card (HWIC) Slots</td>
<td>4</td>
<td>Same As Cisco 3825</td>
</tr>
<tr>
<td>1G/100/1000 GE Ports</td>
<td>2</td>
<td>Same As Cisco 3825</td>
</tr>
<tr>
<td>Small Form Pluggable (SFP) ports</td>
<td>1</td>
<td>Same As Cisco 3825</td>
</tr>
<tr>
<td>Onboard PVDM slots</td>
<td>4</td>
<td>Same As Cisco 3825</td>
</tr>
<tr>
<td>WAN Network Modules</td>
<td>Yes</td>
<td>Same As Cisco 3825</td>
</tr>
<tr>
<td>ATM AIM Modules</td>
<td>Yes</td>
<td>Same As Cisco 3825</td>
</tr>
<tr>
<td>Voice/Fax Network Modules</td>
<td>Yes</td>
<td>Same As Cisco 3825</td>
</tr>
<tr>
<td>WAN Interface Card (WIC) Modules</td>
<td>Yes</td>
<td>Same As Cisco 3825</td>
</tr>
<tr>
<td>Multiflex Voice/WAN Interface Cards</td>
<td>Yes</td>
<td>Same As Cisco 3825</td>
</tr>
<tr>
<td>Voice Interface Card (VIC) Modules</td>
<td>Yes</td>
<td>Same As Cisco 3825</td>
</tr>
<tr>
<td>Modem Modules</td>
<td>Yes</td>
<td>Same As Cisco 3825</td>
</tr>
<tr>
<td>EtherSwitch Modules</td>
<td>Yes, HWIC and Network Modules</td>
<td>Same As Cisco 3825</td>
</tr>
</tbody>
</table>
## Chapter 1

### Cisco 3800 Series Integrated Services Routers

**Performance with Services**
- Up to 14 T1/E1s
- Up to T3

**VPN/Security Advanced Integration Modules (AIM)**
- Yes, AIM-VPN/EPII-PLUS

**Content Engine Network Modules**
- Yes
- Same as Cisco 3825

**Flash Memory (External)**
- 64 MB (default) - 256 MB (optional)
- Same as Cisco 3825

**DRAM Memory**
- 256 MB (default) - 1024 MB (max)
- Same as Cisco 3825

**Power Supply**
- AC, DC, AC + POE, DC, external redundant AC
- AC, DC, internal redundant AC + POE

**Dimensions (H x W x D)**
- 3.5 x 17 x 14.7 in.
- 5.25 x 17.25 x 16 in.

### Selected Part Numbers and Ordering Information

#### Cisco 3800 Series Integrated Services Routers

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CISCO3825</td>
<td>Cisco 3825 Integrated Services Router with 2 Gigabit Ethernet, 1 SFP, 2 NME, 4 HWIC, 2 AIM, Cisco IOS IP Base software, and AC power</td>
</tr>
<tr>
<td>CISCO3825-AC-IP</td>
<td>Same as Cisco 3825</td>
</tr>
<tr>
<td>CISCO3825-DC</td>
<td>Same as Cisco 3825</td>
</tr>
<tr>
<td>CISCO3845</td>
<td>Cisco 3845 Integrated Services Router with 2 Gigabit Ethernet, 1 SFP, 4 NME, 4 HWIC, 2 AIM, Cisco IOS IP Base software, and DC power</td>
</tr>
<tr>
<td>CISCO3845-AC-IP</td>
<td>Same as Cisco 3845</td>
</tr>
<tr>
<td>CISCO3845-DC</td>
<td>Same as Cisco 3845</td>
</tr>
</tbody>
</table>

#### Cisco 3800 Series Secure Voice Bundles

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CISCO3845-V3PN/K9</td>
<td>Cisco 3845 V3PN Bundle with IOS Adv IP Services, PVDM2-64, AIM-VPN/EPII-PLUS, FL-CCME (240 users), 64 MB Flash/256 MB DRAM</td>
</tr>
<tr>
<td>CISCO3825-V3PN/K9</td>
<td>Cisco 3825 V3PN Bundle with IOS Adv IP Services, PVDM2-64, AIM-VPN/EPII-PLUS, FL-CCME (168 users), 128 MB Flash/512 MB DRAM</td>
</tr>
<tr>
<td>C3845-VSEC/K9</td>
<td>Cisco 3845 Voice Security Bundle, PVDM2-64, Adv IP Services, 128 MB Flash/512 MB DRAM</td>
</tr>
<tr>
<td>C3845-VSEC-CCME/K9</td>
<td>Cisco 3845 Voice Security Bundle, PVDM2-64, FL-CCME (240 users), 64 MB Flash/256 MB DRAM</td>
</tr>
<tr>
<td>C3845-VSEC-CCME/K9</td>
<td>Cisco 3845 Voice Security Bundle, PVDM2-64, FL-CCME (168 users), 128 MB Flash/512 MB DRAM</td>
</tr>
<tr>
<td>C3845-VSEC-SRST/K9</td>
<td>Cisco 3845 Voice Security Bundle, PVDM2-64, FL-SRST (240 users), 64 MB Flash/256 MB DRAM</td>
</tr>
<tr>
<td>C3845-VSEC-SRST/K9</td>
<td>Cisco 3845 Voice Security Bundle, PVDM2-64, FL-SRST (168 users), 128 MB Flash/512 MB DRAM</td>
</tr>
</tbody>
</table>

#### Cisco 3800 Series Security Bundles

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CISCO3845-SEC/K9</td>
<td>Cisco 3845 Security Bundle with IOS Adv Security, 64 MB Flash/256 MB DRAM</td>
</tr>
<tr>
<td>C3845-SEC/K9</td>
<td>Cisco 3845 Security Bundle with IOS Adv Security, 64 MB Flash/256 MB DRAM</td>
</tr>
</tbody>
</table>

#### Cisco 3800 Series Voice Bundles

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CISCO3845-V/K9</td>
<td>Cisco 3845 Voice Bundle with IOS SP Services, PVDM2-64, 64 MB Flash/256 MB DRAM</td>
</tr>
<tr>
<td>CISCO3845-SRST/K9</td>
<td>Cisco 3845 Voice Bundle with IOS SP Services, PVDM2-64, FL-SRST (240 users), 64 MB Flash/256 MB DRAM</td>
</tr>
<tr>
<td>C3845-CCME/K9</td>
<td>Cisco 3845 Voice Bundle with IOS SP Services, PVDM2-64, FL-CCME (240 users), 64 MB Flash/256 MB DRAM</td>
</tr>
<tr>
<td>C3845-5/K9</td>
<td>Cisco 3845 Voice Bundle with IOS SP Services, PVDM2-64, 64 MB Flash/256 MB DRAM</td>
</tr>
<tr>
<td>C3845-3/K9</td>
<td>Cisco 3845 Voice Bundle with IOS SP Services, PVDM2-64, FL-SRST (168 users), 64 MB Flash/256 MB DRAM</td>
</tr>
</tbody>
</table>
Cisco 3200 Series Rugged Integrated Services Routers

The Cisco 3200 Rugged ISR is a rugged router that uses Cisco IOS Software to provide access, mobility, and interoperability across multiple wired and wireless networks. The Cisco 3200 Rugged Router has a flexible, compact form factor that is ruggedized to withstand harsh environments. It offers highly secure data, voice, and video communications in mobile and outdoor embedded networks. For mobile applications, standards-based Mobile IP delivers transparent roaming across multiple wireless networks capable of covering wide geographic areas. The components can also be placed in customized enclosures or existing outdoor infrastructure to connect proprietary network devices with an IP network.

Ideal for Companies that Need These Features

- Rugged routers for outdoors or inside vehicles where deployments require extra ruggedness to withstand high temperature ranges, shock and vibration, and moist or dusty environments
- Utility rugged router for IP enabling the electric power substations
- Embedded routers for use with Cisco or third-party custom enclosures
- Mobile applications where customers need transparent connectivity across multiple wireless networks

Key Features

- The hardware architecture of the Cisco 3200 Rugged Router can be embedded in different system designs.
- The Cisco 3200 Rugged Router allows for designs in unique environments for mobile or fixed outdoor networks.
- PC/104-Plus architecture allows for the use of off-the-shelf third-party component cards with the Cisco 3230 Rugged Router.
- Extended temperature ranges of -40ºF to +185ºF (–40 to +85ºC) are possible. (Temperature ranges for completed solutions depend on hardware configuration variables, including enclosures and third-party component cards.)
- The Cisco 3200 Rugged Router meets MIL-STD-810F and Society of Automotive Engineers (SAE) standards.
- The routers provide flexibility for deployment in many different environments where space, heat dissipation, and low power consumption are critical factors.
- The router design allows for added functions by stacking Cisco interface or third-party component cards into a hardware configuration.
- Third-party cards can give added use to provide various LAN or WAN functions, including security, computing, global positioning system (GPS), and cellular connectivity.
- Multiple LAN and WAN devices can be connected to standard 10/100 Ethernet or serial interfaces.
- IEEE 802.11a/b/g access points or bridge modes can be integrated with the rugged router.
- Integrated 2.4, 4.9, and 5-GHz wireless are configured as a bridge for WAN connectivity or as access points for wireless LAN connectivity.
- Cisco Unified Communications Manager Express supports up to 24 phones (Cisco 3230 and 3250 models) and 48 phones (Cisco 3270) for IP telephony services.
- Mobile IP offers transparent roaming for mobile networks, establishing a transparent Internet connection regardless of location or movement.
- IOS Firewall protection provides perimeter security when using public networks.
- Triple Digital Encryption Standard (3DES) and Advanced Encryption Standard (AES) encryption provide for highly secure VPNs when transmitting and receiving data over public networks.
- Intrusion detection monitors potential malicious activity within the network.

Specifications

<table>
<thead>
<tr>
<th>Feature</th>
<th>Cisco 3230</th>
<th>Cisco 3270</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fixed USB 2.0 ports</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>Onboard Fast Ethernet (FE) ports</td>
<td>1 - 10/100</td>
<td>2 – 10/100</td>
</tr>
<tr>
<td>Onboard Copper Gigabit Ethernet Ports</td>
<td>N/A</td>
<td>2 – 10/100/1000 on C3271MARC-TP</td>
</tr>
<tr>
<td>Onboard Fiber Optic ports</td>
<td>N/A</td>
<td>1 – C3271MARC-FO-TP</td>
</tr>
</tbody>
</table>

For More Information

For more information about the Cisco 3800 Series Integrated Services Routers, visit: http://www.cisco.com/go/3800.
### SFP
- **Cisco 3200 Series Rugged Integrated Services Routers**
- | Part Number | Description |
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>N/A</td>
<td>LX = Single Mode 1000</td>
</tr>
<tr>
<td></td>
<td>SX = Multi-mode 1000</td>
</tr>
</tbody>
</table>

### Enclosure Slots
- | Description | Value |
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>N/A</td>
<td>Yes</td>
</tr>
</tbody>
</table>

### Integrated hardware-based encryption
- | Description | Value |
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>N/A</td>
<td>Yes</td>
</tr>
</tbody>
</table>

### Console port
- | Description | Value |
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1-CE9</td>
<td>1-RJ45</td>
</tr>
</tbody>
</table>

### Auxiliary port
- | Description | Value |
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

### Minimum Cisco IOS Software release
- | Description | Value |
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>12.3(11)T</td>
<td>12.4(6)XE</td>
</tr>
</tbody>
</table>

### Rack mounting
- | Description | Value |
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td>No</td>
</tr>
</tbody>
</table>

### Wall mounting
- | Description | Value |
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>

### DC input current
- | Description | Value |
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>9-32VDC</td>
<td>9-32VDC</td>
</tr>
</tbody>
</table>

### AC input current
- | Description | Value |
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>No AC Power Option available</td>
<td>No AC Power Option available</td>
</tr>
</tbody>
</table>

### Operating temp (Enclosure systems)
- | Description | Value |
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>-40ºF to 165ºF; (-40ºC to 74ºC)</td>
<td>-40ºF to 165ºF; (-40ºC to 74ºC)</td>
</tr>
</tbody>
</table>

### Operating humidity
- | Description | Value |
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>95 percent (± 4 percent) relative humidity</td>
<td>95 percent (± 4 percent) relative humidity</td>
</tr>
</tbody>
</table>

### Non operating temp
- | Description | Value |
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>-40ºF to 185ºF; (-40ºC to 85ºC)</td>
<td>-40ºF to 185ºF; (-40ºC to 85ºC)</td>
</tr>
</tbody>
</table>

### Dimensions (H x W x D)
- | Description | Value |
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Height: 14.99 cm (5.89 in.)</td>
<td>Width: 17.27 cm (6.82 in.)</td>
</tr>
<tr>
<td>Depth: 20.32 cm (7.80 in.)</td>
<td>Depth: 41.66 cm (16.4 in.)</td>
</tr>
</tbody>
</table>

### Weight (configured)
- | Description | Value |
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>14.5 lbs (6.54 kg) (includes enclosure, MARC, SMIC, FESMIC, Mobile Router Power Card [MRPC], and 2 WMICs)</td>
<td>18.9 lb (8.6 kg) (enclosure with Cisco 3270 router card, MRPC, SMIC, FESMIC, and 3 WMICs)</td>
</tr>
</tbody>
</table>

### EMC
- | Description | Value |
  |-------------|-------|

### Immunity
- | Description | Value |
  |-------------|-------|

### Selected Part Numbers and Ordering Information

#### Cisco 3200 Rugged Enclosure Bundles
- **C3230ENC-W0-K9**
  - Cisco 3230 bundle w/ rugged enclosure fully assembled with no WMICs
- **C3230ENC-1WMC-K9**
  - Cisco 3230 bundle w/ rugged enclosure fully assembled with (1) WMIC (WMIC is selectable option)
- **C3230ENC-2WMC-K9**
  - Cisco 3230 bundle w/ rugged enclosure fully assembled with (2) WMICs (WMICs are selectable options)
- **C3230ENC-3WMC-K9**
  - Cisco 3230 bundle w/ rugged enclosure fully assembled with (3) WMICs (WMICs are selectable options)
- **C3230ENC-W-4G-K9**
  - Cisco 3230 bundle w/ rugged enclosure fully assembled with (1) 4.9GHz WMIC for U.S.
- **C3230ENC-J-4G-K9**
  - Cisco 3230 bundle w/ rugged enclosure fully assembled with (1) 4.9GHz WMIC for Japan
- **C3230ENC-2W-4K9**
  - Cisco 3230 bundle w/ rugged enclosure fully assembled with (2) 2.4GHz WMICs & (1) 4.9GHz WMIC for U.S.
- **C3230ENC-2W-4G-K9**
  - Cisco 3230 bundle w/ rugged enclosure fully assembled with (2) 2.4GHz WMICs for most of Europe
- **C3230ENC-3WMIC-K9**
  - Cisco 3230 bundle w/ rugged enclosure fully assembled with (3) 4GHz WMICs for most of Europe
- **C3230ENC-2WJ-K9**
  - Cisco 3230 bundle w/ rugged enclosure fully assembled with (2) 4GHz WMICs for Japan
- **C3230ENC-2WJ-10-K9**
  - Cisco 3230 bundle w/ rugged enclosure fully assembled with (2) 4GHz WMICs for Japan (10mW)
- **C3230ENC-2WJ-10-K9**
  - Cisco 3230 bundle w/ enclosure, Fiber & 2WMIC
- **C3230ENC-2WJ-10-K9**
  - Cisco 3230 bundle w/ enclosure, Fiber & 2WMIC
Cisco 2800 Series Integrated Services Routers

For more information about the Cisco 3200 Series Rugged Integrated Services Routers, visit: http://www.cisco.com/go/3200.

Cisco 2800 Series Integrated Services Routers

The Cisco 2800 Series Integrated Services Routers offer performance improvements, increased security and voice performance, wireless support new embedded service options, and increased slot performance and density. These routers maintain support for most existing interface cards and modules available for the Cisco 1700 and 2600 Series Routers. Comprising four platforms (the Cisco 2801, Cisco 2811, Cisco 2821, and Cisco 2851 Integrated Services Routers), the Cisco 2800 Series features the ability to deliver multiple, high-quality, simultaneous services at wire speed at up to multiple T1, E1, and xDSL connections.

Ideal for Companies that Need These Features

- Performance and densities for concurrent data, security, voice, and advanced services up to multiple T1, E1, and xDSL connections.
- VPN connections (or plan to migrate to them over time)
- Integrated security services that enable network device protection, threat defense, secure connectivity, and endpoint protection and control
- Secure integrated call processing, voicemail, flexible telephony interfaces, redundancy for centralized call processing, or robust digital-signal-processor (DSP) support, including local conferencing and transcoding
- Wireless support through integrated IEEE 802.11 a/b/g standalone access-point high-speed WAN interface cards (HWICs)
- Wireless LAN controller modules (components of the Cisco Unified Wireless Network)
- Integrated Layer 2 switching capability in densities from 4 to 48 ports and the ability to use Cisco StackWise connectivity

Key Features

- Cisco 2800 Integrated Services Routers offer a modular architecture; a wide variety of LAN and WAN options are available. Network interfaces can be upgraded in the field to accommodate future technologies.
- Several types of slots are available to add connectivity and services in the future on an "integrate-as-you-grow" basis.
- The routers provide embedded hardware cryptography accelerators, which when combined with an optional Cisco IOS Software upgrade facilitate WAN link security and VPN services.
- Integrated dual Fast Ethernet or Gigabit Ethernet ports provide two 10/100 Ethernet ports on the Cisco 2801 and 2811 models and two 10/100/1000 Ethernet ports on the Cisco 2821 and 2851 models.
- The routers offer high-speed WAN interface card (HWIC) slots with enhanced functions, including wireless LAN (WLAN) access points, dual advanced-integration-module (AIM) slots, and packet-voice-DSP-module (PVDM) slots on the motherboard.
- IP telephony solutions facilitate an all-in-one voice-over-IP (VoIP) solution with Cisco Unified Communications Manager Express, telephony interfaces, and Cisco Unity Express for voicemail and Automated-Attendant functions.
• Onboard hardware-based encryption for Digital Encryption Standard (DES), Triple DES (3DES), and Advanced Encryption Standard (AES) and onboard slots for PVDMs all include high-speed Ethernet interfaces.
• The routers support an optional dedicated security AIM.
• Easy VPN eases administration and management of point-to-point VPNs by pushing new security policies from a single headend to remote sites.
• Digital-signal-processor (DSP) modules deliver support for analog and digital voice, conferencing, transcoding, and secure Real-Time Transport Protocol (RTF) applications.
• Cisco Network Admission Control (NAC), a Cisco Self-Defending Network initiative, seeks to dramatically improve the ability of networks to identify, prevent, and adapt to threats by allowing network access only to compliant and trusted endpoint devices.
• The routers offer an optional integrated power supply for distribution of Power over Ethernet (PoE).
• The routers provide real-time clock support.

### Specifications

<table>
<thead>
<tr>
<th>Feature</th>
<th>Cisco 2801</th>
<th>Cisco 2811</th>
<th>Cisco 2821</th>
<th>Cisco 2851</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fixed USB 1.1 ports</td>
<td>1</td>
<td>2</td>
<td>Same As Cisco 2811</td>
<td>Same As Cisco 2811</td>
</tr>
<tr>
<td>Onboard LAN ports</td>
<td>2 - 10/100</td>
<td>Same As Cisco 2811</td>
<td>2 - 10/100/1000</td>
<td>Same As Cisco 2821</td>
</tr>
<tr>
<td>Onboard AIM (internal) slot</td>
<td>2</td>
<td>Same As Cisco 2801</td>
<td>Same As Cisco 2801</td>
<td>Same As Cisco 2801</td>
</tr>
<tr>
<td>Interface card slots</td>
<td>4 slots, 2 slots support HWIC, VIC, or VWIC type modules</td>
<td>4 slots, each slot can support HWIC, VIC, or VWIC type modules</td>
<td>1 slot supports VIC, or VWIC type modules</td>
<td>1 slot supports VIC or VWIC type modules</td>
</tr>
<tr>
<td>Network-module slot</td>
<td>No</td>
<td>1 slot supports NM and NME type modules</td>
<td>1 slot supports NM, NME, and NME-X type modules</td>
<td>1 slot supports NM, NME, NME-X, and NME-XD type modules</td>
</tr>
<tr>
<td>Extension Voice Module Slot</td>
<td>0</td>
<td>Same As Cisco 2801</td>
<td>1</td>
<td>Same As Cisco 2821</td>
</tr>
<tr>
<td>PVDM (DSP) slots on motherboard</td>
<td>2</td>
<td>Same As Cisco 2801</td>
<td>3</td>
<td>Same As Cisco 2821</td>
</tr>
<tr>
<td>Integrated hardware-based encryption</td>
<td>Yes</td>
<td>Same As Cisco 2801</td>
<td>Same As Cisco 2801</td>
<td>Same As Cisco 2801</td>
</tr>
<tr>
<td>Optional PoE</td>
<td>Yes, requires AC-IP system power supply</td>
<td>Same As Cisco 2801</td>
<td>Same As Cisco 2801</td>
<td>Same As Cisco 2801</td>
</tr>
<tr>
<td>Console port (up to 115.2 kbps)</td>
<td>1</td>
<td>Same As Cisco 2801</td>
<td>Same As Cisco 2801</td>
<td>Same As Cisco 2801</td>
</tr>
<tr>
<td>Auxiliary port (up to 115.2 kbps)</td>
<td>1</td>
<td>Same As Cisco 2801</td>
<td>Same As Cisco 2801</td>
<td>Same As Cisco 2801</td>
</tr>
<tr>
<td>Minimum Cisco IOS Software release</td>
<td>12.3(6)4</td>
<td>Same As Cisco 2801</td>
<td>Same As Cisco 2801</td>
<td>Same As Cisco 2801</td>
</tr>
<tr>
<td>Rack mounting</td>
<td>Yes, 19-inch</td>
<td>Yes, 19- and 23-inch options</td>
<td>Yes As Cisco 2811</td>
<td>Same As Cisco 2811</td>
</tr>
<tr>
<td>Wall mounting</td>
<td>No</td>
<td>Yes</td>
<td>Same As Cisco 2801</td>
<td>Same As Cisco 2801</td>
</tr>
<tr>
<td>AC input voltage</td>
<td>100 to 240 VAC</td>
<td>Same As Cisco 2801</td>
<td>Same As Cisco 2801</td>
<td>Same As Cisco 2801</td>
</tr>
<tr>
<td>AC input frequency</td>
<td>47/63 Hz</td>
<td>Same As Cisco 2801</td>
<td>Same As Cisco 2801</td>
<td>Same As Cisco 2801</td>
</tr>
<tr>
<td>AC input current</td>
<td>2A (110V), 1A (230V)</td>
<td>Same As Cisco 2801</td>
<td>3A (110V), 2A (230V)</td>
<td>Same As Cisco 2821</td>
</tr>
<tr>
<td>AC input surge current</td>
<td>50A maximum, one cycle (-48V power included)</td>
<td>Same As Cisco 2801</td>
<td>Same As Cisco 2801</td>
<td>Same As Cisco 2801</td>
</tr>
<tr>
<td>AC-IP max in-line power distribution</td>
<td>120W</td>
<td>160W</td>
<td>240W</td>
<td>360W</td>
</tr>
<tr>
<td>AC-IP input current</td>
<td>4A (110V), 2A (230V)</td>
<td>Same As Cisco 2801</td>
<td>8A (110V), 4A (230V)</td>
<td>Same As Cisco 2821</td>
</tr>
<tr>
<td>AC-IP input surge current</td>
<td>50A maximum, one cycle (-48V power included)</td>
<td>Same As Cisco 2801</td>
<td>Same As Cisco 2801</td>
<td>Same As Cisco 2801</td>
</tr>
<tr>
<td>DC input voltage</td>
<td>No DC Power Option available</td>
<td>24 to 60 VDC, autorunning positive or negative</td>
<td>Same As Cisco 2811</td>
<td>Same As Cisco 2811</td>
</tr>
</tbody>
</table>
### DC input current

<table>
<thead>
<tr>
<th>DC input current</th>
<th>No DC Power Option available</th>
<th>8A (24V)</th>
<th>12A (24V)</th>
<th>Same As Cisco 2821</th>
</tr>
</thead>
<tbody>
<tr>
<td>Startup current</td>
<td>5A&lt;10 ms</td>
<td>5A&lt;10 ms</td>
<td>50A&lt;10 ms</td>
<td></td>
</tr>
</tbody>
</table>

### Power dissipation

**AC without PoE support**

<table>
<thead>
<tr>
<th>Power dissipation</th>
<th>150W (611 BTU/hr)</th>
<th>170W (680 BTU/hr)</th>
<th>280W (995 BTU/hr)</th>
<th>Same As Cisco 2821</th>
</tr>
</thead>
</table>

**AC with PoE-IP phones**

<table>
<thead>
<tr>
<th>Power dissipation</th>
<th>180W (612 BTU/hr)</th>
<th>190W (646 BTU/hr)</th>
<th>240W (819 BTU/hr)</th>
<th>Same As Cisco 2821</th>
</tr>
</thead>
</table>

**DC**

<table>
<thead>
<tr>
<th>Power dissipation</th>
<th>Same As Cisco 2821</th>
</tr>
</thead>
</table>

### Power dissipation—AC with PoE-IP phones

<table>
<thead>
<tr>
<th>Power dissipation</th>
<th>180W (612 BTU/hr)</th>
<th>190W (646 BTU/hr)</th>
<th>240W (819 BTU/hr)</th>
<th>Same As Cisco 2821</th>
</tr>
</thead>
</table>

### Redundant Power Support (RPS)

<table>
<thead>
<tr>
<th>Redundant Power Support (RPS)</th>
<th>No External only, connector for RPS provided by default</th>
<th>Same As Cisco 2811</th>
<th>Same As Cisco 2821</th>
</tr>
</thead>
</table>

### Recommended RPS unit

<table>
<thead>
<tr>
<th>Recommended RPS unit</th>
<th>No RPS option</th>
<th>Cisco RPS-675 Redundant Power System</th>
<th>Same As Cisco 2811</th>
<th>Same As Cisco 2821</th>
</tr>
</thead>
</table>

### Operating temp

<table>
<thead>
<tr>
<th>Operating temp</th>
<th>32 to 104°F (0 to 40°C)</th>
<th>Same As Cisco 2801</th>
<th>Same As Cisco 2801</th>
<th>Same As Cisco 2801</th>
</tr>
</thead>
</table>

### Operating humidity

<table>
<thead>
<tr>
<th>Operating humidity</th>
<th>10 to 95% non-condensing</th>
<th>Same As Cisco 2811</th>
<th>Same As Cisco 2811</th>
<th>Same As Cisco 2811</th>
</tr>
</thead>
</table>

### Non operating temp

<table>
<thead>
<tr>
<th>Non operating temp</th>
<th>N/A</th>
<th>Same As Cisco 2801</th>
<th>Same As Cisco 2801</th>
<th>Same As Cisco 2801</th>
</tr>
</thead>
</table>

### Dimensions

<table>
<thead>
<tr>
<th>Dimensions (H x W x D)</th>
<th>1.72 x 1.75 x 16.6 in. (43.7 x 445 x 419 mm)</th>
<th>3.5 x 1.725 x 16.4 in. (88.9 x 438.2 x 416.6 mm)</th>
<th>Same As Cisco 2821</th>
</tr>
</thead>
</table>

### Rack height

<table>
<thead>
<tr>
<th>Rack height</th>
<th>1 rack unit (RU)</th>
<th>2RU</th>
<th>Same As Cisco 2821</th>
<th>Same As Cisco 2821</th>
</tr>
</thead>
</table>

### Weight (configured)

<table>
<thead>
<tr>
<th>Weight (configured)</th>
<th>14 lb. (6.4 kg)</th>
<th>25 lb. (11.4 kg)</th>
<th>Same As Cisco 2821</th>
<th>Same As Cisco 2821</th>
</tr>
</thead>
</table>

### Noise level (min/max)

<table>
<thead>
<tr>
<th>Noise level (min/max)</th>
<th>39 dBA for normal operating temperature (&lt;90°F/32.2°C)</th>
<th>57 dBA @ (maximum fan speed)</th>
<th>Same As Cisco 2821</th>
</tr>
</thead>
</table>

### Safety

<table>
<thead>
<tr>
<th>Safety</th>
<th>UL 60950; CAN/CSA C22.2 No. 60950; IEC 60950; EN 60950-1; AS/NZS 60950</th>
</tr>
</thead>
</table>

### Immunity

<table>
<thead>
<tr>
<th>Immunity</th>
<th>EN300386; EN50024/CISPR24; EN50082-1; EN61000-6-2</th>
</tr>
</thead>
</table>

### EMC

<table>
<thead>
<tr>
<th>EMC</th>
<th>FCC Part 15, ICES-003 Class A; EN55022 Class A; CISPR22 Class A; AS/NZS 3548 Class A; VCCI Class A; EN 300386; EN61000-3-3; EN61000-3-2</th>
</tr>
</thead>
</table>

### TELCOM

<table>
<thead>
<tr>
<th>TELCOM</th>
<th>Telecommunication compliance standards depend upon country and interface type. Interfaces comply with FCC Part 68, CS-03, JATE Technical Conditions, European Directive 99/5/EC and relevant TRBs. See the datasheet for the specific interface card.</th>
</tr>
</thead>
</table>

###选型部分号和订购信息

**Cisco 2800 Series Router**

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CISCO2801</td>
<td>Integrated services router with AC power, 2FE, 4 Interface Card Slots, 2 PVDM slots, 2 AIMS, and Cisco IOS IP Base Software</td>
</tr>
<tr>
<td>CISCO2801-AC-IP</td>
<td>Integrated services router with AC power including Inline power distribution capability, 2FE, 4 Interface Card Slots, 2 PVDM slots, 2 AIMS, and Cisco IOS IP Base Software</td>
</tr>
<tr>
<td>CISCO2811</td>
<td>Integrated services router with AC power, 2FE, 1 NME, 4 HWICs, 2 PVDM slots, 2 AIMS, and Cisco IOS IP Base Software</td>
</tr>
<tr>
<td>CISCO2811-AC-IP</td>
<td>Integrated services router with AC power including Inline power distribution capability, 2FE, 1 NME, 4 HWICs, 2 PVDM slots, 2 AIMS, and Cisco IOS IP Base Software</td>
</tr>
<tr>
<td>CISCO2811-DC</td>
<td>Integrated services router with DC power, 2FE, 1 NME, 4 HWICs, 2 PVDM slots, 2 AIMS, and Cisco IOS IP Base Software</td>
</tr>
<tr>
<td>CISCO2821</td>
<td>Integrated services router with AC power, 2GE, 1 NME-X, 1 EVM, 4 HWICs, 2 PVDM slots, 2 AIMS, and Cisco IOS IP Base Software</td>
</tr>
<tr>
<td>CISCO2821-AC-IP</td>
<td>Integrated services router with AC power including Inline power distribution capability, 2GE, 1 NME-X, 1 EVM, 4 HWICs, 3 PVDM slots, 2 AIMS, and Cisco IOS IP Base Software</td>
</tr>
<tr>
<td>CISCO2821-DC</td>
<td>Integrated services router with DC power, 2GE, 1 NME-X, 1 EVM, 4 HWICs, 3 PVDM slots, 2 AIMS, and Cisco IOS IP Base Software</td>
</tr>
<tr>
<td>CISCO2851</td>
<td>Dual Gigabit Ethernet integrated services router with AC power, 2GE, 1 NME-XD, 1 EVM, 4 HWICs, 3 PVDM slots, 2 AIMS, and Cisco IOS IP Base Software</td>
</tr>
</tbody>
</table>
Cisco 1800 Series Integrated Services Routers

Cisco 1800 Series Integrated Services Routers

Cisco 1800 Series offers three classes of routers to meet the diverse needs of small enterprise branch offices and small and medium-sized businesses (SMBs). The Cisco 1861 Integrated Services Router is a unified communications solution that provides voice, data, video, Automated-Attendant, video, and security capabilities while integrating with existing desktop applications such as calendar, e-mail, and customer relationship management (CRM) programs.

For More Information

For more information about the Cisco 2800 Series Integrated Services Routers, visit: http://www.cisco.com/go/2800.
Both the Cisco 1800 Fixed and Modular Routers are designed for secure data connectivity through Frame Relay, leased-line, or broadband access, and wireless LANs. The routers feature secure, fast, and high-quality delivery of multiple, concurrent services. Cisco 1841 offers flexible WAN connectivity options where Cisco 1801, 1802, 1803, 1811, and 1812 offer secure data connectivity in a small, fixed form factor.

**Ideal for Companies that Need These Features**
- Cisco 1801, 1802, and 1803 Integrated Services Routers—Secure data access through broadband DSL; Primary WAN access through asymmetric DSL (ADSL) over basic telephone service (Cisco 1801), ADSL over ISDN (Cisco 1802), or G.SHDSL; Cisco 1803 ADSL 2/2+ capability on Cisco 1801 and 1802 Routers; Backup WAN interface using ISDN Basic Rate Interface (BRI); Integrated 8-port managed 10/100 Ethernet switch; Integrated IEEE 802.11a/b/g wireless LAN (“W” models)
- Cisco 1811 and 1812 Integrated Services Routers—Secure data access at broadband rates; Ability to use 10/100 Ethernet as a WAN access connecting to external DSL or cable modem; Ability to use backup WAN interface with V92 analog modem (Cisco 1811) or ISDN BRI (Cisco 1812); Integrated 8-port managed 10/100 Ethernet switch; Integrated IEEE 802.11a/b/g wireless LAN (“W” models)
- Cisco 1841 Integrated Services Router—Secure data access solution for customer environments up to T1/E1 or xDSL WAN rates with services turned on; Modularity for flexibility in WAN configurations; Support for a broad array of WAN services; Comprehensive security features
- Cisco 1861 Integrated Services Router—Integrated Cisco Unified Communications Manager Express or Cisco Unified Survivable Remote Site Telephony for call processing; Cisco Unity Express for voice messaging and automated attendant; Integrated LAN switching with Power over Ethernet (PoE) expandable through Cisco Catalyst Switches; Support for a range of HWICs; Built-in hardware encryption enabled through optional security image; Comprehensive security features

**Key Features**
- Cisco 1800 Series Integrated Services Routers are available with an IEEE 802.11a/b/g standalone wireless access point for “W” models of Cisco 1801 through Cisco 1812 models, and for a high-speed WAN interface card access point (HVIC-AP) for the Cisco 1841
- The modular Cisco 1841 provides flexibility with an internal advanced-integration-module (AIM) slot designated for higher-speed VPNs and future applications; Several slot types are available to add future connectivity and services on an “integrate-as-you-grow” basis.
- The fixed-configuration Cisco 1801 through 1812 models have an integrated 8-port 10/100 Ethernet switch with Power over Ethernet (PoE). An optional 4-port switch HWIC is available for the Cisco 1841
- These routers support the latest Cisco IOS Software-based quality-of-service (QoS) bandwidth management features.
- The routers offer advanced device management using Cisco Router and Security Device Manager (SDM).
- A high-performance processor supports concurrent deployment of high-performance, secure data services with headroom for future applications.
- Integrated hardware-based encryption acceleration offers a cryptography accelerator as standard integrated hardware that can be enabled with optional Cisco IOS Software for Triple Digital Encryption Standard (3DES) and Advanced Encryption Standard (AES) encryption support.
- A security performance-enhanced feature set offers an intrusion prevention system (IPS), Cisco Network Admission Control (NAC), and firewall functions.
- These routers allow LAN segmentation using VLANs.
- An integrated standard power supply offers easier router platform installation and management.

**Specifications**

<table>
<thead>
<tr>
<th>Feature</th>
<th>Cisco 1861 Series</th>
<th>Cisco 1841 Series</th>
<th>Cisco 1800 Series Fixed-Configuration Routers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Form factor</td>
<td>Desktop, 15 rack unit (RU)</td>
<td>Desktop, 1 rack unit (RU)</td>
<td>Desktop, 1 rack unit (RU) high</td>
</tr>
<tr>
<td>Target Applications</td>
<td>Small Office Unified Communications, Data and Security</td>
<td>Secure data with frame relay or leased line access (T1/E1)</td>
<td>Secure data with broadband access and backup WAN</td>
</tr>
<tr>
<td>Chassis</td>
<td>Metal</td>
<td>Metal</td>
<td>Metal</td>
</tr>
<tr>
<td>Wall-mountable</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Rack-mountable</td>
<td>Yes (optional rackmount kit is required)</td>
<td>Yes (optional 18-in rackmount kit is required)</td>
<td>Yes (optional 18-in rackmount kit required)</td>
</tr>
<tr>
<td>Dimensions (W x D)</td>
<td>26.65 x 19.84 x 11.06 in</td>
<td>15.9 x 10.8 in (32.36 x 26.67 x 28.07 cm)</td>
<td>12.74 x 9.7 in (32.36 x 24.64 cm)</td>
</tr>
<tr>
<td>Weight</td>
<td>8 lb (3.63 kg)</td>
<td>Maximum: 6.2 lb (2.8 kg); with interface cards and modules; Minimum: 6.0 lb (2.7 kg) (no interface cards and modules)</td>
<td>Maximum: 6.1 lb (2.8 kg)</td>
</tr>
</tbody>
</table>
### DRAM
- Cisco IOS Software: 256 MB
- Voice messaging: 512 MB
- Synchronous dual in-line memory module (DIMM) DRAM
- Default: 256 MB
- Maximum: 256 MB

### DRAM capacity
- Default: 256 MB
- Maximum: 256 MB
- Synchronous dual in-line memory module (DIMM) SDRAM
- Default: 128 MB
- Maximum: 384 MB

### Flash memory
- Cisco IOS Software: 128 MB
- Voice messaging: 1 GB
- External removable compact flash
- Default: 128 MB
- Maximum: 256 MB

### Flash memory capacity
- Default: 128 MB
- Maximum: 256 MB

### Modular slots - total
- One (HWIC)
- Two
- None

### Modular slots (WAN)
- One (HWIC)
- Two
- None

### Modular slots (HWICs)
- One (HWIC)
- Two
- None

### VoIP support
- Onboard support analog and digital voice, conferencing, transcoding, and secure Real-Time Transport Protocol (RTP) applications. This feature is not upgradable. Onboard voice ports integrated into the system by default include interfaces for PSTN, PBX, and key system connections, including FXS, FXO, and BRI.
- Voice-over-IP (VoIP) pass-through only
- Same as 1841

### ADSL Port
- Cisco 1861/1841 ADSL: over POTS, ADSL over ISDN via WAN Interface Card

### G.SHDSL Port
- Cisco 1841 Series: The WIC-1SHDSL-V3 in 2-wire mode is interoperable with the following DSLAMs:
  - Cisco 6000 Series IP DSL switches, Alcatel ASAM 7300 (12- and 24-port line cards).
  - CopperEdge 200 DSLAM (24-port line cards).
  - The WIC-1SHDSL-V3 in 4-wire mode is interoperable with the following DSLAMs: Cisco 6000 Series IP DSL switches, Alcatel ASAM 7300 (12- and 24-port line cards).
  - CopperEdge 200 DSLAM (24-port line cards).

### G.SHDSL DSLAM Interoperability
- Cisco 1800 Series Fixed-Configuration Routers: The Cisco 1803 in 2-wire mode is interoperable with the following DSLAMs:
  - CopperEdge 200 DSLAM (24-port line cards).
  - The Cisco 1803 in 4-wire mode is interoperable with the following DSLAMs: Alcatel ASAM 7300 (12- and 24-port line cards).

### Onboard Ethernet ports
- 10/100 Fast Ethernet
- 8 10-/100-Mbps LAN
- 1 10/100 Ethernet expansion port

### Integrated Ethernet Switch Ports
- 10/100 Fast Ethernet
- 8 10-/100-Mbps LAN
- 1 10/100 Ethernet expansion port

### Cisco 1800 Series Integrated Services Routers
### Onboard USB ports
- None
- One ([1](#))
- Two (USB 2.0) on Cisco 1811 and 1812 only. The Cisco 1801, 1802, and 1803 do not offer USB support.

### ISDN S/T BRI Ports
- Two ports on the BRI SKUs
- Optional via WAN Interface Card
- One ISDN S/T BRI port on Cisco 1801, 1802, 1803, and 1812

### V.92 Analog Modem Port
- None
- One up to 115.2 kbps
- One—up to 115.2 kbps

### Console port
- Virtual AUX port
- One: up to 115.2 kbps
- One: up to 115.2 kbps

### Onboard AIM slots
- None
- One (internal)
- None

### Packet-voice-DSP-module (PVDM) slots on motherboard
- No slots: Onboard support analog and digital voice, conferencing, transcoding, and secure Real-Time Transport Protocol (RTP) applications. This feature is not upgradable.
- None: The Cisco 1841 does not support voice
- None: The Cisco 1800 Series does not support voice

### Integrated H/W-based encryption on motherboard
- Yes
- Yes
- Yes

### IPSec Tunnels
- 100 with on-board encryption, 800 with VPN AIM
- 40 Mbps 3DES @ 1400 byte packets
- 40 Mbps 3DES @ 1400 byte packets

### IPSec VPN Performance
- 40 Mbps 3DES @ 1400 byte packets

### Encryption support in software and hardware by default
- IPSec DES, 3DES, and AES 128, 192, and 256 cryptology by using an optional security image
- DES, 3DES, AES 128, AES 192, AES 256
- DES, 3DES, AES 128, AES 192, AES 256

### Cisco IOS Firewall Performance
- 100 Mbps @ 1400 byte packets
- 100 Mbps @ 1400 byte packets

### Wireless LAN Hardware
- Optional 802.11a/b/g models
- Optional IEEE 802.11a/b/g via HWIC
- IEEE 802.11 a/b/g on wireless models

### Wireless LAN features
- 802.11a/b/g: Automatic rate selection for 802.11a/b/g; RP-TNC connectors for field-replaceable external antennas (antenna options for extended coverage); Antenna diversity: Indoor range: 1 Mbps at 320 ft (97.54 m). Wireless Ethernet Compatibility Alliance (WECA) interoperability; Default antenna gain—2.2 dBi
- 802.11a/b/g: Automatic rate selection for 802.11a/b/g; Field-replaceable antennas; External antenna; Antenna diversity; Wi-Fi Certified for WPA-Personal and WPA-Enterprise; Default antenna gain—2.2 dBi
- 802.11a/b/g: Automatic rate selection for 802.11a/b/g; Field-replaceable antennas; External antenna; Antenna diversity; Wi-Fi Certified for WPA-Personal and WPA-Enterprise; Default antenna gain—2.2 dBi

### Data Rates Supported
- The integrated 802.11g access point in the Cisco 1861 supports up to 54-Mbps connections.
- 802.11a: 6, 9, 12, 18, 24, 36, 48, and 54 Mbps; 802.11g: 1, 2, 5.5, 6, 9, 11, 12, 18, 24, 36, 48, and 54 Mbps
- 802.11a: 6, 9, 12, 18, 24, 36, 48, and 54 Mbps; 802.11g: 1, 2, 5.5, 6, 9, 11, 12, 18, 24, 36, 48, and 54 Mbps

### Range
- None
- Range—Indoor 1 Mbps at 320 ft

### Wireless LAN Software Features
- Cisco 1800 Series—802.1X, 802.11i, WPA and WPA2, LEAP authentication, Cisco LEAP Handoff and Extensible Authentication Protocol-Flexible Authentication via Secure Tunneling (EAP-FAST), Static and dynamic WEP, Temporal Key Integrity Protocol/Simple Network Protocol (TKIP/SNIP), encryption, MAC authentication and filter, User database for survivable local authentication using LEAP and EAP-FAST, Configurable limits to the number of wireless clients, Configurable RADIUS accounting for wireless clients, Pre-shared keys (PSKs), Workgroup Bridge Association
- Cisco 1841 Series—N/A
- Cisco 1800 Series Fixed-Configuration Routers—Maximize throughput or maximize range option, Software-configurable transmit power, Support for Wi-Fi Multimedia (WMM), Quality of Service (QoS) for WLANs

### SSIDs
- 8

### Wireless LAN
- Supported by CiscoWorks
- Supported by CiscoWorks 2000

### Management Features
- GUI-based network management for wireless interface is provided
- GUI-based network management is provided

### User Support
- Up to 8 UC users
- Up to 50 users (recommended)
- Up to 50 users (recommended)
Chapter 1

Cisco 1800 Series Integrated Services Routers      1-17

Wireless LAN Security Features

- Cisco 1861 Series: Enhanced security is provided with support for Wi-Fi Protected Access (WPA and WPA2), including authentication with 802.1x and Cisco LEAP, Projected Extensible Authentication Protocol (PEAP), dynamic Wired Equivalent Privacy (WEP), or static WEP.
- Cisco 1841 Series: IEEE 802.1X per-user, per-session mutual authentication with a variety of extensible authentication protocol (EAP) types including Cisco LEAP, Protected Extensible Authentication Protocol (PEAP), and EAP-Transport Layer Security (EAP-TLS), Preshared Key (PSK) Authentication, MAC authentication/filter encryption, WPA Temporal Key Integrity Protocol (TKIP) with support for per-packet key hashing, message integrity check, Static and dynamic wired equivalent privacy (WEP) keys of 40 bits and 128 bits. Additional security features: IEEE 802.1X local authentication; Configurable limit for the number of wireless clients; Configurable RADIUS accounting for wireless clients.
- Cisco 1800 Series Fixed-Configuration Routers: IEEE 802.1X per-user, per-session mutual authentication with a variety of extensible authentication protocol (EAP) types including Cisco LEAP, Protected Extensible Authentication Protocol (PEAP), and EAP-Transport Layer Security (EAP-TLS), Preshared Key (PSK) Authentication, MAC authentication/filter encryption, WPA Temporal Key Integrity Protocol (TKIP) with support for per-packet key hashing, message integrity check, Static and dynamic wired equivalent privacy (WEP) keys of 40 bits and 128 bits. Additional security features: IEEE 802.1X local authentication; Configurable limit for the number of wireless clients; Configurable RADIUS accounting for wireless clients.

Cisco IOS Software

default image

- Cisco IOS Software 12.4(11)XW or Higher Releases
- IP BASE - 12.4(1) 12.3(8)YI

Cisco IOS Software default Image

- SP Services K9
- IP Base (security and broadband bundles have image upgrades)
- Advanced IP services (without voice services) except Cisco 1981 which comes with Cisco IOS IP Broadband

Routing Protocols

- BGP, EIGRP, OSPF, RIP-1, RIP-2
- BGP, EIGRP, OSPF, RIP-1, RIP-2
- BGP, EIGRP, OSPF, RIP-1, RIP-2

Routed Protocols

- IPv4, IPv6 unicast only
- IPv4, IPv6 unicast only
- IPv4, IPv6 unicast only
(Internetwork Packet Exchange [IPX], IBM SNA, AppleTalk supported with optional Advanced Enterprise Services Feature Set)

QoS Protocols

- Weighted Fair Queuing (WQO), Class-Based WQO, CBWFQ, WRED, Committed Access Rate (CAR), Resource Reservation Protocol (RSVP), Network-Based Application Recognition
- Weighted Fair Queuing (WQO), Class-Based WQO, CBWFQ, WRED, Committed Access Rate (CAR), Resource Reservation Protocol (RSVP), Network-Based Application Recognition
- Weighted Fair Queuing (WQO), Class-Based WQO, CBWFQ, WRED, Committed Access Rate (CAR), Resource Reservation Protocol (RSVP), Network-Based Application Recognition

Internal system power supply

- Yes
- Yes
- Yes

Power over Ethernet (PoE) power supply

- Internal
- None
- None

Redundant power supply

- No
- No
- No

DC power support

- No
- No
- No

AC input voltage

- 100 to 240 VAC
- 100 to 240 VAC
- 100 to 240 VAC

Frequency

- 50 to 60 Hz
- 50 to 60 Hz
- 50 to 60 Hz

AC input current

- 4 to 2A (100 to 240V)
- 15A maximum
- 15A maximum

Output power

- 80W
- 50W (maximum)
- 50W (maximum)

PoE Support

- Supported
- Not supported
- Supported on 10/100 Ethernet switch ports with optional PoE kit

PoE Standards

- None
- IEEE 802.3at, Cisco Prestandard PoE

External PoE Power Supply

- Supported Internally
- None
- 80W external power supply

System Power Dissipation

- 153 BTU/hr
- 153 BTU/hr
- 153 BTU/hr

Operating temp

- 32 to 104°F (0 to 40°C)
- 32 to 104°F (0 to 40°C)
- 32 to 104°F (0 to 40°C)
<table>
<thead>
<tr>
<th>Operating humidity</th>
<th>10 to 85% non-condensing operating, 5 to 95 non-condensing, non-operating</th>
<th>10 to 85% non-condensing operating, 5 to 95% non-condensing, non-operating</th>
<th>10 to 85 percent non-condensing operating, 5 to 95 percent non-condensing, non-operating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-operating Temp</td>
<td>4 to 149°F (-20 to 65°C)</td>
<td>4 to 149°F (-25 to 65°C)</td>
<td>4º to 149ºF (-25 to 65ºC)</td>
</tr>
</tbody>
</table>
| Operating altitude | • 104°F (40°C) at sea level
• 87.8°F (31°C) at 6,000 ft (1800m)
• 77°F (25°C) at 10,000 ft (3000m)
• Note: De-rate 34.7°F (1.5°C) per 1,000 ft | • 10,000 feet (3000 meters) @ 77°F (25°C) | • 10,000 ft. (3000m) at 77ºF (25ºC) |
| Noise level | Normal operating temperature: <78°F (25.6°C): 34 dBA
• >78°F (25.6°C) through <104°F (40°C): 37 dBA
• >104°F (40°C): 42 dBA | Normal operating temperature: <78°F (25.6°C): 34 dBA; >78ºF (27ºC) through <104°F (40°C): 36 dBA; >104°F (40°C): 42 dBA | |
| Safety | • IEC 60950-1
• AS/NZS 60950.1
• CAN/CSA-C22.2 No. 60950-1
• EN 60950-1
• UL 60950-1 | UL 60950-1; CAN/CSA 60950-1; AS/NZS 60950 | UL 60950; CAN/CSA C22.2 No. 60950-1; EN 60950-1; AS/NZS 60950 |
| EMI | • Cisco 1861 Series: EN 55022, 1998, class A; CISPR22, 1997, class A; EN61000-3-2 Harmonic Current Emission (only for equipment >75W but <16A); EN61000-3-3 Voltage Fluctuation and Flicker (only for equipment >16A) | • Cisco 1800 Series Fixed-Configuration Routers: EN300386; EN55024(CISPR24); EN61000-4-2; EN61000-4-3; EN41000-4-4; EN41000-4-5; EN41000-4-6; EN41000-4-11; EN50082-1; EN61000-6-2; ITU-T K.21 | • CISPR22 Class A; AS/NZS 3548; lass A; VCCI Class A; EN 300 386; EN61000-3-2; EN61000-3-3 |

**Selected Part Numbers and Ordering Information**

**Cisco 1861**

| C1861/3SRST-F/K9 | Cisco 1861, 8-User SRST license, 4 PSTN trunks (FXO), 4 Analog ports (FXS), 8 PoE ports, 1 HWIC slot for WAN |
| C1861/3SRST-B/K9 | Cisco 1861, 8-User SRST license, 2 BRI trunks (BRi), 4 Analog ports (FXS), 8 PoE ports, 1 HWIC slot for WAN |
| C1861/3SRST-C-F/K9 | Cisco 1861, 8-User SRST & CUE license, 4 PSTN trunks (FXO), 4 Analog ports (FXS), 8 PoE ports, 1 HWIC slot for WAN |
| C1861/3SRST-C-B/K9 | Cisco 1861, 8-User SRST & CUE license, 2 BRI trunks (BRi), 4 Analog ports (FXS), 8 PoE ports, 1 HWIC slot for WAN |
C1861-UC-4FXO-K9  Cisco 1861, 8-user CME, CUE, Phone Licenses, 4 PSTN trunks (FXO), 4 Analog ports (FXS), 8 PoE ports, 1 HWIC slot for WAN

C1861-UC-2BRI-K9  Cisco 1861, 8-user CME, CUE, Phone Licenses, 2 BRI trunks (BRI), 4 Analog ports (FXS), 8 PoE ports, 1 HWIC slot for WAN

C1861-4F2S2/K9  Cisco 1861, 8-user CME, CUE, Phone Lic, 4FXS, 2BRI, 8PoE, HWIC slots, Adv IP

C1861-WRST-4FXO-K9  Cisco 1861, WLAN, 8PoE, 4FXO, 4FXO, SRST, 8-user License, SP Svcs

C1861W-SRST-C/K9  Cisco 1861, WLAN, 8xPOE, 4FXS, 4FXO, SRST 8-user License, CUE, SP

C1861W-UC-4FXO-K9  Cisco 1861, WLAN, 8xPOE, 4FXS, 4FXO, CME 8-user License, CUE, Ph.

CISCO1801                ADSL/POTS router w/IOS IP Broadband

CISCO1801/K9             ADSL/POTS Router with Firewall/IPS and IPSEC 3DES

CISCO1801-M ADSL over POTS Annex M Router w/IOS IP Broadband

CISCO1801-M/K9 ADSL over POTS Annex M Router

CISCO1802 ADSL/POTS router w/IOS IP Broadband

CISCO1802/K9 ADSL/ISDN Router with Firewall/IPS and IPSEC 3DES

CISCO1803/K9 G.SHDSL Router with Firewall/IPS and IPSEC

CISCO1811/K9 Dual Ethernet Security Router with V.92 Modem Backup

CISCO1812/K9 Dual Ethernet Security Router w/ISDN S/T Backup

CISCO181W-AG-C/K9, E/K9, N/K9 Security Router with 802.11a+g (China-C, ETSI-E, Australia/NZ-N) Compliant and Security

CISCO1803W-AG-A/K9, C/K9, N/K9 Security Router with 802.11a+g (FCC-A, ETSI-E) Compliant and Analog B/U

CISCO1803W-AG-C/K9, C/K9, N/K9 Security Router with 802.11a+g (China-C, ETSI-E) Compliant and ISDN S/T

CISCO1841-SEC/K9  1841 Security Bundle,AdvSecurity64FL/256DR

CISCO1841/1SEC/K9  1841 Security bundle w/AM-VPN,AdvP 64FL/256DR

CISCO1841/1TSLC2/K9  1841 Security bundle w/ WLC-10S/11V2, AdvSec64FL/256DR

CISCO1841/ADSL  1841 ADSL Bundle, IP Broadband, 32FL/128DR

CISCO1841/ADSL-DG  1841 ADSL Bundle w/dying gasp Bundle, IP Broadband, 32FL/128DR

CISCO1841/ADSLJ  1841 ADSL Security Bundle, IP Broadband, 32FL/128DR

CISCO1841/ADSL-V3  1841 Bundle, 4-ante Bundle, includes VCL-10S/11S/11P Broadband, 32 MB flash/128 MB DRAM

CISCO1841/ADSL-2  1841 bundle, HWIC-ADSL,  IP, BB, 32FL/128DR

CISCO1841/ADSL-2-I  1841 bundle, HWIC-ADSL-B/31F BB,32FL/128DR

For More Information

For more information about the Cisco 1800 Series Integrated Services Routers, visit: http://www.cisco.com/go/ISR.
Cisco 800 Series Routers

The Cisco 800 Series Router provides enhanced network security, wireless LAN, and proven reliability through Cisco IOS Software for small offices and telecommuters. It connects users to the Internet or to a corporate LAN through asymmetric DSL (ADSL2+), ADSL over ISDN, G.SHDSL, Cable DOCSIS 2.0, or with an Ethernet WAN port connected to an external broadband modem.

This router is ideal for companies with Cisco IOS Software-based networks that want to add telecommuters or very small branch offices. It is also ideal for service providers that offer value-added services to small offices and for value-added resellers (VARs) that are familiar with Cisco IOS Software and want to profitably service small-office customers.

Ideal for Companies that Need These Features

- Ethernet LAN ports and a variety of WAN connectivity, including: ISDN Basic Rate Interface (BRI), ADSL, and G.SHDSL
- Advanced security and wireless LAN

Key Features

- Fixed-configuration support for several types of WAN connections
- Optional standalone IEEE 802.11 b/g wireless LAN access point for Cisco 850 and 870 Series
- Standard security with access control lists (ACLs), Poll Address Translation (PAT) and Network Address Translation (NAT), Password Authentication Protocol (PAP) and Challenge Handshake Authentication Protocol (CHAP), Microsoft CHAP (MS-CHAP), Lock and Key, and generic routing encapsulation (GRE) tunneling
- Enhanced security with Stateful Inspection Firewall, IP Security (IPSec) encryption (Triple Digital Encryption Standard [3DES]) and Advanced Encryption Standard (AES) encryption on Cisco 850 and 870 Series; the Cisco 870 Series also includes security features such as intrusion prevention systems (IPSs), X.25, Dynamic Multipoint VPN (DMVPN), Easy VPN, and URL filtering
- Out-of-band management and dial-backup with an external modem through the auxiliary or console port on the Cisco 870 Series Routers
- Dial backup through the integrated ISDN port on the Cisco 876
- X.25 over D-channel support on the Cisco 876
- DMZ interface on all Cisco 870 Routers; optional external power injector for Power over Ethernet (PoE) on Cisco 870 Routers
- Integrated 4-port 10/100 Ethernet switch on Cisco 850 and 870 Series
- Bandwidth-optimization features such as compression, bandwidth on demand, dial-on-demand routing (DDR), Always-On Dynamic ISDN (AODI), and X.25 over D channel (Cisco 876)

Specifications

<table>
<thead>
<tr>
<th>Feature</th>
<th>851</th>
<th>857</th>
<th>871</th>
<th>876</th>
<th>877</th>
<th>878</th>
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<tr>
<td>Fixed LAN Port Connections</td>
<td>4-port 10/100 Ethernet switch</td>
<td>4-port 10/100 Ethernet switch</td>
<td>4-port 10/100 Ethernet switch</td>
<td>4-port 10/100 Ethernet switch</td>
<td>4-port 10/100 Ethernet switch</td>
<td>4-port 10/100 Ethernet switch</td>
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<tr>
<td>Fixed WAN Port Connections</td>
<td>1-port 10/100 Ethernet</td>
<td>1-port ADSL, ADSL2/2+</td>
<td>1-port 10/100 Ethernet</td>
<td>1-port ADSL over ISDN, 1-port ISDN S/T [ADSL, ADSL2/2+</td>
<td>1-port ADSL over POTs [ADSL, ADSL2/2+</td>
<td>1-port G.SHDSL</td>
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<td>Wireless LAN</td>
<td>IEEE 802.11 b/g (’W’ model)</td>
<td>IEEE 802.11 b/g (’W’ model)</td>
<td>IEEE 802.11 b/g (’W’ model)</td>
<td>IEEE 802.11 b/g (’W’ model)</td>
<td>IEEE 802.11 b/g (’W’ model)</td>
<td>IEEE 802.11 b/g (’W’ model)</td>
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<td>Dual removable antennas</td>
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<td>Dual removable antennas</td>
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<td>Yes</td>
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<td>No</td>
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<td>Yes</td>
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Selected Part Numbers and Ordering Information

Cisco 800 Series Routers

CISCO851-VPN/K9 Cisco 815 ISR, NA-DOSCIS Compliant, with Security
CISCO851-K9 Cisco 851 Ethernet to Ethernet Router
CISCO857/K9 Cisco 857 ADSL Router

1-20 Cisco 800 Series Routers
## Cisco 7000 Series Port Adapter Compatibility Matrix

### ATM Port Adapters

<table>
<thead>
<tr>
<th>Port Adapter</th>
<th>7201</th>
<th>7204VXR</th>
<th>7206VXR</th>
<th>7301</th>
<th>7304 Carrier Card</th>
<th>7600</th>
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<tbody>
<tr>
<td>PA-A3-8T1IMA</td>
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<tr>
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### Ethernet Port Adapters

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<th>7206VXR</th>
<th>7301</th>
<th>7304 Carrier Card</th>
<th>7600</th>
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<tbody>
<tr>
<td>PA-2FE-TX/FX</td>
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<td>PA-4E</td>
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<td>PA-GE</td>
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### Serial Port Adapters

<table>
<thead>
<tr>
<th>Port Adapter</th>
<th>7201</th>
<th>7204VXR</th>
<th>7206VXR</th>
<th>7301</th>
<th>7304 Carrier Card</th>
<th>7600</th>
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<td>PA-4IEEE75</td>
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<td>PA-4IEEE120</td>
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<td>X</td>
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<tr>
<td>PA-4T1+</td>
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<td>X</td>
<td>X</td>
<td>X</td>
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### High-speed Serial Port Adapters

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<th>Port Adapter</th>
<th>7201</th>
<th>7204VXR</th>
<th>7206VXR</th>
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<th>7304 Carrier Card</th>
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<td>PA-H</td>
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<td>PA-2H</td>
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<tr>
<td>PA-E3-1-port</td>
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<td>PA-2E3-2-port</td>
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<td>PA-T3+</td>
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<tr>
<td>PA-2T3+</td>
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<tr>
<td>PA-T3/E3-EC</td>
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For More Information

For more information about the Cisco 800 Series, visit: [http://www.cisco.com/go/800](http://www.cisco.com/go/800).
<table>
<thead>
<tr>
<th>Port Adapter Description</th>
<th>Compatibility Matrix</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Multichannel Serial Port Adapters</strong></td>
<td></td>
</tr>
<tr>
<td>PA-2T3/E3-EC: 2-port Clear-Channel T3 or E3 Enhanced Capability</td>
<td>X X X X X</td>
</tr>
<tr>
<td>PA-MC-8B-S/T: 8-port BRI port adapter, S/T interface</td>
<td>X X X</td>
</tr>
<tr>
<td>PA-MC-2T(1): 2-port multichannel T1 port adapter with integrated CSU/DSUs</td>
<td>X X X X X</td>
</tr>
<tr>
<td>PA-MC-4T(1): 4-port multichannel T1 port adapter with integrated CSU/DSUs</td>
<td>X X X X X</td>
</tr>
<tr>
<td>PA-MC-3TE1+: 8-port multichannel T1/E1 8PRI port adapter</td>
<td>X X X X X</td>
</tr>
<tr>
<td>PA-MC-2E1/120: 2-port multichannel E1 port adapter with G.703 120 ohm interface</td>
<td>X X X X X</td>
</tr>
<tr>
<td>PA-MC-63: 1-port multichannel E3 port adapter</td>
<td>X X X X X</td>
</tr>
<tr>
<td>PA-MC-2T3-E3: 2-port multichannel T3 port adapter enhanced capability</td>
<td>X X X X X</td>
</tr>
<tr>
<td>PA-MC-2T3-E3: 2-port multichannel T3 port adapter enhanced capability</td>
<td>X X X X X</td>
</tr>
<tr>
<td>PA-MC-STM-1MM: 1-port multichannel STM-1 multimode port adapter</td>
<td>X X X X X</td>
</tr>
<tr>
<td>PA-MC-STM-1SM: 1-port multichannel STM-1 single mode port adapter</td>
<td>X X X X X</td>
</tr>
<tr>
<td>PA-MCX-2TE(1): 2-port MIX-enabled multichannel T1/E1 with CSU/DSU</td>
<td>X X</td>
</tr>
<tr>
<td>PA-MCX-4TE(1): 4-port MIX-enabled multichannel T1/E1 with CSU/DSU</td>
<td>X X</td>
</tr>
<tr>
<td>PA-MCX-8TE(1): 8-port MIX-enabled multichannel T1/E1 with CSU/DSU</td>
<td>X X</td>
</tr>
<tr>
<td><strong>SONET Port Adapters</strong></td>
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<tr>
<td>PA-POS-2OC3: 2-port OC-3/STM-1 POS port adapter</td>
<td>X X X X X</td>
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<tr>
<td>PA-POS-1OC3: 1 Port Packet/SONET OC3/STM-1 port adapter</td>
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<tr>
<td><strong>Other Port Adapters and Service Adapters</strong></td>
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<tr>
<td>PA-4C-E: 1-port enhanced ESCON channel port adapter</td>
<td>X X</td>
</tr>
<tr>
<td>7201</td>
<td>7204VXR</td>
</tr>
</tbody>
</table>

1. Support in 12.2(31)SB
2. Native
3. (12.4 (6th release)T

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1.22 Cisco 7000 Series Port Adapter Compatibility Matrix
The Cisco 7600 Series Routers combine optical WAN and metropolitan-area network (MAN) networking and high-volume Ethernet aggregation with a focus on the delivery of high-touch services for the IP and Multiprotocol Label Switching (MPLS) edge. These routers combine Layer 2 and Layer 3 networking capabilities with a high-bandwidth, high-performance architecture, including hardware-based forwarding of Multiprotocol Label Switching (MPLS), IPv4, and IPv6. Cisco 7600 Series form factors include the Cisco 7603, 7604, 7606, 7609, and 7613 models. Each router can deliver DS-0 to OC-192 WAN and n x 10-Mbps Ethernet to n x 10-Gigabit Ethernet connectivity into service provider edge, MAN, and enterprise networks for a variety of quad-play (data, voice, video, and mobile) and aggregation solutions.

**Ideal for Companies that Need These Features**

- Cisco 7603—Three-slot (horizontal) chassis; 320-Gbps backplane bandwidth; 30-Mpps forwarding rate; and Network Equipment Building Standards (NEBS) compliance
- Cisco 7604—Four-slot (horizontal) chassis; 320-Gbps backplane bandwidth; 30-Mpps forwarding rate; and Network Equipment Building Standards (NEBS) compliance
- Cisco 7606—Six-slot (horizontal) chassis; 480-Gbps backplane bandwidth; 30-Mpps forwarding rate; and NEBS compliance
- Cisco 7609—Nine-slot (vertical) chassis; 720-Gbps backplane bandwidth; 30-Mpps forwarding rate; and NEBS compliance
- Cisco 7609-S—Nine-slot (vertical) chassis; 720-Gbps backplane bandwidth; 30-Mpps forwarding rate; and NEBS compliance
- Cisco 7613—Thirteen-slot (horizontal) chassis; 720-Gbps backplane bandwidth; 30-Mpps forwarding rate; and NEBS compliance

**Key Features**

- Cisco 7600 Series Routers provide up to 30-Mpps central or up to 400-Mpps distributed forwarding with hardware-accelerated IPv4, IPv6, and Multiprotocol Label Switching (MPLS).
- The modular routers are scalable from 32- to 720-Gbps switch fabric.
- These routers represent one of the widest, most complete ranges of WAN interfaces in the industry, with DS-0 to OC-192 connectivity.
- Using the Cisco 7600 Series Catalyst 6500 Series Enhanced FlexWAN Module, Cisco 7000 Series port adapters are shared with the Cisco 7200, 7300, 7400, and 7500 models, simplifying sparing and protecting customer investment in interfaces.
- Cisco 7600 Series Routers support many Cisco Catalyst 6500 LAN interfaces, offering n x 10-Mbps Ethernet to 10 Gbps.

### Specifications

<table>
<thead>
<tr>
<th>Feature</th>
<th>Cisco 7603</th>
<th>Cisco 7604</th>
<th>Cisco 7606</th>
<th>Cisco 7609</th>
<th>Cisco 7613</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fixed Ports</td>
<td>SFP &amp; 10/100/1000 (Sup720)</td>
<td>Same as Cisco 7603</td>
<td>Same as Cisco 7603</td>
<td>Same as Cisco 7603</td>
<td>Same as Cisco 7603</td>
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<tr>
<td>Expansion Slots</td>
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<td>6 (horizontal)</td>
<td>9 (vertical)</td>
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<td>WAN Interface Range</td>
<td>DS0 to OC-192</td>
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<td>Same as Cisco 7603</td>
<td>Same as Cisco 7603</td>
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<td>Same as Cisco 7603</td>
<td>Same as Cisco 7603</td>
<td>Same as Cisco 7603</td>
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<td>480 Gbps</td>
<td>720 Gbps</td>
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<td>Flash PCMCIA Memory</td>
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<td>Same as Cisco 7603</td>
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<td>Internal Power Supply</td>
<td>AC or DC</td>
<td>Same as Cisco 7603</td>
<td>Same as Cisco 7603</td>
<td>Same as Cisco 7603</td>
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</tr>
<tr>
<td>RPS Support</td>
<td>Yes</td>
<td>Same as Cisco 7603</td>
<td>Same as Cisco 7603</td>
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1. Bandwidth and forwarding rate numbers assume Sup720 Engine
<table>
<thead>
<tr>
<th>Chassis Height</th>
<th>4 RU</th>
<th>5 RU</th>
<th>7 RU</th>
<th>20 RU</th>
<th>18 RU</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rack Mountable</td>
<td>Yes, up to 11 per rack</td>
<td>Yes, up to 10 per rack</td>
<td>Yes, up to 6 per rack</td>
<td>Yes, up to 2 per rack</td>
<td>Yes, up to 2 per rack</td>
</tr>
<tr>
<td>Dimensions (H x W x D)</td>
<td>7 x 17.37 x 20.3 in.</td>
<td>7 x 17.37 x 21.75 in.</td>
<td>12.25 x 17.37 x 21.75 in.</td>
<td>36.75 x 17.2 x 20.7 in.</td>
<td>33.3 x 17.2 x 18.1 in.</td>
</tr>
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</table>

**Selected Part Numbers and Ordering Information**

**Cisco 7609 Systems**

- 7609-RSP720C-P Cisco 7609 Chassis, 8-slot, RSP720-3C, PS
- 7609-RSP720CXL-P Cisco 7609 Chassis, 8-slot, RSP720-3CXL, PS
- 7609S-RSP720C-P Cisco 7609S Chassis, 8-slot, RSP720-3C, PS
- 7609S-RSP720CXL-P Cisco 7609S Chassis, 8-slot, RSP720-3CXL, PS
- 7609S-S323B-8G-P Cisco 7609S Chassis, 9-slot, SUP32-2X10GE-3B, PS
- 7609S-S323B-10G-P Cisco 7609S Chassis, 9-slot, SUP32-2X10GE-3B, PS
- 7609S-SUP720XL-P Cisco 7609S Chassis, 9-slot, SUP720-3BXL, PS
- 7609S-SUP720XL-P Cisco 7609S Chassis, 9-slot, add SUP720-3BXL, PS
- CISCO7609 Cisco 7609 Chassis
- CISCO7609-S Cisco 7609-S Chassis
- CISCO7609/HA Bundle, Cisco Enhanced Home Agent R1 for 7609 (300k Sessions)
- 7609-S323B-8G-P Cisco 7609 Chassis, 9-slot, SUP32-8GE-3B, PS
- 7609-S323B-10G-P Cisco 7609 Chassis, 9-slot, SUP32-2X10GE-3B, PS
- 7609-SUP720XL-PS Cisco 7609 9-slot, SUP720-3BXL and PS
- 7609-SUP7203B-PS Cisco 7609 Chassis, 9-slot, SUP720-3B, Power Supply
- 7609-SUP7203B-2PS Cisco 7609 Chassis, 9-slot, 2 SUP720-3B, 2 Power Supply
- 7609-VPN+K9 Cisco 7609 IPSec VPN System Bundle

**Cisco 7606 Systems**

- 7606-RSP720C-P Cisco 7606 Chassis, 6-slot, RSP720-3C, PS
- 7606-RSP720CXL-P Cisco 7606 Chassis, 6-slot, RSP720-3CXL, PS
- CISCO7606 Cisco 7606 Chassis
- CISCO7606-S Cisco 7606-S Chassis
- 7606-S323B-8G-P Cisco 7606 Chassis, 6-slot, SUP32-8GE-3B, PS
- 7606-S323B-10G-P Cisco 7606 Chassis, 6-slot, SUP32-2X10GE-3B, PS
- 7606-SUP720XL-PS Cisco 7606 6-slot, SUP720-3BXL and PS
- 7606-SUP7203B-PS Cisco 7606 Chassis, 6-slot, SUP720-3B, Power Supply
- 7606-SUP7203B-2PS Cisco 7606 Chassis, 6-slot, 2 SUP720-3B, 2 Power Supply
- CISCO7606/CHA Bundle, Cisco Enhanced Home Agent R1 for 7606 (300k Sessions)
- 7606-VPN+K9 Cisco 7606 IPSec VPN System Bundle
- 7606S-RSP720C-P Cisco 7606S Chassis, 6-slot, RSP720-3C, PS
- 7606S-RSP720CXL-P Cisco 7606S Chassis, 6-slot, RSP720-3CXL, PS
- 7606S-S323B-8G-P Cisco 7606S Chassis, 6-slot, SUP32-8GE-3B, PS
- 7606S-S323B-10G-P Cisco 7606S Chassis, 6-slot, SUP32-2X10GE-3B, PS
- 7606S-SUP7203B-PS Cisco 7606S Chassis, 6-slot, SUP720-3B, Power Supply
- 7606S-SUP7203B-2PS Cisco 7606S Chassis, 6-slot, 2 SUP720-3B, 2 Power Supply
- 7606S-SUP720XL-PS Cisco 7606S Chassis, 6-slot, SUP720-3BXL, PS
- 7606S-SUP7203B-2PS Cisco 7606S Chassis, 6-slot, 2 SUP720-3B, 2 Power Supply

**Cisco 7604 Systems**

- CISCO7604 Cisco 7604 Chassis
- 7604-RSP720C-P Cisco 7604 Chassis, 4-slot, RSP720-3C, PS
- 7604-RSP720CXL-P Cisco 7604 Chassis, 4-slot, RSP720-3CXL, PS
- 7604-S323B-8G-P Cisco 7604 Chassis, 4-slot, SUP32-8GE-3B, PS
- 7604-S323B-10G-P Cisco 7604 Chassis, 4-slot, SUP32-2X10GE-3B, PS
- 7604-SUP7203B-PS Cisco 7604 Chassis, 4-slot, SUP720-3B, Power Supply
- 7604-SUP7203B-2PS Cisco 7604 Chassis, 4-slot, 2 SUP720-3B, 2 Power Supply
- 7604-SUP720XL-PS Cisco 7604 Chassis, 4-slot, SUP720-3BXL, PS
- 7604-VPN+K9 Cisco 7604 IPSec VPN System Bundle

**Cisco 7603 Systems**
Chapter 1

Cisco 7300 Series Routers      1-25

For More Information
For more information about the Cisco 7600 Series Routers, visit: http://www.cisco.com/go/7600.

Cisco 7300 Series Routers
The Cisco 7300 Series Routers are optimized for flexible, high-performance IP/Multiprotocol Label Switching (MPLS) services at the network, WAN, and broadband edge, where service providers and enterprises link together. The Cisco 7304 is ideally applied as a high-end customer premises equipment (CPE) or as an Internet gateway router. Architected for network high availability and multiprotocol support, it supports the broad set of existing Cisco 7000 Series port adapters with the Cisco 7304 Port Adapter Carrier Card while also supporting the new shared port adapters (SPAs) with the Cisco 7304 Multiservice Carrier Card (MSC). The Cisco 7301 is targeted at principal application areas within a service provider network in a compact, single-rack form factor coupled with a broad set of interfaces and Cisco IOS Software features. It packs high performance of up to 1 Mpps in a space- and power-efficient form factor that includes a single Cisco 7000 Series port adapter slot and 3 onboard Gigabit Ethernet (copper or optical) or Fast Ethernet ports.

Ideal for Companies that Need These Features
• Cisco 7301 —Compact, power-efficient 1RU form factor; Three times the performance increase over the Cisco 7401 Single Cisco 7000 Series port adapter slot
• Cisco 7304—Highly modular price- and performance-optimized platform, rich in IP services; High-performance connectivity—DS-1 through OC48/STM16 with 3.5-Mpps performance. Built-in Gigabit Ethernet connectivity; Support for SPAs; Multiprotocol routing—IP, Internetwork Packet Exchange (IPX), AppleTalk, and DLSw; Compact size, high availability and optimal cooling

Key Features
• Cisco 7304—This router offers up to 1 Mpps processing performance. Pluggable Gigabit Ethernet optics (Small Form-Factor Pluggables [SFPs]): 3 fixed 10-100-1000-Mbps ports (RJ-45 or SFP optics) directly on the processor; Full Cisco IOS Software feature support; Up to 1 GB of available DRAM; up to 256 MB of removable Compact Flash memory; Front-to-back airflow and single-sided management
• Cisco 7304—This router is a mid-range, price/performance optimized Internet router. It delivers high-performance services in IP and MPLS networks, optimized for the network edge where the service provider meets the enterprise, such as service provider PE and IP edge router as well as CPE or enterprise Internet gateway and enterprise WAN aggregation. Comes with a choice of two route processors: Cisco 7304 NSE-150 Network Services Engine and Cisco 7300 NPE-G100 Network Processing Engine: the Cisco 7304 NSE-150 offers Cisco Parallel Express Forwarding-based performance. Provides hardware-accelerated services such as Cisco Parallel Express Forwarding, NetFlow v8, and Turbo Access Control List (ACL). Offers up to 3.5-Mpps performance for Cisco Parallel Express Forwarding-accelerated services with the Cisco 7304 NSE-150 Network Processing Engine; Provides four onboard Gigabit Ethernet interfaces per Cisco 7304 NPE-G100; offers up to 1-Mpps performance; Provides system redundancy—Optional dual processors and dual AC or DC power supplies increase network availability. Cisco 7304 NSE-150 engine offers unmatched price-to-performance ratio —Cisco Parallel Express Forwarding technology delivers hardware-accelerated network services with up to 3.5-Mpps
forwarding rate; improved performance and scalability with 800-MHz microprocessor and 2-Gb main memory; and high platform port density with up to 4 onboard Gigabit Ethernet ports.

**Specifications**

<table>
<thead>
<tr>
<th>Feature</th>
<th>Cisco 7301</th>
<th>Cisco 7304</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fixed Ports</td>
<td>1; Three gigabit Ethernet ports</td>
<td>NPE-G100: 3 gigabit Ethernet Ports</td>
</tr>
<tr>
<td></td>
<td></td>
<td>NSE-150: 4 Gigabit Ethernet Ports</td>
</tr>
<tr>
<td>Expansion Slots</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>WAN Interface Range</td>
<td>DS-1 to OC-3</td>
<td>DS-1 to OC-48</td>
</tr>
<tr>
<td>Forwarding Rate</td>
<td>Up to 1 Mpps</td>
<td>NSE-150: Up to 3.5Mpps, NPE-G100: Up to 1 Mpps</td>
</tr>
<tr>
<td>Backplane Capacity</td>
<td>1.2 Gbps</td>
<td>16 Gbps</td>
</tr>
<tr>
<td>Flash PCMCIA Memory</td>
<td>64 MB (expandable to 256 MB)</td>
<td>NPE-G100: 256 MB; NSE-150: 256 MB</td>
</tr>
<tr>
<td>System DRAM Memory</td>
<td>256 MB (expandable to 1 GB)</td>
<td>NPE-G100: 1 GB; NSE-150: 2 GB</td>
</tr>
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<td>Min Cisco IOS Release</td>
<td>12.2(31)TY2</td>
<td>NPE-G100: 12.2(20)S; NSE-150: 12.2(31)SB2</td>
</tr>
<tr>
<td>Internal Power Supply</td>
<td>AC or DC</td>
<td>AC or DC</td>
</tr>
<tr>
<td>RPS Support</td>
<td>Yes, for AC or DC</td>
<td>Yes, for AC or DC</td>
</tr>
<tr>
<td>Chassis Height</td>
<td>1 RU</td>
<td>4 RU</td>
</tr>
<tr>
<td>Rack Mountable</td>
<td>Yes, up to 40 per rack</td>
<td>Yes, up to 11 per rack</td>
</tr>
<tr>
<td>Dimensions (H x W x D)</td>
<td>1.73 x 1.73 x 13.87 in. (43.9 x 44.94 x 35.23 cm.)</td>
<td>7 x 17.2 x 20.5 in. (17.78 x 43.94 x 52.07 cm.)</td>
</tr>
</tbody>
</table>

**Selected Part Numbers and Ordering Information**

**Cisco 7304 System**

- CSC07304= Cisco 7300, 4-slot chassis
- CSC07304-G100 4-slot chassis, NPE-G100, 1 Power Supply
- CSC07304-G100-GH Channel bundle: chassis, G100, PWR-AC, MEM-RAM, CFM, IOS, FAN
- CSC07304-NSE-150 4-slot chassis, NSE-150, 1 Power Supply, 2GB Memory
- CSC07304G100CH-NSE150 Channel bundle: chassis, NSE-150, PWR-AC, IOS IP PLUS, FAN

**Cisco 7301 System**

- CSC07301= Cisco 7301 chassis, 256MB memory, A/C power, 64MB Flash
- CSC07301-BB Cisco7301, 512MB Mem, 16K license, 64MB Flash, A/C power, IP/IOS
- CSC07301BB-8K 7301, 1 G Mem, 64MB Flash, A/C power, IP/IOS, 8K Sub Broadband Feature License
- CSC07301-BB-8K 7301, 1 G Mem, 64MB Flash, A/C power, IP/IOS, 8K sub BBA license
- CSC07301-BB-8K-1G 7301, 1 G Mem, 64MB Flash, A/C power, IP/IOS, up to 8K sub BBA license
- CSC07301-BB-8K-1G 7301, VAM2+, AC power, 612 sys mem, SDM
- CSC07301BB-1G 7301, 1 G Mem, 64MB Flash, A/C power, IP/IOS, up to 8K sub BBA license

**For More Information**


**Cisco 7200 Series Routers**

The Cisco 7200 Series Routers (Cisco 7201, Cisco 7204/VXR, and Cisco 7206/VXR) deliver an exceptional price-to-performance ratio, versatility, and feature richness in a compact form factor. The Cisco 7200 is an optimized integrated services aggregation OC-3/Gigabit Ethernet edge router that is ideal as a WAN aggregator for the service provider (small point of presence [POP]) or enterprise edge, as an enterprise WAN gateway, as high-end managed customer premises equipment (CPRE) for IBM data center connectivity, or as a small core router. With the hardware-supported IP Security (IPSec) encryption module as well as robust firewall and Virtual Route Forwarding (VRF)-aware IPSec with Network Address Translation (NAT) support, the Cisco 7200 Series is ideal for integrated security services. The Cisco 7200 also supports gatekeeper and IP-to-IP gateway functionality. Modularity combined with a low initial price point helps guarantee both investment protection and maximum return on investment, allowing customers to upgrade or redeploy their Cisco 7200 Series Router as their network needs change.

**Ideal for Companies that Need These Features**

- Cisco 7201—1-slot chassis, Built-in NPE-G2 Network Processing Engine with up to 2 Mpps; WAN services aggregation (for example, Multiprotocol Label Switching [MPLS] provider edge traffic segmentation)
- Integrated edge services (for example, integrated security); IP-to-IP gateway—Highest capacity of call
support in Cisco router portfolio. Multiservice Interchange (MIX)-enabled bus for data, voice, and video applications.
• Cisco 7204VXR Router—4-slot chassis; Modular processor—400 kpps, 1 Mpps, or 2 Mpps (Cisco NPE-400, Cisco NPE-G1, and Cisco NPE-G2 Network Processing Engines); 18-Gbps backplane; WAN services aggregation (for example, MPLS provider edge traffic segmentation); Integrated edge services (for example, integrated security); IP-to-IP gateway—Highest capacity of call support in Cisco router portfolio; MIX-enabled bus for data, voice, and video applications
• Cisco 7206VXR Router—6-slot chassis; Modular processor—400 kpps, 1 Mpps, or 2 Mpps (Cisco NPE-400, Cisco NPE-G1, and Cisco NPE-G2 Network Processing Engines); 18-Gbps backplane; WAN services aggregation (for example, MPLS provider edge traffic segmentation); IP-to-IP gateway—Highest capacity of call support in Cisco router portfolio; MIX-enabled bus for data, voice, and video applications

Key Features
• Compact form factor—The router offers up to six port adapters in a fully modular 3RU form factor; seven port adapters with a port adapter jacket card; choice of a 1-slot, and a 1RU chassis with built-in Cisco NPE-G2.
• Modularity—The router has choices of 1-, 4-, and 6-slot chassis, a selection of processors providing up to 2 Mpps, an extensive range of LAN and WAN interfaces with up to 48 ports per chassis, and single or dual power supplies. Chassis are expandable to an additional slot by using an I/O slot as a port or service adapter slot by using the port adapter jacket card.
• Exceptional value—The router offers superior price-to-performance ratio supporting high-speed media and high-density configurations with up to 2 million packets per second processing at a competitive price point.
• Feature richness—The router supports Cisco IOS Software and enhancements for high-performance network services. It offers industry-leading network services, including MPLS, route reflectors; broadband aggregation; the Cisco IOS Intelligent Services Gateway; QoS; service management; IBM data center; storage-area-network application, security; voice, video, and data support; and gatekeeper and IP-to-IP gateway (session border controller) support.
• Connectivity and flexibility—The router provides high port density and an extensive range of LAN and WAN media.
• Common port adapters—Port adapters are shared with the Cisco 7300 and 7600 Series (with the Cisco FlexWAN Module), simplifying sparing and protecting customer investment in interfaces.

Specifications

<table>
<thead>
<tr>
<th>Feature</th>
<th>Cisco 7201</th>
<th>Cisco 7204VXR</th>
<th>Cisco 7206VXR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fixed Ports</td>
<td>4 GEs</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Expansion Slots</td>
<td>1</td>
<td>4 (with port adapter jacket card)</td>
<td>6 (with port adapter jacket card utilizing the I/O slot)</td>
</tr>
<tr>
<td>WAN Port Adapters</td>
<td>DS0 to OC-3</td>
<td>DS0 to OC-3</td>
<td>Same as 7204VXR</td>
</tr>
<tr>
<td>Forwarding Rate</td>
<td>Up to 2 Mpps</td>
<td>Up to 2 Mpps</td>
<td>Up to 2 Mpps</td>
</tr>
<tr>
<td>Backplane Capacity</td>
<td>N/A</td>
<td>18 Gbps (with NPE-G2)</td>
<td>Same as 7204VXR</td>
</tr>
<tr>
<td>Flash (Compact) Memory</td>
<td>256 MB (default and max.)</td>
<td>256 MB (default and max.)</td>
<td>Same as 7204VXR</td>
</tr>
<tr>
<td>Flash (PCMCIA Memory)</td>
<td>(I/O Controller Card required for NPE-400)</td>
<td>N/A</td>
<td>64 MB (expandable to 128 MB)</td>
</tr>
<tr>
<td>System DRAM Memory</td>
<td>1 GB (default); 2 GB (max.)</td>
<td>NPE-G2: 1 GB (default); 2 GB (max.)</td>
<td>NPE-G1: 512 MB (default); 1 GB (max.)</td>
</tr>
<tr>
<td>Minimum Cisco IOS Release</td>
<td>Cisco 7201: 12.4(4)XD7; 12.2(31)SB4</td>
<td>Cisco 7204VXR: NPE-G2: 12.4(4)XD (based on 2nd release of 12.4T), fifth release of 12.4T (and later), fourth release of 12.2SB (and later), first release of 12.5 mainline (and later). NPE-G1: 12.2(4)BW, 12.2(15)B, 12.2(14)S, 12.3(1)T, 12.3(1)SU, 12.3(1)T, 12.0(28)S, 12.3(1)SU (and later). NPE-400: 12.0(1)S, 12.3(3)E, 12.3(9)E (and later)</td>
<td>Cisco 7206VXR: Same as 7204VXR</td>
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<td>Internal Power Supply</td>
<td>Dual AC or Dual DC—By default</td>
<td>AC or DC, dual option</td>
<td>Same as 7204VXR</td>
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<tr>
<td>Redundant Power Supply</td>
<td>Yes, Dual AC or DC by default</td>
<td>Yes, for AC or DC</td>
<td>Same as 7204VXR</td>
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<tr>
<td>Chassis Height</td>
<td>1 RU</td>
<td>4 RU</td>
<td>6 RU</td>
</tr>
<tr>
<td>Rack Mountable</td>
<td>Yes</td>
<td>Yes, up to 16 per rack</td>
<td>Same as 7204VXR</td>
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</table>
Cisco ASR 1000 Series Aggregation Services Router

The Cisco ASR 1000 Series Aggregation Services Routers are the newest addition to the Cisco routing portfolio. The product family consists of three different versions: the Cisco ASR 1002 Router, the Cisco ASR 1004 Router, and the Cisco ASR 1006 Router. All three models use the new, innovative, and powerful Cisco QuantumFlow Processor and are optimized for both service provider and enterprise deployments.

The Cisco ASR 1000 Series delivers multiple services embedded in the Cisco QuantumFlow Processor at wire speeds of up to 20 Gbps. The services supported on the Cisco Packet QuantumFlow Processor include security services (for example, encryption and firewall), quality of service (QoS), Network-Based Application Recognition (NBAR), Cisco IOS Flexible Packet Matching (FPM), broadband aggregation, and session border controller, among others.

With the separation of the control and data planes in the Cisco ASR 1000 Series Router architecture, software redundancy (on the Cisco ASR 1002 and 1004 models) and hardware redundancy (on the Cisco ASR 1006 Router) are provided. Additionally, the modular Cisco IOS XE Software that is introduced with the Cisco ASR 1000 Series facilitates In Service Software Upgrade (ISSU). I/O connectivity is provided through shared port adapters (SPAs), which are housed in the SPA Interface Processor (SIP) card.

From a price-to-performance perspective, the Cisco ASR 1000 Series Router solution fits well between the Cisco 7200 Series and the Cisco 7600 Series, thus dramatically enhancing the Cisco midrange routing portfolio.

Ideal for Companies that Need These Features

- Cisco ASR 1002—Support for three SPAs; Integrated 10-Gigabit Ethernet SIP (ASR1000-SIP10); Integrated route processor (Cisco ASR 1000 Series Route Processor 1 [RP1]); Support for 1 forwarding engine (Cisco ASR 1000 Series Embedded Services Processor [ESP-5G] or ESP-10G); Built-in four 1-Gigabit Ethernet ports; Cisco IOS Software redundancy and In Service Software Upgrade (ISSU); WAN services aggregation; Integrated edge services (for example, IP Security [IPSec], firewall, session border controller [SBC], Network Based Application Recognition [NBAR]), and Flexible Packet Matching (FPM); Managed customer premises...
equipment (CPE); Layer 2 Tunneling Protocol access concentrator (LAC) or Layer 2 Tunneling Protocol network server (LNS); Layer 3 VPN (L3VPN); Route reflector

• Cisco ASR 1004—Support for eight SPAs; Support for two SIP cards (ASR1000-SIP10), each with 4 SPA slots; Support for one route processor (Cisco ASR 1000 Series RP1); Support for one forwarding engine (Cisco ASR 1000 Series ESP-10G or ESP-20G); Cisco IOS Software redundancy and ISSU; WAN services aggregation; Integrated edge services (for example, IPSec, firewall, SBC, FPM, and NBAR); Managed CPE, LAC or LNS, L3VPN; Route reflector

• Cisco ASR 1006—Support for 12 SPAs; Support for three SIP cards (ASR1000-SIP10), each with 4 SPA slots; Support for up to two route processors (Cisco ASR 1000 Series RP1); Support for up to two forwarding engines (Cisco ASR 1000 Series ESP-10G or ESP-20G); In-box hardware redundancy (dual ESP and route processor); WAN services aggregation; Integrated edge services (for example, IPSec, firewall, SBC, FPM, and NBAR); Managed CPE, LAC or LNS, L3VPN; Route reflector

Key Features

• Compact form factor—The Cisco ASR 1000 Series offers up to 10-Gigabit Ethernet throughput in compact 2-rack unit (2RU) form factor and up to 20 Gigabit throughput in 4-rack unit (4RU) and 6-rack unit (6RU) form factors.

• Modularity—Cisco offers a choice of three chasses that support 3, 8, or 12 SPAs, a selection of forwarding processors providing up to 20-Gigabit throughput, and a growing range of LAN and WAN interfaces. SIPs, SPAs, route processors, and forwarding processors are all modular and fully upgradable as future generations are released (with the exception of carrier card and route processor on the Cisco ASR 1002, which are integrated).

• Integrated services—Services can be enabled either at the time of ordering or after the router is already deployed. Encryption, Cisco IOS Software redundancy, firewall, SBC, and Flexible Packet Inspection (FPI, including NBAR and FPM) can all be enabled by purchasing feature licenses with no need for hardware upgrades.

• High availability—Cisco offers in-box engine redundancy on the Cisco ASR 1006 and Cisco IOS Software redundancy on the Cisco ASR 1002 and 1004 models.

• Common SPAs—SPAs are shared with the Cisco Catalyst 6500 and Catalyst 7600 Series, simplifying sparing and protecting customer investment in interfaces.

Specifications

<table>
<thead>
<tr>
<th>Feature</th>
<th>ASR1002</th>
<th>ASR1004</th>
<th>ASR1006</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fixed Ports</td>
<td>4 GEs</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>SIP Card Slots</td>
<td>integrated</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Shared Port Adapter Slots</td>
<td>3</td>
<td>8</td>
<td>12</td>
</tr>
<tr>
<td>Forwarding Rate</td>
<td>Up to 14 Mpps</td>
<td>Up to 20 Mpps</td>
<td>Up to 20 Mpps</td>
</tr>
<tr>
<td>System DRAM Memory</td>
<td>4 GB (default); 4 GB (max.)</td>
<td>2 GB (default); 4 GB (max.)</td>
<td>2 GB (default); 4 GB (max.)</td>
</tr>
<tr>
<td>Minimum Cisco IOS Release</td>
<td>IOS XE 2.10</td>
<td>IOS XE 2.10</td>
<td>IOS XE 2.10</td>
</tr>
<tr>
<td>Redundant Power Supply</td>
<td>Yes, Dual AC or DC by default</td>
<td>Yes, Dual AC or DC by default</td>
<td>Yes, Dual AC or DC by default</td>
</tr>
<tr>
<td>Chassis Height</td>
<td>2 RU</td>
<td>4 RU</td>
<td>6 RU</td>
</tr>
<tr>
<td>Rack Mountable</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Dimensions (H x W x D)</td>
<td>3.5 x 17.2 x 22 in.</td>
<td>7.0 x 17.2 x 22 in.</td>
<td>10.5 x 17.2 x 22 in.</td>
</tr>
<tr>
<td>Airflow</td>
<td>Front-to-back</td>
<td>Front-to-back</td>
<td>Front-to-back</td>
</tr>
</tbody>
</table>

Selected Part Numbers and Ordering Information

Cisco ASR 1000 Chassis

ASR1002 Cisco ASR1002 chassis, 4 built-in GEs, Dual PFS, 4GB DRAM
ASR1004 Cisco ASR1004 chassis, Dual PFS
ASR1006 Cisco ASR1006 chassis, Dual PFS

For More Information

For more information about the Cisco ASR 1000 Series, visit: http://www.cisco.com/go/asr1000.
Cisco XR 12000 and 12000 Series Routers

The Cisco XR 12000 and 12000 Series Routers compose a portfolio of intelligent routing solutions that scale from 2.5 to nx10Gbps capacity per slot, facilitating carrier-class IP/Multiprotocol Label Switching (MPLS) networks and accelerating the evolution to IP next-generation networks.

Key Features

- The Cisco XR 12000 and 12000 Series Routers deliver up to 1.28-Tbps switching capacity with wire-speed feature performance, scalability, and graceful hardware and software upgrade paths.
- These routers offer full forward compatibility for all line cards and the portfolio of shared port adapters (SPAs) and SPA interface processors (SIPs).
- The routers scale to the edge, supporting backbone- or edge-optimized line cards in the same chassis.
- The routers maximize the value of line-rate edge applications with 10-G uplinks.
- IP quality of service (QoS) and congestion-control implementation facilitates real-time services such as voice over IP (VoIP) and video. The distributed architecture and class-of-service features of the routers, such as priority-based congestion control (Weighted Random Early Detection [WRED]) and dedicated Low Latency Queuing (Modified Deficit Round Robin [MDRR]), along with virtual output queuing (Virtual Output Queuing [VOQ]), eliminate head-of-line blocking (HOL) and maintain packet sequence integrity under all conditions.
- Non-service-affecting online insertion and removal (OIR) of components (including switch fabric cards) and front accessibility reduce downtime and simplify maintenance.
- Cisco Nonstop Forwarding (NSF) and Cisco Stateful Switchover (SSO) eliminate single points of failure, help maintain system performance, and prevent service interruption; packet forwarding remains uninterrupted before, during, and after a route-processor switchover.

Specifications

<table>
<thead>
<tr>
<th>Feature</th>
<th>Cisco XR 12000/12000 16-slot Chassis</th>
<th>Cisco XR 12000/12000 Series 10-Slot Chassis</th>
<th>Cisco XR 12000/12000 Series 6-Slot Chassis</th>
<th>Cisco XR 12000/12000 Series 4-Slot Chassis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Slot Capacity</td>
<td>16 slots</td>
<td>10 slots</td>
<td>6 slots</td>
<td>4 slots</td>
</tr>
<tr>
<td>Aggregate Switching Capacity</td>
<td>12016: 80 Gbps; 12416: 320 Gbps; 12816: 1280 Gbps</td>
<td>12010: 50 Gbps; 12410: 200 Gbps; 12810: 800 Gbps</td>
<td>12006: 30 Gbps; 12406: 120 Gbps</td>
<td>12404: 80 Gbps</td>
</tr>
<tr>
<td>Full-Duplex Throughput Per Slot</td>
<td>12016: 2.5 Gbps/slot; 12416: 10 Gbps/slot; 12816: 40 Gbps/slot</td>
<td>12010: 2.5 Gbps/slot; 12410: 10 Gbps/slot; 12810: 40 Gbps/slot</td>
<td>12006: 2.5 Gbps/slot; 12406: 10 Gbps/slot</td>
<td>12404: 10 Gbps/slot</td>
</tr>
<tr>
<td>Dimensions (H x W x D)</td>
<td>71.5 x 17.25 x 22.0 in.  (181.6 x 184.2 x 55.9 cm); 72.5 x 18.75 x 24.0 in.  (184.2 x 47.6 x 61.0 cm)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>37.5 x 19.22 x 22.0 in. (96.25 x 48.66 x 55.9 cm); 24.0 x 810 cm</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>18.5 in (47.0 cm) chassis width; 17.3 in. (43.9 cm); 18.9 in. (48.0 cm); chassis depth; 28.0 in. (71.1 cm)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>8.75 in. (22.2 cm) chassis width; 17.38 in. (441.5 cm); 18.9 in. (48.01 cm) chassis depth; 27.5 in. (69.85 cm)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Weight</td>
<td>140 lb (64 kg)</td>
<td>125 lb (57 kg)</td>
<td>185 lb (40.4 cm) chassis width; 17.3 in. (43.9 cm); 18.9 in. (48.0 cm) chassis depth; 28.0 in. (71.1 cm)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>390 lb (177 kg)</td>
<td>275 lb (125 kg)</td>
<td>8.75 in. (22.2 cm) chassis width; 17.38 in. (441.5 cm); 18.9 in. (48.01 cm) chassis depth; 27.5 in. (69.85 cm)</td>
<td></td>
</tr>
<tr>
<td>Chassis Per Rack</td>
<td>One</td>
<td>Two</td>
<td>Four</td>
<td>Eight</td>
</tr>
</tbody>
</table>

Software Components (Per Base System)

Cisco IOS XR or Cisco IOS Software Operating System; Cisco Express Forwarding for distributed packet forwarding.

Compatibility

12800—Line cards that support 2.5-, 5-, 10-, or 20-Gbps capability; 12400—Line cards that support 2.5-, 5-, or 10-Gbps capability.

Protocols

IPv4, IPv6, MPLS, RSVP, VRRP, OSPF, BGP, IS-IS, LDP, PIM, DVMRP, and PIM-DM/SM

Connectivity

Packet over SONET/SDH (POS); Ethernet; ATM; copper (DS-3/E3); Channelized (CT3, ChOC-3/CHSTM 1, ChOC-12/CHSTM 16); see Cisco IOS XR Software release notes for specific connectivity support on the Cisco XR 12000 Series.

1. With AC input power shelf or DC input power shelf, front covers installed.
2. Including chassis rack-mount flanges.
3. Including cable-management system and front cover.
4. Chassis only, including power shelf for 16-slot chassis.
5. Chassis fully configured, using all card slots, AC or DC power shelf for 16-slot chassis, & AC or DC input power supplies.
# Selected Part Numbers and Ordering Information

## Cisco XR 12000 16-Slot Systems

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>XR-12416/320-AC</td>
<td>Cisco XR 12000 16-slot chassis w/ 3 AC power supplies, 320-Gbps fabric (2 CSC &amp; 3 SFC cards), 2 blowers, 2 alarms, and 1 PRP-1</td>
</tr>
<tr>
<td>XR-12416/320-AC4</td>
<td>Cisco XR 12000 16-slot chassis w/ 4 AC power supplies, 320-Gbps fabric (2 CSC &amp; 3 SFC cards), 2 blowers, 2 alarms, and 1 PRP-1</td>
</tr>
<tr>
<td>XR-12416/320-DC</td>
<td>Cisco XR 12000 16-slot chassis w/ 4 DC power supplies, 320-Gbps fabric (2 CSC &amp; 3 SFC cards), 2 blowers, 2 alarms, and 1 PRP-1</td>
</tr>
</tbody>
</table>

## Cisco XR 12000 10-Slot Systems

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>XR-12410/200-AC</td>
<td>Cisco XR 12000 10-slot chassis w/ 2 AC power supplies, 200-Gbps fabric (2 CSC &amp; 5 SFC cards), 1 blower, 2 alarms, and 1 PRP-2</td>
</tr>
<tr>
<td>XR-12410/200-DC</td>
<td>Cisco XR 12000 10-slot chassis w/ 2 DC power supplies, 200-Gbps fabric (2 CSC &amp; 5 SFC cards), 1 blower, 2 alarms, and 1 PRP-2</td>
</tr>
</tbody>
</table>

## Cisco XR 12000 6-Slot Systems

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>XR-12406/120-AC</td>
<td>Cisco XR 12000 6-slot chassis w/ 2 AC power supplies, 120-Gbps fabric (1 CSC &amp; 3 SFC cards), 1 blower, 2 alarms, and 1 PRP-2</td>
</tr>
<tr>
<td>XR-12406/120-DC</td>
<td>Cisco XR 12000 6-slot chassis w/ 1 DC power supply, 120-Gbps fabric (1 CSC &amp; 3 SFC cards), 1 blower, 2 alarms, and 1 PRP-2</td>
</tr>
</tbody>
</table>

## Cisco XR 12000 4-Slot Systems

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>XR-12404/80-AC</td>
<td>Cisco XR 12000 4-slot chassis w/ 2 AC power supply, 80-Gbps fabric (consolidated switch fabric, clock scheduler, &amp; alarm card), 1 blower, and 1 PRP-2</td>
</tr>
</tbody>
</table>

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*Note: This table provides a selection of part numbers and ordering information for the Cisco XR 12000 series routers, including 16-slot, 10-slot, 6-slot, and 4-slot chassis configurations with various power supply and fabric options.*
Cisco CRS-1 Carrier Routing System

The Cisco CRS-1 Carrier Routing System is the industry's first carrier routing system offering continuous system operation, unprecedented service flexibility, and system longevity. Powered by Cisco IOS XR Software, this innovative self-healing and self-defending operating system is designed for always-on operation while scaling system capacity up to 92 Tbps. The innovative system architecture combines the Cisco Silicon Packet Processor, the first programmable 40-Gbps application-specific integrated circuit (ASIC), with the Cisco Service Separation Architecture for exceptional service flexibility and speed to service.

The Cisco CRS-1 includes two major elements, line-card shelves and fabric shelves, combinations of which allow the system to scale from four 40-Gbps slots to as many as 1152 40-Gbps slots in 72 line-card shelves interconnected using eight fabric shelves, all operating as a single system.

- Cisco CRS-1 16-Slot Single-Shelf System—A single, 16-slot line-card shelf with total switching capacity of 1.2 Tbps; built from a 16-slot line-card chassis featuring a midplane design
- Cisco CRS-1 8-Slot Single-Shelf System—A single, 8-slot line-card shelf with total switching capacity of 640 Gbps; built from an 8-slot line-card chassis featuring a midplane design.
- Cisco CRS-1 4-Slot Single-Shelf System—A single, 4-slot line-card shelf with total switching capacity of 320 Gbps; built from a 4-slot line-card chassis featuring a midplane design.
- Cisco CRS-1 Multishelf System—Two to 72 line-card shelves and 1 to 8 fabric shelves with a total switching capacity of up to 92 Tbps; shelves are connected only to the fabric-card shelves where stage 2 of the three-stage switching is performed.

Key Features

- Delivery of differentiated voice, video, and data with mobility and business services with better quality of service (QoS) and performance
- Multicast in the fabric for efficient broadcast video applications
- Dedicated 8-KB ingress and egress queues on the line cards for superior performance
- Isolation of different classes of services to deliver high-quality voice, video, and premium traffic
- Granular process-level In Service Software Upgrades (ISSUs)
- Non-service affecting online insertion and removal (OIR) of all components to reduce downtime and simplify maintenance
- Cisco Nonstop Forwarding (NSF) and Stateful Switchover (SSO) to eliminate single points of failure, help maintain system performance, and prevent service interruption; packet forwarding remains uninterrupted before, during, and after a route-processor switchover
- In-service scaling from a single chassis (1.2 Tbps) to 72 chassis with in-service multichassis scaling (92 Tbps) and line-rate performance
- Shared port adapters (SPAs) and SPA interface processors (SIPs) to preserve hardware investment across Cisco platforms, including the Cisco 12000, 7600, and 7300 Series Routers
- Consolidation of multiple networks and elements into a single platform while maintaining physical separation by using secure domain routers (SDRs)
- Interchangeable interfaces between Cisco CRS-1 and a range of other Cisco platforms

Specifications

<table>
<thead>
<tr>
<th>Feature</th>
<th>16 slot Single-Shelf System</th>
<th>8 slot Single-Shelf System</th>
<th>4 slot Single-Shelf System</th>
<th>Fabric Card Chassis</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Design</strong></td>
<td>Midplane design</td>
<td>Midplane design</td>
<td>Midplane design</td>
<td>Midplane design</td>
</tr>
<tr>
<td><strong>Slots</strong></td>
<td>Line card: 16 x 40 Gbps</td>
<td>Line card: 8 x 40 Gbps</td>
<td>Line card: 40 x 40 Gbps</td>
<td>Switch Fabric Card</td>
</tr>
<tr>
<td></td>
<td>slots</td>
<td>slots</td>
<td>slots</td>
<td>24 slots</td>
</tr>
<tr>
<td></td>
<td>Switch Fabric Card 8</td>
<td>Switch Fabric Card 4</td>
<td>Switch fabric card 4</td>
<td></td>
</tr>
<tr>
<td></td>
<td>dedicated slots</td>
<td>dedicated slots</td>
<td>dedicated slots</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Route Processor 2</td>
<td>Route processor 2</td>
<td>Route processor 2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>dedicated slots</td>
<td>dedicated slots</td>
<td>dedicated slots</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Fan Controller: 2</td>
<td>Fan tray: 2 Fan trays</td>
<td>Fan: 4 fans</td>
<td></td>
</tr>
<tr>
<td></td>
<td>dedicated slots</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Full-Duplex Throughput</strong></td>
<td>1280 Gbps</td>
<td>640 Gbps</td>
<td>320 Gbps</td>
<td></td>
</tr>
</tbody>
</table>
Chapter 1

Cisco Routing Services

1-33

Selected Part Numbers and Ordering Information

For More Information

Cisco CRS-1 16-slot System
Cisco CRS-1 16/S Cisco CRS-1 Series 16 Slots Carrier Routing System/Single
Cisco CRS-1 8-slot System
Cisco CRS-1 8/S Cisco CRS-1 Series 8 Slots Carrier Routing System/Single
Cisco CRS-1 4-slot System
Cisco CRS-1 4/S Cisco CRS-1 Series 4 Slots Carrier Routing System

For more information about the Cisco CRS-1 Carrier Routing System, visit: http://www.cisco.com/go/crs.

Cisco Routing Services

Enabling the Agile Business

Agility and innovative new business models are vital in today’s business environment, where your customers increasingly expect a personalized experience above and beyond your product or service, and your competition can come from anywhere, anywhere around the globe.

Success in this fast-paced marketplace requires effective collaboration and efficient use of resources. Business and information technology are inseparable, and the network is what brings them together. It alone touches all people, locations, resources, and applications.
Achieving Business Success Through an Architectural Approach

In collaboration with your team and our partner ecosystem, we take an architectural approach to helping you create a more intelligent, responsive, integrated network. Through a robust portfolio of services, we can help you align IT to the needs of the business, unify network-based services, and create a flexible architecture optimized for your organization. We can help you assess readiness to support proposed solutions, integrate new capabilities, and keep network devices and applications secure, available, and reliable.

- For more information about Cisco Routing Services, visit http://www.cisco.com/go/services/routing-switching.
- To find the right technical service for any Cisco product, use the Service Finder tool at http://www.cisco-servicefinder.com. Enter a product description or part number or search by product series family for a list of suggested services and support coverage options.
- For more information about all services, refer to Chapter 10, “Services”.

1-34  Cisco Routing Services
# LAN Switching

## LAN Switching At a Glance

<table>
<thead>
<tr>
<th>Product</th>
<th>Features</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>MODULAR SWITCHES</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cisco Catalyst 6500 Series Switches</td>
<td>- Highest port density for 10 Gigabit Ethernet, 1 Gigabit Ethernet, Fast Ethernet, and Power over Ethernet (PoE) ports&lt;br&gt;- Scalable up to 720 Gbps of switching capacity with packet throughput scalable to 450 Mbps for IPv4 (&gt;200 Mbps for IPv6) in standalone mode; scales up to 1.44 Tbps and 840 Mbps when using Cisco Catalyst 6500 Virtual Switching System technology&lt;br&gt;- Multigigabit service modules for integrated security, network management, and Layer 4–7 switching&lt;br&gt;- Integrated wireless LAN controller supporting up to 300 access points per module for a total of 1500 access points</td>
<td>2-2</td>
</tr>
<tr>
<td>Cisco Catalyst 4500 Series Switches</td>
<td>- Integrated intelligent Layer 2–4 services for secure unified communications, high resiliency, and simplified operations in enterprise LAN access, small Layer 3 distribution, small- and medium-sized businesses (SMBs), and branch offices&lt;br&gt;- Advanced network control with predictable performance, granular quality of service (QoS), advanced security, and Web-based network management&lt;br&gt;- Up to 388 ports of Fast Ethernet or Gigabit Ethernet and up to thirty-four 10-Gigabit Ethernet ports&lt;br&gt;- High-performance Layer 2–4 switching at speeds up to 320 Gbps and 250 Mpps</td>
<td>2-6</td>
</tr>
<tr>
<td><strong>FIXED CONFIGURATION SWITCHES</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cisco Catalyst 4900 Series Switches</td>
<td>Provides an ideal solution for data center top or rack deployments and for space-constrained branch core deployments that require high performance wire speed services in a 1RU form factor. The Cisco Catalyst 4948 Series Switches are data center top-of-rack optimized switches with emphasis on buffering for high throughput and full mesh traffic profiles. They offer:&lt;br&gt;- Layer 2–4 switching and intelligent services with dynamic IP routing&lt;br&gt;- Up to 28 SFP ports and two 10GE ports for branch core aggregation&lt;br&gt;- Dual, hot-swappable internal AC or DC power supplies&lt;br&gt;- Hot-swappable fan trays</td>
<td>2-10</td>
</tr>
<tr>
<td>Cisco Catalyst 4900M Series Switches</td>
<td>Small 2RU form factor switch offers an ideal solution for space-constrained deployments in the data center and branches that require high performance wire speed services, high availability, and the modular flexibility of deploying Gigabit Ethernet and 10 Gigabit Ethernet. They offer:&lt;br&gt;- Optimized switch with two half-module slots, emphasis on buffering for high throughput and full mesh traffic profiles, very low packet size independent latency&lt;br&gt;- Layer 2–4 switching and intelligent services with dynamic IP routing and IPv6&lt;br&gt;- Dual, hot-swappable internal AC or DC power supplies&lt;br&gt;- Hot-swappable fan trays</td>
<td>2-11</td>
</tr>
<tr>
<td>Cisco Catalyst 3750 Series Switches</td>
<td>These stackable, fixed-configuration switches with Cisco StackWise technology and a 32-Gbps interconnect provide a unified, resilient system of up to nine switches,&lt;br&gt;- The switches offer Layer 2–4 switching and intelligent services with dynamic IP routing and IPv6&lt;br&gt;- They offer Fast Ethernet and Gigabit Ethernet connectivity.&lt;br&gt;- The integrated wireless LAN (WLAN) controller supports 25 or 50 access points per card and up to 4 cards for a total of 200 access points.</td>
<td>2-12</td>
</tr>
<tr>
<td>Cisco Catalyst 3750-E Series Switches</td>
<td>These stackable, fixed-configuration switches with Cisco StackWise Plus technology and a 64-Gbps interconnect provide a unified, resilient system of up to nine switches,&lt;br&gt;- The switches offer Layer 2–4 switching and intelligent services with dynamic IP routing and IPv6&lt;br&gt;- The switches offer up to forty-eight 10/100/1000 ports plus two 10-Gigabit Ethernet ports per stackable switch&lt;br&gt;- The switches offer field-replaceable and upgradeable power supplies and fans&lt;br&gt;- These switches are fully backward-compatible with the Cisco Catalyst 3750 Series Switches.</td>
<td>2-15</td>
</tr>
<tr>
<td>Cisco Catalyst 3560 Series Switches</td>
<td>These switches offer Layer 2–4 switching and intelligent services with dynamic IP routing and IPv6&lt;br&gt;- They offer Fast Ethernet and Gigabit Ethernet connectivity.&lt;br&gt;- They offer up to forty-eight 10/100/1000 ports plus 4 Small Form-Factor Pluggable (SFP) ports.</td>
<td>2-16</td>
</tr>
</tbody>
</table>
Cisco LAN Products Port Matrix

<table>
<thead>
<tr>
<th>Modular Switches</th>
<th>Fixed Switches</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cisco Catalyst 6500</td>
<td>Cisco Catalyst 4500</td>
</tr>
<tr>
<td>Fixed Ports Only</td>
<td>X</td>
</tr>
<tr>
<td>Fixed and Modular Ports</td>
<td>X</td>
</tr>
<tr>
<td>Modular Ports Only</td>
<td>X</td>
</tr>
<tr>
<td>100BASE-FX Switched</td>
<td>X</td>
</tr>
<tr>
<td>10/100 Autosensing Switched</td>
<td>X</td>
</tr>
<tr>
<td>10/100/1000BaseT Switched</td>
<td>X</td>
</tr>
<tr>
<td>Gigabit Ethernet</td>
<td>X</td>
</tr>
<tr>
<td>10 Gigabit Ethernet</td>
<td>X</td>
</tr>
<tr>
<td>Integrated PoE</td>
<td>X</td>
</tr>
</tbody>
</table>

Cisco Catalyst 6500 Series Switches

The Cisco Catalyst 6500 Series continues to be one of the industry’s most innovative switching platforms, delivering very high levels of availability, integrated security, virtualization, enhanced manageability, IP communications, wireless, and applications support to enterprise customers, medium-sized businesses, and service providers. The feature richness, flexibility, density, and scalability of this product line set the standard for converged data, voice, and video networks, and facilitate outstanding operational efficiency and investment protection.
Ideal for Companies that Need These Features

- Cisco Catalyst 6509-E Switch—Ideal for use in the wiring closet, distribution, core, data center, and WAN edge.
- Cisco Catalyst 6506-E Switch—Medium-form factor chassis for the wiring closet, distribution, core, data center, and WAN edge.
- Cisco Catalyst 6504-E Switch—Small form factor, high performance, chassis sharing interface modules and supervisor engines with larger chassis for common sparing. Suitable for small and medium-sized enterprise core or distribution, or the metro or enterprise WAN edge.
- Cisco Catalyst 6503-E Switch—Low-density, wiring-closet chassis sharing interface modules and supervisor engines with larger chassis for common sparing.
- Cisco Catalyst 6513 Switch—High-capacity chassis for Ethernet connectivity, with slots to spare for services modules providing network security and management.
- Cisco Catalyst 6509-V-E Switch—Front-access power supplies: Integrated cable management for high-density cabling environments; Front-to-back airflow optimized for high-density data center deployments
- Cisco Catalyst 6500 Virtual Switching Supervisor Engine 720-10G—High-bandwidth deployments: core, distribution, aggregation, and data center access. It is compatible with all Cisco Catalyst 6500 chassis (except the Cisco Catalyst 6503 Switch).
- Cisco Catalyst 6500 Series Supervisor Engine 720—High-bandwidth deployments: core, distribution, aggregation, and data center access. It is compatible with all Cisco Catalyst 6500 chassis.
- Cisco Catalyst 6500 Supervisor Engine 32 PISA—Ideal for wiring closet access and the WAN edge. It is compatible with all Cisco Catalyst 6500 chassis.
- Cisco Catalyst 6500 Series Supervisor Engine 32—Ideal for wiring closet access. It is compatible with all Cisco Catalyst 6500 chassis.

Key Features

- Cisco IOS Software modularity—The Cisco Catalyst 6500 Series reduces planned and unplanned downtime while boosting operational efficiency. Modular subsystems run as independent processes, facilitating subsystem In Service Software Upgrades (ISSUs). Faults within modular subsystems are isolated from all other processes, and can be restarted without losing state (stateful process restarts).
- Cisco IOS Embedded Event Manager (EEM)—The Cisco IOS EEM automates proactive administrative tasks and network reactions to unexpected events to further enhance operational efficiency.
- Maximum PoE scalability—The Cisco Catalyst 6500 Series supports up to 409 Class 3 devices; it leads the industry in PoE port density and accelerates deployment of PoE-enabled devices such as IP telephones and wireless access points. Cisco Intelligent Power Management allocates the optimal amount of power per device.
- Cisco Catalyst 6500 Virtual Switching Supervisor Engine 720-10G—The Virtual Switching System (VSS) technology, built upon this supervisor engine, facilitates easy-to-use, reliable, and scalable switching for enterprise core, distribution, data center, and server access. VSS delivers a system performance of up to 1.44 Tbps by unifying two physical switches into a single, logical entity offering optimized network convergence, load balancing, and manageability. The supervisor engine can be used in standalone mode to deliver up to 48 Mbps of centralized and 450 Mbps of distributed switching performance, building the foundation for the Cisco Catalyst 6500 Virtual Switching System 1440.
- Cisco Catalyst 6500 Series Supervisor Engine 720—This supervisor engine is optimized for high-bandwidth needs of the enterprise core, distribution, and data centers; it delivers up to 720-Gbps switch-fabric bandwidth and more than 400 Mpps of switching performance. Throughput is increased with support for line cards with Cisco Express Forwarding and distributed Cisco Express Forwarding P424 and Multiprotocol Label Switching (MPLS) are supported in hardware. The switch supports the following Layer 3 routing protocols: Routing Information Protocol (RIP), Enhanced Interior Gateway Routing Protocol (EIGRP), Open Shortest Path First (OSPF), Intermediate System-to-Intermediate System (IS-IS), and Border Gateway Protocol (BGP).
- Cisco Catalyst 6500 Supervisor Engine 32 PISA—This supervisor engine is optimized for oversubscribed wiring closet deployments and the WAN edge, where application intelligence is critical. The Programmable Intelligent Services Accelerator (PISA) technology used on this supervisor engine provides hardware-accelerated Deep Packet Inspection using Network Based Application Recognition (NBAR) and Cisco IOS Flexible Packet Matching (FPM). This intelligence provides greater visibility into critical applications and prevents the spread of worms and viruses. Multiple uplink configurations are available (refer to information about the Cisco Catalyst 6500 Supervisor Engine 32).
- Cisco Catalyst 6500 Supervisor Engine 32—This supervisor engine is optimized for oversubscribed wiring closet deployments; it incorporates a 32-Gbps shared bus architecture with support for up to 15 Mpps of switching performance. Centralizing Layer 2 and Layer 3 forwarding, the supervisor engine is available in two models: 8-port Gigabit Ethernet uplinks or 2-port 10-Gigabit Ethernet uplinks.
- Various integrated service modules allow multigigabit throughput of services such as firewall, intrusion detection, anomaly detection, content switching (load balancing), network analysis, wireless integration (up to 1500 access points), voice gateway, and so on.
### Specifications

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Modular Slots</td>
<td>3</td>
<td>4</td>
<td>6</td>
<td>9</td>
<td>9</td>
<td>13</td>
</tr>
<tr>
<td>Gigabit Ethernet SFP density</td>
<td>98</td>
<td>146</td>
<td>242</td>
<td>386</td>
<td>386</td>
<td>410</td>
</tr>
<tr>
<td>10 Gigabit Ethernet XENPAK/X2 port density</td>
<td>34</td>
<td>50</td>
<td>82</td>
<td>130</td>
<td>130</td>
<td>84</td>
</tr>
<tr>
<td>10/100/1000 density</td>
<td>97</td>
<td>145</td>
<td>241</td>
<td>385</td>
<td>385</td>
<td>577</td>
</tr>
<tr>
<td>10/100 density</td>
<td>192</td>
<td>288</td>
<td>480</td>
<td>768</td>
<td>768</td>
<td>1152</td>
</tr>
<tr>
<td>100BASE-TX density</td>
<td>98</td>
<td>146</td>
<td>242</td>
<td>386</td>
<td>386</td>
<td>577</td>
</tr>
<tr>
<td>Max. watt power consumption (redundant mode)</td>
<td>1,400</td>
<td>2,700</td>
<td>6,000</td>
<td>8,700</td>
<td>8,700</td>
<td>8,700</td>
</tr>
<tr>
<td>AC Internal</td>
<td>48</td>
<td>110</td>
<td>240</td>
<td>384</td>
<td>384</td>
<td>265</td>
</tr>
<tr>
<td>DC Internal</td>
<td>950</td>
<td>2,700</td>
<td>4,000</td>
<td>4,000</td>
<td>4,000</td>
<td>4,000</td>
</tr>
<tr>
<td>Max. number of 10/100/1000 Class 3 devices</td>
<td>48</td>
<td>110</td>
<td>240</td>
<td>384</td>
<td>384</td>
<td>265</td>
</tr>
<tr>
<td>AC Internal</td>
<td>1,400</td>
<td>2,700</td>
<td>6,000</td>
<td>8,700</td>
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<td>8,700</td>
</tr>
<tr>
<td>DC Internal</td>
<td>950</td>
<td>2,700</td>
<td>4,000</td>
<td>4,000</td>
<td>4,000</td>
<td>4,000</td>
</tr>
<tr>
<td>WAN Interfaces</td>
<td>5</td>
<td>10</td>
<td>25</td>
<td>50</td>
<td>50</td>
<td>75</td>
</tr>
<tr>
<td>Available Bandwidth</td>
<td>Scalable to 240 Gbps</td>
<td>Scalable to 320 Gbps</td>
<td>Scalable to 480 Gbps</td>
<td>Scalable to 720 Gbps</td>
<td>Scalable to 720 Gbps</td>
<td></td>
</tr>
<tr>
<td>Throughput</td>
<td>Scalable to 13Mpps</td>
<td>Scalable to 17Mpps</td>
<td>Scalable to 27Mpps</td>
<td>Scalable to 419Mpps</td>
<td>Scalable to 419Mpps</td>
<td></td>
</tr>
<tr>
<td>Redundant Supervisor</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Hot-Swappable Power Supplies</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>VLAN Maximum</td>
<td>4296</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EtherChannel Capable</td>
<td>Yes, up to 8 links of Fast Ethernet, Gigabit Ethernet or 10GBase-TE</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Management Capabilities</td>
<td>CiscoWorks 2000, RMON, Encapsulated Remote Switched Port Analyzer (ERSPAN), SNMP, telnet, BOOTP, and Trivial File Transfer Protocol (TFTP)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rack Unit (RU)</td>
<td>4</td>
<td>5</td>
<td>12</td>
<td>15</td>
<td>21</td>
<td>20</td>
</tr>
<tr>
<td>Dimensions (H x W x D)</td>
<td>7 x 17.5 x 21.7 in.</td>
<td>8.7 x 17.5 x 21.6 cm.</td>
<td>19.2 x 17.5 x 55.2 cm.</td>
<td>24.5 x 17.5 x 44.5 cm.</td>
<td>36.75 x 17.2 x 20.7 cm.</td>
<td>33.3 x 17.3 x 44.6 cm.</td>
</tr>
<tr>
<td>Unit weight (chassis only)</td>
<td>33 lbs.</td>
<td>40 lbs.</td>
<td>50 lbs.</td>
<td>60 lbs.</td>
<td>81 lbs.</td>
<td>113 lbs.</td>
</tr>
<tr>
<td>Chassis supported</td>
<td>All (except 6503 non-E)</td>
<td>All</td>
<td>All</td>
<td>All</td>
<td>All</td>
<td>All</td>
</tr>
<tr>
<td>Bandwidth per slot</td>
<td>40 Gbps</td>
<td>40 Gbps</td>
<td>40 Gbps</td>
<td>40 Gbps</td>
<td>40 Gbps</td>
<td>40 Gbps</td>
</tr>
<tr>
<td>Total bandwidth</td>
<td>720 Gbps</td>
<td>720 Gbps</td>
<td>720 Gbps</td>
<td>720 Gbps</td>
<td>720 Gbps</td>
<td>720 Gbps</td>
</tr>
<tr>
<td>Packets per second</td>
<td>48 Mpps centralized, 457 Mpps distributed</td>
<td>840 Mpps VSS configuration</td>
<td>48 Mpps centralized, 457 Mpps distributed</td>
<td>30 Mpps centralized, 425 Mpps distributed</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MAC addresses supported</td>
<td>98K Max./38K effective</td>
<td>32K Max./32K effective</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Routes supported</td>
<td>256,000 (3C)</td>
<td>1,000,000 (3CXL)</td>
<td>256,000 (3B)</td>
<td>1,000,000 (3BXL)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Onboard memory (DRAM)</td>
<td>1 GB</td>
<td>Up to 1GB</td>
<td>Up to 1GB</td>
<td>Up to 1GB</td>
<td>Up to 1GB</td>
<td>Up to 1GB</td>
</tr>
<tr>
<td>Chassis supported</td>
<td>All</td>
<td>All</td>
<td>All</td>
<td>All</td>
<td>All</td>
<td>All</td>
</tr>
<tr>
<td>Hardware Accelerated Network Based Application Recognition (NBAR)</td>
<td>✓ (approx. 2 Gbps)</td>
<td>N/A</td>
<td>✓ (approx. 2 Gbps)</td>
<td>N/A</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

2-4  Cisco Catalyst 6500 Series Switches
### Selected Part Numbers and Ordering Information

#### Catalyst 6500 Chassis

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>WS-C6503-E</td>
<td>Catalyst 6500 Enhanced 3-slot chassis, 4RU, no PS, no Fan Tray</td>
</tr>
<tr>
<td>WS-C6504-E</td>
<td>Catalyst 6500 Enhanced 4-slot chassis, 4RU, no PS, no Fan Tray</td>
</tr>
<tr>
<td>WS-C6506-E</td>
<td>Catalyst 6500 Enhanced 6-slot chassis, 6RU, no PS, no Fan Tray</td>
</tr>
<tr>
<td>WS-C6509-E</td>
<td>Catalyst 6500 Enhanced 9-slot chassis, 9RU, no PS, no Fan Tray</td>
</tr>
<tr>
<td>WS-C6509E-V</td>
<td>Catalyst 6500 Enhanced 9-slot Chassis (Vertical), No PS, Fan Tray</td>
</tr>
<tr>
<td>WS-C6513</td>
<td>Catalyst 6500 13-slot chassis, 13RU, no PS, no Fan Tray</td>
</tr>
</tbody>
</table>

#### Virtual Switching Supervisor Engine 720-10G Bundles

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>VS-C6504E-S720-10G</td>
<td>Catalyst Chassis + Fan Tray + Sup720-10G (IP Base ONLY, NO VSS)</td>
</tr>
<tr>
<td>VS-C6506E-S720-10G</td>
<td>Catalyst Chassis + Fan Tray + Sup720-10G (IP Base ONLY, NO VSS)</td>
</tr>
<tr>
<td>VS-C6509E-S720-10G</td>
<td>Catalyst Chassis + Fan Tray + Sup720-10G (IP Base ONLY, NO VSS)</td>
</tr>
<tr>
<td>VS-C6513-S720-10G</td>
<td>Catalyst Chassis + Fan Tray + Sup720-10G (IP Base ONLY, NO VSS)</td>
</tr>
</tbody>
</table>

#### Supervisor Engine 32-PISA Bundles

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>WS-C6503E-S32P10GE</td>
<td>Catalyst 6503E chassis, WS-S32-10GE-PISA, Fan Tray (req PS)</td>
</tr>
<tr>
<td>WS-C6504E-S32P10GE</td>
<td>Catalyst 6504E chassis, WS-S32-10GE-PISA, Fan Tray (req PS)</td>
</tr>
<tr>
<td>WS-C6506E-S32P10GE</td>
<td>Catalyst 6506E chassis, WS-S32-10GE-PISA, Fan Tray (req PS)</td>
</tr>
<tr>
<td>WS-C6509E-S32P10GE</td>
<td>Catalyst 6509E chassis, WS-S32-10GE-PISA, Fan Tray (req PS)</td>
</tr>
<tr>
<td>WS-C6513-S32P10GE</td>
<td>Catalyst 6513 chassis, WS-S32-10GE-PISA, Fan Tray (req PS)</td>
</tr>
<tr>
<td>WS-C6503E-S32P-GE</td>
<td>Catalyst 6503E chassis, WS-S32-GE-PISA, Fan Tray (req PS)</td>
</tr>
<tr>
<td>WS-C6504E-S32P-GE</td>
<td>Catalyst 6504E chassis, WS-S32-GE-PISA, Fan Tray (req PS)</td>
</tr>
<tr>
<td>WS-C6506E-S32P-GE</td>
<td>Catalyst 6506E chassis, WS-S32-GE-PISA, Fan Tray (req PS)</td>
</tr>
<tr>
<td>WS-C6509E-S32P-GE</td>
<td>Catalyst 6509E chassis, WS-S32-GE-PISA, Fan Tray (req PS)</td>
</tr>
<tr>
<td>WS-C6513-S32P-GE</td>
<td>Catalyst 6513 chassis, WS-S32-GE-PISA, Fan Tray (req PS)</td>
</tr>
</tbody>
</table>

#### Supervisor Engine 32 Bundles

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>WS-C6503E-S32-10GE</td>
<td>Catalyst 6503E chassis, WS-SUP32-10GE-3B, Fan Tray (req PS)</td>
</tr>
<tr>
<td>WS-C6504E-S32-10GE</td>
<td>Catalyst 6504E chassis, WS-SUP32-10GE-3B, Fan Tray (req PS)</td>
</tr>
<tr>
<td>WS-C6506E-S32-10GE</td>
<td>Catalyst 6506E chassis, WS-SUP32-10GE-3B, Fan Tray (req PS)</td>
</tr>
<tr>
<td>WS-C6509E-S32-10GE</td>
<td>Catalyst 6509E chassis, WS-SUP32-10GE-3B, Fan Tray (req PS)</td>
</tr>
<tr>
<td>WS-C6513-S32-10GE</td>
<td>Catalyst 6513 chassis, WS-SUP32-10GE-3B, Fan Tray (req PS)</td>
</tr>
</tbody>
</table>

#### Advanced Technology Bundles

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>WS-C6504-E-VPN+-K9</td>
<td>Cisco Catalyst 6504E IPSec VPN SPA Security System</td>
</tr>
<tr>
<td>WS-C6506-E-VPN+-K9</td>
<td>Cisco Catalyst 6506E IPSec VPN SPA Security System</td>
</tr>
<tr>
<td>WS-C6509-E-VPN+-K9</td>
<td>Cisco Catalyst 6509E IPSec VPN SPA Security System</td>
</tr>
<tr>
<td>WS-C6513-VPN+-K9</td>
<td>Cisco Catalyst 6513 IPSec VPN SPA Security System</td>
</tr>
<tr>
<td>WS-C6503F-FWM-K9</td>
<td>Cisco Catalyst 6503F Firewall Security System</td>
</tr>
<tr>
<td>WS-C6506F-FWM-K9</td>
<td>Cisco Catalyst 6506F Firewall Security System</td>
</tr>
<tr>
<td>WS-C6509F-FWM-K9</td>
<td>Cisco Catalyst 6509F Firewall Security System</td>
</tr>
</tbody>
</table>
Cisco Catalyst 4500 Series Switches

The Cisco Catalyst 4500 Series is a medium-density modular switch delivering robust intelligent services for unified communications deployments. The simple centralized architecture, media flexibility, and scalability of the Cisco Catalyst 4500 Series deliver maximum investment protection with backward and forward compatibility across several generations dating back to 1999, maximizing return on investment while minimizing recurring operational expenses.

The Cisco Catalyst 4500 E-Series is a high-performance next-generation extension of the Cisco Catalyst 4500 Series Switches. It builds on Cisco Catalyst 4500 Series architecture offering higher services, features, flexibility, and performance while continuing to maximize investment protection across the Cisco Catalyst 4500 Series Switches.

The Cisco Catalyst 4500 Series extends intelligence and operational simplicity to the network edge (wiring closet) for unified communications with intelligent network services, sophisticated quality of service (QoS), predictable performance, advanced security, up to 30 watts of PoE, and comprehensive management features. The Cisco Catalyst 4500 Series delivers high levels of integrated resiliency in both hardware and software, minimizing costly downtime for both planned and unplanned network outages and helping maximize workforce productivity.

The Cisco Catalyst 4500 Series Supervisor Engine 6-E is the latest supervisor engine offering an intelligent, highest-performance Catalyst 4500 supervisor engine optimized for customers deploying unified communications networks.

Ideal for Companies that Need These Features

Supervisors

- **Cisco Catalyst 4500 Series Supervisor Engine 6-E**—Designed for high-density enterprise wiring closets, medium-sized core, distribution, and branch-office collapsed core; it offers the following: Offers high-performance Layer 2, 3, and 4 switching (320-Gbps capacity, 250 mpps); Enables 24 Gbps per slot when deployed in the Cisco Catalyst 4500 E-Series chassis; Offers high-performance IPv4 and IPv6 deployments or migration; Supports classic and E-Series chassis; Simultaneously supports classic and E-Series line cards in same chassis; Supports twin gigabit converter module; Supports dynamic QoS, security, and IPv6 resource optimization.

- **Cisco Catalyst 4500 Supervisor Engine V-10GE**—Designed for high-density enterprise wiring closets and branch-office collapsed core; it offers the following: Supports high-performance Layer 2, 3, and 4 switching; Offers compatibility with future versions with two 10-Gigabit Ethernet and four Gigabit Ethernet uplinks; Supports integrated NetFlow; Supports all Cisco Catalyst 4500 chassis.

- **Cisco Catalyst 4500 Series Supervisor Engine V**—Designed for enterprise wiring closets and branch-office collapsed core; it offers the following: Supports high-performance Layer 2, 3, and 4 switching; Supports Gigabit Ethernet uplinks; Supports classic and E-Series chassis; Offers NetFlow option with daughter card; Supports all Cisco Catalyst 4500 chassis.

- **Cisco Catalyst 4500 Series Supervisor Engine IV**—Designed for entry-level Layer 3 enterprise wiring closets and small branch-office collapsed core; it offers the following: Supports entry-level Layer 2, 3, and 4 switching; Supports Gigabit Ethernet uplinks; Supports Cisco Catalyst 4507R-E, 4507-R, 4506-E, 4508-E, 4503-E, and 4503 model chassis.

- **Cisco Catalyst 4500 Series Supervisor Engine II-Plus-10GE**—Designed for Layer 2 high-density enterprise wiring closets; it offers the following: Supports high-performance Layer 2 switching and services; Offers compatibility with future versions with two 10-Gigabit Ethernet and four Gigabit Ethernet uplinks; Supports Cisco Catalyst 4507R-E, 4507-R, 4506-E, 4508-E, and 4503 model chassis.

- **Cisco Catalyst 4500 Series Supervisor Engine II-Plus**—Designed for Layer 2 enterprise wiring closets; it offers the following: Supports high-performance Layer 2 switching and services; Supports Gigabit Ethernet uplinks; Supports Cisco Catalyst 4507R-E, 4507-R, 4506-E, 4508-E, 4503-E, and 4503 model chassis.

- **Cisco Catalyst 4500 Series Supervisor Engine II-Plus-TS**—Designed for low-density Layer 2 small access layer and branch-office deployments; it offers the following: Supports entry-level Layer 2 switching and services; Provides twelve 10/100/1000 PoE and 8 Small Form-Factor Pluggable (SFP) ports built onto the supervisor engine; Supports Cisco Catalyst 4503-E and 4503 chassis only.

Chassis

- **Cisco Catalyst 4510R-E Switch**—High performance, port density, high availability (SSU) through redundant supervisor engines (when these features are crucial to customer success); Support for both classic and E-Series line cards; Port density up to three hundred eighty-eight 10/100 (RJ-45 with or without PoE), 10/100...
Cisco Catalyst 4500 Series Switches

Chapter 2

Cisco Catalyst 4507R-E Switch—Network resiliency and high availability (ISSU) through redundant supervisor engines (when these features are crucial to customer success); Support for both classic and E-Series line cards; Port density up to two hundred forty-four 10/100 (RJ-45 with or without PoE), 10/100 (RJ-21 with or without PoE), 100BASE-FX, 100BASE-LX-10, 100BASE-BX-D, 1000BASE-X, 10/100/1000BASE-T (with or without PoE), or thirty-two 10-Gigabit Ethernet ports; Support for both classic and E-Series line cards; Support for up to 280-Gbps, 210-Mpps, or 24-Gbps per-slot bandwidth when used with the Supervisor Engine 6-E

Cisco Catalyst 4506-E Switch—Port density up to two hundred forty-four 10/100 (RJ-45 with or without PoE), 10/100 (RJ-21 with or without PoE), 100BASE-FX, 100BASE-LX-10, 100BASE-BX-D, 1000BASE-X, 10/100/1000BASE-T (with or without PoE), or thirty-two 10-Gigabit Ethernet ports; Support for both classic and E-Series line cards; Support for up to 280-Gbps, 210-Mpps, or 24-Gbps per-slot bandwidth when used with the Supervisor Engine 6-E

Cisco Catalyst 4503-E Switch—Port density up to one hundred eight 10/100 (RJ-45 with or without PoE), 10/100 (RJ-21 with or without PoE), 100BASE-FX, 100BASE-LX-10, 100BASE-BX-D, 1000BASE-X, 10/100/1000BASE-T (with or without PoE), or fourteen 10-Gigabit Ethernet ports; Support for both classic and E-Series line cards; Up to 136-Gbps, 102-Mpps, or 24-Gbps per-slot bandwidth when used with the Supervisor Engine 6-E

Note: Compatible sparing between Cisco Catalyst 4510R-E, Catalyst 4507R-E, Catalyst 4506-E, and Catalyst 4503-E chassis provides investment protection with common supervisor engines, power supplies, and switching line cards.

Key Features

- **Investment protection**—Evolutionary centralized modular architecture provides maximum backward compatibility across several generations of Cisco Catalyst 4500 Series Switches. Upgrading all system ports to higher-level functions and features are easy with a simple supervisor-engine upgrade.
- **Flexible options**—Modular 3- and 6-slot single supervisor chassis and 7- and 10-slot redundant supervisor chassis support numerous connectivity and service configurations with 24-GB per-slot capacity.
- **Nonstop communications**—Redundant supervisor engines offer In Service Software Upgrade (ISSU) and Nonstop Forwarding/Stateful Switchover (NSF/SSO) with 50-ms failover; redundant power supplies offer power circuit redundancy; and hot-swappable fan trays are designed with redundant fans.
- **Comprehensive security**—These switches support integrated Cisco Network Admission Control (NAC) and 802.1x, hardware-based Control Plane Policing (CoPP); integrated man-in-the-middle and denial-of-service (DoS) attack mitigation; NetFlow; access control lists (ACLs), and Secure Shell (SSH) Protocol.
- **Comprehensive management**—These switches support CiscoWorks, Cisco Network Assistant, Remote Switched Port Analyzer (RSPAN), Cisco IOS Embedded Event Manager (EEM), IPSLA, Time Domain Reflectometer (TDR), and NetFlow.
- **High port density**—These switches offer up to 384 Fast Ethernet or Gigabit Ethernet ports or thirty-two 10-Gigabit Ethernet ports.
- **IP communications**—Cisco prestandard, up to 15.4W IEEE 802.3af support, 20W for 802.11n support and up to 30 watts per port for future applications

Specifications

### Classic 4500 Chassis

<table>
<thead>
<tr>
<th>Features</th>
<th>WS-C4503</th>
<th>WS-C4506</th>
<th>WS-C4507R</th>
<th>WS-C4510R</th>
</tr>
</thead>
<tbody>
<tr>
<td>Slots</td>
<td>3</td>
<td>6</td>
<td>7</td>
<td>10</td>
</tr>
<tr>
<td>Redundant Supervisor Option</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Gigabit Ethernet GBIC/SFP density</td>
<td>104</td>
<td>240</td>
<td>240</td>
<td>384</td>
</tr>
<tr>
<td>10 GE X2 port density</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>10/100/1000 density</td>
<td>108</td>
<td>240</td>
<td>240</td>
<td>384</td>
</tr>
<tr>
<td>10/100 density</td>
<td>108</td>
<td>240</td>
<td>240</td>
<td>384</td>
</tr>
<tr>
<td>100BASE-FX, LX-10, BX-D density</td>
<td>96</td>
<td>240</td>
<td>240</td>
<td>384</td>
</tr>
<tr>
<td>Rack Unit (RU)</td>
<td>7</td>
<td>10</td>
<td>11</td>
<td>14</td>
</tr>
<tr>
<td>Backplane Capacity</td>
<td>64 Gbps</td>
<td>100 Gbps</td>
<td>100 Gbps</td>
<td>136 Gbps</td>
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<tr>
<td>Stackable</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
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<tr>
<td>1+1 Power Supply Protection</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Power Over Ethernet (PoE) Support</td>
<td>Up to 15.4W on every port</td>
<td>Up to 15.4W on every port</td>
<td>Up to 15.4W on every port</td>
<td>Up to 15.4W on every port</td>
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Cisco Catalyst 4500 Series Switches 2-7
### 4500 E-Series Chassis

#### Features

<table>
<thead>
<tr>
<th></th>
<th>WS-C4503-E</th>
<th>WS-C4506-E</th>
<th>WS-C4507R-E</th>
<th>WS-C4510R-E</th>
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<tbody>
<tr>
<td>Slots</td>
<td>3</td>
<td>6</td>
<td>7</td>
<td>10</td>
</tr>
<tr>
<td>Redundant Supervisor Option</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Gigabit Ethernet GBIC/SFP density</td>
<td>104</td>
<td>244</td>
<td>248 with Dual Sup 6-Es and 4xTwinGigs</td>
<td>292 with Dual Sup 6-Es and 4xTwinGigs</td>
</tr>
<tr>
<td>10 GE X2 port density</td>
<td>14</td>
<td>32</td>
<td>34</td>
<td>34</td>
</tr>
<tr>
<td>10/100/1000 density</td>
<td>108</td>
<td>240</td>
<td>240</td>
<td>384</td>
</tr>
<tr>
<td>10/100 density</td>
<td>96</td>
<td>240</td>
<td>240</td>
<td>384</td>
</tr>
<tr>
<td>100BASE-FX, LX-10, BX-D density</td>
<td>96</td>
<td>240</td>
<td>240</td>
<td>384</td>
</tr>
<tr>
<td>Rack Unit (RU)</td>
<td>7</td>
<td>10</td>
<td>11</td>
<td>14</td>
</tr>
<tr>
<td>Backplane Capacity using Supervisor 6-E</td>
<td>136 Gbps</td>
<td>280 Gbps</td>
<td>280 Gbps</td>
<td>320 Gbps</td>
</tr>
<tr>
<td>Stackable</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Enhanced Power Over Ethernet (PoE) Support</td>
<td>Up to 20W of PoE = 37 ports can be enabled @ 20W</td>
<td>Up to 20W of PoE = 37 ports can be enabled @ 20W</td>
<td>Up to 20W of PoE = 37 ports can be enabled @ 20W</td>
<td>Up to 20W of PoE = 37 ports can be enabled @ 20W</td>
</tr>
<tr>
<td>Power Over Ethernet Plus (PoEP) Support (after software upgrade on premium linecard)</td>
<td>Up to 30W of PoE = 25 ports can be enabled @ 30W</td>
<td>Up to 30W of PoE = 25 ports can be enabled @ 30W</td>
<td>Up to 30W of PoE = 25 ports can be enabled @ 30W</td>
<td>Up to 30W of PoE = 25 ports can be enabled @ 30W</td>
</tr>
<tr>
<td>1+1 Power Supply Protection</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Hot-Swappable Power Supplies</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>

#### Max. watt power consumption

<table>
<thead>
<tr>
<th></th>
<th>AC Internal</th>
<th>AC External with power shelf</th>
<th>DC Internal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max. number of Class 3 devices (15.4W)</td>
<td>108</td>
<td>240</td>
<td>240</td>
</tr>
<tr>
<td>Max. number of Class 3 devices (15.4W)</td>
<td>108</td>
<td>240</td>
<td>240</td>
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</table>

### Supervisor Engines

#### Hot-Swappable Power Supplies

- Yes

#### Max. watt power consumption

<table>
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<tr>
<th></th>
<th>AC Internal</th>
<th>AC External with power shelf</th>
<th>DC Internal</th>
</tr>
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<tbody>
<tr>
<td>Max. number of Class 3 devices (15.4W)</td>
<td>1400</td>
<td>1400</td>
<td>1400</td>
</tr>
<tr>
<td>Max. number of Class 3 devices (15.4W)</td>
<td>1400</td>
<td>1400</td>
<td>1400</td>
</tr>
</tbody>
</table>

### Unit weight (chassis only)

- 31.25 lbs (14.18 kgs)
- 40.5 lbs (18.37 kgs)
- 44.25 lbs (20.07 kgs)
- 51.50 lbs (23.36 kgs)

### Dimensions (H x W x D)

- 12.25 x 17.31 x 12.50 in (31.12 x 43.97 x 31.70 cm)
- 17.38 x 17.31 x 12.50 in (44.13 x 43.97 x 31.70 cm)
- 19.19 x 17.31 x 12.50 in (48.74 x 43.97 x 31.70 cm)
- 24.35 x 17.31 x 12.50 in (61.84 x 43.97 x 31.70 cm)

### 1+1 Power Supply Protection

- Yes

### Hot-Swappable Power Supplies

- Yes
## Chapter 2

### Cisco Catalyst 4500 Series Switches

<table>
<thead>
<tr>
<th>Features</th>
<th>Supervisor 6-E (WS-X45-Sup6-E)</th>
<th>Supervisor V - 10GE (WS-X4516-10GE)</th>
<th>Supervisor V (WS-X4516)</th>
<th>Supervisor IV (WS-X4515)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chassis supported</td>
<td>All</td>
<td>All</td>
<td>All</td>
<td>4503-E, 4506-E, 4507R-E, 4503, 4506, 4507R</td>
</tr>
<tr>
<td>Enhanced Layer 3 option</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>Total bandwidth (Gbps)</td>
<td>320</td>
<td>126</td>
<td>96</td>
<td>64</td>
</tr>
<tr>
<td>Packets per second (Mpps)</td>
<td>250 (IPv4) 125 (IPv6)</td>
<td>102</td>
<td>72</td>
<td>48</td>
</tr>
<tr>
<td>CPU MHz</td>
<td>1300</td>
<td>800</td>
<td>460</td>
<td>333</td>
</tr>
<tr>
<td>NetFlow</td>
<td>no included option option option</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Onboard memory (DRAM)</td>
<td>512 MB upgradable to 1 GB</td>
<td>512 MB</td>
<td>512 MB</td>
<td>512 MB</td>
</tr>
<tr>
<td>On-Board Flash</td>
<td>128 MB</td>
<td>64 MB</td>
<td>64 MB</td>
<td>64 MB</td>
</tr>
<tr>
<td>Compact Flash Support</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Switching Capacity &amp; Throughput</td>
<td>320 Gbps, 250 Mbps</td>
<td>136 Gbps, 102 Mbps</td>
<td>96 Gbps, 72 Mbps</td>
<td>64 Gbps, 48 Mbps</td>
</tr>
<tr>
<td>(E)IGRP, OSPF, IS:IS, BGP</td>
<td>EIGRP, OSPF, BGP, RIPv1/2</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Supervisor Redundancy</td>
<td>4507R, 4510R, 4507R-E, and 4510R-E only</td>
<td>4507R and 4510R Only</td>
<td>4507R and 4510R Only</td>
<td>4507R Only</td>
</tr>
<tr>
<td>QoS</td>
<td>8Q/Port, MQL, Dynamic Tx Queue sizing, policing, shaping, congestion avoidance with DBL marking</td>
<td>4Q/Port, policing, shaping, congestion avoidance</td>
<td>4Q/Port, policing, shaping, congestion avoidance</td>
<td>4Q/Port, policing, shaping, congestion avoidance</td>
</tr>
<tr>
<td>CPU</td>
<td>1300 MHz</td>
<td>800 MHz</td>
<td>400 MHz</td>
<td>333 MHz</td>
</tr>
<tr>
<td>NetFlow Support</td>
<td>No</td>
<td>Yes (built-in functionality; no Daughter Card Required)</td>
<td>Yes (Optional Daughter Card)</td>
<td>Yes (Optional Daughter Card)</td>
</tr>
<tr>
<td>ISL</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>ACLS</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>IP FIB entries</td>
<td>256K</td>
<td>128K</td>
<td>128K</td>
<td>128K</td>
</tr>
<tr>
<td>MAC Addresses</td>
<td>55K Unicast, 16K Multicast</td>
<td>32K Unicast, 16K Multicast</td>
<td>32K Unicast, 16K Multicast</td>
<td>32K Unicast, 16K Multicast</td>
</tr>
</tbody>
</table>

1. With a maximum 750W per slot

### Selected Part Numbers and Ordering Information

#### Catalyst 4500 E-Series—Chassis

- **WS-C4503-E**: Catalyst 4500 E-Series 3-Slot Chassis, fan, no ps.
- **WS-C4503-E-S2+48**: Catalyst 4500 E-Series 3-Slot Chassis, fan, no ps.
- **WS-C4507R-E**: Catalyst 4500 E-Series 7-Slot Chassis, fan, no ps, Red Sup Capable.
- **WS-C4507R-E-S2+48V**: Catalyst 4503 E-PoE Bundle, 1 x 1300AC, 1 x S2+, 1 x WS-X4248-RJ45V
- **WS-C4507R-E-S2+48**: Catalyst 4507R E-Series Data Bundle, 1 x 1000AC, 1 x S2+, 2 x WS-X4248-RJ45V
- **WS-C4507R-E-S2+48**: Catalyst 4507R E-Series Data Bundle, 1 x 1000AC, 1 x S2+, 2 x WS-X4248-RJ45V

#### Catalyst 4500—Chassis

- **WS-C45010R**: Catalyst 4500 Chassis (10-Slot), fan, no ps, Red Sup Capable
- **WS-C4507R**: Catalyst 4500 Chassis (7-Slot), fan, no ps, Red Sup Capable
Cisco Catalyst 4900 Series Switches

The Cisco Catalyst 4900 Series Switches are Layer 2–4 fixed-configuration switches that offer high-performance for data centers and branch core. The Cisco Catalyst 4900 Series offers high performance, low latency in a compact 1-rack unit (1RU) form factor.

Ideal for Companies that Need These Features
- Cisco Catalyst 4948—48 ports of Gigabit Ethernet switching in 1 rack unit (1RU) with dual power supplies
- Nonblocking Layer 2, 3, and 4 10/100/1000 Gigabit Ethernet performance
- Cisco Catalyst 4948-10GE—48 ports of Gigabit Ethernet switching in 1RU with dual power supplies; Nonblocking Layer 2, 3, and 4 10/100/1000 Gigabit Ethernet performance with 10-Gigabit Ethernet uplinks
- Cisco Catalyst 4928-10GE—28 ports SFP Gigabit Ethernet switching in 1RU with dual power supplies; Nonblocking Layer 2, 3, and 4 Gigabit Ethernet performance with 10-Gigabit Ethernet uplinks

Key Features
- Low-latency and wire-speed switching.
- The switches offer up to forty-eight 10/100/1000 ports with four Small Form-Factor Pluggable (SFP) ports or forty-eight 10/100/1000 ports with two 10-Gigabit Ethernet or 28 SFP GE ports with two 10-Gigabit Ethernet
- The switches have redundant internal AC or DC power supplies with a hot-swappable fan tray.
- SFP or X2 flexibility on fiber port interfaces covers a wide range of cabling distances.

Specifications

<table>
<thead>
<tr>
<th>Feature</th>
<th>WS-C4948</th>
<th>WS-C4948-10GE</th>
<th>WS-C4928-10GE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Forwarding bandwidth (Gbps)</td>
<td>96</td>
<td>136</td>
<td>96</td>
</tr>
<tr>
<td>Maximum stack members</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Total stack bandwidth (Gbps)</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Packets per second (Mpps)</td>
<td>72</td>
<td>102</td>
<td>72</td>
</tr>
<tr>
<td>MAC addresses supported</td>
<td>32,768</td>
<td>55,000</td>
<td>55,000</td>
</tr>
<tr>
<td>Routes supported</td>
<td>32,000</td>
<td>32,000</td>
<td>32,000</td>
</tr>
<tr>
<td>Onboard memory (DRAM)</td>
<td>256 MB</td>
<td>256 MB</td>
<td>256 MB</td>
</tr>
<tr>
<td>10 GE density</td>
<td>0</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Gigabit Ethernet GBIC/SFP density</td>
<td>4</td>
<td>0</td>
<td>28</td>
</tr>
<tr>
<td>10 GE XENPAK/X2 port density</td>
<td>0</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>10/100/1000 density</td>
<td>48</td>
<td>48</td>
<td>0</td>
</tr>
<tr>
<td>10/100 density</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Max. watt power consumption</td>
<td>300</td>
<td>300</td>
<td>300</td>
</tr>
<tr>
<td>AC/DC support</td>
<td>AC/DC</td>
<td>AC/DC</td>
<td>AC/DC</td>
</tr>
<tr>
<td>Dimensions (H x W x D)</td>
<td>17.5 x 17.3 x 161 in (44.5 x 43.91 x 40.99 cm.)</td>
<td>17.5 x 17.3 x 161 in (44.5 x 43.91 x 40.99 cm.)</td>
<td>17.5 x 17.3 x 161 in (44.5 x 43.91 x 40.99 cm.)</td>
</tr>
<tr>
<td>Unit weight</td>
<td>16.5 (7.48 kgs.)</td>
<td>16.5 (7.48 kgs.)</td>
<td>16.5 (7.48 kgs.)</td>
</tr>
</tbody>
</table>

For More Information
For more information about the Cisco Catalyst 4500 Series, visit: http://www.cisco.com/go/catalyst4500.
Cisco Catalyst 4900M Series Switches

The Cisco Catalyst 4900M Series Switches are Layer 2–4 fixed-configuration switches that offer high-performance for top of rack server switching and for branch core deployments. The Cisco Catalyst 4900M Series offers high performance, low packet size independent latency, and media flexibility in a compact 2RU form factor.

Ideal for Companies that Need These Features

- Flexibility of GbE and 10GbE ports in the same switch
- Full media flexibility for GbE and 10GbE fiber connectivity (copper, short reach multimode fiber, up to long reach/ DWDM on singlemode fiber)
- Sub 3us packet size independent low latency
- Up to 24 ports of 10 Gigabit Ethernet and up to 40 ports of Gigabit Ethernet in 2RU with dual power supplies
- Non-blocking Layer 2, 3, and 4 10/100/1000 Gigabit Ethernet, 1000BASE-X, and 10-Gigabit Ethernet performance

Key Features

- The Cisco Catalyst 4900M Series Switches provide packet size independent low-latency and wire-speed switching.
- The switches offer up to forty 10/100/1000 ports and up to twenty-four 10-Gigabit Ethernet ports (X2).
- The switches have redundant internal AC or DC power supplies with a hot-swappable fan tray.
- SFP or X2 flexibility on fiber port interfaces covers a wide range of cabling distances.

Specifications

<table>
<thead>
<tr>
<th>Feature</th>
<th>WS-C4900M</th>
</tr>
</thead>
<tbody>
<tr>
<td>Forwarding bandwidth (Gbps)</td>
<td>320</td>
</tr>
<tr>
<td>Maximum stack members</td>
<td>0</td>
</tr>
<tr>
<td>Total stack bandwidth (Gbps)</td>
<td>0</td>
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<tr>
<td>Packets per second (Mpps)</td>
<td>250</td>
</tr>
<tr>
<td>MAC addresses supported</td>
<td>55,000</td>
</tr>
<tr>
<td>Routes supported</td>
<td>256,000</td>
</tr>
<tr>
<td>Onboard memory (DRAM)</td>
<td>512MB</td>
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<tr>
<td>10 GbE density</td>
<td>24</td>
</tr>
<tr>
<td>Gigabit Ethernet GBIC/SFP density</td>
<td>32</td>
</tr>
<tr>
<td>10 GbE XENPAK/X2 port density</td>
<td>24</td>
</tr>
<tr>
<td>10/100/1000 density</td>
<td>40</td>
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<td>10/100 density</td>
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</tr>
<tr>
<td>Max. watt power consumption</td>
<td>1000</td>
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<tr>
<td>AC/DC support</td>
<td>AC/DC</td>
</tr>
<tr>
<td>Dimensions (H x W x D)</td>
<td>3.5 x 17.2 x 17.9in (89 x 437 x 455 cm)</td>
</tr>
<tr>
<td>Unit weight</td>
<td>25 to 39 (11.3 to 17.6kgs)</td>
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</table>

Selected Part Numbers and Ordering Information

Catalyst 4900M Switch Series

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>WS-C4900M</td>
<td>Catalyst 4900M 6 port base system</td>
</tr>
</tbody>
</table>

For More Information

Cisco Catalyst 3750 Series Switches

The Cisco Catalyst 3750 Series Switch is an innovative product for midsize organizations and enterprise branch offices. Featuring Cisco StackWise technology, the switch improves LAN operating efficiency by combining ease of use and the highest resiliency available for stackable switches.

Ideal for Companies that Need These Features
- Cisco Catalyst 3570 Series Switches—Enhanced business productivity, resiliency, security, and scalability; Quick deployment and easy management of their networks; Deployment of IP telephony, wireless, or Gigabit to the Desktop (GTTD)
- Cisco Catalyst 3750-24TS Switches—Low-density access with switch stacking capability; Layer 2+ or Layer 3 features, Power over Ethernet (PoE), and one or more fiber uplinks
- Cisco Catalyst 3750-48TS Switches—Medium-density access with switch stacking capability; Layer 2+ or Layer 3 features, and one or more fiber uplinks
- Cisco Catalyst 3750G-24T Switches—Low-density Layer 2+ or Layer 3 GTTD or Ethernet aggregation with stacking capability without any uplinks
- Cisco Catalyst 3750G-24TS-1U Switches—Low-density Layer 2+ or Layer 3 GTTD or Ethernet aggregation with switch stacking capability and fiber uplinks in a 1-rack unit (1RU) form factor
- Cisco Catalyst 3750G-24TS Switches—Low-density Layer 2+ or Layer 3 GTTD or Ethernet aggregation with switch stacking capability and fiber uplinks in a 1.5RU form factor
- Cisco Catalyst 3750G-24PS Switches—Low-density Layer 2+ or Layer 3 GTTD or Ethernet aggregation with switch stacking capability, PoE, and fiber uplinks
- Cisco Catalyst 3750G-48TS Switches—Medium-density Layer 2+ or Layer 3 GTTD or Ethernet aggregation with switch stacking capability and fiber uplinks
- Cisco Catalyst 3750G-48PS Switches—Medium-density Layer 2+ or Layer 3 GTTD or Ethernet aggregation with switch stacking capability, PoE, and fiber uplinks
- Cisco Catalyst 3750G-12S/SD Switches—Aggregation of wiring-closet switches with optical connectivity and stacking
- Cisco Catalyst 3750-24FS Switches—Low-density access using 100BASE-FX fiber connections with switch stacking capability, basic Layer 3 features, and one or more fiber uplinks
- Cisco Catalyst WS-C3750G-24VS-S2S Switches—Integrated wireless LAN (WLAN) controller functions into Cisco Catalyst 3750G Series Switches (This switch supports 25 access points.)
- Cisco Catalyst WS-C3750G-24WS-S25 Switches—I ntegrated wireless LAN (WLAN) controller functions into Cisco Catalyst 3750G Series Switches (This switch supports 50 access points.)

Key Features
The Cisco Catalyst 3560-E Series Switches offer the same features as the Cisco Catalyst 3560 Series plus:
- Cisco StackWise technology—One IP address and one command-line interface (CLI) simplify management. A 32-Gbps resilient architecture speeds convergence, and 1N stack master redundancy and Layer 3 uplink resilienc e as well as cross-stack Cisco EtherChannel technology and quality of service (QoS) increase availability. Autoconfiguration and Cisco IOS Software version check and update accelerate deployment, and hot add and delete of switches keep the stack running.
- Wireless—The integrated wireless LAN (WLAN) controller delivers centralized security policies, intrusion protection, RF management, QoS and Layer 3 fast secure roaming for WLANs. This WLAN controller is part of the Cisco Unified Wireless Network.

Specifications

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Forwarding bandwidth (Gbps)</td>
<td>32</td>
<td>32</td>
<td>32</td>
<td>32</td>
<td>32</td>
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<tr>
<td>Maximum stack members</td>
<td>9</td>
<td>9</td>
<td>9</td>
<td>9</td>
<td>9</td>
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<tr>
<td>Total stack bandwidth (Gbps)</td>
<td>32</td>
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<tr>
<td>Packets per second (Mpps)</td>
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<td>12,000</td>
<td>12,000</td>
<td>12,000</td>
</tr>
<tr>
<td>Routes supported</td>
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<td>11,000</td>
<td>11,000</td>
<td>11,000</td>
<td>11,000</td>
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<td>Forwarding bandwidth (Gbps)</td>
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<tr>
<td>Maximum stack members</td>
<td>9</td>
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<tr>
<td>Total stack bandwidth (Gbps)</td>
<td>32</td>
<td>32</td>
<td>32</td>
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<td>Packets per second (Mpps)</td>
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<td>MAC addresses supported</td>
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<td>12,000</td>
<td>12,000</td>
<td>12,000</td>
<td>12,000</td>
</tr>
<tr>
<td>Routes supported</td>
<td>11,000</td>
<td>11,000</td>
<td>11,000</td>
<td>11,000</td>
<td>11,000</td>
</tr>
<tr>
<td>10 GE density</td>
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<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
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<tr>
<td>Gigabit Ethernet GBIC/ SFP density</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
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<tr>
<td>10 GE XENPAK/X2 port density</td>
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<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
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<tr>
<td>10/100/1000 density</td>
<td>24</td>
<td>24</td>
<td>48</td>
<td>24</td>
<td>48</td>
</tr>
<tr>
<td>10/100 density</td>
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<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
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<tr>
<td>100BASE-FX density</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>24</td>
<td>0</td>
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<tr>
<td>PoE: Max. 802.3af Class 3 devices (15.4W)</td>
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<td>0</td>
<td>24</td>
<td>24</td>
<td>0</td>
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<tr>
<td>PoE: Max. 802.3af Class 2 devices (7.3W)</td>
<td>0</td>
<td>0</td>
<td>24</td>
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<td>1.73 x 17.5 x 12.8 in (44.4 x 44.5 x 32.6 cm)</td>
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<td>1.73 x 17.5 x 16.1 in (44.4 x 44.5 x 40.9 cm)</td>
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<td>1.7 x 17.5 x 161 in. (4.4 x 44.5 x 40.9 cm.)</td>
<td>2.59 x 17.5 x 116 in. (6.6 x 44.5 x 29.5 cm.)</td>
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<td>21 lbs (9.5 kgs.)</td>
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### Selected Part Numbers and Ordering Information

**Cisco Catalyst 3750 Series Ethernet Switches**
- WS-C3750X-24T-S: 24 10/100/1000T Standard Multilayer Image
- WS-C3750X-24T-E: 24 10/100/1000T Enhanced Multilayer Image
- WS-C3750X-24TS-S: 24 10/100/1000 + 4 SFP Std Multilayer; 1.5RU
- WS-C3750X-24TS-E: 24 10/100/1000 + 4 SFP Enh Multilayer; 1.5RU
- WS-C3750X-24TS-S1U: 24 10/100/1000 + 4 SFP Std Multilayer; 1 RU
- WS-C3750X-24TS-E1U: 24 10/100/1000 + 4 SFP Enh Multilayer; 1 RU
- WS-C3750X-24PS-S: 24 10/100/1000T PoE + 4 SFP Standard Image
- WS-C3750X-24PS-E: 24 10/100/1000T PoE + 4 SFP Enhanced Image
- SWLC3750-25-K9: IP BASE W/O CRYPTO WITH WEB BASED DEV MGR

**Wireless LAN**

**Ethernet Switches**
- WS-C3750X-4BTS-S: 48 10/100/1000 + 4 SFP Standard Multilayer
- WS-C3750X-4BTS-E: 48 10/100/1000 + 4 SFP Enhanced Multilayer
- WS-C3750X-4BPS-S: 48 10/100/1000Port + 4 SFP Standard Image
- WS-C3750X-4BPS-E: 48 10/100/1000Port + 4 SFP Enhanced Image
- WS-C3750X-16TP-S: 16 10/100/1000BaseT + 10GE (req XENPAK) Std Image
- WS-C3750X-16TP-E: 16 10/100/1000BaseT + 10GE (req XENPAK) Enh Image
- WS-C3750X-12S-S: 12 SFP Standard Multilayer Image

**Cisco Catalyst 3750 Series 10/100 Workgroup Switches**
- WS-C3750X-24PS-S: 24 10/100BaseX + 2 SFP Standard Multilayer Image
Cisco Catalyst 3750-E Series Switches

The Cisco Catalyst 3750-E Series with Cisco StackWise Plus technology is an enterprise-class line of stackable wiring-closet switches. Combining 10/100/1000 and Power over Ethernet (PoE) configurations with upgradable 1- to 10-Gigabit Ethernet uplinks, Cisco Catalyst 3750-E Switches help enhance worker productivity by enabling applications such as IP telephony, wireless, and video.

Ideal for Companies that Need These Features

- Cisco Catalyst 3570-E Series Switches—Enhanced business productivity, resiliency, security, and scalability; quick deployment and easy management of their networks; 1- to 10-Gigabit Ethernet upgradable uplinks; deployment of IP telephony, wireless, or Gigabit to the Desktop (GTTD)
- Cisco Catalyst 3750E-24TD Switches—Low-density access with switch stacking capability, Layer 2+ or Layer 3 features, and one or more 10-Gigabit Ethernet fiber uplinks
- Cisco Catalyst 3750E-24PD Switches—Low-density access with switch stacking capability, Layer 2+ or Layer 3 features, Power over Ethernet (PoE), and one or more 10-Gigabit Ethernet fiber uplinks
- Cisco Catalyst 3750-48TD Switches—Medium-density access with switch stacking capability, Layer 2+ or Layer 3 features, and one or more 10-Gigabit Ethernet fiber uplinks
- Cisco Catalyst 3750-48PD Switches—Medium-density access with switch stacking capability, Layer 2+ or Layer 3 features, PoE, and one or more 10-Gigabit Ethernet fiber uplinks
- Cisco Catalyst 3750G-48PD full-power switches—Medium-density access with switch stacking capability, full 15.4W of PoE on every port, Layer 2+ or Layer 3 features, PoE, and one or more 10-Gigabit Ethernet fiber uplinks

Key Features

- Cisco Catalyst 3750-E Series Switches offer the same features as the Cisco Catalyst 3560 Series plus:
  - Cisco StackWise Plus technology: One IP address and one command-line interface (CLI) simplify management. A 64-Gbps resilient architecture speeds convergence, and 1N stack master redundancy and Layer 3 uplink resilience as well as cross-stack Cisco EtherChannel technology and quality of service (QoS) increase availability. Autoconfiguration and Cisco IOS Software version check and update accelerate deployment, and hot add and delete of switches keep the stack running.
  - The Cisco TwinGig Converter Module facilitates migrating uplinks from 1-Gigabit Ethernet (Small Form-Factor Pluggable [SFP]) to 10-Gigabit Ethernet (X2) field-replaceable and -upgradable power supplies and fan tray.
  - The Cisco Catalyst 3750-E Series Switches are fully backward-compatible with the Cisco Catalyst 3750 Series Switches.

Specifications

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<td>10/100/1000 density</td>
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<td>48</td>
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<td>48</td>
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</table>
Cisco Catalyst 3560 Series Switches

The Cisco Catalyst 3560 Series Switches are fixed-configuration switches combining Gigabit Ethernet connectivity and Power over Ethernet (PoE) for small enterprise LAN access and branch office deployments.

Ideal for Companies that Need These Features
- Cisco Catalyst 3560 Series Switches—Enhanced business productivity, resiliency, security, and scalability; quick deployment and easy management of their networks; deployments of IP telephony, wireless, or Gigabit to the Desktop (GTD)
- Cisco Catalyst 3560-24TS Switches—Low-density access, Layer 2+ or Layer 3 features, and one or more fiber uplinks
- Cisco Catalyst 3560-24PS Switches—Low-density access, Power over Ethernet (PoE), Layer 2+ or Layer 3 features, and one fiber or 1000BASE-T uplink
- Cisco Catalyst 3560-24PC Switches—Low-density access, Power over Ethernet (PoE), Layer 2+ or Layer 3 features, and one or more fiber uplinks
- Cisco Catalyst 3560-48PS Switches—Medium-density access, PoE, Layer 2+ or Layer 3 features, and one or more fiber uplinks

Selected Part Numbers and Ordering Information

Catalyst 3560-E Series 10/100/1000 Workgroup Switches

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
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<tbody>
<tr>
<td>WS-C3750E-24TD-S</td>
<td>Catalyst 3750E 24 10/100/1000+2*10GE(X2),265W,IPB s/w</td>
</tr>
<tr>
<td>WS-C3750E-24TD-E</td>
<td>Catalyst 3750E 24 10/100/1000+2*10GE(X2),265W,IPS s/w</td>
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<tr>
<td>WS-C3750E-48TD-S</td>
<td>Catalyst 3750E 48 10/100/1000+2*10GE(X2),265W,IPB s/w</td>
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<td>WS-C3750E-48TD-E</td>
<td>Catalyst 3750E 48 10/100/1000+2*10GE(X2),265W,IPS s/w</td>
</tr>
<tr>
<td>WS-C3750E-24PD-S</td>
<td>Catalyst 3750E 24 10/100/1000 PoE+2*10GE(X2),750WIPB s/w</td>
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<tr>
<td>WS-C3750E-24PD-E</td>
<td>Catalyst 3750E 24 10/100/1000 PoE+2*10GE(X2),750WIPS s/w</td>
</tr>
<tr>
<td>WS-C3750E-48PD-S</td>
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<td>WS-C3750E-48PD-E</td>
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<td>WS-C3750E-48PD-EF</td>
<td>Catalyst 3750E 48 10/100/1000 PoE+2*10GE(X2),1150WIPS s/w</td>
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Catalyst 3750-E Series Product Activation Keys

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<td>3750-E-IPS-LIC-B+</td>
<td>IP Services for 3750-E 24 ports, upgrade from IP Base</td>
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<tr>
<td>3750-E-IPS-LIC-B+</td>
<td>IP Services for 3750-E 24 ports, upgrade from IP Base</td>
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<td>3750-E-IPS-LIC-S+</td>
<td>Advanced IP Services for 3750-E 24 ports, upgrade to IP Base</td>
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<td>3750-E-IPS-LIC-S+</td>
<td>Advanced IP Services for 3750-E 24 ports, upgrade to IP Base</td>
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<td>3750-E-R-IP-LIC-B+</td>
<td>Advanced IP Services for 3750-E 48 ports, upgrade to IP Base</td>
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<td>3750-E-R-IP-LIC-S+</td>
<td>Advanced IP Services for 3750-E 48 ports, upgrade to IP Base</td>
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</table>

For More Information

For more information about the Cisco Catalyst 3750-E Series Switch, visit http://www.cisco.com/go/catalyst3750E.
• Cisco Catalyst 3560G-24TS Switches—Low-density 10/100/1000 access, Layer 2+ or Layer 3 features, and one or more fiber uplinks
• Cisco Catalyst 3560G-24PS Switches—Low-density 10/100/1000 access, PoE, Layer 2+ or Layer 3 features, and one or more fiber uplinks
• Cisco Catalyst 3560G-48TS Switches—Medium-density 10/100/1000 access, Layer 2+ or Layer 3 features, and one or more fiber uplinks
• Cisco Catalyst 3560G-48PS Switches—Medium-density 10/100/1000 access, PoE, Layer 2+ or Layer 3 features, and one or more fiber uplinks

Key Features

• Availability—The Cisco Catalyst 3560 Series Switches offer fault tolerance, load balancing, and rapid recovery; increased available bandwidth with Per VLAN Spanning Tree Plus (PVST+) by allowing traffic on redundant links; and sub-100-millisecond convergence with Flexlink technology.
• Power over Ethernet (PoE)—The switches provide 370W PoE, which simplifies IP telephony, wireless, and video-surveillance deployments; intelligent power-management features; and PoE combined with Fast Ethernet or Gigabit Ethernet.
• Layer 3—The switches support advanced routing protocols such as Open Shortest Path First (OSPF), Enhanced Interior Gateway Routing Protocol (EIGRP), and Policy Based Routing (PBR) to increase network scale; equal cost routing as well as multicast routing such as Protocol Independent Multicast (PIM); Virtual Route Forwarding Lite (VRF-Lite) to secure traffic; and IPv6.
• QoS—Traffic shaping smooths a sudden traffic flow outburst without dropping packets; shaped Round Robin guarantees bandwidth to mission-critical applications; and Scavenger Queuing protects against worms overloading resources.
• Management—Cisco Smartsports quicken and simplify configuration of advanced Cisco Catalyst intelligent capabilities. Express setup facilitates quick and easy setup through a Web interface, and resource templates help tailor switch resources for the application.
• Security—Dynamic Host Configuration Protocol (DHCP) Snooping allows only trusted ports to relay DHCP messages, eliminating rogue DHCP servers. Cisco Network Admission Control (NAC) prevents the propagation of costly worms and viruses; Dynamic ARP Inspection and IP Source Guard prevent against man-in-the-middle attacks; 802.1x and Identity-Based Network Services allow only authorized persons on the network, and port security prevents MAC address flooding attacks.

Specifications

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<td></td>
<td>118 (44 x 445 x</td>
<td>118 (44 x 445 x</td>
<td>118 (44 x 445 x</td>
<td>118 (44 x 445 x</td>
<td>118 (44 x 445 x</td>
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<td>301 cm)</td>
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<td>11,000</td>
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Cisco Catalyst 3560-E Series Switches

Cisco Catalyst 3560-E Series is an enterprise-class line of standalone wiring closet switches that ease the deployment of secure converged applications. Combining 10/100/1000 and Power over Ethernet (PoE) configurations with uplinks that easily upgrade from 1 to 10 Gigabit Ethernet, these switches enhance worker productivity by enabling applications such as IP telephony, wireless, and video.

Ideal for Companies that Need These Features
- Cisco Catalyst 3560-E Series Switches—Enhanced business productivity, resiliency, security, and scalability. Quick deployment and easy management of their networks; Deployment of IP telephony, wireless, or Gigabit to the Desktop (GTD) 1-10 Gigabit Ethernet upgradable uplinks.
- Cisco Catalyst 3560E-24TD Switches—Low-density access, Layer 2+ or Layer 3 features, and one or more 10-Gigabit Ethernet fiber uplinks.
- Cisco Catalyst 3560E-48TD Switches—Medium-density access, Layer 2+ or Layer 3 features, and one or more 10-Gigabit Ethernet fiber uplinks.
- Cisco Catalyst 3560E-24PD Switches—Low-density access, PoE, Layer 2+ or Layer 3 features, and one or more 10-Gigabit Ethernet fiber uplinks.

Selected Part Numbers and Ordering Information

For More Information
For more information about the Cisco Catalyst 3560 Series, visit: http://www.cisco.com/go/catalyst3560.

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### Cisco Catalyst 3560 Series 10/100/1000 Workgroup Switches

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<td>Yes</td>
<td>32</td>
<td>1.73 x 17.5 x 14.9 in. (4.4 x 45 x 37.8 cm)</td>
<td>14 lbs. (6.4 kgs.)</td>
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<tr>
<td>WS-C3560G-24TS-S</td>
<td>24 Port 10/100/1000 + 4 SFP</td>
<td>Yes</td>
<td>32</td>
<td>1.73 x 17.5 x 16.1 in. (4.4 x 45 x 40.9 cm)</td>
<td>15.5 lbs. (7.0 kgs.)</td>
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<tr>
<td>WS-C3560G-48PS-S</td>
<td>48 Port 10/100/1000 PoE + 4 SFP</td>
<td>Yes</td>
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<td>1.73 x 17.5 x 14.9 in. (4.4 x 45 x 37.8 cm)</td>
<td>14 lbs. (6.4 kgs.)</td>
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<tr>
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<td>48 Port 10/100/1000 + 4 SFP</td>
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<td>32</td>
<td>1.73 x 17.5 x 16.1 in. (4.4 x 45 x 40.9 cm)</td>
<td>15.5 lbs. (7.0 kgs.)</td>
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### Cisco Catalyst 3560 Series 10/100 Workgroup Switches

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
<th>PoE</th>
<th>SFP</th>
<th>Dimensions (H x W x D)</th>
<th>Unit Weight</th>
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<tbody>
<tr>
<td>WS-C3560G-12PC-S</td>
<td>12 Port 10/100 PoE + 1 1000BT or 1 SFP</td>
<td>Yes</td>
<td>32</td>
<td>1.73 x 10.6 x 9.1 in. (4.4 x 27 x 23 cm)</td>
<td>5 lbs (2.3 kg)</td>
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<tr>
<td>WS-C3560G-24PC-S</td>
<td>24 Port 10/100 PoE + 2 SFP</td>
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<td>1.73 x 10.6 x 9.1 in. (4.4 x 27 x 23 cm)</td>
<td>5 lbs (2.3 kg)</td>
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<td>WS-C3560G-48PC-S</td>
<td>48 Port 10/100 + 4 SFP</td>
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<td>32</td>
<td>1.73 x 17.5 x 9.1 in. (4.4 x 45 x 23 cm)</td>
<td>13.5 lbs. (6.1 kgs.)</td>
</tr>
</tbody>
</table>

---

1. S=IP Base; E=IP Services
Cisco Catalyst 3560-E Series Switches

- Cisco Catalyst 3560E-48PD Switches—Medium-density access, PoE, Layer 2+ or Layer 3 features, and one or more 10-Gigabit Ethernet fiber uplinks
- Cisco Catalyst 3560E-48PD Full Power—Medium-density 10/100/1000 access, full 15.4W of PoE on every port, Layer 2+ or Layer 3 features, PoE, and 1 or more 10-Gigabit Ethernet fiber uplinks
- Cisco Catalyst 3560E-48TD Switches—Medium-density access, Layer 2+ or Layer 3 features, and one or more 10-Gigabit Ethernet fiber uplinks
- Cisco Catalyst 3560E-12SD Switches—Low-density Gigabit Ethernet fiber aggregation, Layer 2+ or Layer 3 features, and one or more 10-Gigabit Ethernet fiber uplinks
- Cisco Catalyst 3560E-12D Switches—Low-density 10-Gigabit Ethernet fiber aggregation and Layer 2+ or Layer 3 features

**Key Features**

- **Availability**—The Cisco Catalyst 3560-E Series Switches offer fault tolerance, load balancing, and rapid recovery; increased available bandwidth with Per VLAN Spanning Tree Plus (PVST+) by allowing traffic on redundant link; and sub-100-millisecond convergence with Flexlink technology.
- **Power over Ethernet (PoE)**—The switches offer 1150W PoE, which simplifies IP telephony, wireless, and video-surveillance deployments. It provides intelligent power-management features and PoE combined with Fast Ethernet or Gigabit Ethernet.
- **Layer 3**—Advanced routing protocols such as Open Shortest Path First (OSPF), Enhanced Interior Gateway Routing Protocol (EIGRP), and Policy Based Routing (PBR) increase network scale. The switches provide equal cost routing as well as multicast routing such as Protocol Independent Multicast (PIM), Virtual Route Forwarding Lite (VRF Lite) to secure traffic, and IPv6.
- **Quality of service (QoS)**—Traffic shaping smooths a sudden traffic flow outburst without dropping packets; shaped Round Robin guarantees bandwidth to mission-critical applications; and Scavenger Queuing protects against worms overloading resources.
- **Management**—Cisco Smartports quicken and simplify configuration of advanced Cisco Catalyst intelligent capabilities; express setup facilitates quick and easy setup through a Web interface; and resource templates help tailor switch resources for the application.
- **Security**—Dynamic Host Configuration Protocol (DHCP) Snooping allows only trusted ports to relay DHCP messages, eliminating rogue DHCP servers. Cisco Network Admission Control (NAC) prevents the propagation of costly worms and viruses; Dynamic ARP Inspection and IP Source Guard prevent against man-in-the-middle attacks. 802.1x and Identity-Based Network Services allow only authorized persons on the network; and port security prevents MAC address flooding attacks.
- **The switches provide a Cisco TwinGig Converter Module for migrating uplinks from 1 Gigabit Ethernet (Small Form-Factor Pluggable [SFP]) to 10 Gigabit Ethernet (X2).**

**Specifications**

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<tbody>
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<td>PoE: Max. 802.3af Class 3 devices (15.4W)</td>
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<td>48</td>
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<tr>
<td>PoE: Max. 802.3af Class 2 devices (7.3W)</td>
<td>24</td>
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<tr>
<td>AC/DC support</td>
<td>AC and DC</td>
<td>AC and DC</td>
<td>AC and DC</td>
<td>AC and DC</td>
<td>AC and DC</td>
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<td>Dimensions (H x W x D)</td>
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<td>17.3 x 17.5 x 18.1</td>
<td>17.3 x 17.5 x 18.1</td>
<td>17.3 x 17.5 x 18.1</td>
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<td>18.8 lbs (8.6 kgs.)</td>
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<td>20.9 lbs (9.5 kgs.)</td>
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</table>
## Cisco Catalyst 2975 Series Switches

The Cisco Catalyst 2975 is a Layer 2+ 10/100/1000BASE-T Power over Ethernet (PoE) stackable switch. It offers connectivity with intelligent LAN services for small enterprise LAN access or branch-office environments. The switch features the enhanced Layer 2+ LAN Base Cisco IOS Software to deliver enhanced integrated security, quality of service (QoS), and availability to enable new converged applications. The Cisco Catalyst 2975 Switch is ideal for situations where space is a constraint.

### Ideal for Companies that Need These Features
- Intelligent services at entry-level functions
- QoS, enhanced security, and availability
- Easy deployment and management of their networks

### Key Features
- Power over Ethernet (PoE)—The Cisco Catalyst 2975 Switch offers 370W PoE, which simplifies IP telephony, wireless, and video surveillance deployments. It also provides intelligent power-management features.
- Security—Network security is enabled through a wide range of authentication methods, data-encryption technologies, and Cisco Network Admission Control (NAC) based on users, ports, and MAC addresses.
- Availability—The 802.1S/W standard facilitates standards-based fault tolerance, load balancing, and rapid recovery. Flexlink provides sub-100-msec convergence, and Per-VLAN Spanning Tree Plus (PVST+) increases available bandwidth by allowing traffic on redundant links.
- Quality of service (QoS)—Network control and bandwidth optimization are achieved through advanced QoS, granular rate limiting, access control lists (ACLs), and multicast services.
- Management—Cisco Network Assistant is a GUI-based management tool for configuration management and troubleshooting. Cisco Smartports automatically detects connected Cisco devices and recommends preset configurations for the switch port connected to the device.

### Specifications

<table>
<thead>
<tr>
<th>Feature</th>
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<tr>
<td>Forwarding bandwidth (Gbps)</td>
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<tr>
<td>Packets per second (Mpps)</td>
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<td>MAC addresses supported</td>
<td>8,000</td>
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## For More Information
For more information about the Cisco Catalyst 3560-E Series Switches, visit: [http://www.cisco.com/go/catalyst3560E](http://www.cisco.com/go/catalyst3560E)

## Selected Part Numbers and Ordering Information

### Cisco Catalyst 3560-E Series 10/100/1000 Workgroup Switches

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
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<tbody>
<tr>
<td>WS-C3560E-24TD-S</td>
<td>Cisco Catalyst 3560E 24 10/100/1000+2*10GE(X2),265W/IPB s/w</td>
</tr>
<tr>
<td>WS-C3560E-48TD-S</td>
<td>Cisco Catalyst 3560E 48 10/100/1000+2*10GE(X2),265W/IPB s/w</td>
</tr>
<tr>
<td>WS-C3560E-24PD-S</td>
<td>Cisco Catalyst 3560E 24 10/100/1000 PoE+2*10GE(X2),750W/IPB s/w</td>
</tr>
<tr>
<td>WS-C3560E-48PD-S</td>
<td>Cisco Catalyst 3560E 48 10/100/1000 PoE+2*10GE(X2),750W/IPB s/w</td>
</tr>
<tr>
<td>WS-C3560E-24TD-E</td>
<td>Cisco Catalyst 3560E 24 10/100/1000 PoE+2<em>10GE(X2),10GE+2</em>10GE(X2),265W/IPB s/w</td>
</tr>
<tr>
<td>WS-C3560E-48PD-E</td>
<td>Cisco Catalyst 3560E 48 10/100/1000 PoE+2<em>10GE(X2),10GE+2</em>10GE(X2),750W/IPB s/w</td>
</tr>
<tr>
<td>WS-C3560E-12SD-S</td>
<td>Catalyst 3560E 12 SFP + 2*10GE(X2), IPB s/w</td>
</tr>
<tr>
<td>WS-C3560E-12SD-E</td>
<td>Catalyst 3560E 12 SFP + 2*10GE(X2), IPS s/w</td>
</tr>
<tr>
<td>WS-C3560E-12D-S</td>
<td>Catalyst 3560E 12*10GE(X2), IPB s/w</td>
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<tr>
<td>WS-C3560E-12D-E</td>
<td>Catalyst 3560E 12*10GE(X2), IPS s/w</td>
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### Cisco Catalyst 3560-E Series Product Activation Keys

<table>
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<tr>
<th>Key</th>
<th>Description</th>
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<tbody>
<tr>
<td>3560E-AR930LCBOTY</td>
<td>Advanced IP Services for 3560 E, upgrade from IP Base</td>
</tr>
<tr>
<td>3560E-AR930LCQOTY</td>
<td>Advanced IP Services for 3560 E, upgrade from IP Services</td>
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<tr>
<td>3560E-IPSLLCOTY</td>
<td>IP Services for 3560 E, upgrade from the IP Base Feature Set</td>
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</table>

1. S=IP Base; E=IP Services
Cisco Catalyst 2960 Series Switches

The Cisco Catalyst 2960 Series Switches are fixed-configuration switches offering Fast Ethernet, Power over Ethernet (PoE), and Gigabit Ethernet connectivity with intelligent LAN services for midmarket and branch-office networks. The Cisco Catalyst 2960 LAN Base Switches offer enhanced security, quality of service (QoS), and availability, and the Cisco Catalyst 2960 LAN Lite Switches offer entry-level features with scalable management and easy troubleshooting.

Three compact models offer a small footprint and silent operation yet deliver the enterprise feature set; they are ideal for applications outside the wiring closet such as office workspaces, classrooms, and micro branch offices where space is a premium.

Ideal for Companies that Need These Features

- Intelligent services at entry-level functions
- QoS, enhanced security, and availability
- Easy deployment and management of their networks

The Cisco Catalyst 2960 Series Switches are ideal for situations where space is a constraint.

Key Features

- Power over Ethernet (PoE)—Cisco Catalyst 2960 Series Switches offer 370W PoE, which simplifies IP telephony, wireless, and video surveillance deployments. It also provides intelligent power-management features.
- Security—Network security is enabled through a wide range of authentication methods, data-encryption technologies, and Cisco Network Admission Control (NAC) based on users, ports, and MAC addresses.
- Availability—The 802.1S/W standard facilitates standards-based fault tolerance, load balancing, and rapid recovery. Flexlink provides sub-100-msec convergence, and Per-VLAN Spanning Tree Plus (PVST+) increases available bandwidth by allowing traffic on redundant links.
- Quality of service (QoS)—Network control and bandwidth optimization are achieved through advanced QoS, granular rate limiting, access control lists (ACLs), and multicast services.
- Management—Cisco Network Assistant is a GUI-based management tool for configuration management and troubleshooting. Cisco Smartports automatically detects connected Cisco devices and recommends preset configurations for the switch port connected to the device.

Specifications

<table>
<thead>
<tr>
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<tr>
<td>Forwarding bandwidth (Gbps)</td>
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<td>10/100/1000 density</td>
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<td>1.73 x 10.6 x 8.1 in (4.4 x 27 x 20.5 cm)</td>
<td>1.73 x 10.6 x 8.1 in (4.4 x 27 x 20.5 cm)</td>
<td>1.73 x 10.6 x 8.1 in (4.4 x 27 x 20.5 cm)</td>
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<td>1.73 x 10.6 x 8.1 in (4.4 x 27 x 20.5 cm)</td>
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<td>Unit weight</td>
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<td>3 lbs. (1.4 kgs.)</td>
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Cisco Catalyst 2960 Series Switches
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<tbody>
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<td>Forwarding bandwidth (Gbps)</td>
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<td>Packets per second (Mpps)</td>
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**Cisco Catalyst 2960 Series LAN Base Switches**

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<th>Description</th>
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</thead>
<tbody>
<tr>
<td>WS-C2960PD-8TT-L</td>
<td>8 10/100 + 1 1000BT (PoE input) LAN Base Image</td>
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<tr>
<td>WS-C2960-8TC-L</td>
<td>8 10/100 + 1 T/SFP LAN Base Image</td>
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<tr>
<td>WS-C2960-24TC-L</td>
<td>24 10/100 PoE + 2 T/SFP LAN Base Image</td>
</tr>
<tr>
<td>WS-C2960-48PST-L</td>
<td>48 10/100 PoE + 2 1000BT T/SFP LAN Base Image</td>
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<tr>
<td>WS-C2960-24TC-L</td>
<td>24 10/100 PoE + 2 T/SFP LAN Base Image</td>
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<tr>
<td>WS-C2960-24LT-L</td>
<td>24 10/100 (8 PoE) + 2 1000BT LAN Base Image</td>
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<tr>
<td>WS-C2960-24TT-L</td>
<td>24 10/100 + 2 1000BT LAN Base Image</td>
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</table>

**Selected Part Numbers and Ordering Information**

- Gigabit Ethernet GBIC/SFP density: 2
- 10/100/1000 density: 2
- 10/100 density: 24
- 100BASE-FX density: 0
- Max. watt power consumption: 30
- AC/DC support: AC only
- Dimensions (H x W x D): 1.73 x 17.5 x 9.3 in
- Unit weight: 8 lbs. (3.6 kgs.)

- Gigabit Ethernet GBIC/SFP density: 2
- 10/100/1000 density: 2
- 10/100 density: 24
- 100BASE-FX density: 0
- Max. watt power consumption: 45
- AC/DC support: AC only
- Dimensions (H x W x D): 1.73 x 17.5 x 9.3 in
- Unit weight: 8 lbs. (3.6 kgs.)
Cisco Catalyst Express 500 and Catalyst Express 520 Series

Stereo for growing small- and medium-sized businesses (SMBs), providing an easy-to-manage, secure network foundation optimized for data, wireless, and IP communications for organizations with up to 250 employees.

Ideal for Companies that Need These Features

- Power-over-Ethernet (PoE) ports
- Ability to upgrade from unmanaged switches or hubs
- GUI-based configuration and management

These switches are ideal for customers who are deploying switching solutions in networks with fewer than 250 users, wireless networks, or IP communications solutions. The Cisco Catalyst Express 520 Series is preconfigured to support Cisco Smart Business Communications System [SBCS] phone deployments.

Key Features

- Cisco IOS Software support—Cisco IOS Software ships with all Cisco Catalyst Express switches.
- Power over Ethernet (PoE)—Four-, 8-, and 24-port PoE configurations provide full 15.4W simultaneously on all ports and can power connected IP phones, wireless access points, IP video cameras, and other devices directly over the Ethernet connection, simplifying deployment and eliminating the need and cost of installing separate power supplies for connected endpoints.
- Robust network security—These switches provide security at the device level with Secure Sockets Layer (SSL) and Simple Network Management Protocol (SNMP) encryption, and at the network level with the Cisco Network Assistant security slider, which offers three preconfigured security levels.
- Optimized quality of service (QoS) with Cisco Smartports—Cisco Smartports technology matches the appropriate class-of-service (CoS) and differentiated-services-code-point (DSCP) values to the specific Cisco device connected to the Cisco Catalyst Express switch. This setup simplifies the deployment of IP communications and wireless LAN (WLAN) solutions by automatically detecting these applications and optimizing network QoS and security settings to support them.
- Easy installation and configuration—The embedded Device Manager and the free, downloadable Cisco Network Assistant and Cisco Configuration Assistant provide easy-to-use GUIs and Cisco Smartports technology to eliminate the complexity that typically accompanies configuration and simplify the management, troubleshooting, and ongoing optimization of the solutions.
- The Cisco Catalyst Express switches allow centralized management of small and medium-sized business (SMB) networks, including Cisco Catalyst switches, integrated services routers, and Cisco Unified IP Phones using a single IP address. Management can be done locally or remotely using a Secure Sockets Layer (SSL) connection.
- High performance—The solutions provide nonblocking, wire-speed switching on all ports to increase network availability and bandwidth, as well as features to manage port congestion and preserve performance.
- Cisco offers a limited lifetime hardware warranty on these switches.

Specifications

<table>
<thead>
<tr>
<th>Feature</th>
<th>CES500-24TT</th>
<th>CES500-24LC</th>
<th>CES500-24PC</th>
<th>CES500G-12TC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Forwarding bandwidth (Gbps)</td>
<td>8.8</td>
<td>8.8</td>
<td>8.8</td>
<td>24</td>
</tr>
<tr>
<td>Packets per second (Mpps)</td>
<td>6.6</td>
<td>6.6</td>
<td>6.6</td>
<td>18</td>
</tr>
<tr>
<td>MAC addresses supported</td>
<td>8,000</td>
<td>8,000</td>
<td>8,000</td>
<td>8,000</td>
</tr>
</tbody>
</table>
### Selected Part Numbers and Ordering Information

**Cisco Catalyst Express 500 Series**

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>WS-CE500-24TT</td>
<td>24 10/100 and 2 10/100/1000BT uplinks, GUI software</td>
</tr>
<tr>
<td>WS-CE500-24LC</td>
<td>24 10/100 and 2 10/100/1000BT or SFP uplinks, GUI</td>
</tr>
<tr>
<td>WS-CE500-24PC</td>
<td>24 10/100 (24 PoE) and 2 10/100/1000BT or SFP uplinks, GUI/s Ethernet</td>
</tr>
<tr>
<td>WS-CE500G-12TC</td>
<td>8 10/100/1000BT and 4 10/100/1000BT or SFPs, GUI software</td>
</tr>
</tbody>
</table>

**Cisco Catalyst Express 520 Series**

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>WS-CE520-24TT-K9</td>
<td>12 10/100 and 2 10/100/1000BT uplinks, GUI managed</td>
</tr>
<tr>
<td>WS-CE520-24LC-K9</td>
<td>24 10/100/1000BT or SFP uplinks, GUI managed</td>
</tr>
<tr>
<td>WS-CE520-24PC-K9</td>
<td>24 10/100/1000BT or SFP uplinks, GUI managed</td>
</tr>
<tr>
<td>WS-CE520-8PC-K9</td>
<td>8 10/100 PoE and 1 10/100/1000BT or SFP uplink, GUI managed</td>
</tr>
<tr>
<td>WS-CE520-24TC-K9</td>
<td>24 10/100/1000BT ports and 2 10/100/1000 or SFP ports, GUI managed</td>
</tr>
</tbody>
</table>

**For More Information**

For more information about the Cisco Catalyst Express 500 Series, visit [http://www.cisco.com/go/catalystexpress500](http://www.cisco.com/go/catalystexpress500).

---

### Key Specifications

<table>
<thead>
<tr>
<th>Feature</th>
<th>CE520-24TT</th>
<th>CE520-24LC</th>
<th>CE520-24PC</th>
<th>CE520-8P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Forwarding bandwidth (Gbps)</td>
<td>8.8</td>
<td>8.8</td>
<td>8.8</td>
<td>3.6</td>
</tr>
<tr>
<td>Packets per second (Mpps)</td>
<td>6.6</td>
<td>6.6</td>
<td>6.6</td>
<td>3.2</td>
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<tr>
<td>MAC addresses supported</td>
<td>8,000</td>
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<td>8,000</td>
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</tr>
</tbody>
</table>

### Physical Specifications

<table>
<thead>
<tr>
<th>Feature</th>
<th>CE520-24TT</th>
<th>CE520-24LC</th>
<th>CE520-24PC</th>
<th>CE520-8P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dimensions (H x W x D)</td>
<td>1.73 x 175 x 9.9 in (4.39 x 44.45 x 25.15 cm)</td>
<td>1.73 x 175 x 9.9 in (4.39 x 44.45 x 25.15 cm)</td>
<td>1.73 x 175 x 9.9 in (4.39 x 44.45 x 25.15 cm)</td>
<td>1.73 x 175 x 9.9 in (4.39 x 44.45 x 25.15 cm)</td>
</tr>
<tr>
<td>Unit weight</td>
<td>8 lbs (3.7 kgs)</td>
<td>8 lbs (3.7 kgs)</td>
<td>12 lbs (5.5 kgs)</td>
<td>8 lbs (3.7 kgs)</td>
</tr>
</tbody>
</table>
Cisco Switching Services

Enabling the Agile Business
Agility and innovative new business models are vital in today’s business environment, where your customers increasingly expect a personalized experience above and beyond your product or service, and your competition can come from anywhere, anywhere around the globe.

Success in this fast-paced marketplace requires effective collaboration and efficient use of resources. Business and information technology are inseparable, and the network is what brings them together; it alone touches all people, locations, resources, and applications.

Achieving Business Success Through an Architectural Approach
In collaboration with your team and our partner ecosystem, we take an architectural approach to helping you create a more intelligent, responsive, integrated network. Through a robust portfolio of services, we can help you align IT to the needs of the business, unify network-based services, and create a flexible architecture optimized for your organization. We can help you assess readiness to support proposed solutions, integrate new capabilities, and keep network devices and applications secure, available, and reliable.

- For more information about Cisco Switching Services, visit http://www.cisco.com/go/services/routing-switching.
- To find the right technical service for any Cisco product, use the Service Finder tool at http://www.cisco-servicefinder.com. Enter a product description or part number or search by product series family for a list of suggested services and support coverage options.
- For more information about all services, refer to Chapter 10, “Services”.

For more information about Cisco Switching Services, visit http://www.cisco.com/go/services/routing-switching.
## Wireless LAN

### Wireless LAN At a Glance

<table>
<thead>
<tr>
<th>Product</th>
<th>Features</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ENTERPRISE WIRELESS</strong></td>
<td><strong>Access Points and Client Devices</strong></td>
<td></td>
</tr>
</tbody>
</table>
| **Cisco Aironet 1140 Series** <br> *NEW* | - This business-ready 802.11n access point is designed for simple deployment and energy efficiency.  
- Its sleek design blends into enterprise environments.  
- The access point is easy to deploy and offers efficient power with standard 802.3af Power over Ethernet (PoE).  
- Reliable and predictable WLAN coverage improves the user experience for both existing 802.11a/b/g clients and new 802.11n clients.  
- It is available in a lightweight version only; a standalone version will be available in 2009. | 3–4 |
| **Cisco Aironet 1250 Series** | - This rugged indoor access point is designed for challenging RF environments that require the antenna versatility associated with connectorized antennas, a rugged metal enclosure, and a broad operating temperature range.  
- The first enterprise-class access points to support the IEEE 802.11n draft 2.0 standard, these access points offer combined data rates of up to 600 Mbps to give users mobile access to high-bandwidth data, voice, and video applications regardless of their location.  
- Multiple-input, multiple-output (MIMO) technology provides reliable and predictable wireless LAN (WLAN) coverage. | 3–6 |
| **Cisco Aironet 1240 AG Series** Access Points | - Rugged 802.11a/b/g access point designed for indoor industrial deployments and installations that require antenna versatility.  
- Ideal for factories, warehouses, and retailers.  
- The broad operating temperature range and UL 2043 certification for plenum rating requirements set by local fire codes support installation of these access points in environmental air spaces.  
- Link-roll flexibility allows these access points to perform as wireless bridges between access points for backhaul to the network.  
- Available in an autonomous or lightweight version. | 3–9 |
| **Cisco Aironet 1130 AG Series** Access Points | - Dual-band 802.11a/b/g indoor access point  
- Cost-compelling solution for easy deployment in offices and similar facilities  
- Available in an autonomous or lightweight version | 3–10 |
| **Cisco Aironet 1520 Series** Access Points | - Enables cost-effective and scalable deployment of secure outdoor wireless LANs.  
- Designed for Wi-Fi deployments for public access, public safety, industrial deployments, and for enterprise campus outdoor Wi-Fi extensions.  
- The Cisco 1522 Aironet Access Point provides dual-radio support (802.11a, 802.11b/g) and the Cisco 1524 provides modular radio support (802.11a, 802.11b/g, and licensed 4.9-GHz public safety). | 3–12 |
| **Cisco Aironet 1400 Series** Wireless Bridge | - Cisco Aironet 1400 Series Wireless bridges support both point-to-point and point-to-multipoint configurations.  
- Range and throughput of these bridges support data rates up to 54 Mbps.  
- Enhanced security mechanisms are based on 802.11 standards.  
- The ruggedized enclosure is optimized for harsh outdoor environments with an extended operating temperature range. | 3–15 |
| **Cisco Aironet 1300 Series** Access Points | - Cisco Aironet 1300 Series configurable for access point, bridge, or workgroup bridge roles  
- Support for both point-to-point or point-to-multipoint configurations  
- Industry leading range and throughput, supporting 802.11 b/g 2.4 GHz with data rates up to 54 Mbps  
- Ruggedized enclosure optimized for harsh outdoor environments with extended operating temperature range  
- Integrated or optional external antennas for flexibility in deployment | 3–17 |
Cisco Aironet Wireless LAN
Client Adapters
Cisco Aironet 802.11a/b/g CardBus Wireless LAN Client Adapter, with the Cisco Wireless Security Suite and support for Wi-Fi Protected Access (WPA), offer secure network communications.
- These comprehensive utilities provide flexible, easy configuration and management.
- These tools provide high-performance 54-Mbps connectivity in the 2.4- and 5-GHz bands.
- The range and throughput of these tools are exceptional.
- The tools have a world mode for international roaming.

Cisco Secure Services Client
- The Cisco Secure Services Client is a software application that allows businesses of all sizes to deploy a single 802.1x authentication framework across endpoint devices to enable access to both wired and wireless networks.
- The Cisco Secure Services Client supports the Federal Information Processing Standards (FIPS).
- The product offers a simple end-user experience (two-click connect, integrated and automated VPN, and automated access to the network).
- Cisco Secure Services Client offers central provisioning of users' access profiles.

Cisco Aironet Antennas and Accessories
- Cisco offers a wide array of options of antennas and accessories.
- FCC-approved directional and omnidirectional antennas are available.
- Low-loss cable, mounting hardware, and other accessories are available.

Cisco 4400 Series Wireless LAN Controller
- The Cisco 4400 Series Wireless LAN Controller is ideal for enterprise WLAN deployments that require system-level security, scalability, and RF management.
- The controller uses the LWAPP to centrally control Cisco Aironet lightweight access points for WLAN performance optimization and automated network resiliency.
- The controller is available with 2 Gigabit Ethernet ports to support 12, 25, and 50 access points or with 4 Gigabit Ethernet ports to support 100 access points.

Cisco 2100 Series Wireless LAN Controller
- The Cisco 2100 Series Wireless LAN Controller is ideal for enterprise branch and small and medium-sized business (SMB) wireless LAN (WLAN) deployments that require system-level security, scalability, and RF management.
- The controller uses the Lightweight Access Point Protocol (LWAPP) to centrally control Cisco Aironet® lightweight access points for WLAN performance optimization and automated network resiliency.
- The controller supports 6, 12, or 25 lightweight access points, making it a cost-effective solution for enterprise branch offices and SMBs.

Cisco Wireless Control System
- Offers an enterprise-class management platform for simplified, easy-to-use management of the Cisco Unified Wireless Network.
- Provides a wide range of tools for monitoring, configuring, managing, controlling, troubleshooting, and securing the next-generation wireless LAN (WLAN) infrastructure, client devices, and the RF environment.
- Delivers a centralized platform for managing a complete network of Cisco wireless LAN controllers, Cisco Aironet lightweight access points, Cisco Mobility Services Engine (MSE), and Cisco Spectrum Expert.
- Includes monitoring of standalone (autonomous) access points and supports their migration to operate as lightweight access points.
- Support a wide range of Mobility Services including context-aware mobility, mobile intelligent roaming, adaptive wireless IPS, secure client manager, and secure guest access.

Cisco Wireless Control System Navigator
- Offers an aggregated platform for enhanced scalability, manageability, and visibility of large-scale implementations of the Cisco Unified Wireless Network.
- Centralizes the operational control and management of multiple, geographically dispersed Cisco WCS management platforms.

Cisco Spectrum Expert Wi-Fi
- The spectrum analysis tool offers visibility into the RF layer of wireless networks so that organizations can determine the causes of interference problems and optimize network performance.
- Active Devices offers comprehensive lists of all access points, temporary networks, and interferer devices (for example, microwave ovens, cordless phones, wireless security cameras, Bluetooth devices, and RF jammers).
- Channel Summary, Devices View, and Device Finder details visibility of RF activity effect on the wireless network, and the location of devices causing wireless interference.
CiscoWorks Wireless LAN Solution Engine (WLSE) and CiscoWorks Wireless LAN Solution Engine Express

This hardware-based wireless LAN (WLAN) management solution provides template-based configurations with user-defined groups to effectively manage a large number of standalone (autonomous) access points and wireless bridges. It also:
- Monitors IEEE 802.1X authentication server availability
- Enhances security management through misconfiguration detection on standalone access points and wireless bridges

Cisco 3300 Series Mobility Services Engine

- The Cisco 3300 Series Mobility Services Engine transforms existing wireless LANs (WLANs) into comprehensive mobility networks through a uniform way of mobility services delivery.
- The mobility services engine integrates with the Cisco Unified Wireless Network and Cisco Unified Communications Solutions to build on existing business mobility investments.
- This extensible platform supports a suite of software with the ability to scale services through clustering. The software suite includes a context-aware, adaptive wireless intrusion prevention system (IPS), a secure client manager, and mobile intelligent roaming with a unified, open API for developing business-relevant applications.

Cisco Context-Aware Software

- Cisco Context-Aware Software offers advanced and scalable context-aware mobility services to simultaneously track thousands of Wi-Fi clients or Wi-Fi tags for indoor, indoor high ceiling, and outdoor (parking lot/yards) environment.
- The software provides transparent integration with existing networks and applications for faster adoption. Cisco offers an open application programming interface (API) with the context-aware mobility software, making it easier for technology partners to integrate their applications and for customers to choose the right application over the right network for particular users.

Cisco Adaptive Wireless Intrusion Prevention System (IPS) *NEW*

- The Cisco Adaptive Wireless IPS solution employs network analysis and signature-based techniques, combined with tight integration to Cisco Unified Wireless Network, to deliver protection against rogue access points and clients, network reconnaissance, eavesdropping, authentication and encryption cracking, man-in-the-middle attacks, wireless denial-of-service (DoS) attacks, and zero-day unknown attacks.
- The system also provides proactive threat prevention through automated wireless vulnerability and performance monitoring that proactively and persistently scans the wireless network to mitigate problems before they arise.

Cisco Mobile Intelligent Roaming (MIR) software *NEW*

- Cisco Mobile Intelligent Roaming (MIR) software uses the intelligence and visibility of the Cisco Unified Wireless Network to offer automatic, enterprise-quality handoff of mobile communications when users roam between cellular and Wi-Fi networks using dual-mode devices.
- The software provides transparent integration with existing networks and Unified Communications applications. An open application programming interface (API) with the mobile intelligent software makes it easier for ecosystems of dual-mode device manufacturers and third-party mobile gateway partners to integrate with the Cisco Unified Wireless Network, offering a complete end-to-end roaming solution.

SMB WIRELESS

Cisco 521 Wireless Express Access Point

- Part of the Cisco Mobility Express Solution, this flexible, cost-effective wireless solution is designed specifically for small and medium-sized businesses (SMBs).
- The single-band 802.11g access point offers business-class management, security, and scalability.
- The access point offers high-performance wireless connectivity for offices and similar environments.
- The access point operates in either standalone mode or controller-based modes with the Cisco 526 Mobility Controller to accommodate a diverse range of deployment and business mobility requirements.

Cisco 526 Wireless Express Mobility Controller

- Part of the Cisco Mobility Express Solution, this flexible, cost-effective wireless solution is designed specifically for SMBs.
- The controller automatically optimizes a basic wireless network and supports advanced mobility services on top of that network.
- It supports Secure Guest Access and optimized voice over wireless LAN (WLAN).
- A single controller can support up to six Cisco 521 Access Points, and each network can have up to two controllers.

Cisco Configuration Assistant

- Cisco Configuration Assistant is comprehensive, GUI-based configuration and management software for the Cisco Smart Business Mobility Controller to simplify and accelerate wireless network setup.

Cisco Physical Security

For product information on Cisco Video Surveillance products, refer to Chapter 5, “Security.”
Cisco Aironet 1140 Series Access Point

The Cisco Aironet 1140 Series Access Point is a business-ready, 802.11n access point designed for simple deployment and energy efficiency. The high-performance platform, which offers at least six times the throughput of existing 802.11a/g networks, prepares the business for the next wave of mobile devices and applications. Building on the Cisco Aironet heritage of RF excellence, this access point combines the industry’s most widely deployed 802.11n technology with a sleek industrial design that blends transparently into any enterprise environment. Designed for sustainability, the Cisco Aironet 1140 Series delivers high performance from standard 802.3af PoE while decreasing waste with multiunit eco-packs and Energy Star-certified power supplies. As part of the Cisco Unified Wireless Network, these access points provide the industry’s lowest total cost of ownership and investment protection by integrating transparently with the existing network.

Ideal for Companies that Need These Features

- Simple deployment and energy efficiency
- Standard 802.11n performance with standard 802.3af PoE
- Power of dual-radio 802.11n with the efficiency of standard PoE
- Reliable and predictable WLAN coverage

Key Features

The Cisco Aironet 1140 Series offers many new features, including:

- Six times the throughput of existing 802.11a/g networks
- A sleek industrial design that blends into any enterprise environment
- Standard 802.11n performance from standard 802.3af PoE
- Interoperability with a variety of client devices
- Environmentally friendly multiunit eco packs and Energy Star-certified power supplies

Specifications

<table>
<thead>
<tr>
<th>Item</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Software</td>
<td>Cisco Unified Wireless Network Software Release 5.2 or later</td>
</tr>
<tr>
<td>Draft 802.11n Version 2.0 (and Related Capabilities)</td>
<td>2x3 multiple-input multiple-output (MIMO) with two spatial streams, Maximal ratio combining (MRC); Legacy beamforming (hardware supports this capability; not yet enabled in software); 20- and 40-MHz channels; PHY data rates up to 300 Mbps; Packet aggregation: A-MPDU (Tx/Rx), A-MSDU (Tx/Rx); 802.11 11 dynamic frequency selection (DFS) (Bin 5); Cyclic shift diversity (CSD) support</td>
</tr>
</tbody>
</table>
| Frequency Band and 20-MHz Operating Channels | • A (Americas (FCC)): 2.412 to 2.462 GHz: 11 channels; 5.180 to 5.320 GHz: 8 channels; 5.500 to 5.700 GHz: 8 channels (excludes 5.600 to 5.640 GHz); 5.745 to 5.825 GHz: 5 channels
• C (China): 2.412 to 2.472 GHz: 13 channels; 5.745 to 5.825 GHz: 5 channels
• E (ETSI): 2.412 to 2.472 GHz: 13 channels; 5.180 to 5.320 GHz: 8 channels; 5.500 to 5.700 GHz: 11 channels
• I (Israel): 2.412 to 2.472 GHz: 13 channels; 5.180 to 5.320 GHz: 5 channels
• K (Korea): 2.412 to 2.472 GHz: 13 channels; 5.180 to 5.320 GHz: 8 channels; 5.500 to 5.620 GHz: 7 channels; 5.745 to 5.805 GHz: 4 channels
• N (Non-FCC): 2.412 to 2.462 GHz: 11 channels; 5.180 to 5.320 GHz: 8 channels; 5.745 to 5.825 GHz: 5 channels
• P (Japan): 2.412 to 2.472 GHz: 13 channels; 5.180 to 5.320 GHz: 8 channels
• S (Singapore): 2.412 to 2.472 GHz: 13 channels; 5.180 to 5.320 GHz: 8 channels
• T (Taiwan): 2.412 to 2.462 GHz: 11 channels; 5.280 to 5.320 GHz: 3 channels; 5.500 to 5.700 GHz: 11 channels; 5.745 to 5.825 GHz: 5 channels |
| Maximum Number of Non-Overlapping Channels | 2.4 GHz: 802.11b/g: 20 MHz: 3, 20 MHz: 3, 20 MHz: 3, 4 MHz: 3 |
| Non-Overlapping Channels      | 5 GHz: 802.11a: 20 MHz: 21, 20 MHz: 21, 20 MHz: 21, 40 MHz: 9 |
| Note: This varies by regulatory domain. Refer to the product documentation for specific details for each regulatory domain. |
### Data Rates Supported

**802.11a:** 6, 9, 12, 18, 24, 36, 48, and 54 Mbps

**802.11g:** 1, 2, 5.5, 6, 9, 11, 12, 18, 24, 36, 48, and 54 Mbps

**802.11n**

- **2.4 GHz:**
  - MCS Index $^1$ GI = 800ns
  - 20-MHz Rate (Mbps) 40-MHz Rate (Mbps) 20-MHz Rate (Mbps) 40-MHz Rate (Mbps)
  - 0 6.5 13.5 7.2 15
  - 1 13.5 27 14.4 30
  - 2 18.5 40.5 21.7 45
  - 3 25 54 28.9 60
  - 4 37 70.5 43.3 90
  - 5 52 108 57.8 120
  - 6 58.5 121.5 65 135
  - 7 65 135 72.2 150
  - 8 104 216 115.6 240
  - 9 117 243 130 270
  - 10 130 270 144.4 300

- **5 GHz:**
  - MCS Index $^1$ GI = 400ns
  - 20-MHz Rate (Mbps) 40-MHz Rate (Mbps) 20-MHz Rate (Mbps) 40-MHz Rate (Mbps)
  - 0 6.5 13.5 7.2 15
  - 1 13.5 27 14.4 30
  - 2 18.5 40.5 21.7 45
  - 3 25 54 28.9 60
  - 4 37 70.5 43.3 90
  - 5 52 108 57.8 120
  - 6 58.5 121.5 65 135
  - 7 65 135 72.2 150
  - 8 130 260 144 270
  - 9 153 306 176.4 315
  - 10 166 332 192 350
  - 11 180 360 204.8 378

Note: This varies by regulatory domain. Refer to the product documentation for specific details for each regulatory domain.

### Maximum Transmit Power

- **2.4 GHz**
  - 802.11b: -20 dBm with 1 antenna -9 dBm with 1 antenna
  - 802.11g: -20 dBm with 1 antenna -9 dBm with 1 antenna

- **5 GHz**
  - 802.11a: -18 dBm with 1 antenna -9 dBm with 1 antenna
  - 802.11n: -38 dBm with 2 antennas -18 dBm with 2 antennas

Note: The maximum power setting will vary by channel and according to individual country regulations. Refer to the product documentation for specific details.
Cisco Aironet 1250 Series Access Points

The rugged indoor Cisco Aironet 1250 Series Access Point is designed for challenging RF environments that require the antenna versatility associated with connectorized antennas, a rugged metal enclosure, and a broad operating temperature range. It offers combined data rates of up to 600 Mbps to provide users with mobile access to high-bandwidth data, voice, and video applications. The 802.11n standard provides reliable and predictable WLAN coverage to improve the end-user experience for both existing 802.11a/b/g clients and new 802.11n clients.

As part of the Cisco Unified Wireless Network, the Cisco Aironet 1250 Series provides the industry’s lowest total cost of ownership and investment protection by integrating transparently with the existing network. With a Gigabit Ethernet (10/100/1000) interface, it offers the flexibility of inline as well as local power options.

Ideal for Companies that Need These Features
- A high-capacity and high-security WLAN that provides network reliability for mission-critical applications
- A rugged enterprise-class access point designed for indoor industrial deployments and installations that require antenna versatility

Available Transmit Power Settings

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Power Levels</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.4GHz</td>
<td>20 dBm (100 mW), 17 dBm (50 mW), 14 dBm (25 mW), 11 dBm (12.5 mW), 8 dBm (6.25 mW), 5 dBm (3.13 mW), 2 dBm (1.56 mW), -1 dBm (0.78 mW)</td>
</tr>
<tr>
<td>5GHz</td>
<td>20 dBm (100 mW), 17 dBm (50 mW), 14 dBm (25 mW), 11 dBm (12.5 mW), 8 dBm (6.25 mW), 5 dBm (3.13 mW), 2 dBm (1.56 mW), -1 dBm (0.78 mW)</td>
</tr>
</tbody>
</table>

Note: The maximum power setting will vary by channel and according to individual country regulations. Refer to the product documentation for specific details.

Integrated Antenna
- 2.4 GHz: Gain 4.0 dBi, horizontal beamwidth 360°
- 5 GHz: Gain 3 dBi, horizontal beamwidth 360°

Indicators
- Status LED indicates boot loader status, association status, operating status, boot loader warnings, boot loader errors.

Dimensions (W x L x H)
- Access point (without mounting bracket): 8.7 x 8.7 x 1.84 in. (22.1 x 22.1 x 4.7 cm)

Weight
- 2.3 lbs (1.04 kg)

Environmental
- Nonoperating (storage) temperature: -22 to 185°F (-30 to 85°C); Operating temperature: 32 to 104°F (0 to 40°C); Operating humidity: 10 to 90% percent (non-condensing)

System Memory
- 128 MB DRAM; 32 MB flash

Input Power Requirements
- AP1140: 36 to 57 VDC; Power Supply and Power Injector: 100 to 240 VAC, 50 to 60 Hz

Powering Options
- 802.3af Ethernet Switch; Cisco AP1140 Power Injectors (AIR-PWRINJ4=); Cisco AP1140 Local Power Supply (AIR-PWR-A=)

Power Draw
- AP1140: 12.95 W

Note: When deployed using PoE, the power drawn from the power sourcing equipment will be higher by some amount dependent on the length of the interconnecting cable. This additional power may be as high as 2.45W, bringing the total system power draw (access point + cabling) to 15.4W.

Warranty
- 90 days

Compliance
- Standards
  - Safety: UL 60950-1, CAN/CSA-C22.2 No. 60950-1, EN 60950-1
  - Radio approvals: FCC Part 15.247, 15.407; RSS-210 (Canada); EN 300328, EN 301893 (Europe), ARIB-STD B33 (Japan), ARIB-STD 020 (Japan), ARIB-STD T71 (Japan), AS/NZS 4266.2003 (Australia and New Zealand), EMR and susceptibility (Class B), FCC Part 15.107 and 15.109 (ICES-003-Canada), VCCI (Japan) EN 301489-1 and -17 (Europe), EN 60601-1-2 EMC requirements for the Medical Directive 93/42/EEC
  - IEEE Standard: IEEE 802.11a/b/g, IEEE 802.11 n draft 2.0, IEEE 802.11h, IEEE 802.11d
  - Security: 802.11i, Wi-Fi Protected Access 2 (WPA2), WPA, WPA1X, Advanced Encryption Standards (AES), Temporal Key Integrity Protocol (TKIP)
  - EAP Type(s): Extensible Authentication Protocol-Transport Layer Security (EAP-TLS), EAP-Tunneled TLS (T TLS), EAP-TLS; Microsoft Challenge Handshake Authentication Protocol Version 2 (MSCHAPv2); Protected EAP (PEAP) v0 or EAP-Microsoft Challenge Handshake Protocol Version 2 (MSCHAPv2); PEAPv1 or EAP-MSCHAPv2; PEAPv1 or EAP-Generic Token Card (STC); EAP-Subscriber Identity Module (SIM)
  - Multimedia: Wi-Fi Multimedia (WMM™)
  - Other: FCC Bulletin OET-65C; RSS-102

Selected Part Number and Ordering Information

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
</tr>
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<tbody>
<tr>
<td>AIR-LAP1142N-A-K9</td>
<td>802.11a/g/n Fixed Unified AP; Int Ant; FCC Cfg (Dual Band)</td>
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<tr>
<td>AIR-LAP1141N-A-K9</td>
<td>802.11g/n Fixed Unified AP; Int Ant; FCC Cfg (Single Band)</td>
</tr>
</tbody>
</table>

For More Information

For more information about Cisco Aironet 1140 Series Access Points, visit: http://www.cisco.com/go/802.11n.
Key Features
Cisco Aironet 1250 Series Access Points are the first business-class access points to be Wi-Fi 802.11n draft 2.0 certified. They provide reliable and predictable WLAN coverage to improve the end user's experience with both existing 802.11a/b/g clients and new 802.11n clients. With these wireless access points, you can augment throughput for high-bandwidth wireless applications, protect your investment in wireless networking, and increase network reliability for mission-critical applications.

This platform delivers data rates of 300 Mbps per radio; multiple-input, multiple-output technology for enhanced reliability; 2.4- and 5-GHz radio modules, and tested interoperability with leading 802.11n devices.

Specifications

**Software**
- Cisco IOS Software Release 12.4(10b)JA or later (Autonomous Mode).
- Cisco IOS Software Release 12.4(10b)JX or later (Unified Mode).
- Cisco Unified Wireless Network Software Release 4.2 or later.

**Draft 802.11n Version 2.0 (and Related) Capabilities**
- 2x2 MIMO with two spatial streams
- Maximal Ratio Combining (MRC)
- Legacy beam forming (hardware supports this capability, not yet enabled in software)
- 20- and 40-MHz channels
- PHY data rates up to 300 Mbps
- Packet aggregation: A-MPDU (Tx/Rx), A-MSDU (Tx/Rx)
- 802.11 DFS (Bin 5)
- Cyclic Shift Diversity (CSD) support

**Data Rates Supported**

<table>
<thead>
<tr>
<th>MCS Index</th>
<th>GI² = 800ns</th>
<th>20-MHz Rate (Mbps)</th>
<th>40-MHz Rate (Mbps)</th>
<th>20-MHz Rate (Mbps)</th>
<th>40-MHz Rate (Mbps)</th>
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</tr>
</tbody>
</table>

**Frequency Band and 20-MHz Operating Channels**
- A (Americas (FCC))—2.412 to 2.462 GHz; 11 channels; 5.180 to 5.230 GHz; 8 channels; 5.500 to 5.700 GHz; 8 channels; 5.745 to 5.825 GHz; 5 channels; 5.865 to 5.870 GHz; 5 channels; 5.925 to 5.930 GHz; 5 channels; 5.955 to 5.960 GHz; 5 channels
- C (China)—2.412 to 2.472 GHz; 13 channels; 5.745 to 5.825 GHz; 5 channels
- E (Brazil)—2.412 to 2.472 GHz; 13 channels; 5.180 to 5.320 GHz; 8 channels; 5.500 to 5.700 GHz; 11 channels
- I (Israel)—2.412 to 2.472 GHz; 13 channels; 5.180 to 5.320 GHz; 8 channels; 5.500 to 5.700 GHz; 11 channels
- K (Korea)—2.412 to 2.472 GHz; 13 channels; 5.180 to 5.320 GHz; 8 channels; 5.500 to 5.620 GHz; 7 channels; 5.745 to 5.805 GHz; 4 channels
- N (Non-FCC)—2.412 to 2.462 GHz; 11 channels; 5.180 to 5.230 GHz; 8 channels; 5.500 to 5.700 GHz; 8 channels; 5.745 to 5.825 GHz; 5 channels; 5.865 to 5.870 GHz; 5 channels; 5.925 to 5.930 GHz; 5 channels; 5.955 to 5.960 GHz; 5 channels; 5.985 to 5.990 GHz; 5 channels; 5.995 to 6.000 GHz; 5 channels; 6.005 to 6.010 GHz; 5 channels

**NOTE:** This varies by regulatory domain. Refer to the product documentation for specific details for each regulatory domain.

**Maximum Number of Non-Overlapping Channels**
- 2.4 GHz—802.11a/b/g: 20 MHz: 3; 802.11n: 20 MHz: 3, 40 MHz: 1
- 5 GHz—802.11a: 20 MHz: 2; 802.11v: 20 MHz: 2; 40 MHz: 9

**NOTE:** This varies by regulatory domain. Refer to the product documentation for specific details for each regulatory domain.
Power Draw

- AP1250 with two RM 1252 radio modules installed: 16.9 W
- AP1250 with one RM 1252 radio module installed: 12.95 W
- 5GHz: AP1250 with one radio

NOTE: The maximum power setting will vary by channel and according to individual country regulations. Refer to the product documentation for specific details.

Power Settings

Available Transmit Power

- 2.4 GHz: 23 dBm (200 mW), 20 dBm (100 mW), 17 dBm (50 mW), 14 dBm (25 mW), 11 dBm (12.5 mW), 8 dBm (6.25 mW), 5 dBm (3.13 mW), 2 dBm (1.56 mW), -1 dBm (0.78 mW)
- 5 GHz: 20 dBm (100 mW), 17 dBm (50 mW), 14 dBm (25 mW), 11 dBm (12.5 mW), 8 dBm (6.25 mW), 5 dBm (3.13 mW), 2 dBm (1.56 mW), -1 dBm (0.78 mW)

NOTE: The maximum power setting will vary by channel and according to individual country regulations. Refer to the product documentation for specific details.

Powering Options

- Cisco Catalyst switch port capable of sourcing 18.5W or greater; Cisco AP1250 Power Injector (AIR-PWR-INJ4); Cisco AP1250 Local Power Supply (AIR-PWR-SPLY1); 802.3af switch (AP1250 with single radio device). When deployed using PoE, the power drawn from the power sourcing equipment will be higher by some amount dependent on the length of the interconnecting cable. This additional power may be as high as 16W, bringing the total system power draw (access point + cabling) to 18.5 W. A similar consideration applies for an AP1250 with two radios.

AP1250: 36 to 57 VDC; Power Supply and Power Injector: 100 to 240 VAC; 50 to 60 Hz

Safety

- UL 60950-1, EN60950-1; IEC 60950-1; EN60950-1
- FCC Part 15.247, 15.407; RSS-210 (Canada); EN 300.328, EN 301.893 (Europe); ARIB-STD T71 (Japan); AS/NZS 4268.2003 (Australia and New Zealand); Safety: UL 60950-1, EN60950-1; IEC 60950-1
- Other: FCC Bulletin OET-65C; RSS-102

Environment

Non-operating (storage) temperature: -40 to 185°F (-40 to 85°C); Operating temperature: -4 to +131°F (-20 to +55°C); Operating humidity: 10 to 90 percent (non-condensing)

Modularity

Status LED indicates operating state, association status, error/warning condition, boot sequence, and maintenance status; Ethernet LED indicates activity over the Ethernet; status; Radio LED indicates activity over the radio, status.

Dimensions

- AP (with mounting bracket): 8.12 x 9.52 x 2.75 in. (20.62 x 24.18 x 6.99 cm)
- AP (without mounting bracket): 8.12 x 9.52 x 2.35 in. (20.62 x 24.18 x 5.97 cm)

Environmental

- Non-operating (storage) temperature: -40 to 185°F (-40 to 85°C; Operating temperature: -4 to +131°F (-20 to +55°C); Operating humidity: 10 to 90 percent (non-condensing)

Weight

AP with 2 radios installed: 5.1 lbs (2.31 kg); AP chassis: 2.1 lbs (0.95 kg); 2.4 GHz radio: 1.5 lbs (0.68 kg); 5 GHz radio: 1.5 lbs (0.68 kg)

System Memory

64 MB DRAM, 32 MB flash

Input Power Requirements

AP1250: 36 to 57 VDC, Power Supply and Power Injector: 100 to 240 VAC, 50 to 60 Hz

Powering Options

Cisco Catalyst switch port capable of sourcing 18.5W or greater; Cisco AP1250 Power Injector (AIR-PWR-INJ4); Cisco AP1250 Local Power Supply (AIR-PWR-SPLY1); 802.3af switch (AP1250 with single radio only)

Power Draw

- AP1250 with two RM 252 radio modules installed: 16.9 W
- AP1250 with one RM 252 radio module installed: 12.95 W

NOTE: For an AP1250 with two radios, 16.9 W is the maximum power required at the access point (powered device). When deployed using PoE, the power drawn from the power sourcing equipment will be higher by some amount dependent on the length of the interconnecting cable. This additional power may be as high as 16W, bringing the total system power draw (access point + cabling) to 18.5 W. A similar consideration applies for an AP1250 with one radio.

Compliance

- Safety: UL 60950-1, CAN/CSA-C22.2 No. 60950-1; UL 2043; IEC 60950-1, EN60950-1
- Radio approvals: FCC Part 15.247, 15.407; RSS-210 (Canada); EN 300.328, EN 301.893 (Europe); ARIB-STD T71 (Japan); AS/NZS 4268.2003 (Australia and New Zealand); EMI and susceptibility (Class B); FCC Part 15107 and 15.109; IEC 60061-1 and -17 (Europe); EN 30081-2 EMC requirements for the Medical Directive 93/42/EEC
- Security: 802.11i, WPA2, WPA; 802.1X; AES, TKIP
- UL 60601-1-2 EMC requirements for the Medical Directive 93/42/EEC
- Safety: UL 60950-1, CAN/CSA-C22.2 No. 60950-1, UL 2043; IEC 60950-1, EN60950-1
- Other: FCC Bulletin OET-65C, RSS-102

Compliance Standards

- Safety: UL 60950-1, CAN/CSA-C22.2 No. 60950-1; UL 2043; IEC 60950-1, EN60950-1
- Radio approvals: FCC Part 15.247, 15.407; RSS-210 (Canada); EN 300.328, EN 301.893 (Europe); ARIB-STD T71 (Japan); AS/NZS 4268.2003 (Australia and New Zealand); EMI and susceptibility (Class B); FCC Part 15107 and 15.109; IEC 60061-1 and -17 (Europe); EN 30081-2 EMC requirements for the Medical Directive 93/42/EEC
- Security: 802.11i, WPA2, WPA, 802.1X, AES, TKIP
- Other: FCC Bulletin OET-65C, RSS-102
Cisco Aironet 1240AG Series Access Points

Cisco Aironet 1240 AG Series IEEE 802.11a/b/g Access Points deliver the versatility, high capacity, security, and enterprise-class features demanded by wireless LAN (WLAN) customers. They are designed specifically for challenging RF environments such as factories, warehouses, and large retail establishments that require the antenna versatility associated with connectorized antennas, a rugged metal enclosure, and a broad operating temperature range. The Cisco Aironet 1240 AG Series provides local as well as inline power, including support for IEEE 802.3af Power over Ethernet (PoE). These access points are ideal for factories, warehouses and retailers.

Ideal for Companies that Need These Features
- Rugged enterprise-class access point designed for indoor or industrial deployments and installations that require antenna versatility
- Link-roll flexibility to allow the access point to perform as a wireless bridge between access points for backhaul to the network

Key Features
- The Cisco Aironet 1240 AG Series Access Points have integrated 802.11a/b/g radios.
- They are available in an 802.11g-only version for countries that do not allow 5 GHz.
- Connectors offer a variety of both 2.4- and 5-GHz antennas.
- These access points are orderable as autonomous or lightweight access points.
- They can be configured to function as an access point or bridge, enabling a broad array of applications.
- Four power options offer deployment flexibility and cost savings: 802.3af, Cisco Power over Ethernet (PoE), Cisco Power Injector, or a local power supply.

Specifications

Wireless Network Standards and Wi-Fi Certification
- IEEE Standard: IEEE 802.11a; IEEE 802.11b; IEEE 802.11g; IEEE 802.11n draft 2.0; IEEE 802.11ad
- Security: WPA™; Enterprise, Personal; WPA2™; Enterprise, Personal
- EAP Type(s): EAP-Transport Layer Security (TLS); EAP-Tunneled TLS; EAP-Microsoft Challenge Handshake Authentication Protocol Version 2 (MSCHAPv2); Protected EAP (PEAPv0); EAP-Mschapv2; PEAPv1; EAP-Generic Token Card (GTC); EAP-SIM
- Multimedia: WMM™

Selected Part Numbers and Ordering Information
- AIR-AP1252AG-A-K9 802.11a/g/n-draft 2.0 2.4/5-GHz Modular Autonomous AP; 6 RP-TNC; FCC configuration
- AIR-AP1252G-A-K9 802.11g/n-draft 2.0 2.4-GHz Modular Autonomous AP; 3 RP-TNC; FCC configuration
- AIR-LAP1252AG-A-K9 802.11a/g/n-draft 2.0 2.4/5-GHz Modular Unified AP; 6 RP-TNC; FCC configuration
- AIR-LAP1252G-A-K9 802.11g/n-draft 2.0 2.4-GHz Modular Unified AP; 3 RP-TNC; FCC configuration

Software
- Cisco IOS Software Release 12.4(10b)JA or later (Autonomous Mode)
- Cisco IOS Software Release 12.4(10b)JX or later (Unified Mode)
- Cisco Unified Wireless Network Software Release 4.2 or later

Data Rates Supported
- 802.11a: 6, 9, 12, 18, 24, 36, 48, 54 Mbps, 802.11g: 1, 2, 5.5, 6, 11, 12, 18, 24, 36, 48, and 54 Mbps

Network Standards
- IEEE 802.11a/b/g

Uplink
- Auto-sensing 802.3 T(10)10BASE-T Ethernet

Frequency Band and Operating Channels
- Americas (FCC): 2.412 to 2.462 GHz: 11 channels, 5.15 to 5.35, 5.725 to 5.825 GHz: 12 channels; China: 2.412 to 2.472 GHz: 13 channels, 5.15 to 5.725 GHz: 19 channels; Japan (TELCI): 2.412 to 2.414 GHz: 14 channels; Orthogonal Frequency Division Multiple Access (OFDM): 2.412 to 2.484 GHz: 14 channels
- Complementary Code Keying (CCK): 5.15 to 5.25 GHz: 4 channels; North America: 2.412 to 2.422 GHz: 11 channels, 5.15 to 5.25 GHz: 5 channels; Singapore: 2.412 to 2.472 GHz: 13 channels, 5.15 to 5.25 GHz: 5 channels; Taiwan: 2.412 to 2.462 GHz: 11 channels, 5.15 to 5.35 GHz: 5 channels
- Non-Overlapping Channels: 802.11a: 12 channels (FCC; other regulatory domains support different numbers of 802.11a channels), 802.11b/g: 3 channels

For More Information
For more information about Cisco Aironet 1250 Series Access Points, visit: http://www.cisco.com/go/802.11n.
The Cisco Aironet 1130 AG Access Points package high capacity, high security, and enterprise-class features to deliver wireless LAN (WLAN) access for a low total cost of ownership. Designed for WLAN coverage in offices and similar RF environments, these unobtrusive access points features integrated antennas and dual IEEE 802.11a/g radios for robust and predictable coverage, delivering a combined capacity of 108 Mbps. These competitively priced access points are ready to install and easy to manage, reducing the cost of deployment and ongoing maintenance. Cisco Aironet 1130 AG Access Points are available in a lightweight version, an autonomous version that can be field-upgraded to lightweight operation, and a single-band 802.11g version for use in regulatory domains that do not allow 802.11a 5-GHz operation. Two high-performance radios provide simultaneous support for the 802.11a and 802.11g standards, offering 108-Mbps capacity for an organization's growing WLAN.

### Ideal for Companies that Need These Features
- A high-capacity and high-security WLAN in the enterprise office
A low-profile access point that blends into the environment and is easy to deploy.

**Key Features**

- IEEE 802.11a and 802.11g radios with simultaneous dual-band support provide 108-Mbps capacity. The Cisco Aironet 1130 AG Access Point works with dual-band clients to optimize usage of network bandwidth while providing backward compatibility with 802.11b clients. These access points comply with 802.11i security standards and are Wi-Fi Protected Access 2 (WPA2) certified. The access points incorporate Advanced Encryption Standard (AES) encryption in hardware.
- These access points are available in an 802.11g-only version for countries that do not allow 5 GHz.
- They provide robust signals to long distances and mitigate the effects of multipath signal propagation for more consistent coverage.
- Access points that support either Cisco IOS Software or the Lightweight Access Point Protocol (LWAPP) are available. These access points use radio and network management features for simplified deployment, along with built-in omnidirectional antennas that provide robust and predictable wireless LAN (WLAN) coverage for offices and similar RF environments.
- Variable transmit power settings allow access-point coverage to be tuned for differing requirements.
- Integrated 4.5-dBi antennas provide ready-to-use access points without external antennas; they are specifically designed to provide omnidirectional coverage for offices and similar RF environments. A low 0.5-mW setting supports closer spacing of access points in high-density deployments.
- These access points are Wi-Fi Certified.

**Specifications**

<table>
<thead>
<tr>
<th>Data rates supported</th>
<th>802.11a: 6, 9, 12, 18, 24, 36, 48, and 54 Mbps; 802.11g: 1, 2, 5.5, 6, 9, 11, 12, 18, 24, 36, 48, and 54 Mbps</th>
</tr>
</thead>
<tbody>
<tr>
<td>Software</td>
<td>- Cisco IOS Software Release 12.4(10c)JA or later (Autonomous Mode)</td>
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<tr>
<td></td>
<td>- Cisco IOS Software Release 12.4(10c)JX or later (Unified Mode)</td>
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<td>- Cisco Unified Wireless Network Software Release 4.2 or later</td>
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<td>Network standard</td>
<td>IEEE 802.11a, 802.11b, and 802.11g</td>
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<tr>
<td>Uplink</td>
<td>Autosensing 802.3 10/100BaseT Ethernet</td>
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<tr>
<td>Non-overlapping channels</td>
<td>802.11a—Up to 19; 802.11b/g—3</td>
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<td>SNMP compliance</td>
<td>MIB I and MIB II</td>
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<tr>
<td>Antennas</td>
<td>2.4 GHz: Gain 3.0 dBi, Horizontal Beamwidth: 360°; 5 GHz: Gain 4.5 dBi, Horizontal Beamwidth: 360°</td>
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<tr>
<td>Frequency band and Operating Channels</td>
<td>Americas (FCC): 2.412 to 2.462 GHz; 11 channels, 5.15 to 5.35, 5.725 to 5.825 GHz; 12 channels</td>
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<td>- China: 2.412 to 2.472 GHz; 13 channels, 5.725 to 5.825 GHz; 4 channels</td>
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<td></td>
<td>- ETSI: 2.412 to 2.472 GHz; 13 channels, 5.15 to 5.725 GHz; 19 channels</td>
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<td>- Israel: 2.432 to 2.472 GHz; 9 channels, 5.15 to 5.35 GHz; 6 channels</td>
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<td>- Japan (TELEC): 2.412 to 2.472 GHz; 13 channels Orthogonal Frequency Division Multiplexing (OFDM); 2.412 to 2.484 GHz; 14 channels Complementary Code Keying (CCK); 5.15 to 5.25 GHz; 4 channels</td>
</tr>
<tr>
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<td>- Japan-P (TELEC 2 Japan2 Config): 2.412 to 2.472 GHz; 13 channels Orthogonal Frequency Division Multiplexing (OFDM); 5.15 to 5.35 GHz; 8 channels</td>
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<tr>
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<td>- Korea: 2.412 to 2.472 GHz; 13 channels, 5.15 to 5.35, 5.45 to 5.7, 5.725 to 5.825 GHz; 19 channels</td>
</tr>
<tr>
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<td>- North America: 2.412 to 2.462 GHz; 11 channels, 5.15 to 5.35, 5.725 to 5.825 GHz; 12 channels</td>
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<td>- Singapore: 2.412 to 2.472 GHz; 13 channels, 5.15 to 5.35 GHz; 8 channels and 5.725 to 5.825 GHz; 12 channels</td>
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<tr>
<td></td>
<td>- Taiwan: 2.412 to 2.462 GHz; 11 channels, 5.25-5.35 GHz, 5.725 to 5.825, 7 channels</td>
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<td>Receive sensitivity</td>
<td>802.11a—6 Mbps; -87 dBm; 9 Mbps; -86 dBm; 12 Mbps; -85 dBm; 18 Mbps; -84 dBm; 24 Mbps; -80 dBm; 36 Mbps; -79 dBm; 48 Mbps; -73 dBm; 54 Mbps; -71 dBm; 802.11g—1 Mbps; -93 dBm; 2 Mbps; -91 dBm; 5.5 Mbps; -89 dBm; 6 Mbps; -86 dBm; 9 Mbps; -85 dBm; 11 Mbps; -85 dBm; 12 Mbps; -84 dBm; 18 Mbps; -83 dBm; 24 Mbps; -79 dBm; 36 Mbps; -77 dBm; 48 Mbps; -72 dBm; 54 Mbps; -70 dBm</td>
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<td>Available transmit power settings</td>
<td>- 802.11a: OFDM—50 mW (17 dBm), 32 mW (10 dBm), 25 mW (14 dBm); 10 mW (1 dBm), 5 mW (8 dBm), 3 mW (5.5 dBm), 2 mW (2 dBm), 1 mW (1 dBm); 802.11g CCK—100 mW (20 dBm), 50 mW (17 dBm), 25 mW (14 dBm), 12 mW (11 dBm), 6 mW (8 dBm), 3 mW (5.5 dBm), 2 mW (2 dBm), 1 mW (1 dBm); OFDM—50 mW (17 dBm), 25 mW (14 dBm), 10 mW (11 dBm), 5 mW (8 dBm), 3 mW (5.5 dBm), 1 mW (1 dBm)</td>
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<tr>
<td></td>
<td>- Maximum power setting will vary by channel and according to individual country regulations</td>
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</tbody>
</table>
The Cisco Aironet 1524 Lightweight Outdoor Wireless Mesh Access Point allows cost-effective deployment of secure outdoor WLANs that scale to meet current and future demands for mobility. The Cisco Aironet 1524 is a multiradio mesh access point, designed for municipal Wi-Fi deployments for public access and public safety applications. The Cisco Aironet 1524 is preconfigured with three radios compliant with IEEE 802.11a, 802.11b/g, and 4.9-GHz public safety standards. Various uplink connectivity options are supported, such as Gigabit Ethernet (10/100/1000) and Small Form-Factor Pluggable (SFP) for fiber interfaces. Supported power options include 48V DC, 12V DC, Power over Ethernet (PoE), and internal battery backup. It also employs the Cisco Adaptive Wireless Path Protocol (AWPP) to form a dynamic wireless mesh network between remote access points while delivering secure, high-capacity wireless access to any Wi-Fi-compliant client device.

The modular design of the Cisco Aironet 1524 Lightweight Outdoor Mesh Access Point creates a flexible platform that can allow separate mesh access networks within the device. By dedicating multiple separate radios to access, the Cisco Aironet 1524 creates a very robust and secure mesh infrastructure capable of simultaneously supporting public and private applications.
Ideal for Companies that Need These Features
- Municipal and public safety wireless outdoor networks
- An outdoor wireless network within a campus area
- Outdoor infrastructure for mobile users

Key Features
Key features and benefits of the platform include the following:
- Modular radio support (802.11a, 802.11b/g, and licensed 4.9-GHz public safety)
- Upgradability to new radio technologies
- Improved 802.11g radio sensitivity and range performance with Maximal Ratio Combining (MRC)
- Multiple uplink options (Gigabit Ethernet-10/100/1000 and fiber SFP interfaces)
- Multiple power options (Power over Ethernet [PoE], 480 VAC streetlight power, 12 VDC, and internal battery backup power)
- 802.3af-compliant PoE interface to connect IP devices
- National Electrical Manufacturers Association (NEMA) 4X certified enclosure
- LED status indicators

Specifications

### Wireless standards
- Multi-radio configuration—802.11a, 802.11b/g, Public safety 4.9 GHz (5, 10, 20 MHz channels)

### Media Access Protocol
- Carrier Sense Multiple Access with Collision Avoidance (CSMA/CA)

### Data rates and modulation
- 802.11a 5.8 GHz: 54, 48, 36, 24, 18, 12, 9, 6 Mbps, Orthogonal Frequency Division Multiplexing (OFDM)
- 802.11b with MRC: 11, 5.5, 2, 1 Mbps, Direct Sequence Spread Spectrum (DSSS)

### Multi-radio option—Frequency band and operating channels

<table>
<thead>
<tr>
<th>Multi-radio option</th>
<th>Regulatory version</th>
<th>802.11a 5.8GHz (5, 10, 20 MHz channels)</th>
<th>802.11b/g</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>802.11a 5.8GHz</td>
<td>2.412–2.462 GHz, 11 channels (three nonoverlapping channels)</td>
<td>2.4 GHz: 28 dBm</td>
</tr>
<tr>
<td></td>
<td>802.11b/g</td>
<td>2.4 GHz: 28 dBm, 4.9 GHz: 26 dBm, 5.8 GHz: 28 dBm</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4.9 GHz</td>
<td>5 MHz channel width</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>10 MHz channel width</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>20 MHz channel width</td>
<td></td>
</tr>
</tbody>
</table>

### Transmit power (Maximum transmit power will vary by channel, data rate, and individual country regulations)
- 802.11a 5.8 GHz: 6 Mbps: –91 dBm, 9 Mbps: –89 dBm, 12 Mbps: –86 dBm, 18 Mbps: –84 dBm, 24 Mbps: –82 dBm, 36 Mbps: –80 dBm, 48 Mbps: –78 dBm, 54 Mbps: –76 dBm
- 802.11b 1 Mbps: –96 dBm, 2 Mbps: –95 dBm, 5 Mbps: –93 dBm, 11 Mbps: –91 dBm
- 802.11g with MRC: 1 Mbps: –91 dBm, 2 Mbps: –89 dBm, 5.5 Mbps: –88 dBm, 6 Mbps: –86 dBm, 9 Mbps: –84 dBm, 11 Mbps: –82 dBm, 12 Mbps: –80 dBm, 18 Mbps: –78 dBm, 24 Mbps: –75 dBm

### Receive sensitivity (typical)
- 802.11a 5.8 GHz: 6 Mbps: –91 dBm, 9 Mbps: –90 dBm, 12 Mbps: –89 dBm, 18 Mbps: –86 dBm, 24 Mbps: –84 dBm, 36 Mbps: –82 dBm, 48 Mbps: –80 dBm, 54 Mbps: –78 dBm, 60 Mbps: –76 dBm
- 802.11b 1 Mbps: –96 dBm, 2 Mbps: –95 dBm, 5 Mbps: –93 dBm, 11 Mbps: –91 dBm
- 802.11g with MRC: 1 Mbps: –91 dBm, 2 Mbps: –89 dBm, 5.5 Mbps: –88 dBm, 6 Mbps: –86 dBm, 9 Mbps: –84 dBm, 11 Mbps: –82 dBm, 12 Mbps: –80 dBm, 18 Mbps: –78 dBm, 24 Mbps: –75 dBm, 36 Mbps: –73 dBm

### Network interface
- 10/100/1000 Gigabit Ethernet, autosensing, fiber SFP

### Networking features
- LWAPP-based, Managed by Cisco wireless LAN controller and Cisco Wireless Control System (WCS)

### Security
- Wireless bridging/mesh: X.509 digital certificates, MAC address authentication, Hardware-assisted AES encryption
- Wireless access: 802.11i, 802.1X authentication, including EAP-PEAP, EAP-TLS, EAP-TTLS, Cisco LEAP; Hardware-assisted AES, WPA, Temporal Key Integrity Protocol-Message Integrity Check (TKIP-MIC) encryption, VPN pass-through, IP Security (IPsec), Layer 2 Tunneling Protocol (L2TP) (MAC address filtering)
Cisco Aironet 1522 Lightweight Outdoor Wireless Mesh Access Point

The Cisco Aironet 1522 Lightweight Outdoor Wireless Mesh Access Point is a high-performance outdoor wireless mesh product for a cost-effective, scalable, and secure deployment in outdoor environments such as municipalities, public safety environments, and oil and gas or other outdoor enterprises.

The Cisco Aironet 1522 delivers design innovation for radio versatility and provides flexibility for deploying wireless mesh networks in dynamic environments.

The Cisco Aironet 1522 wireless broadband platform operates with Cisco wireless LAN (WLAN) controllers and Cisco Wireless Control System (WCS) software, centralizing critical functions of WLANs to provide scalable management, configuration, and security and transparent mobility between indoor and outdoor environments.

Ideal for Companies that Need These Features
- Municipal and public safety wireless outdoor networks
- An outdoor wireless network within a campus area
- Outdoor infrastructure for mobile users

Key Features
- Versatile—The platform facilitates mobility services that allow rapid development and integration of radio technology.
- Extensible—The platform allows the broadband wireless infrastructure to easily and securely extend services to third-party devices such as IP cameras and automated meter readers in the harshest environmental conditions.
- Fortified—The platform provides a very high standard of security with a secure, rugged enclosure and the Cisco Self-Defending Network architecture.

Specifications

- Wireless Standards: 802.11a, 802.11b/g, 4.9 GHz Public Safety
- Media Access Protocol: Carrier Sense Multiple Access/Collision Avoidance (CSMA/CA)
- Date Rates and Modulation: 802.11a: 54, 48, 36, 24, 18, 12, 9, 6 Mbps; 802.11b: 11, 5.5, 2, 1 Mbps; 802.11g: 54, 48, 36, 24, 18, 12, 9, 6 Mbps, OFDM
- Frequency Band and Operating Channels: 802.11a: 5.725–5.850 GHz 5 channels; 802.11b: 2.412–2.462 GHz; 11 channels
- Transmit Power: Maximum 802.11a: 28 dBm; 802.11b: 24 dBm; 802.11g: 24 dBm

For More Information

Compliance
- Safety—UL 60950, CAN/CSA-C22.2 No. 60950, IEC 60950, EN 60950
- EMI and susceptibility—FCC part 15107; 15109; IES 003

Dimensions
12.0 in x 7.8 in x 6.4 in (30.48 cm x 19.81 cm x 16.26 cm) (including antenna mount)

Weight
18 lbs (8.20 kg)

Operating temperature
–40 to 55 °C (–40 to 131 °F) plus Solar Loading

Storage temperature
–50 to 85 °C (–58 to 185 °F)

Environmental ratings
IP67; NEMA 4X

Wind resistance
Up to 100 MPH sustained winds; Up to 165 MPH wind gusts

Immunity
<= 5 mJ for 6kV/36A @ 8/20 ms waveform; ANSI/IEEE C62.41; EN61000-4-5 Level 4 AC Surge Immunity; EN61000-4-4 Level 4 Electrical Fast Transient Burst Immunity; EN61000-4-3 Level 4 EMC Field Immunity; EN61000-4-2 Level 4 ESD Immunity; EN600650 Overvoltage Category IV

Power options
90 – 480 VAC, 47–63 Hz; Power over Ethernet; 48 VDC, +/-10 percent; 12 VDC; Internal battery backup

For Selected Part Numbers and Ordering Information
AIR-LAP1524PS-A-K9 Cisco Aironet 1524AG Lightweight Outdoor Mesh Access Point, Public Safety (4.9 GHz, 4.9 GHz, 5.8 GHz, 2.4 GHz, FCC configuration)

3-14 Cisco Aironet 1522 Lightweight Outdoor Wireless Mesh Access Point
Cisco Aironet 1400 Series Wireless Bridge

The Cisco Aironet 1400 Series Wireless Bridge creates a benchmark for wireless bridging by providing a high-performance and feature-rich solution for connecting multiple LANs in a metropolitan area. It offers deployment personnel a flexible, easy-to-use solution while also meeting security requirements of WAN professionals.

**Ideal for Companies that Need These Features**
- A cost-effective, high-bandwidth way to connect networks in multiple locations within a metropolitan area.
- A rapid payback period and a lower total cost of ownership than a leased line.
- High-performance data rates of 54 Mbps at point-to-point ranges of 75 miles and point-to-multipoint ranges of two miles.

**Key Features**
- Cisco Aironet 1400 Series Wireless Bridges support both point-to-point and point-to-multipoint configurations.
- Industry-leading range and throughput of these bridges support data rates up to 54 Mbps.
- Enhanced security mechanisms are based on 802.11 standards.
- The ruggedized enclosure, with an extended operating temperature range, is optimized for harsh outdoor environments.
- Integrated or optional external antennas offer flexibility in deployment.
- The bridges are designed specifically for ease of installation and operation.

**Selected Part Numbers and Ordering Information**

<table>
<thead>
<tr>
<th>Product Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>AIR-LAP1522AG-A-K9</td>
<td>Cisco Aironet 1522AG Lightweight Outdoor Mesh Access Point, FCC config</td>
</tr>
<tr>
<td>AIR-LAP1522PC-A-K9</td>
<td>Cisco Aironet 1522PC Lightweight Outdoor Mesh Access Point, Power over cable, FCC config</td>
</tr>
</tbody>
</table>

**For More Information**
### Specifications

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency band</td>
<td>5.725 to 5.825 GHz (FCC UNII 3)</td>
<td>5.725 to 5.825 GHz (FCC UNII 3)</td>
<td></td>
</tr>
<tr>
<td>Wireless modulation</td>
<td>Coded Orthogonal Frequency Division Multiplexing (COFDM)</td>
<td>Coded Orthogonal Frequency Division Multiplexing (COFDM)</td>
<td></td>
</tr>
<tr>
<td>Media access protocol</td>
<td>Carrier Sense Multiple Access with Collision Avoidance (CSMA/CA)</td>
<td>Carrier Sense Multiple Access with Collision Avoidance (CSMA/CA)</td>
<td></td>
</tr>
<tr>
<td>Modulation</td>
<td>BPSK @ 6 and 9 Mbps, QPSK @ 12 and 18 Mbps, 16-QAM @ 24 and 36 Mbps, 64-QAM @ 48 and 54 Mbps</td>
<td>BPSK @ 6 and 9 Mbps, QPSK @ 12 and 18 Mbps, 16-QAM @ 24 and 36 Mbps, 64-QAM @ 48 and 54 Mbps</td>
<td></td>
</tr>
<tr>
<td>Non-overlapping channels</td>
<td>4</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Receive sensitivity (10% PER with 3200 byte packets)</td>
<td>6 Mbps: -83 dBm, 9 Mbps: -83 dBm, 12 Mbps: -81 dBm, 18 Mbps: -80 dBm, 24 Mbps: -77 dBm, 36 Mbps: -74 dBm, 48 Mbps: -70 dBm, 54 Mbps: -68 dBm</td>
<td>6 Mbps: -83 dBm, 9 Mbps: -83 dBm, 12 Mbps: -81 dBm, 18 Mbps: -80 dBm, 24 Mbps: -77 dBm, 36 Mbps: -74 dBm, 48 Mbps: -70 dBm, 54 Mbps: -68 dBm</td>
<td></td>
</tr>
<tr>
<td>Maximum Operational Receive Level</td>
<td>-19 dBm</td>
<td>-19 dBm</td>
<td></td>
</tr>
<tr>
<td>Maximum Survivable Receive Level</td>
<td>0 dBm</td>
<td>0 dBm</td>
<td></td>
</tr>
<tr>
<td>Available transmit power settings</td>
<td>250 mW (24 dBm), 200 mW (23 dBm), 185 mW (22 dBm), 125 mW (21 dBm), 60 mW (18 dBm), 30 mW (15 dBm), 15 mW (12 dBm)</td>
<td>250 mW (24 dBm), 200 mW (23 dBm), 185 mW (22 dBm), 125 mW (21 dBm), 60 mW (18 dBm), 30 mW (15 dBm), 15 mW (12 dBm)</td>
<td></td>
</tr>
<tr>
<td>Point-to-point range</td>
<td>7.5 miles (13 km) @ 54 Mbps, 16 miles (26 km) @ 9 Mbps</td>
<td>7.5 miles (13 km) @ 54 Mbps, 16 miles (26 km) @ 9 Mbps</td>
<td></td>
</tr>
<tr>
<td>Point-to-multipoint range (sector antenna at root)</td>
<td>2 miles (3 km) @ 54 Mbps, 8 miles (13 km) @ 9 Mbps</td>
<td>4 miles (7 km) @ 54 Mbps, 11 miles (18 km) @ 9 Mbps</td>
<td></td>
</tr>
<tr>
<td>Antenna</td>
<td>Captured Linear Polarization; 22.5dBi gain, 10 E-plane by 12 H-plane beamwidth</td>
<td>Captured Linear Polarization; 22.5dBi gain, 10 E-plane by 12 H-plane beamwidth</td>
<td>One N-Type connector for professional installations (antennas sold separately)</td>
</tr>
<tr>
<td>Security</td>
<td>Cisco Wireless Security Suite—Authentication: 802.1x support including LEAP to yield mutual authentication and dynamic per-user, per-session encryption keys; Encryption: Support for static and dynamic IEEE 802.11 WEP keys of 40 bits and 128 bits Pre-standard TKIP-WEP enhancements: key hashing (per packet keying) and Message Integrity Check (MIC)</td>
<td>Cisco Wireless Security Suite—Authentication: 802.1x support including LEAP to yield mutual authentication and dynamic per-user, per-session encryption keys; Encryption: Support for static and dynamic IEEE 802.11 WEP keys of 40 bits and 128 bits Pre-standard TKIP-WEP enhancements: key hashing (per packet keying) and Message Integrity Check (MIC)</td>
<td></td>
</tr>
<tr>
<td>SNMP compliance</td>
<td>v1 and v2</td>
<td>v1 and v2</td>
<td></td>
</tr>
<tr>
<td>Status LEDs</td>
<td>Four LEDs: Install, Radio, Status, Ethernet</td>
<td>Four LEDs: Power ON, Injector status, LAN Ethernet status, Bridge Ethernet status</td>
<td></td>
</tr>
<tr>
<td>RSSI port</td>
<td>BNC connector DC Voltage port (DVDC to 2.7 VDC)</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Uplink</td>
<td>100 Mbps over dual coaxial cables</td>
<td>10/100BaseT Ethernet</td>
<td></td>
</tr>
<tr>
<td>Configuration support</td>
<td>Telnet, HTTP, FTP, TFTP, SNMP</td>
<td>Telnet, HTTP, FTP, TFTP, SNMP</td>
<td>NA</td>
</tr>
<tr>
<td>Compliance</td>
<td>Customers are responsible for verifying approval for use in their country. Please see <a href="http://www.cisco.com/go/aironet/compliance">http://www.cisco.com/go/aironet/compliance</a> to verify approval and to identify the regulatory domain that corresponds to a particular country. All regulatory domains may not have been approved. As they are approved, the part numbers will be available on the Global Price List (individual country regulations)</td>
<td>Customers are responsible for verifying approval for use in their country. Please see <a href="http://www.cisco.com/go/aironet/compliance">http://www.cisco.com/go/aironet/compliance</a> to verify approval and to identify the regulatory domain that corresponds to a particular country. All regulatory domains may not have been approved. As they are approved, the part numbers will be available on the Global Price List (individual country regulations)</td>
<td></td>
</tr>
<tr>
<td>Dimensions (H x W x D)</td>
<td>11.4 x 11.4 x 4.2 in. (29 x 29 x 11 cm)</td>
<td>11.6 x 11.6 x 3.6 in. (29 x 29 x 9 cm)</td>
<td>6.7 x 6.7 x 1.3 in. (17 x 16 x 3 cm)</td>
</tr>
<tr>
<td>Weight</td>
<td>11 lbs. (5 kg)</td>
<td>10 lbs. (5 kg)</td>
<td>14 lbs. (6.3 kg)</td>
</tr>
<tr>
<td>Operational temperature</td>
<td>-30 to +85ºC (-22 to +131ºF)</td>
<td>-30 to +85ºC (-22 to +131ºF)</td>
<td>0 to +50ºC (32 to 122ºF)</td>
</tr>
<tr>
<td>Storage temperature</td>
<td>-40 to +85ºC (-40 to +185ºF)</td>
<td>-40 to +85ºC (-40 to +185ºF)</td>
<td>-40 to +70ºC (-40 to +158ºF)</td>
</tr>
<tr>
<td>Operational altitude</td>
<td>4206 m (13,800 ft.)</td>
<td>4206 m (13,800 ft.)</td>
<td>4206 m (13,800 ft.)</td>
</tr>
<tr>
<td>Storage altitude</td>
<td>4877 m (16,000 ft.)</td>
<td>4877 m (16,000 ft.)</td>
<td>4877 m (16,000 ft.)</td>
</tr>
<tr>
<td>Humidity</td>
<td>0 to 100% (condensing)</td>
<td>0 to 100% (condensing)</td>
<td>0 to 90% (non-condensing)</td>
</tr>
<tr>
<td>Vibration</td>
<td>0.01 G2/Hz from 5 - 100 Hz</td>
<td>0.01 G2/Hz from 5 - 100 Hz</td>
<td>0.01 G2/Hz from 5 - 100 Hz</td>
</tr>
<tr>
<td>Storage vibration</td>
<td>0.1 G2/Hz from 5 - 100 Hz</td>
<td>0.1 G2/Hz from 5 - 100 Hz</td>
<td>0.1 G2/Hz from 5 - 100 Hz</td>
</tr>
<tr>
<td>Enclosure</td>
<td>Aluminum with environmentally sealed plastic radome</td>
<td>NEMA 4, aluminum</td>
<td>Metal case</td>
</tr>
</tbody>
</table>
Cisco Aironet 1300 Series Access Points

The Cisco Aironet 1300 Series Access Points are an 802.11g access point and bridge that provides high-speed and cost-effective wireless connectivity between multiple fixed or mobile networks and clients.

Ideal for Companies that Need These Features
- Configurable for access point, bridge, or workgroup bridge roles
- Support for both point-to-point or point-to-multipoint configurations
- Industry leading range and throughput, supporting data rates up to 54 Mbps
- Enhanced security mechanisms based on 802.1X standards
- Ruggedized enclosure optimized for harsh outdoor environments with extended operating temperature range

Key Features
- Network connections within a campus area; outdoor infrastructure for mobile networks and users; public access for outdoor areas
- Supports temporary networks for portable or military operations
- Supports the 802.11g standard providing 54-Mbps data rates with secure technology while maintaining full backward compatibility with legacy 802.11 b devices
- Easy maintenance and installation by integrating it with your wired network via SWAN solution
- Investment protection with future Cisco IOS Software upgrades
- The Cisco Unified Wireless Network simplifies wireless LAN deployment and management by providing clear visibility and dynamic control of the RF environment
- Operates as a wireless bridge, access point, or a workgroup bridge
- Provides ongoing savings of leased-line expenses, a method to connect networks despite physical barriers such as lakes or highways, and rapid deployment of network connections
- Wi-Fi Certified in Access Point mode

Specifications

<table>
<thead>
<tr>
<th>Features</th>
<th>Cisco Aironet 1300 Series</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compatibility</td>
<td>- Access Point—Compatible with any Wi-Fi Certified client device for basic capability; Compatible with Cisco Aironet clients and Cisco Compatible clients for extended capability; - Workgroup Bridge—Supports operation with Cisco Aironet access points and Cisco bridges</td>
</tr>
<tr>
<td>Air interface standard</td>
<td>802.11b or 802.11g</td>
</tr>
<tr>
<td>Frequency band</td>
<td>2.412 to 2.462 GHz (FCC); 2.412 to 2.472 GHz (ETSI); 2.412 to 2.472 GHz (TELEC)</td>
</tr>
<tr>
<td>Wireless modulation</td>
<td>- 802.11b—Direct Sequence Spread Spectrum (DSSS), Differential Binary Phase Shift Keying (DBPSK) at 1 Mbps; Differential Quadrature Phase Shift Keying (DQPSK) at 2 Mbps; Complementary Code Keying (CCK) at 5.5 and 11 Mbps - 802.11g—Orthogonal Frequency Divisional Multiplexing (OFDM), BPSK at 6 and 9 Mbps, QPSK at 12 and 18 Mbps, 16-quadrature amplitude modulation (QAM) at 24 and 36 Mbps, 64-QAM at 48 and 54 Mbps</td>
</tr>
<tr>
<td>Media access protocol</td>
<td>Carrier Sense Multiple Access/Collision Avoidance (CSMA/CA)</td>
</tr>
<tr>
<td>Operating channels</td>
<td>802.11b/g—ETSI: 13; Americas: 11; TELEC (Japan): 13</td>
</tr>
<tr>
<td>Lightweight Access Point</td>
<td>Protocol: A network protocol for lightweight access points that also provides for centralized management.</td>
</tr>
<tr>
<td>Non-overlapping channels</td>
<td>3</td>
</tr>
</tbody>
</table>
### Security
- **Bridge**—Authentication: 802.1X support including LEAP to yield mutual authentication and dynamic per-user, per-session encryption keys; Encryption: Cisco TKIP, key hashing (per-packet keying) and message, Integrity Check (MIC), AES-ready.
- **Access Point**—Authentication: 802.1X support including LEAP, PEAP, EAP Message Digest 5 (EAP-MD5), EAP TLS, and EAP FAST to yield mutual authentication and dynamic per-user, per-session encryption keys; Encryption: Cisco TKIP and WPA TKIP, key hashing (per-packet keying) and MIC, AES-ready.
- **Workgroup-Bridge**—Authentication: 802.1X support including LEAP to yield mutual authentication and dynamic per-user, per-session encryption keys; Encryption: Cisco TKIP, key hashing (per-packet keying) and MIC, AES-ready.

### SNMP Compliance
- Versions 1 and 2

### Available Transmit Power Settings
1. Maximum power setting will vary according to individual country regulations

<table>
<thead>
<tr>
<th>Feature</th>
<th>AIR-BR1310G-x-K9</th>
<th>AIR-BR1310G-x-K9-R</th>
</tr>
</thead>
<tbody>
<tr>
<td>802.11b</td>
<td>100 mW (20 dBm), 50 mW (17 dBm), 30 mW (15 dBm), 20 mW (13 dBm), 10 mW (10 dBm), 5 mW (7 dBm), 1 mW (5 dBm)</td>
<td>802.11g: 30 mW (15 dBm), 20 mW (13 dBm), 10 mW (10 dBm), 5 mW (7 dBm), 1 mW (0 dBm)</td>
</tr>
<tr>
<td>Maximum operational receive level</td>
<td>-20 dBm</td>
<td>-20 dBm</td>
</tr>
<tr>
<td>Maximum survivable receive level</td>
<td>10 dBm</td>
<td>10 dBm</td>
</tr>
<tr>
<td>Receive sensitivity (10 percent with 3200-byte packets)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Americas: 1.3 miles (2 km) at 54 Mbps, 0.5 miles (0.8 km) at 11 Mbps, EMEA: 0.5 miles (0.8 km) at 54 Mbps, 0.3 miles (0.5 km) at 11 Mbps, TELEC: 0.7 miles (1.1 km) at 54 Mbps, 0.3 miles (0.5 km) at 11 Mbps, Note: 13 dB integrated antenna at root and non-root bridge</td>
<td>Americas: 4.5 miles (7 km) at 54 Mbps, 1.0 miles (1.6 km) at 11 Mbps, EMEA: 0.5 miles (0.8 km) at 54 Mbps, 0.3 miles (0.5 km) at 11 Mbps, TELEC: 0.7 miles (1.1 km) at 54 Mbps, 0.3 miles (0.5 km) at 11 Mbps, Note: 21-dB dish antenna at root and non-root bridge</td>
<td></td>
</tr>
<tr>
<td>Americas: 1.1 miles (1.8 km) at 54 Mbps, 0.5 miles (0.8 km) at 11 Mbps, EMEA: 0.25 miles (0.4 km) at 54 Mbps, 0.1 miles (0.16 km) at 11 Mbps, TELEC: 0.5 miles (0.8 km) at 54 Mbps, 0.3 miles (0.5 km) at 11 Mbps, Note: 14-dB sector antenna at root and 13-dB integrated antenna at non-root</td>
<td>Americas: 2.3 miles (3.7 km) at 54 Mbps, 1.0 miles (1.6 km) at 11 Mbps, EMEA: 0.5 miles (0.8 km) at 11 Mbps, TELEC: 0.7 miles (1.1 km) at 54 Mbps, 0.5 miles (0.8 km) at 11 Mbps, Note: 14-dB sector at root and 21-dB dish at non-root bridge</td>
<td></td>
</tr>
</tbody>
</table>

### Dimensions and Weight
<table>
<thead>
<tr>
<th>Feature</th>
<th>AIR-BR1310G-x-K9 and AIR-BR1310G-x-K9-R</th>
<th>AIR-PWRINJ-BLR2 and AIR-PWRINJ-BLR2T-x-K9-R</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dimensions (H x W x D)</td>
<td>8 x 8 x 3.12 in. (20.3 x 20.57 x 7.87 cm)</td>
<td>4 x 4 x 7.6 x 1.07 in. (10.7 x 12.9 x 2.71 cm)</td>
</tr>
<tr>
<td>Weight</td>
<td>2.5 lb (1.2 kg)</td>
<td>2 lb (1 kg)</td>
</tr>
<tr>
<td>Operational temperature</td>
<td>-22½ to 131½ºF (-30½ to 55½ºC)</td>
<td>Same as AIR-BR1310G-x-K9 and AIR-BR1310G-x-K9-R</td>
</tr>
<tr>
<td>Storage temperature</td>
<td>-40½ to 185½ºF (-40½ to 85½ºC)</td>
<td>Same as AIR-BR1310G-x-K9 and AIR-BR1310G-x-K9-R</td>
</tr>
<tr>
<td>Operational altitude</td>
<td>13,800 ft (4206 m)</td>
<td>Same as AIR-BR1310G-x-K9 and AIR-BR1310G-x-K9-R</td>
</tr>
<tr>
<td>Storage altitude</td>
<td>16,000 ft (4877 m)</td>
<td>Same as AIR-BR1310G-x-K9 and AIR-BR1310G-x-K9-R</td>
</tr>
<tr>
<td>Humidity</td>
<td>0 to 100% at 100½ºF (38½ºC) (condensing)</td>
<td>0 to 90% at 100½ºF (38½ºC) (non-condensing)</td>
</tr>
<tr>
<td>Warranty</td>
<td>One Year</td>
<td>One Year</td>
</tr>
</tbody>
</table>

1. Maximum power setting will vary according to individual country regulations.
2. The distances referenced here are approximations and should be used for estimation purposes only.
Chapter 3

 Cisco Aironet Wireless LAN Client Adapters

The Cisco Aironet Wireless LAN Client Adapters provide high-performance 54-Mbps connectivity in the 2.4- and 5-GHz bands that combines the freedom of wireless connectivity with the performance, security, and manageability that businesses require.

Ideal for Companies that Need These Features

• Ability to operate in a mixed-mode environment
• Mobility within the enterprise to increase productivity, as an addition or alternative to wired networks, or the need for flexibility for frequent LAN wiring changes
• Support for Cisco Compatible Extensions with a Cisco product

Key Features

• The Cisco Aironet 802.11a/b/g CardBus Wireless LAN Client Adapters secure network communications using the Cisco Secure Wireless Solution.
• The tools include the Cisco Aironet Desktop Utility, Cisco Aironet System Tray Utility (STU), and Cisco Aironet Client Administration Utility (CAU).
• World mode is used for international roaming.
• The adapter tools offer exceptional range and throughput.
• The adapter tools support single 802.11b coverage, single 802.11g coverage, dual-mode 802.11b/g coverage, or tri-mode 802.11a/b/g coverage.
• The adapter tools are Wi-Fi Certified, and they support for the Wi-Fi Protected Access (WPA) protocol.
• PCI adapter that offers optimal placement for maximum performance using a dual-band 2.4- or 5-GHz 1-dBi effective gain antenna has a 2-meter cable.
• The PCI adapter provides a low-profile form factor and 2-meter cable length to provide flexibility for installation in low-profile devices, such as slim desktops and point-of-sale (POS) devices.
• The tools support Cisco Compatible Extensions Version 5 and earlier.

Specifications

<table>
<thead>
<tr>
<th>Feature</th>
<th>Cisco Aironet 802.11a/b/g Wireless CardBus Adapter</th>
<th>Cisco Aironet 802.11a/b/g Wireless PCI Adapter</th>
</tr>
</thead>
<tbody>
<tr>
<td>Form Factor</td>
<td>CardBus Type II</td>
<td>Standard and Low-Profile Type II PCI</td>
</tr>
<tr>
<td>Interface</td>
<td>32-bit CardBus with standard 68-pin connector, PC-Card Rev. 7.0 compliant</td>
<td>Standard PCI Interface, PCI Rev. 2.3 compliant</td>
</tr>
<tr>
<td>Data Rates Supported</td>
<td>1, 2, 5.5, 6, 9, 11, 12, 18, 24, 36, 48, 54 Mbps</td>
<td></td>
</tr>
<tr>
<td>Network Standard</td>
<td>IEEE 802.11a/b/g</td>
<td></td>
</tr>
<tr>
<td>Operating Voltage</td>
<td>3.3 V (±0.3 V)</td>
<td></td>
</tr>
<tr>
<td>Media Access Protocol</td>
<td>Carrier-Sense Multiple Access w/ Collision Avoidance (CSMA/CA)</td>
<td></td>
</tr>
<tr>
<td>Wireless Medium</td>
<td>802.11g, Direct Sequence Spread Spectrum (DSSS) and Orthogonal Frequency Division Multiplexing (OFDM); 802.11a, OFDM</td>
<td></td>
</tr>
<tr>
<td>Modulation</td>
<td>802.11b: DSSS—Differential Binary Phase Shift Keying (DBPSK) @ 1 Mbps; Differential Quadrature Phase Shift Keying (DQPSK) @ 2 Mbps; Complementary Code Keying (CCK) @ 5.5 and 11 Mbps</td>
<td>802.11g and 802.11a: OFDM—802.11g: 6 and 9 Mbps; 802.11a: 12 and 18 Mbps; 16-Quadrature Amplitude Modulation (QAM) @ 24 and 36 Mbps; 64-QAM @ 48 and 54 Mbps</td>
</tr>
<tr>
<td>Frequency Bands</td>
<td>2.40 to 2.4835 GHz; 5.15 to 5.35 GHz; 5.725 to 5.85 GHz; 5.95 to 5.985 GHz (Japan)</td>
<td>5.15 to 5.35 GHz (JTS)</td>
</tr>
<tr>
<td>Range [With 2.2 dBi dipole antenna for 802.11g and 802.11b and 6 dBi gain patch for 802.11a]</td>
<td>802.11a—Indoor: 45 ft (13 m) @ 54 Mbps, 110 ft (33 m) @ 18 Mbps, 165 ft (50 m) @ 6 Mbps; Outdoor: 100 ft (30 m) @ 54 Mbps, 600 ft (183 m) @ 18 Mbps, 1000 ft (304 m) @ 6 Mbps; 802.11b/g—Indoor: 90 ft (27 m) @ 54 Mbps, 180 ft (54m) @ 18 Mbps, 160 ft (48 m) @ 11 Mbps, 300 ft (91 m) @ 6 Mbps; 410 ft (124 m), Outdoor: 250 ft (76 m) @ 54 Mbps, 600 ft (183 m) @ 18 Mbps, 1000 ft (304 m) @ 11 Mbps, 1300 ft (396 m) @ 6 Mbps, 2000 ft (610 m) @ 1 Mbps</td>
<td>802.11g—Indoor: 90 ft (27 m) @ 54 Mbps, 180 ft (54m) @ 18 Mbps, 160 ft (48 m) @ 11 Mbps, 300 ft (91 m) @ 6 Mbps; 410 ft (124 m)</td>
</tr>
</tbody>
</table>
Cisco Secure Services Client

Cisco Secure Services Client is a software application that allows businesses of all sizes to deploy a single authentication framework across endpoint devices to enable access to both wired and wireless networks. The solution delivers simplified management, robust security, and lower total cost of ownership. Through a simplified and scalable deployment mechanism, IT administrators can deploy and manage the Cisco Secure Services Client across the enterprise. The software client manages the user and device identity and the network access protocols required for secure access. The Cisco Secure Services Client uses the IEEE 802.1X authentication standard to provide a robust first line of defense against unauthorized network intrusions.

Ideal for Companies that Need These Features

- Centralized and secured management of Wi-Fi devices
- Control of users' access policies
- Identity-based access
- FIPS support
- Simple end-user experience (two-click connect, automated VPN, and automated access to network)

Key Features

- Automatic VPN feature—Cisco IP Security (IPsec) VPN and Secure Computing Soft Token are integrated in the Cisco Secure Services Client.
- FIPS 140-2 Level 1-compliant solution—FIPS drivers (ordered separately) are available.
- Cisco enterprise deployment mechanism—A unified .xml file allows for client provisioning; the single provisioning schema is independent of hardware. The administrator can now easily create an .msi file containing the .xml and .exe files for installation, and then deploy the files using standard deployment tools such as Microsoft Active Directory, Microsoft Short Message Service (SMS), and Altiris.
- Filtering of unwanted Service Set Identifiers (SSIDs)—This feature decreases the number of available networks for users and enforces corporate security policies for end users.
- Enforcing wired over wireless—This feature allows you to disable the wireless interface when a wired connection is present, and it eliminates unwanted wireless bridging to a wired network.
- Policy Enforcement Manager—The Policy Enforcement Manager enforces an 802.1X identity-based network security framework and configures and enforces access policies to protect corporate resources and assets.
- Network Profile Manager—Using the administrator console, administrators can define preconfigurations, lock down client features, and deploy end-user profiles for enterprise, travel, and home connections. The Network Profile Manager provides network entitlement rights for employees, guests, and suppliers with different levels of security.
- Credential Manager—The Credential Manager facilitates Windows single sign-on (SSO) capabilities, including device and user authentication, user-based authentication sessions, and credential challenges.
- Secure network access—This feature allows for authenticated access to 802.1X wired and wireless LANs. Cisco Secure Services Client is compatible with Wi-Fi-certified devices; it supports all Wi-Fi encryption modes: Wired Equivalent Privacy (WEP), Wi-Fi Protected Access-personal mode (WPA-personal mode), WPA2-personal mode, WPA-enterprise mode, WPA2-enterprise mode, Dynamic WEP (802.1X), Advanced Encryption Standard (AES), and Temporal Key Integrity Protocol (TKIP). It also supports a wide selection of
Extensible Authentication Protocol (EAP) types; protects user privacy with EAP “anonymous” access; and integrates with Cisco Trust Agent, providing strong Layer 2 802.1X-based Network Admission Control (NAC) support. In addition, it is compatible with the Cisco Secure Access Control Server (ACS).

- Access management and automated configuration control—This enterprise deployment mechanism, available through a unified xml file, delivers user-access policies to any port accessed by users. It centrally deploys Microsoft Active Directory machine or user group profiles, and facilitates automatic configuration of VLANs, in addition to offering comprehensive SSO support for the Windows login environment.
- Flexible selection of user credentials—User passwords and Windows passwords are interactive. User credentials are checked with RSA SecurID tokens; one-time password (OTP) tokens; Smartcards (Axalto, Gemplus, SafeNet iKey, and Alladin); and X.509 certificates.

**Specifications**

**Operating systems**
- Windows XP, Windows 2000, Windows Vista

**EAP protocols (XP/2000)**
- EAP-Message Digest 5 (MD5), EAP-Transport Layer Security (TLS), EAP-Tunneled TLS (TTLS), Cisco LEAP EAP-Flexible Authentication via Secure Tunneling (FAST), Protected Extensible Authentication Protocol (PEAP)

**EAP protocols (Vista)**
- Cisco LEAP EAP-Flexible Authentication via Secure Tunneling (FAST), Protected Extensible Authentication Protocol (PEAP)

**EAP-TOLES (XP/2000)**
- Password Authentication Protocol (PAP), Challenge Handshake Authentication Protocol (CHAP), Microsoft CHAP (MSCHAP), MSCHAPv2, EAP-MD5

**EAP-PEAP (XP/2000)**
- EAP-MSCHAPv2, EAP-TLS, and EAP-Generic Token Card (GT)

**EAP-TTLS (XP/2000)**
- EAP-MSCHAPv2 and EAP-Generic Token Card (GT)

**Encryption support**
- WEP, WPA, WPA2, WPA-Pre-Shared Key (WPA-PSK), WPA2-PSK, Dynamic WEP (802.1X), AES, TKIP

**Media support**
- Wired Ethernet 802.3 and Wi-Fi 802.11 a, b, g, n

**Switch interoperability**
- Any 802.1X-compatible Wi-Fi access point and wired Ethernet switch

**Authentication, authorization, and accounting (AAA) interoperability**
- Supports standard RADIUS servers such as Cisco Secure Access Control Server (ACS) and Microsoft Internet Authentication Service (IAS)

**Windows SSO**
- Active Directory machine and user authentication

**Enterprise deployment**
- Export network profiles and lock user interface

**Integrated VPN**
- Automatic VPN requires the following software to be preinstalled:
  - Cisco IPSec VPN version 4.8 or higher on Windows XP
  - Cisco IPSec VPN version 5.0.03.0560 or higher on Windows Vista

**Integrated Software Token Applications (XP/2000)**
- Automatic software token generation requires the following software to be preinstalled:
  - Secure Computing SofT oken II (Version 2.1 or later)

**FIPS solution**
- Requires the purchase of separate drivers for a complete FIPS 140-2 Level 1 client solution.
- Driver part numbers are AIR-SSCFIPS-DRV (see ordering guide for more detail).
- Supports Intel, Broadcom, and Atheros Wi-Fi chipsets.
- FIPS mode includes support for EAP-TLS, EAP-FAST, and PEAP association methods.

**Selected Part Numbers and Ordering Information**

**Windows 2000 Windows XP**
- AIR-SC5.0-XP2K
- SW Client 5.0 for Win XP2K for wired/wireless devices
- Specified seat count up to 250: 25-1=1000, 1001–2500, 2501–5000, 5001–10,000, 10,001–25,000, 25,001–50,000, 50,001–100,000

**Windows Vista**
- AIR-SCC-VIST A
- Software Client 5.1 for Windows Vista for wired/wireless devices
- Specified seat count up to 250: 25-1=1000, 1001–2500, 2501–5000, 5001–10,000, 10,001–25,000, 25,001–50,000, 50,001–100,000

**For More Information**
Cisco Aironet Antennas and Accessories

Every wireless LAN (WLAN) deployment is different. When engineering an in-building solution, varying facility sizes, construction materials, and interior divisions raise transmission and multipath considerations. Cisco offers a complete range of 2.4- and 5-GHz antennas for access-point and bridge equipment that facilitate a customized wireless solution for almost any installation.

Key Features
- Client adapter antennas extend the transmission range for more specialized applications; a variety of optional, higher-gain antennas are provided that are compatible with selected client adapters.
- Access-point antennas are compatible with all Cisco RP-TNC-equipped access points; they are available with different gain and range capabilities, beam widths, and form factors.
- Bridge antennas are available in directional configurations for point-to-point transmission and in an omnidirectional configuration for point-to-multipoint implementations.
- Low-loss cable extends the length between any Cisco Aironet bridge and the antenna. With a loss of 6.7 dB per 100 feet (30m), low-loss cable provides installation flexibility without a significant sacrifice in range.
- Cisco offers a complete range of antennas for 5-GHz bridging applications.

Specifications

### Cisco Aironet 2.4 GHz Access Point Antennas with RP-TNC Connectors

<table>
<thead>
<tr>
<th>Feature</th>
<th>Description</th>
<th>Application</th>
<th>Approximate Indoor Range1</th>
<th>Cable Length</th>
<th>Dimensions (H x W x D)</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>AIR-ANT5599</td>
<td>2-dBi Diversity omnidirectional ceiling mount</td>
<td>Indoor unobtrusive antenna, best for ceiling mount. Excellent throughput and coverage solution in high multipath cells and dense user population</td>
<td>6 Mbps: 295 ft (90 m) 54 Mbps: 88 ft (27 m)</td>
<td>3 ft. (0.91 m)</td>
<td>11.25 x 1 in. (28.5 x 2.5 cm)</td>
<td>4.6 oz. (131g)</td>
</tr>
<tr>
<td>AIR-ANT2410Y-R</td>
<td>10-dBi Yagi mast or wall mount</td>
<td>Indoor/outdoor directional antenna for use with Access Points or Bridges</td>
<td>6 Mbps: 548 ft (167 m) 54 Mbps: 160 ft (50 m)</td>
<td>3 ft. (0.91 m)</td>
<td>5.5 in. (14 cm)</td>
<td>1 oz. (27g)</td>
</tr>
<tr>
<td>AIR-ANT2012</td>
<td>Diversity patch wall mount</td>
<td>Indoor/outdoor, unobtrusive medium range antenna</td>
<td>6 Mbps: 418 ft (127 m) 54 Mbps: 128 ft (39 m)</td>
<td>3 ft. (0.91 m)</td>
<td>5.5 in. (14 cm)</td>
<td>1 oz. (27g)</td>
</tr>
<tr>
<td>AIR-ANT3213</td>
<td>5.2-dBi Pillar mount</td>
<td>Indoor/outdoor, unobtrusive medium-range antenna</td>
<td>6 Mbps: 378 ft (114 m) 54 Mbps: 114 ft (35 m)</td>
<td>3 ft. (0.91 m)</td>
<td>N/A</td>
<td>N/A</td>
</tr>
</tbody>
</table>

### Cisco Aironet 5 GHz Access Point Antennas with RP-TNC Connectors

<table>
<thead>
<tr>
<th>Feature</th>
<th>Description</th>
<th>Application</th>
<th>Approximate Indoor Range1</th>
<th>Cable Length</th>
<th>Dimensions (H x W x D)</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>AIR-ANT1729</td>
<td>5.2-dBi omnidirectional ceiling mount</td>
<td>Indoor medium-range antenna, typically hung from crosstabs of drop ceilings</td>
<td>6 Mbps: 305 ft (92 m) 54 Mbps: 114 ft (35 m)</td>
<td>3 ft. (0.91 m)</td>
<td>11.25 x 1 in. (28.5 x 2.5 cm)</td>
<td>4 oz. (113g)</td>
</tr>
<tr>
<td>AIR-ANT1728</td>
<td>2.2-dBi black dipole antenna</td>
<td>Indoor omnidirectional coverage</td>
<td>54 Mbps: 300 ft (91 m) 54 Mbps: 90 ft (27 m)</td>
<td>3 ft. (0.91 m)</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>AIR-ANT4941</td>
<td>2.2-dBi gray non-articulating dipole antenna</td>
<td>Indoor omnidirectional coverage</td>
<td>6 Mbps: 397 ft (120 m) 54 Mbps: 114 ft (35 m)</td>
<td>N/A</td>
<td>5.5 in. (14 cm)</td>
<td>1 oz. (27g)</td>
</tr>
<tr>
<td>AIR-ANT2422DG-R</td>
<td>2.2-dBi white dipole antenna</td>
<td>Indoor omnidirectional coverage</td>
<td>54 Mbps: 300 ft (91 m) 54 Mbps: 90 ft (27 m)</td>
<td>N/A</td>
<td>5.5 in. (14 cm)</td>
<td>1 oz. (27g)</td>
</tr>
</tbody>
</table>

### Cisco Aironet 5 GHz Bridge Antennas

<table>
<thead>
<tr>
<th>Feature</th>
<th>Description</th>
<th>Application</th>
<th>Approximate Indoor Range1</th>
<th>Cable Length</th>
<th>Dimensions (H x W x D)</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>AIR-ANT2460P-R</td>
<td>8.5-dBi patch wall mount</td>
<td>Indoor outdoor, unobtrusive, midrange antenna (may also be used as a medium range bridge antenna)</td>
<td>6 Mbps: 403 ft (123 m) 54 Mbps: 121 ft (37 m)</td>
<td>3 ft. (0.91 m)</td>
<td>15.7 x 7 in. (40 x 18 cm)</td>
<td>3 oz. (85g)</td>
</tr>
<tr>
<td>AIR-ANT2485P-R</td>
<td>8.5-dBi patch wall mount</td>
<td>Indoor unobtrusive, long-range antenna (may also be used as a midrange bridge antenna)</td>
<td>507 ft (155 m)</td>
<td>3 ft. (0.91 m)</td>
<td>12.5 in. (32 cm)</td>
<td>1 oz. (27g)</td>
</tr>
<tr>
<td>AIR-ANT2465P-R</td>
<td>6-dBi diversity patch wall mount</td>
<td>Indoor unobtrusive medium range antenna</td>
<td>403 ft (122 m) 121 ft (37 m)</td>
<td>3 ft. (0.91 m)</td>
<td>126 ft (38 m)</td>
<td>3 oz. (85g)</td>
</tr>
</tbody>
</table>

1 Approximate Indoor Range is based on an in-building installation with typical materials and obstructions. Actual performance may vary. 

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3-22 Cisco Aironet Antennas and Accessories
Cisco offers antennas that can be used with the Cisco Aironet 1250 Series Access Points, which feature 802.11n technology. The antennas and access points use an RP-TNC type connector. Two antennas are available for the 2.4- and 5-GHz band.

### Dimensions

<table>
<thead>
<tr>
<th>Feature</th>
<th>AIR-ANT5145V-R</th>
<th>AIR-ANT5160V-R</th>
<th>AIR-ANT5170P-R</th>
<th>AIR-ANT5195P-R</th>
</tr>
</thead>
<tbody>
<tr>
<td>Description</td>
<td>4.5-dBi diversity omnidirectional ceiling mount</td>
<td>6-dBi omnidirectional antenna</td>
<td>70-dBi Diversity patch wall mount</td>
<td>95-dBi Patch wall or articulating mast mount</td>
</tr>
<tr>
<td>Application</td>
<td>Indoor midrange antenna</td>
<td>Indoor/outdoor midrange antenna</td>
<td>Indoor/outdoor directional wall mount antenna</td>
<td>Indoor/outdoor patch antenna provides different mounting options</td>
</tr>
<tr>
<td>Approximate Range [3]</td>
<td>6 Mbps: 732 ft (223 m) 54 Mbps: 82 ft (25 m)</td>
<td>6 Mbps: 980 ft (270 m) 54 Mbps: 140 ft (43 m)</td>
<td>6 Mbps: 1030 ft (313 m) 54 Mbps: 170 ft (52 m)</td>
<td>6 Mbps: 1030 ft (313 m) 54 Mbps: 170 ft (52 m)</td>
</tr>
<tr>
<td>Beam Width</td>
<td>360° H 50° E</td>
<td>360° H 17° E</td>
<td>70° H, 50° V</td>
<td>50° H, 45° V</td>
</tr>
<tr>
<td>Cable Length</td>
<td>3 ft (0.91 m)</td>
<td>3 ft (0.91 m)</td>
<td>3 ft (0.91 m)</td>
<td>3 ft (0.91 m)</td>
</tr>
<tr>
<td>Dimensions (L x D)</td>
<td>6.75 x 4.1 in (17.1 x 10.4 cm)</td>
<td>12 x 1 in (30.5 x 2.5 cm)</td>
<td>5.7 in (14.5 cm) x 4.3 in (10.9 cm) x 0.7 in (1.8 cm)</td>
<td>5.1 in (12.9 cm) x 6.1 in (12.9 cm) x 1 in (2.5 cm)</td>
</tr>
<tr>
<td>Weight</td>
<td>11.5 oz</td>
<td>5.3 oz</td>
<td>8 oz (0.2 kg)</td>
<td>9 oz (0.25 kg)</td>
</tr>
</tbody>
</table>

### Weight

- 4.9 oz (139 g)
- 8.2 oz (231.3 g)
- 6 oz (1.715 g)
- 116 oz (330.2 g)

### Cisco Aironet 5 GHz Access Point Antennas with RP-TNC Connectors

<table>
<thead>
<tr>
<th>Feature</th>
<th>AIR-ANT5153D-R</th>
<th>AIR-ANT5135DG-R</th>
<th>AIR-ANT5135DW-R</th>
</tr>
</thead>
<tbody>
<tr>
<td>Description</td>
<td>3.5-dBi black dipole antenna</td>
<td>3.5-dBi gray non-articulating antenna</td>
<td>3.5-dBi white dipole antenna</td>
</tr>
<tr>
<td>Application</td>
<td>Indoor omnidirectional coverage</td>
<td>Indoor omnidirectional coverage</td>
<td>Indoor omnidirectional coverage</td>
</tr>
<tr>
<td>Approximate Range [3]</td>
<td>75 ft (22.9 m)</td>
<td>75 ft (22.9 m)</td>
<td>75 ft (22.9 m)</td>
</tr>
<tr>
<td>Beam Width</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Cable Length</td>
<td>5.3 x 0.6 in (13.5 x 15 cm)</td>
<td>5.3 x 0.6 in (13.5 x 15 cm)</td>
<td>5.3 x 0.6 in (13.5 x 15 cm)</td>
</tr>
<tr>
<td>Dimensions (L x D)</td>
<td>1 oz (28.3 g)</td>
<td>1 oz (28.3 g)</td>
<td>1 oz (28.3 g)</td>
</tr>
<tr>
<td>Weight</td>
<td>1 oz (28.3 g)</td>
<td>1 oz (28.3 g)</td>
<td>1 oz (28.3 g)</td>
</tr>
</tbody>
</table>

### Weight

- 1 oz (28.3 g)

---

1. All range estimations are based on an integrated client adapter antenna associating with an access point under ideal indoor conditions. The distances referenced here are approximations and should be used for estimation only.

Cisco offers antennas that can be used with the Cisco Aironet 1250 Series Access Points, which feature 802.11n technology. The antennas and access points use an RP-TNC type connector. Two antennas are available for the 2.4- and 5-GHz band.

### 2.4- and 5-GHz Access Point Antennas with RP-TNC Connectors for Cisco Aironet 1250 Series Access Points

<table>
<thead>
<tr>
<th>Feature</th>
<th>AIR-ANT2430V-R</th>
<th>AIR-ANT2450S-R</th>
<th>AIR-ANT5140V-R</th>
</tr>
</thead>
<tbody>
<tr>
<td>Description</td>
<td>Ceiling mount omnidirectional</td>
<td>Wall mount sector</td>
<td>Ceiling mount omnidirectional</td>
</tr>
<tr>
<td>Application</td>
<td>Indoor carpeted area type, unobtrusive omnidirectional antennas for Cisco Aironet 1250 Series MIMO Radios</td>
<td>Indoor, outdoor, midrange, sector antenna (may be used as a midrange bridge antenna)</td>
<td>Indoor carpeted area type unobtrusive omnidirectional antenna for Cisco Aironet 1250 Series MIMO Radios</td>
</tr>
<tr>
<td>Gain</td>
<td>3.0 dBi</td>
<td>5.0 dBi</td>
<td>4.5 dBi</td>
</tr>
<tr>
<td>Frequency</td>
<td>2.4 GHz</td>
<td>2.4 GHz</td>
<td>5 GHz</td>
</tr>
<tr>
<td>Approximate Indoor Range at 6 Mbps [1]</td>
<td>507 ft (155 m)</td>
<td>379 ft (116 m)</td>
<td>403 ft (123 m)</td>
</tr>
<tr>
<td>Approximate Indoor Range at 54 Mbps [1]</td>
<td>153 ft (47 m)</td>
<td>114 ft (35 m)</td>
<td>121 ft (37 m)</td>
</tr>
<tr>
<td>Beam Width</td>
<td>360° H, 60° V</td>
<td>360° H, 60° V</td>
<td>360° H, 60° V</td>
</tr>
<tr>
<td>Cable Length</td>
<td>3 ft (0.91 m)</td>
<td>3 ft (0.91 m)</td>
<td>3 ft (0.91 m)</td>
</tr>
<tr>
<td>Dimensions &amp; Weight</td>
<td>12 x 4.2 x 1.6 in (30.3 x 10.6 x 4.0 cm)</td>
<td>6 x 3.8 x 2 in (15.2 x 9.8 x 5 cm)</td>
<td>6.9 x 3.9 x 0.9 in (17.5 x 9.9 x 2.3 cm)</td>
</tr>
</tbody>
</table>

---

1. All range estimations are based on an integrated client adapter antenna associating with an access point under ideal indoor conditions. The distances referenced here are approximations and should be used for estimation only.
Cisco offers antennas for the Cisco Aironet 1500 Series Outdoor Mesh Access Points in various gains and antenna types.

### 2.4- and 5-GHz Antennas with N-Type Connectors for the Cisco Aironet 1500 Series Lightweight Outdoor Mesh APs

<table>
<thead>
<tr>
<th>Feature</th>
<th>AIR-ANT2450V-N</th>
<th>AIR-ANT2455V-N</th>
<th>AIR-ANT2480V-N</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Description</strong></td>
<td>5 dBi, direct mount omnidirectional antenna for 2.4 GHz</td>
<td>5.5 dBi, direct mount omnidirectional antenna for 2.4 GHz</td>
<td>8 dBi direct mount omnidirectional antenna for 2.4 GHz</td>
</tr>
<tr>
<td><strong>Application</strong></td>
<td>Omnidirectional antenna for outdoor mesh access points. Suitable for all access point deployments, specifically for cable strand mount applications.</td>
<td>Omnidirectional antenna suitable for use on Cisco Aironet 1500 Series Lightweight Outdoor Mesh Access Points in all deployments. Not suitable for use on Cisco Aironet 1500 Series Lightweight Outdoor Mesh Access Points in cable strand mount situations.</td>
<td>Extended range omnidirectional antenna for outdoor mesh access points. Suitable for pole or roof mounting deployments.</td>
</tr>
<tr>
<td><strong>Gain</strong></td>
<td>5 dBi</td>
<td>5.5 dBi</td>
<td>8 dBi</td>
</tr>
<tr>
<td><strong>Frequency</strong></td>
<td>2.4 GHz</td>
<td>2.4 GHz</td>
<td>2.4 GHz</td>
</tr>
<tr>
<td><strong>Beam width</strong></td>
<td>30° V</td>
<td>25° V</td>
<td>10° V</td>
</tr>
<tr>
<td><strong>Cable Length</strong></td>
<td>None</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td><strong>Dimensions</strong></td>
<td>11 in. x 1 in. (27.94 x 2.54 cm)</td>
<td>12.5 in. x 1 in. (31.75 x 2.54 cm)</td>
<td>19.5 in. x 7/8 in. diameter (49.5 cm x 2.22 cm)</td>
</tr>
<tr>
<td><strong>Weight</strong></td>
<td>0.40 lbs. (0.18 kg)</td>
<td>0.31 lbs. (0.14 kg)</td>
<td>0.45 lbs. (0.20 kg)</td>
</tr>
<tr>
<td><strong>Operating Temperature</strong></td>
<td>-30° to +70°C</td>
<td>-30° to +70°C</td>
<td>-30° to +70°C</td>
</tr>
</tbody>
</table>

### 2.4 GHz Bridge Antennas

<table>
<thead>
<tr>
<th>Feature</th>
<th>AIR-ANT1949</th>
<th>AIR-ANT3338</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Description</strong></td>
<td>13.5 dBi mast mount</td>
<td>21 dBi solid dish</td>
</tr>
<tr>
<td><strong>Gain</strong></td>
<td>12 dBi</td>
<td>14 dBi</td>
</tr>
<tr>
<td><strong>Frequency</strong></td>
<td>2.4 GHz</td>
<td>2.4 GHz</td>
</tr>
<tr>
<td><strong>Beam width</strong></td>
<td>29° H, 29° E</td>
<td>90° H, 9° E</td>
</tr>
<tr>
<td><strong>Cable Length</strong></td>
<td>1 ft (0.30 m)</td>
<td>1 ft (0.30 m)</td>
</tr>
<tr>
<td><strong>Dimensions</strong></td>
<td>11.65 in. x 1 in. (29.41 x 2.54 cm)</td>
<td>11 in. x 1 in. (27.94 x 2.54 cm)</td>
</tr>
<tr>
<td><strong>Weight</strong></td>
<td>0.38 lbs. (0.17 kg)</td>
<td>0.4 lbs. (0.18 kg)</td>
</tr>
<tr>
<td><strong>Operating Temperature</strong></td>
<td>-30° to +70°C</td>
<td>-30° to +70°C</td>
</tr>
</tbody>
</table>
### Cisco Aironet Antennas and Accessories

#### Application

<table>
<thead>
<tr>
<th>Indoor Range</th>
<th>Outdoor Short-range Point-to-Multipoint Applications</th>
<th>Outdoor Medium-range Point-to-Multipoint Applications</th>
<th>Outdoor Long-range Point-to-Multipoint Applications</th>
<th>Outdoor Medium-range Directional Connections</th>
<th>Outdoor Long-range Directional Connections</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 Mbps: 3.3 miles (5.31 km)</td>
<td>11 Mbps: 166 miles (264 km)</td>
<td>54 Mbps: 21 miles (34 km)</td>
<td>2 Mbps: 10 Mbps (16 km)</td>
<td>2 Mbps: 18.33 miles (29.49 km)</td>
<td>2 Mbps: 28.49 miles (45.42 km)</td>
</tr>
<tr>
<td>11 Mbps: 792 miles (1275 km)</td>
<td>54 Mbps: 54 miles (87 km)</td>
<td>54 Mbps: 126 miles (203 km)</td>
<td>11 Mbps: 889 miles (1430 km)</td>
<td>11 Mbps: 1119 miles (1810 km)</td>
<td>11 Mbps: 201 miles (323 km)</td>
</tr>
<tr>
<td>54 Mbps: 21 miles (34 km)</td>
<td>11 Mbps: 166 miles (264 km)</td>
<td>54 Mbps: 126 miles (203 km)</td>
<td>54 Mbps: 141 miles (227 km)</td>
<td>54 Mbps: 446 miles (717 km)</td>
<td>54 Mbps: 446 miles (717 km)</td>
</tr>
</tbody>
</table>

#### Approximate Indoor Range

<table>
<thead>
<tr>
<th>Indoor Range</th>
<th>Approximate Indoor Range or Dimensions</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 Mbps: 3.3 miles (5.31 km)</td>
<td>1 ft. (0.3 m)</td>
</tr>
<tr>
<td>11 Mbps: 166 miles (264 km)</td>
<td>5 ft. (1.5 m)</td>
</tr>
<tr>
<td>54 Mbps: 21 miles (34 km)</td>
<td>10 ft. (3.0 m)</td>
</tr>
</tbody>
</table>

#### Cable Length

<table>
<thead>
<tr>
<th>Dimensions (L x D)</th>
<th>Cable Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>13 x 1 in. (33 x 2.5 cm)</td>
<td>3 ft. (0.91 m)</td>
</tr>
<tr>
<td>50 x 1 in. (127 x 2.5 cm)</td>
<td>1 ft. (0.30 m)</td>
</tr>
<tr>
<td>36 x 6 x 1.25 in. (91 x 15 x 10 cm)</td>
<td>5 ft. (1.5 m)</td>
</tr>
<tr>
<td>18 x 3 x 1.25 in. (46 x 76 cm)</td>
<td>3 ft. (0.91 m)</td>
</tr>
<tr>
<td>24 in. (61 cm)</td>
<td>1 ft. (0.30 m)</td>
</tr>
</tbody>
</table>

#### Weight

| Weight | 5 oz. (14 g) | 1.5 lb. (68 kg) | 6.5 lb. (3 kg) | 12 oz. (34 kg) | 11 lb. (5 kg) |

### Cisco Aironet Accessories

#### Feature AIR-ACC2537-060

**Description**
Flexible antenna cable that extends access point cabling typically within an enclosure

**Application**
Flexible antenna cable that extends access point cabling typically within an enclosure

**Application**
Flexible antenna cable that extends access point cabling typically within an enclosure

**Application**
Flexible antenna cable that extends access point cabling typically within an enclosure

#### Feature AIR-ANT58G9VOA-N

**Description**
9.0-dBi omnidirectional mast mount

**Application**
Outdoor short-range point-to-multipoint applications

**Application**
Outdoor medium-range point-to-multipoint applications

**Application**
Outdoor long-range directional connections

#### Feature AIR-ANT58G10SSA-N

**Description**
9.5-dBi sector antenna mast mount

**Application**
Outdoor medium-range point-to-multipoint applications

**Application**
Outdoor long-range directional connections

#### Feature AIR-ANT58G28SDA-N

**Description**
28.0-dBi dish antenna mast mount

**Application**
Outdoor long-range directional connections

**Application**
Outdoor long-range directional connections

**Application**
Outdoor long-range directional connections

#### Feature AIR-ACCRWM1400

**Description**
Roof/Wall mount kit

**Application**
Helps prevent damage due to lightning-induced surges or static electricity

**Application**
Helps prevent damage due to lightning-induced surges or static electricity

**Application**
Helps prevent damage due to lightning-induced surges or static electricity

#### Feature AIR-ACCBRGB-

**Description**
Grounding block

**Application**
Helps prevent damage due to lightning-induced surges or static electricity

**Application**
Helps prevent damage due to lightning-induced surges or static electricity

**Application**
Helps prevent damage due to lightning-induced surges or static electricity

#### Feature AIR-CAB020DRG6-F=

**Description**
20 ft. (6m) cable length

**Application**
Allows mounting to flat surfaces includes full elevation and azimuth adjustment

**Application**
Allows mounting to flat surfaces includes full elevation and azimuth adjustment

**Application**
Includes both elevation and polarization adjustment

#### Feature AIR-CAB050DRG6-F=

**Description**
50 ft. (15m) cable length

**Application**
Includes both elevation and polarization adjustment

**Application**
Includes both elevation and polarization adjustment

**Application**
Includes both elevation and polarization adjustment

### Notes
1. Cisco Aironet 1500 Series Access Points are available in single-band (2.4 GHz) and dual-band (2.4 GHz and 5 GHz) versions. Check your access point for proper antenna selection before placing an order.
Cisco offers a dual band antenna, or a radome, which has both 2.4 GHz and 5 GHz elements in one low profile package. The antenna has 4 cables, two for 2.4 GHz and 2 for 5 GHz, color coded to prevent any accidental connections. Easy to install and lightweight, this antenna is ideal for indoor wall or ceiling mount applications.

### Cisco Dual Band Antenna for 2.4 GHz and 5 GHz Access Points

<table>
<thead>
<tr>
<th>Feature</th>
<th>Description</th>
<th>Application</th>
<th>Gain</th>
<th>Frequency*</th>
<th>Approximate Indoor Range at 6 Mbps**</th>
<th>Approximate Indoor Range at 54 Mbps**</th>
<th>Beam Width</th>
<th>Cable Length</th>
<th>Dimensions</th>
<th>Weight</th>
<th>Operating Temperature</th>
</tr>
</thead>
<tbody>
<tr>
<td>AIR-ANT2451V-R</td>
<td>Dual band: 2 dBi in 2.4 GHz and 3dBi in 5 GHz omnidirectional ceiling mount</td>
<td>Indoor midrange antenna</td>
<td>2 dBi in 2.4 GHz; 3 dBi in 5 GHz</td>
<td>2.4 and 5 GHz</td>
<td>2.4 GHz: 295 ft (90 m); 5 GHz: 675 ft (206 m)</td>
<td>2.4 GHz: 88 ft (27 m); 5 GHz: 75 ft (23 m)</td>
<td>2.4GHz: 360°H, 80°E; 5 GHz: 360°H, 50°E</td>
<td>18 in (45.7 cm)</td>
<td>8.5 in x 6 in x 0.9 in (21.5 cm x 15.2 cm x 2.4 cm)</td>
<td>1 lb (4.5 kg)</td>
<td>0° to +45°C</td>
</tr>
</tbody>
</table>

### Selected Part Numbers and Ordering Information

#### Cisco Aironet Accessories
- AIR-ACC2562: Yagi Antenna Articulating Mount
- AIR-ACC2553/000: 60 in. (152 cm) bulkhead extender
- AIR-ACC2555/4LA-R: 2.4 GHz and 5 GHz lightning arrestor
- AIR-CAB020LL-R: 20 ft. (6m) low-loss antenna cable
- AIR-CAB050LL-R: 50 ft. (15m) low loss antenna cable
- AIR-CAB100ULL-R: 100 ft. (30m) low loss antenna cable
- AIR-CAB150ULL-R: 150 ft. (46m) low loss antenna cable

#### Cisco Aironet Antennas
- AIR-ANT1728: 5.2 dBi Omni Ceiling Mount Antenna
- AIR-ANT1729: 6 dBi Patch Wall Mount Antenna
- AIR-ANT1949: 13.5 dBi Yagi Mast Mount Antenna
- AIR-ANT2012: 8.5 dBi Diversity Patch Wall Mount Antenna
- AIR-ANT2506: 5.2 dBi Omnidirectional Mast Mount Antenna
- AIR-ANT3213: 5.2 dBi Pillar-Mount Diversity Omni Antenna
- AIR-ANT2410V-R: 10 dBi Yagi mast or wall mount
- AIR-ANT3338: 21 dBi Solid Dish Antenna
- AIR-ANT2430V-R: Ceiling mount omnidirectional
- AIR-ANT24130: 12 dBi Omnidirectional Mast Mount Antenna
- AIR-ANT15941: 2.2 dBi Dipole Antenna (standard Rubber Duck)
- AIR-ANT15140V-R: Ceiling mount omnidirectional
- AIR-ANT15959: 2.0dB Diversity Omni Ceiling Mount Antenna
- AIR-ANT24145-R: 14.5 dBi Sector Mast Mount Antenna
- AIR-ANT15145V-R: 4.5 dBi omni
- AIR-ANT15160V-R: 6 dBi omni
- AIR-ANT15170P-R: 7.0 dBi Diversity patch wall mount
- AIR-ANT15195P-R: 9.5 dBi Patch wall or articulating mast mount
- AIR-ANT2422030-R: 2.2 dBi Gray non-articulating dipole
- AIR-ANT242220W-R: 2.2 dBi White dipole
- AIR-ANT24505V-N: 5 dBi direct mount omnidirectional antenna for 2.4 GHz
- AIR-ANT24505V-N: 8 dBi direct mount omnidirectional antenna for 2.4 GHz
- AIR-ANT151485P-R: 6.5 dBi Patch wall mount
- AIR-ANT151480P-R: 6 dB Patch wall mount
- AIR-ANT151485P-R: 6.5 dBi Diversity patch wall mount
- AIR-ANT151148P-N: 14 dB wall/mast mount articulating patch antenna for 5 GHz
Cisco 4400 Series Wireless LAN Controller

The Cisco 4400 Series Wireless LAN Controller provides system-wide WLAN functions for medium to large-sized facilities. By automating WLAN configuration and management functions, network managers have the control, security, redundancy, and reliability needed to cost-effectively scale and manage their wireless networks as easily as they scale and manage their traditional wired networks. The Cisco 4400 Series Wireless LAN Controller works in conjunction with Cisco Aironet lightweight access points, the Cisco Wireless Control System (WCS), the Cisco Mobility Services Engine, and the Cisco Wireless Location Appliance to support business-critical wireless data, voice, and video applications. It provides real-time communication between lightweight access points and other WLAN controllers to deliver centralized security policies, wireless intrusion prevention system (IPS) capabilities, award-winning RF management, QoS, and mobility.

Ideal for Companies that Need These Features
- Enterprise scalability—Scalable architecture that provides business-critical wireless services for locations of all sizes
- Integrated radio resource management (RRM)—An intelligent RF control plane for self-configuration, self-healing, and self-optimization
- Enterprise reliability—Automated recovery from lightweight access point and WLAN controller failures to maximize the availability of the wireless network

Key Features
- Component of Cisco Unified Wireless Network
- Multilayered security
- Rogue AP detection, location, and containment
- Zero-configuration deployment

Specifications

<table>
<thead>
<tr>
<th>Features</th>
<th>Cisco 4400 Series Wireless LAN Controller</th>
</tr>
</thead>
</table>
| Wireless          | IEEE 802.11a, 802.11b, 802.11g, 802.11n, 802.1
| Data RFCs         | RFC 768 UDP, RFC 791 IP, RFC 792 ICMP, RFC 793 TCP, RFC 826 ARP, RFC 1122 Requirements for Internet Hosts, RFC 1519 CDIR, RFC 1542 BOOTP, RFC 2131 DHCP |
| Encryption        | WEP and TKIP-RC4: 40, 104 and 128 bits (both static and shared keys); Secure Sockets Layer (SSL) and TLS, RC4 128-bit and RSA 1024- and 2048-bit, AES GCM, COMP |
| Management Interfaces | Web-based: HTTP/HTTPS, Command-line interface, Telnet, SSH, serial port |

For More Information
For more information about Cisco antennas and accessories, visit: http://www.cisco.com/go/antenna.
Selected Part Numbers and Ordering Information

For More Information

Cisco 2100 Series Wireless LAN Controller

Cisco wireless LAN (WLAN) controllers are responsible for systemwide WLAN functions such as security policies, intrusion prevention, RF management, and quality of service (QoS). They work in conjunction with Cisco lightweight access points and the Cisco Wireless Control System (WCS) to support business-critical wireless applications. From voice and data services to location tracking, Cisco WLAN controllers provide the control, scalability, and reliability that network managers need to build secure, enterprise-scale wireless networks, from branch offices to main campuses.

The Cisco 2100 Series Wireless LAN Controllers support up to six, twelve or twenty-five access points, making it a cost-effective solution for enterprise branches and small and medium businesses. These controllers come with eight Ethernet ports, two of which can provide power directly to Cisco lightweight access points.

Ideal for Companies that Need These Features

- An enterprise scalable architecture that provides business-critical wireless services for small and medium-sized businesses and branch offices
- An intelligent RF control plane for self-configuration, self-healing, and self-optimization
- A system that can be deployed without modifying existing routing and switching infrastructures or touching access points

Key Features

- Component of Cisco Unified Wireless Network
- Business-class RF security and WLAN security policy monitoring
- Simplified network deployment, operations, and management to help reduce overall operational expenses
- Integration with the Cisco PCI security-compliant reference design

Specifications

Interfaces and Indicators

| Interface                          | Description                          
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Uplink</td>
<td>2 (4402) or 4 (4404) 1000Base-X mini-GBIC transceiver slots (SFP) – LED indicators: link, activity, Status, Alarm, Power Supply 1, Power Supply 2</td>
</tr>
<tr>
<td>Service Port</td>
<td>10/100 Mbps Ethernet (RJ45) – LED indicators: link, activity, Utilility Port: 10/100 Mbps Ethernet (RJ45) – LED indicators: link, activity, Expansion Slots: 1</td>
</tr>
</tbody>
</table>
Cisco Wireless Control System

Cisco Wireless Control System (WCS) is the industry-leading platform for WLAN planning, configuration, management, and mobility services. It provides a powerful foundation that allows IT managers to design, control, and monitor next-generation enterprise wireless networks from a centralized location, simplifying operations and reducing total cost of ownership (TCO). With Cisco WCS, network administrators have a single solution for RF prediction, policy provisioning, network optimization, troubleshooting, user tracking, security monitoring, VoWLAN configuration, and WLAN systems management. Robust graphical interfaces make WLAN deployment and operations simple and cost-effective. Detailed trending, inventory, performance, security, device, and analysis reports make Cisco WCS vital to ongoing network operations. High availability helps maximize the uptime for services delivery and improve operational efficiency.

The platform supports built-in secure guest access. It interfaces with Cisco Spectrum Expert to detect Wi-Fi and RF interference. It manages the Cisco Mobility Services Engine (MSE) to support mobility services including context-aware mobility (location services), mobile intelligent roaming, adaptive wireless IPS, and secure client management.

**Ideal for Companies that Need These Features**
- A centralized platform for managing a complete network of Cisco Wireless LAN controllers, Cisco Aironet lightweight access points, Cisco Aironet standalone access points, and mobility services including Cisco MSE
- WLAN planning tools to increase the effectiveness of WLAN design and deployment, including VoWLAN and location services
- Real-time security monitoring with intrusion detection systems (IDSs) and adaptive wireless intrusion prevention systems (wIPSs)
- Simplified client troubleshooting tools
- Secure, cost-effective wired and wireless guest access
- Quick and simple bulk configuration of controllers
- Easy detection of Wi-Fi and RF interference
- Virtual domain partitioning of the network to allow individual IT administrators management access to only the segments of the wireless network under their responsibility

**Key Features**
- Simplified ease-of-use—Intuitive GUI supports easy configuration, monitoring, and troubleshooting of wireless networks with minimal IT training.
- Hierarchical maps—Quick access to different geographies, campuses, buildings, floors, and regions supports better network visibility and control.
- Standalone access point migration tool—Easy migration of standalone (autonomous) access points to operate as lightweight access points with wireless LAN controllers reduces operational costs.
- Monitoring of standalone access points—Built-in monitoring of selected Cisco Aironet standalone access points is supported as well as monitoring of selected Cisco integrated services routers access points.

### Selected Part Numbers and Ordering Information

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>AIR-WLC2106-K9</td>
<td>Cisco 2106 Series Wireless LAN Controller for up to six Cisco Aironet access points</td>
</tr>
<tr>
<td>AIR-WLC2112-K9</td>
<td>Cisco 2112 Series Wireless LAN Controller for up to twelve Cisco Aironet access points</td>
</tr>
<tr>
<td>AIR-WLC2125-K9</td>
<td>Cisco 2125 Series Wireless LAN Controller for up to twenty-five Cisco Aironet access points</td>
</tr>
</tbody>
</table>

For more information about the Cisco 2100 Series WLANs, visit: [http://www.cisco.com/go/wireless](http://www.cisco.com/go/wireless).
- WLAN planning tools—Integrated RF prediction tools can be used to create a detailed wireless LAN design leading to more effective and efficient WLAN design and deployment.
- Reports—Extensive on-demand and automated reports can be run to address inventory, performance, controllers, access points, clients, security, RF environment, and alarms.
- PCI compliance report—Event analysis and audit trails provide assistance in creating a PCI Assessment Report.
- Virtual domains—Enterprise-wide access control supports limiting access for individual IT administrators to only those network segments that are under their individual responsibility.
- Managed service providers—Virtual domains give managed service providers the ability to easily manage multiple customer WLANs directly from a single Cisco WCS platform.
- Client troubleshooting tool—Quick and simplified tools support easy client troubleshooting using a simple step-by-step method.
- RF interference detection and mitigation—Integration with Cisco Spectrum Expert supports investigating Wi-Fi and RF interference sources within the vicinity of Cisco lightweight access points.
- Context-Aware Mobility Solution—Detailed contextual information about items such as location, temperature, the availability of an asset, and applications used can be integrated into the network in conjunction with Cisco MSE and Cisco Context-Aware software.
- Configuration templates—Policy management and configuration templates support easy creation and enforcement of policies across the entire enterprise.
- Secure guest access—Organizations can provide wireless access to guests such as customers, vendors, and partners, while keeping their wireless network secure.
- Centralized security—Streamlined administration and monitoring of the WLAN's security status for all security-related events and network conditions is provided from a single, comprehensive view.
- Adaptive wireless Intrusion Prevention System (wIPS)—Adaptive wIPS is supported to deliver comprehensive wireless threat detection, mitigation, and prevention.
- Voice over Wireless LAN—A variety of advanced tools are included to plan, deploy, monitor, and optimize the WLAN for voice over wireless LAN (VoWLAN).
- Simplified software upgrades—One-click software upgrade simplifies the process for upgrading to the latest software release.
- Easy conversion of CiscoWorks Wireless LAN Solution Engine (WLSE)—Converting an existing CiscoWorks WLSE (models 1130-19 and 1133) to operate as a Cisco WCS is supported to reduce capital expenditures and improve operational efficiency.

### Specifications

#### Operating Systems (Customer Supplied Server)
- Windows 2003 SP1 or greater
- Redhat Linux AS/ES v5.0 (Releases 4.2.x or 5.0 or later), Redhat Linux AS/ES v4.0 (Release 4.2 and later)
- VMware ESX Server 3.01 or later (Minimum hardware requirements for a dedicated and guaranteed VMware server: Intel® Xeon Quad CPU, 315 GHz, 8 GB RAM, 200 GB HDD)

#### Minimum Server Requirements
- Cisco WCS High-End Server: 3000 lightweight access points, 1250 standalone access points, 750 wireless LAN controllers, Two Intel® Dual Core CPU; 3.0 GHz, 8 GB RAM, 200 GB HDD
- Cisco WCS Standard Server: 2000 lightweight access points, 1000 standalone access points, 450 wireless LAN controllers, Intel® Dual Core CPU; 3.2 GHz, 4 GB RAM, 80 GB HDD
- Cisco WCS Low-End Server: 500 lightweight access points, 200 standalone access points, 125 wireless LAN controllers, Intel® CPU, 3.06 GHz, 2 GB RAM, 30 GB HDD
- CiscoWorks WLSE Models 1130-19 or 1133 running Cisco WCS: 1500 lightweight access points, 161 wireless LAN controllers, Intel Pentium 4 CPU; 3 GHz, 3 GB RAM, 38 GB HDD

#### Minimum Client Requirements
- Internet Explorer 6.0/SP1 or later

#### Management
- SNMP v1, v2c, v3 and TACACS+

#### Managed Devices
- Monitoring and migration of selected Cisco Aironet standalone (autonomous) access points.
- Monitoring of the standalone access points of Cisco 800, 1800, 2800, and 3800 Series Integrated Services Routers

#### Database
- Integrated Solid Flow Engine SQL

### Selected Part Numbers and Ordering Information

**WCS-STANDARD-K9** Cisco WCS Base and Plus licenses for new and expanded Cisco WCS deployments. Supports deployment of Cisco WCS on a single server. Cisco WCS Plus license also supports mobility services enablement, high availability, and location services for one device or tag on demand.

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3-30  Cisco Wireless Control System
For More Information

Cisco Wireless Control System Navigator

The Cisco Wireless Control System (WCS) Navigator delivers an aggregated platform for enhanced scalability, manageability, and visibility of large-scale implementations of the Cisco Unified Wireless Network. This solution gives network administrators cost-effective, easy access to information from multiple, geographically dispersed Cisco WCS management platforms.

The navigator supports partitioning of the unified wireless network at the management plane. It runs on a server platform with an embedded database.

Ideal for Companies that Need These Features

- Ability to manage up to 20 geographically dispersed Cisco WCS management platforms with up to 30,000 Cisco Aironet lightweight access points from a single management console
- Ability to partition the unified wireless network at the management plane

---

<table>
<thead>
<tr>
<th>License Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>WCS-APBASE-50, 100, 500</td>
<td>Cisco WCS Base License, Windows/Linux (supports 50, 100, and 500 APs)</td>
</tr>
<tr>
<td>WCS-PLUS-50, 100, 500</td>
<td>Cisco WCS with Plus license for mobility services enablement and high availability, Windows/Linux (supports 50, 100, and 500 APs)</td>
</tr>
<tr>
<td>WCS-WLSE-UPG-K9</td>
<td>Converting Existing CiscoWorks WLSE to Cisco WCS (Only supported on Linux platform for CiscoWorks WLSE Models 1130-19 and 1133)</td>
</tr>
<tr>
<td>WCS-WLSE-APB-50, 100, 500</td>
<td>Cisco WCS Base License for WLSE conversion, Linux (supports 50, 100, 500, and 1000 APs)</td>
</tr>
<tr>
<td>WCS-WLSE-PLUS-50, 100, 500</td>
<td>Cisco WCS Plus license with mobility services enablement and high availability for WLSE conversion, Linux (supports 50, 100, 500, and 1000 APs)</td>
</tr>
<tr>
<td>WCS-PLUS-UPG-K9</td>
<td>Upgrading Cisco WCS Base to Cisco WCS Plus. Supports deployment of Cisco WCS on a single server. Supports upgrading aCisco WCS base license to support mobility services enablement, high availability, and location services for one device or tag on demand.</td>
</tr>
<tr>
<td>WCS-PLUS-UPG-50, 100, 500</td>
<td>Cisco WCS Plus Upgrade license with mobility services enablement and high availability, Windows/Linux (supports 50, 100, and 500 APs)</td>
</tr>
<tr>
<td>WCS-ENT-PLUS-K9</td>
<td>Cisco WCS Enterprise Plus license with mobility services enablement and high availability, Windows/Linux on multiple Cisco WCS servers (supports 1000, 2500, 10000, and 50000 APs)</td>
</tr>
<tr>
<td>AIR-WCS-DEMO-K9</td>
<td>Cisco WCS Demonstration License (This license is only available from <a href="http://www.cisco.com/go/license">http://www.cisco.com/go/license</a>. After requesting the license, go to Cisco Wireless Software Center [login required] to download Cisco WCS software.)</td>
</tr>
<tr>
<td>AIR-WCS-DEMO-K9</td>
<td>Free Cisco WCS full featured, location-enabled, 30 day demonstration license supporting ten lightweight access points</td>
</tr>
<tr>
<td>WCS-STDARD-K9</td>
<td>Cisco WCS Base and Location licenses for new and expanded Cisco WCS deployments. Supports deployment of Cisco WCS on a single server. Includes location services to support tracking of a single Wi-Fi device on demand or expanded location capabilities by adding a Cisco Wireless Location Appliance. Cisco WCS Location must be installed to support deployment of a Cisco Wireless Location Appliance.</td>
</tr>
<tr>
<td>WCS-APLOC-50, 100, 500</td>
<td>Cisco WCS with Location License, Windows/Linux (supports 50, 100, and 500 APs)</td>
</tr>
<tr>
<td>WCS-WLSE-UPG-K9</td>
<td>Converting Existing CiscoWorks WLSE to Cisco WCS (Only supported on Linux platform for CiscoWorks WLSE Models 1130-19 and 1133)</td>
</tr>
<tr>
<td>WCS-WLSE-APL-50, 100, 500, 1000, 2500, 10000, 50000</td>
<td>Cisco WCS Location License for WLSE conversion, Linux (supports 50, 100, 500, 1000, and 2500 APs)</td>
</tr>
<tr>
<td>WCS-LOC-UPG-K9</td>
<td>Upgrading Existing Cisco WCS Base to Cisco WCS Location. Supports tracking a single Wi-Fi device on demand or expanded location capabilities by adding a Cisco Wireless Location Appliance. Cisco WCS Location must be selected to support deployment of a Cisco Wireless Location Appliance.</td>
</tr>
<tr>
<td>WCS-APLOC-UPG-50, 100, 500</td>
<td>Cisco WCS Location Upgrade License, Windows/Linux (supports 50, 100, and 500 APs)</td>
</tr>
<tr>
<td>WCS-ENT-K9</td>
<td>Enterprise licenses for large-scale deployments. Supports expanded location capabilities by adding a Cisco Wireless Location Appliance. Enterprises licenses of 10000 and 50000 include a Cisco WCS Navigator license (WCS-NAV-20).</td>
</tr>
<tr>
<td>WCS-ENT-100000, 25000, 100000, 50000</td>
<td>Cisco WCS Enterprise License with Location, Windows/Linux on Multiple Cisco WCS Servers (supports 1000, 2500, 10000, and 50000 APs)</td>
</tr>
</tbody>
</table>
• Ability to conduct centralized and quick searches across the entire network, multiple Cisco WCS management platforms, and all devices
• Ability to partition Cisco WCS platforms to restrict selected users to a single Cisco WCS platform or group of Cisco WCS platforms to support access control based on a variety of criteria, including geography, departments, and managed services customers

Key Features
• Intuitive GUI—Easy configuration and monitoring of multiple Cisco WCS management platforms with minimal training is supported.
• Monitoring—Real-time network monitoring is fully supported.
• Network summary screen—Outstanding alarms, fault summaries, client counts, and status counts of all connected Cisco WCS management platforms and devices are displayed on a network summary screen.
• Secure single sign-on—With a secure single sign-on feature, individual users do not need to be created on each Cisco WCS management platform.
• Automated browser redirect—Users are automatically redirected to the corresponding Cisco WCS management platform detail page on searches or displays.
• Searches—Centralized and quick searches across the entire network, multiple Cisco WCS management platforms, and all devices are easy to perform.
• Tracking—Client locations and Wi-Fi and rogue devices are easily tracked across the entire network.
• Centralized management—Indoor and outdoor WLANs can be monitored from a single management console.
• Reports—Detailed inventory reports can be automatically generated, scheduled and exported by e-mail message or CSV file.

Specifications

<table>
<thead>
<tr>
<th>Features</th>
<th>Cisco Wireless Control System Navigator</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimum server requirements</td>
<td>Windows 2003 SP1 or greater, or Redhat Linux AS/ES v4.0</td>
</tr>
<tr>
<td></td>
<td>High-End Server: Intel® Xeon Quad CPU, 3.15 GHz, 8-GB RAM, and 200-GB HDD</td>
</tr>
<tr>
<td>Minimum client requirements</td>
<td>Internet Explorer 6.0 with SP1 or later</td>
</tr>
<tr>
<td>Software release requirements</td>
<td>Cisco WCS management platforms must be running Cisco Unified Wireless Network Software Release 4.1 or later to interface with Cisco WCS Navigator</td>
</tr>
<tr>
<td>Management</td>
<td>SNMP v1, v2c, and v3</td>
</tr>
<tr>
<td>Managed devices</td>
<td>Up to 20 Cisco WCS management platforms with manageability of up to 30,000 Cisco Aironet lightweight access points</td>
</tr>
<tr>
<td>Database</td>
<td>Integrated Solid FlowEngine Structured Query Language (SQL)</td>
</tr>
<tr>
<td>WCS-NAV-20</td>
<td>Cisco WCS Navigator License to support 20 Cisco WCS management platforms</td>
</tr>
</tbody>
</table>

For More Information
For more information about Cisco Wireless Control System Navigator, visit:

Cisco Spectrum Expert Wi-Fi
The Cisco Spectrum Expert Wi-Fi integrates with the Cisco Unified Wireless Network to deliver real-time spectrum intelligence for Wi-Fi networks. This industry-leading solution detects, classifies, and locates sources of RF interference in the unlicensed 2.4- and 5-GHz bands. The Cisco Wireless Control System (WCS) works in conjunction with Cisco Spectrum Expert Wi-Fi to provide visibility into non-Wi-Fi interference sources that may cause wireless performance degradation. You can determine the source of the interference with Cisco Spectrum Expert Wi-Fi, allowing your business to remove, move, shield, adjust, or replace the interference source. Your organization can troubleshoot its wireless networks to determine the root causes of interference problems and optimize network performance.

Ideal for Companies that Need These Features
• Troubleshoot interference causing performance loss or connection drops
• Locate specific devices that are causing interference, by name and by type
• Ensure access points are providing reliable coverage with spectrum performance audits
• Secure a network by locating non-Wi-Fi rogue devices
• See hacked or rogue Wi-Fi devices that other intrusion detection systems/intrusion protection systems (IDSs/IPs) do not detect
• Locate unauthorized devices such as Bluetooth radios and video cameras
• Determine if neighbors are interfering with the Wi-Fi network

Key Features
The Cisco Spectrum analysis tool monitors the airwaves in your wireless network and allows you to:
Chapter 3

Cisco Spectrum Expert Wi-Fi Specifications

• Quickly and accurately determine Wi-Fi spectrum health and sources of interference
• Manage channel capacity and quality at the physical layer
• Quickly eliminate interference sources

Specifications

Cisco Spectrum Expert Wi-Fi Specifications

Dimensions

Unit sizes: CardBus Type II and Express Card 54 mm; Unit weight: 1 lb. Operating temperature: 32 to 131°F; Storage temperature: -4 to 149°F.

Analyzer Specification

Displayed average noise level: -94 dBm; Reference level -150 (min) to +10 (max); 5.12 MHz capture limit; Frequency stability: +/-0.02 ppm; Max safe input level: 0 dBm; Amplitude accuracy: +/-2.5 dBm; Public safety: 4.9 GHz; Frequency span at 2.4 GHz: 0.03 (min) to 100 (max) MHz; Frequency span at 5 GHz: 0.03 (min) to 975 (max) MHz; Center frequency resolution: 10 kHz; Resolution bandwidth: 0.01 (min) to 9 (max) MHz; Sweep time RTFFT mode: 6.4 us; Sweep time PoT mode: 10 ms (max); Trigger delay: -10 (min) to +10 (max); Power consumption: 3.3V @ 425 mA or 1.4 watts.

Classifier Specification

802.11a/b/g/v/ea/n/ha on board or external Wi-Fi chipset; Bluetooth SIG ACL; DECT cordless phones; TDD cordless phones; Analog cordless phones; Analog video (NTSC, PAL, SECAM); Microwave ovens; Generic classifiers; Radar.

Application Specifications

Minimum system requirements

Microsoft Vista or Windows XP SP2; Processor: 1 GHz or equivalent; 150 MB hard drive available storage space; 800 x 600 display.

Interoperability

Cisco WCS 4.2 Later.

Cisco Spectrum Expert Antenna Specifications

Frequency Range

2.4-2.5 GHz, 4.9-5.9 GHz.

Gain

5 dBi.

Polarization

Linear.

Selected Part Numbers and Ordering Information

Cisco Spectrum Expert Antenna Spare

AIR-ANT-SE-WIFI-D= 2.4-2.5 and 4.9-5.9 GHz Directional Antenna, Spare—Spare Directional antenna for Cisco Spectrum Expert Wi-Fi.

AIR-ANT-SE-WIFI-O= 2.4-2.5 and 4.9-5.9 GHz Omni Antenna, Spare—Spare Omni antenna for Cisco Spectrum Expert Wi-Fi.

WCS-ADV-K9 Family SKU for WCS Advance License Products—Top-level SKU for Cisco WCS advance feature licenses.

WCS-ADV-SI-SE-10 Cisco WCS Spectrum Intelligence License for 10 Sensors—License option compatible with Cisco WCS 4.2 or later configured with Base and/or Location license.

WCS-ADV-SI-SE-10= Cisco WCS Spectrum Intelligence License for 10 Sensors, Spare—Spare license compatible with Cisco WCS 4.2 or later configured with Base and/or Location license.

Cisco Spectrum Expert Wi-Fi Product and Service

AIR-CSI-SE-WIFI- C= Cisco Spectrum Expert Wi-Fi (CardBus)—Includes CardBus adapter, Omni antenna with clip, and quick start guide with software download instructions. A single Cisco Spectrum Expert Software seat can only be used with one Cisco Spectrum Expert Sensor Wi-Fi.

CON-SNT-SE-WIFI-1B Cisco Spectrum Expert Wi-Fi (CardBus)—SMART next business day service.

1. Includes advanced replacements next business day, 24-hour Cisco Technical Assistance Center (TAC) access, and software downloads.

A Cisco WCS Spectrum Intelligence license is required to operate Cisco Spectrum Expert Wi-Fi with Cisco WCS. The following table provides the part numbers for the Cisco WCS Spectrum Intelligence license for Cisco Spectrum Expert Wi-Fi.

WCS-ADV-SI-SE-10 Cisco WCS Spectrum Intelligence License for 10 Sensors—License option compatible with Cisco WCS 4.2 or later configured with Base and/or Location license.

License Pack Guidelines

Customers can purchase the Cisco Spectrum Intelligence license for Cisco Spectrum Expert Wi-Fi in two ways. Customers who wish to purchase all WCS advanced feature licenses, including the Cisco Spectrum Intelligence license, for use on a single WCS host should purchase the Cisco WCS advanced feature pack (WCS-ADV-K9) and then specify the option for the Cisco Spectrum Intelligence license (WCS-ADV-SI-SE-10). Customers who wish to purchase licenses that can be used across multiple WCS hosts should purchase Cisco Spectrum Intelligence license spares (WCS-ADV-SI-SE-10=).

• WCS-ADV-K9—The Cisco WCS advanced feature license pack includes license keys for advanced features, including Cisco Spectrum Intelligence. The license pack may only be used on a single WCS host.
• WCS-ADV-SI-SE-10—This part number represents the option for the Cisco Spectrum Intelligence advanced feature as part of the Cisco WCS advanced feature license pack (WCS-ADV-K9). Customers must specify this part number when ordering Cisco Spectrum Intelligence as part of the combined WCS advanced feature license pack.
• WCS-ADV-SI-SE-10=—Users who wish to purchase multiple licenses to be deployed across numerous WCS hosts should purchase the Cisco Spectrum Intelligence license as a spare unit (WCS-ADV-SI-SE-10=). If a customer orders more than one
Cisco customers can contact their local Cisco representatives for questions related to Cisco WCS licensing. Cisco employees or partners can contact wcs-customer-license@cisco.com.

For More Information

CiscoWorks Wireless LAN Solution Engine (WLSE) and CiscoWorks Wireless LAN Solution Engine Express
CiscoWorks Wireless LAN Solution Engine (WLSE) is a centralized network management solution for managing standalone access points in the Cisco wireless LAN infrastructure. CiscoWorks WLSE Express is an integrated security and management solution for managing Cisco Aironet standalone access points located in one or multiple locations.

Ideal for Companies that Need These Features

- Template-based configuration and management of Cisco Aironet standalone access points and wireless bridges
- Simplified deployment and reduced operational complexity for standalone access points and wireless bridges
- Remote branch-office deployments with limited WAN bandwidth, and an integrated and embedded user authentication and authorization server [CiscoWorks WLSE Express]

Key Features

- CiscoWorks WLSE is a management component for Cisco Aironet standalone (autonomous) access points and wireless bridges.
- Simplified deployment—Device (access point or bridge)-specific settings such as host name, radio power, and channel can be imported into CiscoWorks WLSE and WLSE Express through a comma-separated value (CSV) file, with unique Ethernet MAC address mapping that supports automatic application of device-specific settings without touching each access point.
- Enhancements to the Site Survey wizard—Specific RF settings such as channel and power can be applied to devices based on a schedule.
- Friendly to rogue reclassification—You can periodically monitor for changes in the status of rogue access points that are marked “friendly” to alert the administrator in case location or received signal strength indicator (RSSI) values change.
- Authentication—CiscoWorks WLSE supports popular Extensible Authentication Protocol (EAP) types, including Cisco LEAP, Protected EAP (PEAP), EAP-Flexible Authentication via Secure Tunneling (EAP-FAST), and EAP-Transport Layer Security (EAP-TLS).
- CiscoWorks WLSE Express—The standard version supports up to 500 users and 50 Cisco Aironet access points.
- CiscoWorks WLSE Express—The license-upgraded version supports up to 1000 users and 100 Cisco Aironet access points.
- CiscoWorks WLSE manages up to 2500 Cisco Aironet access points operating autonomously for network management and up to 1800 access points when RF management is turned on.

Selected Part Numbers and Ordering Information

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CWWLSE-1133-19-K9</td>
<td>CiscoWorks WLSE 2.15; includes the Cisco 1133 hardware platform and wireless LAN management software version 2.15</td>
</tr>
<tr>
<td>CWWLSE-215-5WUP-K9</td>
<td>Software only upgrade kit for customers with CiscoWorks 1133 running CiscoWorks WLSE 2.x to 2.15</td>
</tr>
<tr>
<td>CWWLSE-1030-K9</td>
<td>CiscoWorks WLSE Express 2.15 includes the CiscoWorks 1030 hardware platform and CiscoWorks WLSE Express Release 2.15</td>
</tr>
<tr>
<td>CWWLSE-215-5LCUK9</td>
<td>CiscoWorks WLSE Express 2.15 license upgrade option from 50 Cisco Aironet access points with a maximum of 500 users upgraded to 100 Cisco Aironet access points with a maximum of 1000 users.</td>
</tr>
</tbody>
</table>

For More Information
For more information about the CiscoWorks WLSE, visit: http://www.cisco.com/go/wlse.

Cisco 3300 Series Mobility Services Engine
The Cisco 3300 Series Mobility Services Engine is an open platform that provides a new approach for the delivery of mobility services to enable mobile business applications. A combination of hardware and software, the mobility services engine is an appliance-based solution that supports a suite of software services to provide centralized and scalable service delivery. It transforms the wireless LAN (WLAN) into a mobility network by abstracting the application layer from the network layer, effectively allowing for the delivery of mobile applications across different types of networks, including Wi-Fi, Ethernet, cellular, WiMAX, and RFID.
To deliver true business mobility, IT must take a practical approach focused on unifying networks, managing the wave of mobile devices, and enabling mobile application development. The Cisco 3300 Series Mobility Services Engine is at the heart of this mobility architecture evolution. It provides an open application programming interface (API) that allows a broader ecosystem of partners to access network intelligence to develop industry-relevant mobility solutions. An extension of the Cisco Unified Wireless Network, the mobility services engine integrates with Cisco Unified Communications and Cisco compatible devices to deliver a comprehensive approach to business mobility, an approach that extends applications to the right device at the right time, no matter which network is being used.

**Ideal for Companies that Need These Features**
- Platform for rapid delivery of services and applications
- Unification of multiple access networks to help ensure more transparent application delivery
- Scalability, manageability, and flexibility for service delivery
- Investment protection of the existing Cisco Unified Wireless Network

**Key Features**
- Extensible platform for rapid delivery of services and applications—This platform allows the abstraction of services and applications from the control and data planes so that each may evolve independently. The solution offers a common framework for hosting multiple mobility services; An open application programming interface (API) supports third-party and partner application development.
- Ecosystem of application partners—This ecosystem delivers mobility solutions targeted at various industries, including healthcare, retail, education, and manufacturing.
- Scalability—Multiple services can be deployed on a single Cisco 3300 Series Mobility Services Engine or a single service can span multiple mobility services engines.
- Manageability—The Cisco 3300 Series Mobility Services Engine serves as a single point of integration for the various value-added services; All mobility services are managed centrally through integration with the Cisco Wireless Control System.
- Flexibility—The Cisco 3300 Series Mobility Services Engine is an extensible platform capable of supporting a variety of services configurations to meet business requirements. The architecture facilitates the inclusion of newer technology standards as and when they become available.
- Return on investment—The Cisco 3300 Series Mobility Services Engine integrates with the Cisco Unified Wireless Network to provide network intelligence, including contextual information to optimize business applications. This architecture builds upon the existing investment in Cisco wireless and mobility solutions and provides a platform that is both flexible and scalable to meet evolving business mobility requirements.

**Specifications**

<table>
<thead>
<tr>
<th></th>
<th>Cisco 3310 Mobility Services Engine</th>
<th>Cisco 3350 Mobility Services Engine</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Supported Services</strong></td>
<td>Context-aware software to track up to 2000 Wi-Fi Clients or Wi-Fi Tags</td>
<td>Context-aware software to track up to 18,000 Wi-Fi Clients or Wi-Fi Tags</td>
</tr>
<tr>
<td></td>
<td>Adaptive Wireless Intrusion Prevention System software to support up to 2000 monitor mode access points</td>
<td>MIR software for up to 2000 simultaneous registered devices</td>
</tr>
<tr>
<td></td>
<td>Mobile Intelligent Roaming (MIR) software for up to 500 simultaneous registered devices</td>
<td></td>
</tr>
<tr>
<td><strong>Processor</strong></td>
<td>(1) Dual-Core Intel Processor 1.8 GHz</td>
<td>(2) Quad-Core Intel Xeon Processors 2.33 GHz</td>
</tr>
<tr>
<td><strong>Memory</strong></td>
<td>4-GB PC2-5300 (4 x 1 GB)</td>
<td>8-GB PC2-5300 (4 x 2 GB)</td>
</tr>
<tr>
<td><strong>Hard Disk</strong></td>
<td>(2) Fixed 247-GB Serial ATA/SAATA-150/SATA-300 MBps drives</td>
<td>(2) Hot-swappable 137-GB SAS-300 MBps drives</td>
</tr>
<tr>
<td><strong>Removable Media</strong></td>
<td>DVD/CD-RW combo drive</td>
<td>DVD/CD-RW combo drive</td>
</tr>
<tr>
<td><strong>Ports</strong></td>
<td>Serial: One 9-pin connector</td>
<td>Serial: One 9-pin connector</td>
</tr>
<tr>
<td></td>
<td>RJ-45: Two RJ-45 connectors for connection to two Gigabit Network Adapters</td>
<td>RJ-45: Two RJ-45 connectors for connection to two Gigabit Network Adapters</td>
</tr>
<tr>
<td></td>
<td>2 USB 2.0 ports: (1) front, and (2) rear accessible ports</td>
<td>4 USB 2.0 ports: (1) front, (1) internal, and (2) rear accessible ports</td>
</tr>
<tr>
<td></td>
<td>2 PS/2 ports: One mouse and one keyboard</td>
<td>2 PS/2 ports: One mouse and one keyboard</td>
</tr>
<tr>
<td></td>
<td>1 VGA port</td>
<td>1 VGA port</td>
</tr>
<tr>
<td><strong>Connectivity</strong></td>
<td>Network: Two embedded Multifunction Gigabit Network Adapters</td>
<td>Network: Two embedded Multifunction Gigabit Network Adapters with TCP/IP Offload Engine</td>
</tr>
<tr>
<td><strong>Management</strong></td>
<td>SNMP v1, v2c, and v3</td>
<td>SNMP v1, v2c, and v3</td>
</tr>
<tr>
<td><strong>Management Interface</strong></td>
<td>Cisco WCS Mobility Services v5.2 or greater running Internet Explorer 6.0/Service Pack 1 or later</td>
<td>Cisco WCS Mobility Services v3.2 or greater running Internet Explorer 6.0/Service Pack 1 or later</td>
</tr>
</tbody>
</table>
The Cisco Context-Aware Mobility Solution provides the ability to capture and integrate into business processes detailed contextual information about parameters such as location, temperature, and the availability of an asset. The integration of contextual information with business-process applications is fast becoming the next level of true enterprise mobility. With the Cisco Context-Aware Mobility Solution, mobile users can go beyond any time, anywhere connectivity to automatically having the right device, the right application, and the right environment while on the go. They can now answer business-critical questions about both mobile assets and the users of those assets, to improve their organization's profitability.

Ideal for Companies that Need These Features

- Advanced and scalable context-aware mobility service that simultaneously tracks thousands of Wi-Fi clients and Wi-Fi tags
- Context-aware information integrated into business processes (The Cisco Context-Aware Software supports integration with customizable business applications through tight and transparent integration with the open application programming interface (API)).
- Context-aware services are available in indoor high-ceiling indoor, and outdoor environments.
Integrated context-aware services using existing Cisco Unified wireless-enabled infrastructure, to minimize capital expenditures and help ensure better wireless LAN (WLAN) visibility

**Key Features**

- Scalability—Cisco Context-Aware Software can track up to 18,000 assets simultaneously, including Wi-Fi clients and assets with Wi-Fi tags.
- Multiple context-aware engines—The modular design of the software allows for the use of the context-aware engine for clients and the context-aware engine for tags simultaneously or separately for the estimation of location.
- Multiple location technologies—Clients and tags can be tracked in indoor, indoor high-ceiling, and outdoor environments. Tracking is done using the Received Strength Signal Indicator (RSSI)-based RF fingerprinting technology for indoor environments and Time Difference of Arrival (TDOA) technology for outdoor and high-ceiling environments. The Cisco Context-Aware Mobility Service Module also supports the use of chokepoints for applications requiring high fidelity and deterministic context-aware information.
- Open platform for business applications—To facilitate the deployment of context-aware based applications in the enterprise, the context-aware mobility software allows for the integration of business applications through a rich and open Simple Object Access Protocol (SOAP)- or Extensible Markup Language (XML)-based application programming interface (API).
- Alerts and notifications—Alerts and notifications can be customized by the user based on business policy requirements.
- Deployment planning optimization—The process of planning and deployment of data, voice, and context-aware services is made simpler by the identification of coverage holes for the particular deployment scenario.
- Enhanced security—Detection of rogue access points and devices is made simpler by providing the location of these devices.
- Information-exchange configuration—Information-exchange configuration allows for control of which layer of information gets forwarded from the Cisco Unified Network controller to the Cisco Context-Aware Mobility Service Module. This control helps reduce the amount of contextual information gathered and transmitted across the network.
- Historical data—Historical data on the elements being tracked is collected and stored. This information can be used for drawing up trends and troubleshooting, among other uses.
- Scalable license management—The license management of the Cisco Context-Aware Software allows for flexibility in the type and quantity of licenses purchased to match the various scenarios. The licenses are additive (up to 18,000 assets tracked) and thus provide for growth of the system.

**Specifications**

<table>
<thead>
<tr>
<th>Features</th>
<th>Cisco Context-Aware Software</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hardware requirements</td>
<td>Cisco Mobility Services Engine 3350 or Cisco Mobility Services Engine 3310</td>
</tr>
<tr>
<td>Network Management</td>
<td>Cisco WCS v.5.1 or greater running Internet Explorer 6.0/Service Pack 1 or later</td>
</tr>
<tr>
<td>Programming Interfaces</td>
<td>SOAP/XML APIs</td>
</tr>
<tr>
<td>Database</td>
<td>Integrated Solid Flow Engine Structured Query Language (SQL)</td>
</tr>
</tbody>
</table>

**Selected Part Numbers and Ordering Information**

- AIR-CAS-1KC-K9: Context-Aware Engine for Clients License for 1K Clients
- AIR-CAS-3KC-K9: Context-Aware Engine for Clients License for 3K Clients
- AIR-CAS-6KC-K9: Context-Aware Engine for Clients License for 6K Clients
- AIR-CAS-12KC-K9: Context-Aware Engine for Clients License for 12K Clients
- AIR-CAS-1KT-K9: Context-Aware Engine for Tags License for 1K Tags
- AIR-CAS-3KT-K9: Context-Aware Engine for Tags License for 3K Tags
- AIR-CAS-6KT-K9: Context-Aware Engine for Tags License for 6K Tags
- AIR-CAS-12KT-K9: Context-Aware Engine for Tags License for 12K Tags
- AIR-MSE-3310-K9: Cisco 3310 Mobility Services Engine
- AIR-MSE-3350-K9: Cisco 3350 Mobility Services Engine

**For More Information**


**Cisco Adaptive Wireless Intrusion Prevention System (IPS)**

The Cisco Adaptive Wireless IPS solution protects against attacks and proactively prevents threats. It scales to meet the robust demands of even the largest networks, and delivers visibility and control across the network without the need for additional scanning equipment.
Ideal for Companies that Need These Features

- A system to mitigate unauthorized wireless access and attacks against the wireless network and rogue access points
- A system to assist with regulatory compliance, particularly Payment Card Industry (PCI) compliance
- Integration with Cisco wired security infrastructure
- Investment protection of existing Cisco Unified Wireless Network

Key Features

- Detects, analyzes, and mitigates RF-based attacks using signature- and network-based methods for protection against known and unknown wireless threats
- Integrates into the Cisco Unified Wireless Network infrastructure using the same access points and wireless LAN controllers for simplified administration and lower capital expenditures and total cost of ownership
- Offers advanced reporting for increased regulatory compliance and forensic analysis
- Provides increased visibility and ease of administration through wired and wireless network security integration
- Uses the Cisco 3300 Series Mobility Services Engine for performance and centralized processing of wireless network threat analysis

Specifications

<table>
<thead>
<tr>
<th>Features</th>
<th>Cisco Adaptive Wireless IPS Software</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hardware requirements</td>
<td>Cisco Mobility Services Engine 3310</td>
</tr>
<tr>
<td>No of Supported Monitor Mode APs</td>
<td>2000 per Mobility Services Engine Appliance</td>
</tr>
<tr>
<td>Management Interface</td>
<td>Cisco Wireless Control System version 5.2 or later</td>
</tr>
</tbody>
</table>

Selected Part Numbers and Ordering Information

- AIR-WIPS-AP-25, 100, 500 License for Access Points (supports 25, 100, and 500 APs)
- AIR-WIPS-AP-UNL License for unlimited Access Points
- AIR-MSE-3310-K9 Cisco 3310 Mobility Services Engine

For More Information


Cisco Mobile Intelligent Roaming Software

The Cisco Mobile Intelligent Roaming (MIR) software offers transparent, enterprise-quality handoff of mobile communications when users roam between cellular and Wi-Fi networks using dual-mode devices. It resides on the Cisco 3300 Series Mobility Services Engine, which provides integration with existing networks and Unified Communications applications, and an open API allows for integration of third-party devices and ecosystems with the Cisco Unified Wireless Network. The software sends network-assisted notification triggers to the roaming client or a third-party mobile gateway, which interoperates with the enterprise private branch exchange (PBX) to initiate the client roaming. Users no longer need to manually hand off calls as they move from the Wi-Fi network to the cellular network and conversely, resulting in improved end-user productivity and satisfaction, reduced costs, and more flexible deployment options.

Ideal for Companies that Need These Features

- Optimized end-user voice experience across multiple wireless networks
- Enhanced end-user productivity offering session continuity while roaming from the Wi-Fi network to the cellular network
- Reduced costs using least-cost routing for business communications
- Mobile intelligent roaming integrated into the existing Unified Communications infrastructure
- Integrated mobile intelligent services using existing Cisco Unified Wireless-enabled infrastructure, to minimize capital expenditures and help ensure a predictable and reliable handoff based on network intelligence

Key Features

- Scalability—Cisco Mobile Intelligent Roaming software can scale to support 100 to 500 clients to roam between the cellular and the Wi-Fi network. Licenses are additive and provide for system growth. The pay-as-you-grow model allows enterprises to manage system scalability, growth, and investment.
- Intelligent voice call roaming notification—Real-time network intelligence (received signal strength indication [RSSI] and client location) generates network-assisted triggers to initiate the call handoff by the client software or the mobile gateway client, providing a more predictable and reliable enterprise handoff.
- Open solution architecture—An open client API allows a broad ecosystem of device manufacturers and third-party gateway partners to access the network-initiated triggers to provide a transparent handoff across a wide range of IP PBX solutions and mobile devices.
Chapter 3

• Integration with Cisco Unified Communications Manager—This integration enhances end-user productivity and satisfaction by extending advanced Unified Communications features and business continuity across multiple networks.

• Tracking optimization monitor mode access point—This access point determines the handoff requirements when the dual-mode device reaches the end of the wireless network, to ensure a more predictable and reliable handoff.

• Voice deployment planning optimization tools—The voice audit and voice readiness tools simplify the planning and deployment of a pervasive voice-ready wireless network.

Specifications

<table>
<thead>
<tr>
<th>Feature</th>
<th>Cisco Mobile Intelligent Roaming Software</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hardware requirements</td>
<td>Cisco Mobility Services Engine 3310</td>
</tr>
<tr>
<td>Network Management</td>
<td>Cisco WCS v5.2 or greater running Internet Explorer 6.0/Service Pack 1 or later</td>
</tr>
<tr>
<td>Programming Interfaces</td>
<td>SOAP/XML APIs</td>
</tr>
<tr>
<td>Database</td>
<td>Integrated Solid Flow Engine Structured Query Language (SQL)</td>
</tr>
</tbody>
</table>

Selected Part Numbers and Ordering Information

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>AIR-EML-100-1-K9</td>
<td>Enterprise Mobile Connection License—100 clients</td>
</tr>
<tr>
<td>AIR-EML-200-1-K9</td>
<td>Enterprise Mobile Connection License—200 clients</td>
</tr>
<tr>
<td>AIR-EML-500-1-K9</td>
<td>Enterprise Mobile Connection License—500 clients</td>
</tr>
</tbody>
</table>

For More Information

For more information about Cisco Intelligent Roaming software, visit: http://www.cisco.com/go/wireless.

Cisco 521 Wireless Express Access Point

The Cisco 521 Wireless Express Access Point is a single-band 802.11g access point that features business-class management, security, and scalability. It offers high-performance wireless connectivity in offices and similar environments in small and medium-sized businesses. Cisco 521 Wireless Express Access Points can operate in standalone mode or controller-based mode with the Cisco 500 Series Wireless Express Mobility Controller to accommodate a diverse range of deployment and business mobility requirements.

Ideal for Companies that Need These Features
• An affordable, entry-level wireless solution through standalone access points
• Compliance with the latest Wi-Fi standards
• Investment protection: Standalone access points can be upgraded to a controller-based solution at a later date.
• Transparent integration with the Cisco Smart Business Communications System

Key Features
• An IEEE 802.11g radio provides 54-Mbps capacity and backward compatibility with older 802.11b clients.
• The industry-leading radio design provides robust signals over long distances and mitigates the effects of multipath signal propagation for more consistent coverage.
• Variable transmit power settings allow tuning of access-point coverage to accommodate various requirements; a low-dBm setting supports closer spacing of access points in high-density deployments.
• Integrated antennas allow quick deployment of the complete system without external antennas; the antennas provide omnidirectional coverage for offices and similar RF environments.
• The Cisco 512 Wireless Express Access Point complies with IEEE 802.11i security standards and is Wi-Fi Protected Access (WPA) and WPA2 certified. It facilitates hardware-assisted Advanced Encryption Standard (AES) encryption to provide high security without performance degradation.
• The access point is orderable as a standalone access point or as a controller-based access point.
• The Cisco 521 Wireless Express Access Point is Wi-Fi certified.

Specifications

<table>
<thead>
<tr>
<th>Feature</th>
<th>Cisco 521 Wireless Express Access Point</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data Rates Supported</td>
<td>802.11g, 1, 2, 5.5, 6, 9, 11, 12, 18, 24, 36, 48, and 54 Mbps</td>
</tr>
<tr>
<td>Network Standard</td>
<td>IEEE 802.11b and 802.11g</td>
</tr>
<tr>
<td>Uplink</td>
<td>Autosensing 802.3 10/100BASE-T Ethernet</td>
</tr>
</tbody>
</table>
### Frequency Band and Operating

- **Americas (FCC):** 2.412 to 2.462 GHz; 11 channels
- **Europe (ETSI):** 2.412 to 2.472 GHz; 13 channels
- **Japan-P (TELEC 2 [Japan2]), Cnfg:** 2.412 to 2.464 GHz; 13 channels

### Nonoverlapping Channels

- 802.11bg, Up to 3

### Receive Sensitivity (Typical)

- 802.11g—1 Mbps: –93 dBm; 2 Mbps: –91 dBm; 5.5 Mbps: –88 dBm; 6 Mbps: –86 dBm; 9 Mbps: –85 dBm; 11 Mbps: –85 dBm; 12 Mbps: –84 dBm; 18 Mbps: –83 dBm; 24 Mbps: –79 dBm; 36 Mbps: –77 dBm; 48 Mbps: –72 dBm; 54 Mbps: –70 dBm

### Available Transmit Power Settings

- **802.11b:** Complementary Code Keying (CCK)— 20 dBm (100 mW); 17 dBm (50 mW); 14 dBm (25 mW); 11 dBm (12 mW); 8 dBm (6 mW); 5 dBm (3 mW); 2 dBm (2 mW); –1 dBm (1 mW)
- **802.11g:** Orthogonal Frequency Division Multiplexing (OFDM)— 17 dBm (50 mW); 14 dBm (25 mW); 11 dBm (12 mW); 8 dBm (6 mW); 5 dBm (3 mW); 2 dBm (2 mW); –1 dBm (1 mW)

### Range

- **Indoor:** 802.11g—120 ft (37 m) @ 54 Mbps; 175 ft (53 m) @ 48 Mbps; 250 ft (76 m) @ 36 Mbps; 275 ft (84 m) @ 24 Mbps; 325 ft (99 m) @ 18 Mbps; 350 ft (107 m) @ 12 Mbps; 360 ft (110 m) @ 11 Mbps; 375 ft (114 m) @ 9 Mbps; 400 ft (122 m) @ 6 Mbps; 420 ft (128 m) @ 5.5 Mbps; 440 ft (134 m) @ 5 Mbps; 450 ft (137 m) @ 4 Mbps; 460 ft (142 m) @ 3 Mbps; 470 ft (145 m) @ 2 Mbps; 480 ft (148 m) @ 1 Mbps
- **Outdoor:** 802.11g—120 ft (37 m) @ 54 Mbps; 350 ft (107 m) @ 48 Mbps; 650 ft (198 m) @ 36 Mbps; 680 ft (207 m) @ 24 Mbps; 710 ft (216 m) @ 18 Mbps; 750 ft (229 m) @ 12 Mbps; 800 ft (244 m) @ 11 Mbps; 820 ft (249 m) @ 9 Mbps; 890 ft (270 m) @ 6 Mbps; 940 ft (287 m) @ 5 Mbps; 980 ft (296 m) @ 4 Mbps; 1000 ft (305 m) @ 3 Mbps

### Antennas

- 2.4 GHz; Gain: 3.0 dBi; Horizontal beam width: 360°

### Status LEDs

- **External:** Status LED indicates operating state, association status, error/warning condition, boot sequence, and maintenance status
- **Internal:** Ethernet LED indicates activity over the network

### Dimensions (H x W x D)

- 7.5 x 7.5 x 1.3 in. (191 x 191 x 3.3 cm)

### Weight

- 15 lb (6.7 kg)

### Environmental

- 32 to 104°F (0 to 40°C)
- 10 to 90% humidity (noncondensing)

### System Memory

- 32 MB RAM
- 16 MB flash

### Input Power

- 100 to 240 VAC, 50 to 60 Hz (power supply)
- 36 to 57 VDC (device)

### Power Draw

- 9.9W maximum

### Warranty

- 1 Year

### Wi-Fi Certification

- **Compliance Standards**
  - **Safety—** UL 60950-1; CAN/CSA-C22.2 No. 60950-1; UL 2043; IEC 60950-1; EN 60950-1; NIST FIPS 140-2; Level 2 validation
  - **Radio Approvals—** FCC Part 15.247, 15.407; RSS-210 (Canada); EN 300.328, en 301.893 (Europe); ARIB STD 33 (Japan); ARIB STD 66 (Japan); AS/NZS 4268.2003 (Australia and New Zealand)
  - **EMI and Susceptibility (Class B)—** FCC Part 15.107 and 15.109; ICES-003 (Canada); VCCI (Japan); EN 301.489-1 and -17 (Europe)
  - **Security—** 802.11i, WPA2, WPA, 802.1X; AES, TKIP; FIPS 140-2 Pre-Validation List; Common Criteria (when running Cisco IOS Software)
  - **Other—** IEEE 802.11p FCC Bulletin OET-65C, RSS-102

### System Requirements

### Access Utilizing

#### Browser

- Using the web browser management GUI requires a computer running Internet Explorer Version 6.0 or newer, or Netscape Navigator Version 7.0 or newer

### Power over Ethernet (PoE)

- Power sourcing equipment (PSE) compliant with Cisco Inline Power or IEEE 802.3at and providing at least 12.2W at 48 VDC
### Chapter 3

#### Cisco 526 Wireless Express Mobility Controller

The Cisco 526 Wireless Express Mobility Controller is a network appliance that automatically optimizes the basic wireless network and supports advanced mobility services on top of that network. The Cisco Mobility Express solution brings together the Cisco 526 Controller and the Cisco 521 Wireless Express Access Point as a flexible, cost-effective wireless solution specifically designed to meet the needs of small and medium-sized businesses.

The Cisco 526 Wireless Express Mobility Controller harnesses the power of Cisco Lightweight Access Point Protocol (LWAPP) technology, best-in-class automatic radio optimization, mobility performance, and multi-access-point management. On top of the basic transport layer, the controller supports Cisco Secure Guest Access and voice-over-WLAN advanced mobility services.

**Ideal for Companies that Need These Features**
- Centralized management for easier access-point configuration and updating
- Dynamic RF management for optimal coverage without extensive site surveys
- Advanced mobility features such as Cisco Secure Guest Access and voice-over-WLAN

**Key Features**
- The Cisco 526 Wireless Express Mobility Controller supports Cisco LWAPP technology to communicate between access points and controllers for simplified deployment and management and to automate functions required for a pervasive WLAN end-user experience.
- The controller is mobility services-ready; it supports Cisco Secure Guest Access and voice-over-WLAN optimization.
- Multi-access point radio resource management coordinates access points in real time to optimize radio coverage and capacity while avoiding points of interference.
- The controller supports industry-standard authentication mechanisms, including Wireless Equivalent Privacy (WEP), MAC Filtering, WPA, WPA2, WebAuth, and Extensible Authentication Protocol (EAP) to facilitate scalable security architectures and minimize interoperability problems.
- The controller supports up to eight Service Set Identifiers (SSIDs) or VLANs, thereby allowing one physical WLAN infrastructure to be shared as a virtual wired or wireless network.

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### Selected Part Numbers and Ordering Information

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
<th>Operating Mode</th>
<th>Regulatory Domains</th>
</tr>
</thead>
<tbody>
<tr>
<td>AIR-AP521G-x-K9</td>
<td>Standalone mode, Cisco IOS® Software</td>
<td>Standalone mode</td>
<td>(x=regulatory domain) A=FCC, E=ETSI, P=Japan</td>
</tr>
<tr>
<td>AIR-LAP521G-x-K9</td>
<td>Controller mode, requires the Cisco Wireless Express Mobility Controller</td>
<td>Controller mode</td>
<td>(x=regulatory domain) A=FCC, E=ETSI, P=Japan</td>
</tr>
</tbody>
</table>

Customers are responsible for verifying approval for use in their individual countries. To verify approval and to identify the regulatory domain that corresponds to a particular country, visit: [http://www.cisco.com/go/aironet/compliance](http://www.cisco.com/go/aironet/compliance).

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### For More Information


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### Table 3-1

#### Security

<table>
<thead>
<tr>
<th>Security</th>
<th>Encryption</th>
<th>Authentication</th>
</tr>
</thead>
<tbody>
<tr>
<td>No security</td>
<td>None</td>
<td>Open</td>
</tr>
<tr>
<td>WEP</td>
<td>WEP</td>
<td>Open</td>
</tr>
<tr>
<td>LEAP</td>
<td>Dynamic WEP</td>
<td>Open-EAP Network-EAP</td>
</tr>
<tr>
<td>WPA</td>
<td>TKIP</td>
<td>Open-EAP Network-EAP</td>
</tr>
<tr>
<td>WPA-PSK</td>
<td>TKIP</td>
<td>WPA-PSK</td>
</tr>
<tr>
<td>WPA2</td>
<td>AES CCMP*</td>
<td>Open-EAP Network-EAP</td>
</tr>
<tr>
<td>WPA2-PSK</td>
<td>AES CCMP*</td>
<td>WPA-PSK</td>
</tr>
<tr>
<td>MAC</td>
<td>None</td>
<td>Open, MAC</td>
</tr>
<tr>
<td>MAC and EAP</td>
<td>Dynamic WEP</td>
<td>Open, MAC, Network-EAP</td>
</tr>
</tbody>
</table>

#### Standalone Access Point

<table>
<thead>
<tr>
<th>Security</th>
<th>Encryption</th>
<th>Authentication</th>
</tr>
</thead>
<tbody>
<tr>
<td>No security</td>
<td>None</td>
<td>Open</td>
</tr>
<tr>
<td>WEP</td>
<td>WEP/shared</td>
<td>Open</td>
</tr>
<tr>
<td>LEAP</td>
<td>WEP</td>
<td>Open-EAP Network-EAP</td>
</tr>
<tr>
<td>WPA</td>
<td>TKIP</td>
<td>WPA-PSK</td>
</tr>
<tr>
<td>WPA2</td>
<td>AES CCMP*</td>
<td>Open-EAP Network-EAP</td>
</tr>
<tr>
<td>WPA2-PSK</td>
<td>AES CCMP*</td>
<td>WPA-PSK</td>
</tr>
</tbody>
</table>

#### Controller-Based Access Point

<table>
<thead>
<tr>
<th>Security</th>
<th>Encryption</th>
<th>Authentication</th>
</tr>
</thead>
<tbody>
<tr>
<td>No security</td>
<td>None</td>
<td>Open</td>
</tr>
<tr>
<td>WEP</td>
<td>WEP</td>
<td>Open</td>
</tr>
<tr>
<td>LEAP</td>
<td>WEP</td>
<td>Open-EAP Network-EAP</td>
</tr>
<tr>
<td>WPA</td>
<td>TKIP</td>
<td>WPA-PSK</td>
</tr>
</tbody>
</table>

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1. Maximum power setting will vary by channel and according to individual country regulations.
2. Ranges and actual throughput vary based on numerous environmental factors so individual performance may differ.
Cisco Configuration Assistant

Cisco Configuration Assistant is an integral component of the Cisco Smart Business Communications System. Built for small and medium-sized business networks, this PC-based, easy-to-use network configuration and management tool simplifies the task of configuring, deploying, and administering Cisco network solutions. With a simple GUI, Cisco Configuration Assistant discovers all devices in the network and dynamically configures all routers, switches, and wireless access points and controllers. After the network is deployed, Cisco Configuration Assistant can be used to generate status reports, synchronize passwords, and upgrade software across all Cisco network devices.

Key Features
- Holistic, network-level insight through multiple network views
- Simplified topology mapping and deployment through dynamic discovery
- Clear separation of services through VLAN highlighting
- Improved network visibility with continual health monitoring
- Simplified network status reporting
- Enhanced security for configuration and monitoring activities
- Increased staff efficiency through simplified software updates

System Requirements

<table>
<thead>
<tr>
<th>Features</th>
<th>Cisco Configuration Assistant System Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating System</td>
<td>Windows XP Professional (Service Pack 1 or later) or Windows Vista Ultimate</td>
</tr>
<tr>
<td>Disc Space</td>
<td>200 MB</td>
</tr>
<tr>
<td>Hardware</td>
<td>PC with Pentium IV</td>
</tr>
</tbody>
</table>

Selected Part Numbers and Ordering Information

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>AIR-WLC526-K9</td>
<td>Cisco 526 Wireless Express Mobility Controller for up to 6 Cisco 500 Series Wireless Express APs</td>
</tr>
<tr>
<td>ASA5505-SRACK-MNT=</td>
<td>Rack Mount Kit (works with AIR-WLC526-K9) securely mounts up to two units in a standard 19&quot; equipment rack, including power supplies and cable management</td>
</tr>
<tr>
<td>ASA5505-WALL-MNT=</td>
<td>Wall Mount Kit (works with AIR-WLC526-K9) securely mounts one unit to a wall or other surface</td>
</tr>
</tbody>
</table>

For More Information

For more information about the Cisco 526 Wireless Express Mobility Controller, visit: http://www.cisco.com/go/mobilityexpress.
For more information about the Cisco Configuration Assistant, visit: http://www.cisco.com/go/sbcs.

Cisco Wireless LAN Services
Cisco and partners accelerate business transformation, operational maturity, and agility through consultative planning, solution development, and full deployment, creating network architectures that can optimize IT services and enhance your business.

Whether integrating a wireless LAN (WLAN) with your wired infrastructure or migrating from an autonomous solution to a Cisco Unified Wireless Network, planning and design services can help you take a more holistic approach to business mobility. This end-to-end approach makes it easier to manage the increasing quantity and diversity of mobile devices, deliver device-to-network-to-application integration and security, create an open platform for the development of mobility applications, and integrate secure unified communications to enable mobile workspaces.

Cisco has a portfolio of technical services that help maintain the health and performance of every Cisco product. These services range from traditional maintenance to proactive and predictive services that use smart services capabilities. Cisco Smart Services provide detailed diagnostics and real-time alerts on core network devices to help resolve problems quickly and improve network availability. The Cisco Technical Services portfolio is built on foundational capabilities and expanded performance capabilities to meet the changing technology needs of our customers.

Wireless LAN Optimization Service can help you achieve operational excellence through ongoing performance improvement and expanded services, thereby increasing your ability to compete in an ever-changing world.

- To find the right technical service for any Cisco product, use the Service Finder tool at http://www.cisco-servicefinder.com. Enter a product description or part number or search by product family for a list of suggested services and support coverage options.
- For more information about Cisco Wireless LAN planning, design, and optimization services, visit http://www.cisco.com/go/wirelesslanservices.
- For more information about all services, refer to Chapter 10, "Services".
The Cisco collaboration portfolio consists of Cisco Unified Communications, Cisco TelePresence, and Cisco WebEx, all of which use the network as the platform to help enable people to connect, communicate, and collaborate from any application, device, and workspace.

This chapter includes the following three sub-chapters: Unified Communications, Video, and WebEx.

### Unified Communications At a Glance

<table>
<thead>
<tr>
<th>Product</th>
<th>Features</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>COMMUNICATIONS INFRASTRUCTURE</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cisco AS5350XM Universal Gateway</td>
<td>High performance, 1RU universal gateway offering best in class voice, fax, remote access and session border control services</td>
<td>4–5</td>
</tr>
<tr>
<td>Cisco AS5400XM Universal Gateway</td>
<td>High performance, 2RU universal gateway offering best in class voice, fax, remote access and session border control services</td>
<td>4–7</td>
</tr>
<tr>
<td>Cisco AS5850 Universal Gateway</td>
<td>High density universal gateway for service providers and large enterprises</td>
<td>4–8</td>
</tr>
<tr>
<td>Cisco Unified Border Element</td>
<td>An application that terminates and reoriginates both signaling (H.323 and Session Initiation Protocol [SIP]) and media streams (Real-Time Transport Protocol [RTP] and RTP Control Protocol [RTCP]) while performing border interconnection services between IP networks</td>
<td>4–10</td>
</tr>
<tr>
<td><strong>NEW</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cisco Voice Gateways</td>
<td>Dedicated Cisco VG202, VG204, VG224, and VG248 Analog Voice Gateways provide connectivity between IP networks and traditional telephones</td>
<td>4–11</td>
</tr>
<tr>
<td>Cisco MCS 7800 Series Media Convergence Servers</td>
<td>High availability server platform for Cisco IP telephony systems</td>
<td>4–12</td>
</tr>
<tr>
<td><strong>IP TELEPHONY</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cisco ATA Analog Telephone Adapters</td>
<td>Turns any analog telephone into an IP telephone. Each of the two voice ports supports independent telephone numbers, providing two separate lines</td>
<td>4–13</td>
</tr>
<tr>
<td>Cisco Smart Business Communications System</td>
<td>The server-based call-processing and call-control component of the Cisco Unified Communications Solution, offering a suite of integrated voice applications and utilities</td>
<td>4–14</td>
</tr>
<tr>
<td>Cisco Unified Communications Manager</td>
<td>The server-based call-processing and call-control component of the Cisco Unified Communications System for small businesses with up to 50 users with expansion capabilities to 64 users</td>
<td>4–15</td>
</tr>
<tr>
<td>Cisco Unified Communications Manager Assistant</td>
<td>A component of the Cisco Unified Communications Manager, this PC and phone application provides productivity tools that enhance communications between manager and administrative assistant</td>
<td>4–16</td>
</tr>
<tr>
<td>Cisco Unified Communications Manager Business Edition</td>
<td>Cisco Unified Communications Manager Business Edition is designed for medium-sized businesses with up to 500 employees and up to 20 sites (19 remote sites)</td>
<td>4–17</td>
</tr>
<tr>
<td>Cisco Unified Communications Manager Express</td>
<td>Cisco Unified Communications Manager Express is designed for medium-sized businesses with up to 500 employees and up to 20 sites (19 remote sites)</td>
<td>4–18</td>
</tr>
<tr>
<td>Cisco Unified Survivable Remote Site Telephony (SRST)</td>
<td>Cisco Unified Survivable Remote Site Telephony (SRST) software is a Cisco IOS Software-based feature set that provides key backup telephony functions for remote branch offices if connectivity to the centrally-located Cisco Unified Communications Manager fails (that is, a WAN link is interrupted). During a WAN outage, the Cisco Unified SRST-enabled router provides robust telephony services (including off-net calls to 911)</td>
<td>4–20</td>
</tr>
</tbody>
</table>
Cisco Unified IP Phones
7900 Series
An exciting, distinctively stylish, and purely VoIP phone portfolio to meet the wide range of business communication needs at affordable prices
- Integrated inline power and 2-port Ethernet switch provides end-to-end infrastructure integration
- Rich application environment enabled by open APIs based on XML
- Cisco SMARTnet services available

Cisco Unified Department and Business Attendant Consoles
*NEW*
- The Cisco Unified Department Attendant Console is a feature-rich operator attendant console designed specially for departmental use with Cisco Unified Communications Manager. This application supports a maximum of 150 Cisco Unified IP Phones and two operator clients per department.
- The Cisco Unified Business Attendant Console is a feature-rich operator attendant console designed specially for the midsize growing Cisco Unified Communications Manager Business Edition customer with a maximum of 500 Cisco Unified IP Phones.
- Essential Operate Services (ESW) are required for software.

UNIFIED COMMUNICATIONS APPLICATIONS

Cisco Emergency Responder
Works with Cisco Unified Communications Manager to automatically provide E9-1-1 features in North America, intra-enterprise features are also compatible with any internal or external emergency number
- Essential Operate Services (ESW) for the software license and per seat

Cisco IP Communicator
A software-as-a-service application that delivers enhanced telephone support through the PC, allowing remote users to take their office extension with them
- Essential Operate Services (ESW) required for User License

Cisco Unified Application Environment
A software-as-a-service application that delivers enhanced telephone support through the PC, allowing remote users to take their office extension with them
- Essential Operate Services (ESW) required for User License

Cisco Unified MeetingPlace Express
Cisco Unified MeetingPlace Express is an integrated voice, video, and web collaboration solution for midsize organizations.
- It facilitates real-time collaboration for Cisco Unified Communications solutions.
- This on-premises solution offers cost savings and security.
- It is easy to deploy and manage.
- Essential Operate Services (ESW) are required for most features

Cisco Unified Mobile Communicator
Cisco Unified Mobile Communicator enables collaboration by securely extending Cisco Unified Communications to your mobile smartphone.
- Cisco Unified Mobile Communicator provides real-time access to company directory, presence, visual voice mail, integrated call history, and conference notifications and other vital information; so you always have the information you need at your fingertips when you are on the go.
- Essential Operate Services (ESW) are required for most features

Cisco Unified Personal Communicator
If transparently integrates your most frequently used communications applications and services into a single, unified client.
- From an easy-to-use interface on a PC or Mac, it provides quick and easy access to powerful communications tools—softphone, presence, instant messaging, visual voicemail, click to call, employee directory, communication history, video, and web conferencing—to help you communicate effectively and work more productively.
- Essential Operate Services (ESW) are required for User License

Cisco Unified Presence
This standards-based platform collects information from multiple sources about user availability and communications capabilities to provide rich presence status and facilitate presence-enabled communications with Cisco Unified Communications and other critical business applications.
- It enables sharing of presence and IM with Cisco Unified Personal Communicator.
- It supports the ability to view phone presence from Cisco Unified Personal Communicator IBM Lotus Sametime, or Microsoft Office Communicator.
- It facilitates the ability to expose presence in corporate web directories, point-of-sale applications, or customer-relationship-management systems through standards-based application programming Interfaces (APIs).
- It provides the ability for subject matter experts anywhere in your enterprise to handle incoming customer calls with Cisco Unified Expert Advisor and Cisco Unified Personal Communicator.
- Essential Operate Services (ESW) are required for most features

Cisco Unity Connection
Combines unified messaging, speech recognition and call routing rules into an easy-to-manage system on a Linux appliance
- Essential Operate Services (ESW) required based Voice Mail Box
Cisco Unity Express
Integrated voice mail, automated attendant, and IVR services locally delivered for small businesses or branch offices. Takes advantage of the data infrastructure supported on broad range of Cisco access routers and new Cisco Integrated Services Routers.
- Cisco SMARTnet services available.

Speech Connect for Cisco Unity
Speech Connect for Cisco Unity offers unmatched performance in speech recognition because of advanced disambiguation, the Names Tuning service, and a dynamic names dictionary.

Cisco Unity Unified Messaging
Voice mail and unified messaging system delivers all messages into single inbox for access through phone, e-mail, and many other clients and devices.
- Essential Operate Services (ESW) are required based on Voice Mail Box (VM or UM) for software.

Cisco Unified Messaging Gateway
NEW
An open and secure method of intelligently routing messages and exchanging subscriber and directory information within a unified messaging network; it acts as the central hub in a network of voice and unified messaging solutions.
- Cisco Unified Messaging Gateway includes Software Application Support and Software Applications Support with Upgrades (SAS/SASU).

Voice and Security Bundles
Voice and security bundles are designed for enterprise branch offices, small and medium-sized businesses (SMBs), and managed network service providers seeking consolidated, easy-to-order, versatile, and cost-effective solutions.

CUSTOMER CONTACT

Cisco Unified Contact Center Enterprise
Cisco Unified Contact Center Enterprise delivers intelligent, integrated contact routing, network-to-desktop computer telephony integration (CTI), and multichannel contact management to contact center agents over an all-IP infrastructure or mixed IP and time-division multiplexing (TDM) infrastructure. It offers:
- Essential Operate Services (ESW) required for most features

Cisco Unified Contact Center Express
Cisco Unified Contact Center Express is ideal for departmental, enterprise branch-office, or small and medium-sized contact centers with Cisco IP Telephony networks. The solution supports up to 300 and is available in three versions: Standard, Enhanced, and Premium, to better match product functions with your customer contact interaction management requirements. The solution offers:
- Essential Operate Services (ESW) required for only the Agents

Cisco Unified Contact Center Hosted
Cisco Unified Contact Center Hosted is suitable for both enterprise customers and service providers.
- The service provider hosts the contact-center infrastructure software, which is shared by multiple business customers in its central office or data center
- Essential Operate Services (ESW) required for most features

Cisco Unified Customer Voice Portal
Cisco Unified Customer Voice Portal delivers intelligent, personalized self-service over the phone. It allows customers to efficiently and enjoyably retrieve the information they need from the contact center. The solution:
- Offers a prompt collect, queuing, and call-control service using standard IP technologies
- Provides sophisticated voice and video self-service options with the ability to quickly and easily escalate to assisted service as required
- Essential Operate Services (ESW) required for most features

Cisco Unified Expert Advisor
Cisco Unified Expert Advisor expands the scope of the contact center by allowing enterprise knowledge workers to handle incoming customer calls without the need for the rigid tools and business rules typically found in formal contact centers. The solution:
- Allows formal contact-center agents to use real-time subject matter expertise to best advantage across the enterprise
- Essential Operate Services (ESW) required for most features

Cisco Unified Intelligence Suite
The Cisco Unified Intelligence Suite offers customers a powerful Web-based reporting platform that is as flexible as it is intuitive. Customers can report on the details of every contact across all channels from a single interface, regardless of the resources involved.
- Essential Operate Services (ESW) required for most features

Cisco Unified Intelligent Contact Management Enterprise
Cisco Unified Intelligent Contact Management Enterprise provides call routing and CTI for multisite, TDM-based or IP-based contact centers in a distributed, fault-tolerant architecture.
- Essential Operate Services (ESW) required for most features

Cisco Unified Intelligent Contact Management Hosted
Cisco Unified Intelligent Contact Management Hosted helps service providers address a full range of business opportunities.
- Essential Operate Services (ESW) required for most features

Unified Communications At a Glance 4-3
SOFTWARE SUBSCRIPTION AND LICENSING

Cisco Unified Workspace Licensing *NEW*
Cisco Unified Workspace Licensing allows organizations to cost-effectively access a wide range of Cisco Unified Communications applications and services in a comprehensive offering. It packages client and server software, licensing, service and support, and software subscription on a per-user basis.

Cisco Unified Communications Software Subscription *NEW*
Cisco Unified Communications Software Subscription allows you to purchase major software version upgrades of various Cisco Unified Communications products at a reduced cost through a 1-, 2-, 3-, or 5-year subscription. You can also optimize your savings by purchasing a multiyear plan.

SERVICES

Cisco Unified Communications Services
Services, delivered by Cisco and our partners, help organizations deploy a secure, resilient Cisco Unified Communications solution, enabling powerful ways to collaborate with coworkers, partners, and customers across any workspace.

Video At a Glance

<table>
<thead>
<tr>
<th>Product</th>
<th>Features</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cisco TelePresence System</td>
<td>The Cisco TelePresence system integrates advanced audio, high-definition video, and interactive elements with the power of the underlying network to deliver an immersive in-person experience.</td>
</tr>
<tr>
<td>Cisco TelePresence System 500 <em>NEW</em></td>
<td>The smaller footprint of the Cisco TelePresence System 500 gives organizations the flexibility to deploy Cisco TelePresence within personal offices to support one-on-one meetings, or to join large, multipoint Cisco TelePresence calls.</td>
</tr>
<tr>
<td>Cisco TelePresence System 1000</td>
<td>The Cisco TelePresence system 1000 is ideal for small group or one-on-one meetings around the &quot;virtual table&quot;.</td>
</tr>
<tr>
<td>Cisco TelePresence System 3000</td>
<td>The Cisco TelePresence system 3000 is an ideal endpoint for group meetings, creating an environment for six people to sit around the &quot;virtual table&quot; in a single location.</td>
</tr>
<tr>
<td>Cisco TelePresence System 3200 <em>NEW</em></td>
<td>The Cisco TelePresence system 3200 enables organizations to host up to 18 meeting participants in a single large room.</td>
</tr>
<tr>
<td>Cisco TelePresence Manager</td>
<td>Cisco TelePresence Manager software makes it easy for you to schedule and manage Cisco TelePresence calls.</td>
</tr>
<tr>
<td>Cisco TelePresence Multipoint Switch</td>
<td>Easily and reliably include three or more locations in a single meeting, with support for up to 48 locations.</td>
</tr>
<tr>
<td>Cisco Unified Video Advantage</td>
<td>Video is now just a phone call. Cisco Unified Video Advantage brings video communications to Cisco Unified IP Phones and Cisco IP Communicator.</td>
</tr>
<tr>
<td>Cisco Unified Videoconferencing 3500 Series Products</td>
<td>The Cisco Unified Videoconferencing 3500 Series provides a flexible, cost-effective video infrastructure for Cisco Unified Communications solutions.</td>
</tr>
</tbody>
</table>

Cisco Physical Security
For product information on Cisco Video Surveillance products, see Chapter 5, "Security".

Cisco Digital Media System
For product information, see Chapter 7, "Video and Broadband Cable".
WebEx At a Glance

<table>
<thead>
<tr>
<th>Product</th>
<th>Features</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cisco WebEx Connect</td>
<td>Cisco WebEx Connect is an enterprise-class, on-demand collaboration platform that combines instant messaging, team spaces, and business applications to bring people, data, and processes together.</td>
<td>4–51</td>
</tr>
<tr>
<td><em>NEW</em></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cisco WebEx Meeting</td>
<td>Cisco WebEx Meeting Center allows business professionals to easily and reliably reach across the web to collaborate and work, inside or outside their organization.</td>
<td>4–52</td>
</tr>
<tr>
<td>Center <em>NEW</em></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cisco WebEx Event</td>
<td>Cisco WebEx Event Center is an online events- and webinar application for you to manage the entire online event lifecycle from planning, promoting, and presenting to follow-up and analysis.</td>
<td>4–52</td>
</tr>
<tr>
<td>Center <em>NEW</em></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cisco WebEx Training</td>
<td>Cisco WebEx Training Center is an online classroom solution that enables you to deliver dynamic, interactive learning to anyone who has web access and a browser.</td>
<td>4–53</td>
</tr>
<tr>
<td>Center <em>NEW</em></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cisco WebEx Sales</td>
<td>Cisco WebEx Sales Center is a sales collaboration application that enables sales organizations to engage prospects more effectively and more frequently, extend their geographical reach, collaborate with prospects and sales-team members, and shorten their sales cycle.</td>
<td>4–54</td>
</tr>
<tr>
<td>Center <em>NEW</em></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cisco WebEx Support</td>
<td>Cisco WebEx Support Center enables IT and customer support to reduce costs, increase the productivity of their technical support representatives, reduce customer downtime, and increase customer satisfaction by improving the efficiency and effectiveness of remote support.</td>
<td>4–54</td>
</tr>
<tr>
<td>Center <em>NEW</em></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Product Ordering Website</td>
<td>To place an order or for more part numbers, visit: <a href="http://www.cisco.com/en/US/ordering/index.shtml">http://www.cisco.com/en/US/ordering/index.shtml</a>. This chapter only provides a small subset of all part numbers available. See the URL listed in the “For More Information” section of each product to get a complete list of part numbers.</td>
<td></td>
</tr>
</tbody>
</table>

Unified Communications

Cisco AS5350XM Universal Gateway

The Cisco AS5350XM Universal Gateway is a 1-rack-unit (1RU) gateway supporting 2- to 16-port T1/E1 or 1 CT3 configurations. The Cisco AS5350XM provides voice, fax, data, and session-border-control (SBC) services on any port at any time. This cost-effective platform is ideally suited for service provider and enterprise environments.

Ideal for Companies that Need These Features

- High density in a small footprint (up to 20 CT1/CE1 or 1 CT3, any codec type, fax protocol or modem type)
- High-performance voice, fax, data, and session-border-control (SBC) services
- Concurrent voice gateway and SBC
- High call rates (up to 20 calls per second)
- Enhanced performance for processor-intensive Tool Command Language (TCL) or Voice Extensible Markup Language (VoiceXML) scripting for complex voice services
- T.38 real-time fax relay, T.37 fax store and forward, fax detection, and unified communications

Key Features

- The Cisco AS400XM Universal Gateway is ideally suited for service provider and enterprise environments that require innovative voice, fax, and data services.
- This universal gateway has a 2-rack unit (2RU), CT3-capable universal gateway with hot-swappable cards and internal redundant power supply.
- This universal gateway offers best-in-class voice, fax, remote access, and session-border-control (SBC) services.
- The gateway provides concurrent gateway and SBC operation.
- This gateway includes the following feature cards: 4 or 8 T1/E1/Primary Rate Interface (PRI) feature cards (ISDN calls terminated on the card); one CT3 feature card; a 60- or 108-channel universal port feature card; and a 384-channel voice feature card.
- This gateway has two 10/100/1000 autosensing Gigabit Ethernet LAN ports.
This gateway has redundant 8-Mbps serial backhaul ports for Frame Relay, High-Level Data Link Control (HDLC) or Point-to-Point Protocol (PPP) WAN backhaul.

The gateway provides one fast console port for local administrative access and one auxiliary port for remote administrative access, as well as redundant LAN and WAN backhaul ports.

The gateway is European Telecommunications Standards Institute/Network Equipment Building Standards (ETSI/NEBS) Level 3 compliant, and has a redundant AC or DC power supply with dual fans.

The gateway is interoperable with the Cisco Signaling System 7 (SS7) Interconnect for Voice Gateway (signaling gateway).

**Specifications**

<table>
<thead>
<tr>
<th>Feature</th>
<th>Cisco AS5350XM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Processor</td>
<td>750 MHz RISC processor</td>
</tr>
<tr>
<td>SDRAM</td>
<td>512 MB (default), 1 GB (maximum)</td>
</tr>
<tr>
<td>System Flash</td>
<td>128 MB (default), 1 GB (maximum)</td>
</tr>
<tr>
<td>Feature Card Slots</td>
<td>3 slots</td>
</tr>
<tr>
<td>Trunk Feature Cards</td>
<td>2 T1/E1/PRI, 2 T1/E1/PRI, 2 T1/E1/PRI, 1 CT3</td>
</tr>
<tr>
<td>DSP Feature Cards</td>
<td>60 Universal port card, 18 Universal port card, 384 port voice/fax card</td>
</tr>
</tbody>
</table>

**Egress Ports**

2 10/100/1000 autosensing Ethernet LAN ports
2 8-Mbps serial ports
T1/E1 DS1 and CT3 trunk feature cards

**LAN Protocols**

- IP
- IPX
- AppleTalk
- DECNet
- ARA
- NetBEUI
- bridging
- HSRP
- 802.1Q

**WAN Protocols**

- Frame Relay
- PPP
- HDLC (leased line)

**Routing Protocols**

- Routing Information Protocol (RIP), RIP V2, OSPF, IS-IS, EIGP, ISIS, OSPF-EX, OE-EX, Next Hop Resolution Protocol (NHRP), Apple Talk Update-based Routing Protocol (AURP)

**QoS Protocols**

- P-Precedence
- Resource Reservation Protocol (RSVP)
- Weighted Fair Queuing (WFQ)
- Weighted Random Early Detection (WRED)
- Multichassis Multilink PPP (MPPP), fragmentation and interleaving

**Access Protocols**

- PPP
- Serial Line Internet Protocol (SLIP)
- TCP Clear
- IPXCP
- A TCP
- ARA
- NBFCP
- NetBIOS over TCP/IP
- NetBEUI over PPP
- protocol translation (PPP, SLIP, ARA, X.25, TCP)
- local-area transport (LAT), Telnet, and Xremote

**Bandwidth Optimization**

- Multilink PPP (MPPP), LEMP header compression, Bandwidth Allocation Control Protocol (BACP)

**Voice Compression**

- G.711, G.722, G.723.1, G.726, G.729ab, G.725 clear, GSM-FR, AMR-NB, iLBC

**DSP Voice Features**

- Echo cancellation, programmable up to 128 MHz
- Voice activity detection, silence suppression, comfort noise generation, Fixed and adaptive jitter buffering
- Call progress tone detection and generation—Dial tone, busy, ring-back, congestion, and re-order tones with local country variants
- STMF Multifrequency (MF) Continuity Testing (COT)

**Voice and Fax Signaling Protocols**


**SS7**

- Integrated Signaling Link Terminal (ISLT), MTPT, MTP2, UA, RUDP backhaul

**Network Security**

- MD5, SHA-1, GSS-API, CHAP, and MTP/CHAP authentication, local user/password database
- DNS, SLID, call type pre-authentication
- Inbound/outbound traffic filtering (including PPP, AppleTalk, bridged traffic)
- Network Address Translation (NAT) and dynamic access lists (ACLs)
- SNMPv2, SNMPv3, SSHv2, H.235

**Virtual Private Networking**

- IP Security (IPsec) and policy enforcement (RAAS), of AGACAs, T.121, Layer 1 Forwarding (L1F)
- and generic routing encapsulation (GRE) tunnels
- Firewall security and intrusion detection
- QoS features (committed access rate [CAR]) and Multilayer IP routing
- Redirection (IPsec, policy-based routing)

**Session Border Control**

- H.248 or H.245 (including Cisco Unified Communications Manager), H.248 to SIP (including Cisco Unified Communications Manager), SIP to SIP (including Cisco Unified Communications Manager), 1000 concurrent calls with 2000 sessions in flow-through mode

**Channelized T1**

- N bubbled-bit signaling, Loop Start, Immediate Start, and With Start Protocols

**Channelized E1**

- CAS, PRI, T1, or E1, based on the Frame Relay, G.703, G.704

**ISDN Protocols Supported**

- ISDN Basic Rate:速率 PPP v2 (for eorps, Internet access, and user-side voice NELS with backup B-channel), QSIG, Feature Group B, Feature Group D, Dov/BIS

**Modem Protocols Supported**

- Modems with standard supporting rates of 56000 to 26000 in 1333 bps increments
- V.90 Modem on Hold and Quick Connect, V.44 Compression supporting increased throughput by more than 100 percent for Internet browsing, K56Flex at 56000 to 24000 bps increments

ITU-T V.44 Annex A at 33600 and 31200 bps
ITU-T V.44 at 28800, 26400, 24000, 21600, 19200, 16800, 14400, 12000, 9600, 7200, 4800, or 2400 bps
V.35bis at 14400, 12000, 9600, 7200, 4800, V.32 at 9600, 4800, V.22bis at 2400, 1200, V.21 at 300, Bell 103, 300, V.22 at 1200, V.23 at 1200/76, ITU-T V.42 including Microcom Networking Protocol (MNP) 2-4 and Link Access Procedure for Modems (LAPM) error correction, ITU-T V.42bis (1000 nodes) and MNP 6 data compression, Async-mode PPP
Cisco AS5400XM Universal Gateway

The Cisco AS5400XM Universal Gateway offers exceptional capacity in only two rack units (2RU) and provides voice, fax, and data services on any port at any time. High-density (up to one CT3 of voice over IP [VoIP] and two CT3 of time-division multiplexing [TDM] switching), low-power consumption (as low as 3.5A at 48 VDC per CT3 of G.711), and universal port digital signal processors (DSPs) make the Cisco AS5400XM Universal Gateways ideal for many network deployment architectures, especially co-location environments and mega points of presence (POPs).

Ideal for Companies that Need These Features

- High density in a small footprint (up to 20 CT1/CE1 or 1 CT3, any codec type, fax protocol or modem type)
- High-performance voice, fax, data, and session-border-control (SBC) services
- Concurrent voice gateway and SBC
- High call rates (up to 20 calls per second)
- Enhanced performance for processor-intensive Tool Command Language (TCL) or Voice Extensible Markup Language (Voice/XML) scripting for complex voice services
- T.38 real-time fax relay, T.37 fax store and forward, fax detection, and unified communications

Key Features

- The Cisco AS5400XM Universal Gateway is ideally suited for service provider and enterprise environments that require innovative voice, fax, and data services.
- This universal gateway has a 2-rack unit (2RU), CT3-capable universal gateway with hot-swappable cards and internal redundant power supply.
- This universal gateway offers best-in-class voice, fax, remote access, and session-border-control (SBC) services.
- The gateway provides concurrent gateway and SBC operation.
- This gateway includes the following feature cards: 4 or 8 T1/E1/Primary Rate Interface (PRI) feature cards (ISDN calls terminated on the card); one CT3 feature card; a 60- or 108-channel universal port feature card; and a 384-channel voice feature card.
- This gateway has two 10/100/1000 autosensing Gigabit Ethernet LAN ports.
- This gateway has redundant 8-Mbps serial backhaul ports for Frame Relay, High-Level Data Link Control (HDLC) or Point-to-Point Protocol (PPP) WAN backhaul.
- The gateway provides one fast console port for local administrative access and one auxiliary port for remote administrative access, as well as redundant LAN and WAN backhaul ports.
- The gateway is European Telecommunications Standards Institute/Network Equipment Building Standards (ETSI/NEBS) Level 3 compliant, and has a redundant AC or DC power supply with dual fans.
- The gateway is interoperable with the Cisco Signaling System 7 (SS7) Interconnect for Voice Gateway (signaling gateway).

Specifications

- Processor: 750 MHz RISC processor
- Calls Supported: Voice, fax, and remote access services to 648 concurrent calls (to 1CT3/16E1s)
- SDRAM: 512 MB (default), 1 GB (maximum)
- Boot Flash: N/A
- System Flash: 128 MB (default), 1 GB (maximum)
- Feature Card Slots: 7
- Trunk Feature Cards: 4 T1/E1/PRI, 8 T1/E1/PRI, 1 CT3
- DSP Feature Cards: 60 Universal port card, 108 Universal port card, 384 low complexity, 192 medium complexity or 144 high complexity port voice/fax card
- Egress Ports: 2 10/100/1000 autosensing Gigabit Ethernet LAN ports, 2 8-Mbps serial ports, T1/E1 DS1 and CT3 trunk feature cards

For More Information


For More Information

**Cisco AS5850 Universal Gateway**

The Cisco AS5850 Universal Gateway is a high-density gateway with carrier-class attributes, offering high availability and exceptionally high capacity. It supports a wide range of IP-based, value-added services such as high-volume Internet access, corporate VPNs, long distance for Internet service providers (ISPs), international wholesale long distance, distributed prepaid calling, Cisco Signaling System 7 (SS7) interconnect and managed voice services including hosted IP telephony, managed IP private branch exchange (PBX), multiservice VPNs, and IP contact centers.

**Ideal for Companies that Need These Features**

- Support for up to 2688 sessions of data, voice, or fax services using T1, E1, DS-3, or STM-1 trunk interfaces, with larger configurations supported for dial and time-division multiplexing (TDM) switching
- Service provider or large enterprise installations
- High port count behind one IP address
- Highly available single system with multiple redundancy

Chapter 4
• Wholesale dial and voice, retail dial and voice, TDM grooming, or wireless applications

Key Features
• The Cisco AS5850 Universal Gateway offers hot-swappable, redundant power supplies and power feeds.
• This universal gateway provides redundant digital signal processors (DSPs) and route switch controllers
(RSCs) a redundant blower for cooling, and Call Admission Control (CAC).
• Supports any codec at 100-percent capacity, simplifying network engineering.
• Supports Route Processor Redundancy Plus (RPR+) for high availability.
• This gateway provides thermal management and power management and redundant fans.
• This gateway offers the DSP Resource Recovery feature.
• Supports H.323v2, H.323v3, H.323v4, Session Initiation Protocol (SIP), and Media Gateway Control Protocol
(MGCP) 1.0 and provides application-specific support, including support for AOL and Prodigy traffic.
• Offers WAN optimization, including routing filters, snapshot routine, and dial-on-demand routing (DDR).
• This gateway is European Telecommunications Standards Institute/Network Equipment Building Standards
(ETSI/NEBS) Level 3 compliant.
• The gateway is interoperable with the Cisco Signaling System 7 (SS7) Interconnect for Voice Gateway
(signaling gateway).
• This gateway provides Stratum-3 clock support and 802.1Q/1p VLAN/Inter-Switch Link (ISL) support.
• This gateway provides up to three chassis per rack (14RU chassis) and only 30A at 48V for 4 CT3 cards of highcomplexity voice (11ma per voice channel, 12ma with route processor redundancy).

Specifications
Feature
Slots

Cisco AS5850
12 feature board slots; 2 ERSC slots

Processor

650 MHz Broadcom 1250 Dual Core

ERSC Switch Fabric

5 Gbps. Layer 3/4 switching

Memory

1 GB SDRAM with ECC per ERSC
128 MB SDRAM (with parity) per feature card
Single CT3 plus 216 DSP Channel feature card; 24 Ce1/CT1 feature card; Single port Channelized STM-1
feature card
324 Channel DSP-feature card

Trunk Cards
Universal Port Card

LAN Protocols

Dual Gigabit load-balanced redundant Ethernet ports with GBIC interfaces for user traffic
Dual 10/100 Mbps Ethernet port with RJ-45 connector for management traffic
IP, bridging, HSRP, 802.1Q

Service Support

Port Policy Management and SS7/C7

Routing Protocols

RIP, RIPv2, OSPF, IGRP, EIGRP, BGPv4, IS-IS, NHRP

Access Protocols

PPP, SLIP, TCP Clear

Bandwidth
Optimization

Multilink PPP (MLPPP), TCP/IP header compression, Bandwidth Allocation Control Protocol (BACP),
Bandwidth on demand, Nonfacility-associated signaling (NFAS), traffic shaping

Network Security

Channelized T1

RADIUS or TACACS+, PAP or CHAP authentication, local user/password database, DNIS, CLID, call-type
pre-authentication, Inbound/outbound traffic filtering (including IP), SNMPv2, SNMPv3
IP Security (IPSec) and policy enforcement (RADIUS or TACACS+) L2TP, Layer 2 Forwarding (L2F), and
generic routing encapsulation (GRE) tunnels; Firewall security and intrusion detection; QoS features
(committed access rate [CIR], Random Early Detection [RED], IP Precedence, policy-based routing)
PRI, robbed-bit signaling; Loop Start; Immediate Start, and Wink Start Protocols

Channelized DS3

PRI, robbed-bit signaling; Loop Start; Immediate Start, and Wink Start Protocols

Channelized E1

CAS, PR1, E1 R2,SS7 IMT

Channelized STM-1

CAS, PR1, E1 R2,SS7 IMT

Voice Compression

G.711, G.723.1 (5.3K and 6.3K), G.726, G.729ab, G. Clear, GSM-FR,

DSP Voice Features

Echo cancellation, programmable up to 128 MB; Transparent transcoding between A-law and mu-law
encoding; Voice activity detection, silence suppression, comfort noise generation; Fixed and adaptive
jitter buffering; Call progress tone detection and generation—Dial tone, busy, ring-back, congestion, and
re-order tones with local country variants; DTMF, Multifrequency (MF); Continuity Testing (COT)
H.323v2, H.323v4, SIP, MGCP 1.0, TGCP 1.0, Voice XML, Real-Time Streaming Protocol (RTSP), Extended
Simple Mail Transfer Protocol (ESMTP); Fax out (transmission) Group 3, standards EIA 2388 Class 2 and
EIA 592 Class 2.0 at modulations V.33, V.17, V.29, V.27ter, V.21; ITU-T T.30, T4; Fax detection; Fax and modem
passthrough; Open Settlements Protocol (OSP), Media Recording Control Protocol (MRCP) to enable TTS
and ASR Services
Sync mode PPP, V.110 at rates up to 38400 bps; Network- and user-side ISDN; NFAS with backup Dchannel; QSIG, Feature Group B, Feature Group D; DoVBS

Egress Ports

Virtual Private
Networking

Voice and Fax
Signaling Protocols

ISDN Protocols
Supported

Cisco AS5850 Universal Gateway

4-9


Cisco Unified Border Element

The Cisco Unified Border Element (Cisco UBE) is an intelligent unified communications network element. Formerly known as the Cisco Multiservice IP-to-IP Gateway, the Cisco Unified Border Element, in addition to other Cisco IOS Software features, includes session border controller (SBC) functions that enable end-to-end IP-based transport of voice, video, and data between independent unified communications networks. SBCs are critical components for scaling unified communications networks from being “IP islands” within a single customer network to becoming an end-to-end IP community. One of the most significant uses of the Cisco Unified Border Element is to allow call-control elements such as Cisco Unified Communications Manager to connect to service providers for public-switched-telephone-network (PSTN) access offerings over Session Initiation Protocol (SIP) trunks. Today, the Cisco UBE is used as an IP-to-IP gateway by service provider, enterprise, and commercial customers to interconnect SIP and H.323 voice and video networks.

Ideal for Companies that Need These Features

- Session management, or the ability to count and manage the number of sessions flowing through a router
- Interworking, or the ability to interconnect different signaling methods and variants
- Demarcation, or the ability to act as a distinct demarcation point between the two networks
- Security, or the ability to act as a Layer 7 device that intelligently allows or disallows traffic between networks

Key Features

The Cisco Unified Border Element delivers the following features and benefits:

- Essential network border security features
- Privacy features for hiding internal network address structure from other administrative domains
- Layer 7 application layer gateway features
- Interworking features for interconnecting different voice-over-IP (VoIP) network types, such as H.323-to-SIP
- Dual tone multifrequency (DTMF) interworking
- Capacity control and improved call routing control using carrier-based routing
- Codec filtering by restricting codecs advertised on outbound call legs
- Billing and settlement features
- Software and hardware media-termination-point (MTP) functions for Cisco Unified Communications Manager (applies to Cisco 2800 and 3800 Series Integrated Services Routers only)
- Support for changing codecs during rotary dial-peer selection
- Simultaneous operation with TDM gateways on Cisco integrated service routers, permitting graceful migration from TDM to IP trunking
- Support for Lawful Intercept capabilities
- Support for Open Settlement Protocol
- Configurable Session Initiation Protocol (SIP) trunk profiles support
- Available in various licensing configurations to match customer capacity and price-point needs

Selected Part Numbers and Ordering Information

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>FL-CUBE-25(=)</td>
<td>Feature license applicable on any Cisco IOS software platform for 25 simultaneous sessions</td>
</tr>
<tr>
<td>FL-INTVVSRV-261X(=)</td>
<td>Cisco 261X Integrated Voice Video License: IP-to-IP Gateway</td>
</tr>
<tr>
<td>FL-INTVVSRV-2811(=)</td>
<td>Cisco 2811 Integrated Voice Video License: IP-to-IP Gateway</td>
</tr>
<tr>
<td>FL-INTVVSRV-3845(=)</td>
<td>Cisco 3845 Integrated Voice Video License: IP-to-IP Gateway</td>
</tr>
<tr>
<td>FL-GK-IPIP7200(=)</td>
<td>Cisco 7200 IP-to-IP Gateway</td>
</tr>
<tr>
<td>FL-INTVVSRV-5X(=)</td>
<td>Cisco AS5350XM &amp; AS5400XM Integrated Voice Video License: IP-to-IP Gateway</td>
</tr>
</tbody>
</table>

For More Information

Cisco Voice Gateways
Cisco voice gateways interface directly to private branch exchanges (PBXs) or public telephone networks to carry voice traffic across IP networks by converting IP calls to standard telephony calls, and conversely. They provide connectivity between packet telephony and traditional telephony such as public switched telephone network (PSTN), private branch exchanges (PBXs), fax machines, and other devices.

Cisco VG200 Series Gateways provide:
- High-density gateways for centralized deployments of analog phones, fax machines, modems, voicemail systems, and speakerphones
- Low-density gateways for distributed deployments of analog phones, fax machines, modems, and speakerphones
- A broad range of features for enterprise voice systems based on Cisco Unified Communications Manager or Cisco Unified Communications Manager Express

Cisco offers the Cisco VG202 and VG204 (low density), and the VG224 and VG248 (high density) dedicated analog voice gateways. The full line of Cisco access and integrated routers can also add analog and digital voice gateway functions through the use of network modules and voice interface cards.

Cisco VG202 and VG204 Analog Phone Gateways
The Cisco VG204 and Cisco VG202 Analog Phone Gateways offer 4 and 2 full-featured analog phone lines, respectively, for use as extensions to Cisco Unified Communications Manager or Cisco Unified Communications Manager Express systems in a desktop form factor with a fanless design. Based on a Cisco IOS Software platform, the Cisco VG204 and Cisco VG202 offer identical functions and support similar network topologies as the Cisco VG224.

Cisco VG224 Analog Phone Gateway
The Cisco VG224 Analog Phone Gateway is a high-density, 24-port Cisco IOS Software gateway for analog phones, fax machines, modems, and speakerphones within an enterprise voice system based on Cisco Unified Communications Manager or Cisco Unified Communications Manager Express. Having these devices tightly integrated with the IP-based phone system is advantageous for increased manageability, scalability, and cost-effectiveness. Commercial businesses can also use the Cisco VG224 in conjunction with Cisco Unified Communications Manager Express to effectively augment an integrated services router environment. This topology environment supports a business that needs a high concentration of analog voice ports for basic calls, with supplementary services such as transfer, hold, park, and pickup.

With Cisco Unified Communications Manager or Cisco Unified Communications Manager Express, the Cisco VG224 can provide supplementary analog services while using the Cisco IOS Software gateway for reliable fax and modem delivery.

Cisco VG248 48-Port Analog Phone Gateway
The Cisco VG248 48-Port Analog Phone Gateway is a 1-unit-high, rack-mountable device allowing 48 analog devices (phones, fax machines, and modems) to be used with Cisco Unified Communications Manager. It allows organizations such as hotels, universities, and hospitals with large numbers of analog phones to deploy IP telephony while maintaining the investment in traditional handsets. The analog lines are full-featured, with caller ID, message waiting lights, and feature codes. The price per port is competitive with a traditional private branch exchange (PBX).

The Cisco VG248 supports the traditional voicemail Simple Message Desk Interface (SMDI) voicemail interface that allows the connection of a Cisco Unified Communications Manager network to a traditional voicemail system. It also allows the sharing of existing SMDI-based voicemail systems between the Cisco Unified Communications Manager and the traditional PBX.

Ideal for Companies that Need These Features
- Cisco VG202 2-Port Analog Phone Gateway—Skinny Client Control Protocol (SCCP), Media Gateway Control Protocol (MGCP), Session Initiation Protocol (SIP), or H.323 support for analog ports; cost-effective, desktop form factor with a fanless design, foreign-exchange-station (FXS) interfaces for Cisco Unified Communications Manager Express (CME) or Cisco Unified Communications Manager applications
- Cisco VG224 24-Port Analog Phone Gateway—SCCP, MGCP, SIP, or H.323 support for analog ports; cost-effective, 1-rack unit (1RU), FXS interfaces for Cisco Unified Communications Manager Express (CME) or Cisco Unified Communications Manager applications
- Cisco VG248 48-Port Analog Phone Gateway—SMDI termination; ability to allow the sharing of Simple Message Desk Interface (SMDI)-based voicemail systems between the Cisco Unified Communications Manager and a traditional private branch exchange (PBX)

Selected Part Numbers and Ordering Information

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>VG202</td>
<td>Cisco VG202 analog phone gateway</td>
</tr>
<tr>
<td>VG204</td>
<td>Cisco VG204 analog phone gateway</td>
</tr>
<tr>
<td>VG224</td>
<td>Cisco VG224 analog phone gateway</td>
</tr>
<tr>
<td>VG248</td>
<td>Cisco VG248 analog phone gateway</td>
</tr>
</tbody>
</table>
Cisco MCS 7800 Series Media Convergence Servers

The Cisco media convergence server product family provides robust hardware platforms for hosting Cisco Unified Communications software products. Technical support, service dispatch, and replacement of failed hardware are provided as part of a standard Cisco maintenance contract.

Cisco MCS 7800 Media Convergence Servers have different model designations based on their capacity and fault-tolerance features. A given Cisco MCS 7800 model will also have different generation designations (such as -H2 or -I2) based on its vintage, specifications, and original manufacturer. An orderable part number for a Cisco MCS 7800 will convey its model, generation, original manufacturer, and whether the server is "bare-metal" shipped with a software media kit, or shipped with a factory preinstalled software image. For example, the Cisco MCS 7835-H2-IPC2 is model 7835, manufacturer HP generation 2, shipped as "bare-metal", vs. the Cisco MCS 7835-H2-K9-CMC1, which is the same hardware but ships with a factory preinstalled image of Cisco Unified Communications Manager 7.0.

Cisco Unified Communications Manager also supports a "software-only" procurement model where servers may be purchased direct from HP and IBM, provided the vendor, make, model, and parts list are exact matches for the corresponding Cisco MCS 7800 model or generation. These hardware specifications can be found at http://www.cisco.com/go/swonly.

Compatibility among Cisco MCS 7800 models or generations and versions of Cisco Unified Communications software should be verified prior to a new order, a hardware migration, or a software upgrade.

Many of these server models also have an optional tape drive (for backups) for purchase.

Cisco MCS 7816
The Cisco MCS 7816 is a 1-rack-unit (1RU) high entry-level server platform with a single CPU, single disk drive, and a single non-hot-swap power supply.

Cisco MCS 7825
The Cisco MCS 7825 is a 1RU high-value server platform with a single CPU, two hard drives - configured as a Redundant Array of Independent Disks 1 (RAID1), and a single non-hot-swap power supply.

Cisco MCS 7828
The Cisco MCS 7828 is a more powerful variant of the Cisco MCS 7825 for use with Cisco Unified Communications Manager Business Edition. Depending on generation, it has a more powerful CPU, more memory, and more hard disk space than the Cisco MCS 7825, but is otherwise identical.

Cisco MCS 7835
The Cisco MCS 7835 is a 2RU high, high-availability server platform with a single CPU, up to eight hot-swap hard disks (though usually only two are supported by the Cisco software), a RAID 1/0 controller, hot-swap redundant fans, and redundant hot-swap power supplies.

Cisco MCS 7845
The Cisco MCS 7845 is a more powerful variant of the Cisco MCS 7835 used for higher-capacity deployments. It uses dual CPUs and up to eight hot-swap hard disks (though usually only four are supported by the Cisco software); otherwise it is identical to the Cisco MCS 7835.

Ideal for Companies that Need These Features
- Cisco MCS 7816—Low-price solution (These media convergence servers are ideal for small customer deployments.)
- Cisco MCS 7825—Small customer deployments where RAID is important (These media convergence servers are ideal for customers with racks.)
- Cisco MCS 7828—Medium-sized customer deployments where RAID is important; Power and fan redundancy (These media convergence servers are ideal for customers with racks.)
- Cisco MCS 7835—Large-sized customer deployments where RAID is important and power and fan redundancy are important (These media convergence servers are ideal for customers with racks.)

Specifications

Selected Part Numbers and Ordering Information
The part number to order depends on a number of factors, including but not limited to:
- The 7800 model, e.g. 7816, 7825, etc.
- The manufacturer and generation, e.g. -H3, -I3, etc.
- Whether the server will be shipped "bare-metal", or with a software media kit, or with a factory pre-installed software image.
- With what software product the server will be used.

Sample part numbers are provided below to illustrate part number syntax for the above factors. Check the documentation for your software product as well as the descriptions of the part numbers below for assistance with ordering the correct hardware.
Cisco ATA Analog Telephone Adapters

The Cisco ATA 186 and ATA 188 Analog Telephone Adaptors bring analog telephones into the networked world. The Cisco ATA products address the low-end product portfolio need by targeting the enterprise, business local services, small-office environment, and the emerging managed voice-services market. These cost-effective handset-to-Ethernet adaptors help enable analog devices, such as phones and fax machines, to support voice-over-IP (VoIP) services.

Cisco ATA adapters can be configured to use the standards-based VoIP protocols Session Initiation Protocol (SIP) and Skinny Client Control Protocol (SCCP).

Ideal for Companies that Need These Features
- Analog devices such as phones and fax machines enabled to support VoIP services by converting the analog signal into an IP signal
- Continuing use of existing analog phones with an IP network

Key Features
- Autoprovisioning with Trivial File Transfer Protocol (TFTP) provisioning servers
- Automatic assignment of IP address, network route IP, and subnet mask through Dynamic Host Configuration Protocol (DHCP)
- Optional web configuration through built-in web server
- Optional touch-tone telephone keypad configuration with voice prompt
- Administration password to protect configuration and access
- High-performance line-echo cancellation to eliminate noise and echo
- Voice activity detection (VAD) and comfort noise generation (CNG) to save bandwidth by delivering voice, not silence
- Dynamic network monitoring to reduce jitter artifacts such as packet loss

Specifications

<table>
<thead>
<tr>
<th>Feature</th>
<th>Cisco ATA 186</th>
<th>Cisco ATA 188</th>
</tr>
</thead>
<tbody>
<tr>
<td>Telephone and network interfaces</td>
<td>2 RJ-11 FXS ports</td>
<td>2 RJ-11 FXS ports</td>
</tr>
<tr>
<td></td>
<td>1 RJ-45 interface for network connections</td>
<td>1 RJ-45 interface for network connections</td>
</tr>
<tr>
<td></td>
<td>1 RJ-45 interface for 2 port connection</td>
<td>1 RJ-45 interface for 2 port connection</td>
</tr>
<tr>
<td></td>
<td>for connection to PC</td>
<td>for connection to PC</td>
</tr>
<tr>
<td></td>
<td>or another downstream Ethernet device</td>
<td>or another downstream Ethernet device</td>
</tr>
<tr>
<td></td>
<td>Note: “Daisy-chaining” multiple A TAs</td>
<td>Note: “Daisy-chaining” multiple A TAs</td>
</tr>
<tr>
<td></td>
<td>together through the second RJ-45 port</td>
<td>together through the second RJ-45 port</td>
</tr>
<tr>
<td></td>
<td>is not supported</td>
<td>is not supported</td>
</tr>
<tr>
<td>Dimensions (H x W x D)</td>
<td>15 x 6.5 x 3.75 in. (38 x 165 x 95 cm)</td>
<td>15 x 6.5 x 3.75 in. (38 x 165 x 95 cm)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>16 oz (425 gm)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>15 oz (425 gm)</td>
</tr>
<tr>
<td>VoIP Protocols</td>
<td>SIP (RFC 2544); SCCP</td>
<td>SIP (RFC 2544); SCCP</td>
</tr>
</tbody>
</table>

Selected Part Numbers and Ordering Information

Cisco ATA Series of Analog Telephone Adaptors

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>A186-1 / A</td>
<td>Cisco ATA 186 1 x port adaptor, complex impedance 600 ohm in series w/ 750 ohm &amp; 150 nF in parallel</td>
</tr>
<tr>
<td>A186-2 / A</td>
<td>Cisco ATA 186 2 x port adaptor, complex impedance 600 ohm in series w/ 750 ohm &amp; 150 nF in parallel</td>
</tr>
</tbody>
</table>

1. Some countries have telephone networks that list multiple impedance requirements, so closely approximate the impedance of the typical handsets used in the region when selecting the proper configuration to avoid poor echo cancellation performance.
Cisco Smart Business Communications System

The Cisco Smart Business Communications System (SBCS) combines voice, data, video, fax, and wireless into a single, purpose-built platform. This easy-to-deploy, easy-to-use solution will change the way customers communicate among their employees and with their customers, helping them become more efficient and more effective. With flexible support for up to 48 users and expansion capabilities for up to 84 users and up to five interconnected offices, the Cisco Smart Business Communications System can grow as customers grow.

Ideal for Companies that Need These Features

- Communications application for a site with fewer than 50 telephony users

Key Features

- Comprehensive connectivity—Cisco Unified Communications 500 Series for Small Business includes robust voice and call-processing capabilities, voice messaging, public-switched-telephone-network (PSTN) and Internet connectivity, integrated firewall, and an optional integrated wireless LAN (WLAN) access point.

- Five Cisco Unified 500 Series can be connected for interoffice calling and transfers, including phone connectivity for remote employees, teleworkers, and other mobile staff.

- The Cisco Smart Business Communications System supports up to five Cisco Unified 500 Series with device-level interfaces for remote employees, teleworkers, and other mobile staff.

- The Cisco Unified Communications 500 Series supports static routing and routing between VLANs and the built-in interfaces.

- Application integration—Desktop applications provide capabilities such as visual access to voicemail, integration with email, click to dial from any application, integrated faxing, and dynamic call recording. These applications include Cisco Unified CallConnector, Microsoft Dynamics CRM software, and additional third-party business-productivity applications.

- Collaboration—The Cisco Smart Business Communications System supports impromptu video communications, instant messaging, and presence capabilities to accelerate business processes for competitive advantage. It provides support for 8-party impromptu voice conferencing and up to 32-party Meet Me conference bridge capabilities.

- Secure wireless—Cisco Mobility Express provides highly secure, integrated business-class wireless network capabilities for greater flexibility. It allows customers to offer wireless guest access to the Internet without providing access to the internal network.

- Simplified management—A GUI-based system configuration and management tool, Cisco Configuration Assistant, makes it easy to set up and administer the Cisco SBCS.

- Reduced complexity and improved reliability—Cisco SBCS reduces the complexity of the typical multivendor small business network and improves reliability through tighter integration of the critical components of an organization’s network and phone system, all supported end to end by Cisco.

- Easy to own—The application is simple to order, with easy finance options available through Cisco Capital (includes Easy Lease); multilevel service options help ensure optimal return on investment (ROI).

- Flexible deployment options—The application works in customer premises, hosted, or managed service scenarios. It is available in desktop or 19-inch rack-mount form factors.

Specifications

<table>
<thead>
<tr>
<th>Feature</th>
<th>Cisco Smart Business Communications System</th>
</tr>
</thead>
<tbody>
<tr>
<td>Platform</td>
<td>Cisco Unified Communications 500 Series, Cisco Catalyst Express 520 Series Switches, Cisco 521 Wireless Express Access Point, Cisco 52E Wireless Express Mobility Controller, Cisco Unified IP Phones</td>
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<tr>
<td>IOS Images</td>
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Selected Part Numbers and Ordering Information

Cisco Smart Business Communications System

<table>
<thead>
<tr>
<th>Product Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>UCSW-4U-18X-K9</td>
<td>4U Unified CME base, Cisco Unity Express, and phone FL, w/4FXO, W1, W2</td>
</tr>
</tbody>
</table>

Cisco Unified Communications 500 Series Models with Optional Integrated WLAN Access Point

<table>
<thead>
<tr>
<th>Product Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>UCSW-4U-18X-K9</td>
<td>4U Unified CME base, Cisco Unity Express, and phone FL, w/4FXO, W1, W2</td>
</tr>
</tbody>
</table>

For More Information

License-based upgrades are available for the Unified Communications 500 Series models. This allows upgrades from the 8-user, desktop form factor version to the 16-user version. In addition, the 24-user system, available in the 19-inch rack mount form factor, can be upgraded to a 32 or 48-user system and a 32 user system can be upgraded to 48 users. A software license upgrade from 48 to 64 users is also available. Upgrades to 64 users must be from a 48 user system; upgrades to 64 users from a 24 or 32 user system are not available.

For customers that want to move from the 8/16-user version to the 24/32/48-user version, a hardware replacement is required. The Cisco to Cisco Technology Migration Program (TMP) will provide a 10 percent credit of the original list price toward the larger system. More information on the TMP can be found at http://www.cisco.com/go/tradein.

For More Information

For more information about the Cisco Smart Business Communications System, visit: http://www.cisco.com/go/sbcs.

Cisco Unified Communications Manager

Cisco Unified Communications Manager focuses on lowering the total cost of ownership for customers and improving the user experience of end users and system administrators. Major highlights include:

- Local route groups and transformation patterns greatly reduce the configuration effort to create dial plans.
- Intelligent bridge selection saves customers money by optimizing the use of video bridge resources.
- Trusted relay points enable trusted quality of service and Call Admission Control, as well as trusted VLAN traversal for unified communications software clients.
- Early offer support with G.729 on Session Initiation Protocol (SIP) trunks provides the savings of low-bandwidth codecs.

Key Features

- Cisco Unified Communications Manager is installed on Cisco 7800 Series Media Convergence Server platforms and selected third-party servers.
- Multiple Cisco Unified Communications Manager servers can be clustered and managed as a single entity. The application offers scalability from 1 to 30,000 IP phones per cluster with load-balancing and call-processing service redundancy. Interlinking allows system capacity to reach 1 million users in a system of more than 100 sites. The solution aggregates the power of multiple, distributed installations, enhancing the scalability and accessibility of the servers to phones, gateways, and applications, and triple call-processing server redundancy improves overall system availability.
- Call Admission Control (CAC) helps ensure that voice quality of service (QoS) is maintained across constricted WAN links, and automatically diverts calls to alternate public-switched-telephone-network (PSTN) routes when WAN bandwidth is not available.
- Devices can automatically update location information as they move from location to location to improve CAC performance.
- Cisco Unified Communications Manager offers improved security, supportability, manageability, as well as usability enhancements to user features, including park, hunt group, Cisco Unified Communications Manager Assistant, and call pickup features that have been supported in past releases.
- This solution effectively supports IP phone activities; Cisco Unified Communications Manager Assistant has been ported to an Extensible Markup Language (XML) service that can be run on the phone, allowing assistants that handle executive and manager phones to have increased features without having to rely on a PC to provide the user interface.
- Cisco Unified Communications Manager integrates with a Lightweight Directory Access Protocol (LDAP) directory such as Active Directory to provide required security features.
- Improved management of mobile and remote devices is achieved by tracking devices as they move from one location to another by mapping the IP address of the phone to a list of configured locations, allowing emergency calls made by mobile devices to call out the correct gateway. The software accurately tracks bandwidth and codec use for CAC purposes.
- Cisco Unified Communications Manager provides improved call routing to remote phones connected over a WAN. It allows alternate routing when the WAN is out of bandwidth or out of service. It provides routing to the originally called phone number through the PSTN or can call an alternate phone such as a mobile phone during a WAN failure or an out-of-bandwidth situation.
- The solution offers improved voice-quality troubleshooting and tracking on Cisco Unified IP Phones. The phones report voice-quality statistics, such as mean opinion score (MOS), to help the user and system administrator track voice quality on a call-by-call basis.
- Access through a full GUI and a command-line interface facilitates diagnostics. The solution supports all system management activities such as disk-space monitoring, system monitoring, and upgrades, which are either automated or controlled. The solution supports basic systems management features such as starting or stopping services and rebooting the appliance. No access to the underlying operating system is necessary.
- The solution is preloaded with Cisco Security Agent.
- A host-based firewall has been added, along with IP Security (IPSec) connectivity between all cluster members.
- An expanded Session Initiation Protocol (SIP) trunk interface conforms to RFC 3261, allowing support of video calls over the SIP trunk and improving conferencing and application support experiences when used with the Cisco Unity and Cisco Unified MeetingPlace solutions. Cisco Unified Communications Manager supports line-side devices, including IETF RFC 3261-compliant devices available from Cisco and other manufacturers.
- The Resource Reservation Protocol (RSVP) agent on a Cisco router extends CAC capability beyond a hub-and-spoke topology within a cluster. Now a call can be routed directly between two locations without having to traverse the hub, allowing alternative network topologies and more efficient use of networks.
- Simple Network Management Protocol (SNMP) support allows managers to set and report traps on conditions that could affect service and send them to the remote-monitoring systems. The solution offers an overall syslog performance MIB, the serviceability interface has instrumented appliance-specific counters, and the programming interface has added the ability to execute insert, update, and delete database commands.
- The solution offers enhanced administration features, such as the ability to add users faster, rearrange line appearances, copy stations, and administer presence groups.

Specifications

<table>
<thead>
<tr>
<th>Feature</th>
<th>Cisco Unified Communications Manager</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>New and Enhanced User Features</strong></td>
<td>For Easier Administration: Saving You Time and Resources—Calling party normalization; E.164 with &quot;+&quot; dialing; Local route groups and transformation; Trusted relay point; Intelligent bridge selection</td>
</tr>
<tr>
<td></td>
<td>Mobility Features—Dial via Office; Directed call park; Reverse callback; Simultaneous ring time-of-day access list</td>
</tr>
<tr>
<td></td>
<td>Greater Interoperability with Partners—Click to conference with IBM Sametime; Simultaneous ring Uniform Resource Identifier (URI) dialing with Microsoft OCS; T.38 Fax interoperability with Microsoft Exchange; Active Directory 2008</td>
</tr>
<tr>
<td></td>
<td>New Telephony Features—Directed call pick up. Do not disturb — call reject; Extension mobility feature safe; Phone services provisioning</td>
</tr>
<tr>
<td></td>
<td>Additional Localization—Estonian; Latvian; Lithuanian</td>
</tr>
<tr>
<td></td>
<td>New SIP Support—Single button barge; Join across lines; Busy-lamp-field (BLF) alert, BLF pickup; Conference chaining. Do not disturb — call reject; Cisco Unified IP Phone 7931G</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Platforms</th>
<th>Media Convergence Server (MCS); Selected third-party servers</th>
</tr>
</thead>
</table>

| Pre-installed Software | Cisco Unified Communications Manager configuration database, administrative software, CDR Analysis and Reporting Tool, Bulk Administration Tool (BAT), Real-Time Monitoring Tool (RTMT), Cisco Conference Bridge, Locale Installer, JTAPI, Telephony Service Provider, Cisco Unified Communications Manager Assistant, Cisco Unified Mobility, Cisco Unified IP Phone Address Book Synchronizer, Cisco Dialed Number Analyzer |

<table>
<thead>
<tr>
<th>Sample Subset of Administrative Features</th>
<th>Conceals seconds calculation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean Opinion Score (MOS) calculation using K-Factor</td>
</tr>
<tr>
<td></td>
<td>Support for password aging, complex password requirements, one-time passwords, with LDAP directory</td>
</tr>
<tr>
<td></td>
<td>Voice-quality statistics on a call-by-call basis</td>
</tr>
<tr>
<td></td>
<td>Application discovery and registration to SNMP manager</td>
</tr>
<tr>
<td></td>
<td>Intelligent Bridge Selection</td>
</tr>
<tr>
<td></td>
<td>Automated alternate routing groups, local route groups, and transformation patterns</td>
</tr>
<tr>
<td></td>
<td>AXL SOAP API with performance and real-time information, bulk administration</td>
</tr>
</tbody>
</table>
Chapter 4

Cisco Unified Communications Manager Assistant

Selected Part Numbers and Ordering Information

For More Information
For more information about Cisco Unified Communications Manager, visit: http://www.cisco.com/go/callmgr.

For more information about Cisco CMA, visit: http://www.cisco.com/go/ipma.

New and Enhanced System Capabilities

- Alternate automatic routing (AAR); Attenuation and gain adjustment per device (phone and gateway)
- Automated bandwidth selection: auto route selection (ARS)
- Codec support for automated bandwidth selection: G.711 (mu-law and a-law), G.722, G.722.1, G.728, G.729A/B, G.323 F/R, G.726 F/R, and wideband audio (proprietary 16-bit resolution, 16 kHz sampled audio). Digit analysis and call treatment (digit string insertion, deletion, stripping, dial access codes, and digit string translation). Distributed call processing—Deployment of devices and applications across an IP network: Virtual clusters of up to eight Cisco Unified Communications Manager servers for scalability, redundancy, and load balancing. Maximum of 7500 IP phones per Cisco Unified Communications Manager server and 30,000 per server cluster (configuration-dependent). Maximum of 100,000 busy-hour call completions (BHCCs) per Cisco Unified Communications Manager server and 250,000 per server cluster (configuration-dependent). Intracluster scalability to more than 100 sites or clusters through H.233 gatekeeper. Intracell feature and management transparency
- Fax over IP—G.711 pass-through and Cisco Fax Relay: Forced authorization codes and client matter codes (account codes), Hotline and private line automated ringdown (PLAR), Hunt groups—Broadcast, circular, longest idle, and linear; Language support for client-user interfaces (languages specified separately)
- Multiple remote Cisco Unified Communications Manager platform administration and debug utilities—Prepackaged alerts, monitor views, and historical reports with RTMT: Real-time and historical application performance monitoring through operating system tools and SNMP: Monitored data collection service: Remote terminal service for off-net system monitoring and alerting: Real-time event monitoring and presentation to common syslog. Trace setting and collection utility: Browse to onboard device statistics. Clusterwide trace setting tool. Trace collection tool: MultiSite (cross-IPAN) capability with interSite CAC
- Off-premises extension (OPX): Outbound call blocking: Out-of-band dual tone multifrequency (DTMF) signaling over IP: PSTN failover on route nonavailability—AAR, Call preservation—redundancy and automated failover—on call-processing failure: Station-to-station
- Security—Device authentication: New model phones have an embedded X.509v3 certificate, a certificate authority proxy function (CAPF) is used to install locally significant certificate in the phones
- Cisco Unified SRST
- Silence suppression and voice activity detection: Simplified North American Numbering Plan (NANP) and non-NANP support: T.38 fax support (H.263 and SIP). Time-of-day, day-of-week, and day-of-year routing and restrictions
- Unified device and system configuration: Unified dial plan
- Video codecs: H.261, H.263, H.264, and Cisco Wideband Video Codec (Cisco Unified Video Advantage)
- Video Telephony (SIP, H.323, and H.264)

1. Additional RAM may be required in Media Convergence Servers to support existing and enhanced services in Cisco Unified Communications Manager:

UNIFIED-CM-7.0 Unified CM 7.0 Top Level Part Number

Cisco Unified Communications Manager Assistant

Cisco Unified Communications Manager Assistant provides the call-routing and call-management capabilities required in a manager or administrative assistant business environment while giving users a choice of phone devices that better fit their needs. By combining a PC-based console application with various softkeys and display panes on Cisco Unified IP Phones, it can present users job-specific tools, such as directories with Click-to-Dial and drag-and-drop functions, to more efficiently manage calls.

Cisco Unified Communications Manager Assistant is configured in either proxy-line mode or shared-line mode. In proxy-line mode, managers and assistants have different directory numbers or lines on their phones, but calls to managers are usually diverted to the assistant's line based on customizable dynamic filters. In shared-line mode, both managers and assistants share the same directory number, but assistants can handle calls without disturbing managers. Either mode can be used in conjunction with the PC-based console application or a new Extensible Markup Language (XML)-based phone service that does not require a PC.

Ideal for Companies that Need These Features

- Administrative assistants who need an efficient way to monitor and manage calls for multiple managers
- Managers who regularly have their calls answered by an assistant

For More Information
For more information about Cisco CMA, visit: http://www.cisco.com/go/ipma.
Cisco Unified Communications Manager Business Edition

Cisco Unified Communications Manager Business Edition is designed for medium-sized businesses with up to 500 employees and up to 20 sites (19 remote sites). The Cisco Unified Communications Manager Business Edition integrates the benefits of voice, video, mobility, and messaging on a single platform. Previously, organizations needed one hardware server for each application. Consolidating applications on a single server makes the Cisco Unified Communications Manager Business Edition a cost-effective solution by eliminating the need to have multiple hardware servers to run each application. It also dramatically simplifies the installation, support, upgrade, and ongoing management of the system, thereby reducing the total cost of ownership (TCO).

Key Features

The Cisco Unified Communications Manager Business Edition inherits nearly all of the core features and functions of the Cisco Unified Communications Manager and Cisco Unity Connection products. Some of the core capabilities are summarized here.

- Call control—In addition to standard telephony features such as call coverage, call transfer, call waiting, hold, conference, park, and pickup, Cisco Unified Communications Manager Business Edition delivers a powerful set of telephony features for medium-sized businesses—for instance, intercom with whisper page, do not disturb, hold reversion, immediate divert to voicemail, and hunt groups.
- Personal Web administration: Cisco Unity Connection allows users to customize their personal settings from a Web browser using the Cisco Unity Connection Assistant. Users can quickly and easily establish or change personal settings such as their voicemail options, security codes, personal distribution lists, and message-delivery options.
- Voice-activated user interface—Cisco Unified Communications Manager Business Edition offers an optional integrated messaging option, delivering voice messages to users' desktop e-mail inboxes.
- Web access to voicemail—The optional Cisco Unity Connection Inbox, a message-access console, provides a dedicated voicemail inbox on the desktop. With the Cisco Unity Connection Inbox, users can immediately view and manage their voicemail messages by using their IP WAN connections for their site-to-site calling instead of using more-expensive PSTN trunks.
- Call Admission Control (CAC)—CAC helps ensure that voice quality of service (QoS) is maintained across constrained WAN links, and it automatically diverts calls to alternate public-switched-telephone-network (PSTN) routes when WAN bandwidth is not available. New medium-sized businesses can save significant costs by using their IP WAN connections for their site-to-site calling instead of using more-expensive PSTN trunks.
- Session Initiation Protocol (SIP) support: SIP support is available in Cisco Unified Communications Manager with support of line-side devices, including IETF RFC 3261-compliant devices available from Cisco and other manufacturers.
- The import/export tool has been updated to allow administrators to export the complete set of Cisco Unified Communications Manager data, making it easier to copy the configuration onto another device for testing and troubleshooting.
- Remote sites—Currently Cisco Unified Communications Manager Business Edition supports up to 20 Survivable Remote Site Telephony (SRST) sites using a centralized call-processing model.
- Survivable Remote Site Telephony (SRST) sites using a centralized call-processing model.
- Conference and calendaring integration—Users can now browse their Microsoft Outlook calendar, Cisco Unified MeetingPlace meetings, or Cisco Unified MeetingPlace Express meetings by simply calling into the voicemail system.
- Personal Web administration: Cisco Unity Connection allows users to customize their personal settings from a Web browser using the Cisco Unity Connection Assistant. Users can quickly and easily establish or change personal settings such as their voicemail options, security codes, personal distribution lists, and message-delivery options.
- Call control—In addition to standard telephony features such as call coverage, call transfer, call waiting, hold, conference, park, and pickup, Cisco Unified Communications Manager Business Edition delivers a powerful set of telephony features for medium-sized businesses—for instance, intercom with whisper page, do not disturb, hold reversion, immediate divert to voicemail, and hunt groups.
- Personal Web administration: Cisco Unity Connection allows users to customize their personal settings from a Web browser using the Cisco Unity Connection Assistant. Users can quickly and easily establish or change personal settings such as their voicemail options, security codes, personal distribution lists, and message-delivery options.
- Voice-activated user interface—Cisco Unified Communications Manager Business Edition offers an optional integrated messaging option, delivering voice messages to users' desktop e-mail inboxes.
- Web access to voicemail—The optional Cisco Unity Connection Inbox, a message-access console, provides a dedicated voicemail inbox on the desktop. With the Cisco Unity Connection Inbox, users can immediately view and manage their voicemail messages by using their IP WAN connections for their site-to-site calling instead of using more-expensive PSTN trunks.
- Call Admission Control (CAC)—CAC helps ensure that voice quality of service (QoS) is maintained across constrained WAN links, and it automatically diverts calls to alternate public-switched-telephone-network (PSTN) routes when WAN bandwidth is not available. New medium-sized businesses can save significant costs by using their IP WAN connections for their site-to-site calling instead of using more-expensive PSTN trunks.
- Session Initiation Protocol (SIP) support: SIP support is available in Cisco Unified Communications Manager with support of line-side devices, including IETF RFC 3261-compliant devices available from Cisco and other manufacturers.
- The import/export tool has been updated to allow administrators to export the complete set of Cisco Unified Communications Manager data, making it easier to copy the configuration onto another device for testing and troubleshooting.
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- Personal Web administration: Cisco Unity Connection allows users to customize their personal settings from a Web browser using the Cisco Unity Connection Assistant. Users can quickly and easily establish or change personal settings such as their voicemail options, security codes, personal distribution lists, and message-delivery options.
- Voice-activated user interface—Cisco Unified Communications Manager Business Edition offers an optional integrated messaging option, delivering voice messages to users' desktop e-mail inboxes.
Specifications

Platform
The Cisco Unified Communications Manager Business Edition software suite is supported on the Cisco MCS 7828 Unified Communications Manager Business Edition Appliance, a member of the Cisco media convergence server portfolio.

System Capacities

<table>
<thead>
<tr>
<th>Maximum total users</th>
<th>500</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mailboxes and voicemail ports</td>
<td>500 mailboxes and 16 voicemail ports</td>
</tr>
<tr>
<td>Number of remote sites</td>
<td>20 (centralized call processing, with Cisco Unified Survivable Remote Site Telephony [SRST] for redundancy)</td>
</tr>
</tbody>
</table>

Telephony and voicemail feature limitations
Cisco Unified Communications Manager Business Edition supports all the standard telephony features of Cisco Unified Communications Manager and voice-messaging features of Cisco Unity Connection except the following:
- Call processing and voicemail redundancy
- Distributed call processing—Cisco Unified Communications Manager Business Edition is supported only in the centralized call-processing model with Cisco Unified SRST

User and Administrator Features
For a summary of user and administrator features, please refer to the Cisco Unified Communications Manager 7.0 and Cisco Unity Connection 7.0 data sheets.

Localization
The Cisco Unified Communications Manager Business Edition supports 14 core languages for user locales, the voicemail telephone user interface, and the GUI.
In addition to the core languages, Cisco Unified Communications Manager supports an additional 13 user localizations. Refer to the data sheet for full details.

Cisco Unified Workspace Licensing Business Edition
Cisco Unified Workspace Licensing Business Edition extends the concept of workspace licensing to Cisco Unified Communications Manager Business Edition. Cisco Unified Workspace Licensing Business Edition offers a new easy and affordable way for customers to procure and deploy a broad range of Cisco unified applications and services. The Cisco Unified Communications Manager Business Edition Workspace Bundle includes all the clients, server software licenses, services, and software subscriptions that facilitate consistent deployment of multiple applications to all users in their workspace.

The following chart shows the functions available under the two licenses available for Cisco Unified Communications Manager Business Edition.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Presence</td>
<td>Cisco Unified Presence Profile</td>
<td>N</td>
<td>Y</td>
</tr>
<tr>
<td>Mobility</td>
<td>Cisco Unified Mobility Profile</td>
<td>N</td>
<td>Y</td>
</tr>
<tr>
<td>Soft client</td>
<td>Cisco Unified Personal Communicator or Cisco IP Communicator with Cisco Unified Video Advantage</td>
<td>N</td>
<td>Y</td>
</tr>
<tr>
<td>Phone license</td>
<td>Cisco unified IP Phone license</td>
<td>N</td>
<td>Y (1 phone any model)</td>
</tr>
<tr>
<td>Messaging</td>
<td>Voice messaging (VM) or Integrated messaging, including Automatic Speech Recognition (ASR), Text-To-Speech (TTS), and Web and e-mail access</td>
<td>VM</td>
<td>VM, Integrated Messaging, ASR, and TTS</td>
</tr>
<tr>
<td>Call Processing</td>
<td>Cisco Unified Communications Manager</td>
<td>Y</td>
<td>Y</td>
</tr>
</tbody>
</table>

Selected Part Numbers and Ordering Information
Cisco Unified Communications Manager Business Edition can be ordered in a couple of different ways, either independently (with traditional licenses) or as part of a workspace bundle (with workspace licenses).
Both Cisco Unified Communications Manager Business Edition licenses require purchasing a starter bundle. The starter bundles include all the unified communications server and client software for the applications included under the licenses, the Cisco MCS 7828 server hardware for deploying Cisco Unified Communications Manager Business Edition, and licenses for the first 50 users.
To deploy Cisco Unified Presence, customers need to purchase a separate adjunct server.
Cisco Unified Workspace Licensing-Business Edition requires a prerequisite 3-year Cisco Unified Communications Software Subscription contract, which entitles customers to upgrades for all the client and server application software covered under the license. One-year agreements are available for government and education customers subject to applicable laws regarding multiyear contracts. In addition, 1-month contracts are available to enable co-termination when users are added during the course of a 3-year contract. A valid Essential Operate Services contract is required to activate the Cisco Unified Communications Software Subscription contract. Continue reading this ordering guide for details.

MCS7828I3-K9-WL - CUCMBE, medium-sized appliance, Workspace License 50 Users
MCS7828H3-K9-WL - CUCMBE, high-end appliance, Workspace license 100 Users
Cisco Unified Communications Manager Express

Cisco Unified Communications Manager Express delivers complete IP telephony and unified communications features on an all-in-one platform that facilitates voice, video, and data networking convergence.

Ideal for Companies that Need These Features

- Cisco Unified Communications Manager Express on Cisco integrated services routers—Data networking capabilities and would like to enable IP voice and unified communications on the same platform (for customers with up to 250 employees in their headquarters or branch office)
- IP voice and unified communications enabled on the same platform (for customers who have an appropriate Cisco integrated services router)
- Cisco Unified Communications Manager Express on the Cisco Unified Communications 500 Series for Small Business—Voice and basic security feature set for small business that is easy to set up and use (for customers who already have a Cisco integrated services router or a customer-premises-equipment [CPE] router for WAN connectivity)
- A converged voice and data solution (for customers with up to 64 employees per site at up to five sites networked together)

Key Features

- A cost-effective, converged data and voice solution inside Cisco integrated services routers
- Key system and small private-branch-exchange (PBX) features plus innovative convergence applications for up to 250 users
- Increased user productivity with Cisco Unified CallConnector for Microsoft Windows, a presence-based Windows application that gives users call control, location, and status of other users
- Single-number-reach function, which can forward incoming business calls to mobile or home phones based on user-specified call-handling rules
- An intuitive GUI for easy installation; adds, moves, and changes
- Interworking with Cisco Unified Communications Manager
- Industry-leading investment protection for future growth

Specifications

### Selected Part Numbers and Ordering Information

Cisco Integrated Service Routers Unified Communications Bundles that include the Cisco Router, Cisco Unified Communications Manager Express Feature License, Cisco Unity Express hardware and licensing, Cisco Unified IP Phone licensing and Cisco Unified CallConnector for Microsoft Windows licensing.

<table>
<thead>
<tr>
<th>Feature</th>
<th>Cisco Unified Communications Manager Express</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Platform</strong></td>
<td>Cisco 1861, 2801, 2811, 2821, 2851, 3200, 3270, 3825, and 3845 Integrated Services Routers. Cisco Unified 500 Series as part of Cisco Smart Business Communications System</td>
</tr>
<tr>
<td><strong>Phones Supported</strong></td>
<td>All Cisco Unified IP Phones 7900 Series and Cisco Unified SIP Phones 3900 Series</td>
</tr>
<tr>
<td><strong>IOS Images</strong></td>
<td>Version 3.3 supported with IOS 12.4; Version 3.4 with IOS 12.4(2), Version 4.0 with IOS 12.4(3); Version 4.1 with 12.4(4)T; Version 7.0 with 12.4(9)T</td>
</tr>
</tbody>
</table>

**Selected Part Numbers and Ordering Information**

- **C3845-35UC-VSEC/K9** UC plus Security with Cisco Unity Express—Cisco 3800 Series Integrated Services Routers: Cisco 3845 base router, 128 MB flash, 512 MB DRAM, DSP-64, NME-CUE, CCME FL for 35 users, CUE FL for 35 users, 35 phone device licenses, Cisco IOS Advanced IP Services, 10 UCC desktop client licenses
- **C2851-35UC-VSEC/K9** UC plus Security with Cisco Unity Express—Cisco 2800 Series Integrated Services Routers: Cisco 2851 base router, 128 MB flash, 256 MB DRAM, DSP-48, NME-CUE, CCME FL for 35 users, CUE FL for 35 users, 35 phone device licenses, Cisco IOS Advanced IP Services, 10 UCC desktop client licenses
- **C2821-25UC-VSEC/K9** UC plus Security with Cisco Unity Express—Cisco 2800 Series Integrated Services Routers: Cisco 2821 base router, 128 MB flash, 256 MB DRAM, DSP-32, AIM-CUE, CCME FL for 25 users, CUE FL for 25 users, 25 phone device licenses, Cisco IOS Advanced IP Services, 5 UCC desktop client licenses
- **C2801-10UC-VSEC/K9** UC plus Security with Cisco Unity Express—Cisco 2800 Series Integrated Services Routers: Cisco 2801 base router, 128 MB flash, 256 MB DRAM, DSP-32, AIM-CUE, CCME FL for 10 users, CUE FL for 10 users, 10 phone device licenses, Cisco IOS Advanced IP Services, 2 UCC desktop client licenses
- **C3845-35UC/K9** UC with Cisco Unity Express—Cisco 3800 Series Integrated Services Routers: Cisco 3845 base router, 128 MB flash, 512 MB DRAM, DSP-64, NME-CUE, CCME FL for 35 users, CUE FL for 35 users, 35 phone device licenses, Cisco IOS SP Services, 10 UCC desktop client licenses
- **C2851-35UC/K9** UC with Cisco Unity Express—Cisco 2800 Series Integrated Services Routers: Cisco 2851 base router, 128 MB flash, 256 MB DRAM, DSP-48, NME-CUE, CCME FL for 35 users, CUE FL for 35 users, 35 phone device licenses, Cisco IOS SP Services, 10 UCC desktop client licenses
- **C2821-25UC/K9** UC with Cisco Unity Express—Cisco 2800 Series Integrated Services Routers: Cisco 2821 base router, 128 MB flash, 256 MB DRAM, DSP-32, AIM-CUE, CCME FL for 25 users, CUE FL for 25 users, 25 phone device licenses, Cisco IOS SP Services, 5 UCC desktop client licenses
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Cisco Communications Manager Express Voice Bundles that include the Cisco Router with IOS Software voice features and Communications Manager Express Feature License:

- **Cisco Communications Manager Express Voice + Security Bundles** that include the Cisco Router with an IOS Software Security feature and Communications Manager Express Feature License:

For More Information

For more information about the Cisco Unified Communications Manager Express, visit: http://www.cisco.com/go/ccme.

Cisco Unified Survivable Remote Site Telephony

Cisco Unified Survivable Remote Site Telephony (SRST) provides critical backup telephony functions at remote branch offices when connectivity to the centrally located Cisco Unified Communications Manager fails (that is, the WAN link is interrupted). During WAN outage the Cisco Unified SRST-enabled router provides robust telephony services (including off-net calls to 911). This product is ideal for enterprise organizations looking to cost-effectively deploy IP telephony in their branch-office locations. Cisco Unified SRST is available on the Cisco 880 Series, 1861, and 2800 and 3800 Series Integrated Services Routers and the Cisco Catalyst 6500 Series Switches using the Cisco Communications Media Module (CMM).

**Key Features**

- Business resiliency is achieved through redundant, localized call processing with intelligent and automatic failover configuration—no manual IT or telecom intervention is required.
- This single appliance device is ideal for routing, security, public switched telephone network (PSTN) gateway services, and call control during WAN outages.
- Cisco Unified SRST supports all Cisco Unified IP Phones, supporting 8 to 730 phones per platform.
- All common PSTN interfaces and protocols are supported, in addition to support for both internal and external calling during failover with calls maintained during failover and fall-back.
- Voicemail is supported during WAN outages with local Cisco Unity Express or centralized Cisco Unity unified messaging through the PSTN.

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<table>
<thead>
<tr>
<th>SRST Platform Density and Feature License*</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Part Number</strong></td>
</tr>
<tr>
<td>-----------------</td>
</tr>
<tr>
<td>Included</td>
</tr>
<tr>
<td>Included</td>
</tr>
<tr>
<td>FL-SRST1-2B</td>
</tr>
<tr>
<td>FL-SRST1-3I</td>
</tr>
<tr>
<td>FL-SRST1-5I</td>
</tr>
<tr>
<td>FL-SRST1-10G</td>
</tr>
<tr>
<td>FL-SRST1-40B</td>
</tr>
</tbody>
</table>

*Available with IOS Version 12.3(15)T release

**For More Information**

For more information about the Cisco Unified Communications Manager Express, visit: [http://www.cisco.com/go/ccme](http://www.cisco.com/go/ccme).

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<td>-----------------</td>
</tr>
<tr>
<td>Included</td>
</tr>
<tr>
<td>Included</td>
</tr>
<tr>
<td>FL-SRST1-2B</td>
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<td>FL-SRST1-3I</td>
</tr>
<tr>
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</tr>
<tr>
<td>FL-SRST1-10G</td>
</tr>
<tr>
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**For More Information**

For more information about the Cisco Unified Communications Manager Express, visit: [http://www.cisco.com/go/ccme](http://www.cisco.com/go/ccme).
Cisco Unified IP Phones 7900 Series

With Cisco Unified IP Phones, organizations can take full advantage of converged voice and data networks while retaining the convenience and user friendliness they expect from a business phone. Cisco Unified IP Phones help improve productivity by meeting the needs of different users throughout organizations. Cisco Unified IP Phone 7975G, 7965G, 7962G, 7945G, and 7942G models are advanced media endpoints, integrating wideband audio to deliver rich, high-fidelity audio performance. The Cisco Unified IP Phone 7975G, 7965G, and 7945G models come standard with an integrated Gigabit Ethernet port, providing for additional bandwidth when connecting to a PC or server at the desktop. The Cisco Unified IP Phone 7975G, 7965G, and 7945G models address the communication needs for medium to high phone traffic environments. The Cisco Unified IP Phone 7942G, 7941G, and 7940G models address the communication needs for low to medium telephone traffic. The Cisco Unified IP Phone Expansion Modules 7915 and 7916 provide additional buttons and LCD displays to the Cisco Unified IP Phone 7975G, 7965G, 7961G, and 7960G models, increasing the total number of buttons to 20 with one module, or 34 with two modules. High-quality, hands-free conferencing, designed for use on desktops and offices and in small to medium-sized conference rooms, is supported by the Cisco Unified IP Conference Station 7937G and 7936 models. The Cisco Unified IP Conference Station 7937G adds wideband capability and a larger backlit LCD display. For an all-in-one video solution, the Cisco Unified IP Phone 7985G is a personal desktop video phone with a camera and color video screen in one unit. For mobile professionals within the campus, the Cisco Unified Wireless IP Phone 7921G and 7925G models are easy-to-use wireless endpoints that provide comprehensive voice communications in conjunction with Cisco Unified Communications Manager and the Cisco Unified Wireless Network. IEEE 802.11 a,b,g standards allow customers to use the phone in the 2.4- or 5-GHz bands.

Key Features

- Large color LCD displays available on selected models
- Touchscreen capability on Cisco Unified IP Phone 7975G
- Dynamic softkeys for call features and functions
- Support for information services, including XML capabilities to extend IP phone systems
- Customizable XML-based services to access a variety of information, such as stock quotes, employee directories, and web-based content
- Automatic phone discovery VLAN configuration, and registration
- Quality of service (QoS) through support of 802.10/p, in addition to configurable Differentiated Services (DiffServ) and type of service (ToS)
- Voice Activity Detection (VAD), silence suppression, comfort-noise generation, and error concealment
- G.711, G.711u, and G.722 audio-compression codec support; most models also support the G.722 wideband codec
- Software upgrade support through a Trivial File Transfer Protocol (TFTP) server
- Ethernet connectivity for a downstream PC; selected models add Gigabit Ethernet port integration
- Integrated inline power support, which allows the phone to receive power over the LAN
- Hearing-aid-compatible handset

Specifications

<table>
<thead>
<tr>
<th>Feature</th>
<th>SIP 3911</th>
<th>7906G</th>
<th>7911G</th>
<th>7931G</th>
<th>Conf. Station 7936G</th>
</tr>
</thead>
<tbody>
<tr>
<td>Integral Switch</td>
<td>No</td>
<td>No</td>
<td>10/100</td>
<td>10/100</td>
<td>No</td>
</tr>
<tr>
<td>Display</td>
<td>144x32 monochrome</td>
<td>192x64 monochrome</td>
<td>192x64 monochrome</td>
<td>192x64 graphical, monochrome, backlit</td>
<td>Pixel-based</td>
</tr>
</tbody>
</table>
## Chapter 4

### Cisco Unified IP Phones 7900 Series

<table>
<thead>
<tr>
<th>Feature</th>
<th>7937G</th>
<th>7940G</th>
<th>7941G</th>
<th>7942G</th>
<th>7945G</th>
<th>7960G</th>
</tr>
</thead>
<tbody>
<tr>
<td>Feature Conf. Station</td>
<td>7937G</td>
<td>7940G</td>
<td>7941G</td>
<td>7942G</td>
<td>7945G</td>
<td>7960G</td>
</tr>
<tr>
<td>Integral Switch</td>
<td>No</td>
<td>10/100</td>
<td>10/100</td>
<td>10/100/1000</td>
<td>10/100/1000</td>
<td>10/100</td>
</tr>
<tr>
<td>Display</td>
<td>Pixel-based Monochrome, 4-bit grayscale, 5&quot;</td>
<td>Digital, 16-bit graphical backlit TFT Color 5&quot;</td>
<td>Digital, 16-bit graphical backlit TFT Color 5&quot;</td>
<td>Digital, 16-bit graphical backlit TFT Color 5&quot;</td>
<td>Digital, 16-bit graphical backlit TFT Color 5&quot;</td>
<td>Digital, 16-bit graphical backlit TFT Color 5&quot;</td>
</tr>
<tr>
<td>Programmable (line) keys</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>24</td>
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<tr>
<td>Programmable (soft) keys</td>
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<td>Speakerphone</td>
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<td>Yes</td>
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<td>Headset port</td>
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<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
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<tr>
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<td>Limited</td>
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<tr>
<td>ILBC support</td>
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<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td></td>
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<tr>
<td>&quot;5-way&quot; navigation cluster</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
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<tr>
<td>XML application</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
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<tr>
<td>Extension mobility</td>
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<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
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<tr>
<td>Video Advantage Camera support</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
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<td>Signaling protocol</td>
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<td>SCCP</td>
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### Cisco Unified IP Phones 7900 Series

<table>
<thead>
<tr>
<th>Feature</th>
<th>7961G</th>
<th>7962G</th>
<th>7965G</th>
<th>7975G</th>
<th>7985G</th>
<th>7921G/7925G</th>
</tr>
</thead>
<tbody>
<tr>
<td>Integral Switch</td>
<td>10/100</td>
<td>10/100</td>
<td>10/100/1000</td>
<td>10/100/1000</td>
<td>10/100</td>
<td>N/A</td>
</tr>
<tr>
<td>Display</td>
<td>4-bit grayscale, 5&quot;</td>
<td>4-bit grayscale, 5&quot;</td>
<td>Digital, 16-bit graphical backlit TFT Color 5&quot;</td>
<td>Digital, 16-bit graphical backlit TFT Color 5&quot;</td>
<td>8.4&quot; color for 2-way video</td>
<td>Digital, 16-bit graphical backlit TFT Color 2&quot;</td>
</tr>
<tr>
<td>Programmable (line) keys</td>
<td>6-lighted</td>
<td>6-lighted</td>
<td>6-lighted</td>
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<td>Yes</td>
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<td>Yes</td>
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</tr>
</tbody>
</table>

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Cisco Unified IP Phones 7900 Series  4-23
Cisco Unified Department and Business Attendant Consoles

Cisco Unified Department and Unified Business Attendant Consoles are feature-rich operator applications that are designed specifically for the growing Cisco Unified Communications Manager customer. Associated with a Cisco Unified IP Phone, these applications enable a human attendant console operator to quickly accept and effectively dispatch incoming calls to enterprise users. From the small department setting supporting up to 150 IP phones to the mid-size business with up to 500 IP phones, these feature-rich applications provide the tools for the operator to provide high-level customer service.

Ideal for Companies that Need These Features
- Administrative personnel (operator) who can quickly accept calls, easily look up busy status, and effectively dispatch incoming calls by supporting either blind or consultative transfer to enterprise users.
- Prioritized call queues.

Key Features
- Cisco Unified Department Attendant Console
- This application supports a maximum of 150 Cisco Unified IP Phones and two operator clients per department.
- A rich feature set includes a call queuing engine, busy status, as well as directory search capabilities that are integrated into the Cisco Unified Communications Manager directory.
- One call queue and three directory search options allow the department administrators to quickly find call destinations and effectively dispatch calls. These search options include last name, first name, and extension.
- Cisco Unified Business Attendant Console
- This application supports a maximum of 500 Cisco Unified IP Phones and up to six operator clients per Cisco Unified Communications Manager Business Edition.

Selected Part Numbers and Ordering Information

For More Information
Chapter 4

Cisco Emergency Responder

The application includes a powerful queuing engine to direct the calls to the operator and provides the operator several monitoring features to help ensure that incoming calls are handled efficiently. Four directory search options allow the operator to quickly find call destinations and quickly dispatch calls.

For the operator who needs in-depth presence information, Cisco Unified Presence can be integrated with the Cisco Unified Business Attendant Console.

Selected Part Numbers and Ordering Information

For More Information

For more information about Cisco Unified Department and Business Consoles, visit:

Cisco Emergency Responder

Cisco Emergency Responder enhances emergency calling from Cisco Unified Communications Manager. It helps ensure that Cisco Unified Communications Manager sends emergency calls to the appropriate Public Safety Answering Point (PSAP) and then helps the PSAP identify the caller’s location and, if necessary, return the call.

Key Features

- Cisco Emergency Responder automatically tracks IP phone locations by their MAC or IP addresses, eliminating the need for administrators to update location when an IP phone is relocated.
- Cisco Emergency Responder provides instructions to Cisco Unified Communications Manager to route emergency calls to a public-switched-telephone-network (PSTN) gateway capable of reaching the responsible Physical Service Access Point (PSAP) for the caller’s location.
- Cisco Emergency Responder identifies the caller’s location to local exchange carriers (LECs) and PSAPs, replacing the calling-party number associated with an emergency call with one that corresponds to the caller’s location, eliminating the need to update the Automatic Location Information (ALI) database when an IP phone is relocated.
- Cisco Emergency Responder integrates with Intrado V9-1-1 service, centralizing and automating the initial administration of Emergency Location Identification Numbers (ELINs) and Emergency Response Locations (ERLs) for on-premises users, and facilitating emergency call completion with user-entered location information for off-premises users.
- Cisco Emergency Responder facilitates PSAP callback to reach the most recent callers from each location, including callers from stations without direct-inward-dialing (DID) numbers.
- Cisco Emergency Responder provides voice, web and email alerts to customer security personnel, enabling them to assist emergency callers immediately, and to direct fire, police, or ambulance services when they arrive.
- Cisco Emergency Responder is a software appliance that simplifies software installation and upgrade and enhances system security and stability.

Specifications

<table>
<thead>
<tr>
<th>Feature</th>
<th>Cisco Emergency Responder</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supported Platform</td>
<td>Cisco 7800 Series Media Convergence Servers</td>
</tr>
<tr>
<td>Software Compatibility</td>
<td>Cisco Operations Manager, Cisco Unified Communications Manager</td>
</tr>
</tbody>
</table>

For more information about specific models and releases supported, visit:
Cisco IP Communicator

Cisco IP Communicator is a software-based application that gives computers the capabilities and features of Cisco Unified IP Phones, providing high-quality voice calls and connection to company services for employees from on the road, in the office, or wherever they may have access to the corporate network. When registered to the Cisco Unified Communications Manager call-processing system, Cisco IP Communicator has the features and functions of a full-featured Cisco Unified IP Phone, including the ability to transfer calls, forward calls, and add additional participants to an existing conference call.

Ideal for Companies that Need These Features

- A softphone that provides high-quality voice calls and extensive telephony features
- A supplemental telephone that provides access to phone extensions and services outside the office

Selected Part Numbers and Ordering Information

For More Information


Cisco Unified Application Environment

Cisco Unified Application Environment offers an increasingly rich portfolio of ready-to-use packaged applications that deliver immediate out-of-box value and custom development tools that allow clients to transform their business by integrating unified communications into other business applications as well as build their own custom applications.

System Capacity

<table>
<thead>
<tr>
<th></th>
<th>MCS 7816</th>
<th>MCS 7825</th>
<th>MCS 7835</th>
<th>MCS 7845</th>
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<tr>
<td>Automatically Tracked Phones</td>
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<td>12,000</td>
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<tr>
<td>Manually Configured Phones</td>
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<td>2,500</td>
<td>5,000</td>
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<td>Roaming Phones (per Cisco Emergency Responder Cluster)</td>
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<tr>
<td>Switches</td>
<td>200</td>
<td>500</td>
<td>1,000</td>
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<tr>
<td>Switch Ports</td>
<td>12,000</td>
<td>30,000</td>
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</tr>
</tbody>
</table>

For More Information

For more information about Cisco Emergency Responder, visit: http://www.cisco.com/go/cr.
Key Features

- A rich portfolio of packaged applications available today, with more being added each month. These applications span a wide variety of markets; some are designed for specific industries such as retail and healthcare, whereas others are applicable to all industries.
- These automated test tools perform functional, load, system, and regression tests to reduce test cycles and increase the success rate of project completion.
- This set of application lifecycle management tools standardizes, centralizes, and automates management of all unified communications applications.
- A standard applications container facilitates development, quality assurance, and operations to collaboratively manage scalability, performance, and reliability of all unified communications applications.
- The solution summarizes implementation differences across products and versions to minimize interoperability challenges, so customers can upgrade their unified communications infrastructure without breaking their applications.
- Increased support for integrated development environments including Eclipse and Microsoft Visual Studio, allows web and enterprise developers who lack telephony skills to easily and rapidly develop feature-rich applications.

Specifications

<table>
<thead>
<tr>
<th>Components</th>
<th>Cisco Unified Application Environment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cisco Unified Application Designer</td>
<td>The Cisco unified application designer is a visual integrated development environment (IDE). Without learning the complex details of telephony protocols, developers with little or no IP communications development expertise can use the Cisco Unified Application Designer to easily and rapidly develop rich applications that converge voice and video with enterprise applications and data.</td>
</tr>
<tr>
<td>Cisco Unified Application Server</td>
<td>The Cisco unified application server is an application server for converged voice, video and data applications. It abstracts the complexity of telephony protocols, protects the reliability of the IP PBX from the applications, and provides a standard way to manage applications.</td>
</tr>
<tr>
<td>Cisco Unified Media Engine</td>
<td>The Cisco unified media engine is a software-only media server it provides ready-to-use and sophisticated media processing capabilities for all applications built using the Cisco unified Application Designer.</td>
</tr>
</tbody>
</table>

Selected Part Number and Ordering Information

Configuration and ordering of Cisco Unified Application Environment products can be complicated because of the arbitrary and highly variable nature of the application developed. Please consult your Cisco account team or channel partner if you have any configuration, ordering and pricing questions.

For More Information

For more information about Cisco Unified Application Environment, visit:

Cisco Unified MeetingPlace Conferencing

Cisco Unified MeetingPlace conferencing is a rich-media collaboration solution within Cisco Unified Communications. It delivers an exceptional user experience with integrated voice, video, and web collaboration and industry-leading setup, attendance, and in-meeting controls. You can realize significant cost savings and security because the solution is deployed on-premises, over your IP network. In addition, the Cisco Unified MeetingPlace solution extends the value of Cisco WebEx meeting applications with integrated, on-premises voice conferencing.

Key Features

- Cost savings—Cisco Unified MeetingPlace conferencing is deployed on-premises on an organization's converged IP network, a scenario that can reduce costs by virtually eliminating conferencing telephony and service fees paid to service providers.
- Deployment flexibility—On-premises voice conferencing for Cisco WebEx meeting applications—You can deploy the Cisco Unified MeetingPlace solution as a complete on-premises voice, video, and web conferencing solution or integrate it with Cisco WebEx web conferencing services. These solutions together combine the cost savings advantages of on-premises voice conferencing with the productivity benefits of on-demand web conferencing.
- Tightly integrated rich-media conference setup—Cisco Unified MeetingPlace conferencing supports multiple interfaces for initiating impromptu conferences or scheduling future rich-media conferences. In a single step, meeting organizers can schedule or initiate immediate voice, video, and Web resources through a Web interface, touch-tone and Cisco Unified IP Phone, and Microsoft Outlook or IBM Lotus Notes calendar.
- Easy attendance of rich-media conferences—Attending a rich-media conference is as simple as a single mouse click. Cisco Unified MeetingPlace conferencing simultaneously launches the Web conference and dials out to the user's voice or video endpoint (either a room-based video system or desktop endpoint). Participants can also connect to the voice and video portions of the conference by directly dialing in from any video endpoint or telephone.
- Advanced rich-media conference capabilities and control:
- Cisco Unified MeetingPlace conferencing tightly integrates voice, video, and Web conferencing capabilities for highly engaging and productive virtual meetings and interactions. With feature-rich voice, video, and Web conferencing capabilities, support for presentation of rich content, and preconfigured meeting application templates, Cisco Unified MeetingPlace conferencing gives organizations a single conferencing solution that meets a wide range of conferencing needs, including collaborative meetings, presentations, training, and Web seminars.

- Cisco Unified MeetingPlace conferencing provides industry-leading in-meeting controls within the Web conference. Without disrupting a meeting, users know who is attending, how users are attending (voice, video, or web), who is speaking, and who is sharing.

- With carrier-grade hardware and a dedicated on-network system, Cisco Unified MeetingPlace delivers the scalability, reliability, simplified administration, security, and cost-effectiveness that IT organizations require.

- Security:
  - The solution offers a dedicated on-network system; each customer is provided with a dedicated Cisco Unified MeetingPlace solution integrated with the private network.
  - The solution offers Internet lockout controls; meetings can be set up as internal-only meetings and held entirely behind the corporate firewall or as external meetings that are accessible to Internet and internal participants. Administrators and meeting organizers have complete control.
  - The solution offers access authentication, encryption, and in-session meeting controls.

- For More Information
  For more information about Cisco Unified MeetingPlace conferencing, visit: http://www.cisco.com/go/meetingplace.

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Cisco Unified MeetingPlace Express
Cisco Unified MeetingPlace Express, part of the Cisco Unified Communications family of products, is an integrated voice, Web, and video conferencing solution that helps midsize organizations realize the cost savings and productivity benefits of deploying conferencing over internal networks. Cisco Unified MeetingPlace Express provides simple, powerful conferencing functions that are easy to deploy and manage. As a component of the Cisco Unified Communications System, Cisco Unified MeetingPlace Express delivers productivity that goes beyond traditional conferencing solutions by enabling rich-media conferencing used in a broad range of communication scenarios.

Key Features
- Cost savings and security—Cisco Unified MeetingPlace Express is deployed in-house on an organization’s converged IP network, a scenario that can reduce costs by virtually eliminating conferencing telephony and service fees paid to service providers.
- Easy deployment and management—Cisco Unified MeetingPlace Express is a software solution installed on a single server that supports industry-standard protocols (H.323 and SIP), to help ensure connectivity with a range of telephony systems, including Cisco Unified Communications Manager and Cisco Unified Communications Manager Express.
- Simple conference setup and attendance—Cisco Unified MeetingPlace Express includes Microsoft Outlook, Web, Cisco Unified IP Phone, and touchtone phone interfaces for setting up and attending meetings. In a single step, meeting organizers can initiate an immediate (reservationless) voice, Web, and video conference from any of these interfaces.
- Advanced voice, web, and video conferencing—Cisco Unified MeetingPlace Express tightly integrates voice, Web, and video conferencing capabilities, making it well-suited for interactive meetings and presentations. Meeting attendees experience high-quality voice conferencing, and video participants see the person who is speaking or the person who last spoke.
- Cisco Unified MeetingPlace Express provides innovative meeting-management functions that facilitate more productive meetings. From the Web interface, users can mute and unmute themselves, see who is in the meeting and how they are participating (voice, video, or Web), see who is speaking, and see who is sharing content.
- Cisco Unified Personal Communicator users can share content through a simple screen-sharing interface served by Cisco Unified MeetingPlace Express. In addition to adding impromptu Web conferencing support, Cisco Unified Personal Communicator environments can add multiparty voice and video capabilities with Cisco Unified MeetingPlace Express VT.
- Security—Security features include Secure Sockets Layer (SSL) encryption, behind-the-firewall deployment, and multiple meeting security options, including meeting access authentication and in-meeting controls such as “lock-meeting” and “remove-participants” functions. The solution offers Internet lockout controls; meetings can be set up as internal-only meetings and held entirely behind the corporate firewall or as external meetings that are accessible to Internet and internal participants. Administrators and meeting organizers have complete control.

Specifications

<table>
<thead>
<tr>
<th>Feature</th>
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<td>IP Phone Application Compatibility</td>
<td>Cisco Unified IP Phone 7940 Series, Cisco Unified IP Phone 7960 Series, Cisco Unified IP Phone 7970 Series, Cisco IP Communicator</td>
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For More Information

Cisco Unified Mobile Communicator

As an integral part of the Cisco Unified Communications Family of products, Cisco Unified Mobile Communicator is an easy-to-use software application that enables collaboration by securely extending Cisco Unified Communications to mobile smartphones. With Cisco Unified Mobile Communicator, you can place and receive calls, access company directory contacts, check presence information, and review voice-mail messages, as well as receive Cisco Unified MeetingPlace notifications and other vital information, all from a single, intuitive interface connected to a Cisco Unified Communications System.

Key Features

- Unified contact list—Search your corporate directory (Microsoft Active Directory) and personal contacts (Microsoft Outlook) from one easy-to-use interface to locate contacts quickly
- Presence—Find a contact and see whether the person is available to talk—before you place the call. View a person’s availability status from the directory on your mobile handset.
- Single business number—Single number reach, supported by Cisco Unified Mobility, makes it easier for you to be reached and gives you the flexibility to answer the call that is most important for you at a given time. Using Cisco Unified Mobile Communicator, you can enable or disable the setting with a simple click of the button.
- Dial via Office—Transparently place calls through Cisco Unified Communications Manager to reduce toll charges and meet regulatory requirements. Administrator policy can dictate whether calls are always, never, or on a case-by-case basis dialed with Dial via Office. If the feature is enabled, you can place a Dial via Office call from any application on your mobile phone, including the native phone dialer.
- Secure text messaging—Send and receive text messages from colleagues when they are unavailable to talk. A visual list on your mobile handset shows at a glance who is trying to reach you. Incoming messages are conveniently grouped by person, showing the sender, the priority, and a brief subject line, if available.
- Visual voicemail—You have visual access to Cisco Unity and Cisco Unity Connection voicemail messages. Select, view, play back, and delete messages in any order—all from your smartphone. Cisco Unified Mobile Communicator supports secure message playback with the Cisco Unity and Cisco Unity Connection applications.
• Conferencing—Receive Cisco Unified MeetingPlace conference notifications on your smartphone. With a simple press of a button, you can access the conference bridge.
• Call logs—View a list of recent calls on your mobile device and learn what calls were missed, placed, and received from your mobile device and your Cisco Unified IP Phone.
• Broad operator and device support—Working simultaneously across multiple networks, mobile operators, and handset platforms, Cisco Unified Mobile Communicator helps ensure end-user choice and delivery.
• Enterprise-grade security—Cisco Unified Mobility Advantage server is deployed securely behind the enterprise firewall. It uses industry-standard Secure Sockets Layer (SSL) and Transport Layer Security (TLS) encryption to protect transmission of data between handsets and your corporate infrastructure. End users authenticate with existing Lightweight Directory Access Protocol (LDAP) directories. The Cisco ASA 5500 Series Adaptive Security Appliance proxies sessions between mobile devices on external networks and the Cisco Unified Mobility Advantage server and enterprise infrastructure, and it also applies other security services such as deep packet inspection of protocols and content. If a mobile handset is lost or stolen, IT staff can remotely deactivate the device and erase sensitive company information.
• Management—Simple, web-based management allows IT staff to manage user activation, configuration, and administration; set system privileges and security; report statistics; and manage devices. The end-user portal allows provisioning, directory management, and configuration of user preferences.

Selected Part Numbers and Ordering Information

For More Information

Cisco Unified Personal Communicator

An integral component of the Cisco Unified Communications Family of products, Cisco Unified Personal Communicator transparently integrates your most frequently used communications applications and services into a single, unified client. From an easy-to-use interface on a PC or Mac, it provides quick and easy access to powerful communications tools—softphone, presence, instant messaging, visual voicemail, click-to-call, employee directory, communication history, video, and web conferencing—to help you communicate effectively and work more productively.

Ideal for Companies that Need These Features
• A unified client that transparently integrates presence, voice, video, instant messaging, and Web conferencing
• Powerful communications capabilities integrated with the personal computer, including integrated contact lists, Click-to-Call, voicemail playback, inbound call notification, and media escalation
• A supplemental telephone that provides access to phone extensions and services outside the office

Key Features
• Communication integration—Take advantage of a single, intuitive interface for voice and video calls, instant messaging, voicemail playback, web conferencing, and integrated directories.
• Presence: View real-time availability of other Cisco Unified Personal Communicator and Cisco Unified IP Phone users. You can also display customized messages, set an out-of-office message, and automatically show your availability based on free and busy status on your Microsoft Outlook Calendar.
• Do not disturb (DND): Easily block incoming calls with synchronized DND status from your Cisco Unified Personal Communicator or Cisco Unified IP Phone or use the privacy preference setting to block instant messages when you need additional privacy.
• Contact list—Search your corporate directory from one easy-to-use interface to locate contacts quickly and simply click to call. Add your most frequently contacted personal contacts, co-workers, and federated business contacts.
• Click to call—Dial from the contact list, using either the integrated softphone or an associated Cisco Unified IP Phone. You can also click to call directly from Microsoft Outlook using an Outlook toolbar.
• Integrated voice and video calling: Exchange ideas face-to-face with a coordinated video display on the PC screen and audio conversation with the softphone. You can place video calls using Cisco Unified Personal Communicator, Cisco Unified Video Advantage, or the Cisco Unified IP Phone 7985G, a personal desktop videophone.
• Instant messaging—Chat in real time using instant messaging with other Cisco Unified Personal Communicator users to save time and reduce phone tag. Conferencing—Create voice or video conferencing sessions by simply merging conversation sessions. There is no need to call into a separate conference bridge.
• Web conferencing—Launch a Cisco Unified MeetingPlace or Cisco Unified MeetingPlace Express web conferencing session at a moment’s notice to share content, such as a presentation, with others.
• Voice messages—Access secure Cisco Unity or Cisco Unity Connection encrypted voicemail messages—view, play back, sort, and delete messages—all from within the application.
Cisco Unified Presence is a standards-based platform that collects information from multiple sources about user availability and communications capabilities to provide rich presence status and facilitate presence-enabled communications with Cisco Unified Communications and other critical business applications.

Ideal for Companies that Need These Features

- Looking to increase productivity by providing the ability to connect with colleagues on the first try by knowing their availability in advance on either Cisco Unified Personal Communicator or Cisco Unified IP Phone
- Seeking to enhance collaboration by sharing availability information and instant messages with co-workers within your business or between businesses with Cisco Unified Personal Communicator
- Exposing presence information and user communications capabilities in corporate web directories, point-of-sales applications, or customer-relationship-management systems through Cisco Unified Application Environment and standards-based application programming interfaces (APIs) on Cisco Unified Presence
- Allowing subject matter experts anywhere in your enterprise to handle incoming customer calls with presence capabilities delivered with Cisco Unified Expert Advisor, Cisco Unified Presence, and Cisco Unified Personal Communicator

Key Features

- Cisco Unified Presence provides enterprise-class scalability, redundancy, and high availability desired by large businesses and organizations.
- Cisco Unified Presence provides a standards-based connectivity to any Session Initiation Protocol (SIP) or SIMPLE capable application or network.
- Cisco Unified Presence supports business-to-business federation with Cisco Unified Presence and Microsoft Live Communications Server (LCS) or Microsoft Office Communications Server (OCS) to enable them to secure exchange instant messaging and presence information between users in different businesses or organizations.
- Cisco Unified Presence provides the SIP proxy services needed to support large Cisco Customer Voice Portal 4.0 (and later) deployments.
Cisco Unity Express provides integrated messaging, voicemail, Automated Attendant services, and optional interactive voice response (IVR) specifically for the small and medium-sized office or branch office. The application is delivered on either a network module or advanced integration module, both of which are supported on a variety of voice-enabled integrated services routers.

Ideal for Companies that Need these Features

- Integrated messaging, voicemail, Automated Attendant, or interactive-voice-response (IVR) services at the branch or small office to support local users
- Up to 250 users per site
- Networking of multiple Cisco Unity Express systems for easy management of messages across sites

Key Features

- The solution offers affordable messaging and greeting services for increased customer service and rich employee communications.
- Intuitive telephone prompts and a web-based interface provide fast, convenient voicemail and Automated Attendant administration.
- Cisco Unity Express can view, sort, search, and play back voice messages using the display of a Cisco Unified IP Phone or your e-mail client.
- The solution offers scalability from 4 to 16 concurrent voicemail or Automated Attendant calls and 12 to 250 mailboxes.
- The solution is deployable with Cisco Unified Communications Manager Express, Cisco Unified Communications Manager, Cisco Unity, and Cisco Unity Connection systems.

Specifications

<table>
<thead>
<tr>
<th>Feature</th>
<th>Cisco Unity Express</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hardware</td>
<td>Fully self-contained modules with onboard storage, memory, and processing supporting a variety of mailbox densities, storage capacities, and concurrent sessions to meet the needs of every small-to-medium office or branch</td>
</tr>
<tr>
<td>Software</td>
<td>Cisco Unity Express release 7.0</td>
</tr>
</tbody>
</table>

For More Information


Speech Connect for Cisco Unity Unified Messaging

Speech Connect for Cisco Unity is a speech-enabled Automated Attendant for the enterprise. Internal or external callers can speak the name of an employee into the phone and instantly be connected to that employee. Enhanced software fine-tunes pronunciation, improving accuracy over time for superior voice-recognition performance.

Key Features

- Speech Connect for Cisco Unity offers unmatched performance in speech recognition because of advanced disambiguation, the names-tuning service, and a dynamic names dictionary.
Cisco Unity Unified Messaging

Cisco Unity unified messaging is an enterprise-ready voice and unified messaging platform. As part of a unified communications solution, the application offers a reliable, secure, scalable, and full-featured voice and unified messaging platform.

Key Features

• Access voice messages anytime from a variety of clients and devices: Email inbox, web browser, desk phone, instant messaging client, and mobile phones, including speech access on phones.
• The flexible platform allows for configuration as voicemail or unified messaging, with a single message store on a Microsoft Exchange or Lotus Domino email server or a separate message store for voice messages.
• The system is scalable to 200 ports and 15,000 users per server; it offers server options with multiple processors, redundant fans, redundant power supplies, and Redundant Array of Independent Disks (RAID) hard disk drives.
• The solution supports Audio Messaging Interchange Specification analog (AMIS-A), Voice Profile for Internet Mail (VPIM), and Cisco Unity Bridge for Octel to facilitate interoperability with older voicemail systems.
• Integration with the Cisco Fax Server allows you to send and receive fax messages from your email inbox.

Specifications

Unified Messaging Gateway

Cisco Unified Messaging Gateway provides an open and secure method of intelligently routing messages and exchanging subscriber and directory information within a unified messaging network. It acts as the central hub in a network of Cisco unified messaging solutions and third-party gateways that interface with older voicemail systems.

Ideal for Companies that Need these Features

• Scale the unified messaging network as required for branch-office customers and larger distributed enterprises
• Simplify configuration tasks and centralize voicemail system management
• Transparently integrate Cisco Unified Communications solutions into existing voicemail installations

Key Features

• Integrate small to large-scale unified messaging deployments that consist of more than five Cisco Unity Express systems.
• Integrate up to 10,000 mixed Cisco Unity Express, Cisco Unity, and Cisco Unity Connection systems.
Specifications

<table>
<thead>
<tr>
<th>Feature</th>
<th>Cisco Unified Messaging Gateway</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hardware</td>
<td>NME-UMG or NME-UMG-EC</td>
</tr>
<tr>
<td>Platform Supported</td>
<td>Cisco 1861, 2600XM, 2691, 3700 Series Multi-Service Routers and Cisco 2800, 3800 Integrated Services Routers</td>
</tr>
</tbody>
</table>

For More Information


Cisco Voice and Security Bundles

Voice and security bundles are designed for enterprise branch offices, small and medium-sized businesses (SMBs), and managed network service providers seeking consolidated, easy-to-order, versatile, and cost-effective solutions.

- Cisco Integrated Services Router Unified Communications Bundles include—A Cisco integrated services router with necessary memory and the recommended Cisco IOS Software feature set; Cisco Unified Communications Manager Express licenses for call processing; Cisco Unity Express hardware, software, and feature licenses for voicemail and integrated messaging; Digital-signal-processor (DSP) resources for conferencing and public-switched-telephone-network (PSTN) connectivity to IP; Phone device licenses to deploy Cisco Unified IP Phones; Cisco Unified Border Element licenses for connecting to a Session Initiation Protocol (SIP) telephony provider or to connect multiple sites together; Cisco Unified CallConnector for Microsoft Windows personal client desktop integration
- Cisco Unified Communications Manager Express Voice Bundles include—A Cisco integrated services router with necessary memory and the recommended Cisco IOS Software feature set; Cisco Unified Communications Manager Express licenses for call processing; DSP resources for conferencing and PSTN connectivity to IP; Cisco Unified Border Element (UBE) licenses for connecting to a SIP telephony provider or to connect multiple sites together
- Cisco Unified Survivable Remote Site Telephony (SRST) Voice Bundles include—A Cisco integrated services router with necessary memory and the recommended Cisco IOS Software feature set; Cisco Unified SRST feature licenses; DSP resources to support PSTN connectivity to IP
- H-VSEC Bundles include—A Cisco integrated services router with necessary memory and the recommended Cisco IOS Software feature set; Cisco Unified Communications Manager Express feature license, which can also be used for SRST; DSP resources for conferencing and PSTN connectivity to IP; Cisco Unified Border Element licenses for connecting to a SIP telephony provider or to connect multiple sites together; Cisco IOS Advanced IP Services; A Cisco AIM-VPN accelerator card for maximum performance of security features, including VPN tunneling

For customers who want to deploy security features along with voice features using the Cisco Integrated Services Router enabled with either Cisco Unified Communications Manager Express, or Cisco Unified Survivable Remote Site Telephony (SRST) they can buy the voice-plus-security versions of these bundles. The voice plus-security bundles add security features such as VPN, firewall, and intrusion detection systems (IDSs) to the existing voice and data features provided.

Ideal for Companies that Need These Features

- Support for 8 to 250 phones per location; data, IP telephony, and VPN in an all-in-one solution based on a Cisco integrated services router
- Low entry price for a complete unified communications solution with room to grow in the future
- Investment protection (for customers who may migrate from Cisco Unified Communications Manager Express to Cisco Unified Communications Manager as the future dictates)

Selected Part Numbers and Ordering Information

<table>
<thead>
<tr>
<th>Cisco Integrated Services Router Unified Communications Voice plus Security Bundles</th>
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<tbody>
<tr>
<td>C3845-35UC-VSEC/K9</td>
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<td>C3825-35UC-VSEC/K9</td>
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<td>C2811-15UC-VSEC/K9</td>
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<tr>
<td>C2801-10UC-VSEC/K9</td>
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</tbody>
</table>
For More Information

For more information about Cisco Unified Communications Manager Express, visit: http://www.cisco.com/go/ccme.


Cisco Unified Contact Center Enterprise

Cisco Unified Contact Center Enterprise delivers skills-based contact routing, voice self-service, computer telephony integration (CTI), and multichannel contact management over an IP infrastructure. With multichannel automatic-call-distributor (ACD) functions combined with IP telephony in a unified solution, companies can rapidly deploy a distributed contact center infrastructure. Cisco Unified Contact Center Enterprise supports single and multisite deployments in both all-IP environments and mixed IP and time-division multiplexing (TDM) environments. It segments customers, monitors resource availability, and delivers each contact to the most appropriate resource anywhere in the enterprise or at home. The software profiles each customer contact using related data such as dialed number and calling line ID, caller-entered digits, data submitted on a Web form, and information obtained from a customer database lookup. This combination of customer and contact center data is processed through user-defined routing scripts that graphically reflect a company's business rules.

Cisco Unified Communications Manager Express Voice plus Security Bundles

<table>
<thead>
<tr>
<th>Model Code</th>
<th>Features and Licenses Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>C3845-VSEC-CCME/K9</td>
<td>Cisco 3845 Voice Bundle with IOS Adv IP Services, PVDM2-64, FL-CCME (250 users), 50 CUBE licenses, 128 MB Flash/512 MB DRAM</td>
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<td>C3825-VSEC-CCME/K9</td>
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<td>C2851-VSEC-CCME/K9</td>
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<td>C2821-VSEC-CCME/K9</td>
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<td>C2811-VSEC-CCME/K9</td>
<td>Cisco 2811 Voice Bundle with IOS Adv IP Services, PVDM2-16, FL-CCME (35 users), 5 CUBE licenses, 128 MB Flash/256 MB DRAM</td>
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Cisco Survivable Remote Site (SRST) Voice plus Security Bundles

<table>
<thead>
<tr>
<th>Model Code</th>
<th>Features and Licenses Details</th>
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<tbody>
<tr>
<td>C2851-SRST/K9</td>
<td>Cisco 2851 Voice Bundle with IOS Adv IP Services, PVDM2-48, FL-SRST (100 users), 10 CUBE licenses, 128 MB Flash/256 MB DRAM</td>
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<tr>
<td>C2821-SRST/K9</td>
<td>Cisco 2821 Voice Bundle with IOS Adv IP Services, PVDM2-32, FL-SRST (50 users), 10 CUBE licenses, 128 MB Flash/256 MB DRAM</td>
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<tr>
<td>C2811-SRST/K9</td>
<td>Cisco 2811 Voice Bundle with IOS Adv IP Services, PVDM2-16, FL-SRST (35 users), 5 CUBE licenses, 128 MB Flash/256 MB DRAM</td>
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Cisco H-VSEC Bundles

<table>
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<tr>
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<th>Features and Licenses Details</th>
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<tr>
<td>C3845-H-VSEC/K9</td>
<td>Cisco 3845 High Performance Voice Security Bundle with IOS Advanced P Services, PVDM2-64, AIM-VPN/SSL-3, 25 User SSL License, 100 users feature license for CME/SRST, 50 CUBE licenses, 128 MB Flash/256 MB DRAM</td>
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<tr>
<td>C3825-H-VSEC/K9</td>
<td>Cisco 3825 High Performance Voice Security Bundle with IOS Advanced P Services, PVDM2-64, AIM-VPN/SSL-2, 10 User SSL License, 50 users feature license for CME/SRST, 128 MB Flash/256 MB DRAM</td>
</tr>
</tbody>
</table>

For More Information

For more information about Cisco Unified Communications Manager Express, visit: http://www.cisco.com/go/ccme.

Ideal for Companies that Need these Features

• Single contact center solution to support agents located in multiple locations, including formal contact centers, branch offices, and home agents
• Single contact center solution to support inbound, outbound, e-mail, and Web collaboration channels
• A fully redundant solution

Key Features

• Cisco Unified Contact Center Enterprise offers full scalability from less than a hundred to thousands of seats; it supports multisite contact centers and customer-relationship-management (CRM) integration.
• Carrier-class, distributed fault tolerance helps ensure uninterrupted operation.
• Multichannel interaction is possible, including Web collaboration with chat and callback, e-mail, voicemail, and fax routing.
• The solution provides continuous-contact call detail records.
• The solution provides common agent and supervisor desktops across all Cisco customer-interaction-management products.
• Cisco Unified Contact Center Enterprise provides predefined and custom real-time and historical reports; real-time data is also integrated in the agent and supervisor desktops.
• Support for custom call treatment for calls in queue includes support for music in queue and custom messaging; a standard screen pop allows any caller-entered information to be forwarded to the agent.
• Cisco Unified Contact Center Enterprise supports agent-supervisor interaction through chat, agent-supervisor messages are predefined.
• The solution offers enterprise presence integration through Cisco Unified Expert Advisor and Cisco Agent Desktop to tie-in or extend intelligently routed calls to knowledge workers or informal agents.

Selected Part Numbers and Ordering Information

For More Information

For more information about Cisco Unified Contact Center Enterprise, visit: http://www.cisco.com/go/ipcc.

Cisco Unified Contact Center Express

Cisco Unified Contact Center Express provides easy-to-deploy, easy-to-use, highly available, and sophisticated customer interaction management for 1 to 300 agents by supporting a highly available virtual contact center with integrated self-service applications across multiple sites secured with Cisco Security Agent. All Cisco Unified Contact Center Express solutions are tightly integrated with Cisco Unified Communications Manager.

Ideal for Companies that Need these Features

• Contact center-in-a-box that delivers intelligent routing, call treatment, network-to-desktop and computer telephony integration (CTI), and integrated self-service for customer contact management over an IP infrastructure
• Ability to handle e-mail and Web-based contacts and provide outbound dialing support
• Sophisticated workforce management
• Ability to integrate multiple Cisco Unified Contact Center Express systems in the cloud under the control of Cisco Unified Intelligent Contact Management, including pre- and postrouting and centralized reporting
• Redundancy with high availability

Cisco Unified Contact Center Express is a virtual contact center solution for 1 to 300 agents that is easy to deploy, configure, and manage. It is available in three different packages (Standard, Enhanced, and Premium) to help ensure the right match with your business requirements. This interactive-voice-response (IVR) self-service solution is fully integrated with contact center operations, including the ability to deploy advanced self-service technologies such as Automatic Speech Recognition (ASR) and Text to Speech (TTS).

Key Features

• Cisco Unified Contact Center Express reduces business costs while improving customer response by providing sophisticated and distributed automatic call distributor (ACD), interactive voice response (IVR), computer telephony integration (CTI), and agent and desktop services.
• The solution offers numerous sophisticated options traditionally associated with enterprise contact centers, including the ability to handle e-mail and Web-based contacts, presence integration, outbound preview dialing, and a complete workforce-management solution.
• Administration is browser-based, integrating with Cisco Unified Communications Manager browser-based administration.
• The solution provides ongoing contact call detail records.
The standard screen allows any caller-entered information to be forwarded (through a pop) to the agent.

The solution provides predefined or custom historical reports; real-time reports are provided within the agent and supervisor desktops.

This complete, enterprise-wide, scalable unified contact center solution works in the Cisco Customer Interaction Network.

Cisco Unified Contact Center Express fully supports agent-supervisor interaction through chat and predefined messages.

The solution offers full IP call queue points and prompts; it collects voice interaction capabilities.

Optional Automatic Speech Recognition (ASR) and Text-to-Speech (TTS) capabilities are available.

The solution supports custom call treatment such as music for calls in queue.

NOTE: This is an abbreviated list of Cisco Unified Contact Center features.

### Selected Part Numbers and Ordering Information

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
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<tbody>
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<td>New 7.0 Standard deployment</td>
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<tr>
<td>IPCX-70-ENH</td>
<td>New 7.0 Enhanced deployment</td>
</tr>
<tr>
<td>IPCX-70-PRE</td>
<td>New 7.0 Premium deployment</td>
</tr>
<tr>
<td>IPCX-70-STD-ADDON</td>
<td>Add-ons to an existing 7.0 Standard deployment</td>
</tr>
<tr>
<td>IPCX-70-ENH-ADDON</td>
<td>Add-ons to an existing 7.0 Enhanced deployment</td>
</tr>
<tr>
<td>IPCX-70-PRE-ADDON</td>
<td>Add-ons to an existing 7.0 Premium deployment</td>
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</table>

### Cisco Unified Contact Center Hosted Edition

The Cisco Unified Contact Center Hosted Edition solution is suitable for both enterprise customers and service providers. For service providers, it creates a new, high-margin service revenue stream for incumbent providers as well as new service carriers. The service provider hosts the contact center infrastructure software, which is shared by multiple business customers, in its central office or data center. Subscribing business customers can have IP infrastructures, time-division multiplexing (TDM) infrastructures, or a combination of the two. For the enterprise customer with multiple branch offices or divisions, the value is a centralized contact center infrastructure with the ability to offer services to its various divisions or satellite offices.

### Ideal for Companies that Need These Features

- Multiple business units that function autonomously

This solution is ideal for very large enterprise customers who want to deploy a single solution to support multiple businesses such as state government. It is also ideal for service providers that want to offer managed contact center services to their customers.

### Key Features

- Cisco Unified Contact Center Hosted is a virtual call center; calls are routed to contact center agents independent of their location, a service especially appealing to businesses with branch offices or home agents.
- Network routing with a computer-telephony-integration (CTI) network-based automatic call distributor (ACD) is combined with CTI services.
- Network interactive-voice-response (IVR) functions are located in the network to provide information to callers or to collect information from callers before they speak with a live agent.
- Calls are routed between contact centers based on call-context information (dialed number and caller ID), agent availability, and customer information from databases.

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<tbody>
<tr>
<td>IPCX-BUNDLE</td>
<td>The Hosted bundle consists of two separately-licensed sets of components.</td>
</tr>
</tbody>
</table>
- The base licenses for the shared infrastructure, such as the NAM, the network interfaces, shared network IVRs, CCMs, and Hosted IPCC Agent licenses; (redundant) Router; (redundant) Logger; (redundant) Communications Manager Peripheral Gateway(s); (redundant) IVR Peripheral Gateway(s); for connection to Cisco IVR systems ISN and IP-IVR (non-Cisco IVRs require third-party IVR port licenses); Administrative workstation(s); Historical database server(s); WebView server and WebView user connections; Internet Script Editor (ISE) server and ISE user connections; application gateways; (redundant) CTI server for third-party CTI connections (only for non-agent desktop application) |

### For More Information

For more information about Cisco Unified Contact Center Hosted, visit: [http://www.cisco.com/go/ipcchosted](http://www.cisco.com/go/ipcchosted).

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### For More Information

For more information about Cisco Unified Contact Center Hosted, visit: [http://www.cisco.com/go/ipcchosted](http://www.cisco.com/go/ipcchosted).

### Cisco Unified Customer Voice Portal

The Cisco Unified Customer Voice Portal integrates with both traditional time-division multiplexing (TDM) and IP-based contact centers to provide an unparalleled call-management and call-treatment solution with a self-
Cisco Unified Expert Advisor

The Cisco Unified Expert Advisor expands the scope of the contact center by allowing presence-enabled enterprise knowledge workers to handle incoming customer calls without the need for the rigid tools and business rules typically found in formal contact centers. Cisco Unified Expert Advisor can be deployed as an add-on to Cisco Contact Center solutions, or in a standalone mode without any formal contact center agents in the call flow. Experts receive pre-call data, allowing faster problem resolution. The solution is highly flexible and customizable, allowing enterprises to implement the most appropriate architecture and business logic to meet their customer contact needs.

Ideal for Companies that Need these Features

- Formal contact centers with agents that require escalation to third- or fourth-level support or specialists in the enterprise who have the ability to improve on customer service by addressing the sought-after “first-call resolution.”
- This solution is ideal for small to medium-sized contact centers that require extension of customer calls to knowledge workers and for informal contact centers that do not process a high load of calls or where most customers address their needs from a self-service application.
- It is also ideal for environments where there is only a self-service or queuing application and no formal agents.

Key Features

- The solution improves first-call resolution and increases customer satisfaction by allowing subject matter experts anywhere in the enterprise to handle incoming customer calls.
- When deployed with Cisco contact center solutions, formal agents can request expert help with the click of a button.
- Agents can transfer the caller to the expert, or engage in a three-way conference with the caller and the expert.
- When deployed in standalone mode, Cisco Unified Expert Advisor provides robust, efficient customer interactions without the need for traditional contact center agents.
- Real-time and historical reports give decision makers detailed insights and control over their customer interaction flows. The solution offers higher rates of first-call resolution and reduced customer turnover.

Selected Part Numbers and Ordering Information

For More Information


Cisco Unified Intelligence Suite

The Cisco Unified Intelligence Suite comprises two components: Intelligence Center and the Archiver data repository. The suite also includes advanced integration tools that help users evolve the platform into an enterprise-wide information portal.

Intelligence Center is a web-based application that provides real-time and historical reporting in an easy-to-use, wizard-based interface. The Archiver is an external Microsoft Structured Query Language (MS-SQL) data repository that adds significant scalability and flexibility to Cisco Unified Contact Center reporting. The advanced integration tools allow customers to integrate data from nontraditional contact center sources such as...
as Really Simple Syndication (RSS) feeds, external websites, and third-party databases to further improve business efficiency and effectiveness.

**Ideal for Companies that Need these Features**

- A powerful web-based reporting platform that is as flexible as it is intuitive
- The ability to report on the details of every contact across all channels from a single interface, regardless of the resources involved

**Key Features**

- Cisco Unified Intelligence Suite offers real-time and historical reporting in an easy-to-use, wizard-based interface.
- The solution offers a variety of presentation formats such as interactive grids, charts, web pages, and RSS feeds.
- Administrators can control access to features, reports, and data by granting privileges to individual users or groups of users.
- The solution offers integrated reporting for any data source, including third-party automatic call distributors (ACDs), Cisco Unified Workforce Management, customer relationship management (CRM), and CM products.
- The solution offers the ability to move between reports through hyperlinks providing drill-up, drill-down, and drill-across capabilities.
- Advanced drill-down capabilities allow customers to link multiple reports, including the ability to drill across data sources for maximum flexibility.

**For More Information**

For more information about the Cisco Unified Intelligence Suite, visit: [http://www.cisco.com/go/cc](http://www.cisco.com/go/cc)

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**Cisco Unified Intelligent Contact Management Enterprise**

Through a combination of multichannel contact management, intelligent routing, and network-to-desktop computer telephony integration (CTI), the Cisco Unified Intelligent Contact Management Enterprise segments customers, monitors resource availability, and delivers each contact to the most appropriate resource anywhere in the enterprise.

The Cisco Unified Intelligent Contact Management Enterprise solution allows customers to keep their current legacy solutions in place regardless of TDM or IP voice transports, while giving them a migration path to new technologies such as VOIP multi-channel and presence. When deployed with the Cisco Unified Customer Voice Portal, it lets customers begin to move call routing and queuing into the IP network, while leaving their existing TDM automatic call distributors (ACDs) and agents in place. Therefore, customers can decide to replace aging technologies independently, when it makes the most sense for them.

**Ideal for Companies that Need These Features**

- Customers with existing, multi-site, single or multi vendor legacy ACD infrastructure looking for a unified call routing and CTI solution
- Customers looking for a migration path from their existing TDM architecture to an IP solution
- Customers who require unified routing across media types and across disparate vendor PBX and ACD solutions

**Key Features**

- Cisco Unified Intelligent Contact Management Enterprise offers carrier-class, distributed fault tolerance for uninterrupted operation.
- The solution provides profiles using contact-related data: dialed number and calling line ID (CLID), caller-entered digits, data submitted on a Web form, or information obtained from a customer profile database lookup. Profiles are processed with user-defined routing scripts that graphically reflect business rules. The solution routes each contact to the optimum resource anywhere in the enterprise, and delivers a unique and rich set of call-event and customer-profile data to the targeted desktop as a contact arrives, personalizing service and maximizing efficiency.
- Cisco Unified Intelligent Contact Management Enterprise gives customers the choice to interact through their phone, the web, voice over IP (VoIP), text chat, e-mail, or IM.
- The solution provides centralized management control over customer contacts, allowing users to implement a single set of business rules that uniformly address customer needs independent of contact channel or resource location.

**Selected Part Numbers and Ordering Information**

| ICME-BUNDLE | Requires the purchase of at least one ACD PG and one ICM Agent license. Functionality includes monitor third-party ACD (call and agent); Call routing, including pre-routing from a carrier network and post-routing from an ACD; Historical database server(s), WebView server and WebView user connections; Internet Script Editor (ISE) server and ISE user connections; application, SQL, and ICM-to-ICM gateways; redundant deployment of all licensed components; Integrations through the ICM interfaces with third-party devices that are not intended for agent desktop usage. Connections to Cisco IVR systems (IP-IVR and CVP) and all related functions an ICM can perform, such as monitoring, reporting, and routing. |
Cisco Unified Intelligent Contact Management Hosted

The Cisco Unified Intelligent Contact Management Hosted solution allows a service provider to quickly become a strategic business partner by hosting a broad continuum of mission-critical customer applications. With current users, its functions create new revenue opportunities while strengthening customer loyalty.

Ideal for Companies that Need These Features

- Open architecture: This solution facilitates a smooth migration from circuit-switched to packet-based voice technology while facilitating business-to-business services, e-commerce, and multimedia applications such as Web collaboration and e-mail response management, all transparent to the end user.
- Ability to deliver critical applications tailored to each customer’s business strategy; and to sharply differentiate from competitors, making it easier to gain entry and obtain feature or transport revenue (for the service provider).
- Services to take advantage of value-added service provider capabilities to meet business goals (for the customer).

This solution benefits the service provider and the customer as well.

Key Features

- From this virtual call center, calls are routed to contact center agents independent of their location, a service especially appealing to businesses with branch offices or home agents.
- A network-based automatic call distributor (ACD) is combined with computer-telephony-integration (CTI) services.
- Network interactive-voice-response (IVR) functions are located in the network to provide information to callers or to collect information from callers before they speak with a live agent.
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Cisco Unified Workspace Licensing

Cisco Unified Workspace Licensing allows organizations to cost-effectively access a wide range of Cisco Unified Communications applications and services in a comprehensive offering. It packages client and server software, licensing, service and support, and software subscription on a per-user basis.

Cisco Unified Workspace Licensing is available in three versions to meet a variety of customer needs:

- **Business Edition**—Optimized for small businesses of fewer than 500 users in a single server, this appliance-based solution does not mandate the use of a command-line interface (CLI), but provides the option of a simple web management interface to manage a rich set of applications.
- **Standard Edition**—This application provides the same benefits as Business Edition, but is optimized for larger businesses.
- **Professional Edition**—This superset to the Standard Edition adds advanced collaboration to facilitate audio, video, and web conferencing and extends collaboration to mobile devices and customer interactions with Cisco Unified Contact Center Express.

Ideal for Companies that Need these Features

- True and complete unified communications experience for all their users.
- A more complete Cisco Unified Communications experience, but have not yet deployed all the Cisco Unified Communications applications to all their users.
- A solution that is easy to purchase and track and provides a technology upgrade path complete with full 24-hour technical support.

Specifications

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<tr>
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Cisco Unified Communications Software Subscription

Cisco Unified Communications Software Subscription is a product offering that allows you to purchase major software version upgrades of various Cisco Unified Communications products at a reduced cost through a 1-, 2-, 3- or 5-year subscription. This offering provides a cost-effective way to predict and plan your IP communications upgrades over many years. The Cisco Unified Communications Software Subscription complements Cisco Unified Communications Operate Services to help you maintain the high availability, security, and operational efficiency of your Cisco Unified Communications System.

Ideal for Companies that Need these Features

- Maximizing return on investment and lower total ownership costs
- Keeping pace with technology advancements and enhance productivity
- Protecting Cisco Unified Communications investment in the future, regardless of what happens
- Predicting and planning IP communications budgets over multiple years or budget only once

Selected Part Numbers and Ordering Information

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For More Information

For more information about Cisco Unified Workspace Licensing, visit: http://www.cisco.com/go/cuwl.
Cisco Unified Communications Services

Cisco and our partners offer a portfolio of services to help protect, maintain, and optimize Cisco products. Services range from traditional maintenance to proactive and predictive services. To find the appropriate service, visit the Service Finder tool at http://www.cisco-servicefinder.com (enter a product description or part number or search by product series family).

All your Cisco Unified Communications hardware products require Cisco SMARTnet support. All your software Cisco Unified Communications products require Essential Operate Services (ESW). The combination of hardware and software services is critical to optimizing product performance.

• For more information about Cisco Unified Communications Services specifically, visit http://www.cisco.com/go/ucservices.
• For more information about Cisco Services, see Chapter 10, “Services.”

Cisco TelePresence System

Critical to delivering the Cisco TelePresence experience are three critical principles: quality that is as good as being there, a system that is extremely simple to use, and an architecture that uses existing services to provide a low total cost of ownership. The Cisco TelePresence solution gives users the tools to cost-effectively improve productivity: gain closer ties to customers, partners, and suppliers; and promote internal collaboration.

Designed to deliver an immersive “in-person” experience, the Cisco TelePresence solution incorporates high-quality spatial audio and lifelike video in a specially tuned environment. The full-duplex audio and near-zero latency allow you to communicate in real time, catching every comment and every nuance of the conversation. The industry-leading, 1080p high-definition video makes every expression and every gesture clearly visible, whether you are meeting across town or across time zones. You can now collaborate globally, not compromise on communications.

The Cisco TelePresence solution is designed to take advantage of the tools you use every day. It integrates with both enterprise groupware and unified communications, so scheduling a Cisco TelePresence meeting is as simple as booking a meeting. Whether you are meeting with one or many sites, the simple and intuitive user interface eliminates the need for staff, training, or manuals so that you can focus on the business opportunity—not the technology. And thanks to the simplicity and reliability of this solution, you can focus your IT resources on strategic projects instead of operational tasks.

The Cisco TelePresence solution delivers the industry’s leading in-room experience, so users can conduct business as easily and naturally as in person, but more cost-effectively. The solution offers intercompany capabilities for secure face-to-face communications across enterprise networks, interoperability with standards-based video conferencing, and scalable, cost-effective multipoint capabilities with support for up to 48 sites in a single meeting.

The Cisco TelePresence solution uses intelligent network architecture, with innovative services and integrated security—and industry-leading reliability. It takes advantage of the real-time collaborative communications services built into the network, delivering quality of service, security, and high availability. You can deploy and scale the application quickly, with a low total cost of ownership, for immediate productivity gains. Your organization can depend on this solution as a strategic communications platform that provides an in-person experience with the quality, simplicity, and reliability of a telephone call.

Key Features

• The solution is available as an entire portfolio of rooms and endpoints in a variety of configurations to meet all meeting and collaboration needs, from one-on-one meetings to very large team meetings or classroom applications.
• The solution is simple to use and it integrates with Microsoft Outlook and Lotus Notes for one-button-to-push meeting initiation.
• Meeting participants can share documents, photos, video, and physical objects through Cisco TelePresence Auto-Collaboration.
• Cisco TelePresence systems can participate in multipoint meetings by using the Cisco TelePresence Multipoint Switch.
• The Cisco TelePresence solution provides comprehensive security through media and signaling encryption for point-to-point and multipoint calls. Built-in encryption maintains the immersive meeting experience without adding discernable latency.
Chapter 4

Cisco TelePresence System 500

The Cisco TelePresence System 500 brings the virtual in-person experience of Cisco TelePresence meetings directly into the private office. Creating a new category called Cisco TelePresence, the Cisco TelePresence System 500 allows individuals, subject matter experts, and executives to join Cisco TelePresence calls with equal stature—appearing life-size on Cisco TelePresence System 3000 and other endpoints.

The Cisco TelePresence System 500 is ideal for joining large, multilocation group meetings, such as operational reviews, status update meetings, and quarterly customer presentations. It also supports personal meetings such as negotiations, job interviews, and personnel reviews.

Specifications

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<thead>
<tr>
<th>Product compatibility</th>
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<tbody>
<tr>
<td>Cisco TelePresence System 1000 with CTS software version 1.4 or later</td>
</tr>
<tr>
<td>Cisco TelePresence System 3000 with CTS software version 1.4 or later</td>
</tr>
<tr>
<td>Cisco TelePresence System 3200 with CTS software version 1.4 or later</td>
</tr>
<tr>
<td>Cisco Unified Communications Manager 6.0 or later</td>
</tr>
<tr>
<td>Cisco TelePresence Multipoint Switch 1.0 or later</td>
</tr>
<tr>
<td>Cisco TelePresence Manager 14.0 or later</td>
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<table>
<thead>
<tr>
<th>Software compatibility</th>
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</thead>
<tbody>
<tr>
<td>Cisco TelePresence system software Version 1.4 or later</td>
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<table>
<thead>
<tr>
<th>Protocols</th>
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<tbody>
<tr>
<td>Cisco Discovery Protocol, SIP, Dynamic Host Configuration Protocol (DHCP), Secure Shell (SSH) Protocol, 802.1p/q, and Real-Time Transport Protocol (RTP)</td>
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<table>
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<tr>
<th>Connectivity</th>
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<tbody>
<tr>
<td>Ethernet (1 LAN/RJ-45 connection — 100/1000 Mbps) internal 4-port Ethernet switch, and high-definition video connector</td>
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<table>
<thead>
<tr>
<th>Physical dimensions (H x W x D)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimum room dimensions: 8 x 6 x 8 feet</td>
</tr>
<tr>
<td>Table top: Height 30.5”, Width 32”, Depth 14.5”</td>
</tr>
<tr>
<td>Freestanding pedestal: Height 36.5”, Width 32”, Depth 14.5”</td>
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<tr>
<td>Wall mounted pedestal: Height 56.5”, Width 32”, Base width 29”, Base depth 11.5”</td>
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<table>
<thead>
<tr>
<th>Weight</th>
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<tbody>
<tr>
<td>230 lb with pedestal; 65 lb without pedestal and CODEC</td>
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</table>

<table>
<thead>
<tr>
<th>Power</th>
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<tbody>
<tr>
<td>350W (3 Amps @ 100V to 1.5 Amps @ 240V); Two power plugs are required</td>
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<thead>
<tr>
<th>Video and Audio Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bandwidth consumption: 3 to 4 Mbps (1080p) or 1 to 3 Mbps (720p) for IP QoS connections is recommended. Note: The bandwidth recommendations for the Cisco TelePresence System 500 are identical to those for the Cisco TelePresence System 1000.</td>
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<th>Video standards</th>
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<table>
<thead>
<tr>
<th>Data and graphics frame rate</th>
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</thead>
<tbody>
<tr>
<td>Graphics sharing at 5 frames per second (standard configuration)</td>
</tr>
<tr>
<td>Optional graphs sharing at 30 frames per second using a dedicated presentation codec</td>
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<table>
<thead>
<tr>
<th>Native National Television Standards Committee (NTSC)</th>
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<tr>
<td>1920 x 1080 Native</td>
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<table>
<thead>
<tr>
<th>Audio standards</th>
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<tbody>
<tr>
<td>G.711 and AAC_LD [22 kHz]</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Audio features</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cisco Dynamic Echo Cancellation</td>
</tr>
<tr>
<td>Complementary Metal Oxide Semiconductor (CMOS) 2/3-inch sensor</td>
</tr>
<tr>
<td>C-mount lens</td>
</tr>
<tr>
<td>1080p 30</td>
</tr>
<tr>
<td>Minimum illumination 300 lux</td>
</tr>
<tr>
<td>Manual focus</td>
</tr>
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</table>

<table>
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<tr>
<th>H.264 interoperability</th>
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<tr>
<td>Using CIF and G.711 with CUVC/3xx Series platforms</td>
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<table>
<thead>
<tr>
<th>Additional Specifications</th>
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<tr>
<td>Firmware upgrades: Downloadable from Cisco Unified Communications Manager</td>
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<table>
<thead>
<tr>
<th>Video network features</th>
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<tr>
<td>Intelligent packet loss recovery of video transmission</td>
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<table>
<thead>
<tr>
<th>Network interface</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 LAN or Ethernet (RJ-45), 100/1000 Mbps</td>
</tr>
<tr>
<td>Internal 4-port Ethernet switch with 2 PoE (IEEE 802.3at) ports on codec</td>
</tr>
</tbody>
</table>
Cisco TelePresence System 1000

The Cisco TelePresence System 1000 is ideal for small group or one-on-one meetings around the "virtual table". Two Cisco TelePresence System 1000 endpoints in a single meeting create a virtual table for up to 4 participants. The Cisco TelePresence System 1000 is suitable for uses such as direct customer engagements, small presentations, regular one-on-one meetings with remote employees or partners, supply-chain dealings, press briefings, operational or engineering reviews, or negotiations and interviews.

Specifications

Product compatibility
- Cisco TelePresence System 500 with CTS software version 1.5 or later
- Cisco TelePresence System 3000 with CTS software version 1.1 or later
- Cisco TelePresence System 3200 with CTS software version 1.4 or later
- Cisco Unified Communications Manager 5.1 or later
- Cisco TelePresence Multipoint Switch 1.0 or later
- Cisco TelePresence Manager 1.4 or later

Software compatibility
- Cisco TelePresence System software Version 1.2

Protocols
- Cisco Discovery Protocol
- SIP
- IP
- Dynamic Host Configuration Protocol (DHCP)
- Secure Shell (SSH) Protocol
- 802.1p/q
- Real-Time Transport Protocol (RTP)

Connectivity
- Ethernet (1 LAN, RJ-45 connection—100/1000m), internal 4-port Ethernet switch, and high-definition video connector (socket and cable)

Programming interfaces
- Web-based user interface
- IP address assignment can be statically configured or configured through the Cisco TelePresence Web interface

Physical dimensions
- 61 x 62 x 14 in.; Designed for small conference room or office

Power
- Maximum—1160W (9.7 A @ 120V to 4.8A @ 240V); Typical—1079W (9A @ 120V to 4.5A @ 240V)

Video and Audio Specifications

Bandwidth
- 1.5 Mbps (720p) or 3.4 Mbps (1080p) for IP Cisco connections is recommended; on average, a Cisco TelePresence System 1000 uses 1-2 Mbps (1080p)

Video standards
- H.264

Audio standards
- G.711 and AAC-LD (22 kHz)

Audio features
- Cisco dynamic echo cancellation

Cisco TelePresence High-Definition Camera
- CMOS 2/3-in sensor, C Mount Lens, 1080p 30, Minimum Illumination 300 Lux, Manual focus

Resolution
- 1920 x 1080 (native)

Audio standards
- G.711 and AMR-LD (22 kHz)

Audio features
- Cisco dynamic echo cancellation

Firmware upgrades
- downloadable from Cisco Unified Communications Manager

Dimensions
- 61 x 62 x 14 in.

Footprint
- Small conference room or executive office

For More Information
For more information about the Cisco TelePresence System, visit: http://www.cisco.com/go/telepresence

Selected Part Numbers and Ordering Information

Power cords
Select the appropriate power cord pair option to plug into the wall outlets in the country where the Cisco TelePresence system will be deployed.

Auxiliary control unit
CTS-LIGHT-CTRL—This is an optional control unit that is used to turn off system lighting when not in a meeting and is not required for Cisco TelePresence 500 operation. The built-in lighting for the system is included and does not need to be ordered separately.

Presentation codec
- CTS500-STRUC-PED—This mounting option provides a free standing floor mount for the CTS-500 with codec integrated to the pedestal
- CTS500-STRUC-TABL—This mounting option is for the display sitting on a table or shelf and codec sits on the floor with a cable harness
- CTS500-STRUC-WALL—This mounting option is for the display attached to a wall and codec sits on the floor with a cable harness

Mounting Options
(Choose one at NC)

Product compatibility
- Cisco TelePresence System 500 with CTS software version 1.5 or later
- Cisco TelePresence System 3000 with CTS software version 1.1 or later
- Cisco TelePresence System 3200 with CTS software version 1.4 or later
- Cisco Unified Communications Manager 5.1 or later
- Cisco TelePresence Multipoint Switch 1.0 or later
- Cisco TelePresence Manager 1.4 or later

Software compatibility
- Cisco TelePresence System software Version 1.2

Protocols
- Cisco Discovery Protocol
- SIP
- IP
- Dynamic Host Configuration Protocol (DHCP)
- Secure Shell (SSH) Protocol
- 802.1p/q
- Real-Time Transport Protocol (RTP)

Connectivity
- Ethernet (1 LAN, RJ-45 connection—100/1000m), internal 4-port Ethernet switch, and high-definition video connector (socket and cable)

Programming interfaces
- Web-based user interface
- IP address assignment can be statically configured or configured through the Cisco TelePresence Web interface

Physical dimensions
- 61 x 62 x 14 in.; Designed for small conference room or office

Power
- Maximum—1160W (9.7 A @ 120V to 4.8A @ 240V); Typical—1079W (9A @ 120V to 4.5A @ 240V)

Video and Audio Specifications

Bandwidth
- 1.5 Mbps (720p) or 3.4 Mbps (1080p) for IP Cisco connections is recommended; on average, a Cisco TelePresence System 1000 uses 1-2 Mbps (1080p)

Video standards
- H.264

Audio standards
- G.711 and AAC-LD (22 kHz)

Audio features
- Cisco dynamic echo cancellation

Cisco TelePresence High-Definition Camera
- CMOS 2/3-in sensor, C Mount Lens, 1080p 30, Minimum Illumination 300 Lux, Manual focus

Firmware upgrades
- downloadable from Cisco Unified Communications Manager

Dimensions
- 61 x 62 x 14 in.

Footprint
- Small conference room or executive office
Chapter 4

Cisco TelePresence System 3000

The Cisco TelePresence System 3000 is an ideal endpoint for group meetings, creating an environment for six people to sit around the “virtual table” in a single location. Two Cisco TelePresence System 3000 systems in a meeting create a virtual table for 12 participants. The Cisco TelePresence System 3000 is suitable for uses such as customer engagements, presentations to small or large groups, supply-chain dealings, press briefings, operational or engineering reviews, negotiations, or regular team meetings.

Specifications

Product compatibility
Cisco TelePresence System 3000 with CTS software version 1.5 or later; Cisco TelePresence System 3000 with CTS software version 11 or later; Cisco TelePresence System 3200 with CTS software version 1.4 or later; Cisco Unified Communications Manager 5.1 or later; Cisco TelePresence Multipoint Switch 1.0 or later; Cisco TelePresence Manager 1.0 or later

Software compatibility
Cisco TelePresence System software Version 1.1 or later

Protocols
Cisco Discovery Protocol, SIP, IP, Dynamic Host Configuration Protocol (DHCP), Secure Shell (SSH), IPv4, IPv6, 802.1p/q, and Real-Time Transport Protocol (RTP)

Connectivity
Ethernet (1 LAN, HU-4b connection — 100/1000m), internal 4-port Ethernet switch, and high-definition video connector

Programming interfaces
Web-based user interface; IP address assignment can be statically configured or configured through the Cisco TelePresence administrator Web interface

Physical dimensions
(H x W x D)
8 x 15 x 19 feet of space is required at minimum

Weight
2020 lb (freight weight)

Power
Maximum — 5292W (44.1A @ 120V to 22A @ 240V)
Typical — 4410W (36.8A @ 120V to 18.4A @ 240V)

Video and Audio Specifications

Bandwidth consumption
3-9 Mbps (720p) or 9-12 Mbps (1080p) for IP QoS connections recommended; on average, a Cisco TelePresence System 3000 uses 6-8 Mbps (1080p)

Video standards
H.264

Frame rates
30 frames per second using H.264

Data and graphics frame rate
Optional graphics sharing at 30 frames per second using a dedicated presentation codec

Native National Television Standards Committee (NTSC)
720p and 1080p

Resolution
1920 x 1080 Native

Audio standards
G.711 and AMRC-LD (22 kHz)

Cisco TelePresence High-Definition Camera
- CMOS 2/3-inch sensor
- C Mount Lens
- 1080p 30
- Minimum illumination 300 Lux
- Manual focus

For More Information
For more information about the Cisco TelePresence System, visit: http://www.cisco.com/go/telepresence.
Cisco TelePresence System 3200

For large, distributed organizations striving to thrive and grow in today’s global virtual economy, the Cisco TelePresence System 3200 brings the power of Cisco TelePresence technology to larger room venues. Ideal for headquarters sites or large regional offices, the system allows large teams to meet and collaborate virtually using the Cisco TelePresence solution when much of the team is in one physical location.

With seating for up to 18 participants in a single room, the system delivers the same superior video and audio quality as the rest of the Cisco TelePresence portfolio. Applications for the Cisco TelePresence 3200 include large team meetings, cross-functional team meetings, and training or classroom events. The solution can now scale to fit your organization’s wide range of meeting needs today and into the future.

Specifications

Audio features
- Cisco Dynamic Echo Cancellation for spatial audio

Additional Specifications
- Firmware upgrades
- Downloadable from Cisco Unified Communications Manager
- Video network features
- Intelligent packet loss recovery of video transmission
- Network interface
- 1 LAN or Ethernet (RJ-45), 100/1000 Mbps, internal 4-port Ethernet switch with 2 PoE (IEEE 802.3af) ports on codec

Selected Part Numbers and Ordering Information

CTS-3000
Cisco TelePresence System 3000

Power Cords
Select the appropriate power cord option to plug into the wall outlets in the country where the TelePresence system will be deployed.

Laptop Connectivity Modules
Select the appropriate connectivity modules based on the country where the TelePresence system will be deployed. These modules allow participants to plug their laptop PCs or other portable electronic devices into power outlets integrated into the system table legs.

Lighting Fixtures
Select the appropriate system lighting fixture based on the region where the TelePresence system will be deployed. Special lighting fixtures are required for Europe and Japan.

Auxiliary control unit
CTS-LIGHT-CTRL—This is an optional control unit that is not required for Cisco TelePresence System 3000 operation.

Projectors
Projector options are offered to meet country specific regulatory requirements. Select from standard, Chinese or none.

Presentation Codec
CTS-HFR-COLLAB—This is a chargeable option to add a dedicated presentation codec to enable high frame rate Auto Collaboration.

For More Information
For more information about the Cisco TelePresence System, visit: http://www.cisco.com/go/telepresence

Cisco TelePresence System 3200

For large, distributed organizations striving to thrive and grow in today’s global virtual economy, the Cisco TelePresence System 3200 brings the power of Cisco TelePresence technology to larger room venues. Ideal for headquarters sites or large regional offices, the system allows large teams to meet and collaborate virtually using the Cisco TelePresence solution when much of the team is in one physical location.

With seating for up to 18 participants in a single room, the system delivers the same superior video and audio quality as the rest of the Cisco TelePresence portfolio. Applications for the Cisco TelePresence 3200 include large team meetings, cross-functional team meetings, and training or classroom events. The solution can now scale to fit your organization’s wide range of meeting needs today and into the future.

The Cisco TelePresence 3200 is ideal for large group meetings with many participants in a single location, connecting to other satellite groups in remote locations. It provides an equal seat at the table for participants for applications such as operations reviews, status update meetings, quarterly meetings with clients or partners, executive presentations, or meetings requiring staff to be present.

Specifications

Product compatibility
- Cisco TelePresence System 500 with Cisco TelePresence System software 1.4 or later
- Cisco TelePresence System 1000 with Cisco TelePresence System software 12 or later
- Cisco TelePresence System 3000 with Cisco TelePresence System software 12 or later
- Cisco Unified Communications Manager 6.0 or later
- Cisco TelePresence Multipoint Switch 10 or later
- Cisco TelePresence Manager 1.4 or later

Software compatibility
- Cisco TelePresence system software 1.4 or later

Protocols
- Cisco Discovery Protocol
- SIP
- IPv4
- Dynamic Host Configuration Protocol (DHCP)
- Secure Shell (SSH)
- 802.1p/q
- Real-Time Transport Protocol (RTP)

Connectivity
- Ethernet (1 LAN, RJ-45 connection—100/1000 Mbps, internal 4-port Ethernet switch, and high-definition video connector)

Programming interfaces
- Web-based user interface; you can configure IP address assignment statically or through the Cisco TelePresence administrator Web interface

Physical dimensions (H x W x D)
8 x 24 x 23 feet minimum room dimensions for reduced back-row table configuration (total room capacity of 14 participants). Dimensions for the 12-person second row table are 8 x 31 x 23 feet. Note that higher ceilings may be required to mount an optional data display. Contact your Cisco Authorized Technology Provider (ATP) partner for data display options and mounting options.

Weight
Approximately 2595 lb (1177 kg; freight weight)

Power
8856 W (73.8 A @ 120V to 36.9 A @ 240V maximum)

Video and Audio Specifications
Cisco TelePresence Manager

Cisco TelePresence Manager software makes it easy for you to schedule and manage Cisco TelePresence calls. As an integral part of the Cisco TelePresence experience, the software facilitates call scheduling and setup from common enterprise groupware such as Microsoft Exchange and Lotus Notes.

**Key Features**
- Web-based user interface for easy administration
- Easy scheduling to minimize user training and support
- Ability to launch calls with one button on the phone interface
- Microsoft Exchange and Lotus Notes compatibility
- Integration with Cisco Unified Call Manager for call control
- Optimized resource allocation for multipoint calls
- Consolidated views of scheduled meetings with export functions for ROI reporting

**Specifications**

<table>
<thead>
<tr>
<th>Specifications</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>Product compatibility</td>
<td>Cisco TelePresence HC and MCs 7800 to Media Convergence Servers</td>
</tr>
<tr>
<td>Software compatibility</td>
<td>Microsoft Internet Explorer 6.x</td>
</tr>
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</table>

**For More Information**
For more information about the Cisco TelePresence System, visit: [http://www.cisco.com/go/telepresence](http://www.cisco.com/go/telepresence)

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**Bandwidth consumption**
- 15.3 Mbps (1080p, best motion handling) or 11.7 Mbps (720p, best motion handling) for IP QoS connections recommended
- 19.8 Mbps (1080p) or 16.2 Mbps (720p) when including at 30 fps presentation codec

**Video frame rate**
- 24 frames per second using H.264

**Data and graphics frame rate**
- Graphics sharing at 6 frames per second (standard configuration)
- Optional graphics sharing at 30 frames per second using a dedicated presentation codec

**Native National Television Standards Committee (NTSC)**
- 1080p and 1080i

**Audio standards**
- G.711 and AAC-LD (22 kHz)

**Audio features**
- Cisco Dynamic Echo Cancellation for spatial audio

**Cisco TelePresence High-Definition Camera**
- CMOS 2/3-inch sensor
- C-mount lens
- 1080p 30
- Minimum illumination 300 Lux
- Manual focus

**Firmware upgrades**
Downloadable from Cisco Unified Communications Manager

**Video network features**
Intelligent packet loss recovery of video transmission

**Network interface**
- 1 LAN or Ethernet (RJ-45), 100/1000 Mbps
- Internal 4-port Ethernet switch with 2 PoE (IEEE 802.3af) ports on codec

**For More Information**
For more information about the Cisco TelePresence System, visit: [http://www.cisco.com/go/telepresence](http://www.cisco.com/go/telepresence)
Cisco TelePresence Multipoint Switch

Easily and reliably include three or more locations in a single meeting with the Cisco TelePresence Multipoint Switch. With support for up to 48 locations in a single meeting across many endpoints, the switch allows all participants to be seen in life-like, high-definition video and heard in CD-quality, spatial audio with no perceivable latency. The Cisco TelePresence Multipoint Switch is an affordable, purpose-built appliance that offers superior scalability and is easy to install. It delivers automatic voice-activated switching either site-by-site or by individual table segment.

Key Features
- Easy meeting setup through enterprise groupware such as Microsoft Outlook or Lotus Notes
- One-button-to-push meeting start with the in-room IP phone
- The system supports connections among 48 single-screen Cisco TelePresence 500 or Cisco TelePresence 1000 endpoints, 16 triple-screen Cisco TelePresence 3000 or Cisco TelePresence 3200 endpoints, or a mix of both in a single meeting.
- Voice-activated switching with spatial audio and seating location on screen maintained as switching occurs
- When linked with the Cisco Unified Video Conferencing 3515 or 3545 MCU, the Cisco TelePresence Multipoint Switch provides full interoperability with the installed base of H.323 and SIP (Session Initiation Protocol) video conferencing endpoints.
- Latency of less than 10 milliseconds for transparent switching between sites or segments during a multipoint call
- Data sharing and auto-collaboration to share images with all other participants and rooms
- Web-based administration with role-based profiles for administrators at both group and department levels

Specifications

Cisco TelePresence Attribute
- Product compatibility: Cisco TelePresence system Version 1.4.2 or later
- Software compatibility: Cisco TelePresence Manager version 1.3 or later
- Call signaling: SIP trunk with Cisco Unified Communications Manager version 6.3 or later and IP Version 4 (IPv4)
- Media protocol: Real-time Transport Protocol (RTP) and Real-time Transport Control Protocol (RTCP), user datagram Protocol (UDP), and IP Unicast
- Video protocol: H.264 baseline high-definition (HDTV) 16:9 aspect ratio
- Video resolution: Progressive 1080p (1920 x 1080 pixels at 30 frames per second [fps]) and 720p (1280 x 720 pixels at 30 fps)
- Auto Collaboration video: 1024 x 768 pixels at 5 fps or 30 fps presentation video
- Audio: Advanced Audio Coding with low delay (AAC-LD/HBR) 22-MHz (CD-quality) audio; 4 channel audio streams
- Additional hardware: No additional hardware required

Cisco TelePresence Interoperability
- Product compatibility: Cisco TelePresence system Version 1.4.2 or later
- Software compatibility: Cisco TelePresence Manager version 1.3 or later
- Call signaling: SIP trunk with Cisco Unified Communications Manager Version 6.3 or later and IP Version 4 (IPv4)
- Media protocol: RTP and RTCP, UDP, and IP Unicast

For More Information
For more information about the Cisco TelePresence System, visit: http://www.cisco.com/go/telepresence

Selected Part Numbers and Ordering Information

Selected Part Numbers and Ordering Information

For More Information
For more information about the Cisco TelePresence System, visit: http://www.cisco.com/go/telepresence

Cisco TelePresence Multipoint Switch

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Key Features
- Easy meeting setup through enterprise groupware such as Microsoft Outlook or Lotus Notes
- One-button-to-push meeting start with the in-room IP phone
- The system supports connections among 48 single-screen Cisco TelePresence 500 or Cisco TelePresence 1000 endpoints, 16 triple-screen Cisco TelePresence 3000 or Cisco TelePresence 3200 endpoints, or a mix of both in a single meeting.
- Voice-activated switching with spatial audio and seating location on screen maintained as switching occurs
- When linked with the Cisco Unified Video Conferencing 3515 or 3545 MCU, the Cisco TelePresence Multipoint Switch provides full interoperability with the installed base of H.323 and SIP (Session Initiation Protocol) video conferencing endpoints.
- Latency of less than 10 milliseconds for transparent switching between sites or segments during a multipoint call
- Data sharing and auto-collaboration to share images with all other participants and rooms
- Web-based administration with role-based profiles for administrators at both group and department levels

Specifications

Cisco TelePresence Attribute
- Product compatibility: Cisco TelePresence system Version 1.4.2 or later
- Software compatibility: Cisco TelePresence Manager version 1.3 or later
- Call signaling: SIP trunk with Cisco Unified Communications Manager version 6.3 or later and IP Version 4 (IPv4)
- Media protocol: Real-time Transport Protocol (RTP) and Real-time Transport Control Protocol (RTCP), user datagram Protocol (UDP), and IP Unicast
- Video protocol: H.264 baseline high-definition (HDTV) 16:9 aspect ratio
- Video resolution: Progressive 1080p (1920 x 1080 pixels at 30 frames per second [fps]) and 720p (1280 x 720 pixels at 30 fps)
- Auto Collaboration video: 1024 x 768 pixels at 5 fps or 30 fps presentation video
- Audio: Advanced Audio Coding with low delay (AAC-LD/HBR) 22-MHz (CD-quality) audio; 4 channel audio streams
- Additional hardware: No additional hardware required

Cisco TelePresence Interoperability
- Product compatibility: Cisco TelePresence system Version 1.4.2 or later
- Software compatibility: Cisco TelePresence Manager version 1.3 or later
- Call signaling: SIP trunk with Cisco Unified Communications Manager Version 6.3 or later and IP Version 4 (IPv4)
- Media protocol: RTP and RTCP, UDP, and IP Unicast

For More Information
For more information about the Cisco TelePresence System, visit: http://www.cisco.com/go/telepresence

Selected Part Numbers and Ordering Information
Cisco Unified Video Advantage

Cisco Unified Video Advantage (formerly Cisco VT Advantage) adds video to your communications experience by providing video telephony functions to Cisco Unified IP Phones (Cisco Unified IP Phones 7900 Series and Cisco IP Communicator softphone application). With Cisco Unified Video Advantage, video telephony is now just a phone call. This solution comprises Cisco Unified Video Advantage software and Cisco VT Camera II, a video telephony USB camera. With Cisco Unified Video Advantage, you can use the familiar phone interface to make and receive video calls on your Cisco Unified IP Phone with the video component displayed on your PC. Enterprise organizations can take advantage of their existing IP networks to extend video to everyone in their organization.

Ideal for Companies that Need These Features
- Desktop video calling
- High-quality video with rich telephony features on their PC
- Transparent integration with desktop IP phone or Cisco IP Communicator for familiar phone interface

Key Features
- Consistent voice and video user experience: Cisco Unified Video Advantage offers easy, low-cost, high-quality video calling. Familiar call features such as call forward, transfer, conference, hold, and mute are initiated through the phone, and available video is viewed through the PC.
- Easy to manage: Unified administration is possible with Cisco Unified IP Phones and automatic software upgrades.

**Selected Part Numbers and Ordering Information**

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>LIC-CLM-15</td>
<td>Cisco TelePresence Multipoint Switch (CTMS)</td>
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<tr>
<td>LIC-C1MS-15 (Included)</td>
<td>Cisco C1MS Software License/Application</td>
</tr>
<tr>
<td>NCS-7845-N2-CS2 (Included — standard)</td>
<td>Cisco MCS 7845-H2 Media Convergence Server (HP)</td>
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<tr>
<td>NCS-7845-I2-CS2 (Included — alternate)</td>
<td>Cisco MCS 7845-I2 Media Convergence Server (IBM)</td>
</tr>
</tbody>
</table>

For More Information
For more information about the Cisco TelePresence System, visit: [http://www.cisco.com/go/telepresence](http://www.cisco.com/go/telepresence)
Cisco Unified Videoconferencing is a video infrastructure solution for Cisco Unified Communications. The solution allows participants to collaborate effectively and share information in real time to help organizations eliminate the barriers of time, distance, and resources and permit people around the world to function as if they were in the same room. The solution supports multiple protocols to facilitate connectivity with a wide variety of video-enabled devices from desktop video telephony to standard-definition and high-definition room systems. Cisco Unified Videoconferencing solutions are integrated into Cisco Unified Communications and rich-media conferencing solutions to deliver productivity that goes beyond traditional video conferencing by integrating video into a broad range of communication scenarios.

Key Features

- Multiprotocol support—broad video interoperability—The Cisco Unified Videoconferencing 3500 Series supports multiple standards, codecs, and protocols, including H.323, Session Initiation Protocol (SIP), Skinny Client Control Protocol (SCCP), and H.320, to help ensure broad connectivity with traditional and emerging video environments, including traditional room and desktop video conferencing systems, newer high-definition (HD) video solutions, Cisco TelePresence systems, and Cisco Unified Videoconferencing Manager video telephony environments.
- High-performance, flexible solution—The Cisco Unified Videoconferencing 3500 Series offers an optimized experience for everyone. Its powerful hardware design has flexible processing capabilities to provide an exceptional user experience that is also scalable and cost-effective.
- High-quality standard-definition video conferencing—Because every port has dedicated audio and video encoders, standard-definition (SD) endpoints can connect to any conference, at any supported bit rate, with any supported audio or video codec, at any supported SD resolution, and with any screen layout.
- High-capacity standard-definition video conferencing—The Cisco Unified Videoconferencing 3545 System has the flexibility to distribute processing resources that are not being fully used by personal or desktop video conferencing endpoints.
- The solution enhances the collaboration capabilities of Microsoft Office Communications (MOC) and Sametime by adding embedded, multiparty video. MOC and Sametime users can now initiate impromptu video communications with other MOC or Sametime users or with any video solution that can connect to Cisco Unified Videoconferencing.
- The Cisco Unified Videoconferencing ISDN Gateway Modules allow ISDN H.320 endpoints to participate in the same conferences as IP-based H.323, Skinny Client Control Protocol (SCCP), or Session Initiation Protocol (SIP) endpoints.
- Advanced solution management, desktop video, and streaming media—Cisco Unified Videoconferencing Manager—Cisco Unified Videoconferencing Systems can be managed as standalone devices or with the Cisco Unified Videoconferencing Manager, which helps organizations of all sizes use their video conferencing resources more effectively.

Specifications

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<thead>
<tr>
<th>Feature</th>
<th>Cisco Unified Videoconferencing 3500 Series</th>
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<tbody>
<tr>
<td><strong>Video Capabilities</strong></td>
<td>Video codecs—H.261, H.263, and H.264; Live video resolutions—Quarter Common Intermediate Format (QCIF), Common Intermediate Format (CIFF), Standard Input Format (SIF), 4CIF, 1280 x 720p, and 1920 x 1080p (switched HD service only); Presentation video resolutions—Video Graphics Array (VGA), Super Video Graphics Array (SVGA), and Extended Graphics Array (XGA); Video bandwidth—Up to 2 Mbps per port; Full transcoding and transrating for all SD (up to and including 4CIF) video codecs and speeds on all ports; All continuous-presence layout options support both SD and HD participants (for HD service), 4CIF resolution on all ports for all layout combinations; H.264 codec on all ports for all layout combinations; QualiVision for highly improved, standards-based video quality in networks with packet loss; supports both SD and HD connections; QoS support with Differentiated Services (DiffServ), type of service (ToS), and IP Precedence, Peer-to-peer (rather than per-conference) video processing, allowing unique and optimal video settings for each user</td>
</tr>
<tr>
<td><strong>Audio Capabilities</strong></td>
<td>3D audio codecs—G.711, G.722 (22 kHz), G.722.1, G.721, G.728, and G.729A; OMF tone detection (pf-band, H.249), DTMF tones, and RFC 2833); Entry and exit sounds played when conference participants join or leave a conference; Ability to record and upload custom messages; Full transcoding and mixing on all audio ports</td>
</tr>
<tr>
<td><strong>Signaling Protocols</strong></td>
<td>H.223, SCCP, SIP, H.240 with gateway modules</td>
</tr>
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For More Information


Selected Part Numbers and Ordering Information

CUVA-V2- 1= Cisco Unified Video Advantage with VT Camera II
CUVA-V2-24BU= Cisco Unified Video Advantage and VT Camera II 24-Unit Pack
CUVA-SW-2.x= Cisco Unified Video Advantage 2.x software only
CUVA-SW-2.x-KU= Cisco Unified Video Advantage 2.x software for User License

For More Information

Cisco WebEx Connect

Cisco WebEx Connect is an enterprise-class, on-demand collaboration platform that combines instant messaging, team spaces, and business applications to bring people, data, and processes together. It is the first collaborative software-as-a-service (SaaS) platform that allows developers and customers to integrate multiple applications to create powerful collaborative business solutions.

Ideal for Companies that Need These Features

- Unified communications and collaboration platform
- Web 2.0 applications deployment through an extensible client
- Fast deployment with low maintenance through software-as-a-service (SaaS) deployment model: Cross-company collaboration, one interface for business collaboration and communication, smooth real-time and non-real-time collaboration, and customizable team spaces without IT assistance
- Integrated instant messaging (IM), voice, video, web meetings, presence, shared workspaces, and document sharing, all in one platform

Key Features

- One unified interface for business collaboration—Users can work with others as if they are in the same room, allowing them to make informed decisions in real time using IM, video, voice over IP (VoIP), desktop sharing, and chat features. Integration with Cisco Unified Communications Solutions delivers transparent communication and collaboration.
- Cross-company collaboration—Users can work closely with colleagues, partners, or customers inside and outside your organization. They can create virtual team spaces where they can access shared assets instantly from any computer, including documents, persistent discussions, and even multiple business applications.
- Extensible Web 2.0 Development Platform—Cisco WebEx Connect provides an open and extensible collaboration platform, allowing for easy integration, so users can enrich and extend the value of their applications and business processes. Additionally, customers can create new composites of “mash-up” applications that enable collaborative business processes, which can be developed by Cisco, in-house developers, or third-party developers.
- Dynamic end-user collaboration without giving up control—Administrators can add, update, or deactivate users easily with batch functions and manage enterprise usage by creating any number of domains and subdomains.
- Avoidance of added infrastructure—Speed deployment and reduce maintenance costs by taking advantage of the Cisco WebEx MediaTone Network, a private global network that provides security, reliability, and scalability on demand. There is no hardware to purchase, maintenance or upgrade costs, and no long software deployment cycles.
- Security—The Cisco WebEx MediaTone Network delivers data content security and uses Secure Sockets Layer (SSL) and Advanced Encryption Standard (AES) encryption; the application has achieved third-party accreditation through compliance with SAS-70 Type I and II and FDA CFR21 Part 11.

Cisco WebEx Connect Advanced Auditor is an optional administration module that augments the security capabilities and user functions of Cisco WebEx Connect IM with centralized, server-based storage, comprehensive identity management, and message archive. Customer can enforce corporate messaging.

For More Information

For more information about the Cisco Unified Videoconferencing 3500 Series, visit: http://www.cisco.com/go/ipvc.
standards and policies, and enable compliance with government regulations with Cisco WebEx Connect Advanced Auditor.

For More Information
For more information about Cisco WebEx Connect, visit: http://www.webex.com/enterprise/webex-connect.html.

Cisco WebEx Meeting Center
Cisco WebEx Meeting Center allows business professionals to easily and reliably reach across the web to collaborate and work, inside or outside their organization. The solution increases the reach, speed, and cost-effectiveness of business through media-rich web-based meetings that enable multiple parties to conduct business meetings online—regardless of where they might be. Cisco WebEx Meeting Center enables companies to extend their business models over the web in a high-touch yet low-cost manner.

Ideal for Companies that Need These Features:
• Ability to meet remote colleagues, customers, and partners online to share presentations and collaborate
• SaaS delivery model that allows them to deploy a web conferencing solution over the web, eliminating the need for hardware and resources to maintain the infrastructure
• A secure and reliable method to collaborate both inside and outside the firewall

Key Features
• Integrated live audio, video, and data—Easily create dynamic and persuasive multimedia presentations that integrate live audio, video, and data. Use powerful presentation techniques such as animations and Macromedia Flash to deliver the true presentation experience.
• Powerful annotation tools—Presenters and participants can annotate and make notes on documents as if on a white board, for concise and clear communication or editing.
• Meeting platform you can trust—When the technology fails there is no makeup session. Rest assured; all Cisco WebEx events run on the Cisco WebEx MediaTone Network, ensuring security, reliability, and performance.
• Cisco WebEx Network Based Recording (NBR)—With a simple click, you can record all your events, which are then available for replay. Choose from multiple options such as requiring registration, destination URL, and post meeting surveys.
• Multiplatform—Let your prospects join your event on the platform of their choice: Windows, Mac, Linux, and UNIX.

For More Information
For more information about Cisco WebEx Meeting Center, visit: http://webex.com/enterprise/web-meeting.html.

Cisco WebEx Event Center
Cisco WebEx Event Center is an online event-management application for you to manage the entire online event lifecycle from planning, promoting, and presenting to follow-up and analysis. Whether you need to increase your lead numbers, launch a new product, or hold all-hands company meetings, Cisco WebEx Event Center can help you cost-effectively target the right people—anywhere—and get your message across at every touch point, not just during a live online event.

Ideal for Companies that Need These Features:
• Ability to deliver marketing events and corporate events over the web
• Comprehensive online event management with registrations, promotions, and follow-ups
• Robust online event session features for high-quality professional event production
• Software-as-a-service (SaaS) delivery model that allows them to deploy a web conferencing solution over the web, eliminating the need for hardware and resources to maintain the infrastructure
• Secure and reliable method to conduct events both inside and outside the firewall

Key Features
• Sophisticated event management features that are easy for any technically novice marketers—From customizable HTML templates and event registration forms to automated lead management and lead scoring. Cisco WebEx Event Center has the features you need for a successful webcast that delivers the results you want.
• Higher return on investment (ROI)—Extend the life of your events with Cisco WebEx Network Based Recording (NBR). With a simple click, you can record all your events, which are then available for replay. Choose from multiple options such as requiring registration or destination URL, or even posting surveys.
• Meeting platform you can trust—When the technology fails there is no makeup session. Rest assured; all Cisco WebEx events run on Cisco WebEx MediaTone Network, ensuring security, reliability, and performance.
• Audio broadcast—Cisco WebEx meeting applications offer multiple audio options to meet your event needs and budget. Audio broadcast allows presenters to deliver over a regular telephone while the meeting participants listen through their computers.
• Multiplatform—Let your prospects join your event on the platform of their choice: Windows, Mac, Linux, or UNIX.
Cisco WebEx Training Center

Cisco WebEx Training Center is a hosted online training solution that enables you to deliver dynamic, interactive learning to anyone who has web access and a browser. Designed to provide instructors with flexible, easy-to-use tools that encourage interactions and engage learners, Cisco WebEx Training Center is the leading virtual classroom solution on the market. With this application you can significantly decrease the cost of delivering live training, reach your learners more often, and reduce the time your learners spend away from their jobs and their customers.

Ideal for Companies that Need These Features:
- Online classroom for interactive learning
- Comprehensive online learning management with registrations, testing, hands-on labs, and breakout rooms
- Software-as-a-service (SaaS) delivery model that allows them to deploy a web conferencing solution over the web, eliminating the need for hardware and resources to maintain the infrastructure
- Secure and reliable method to conduct events both inside and outside the firewall

Key Features
- Keep learners engaged and involved with Quick Response tools that make it easy for instructors and learners to communicate. These tools allow students to interact with instructors and other students with the click of an icon.
- Promote collaborative learning with virtual breakout sessions that allow students to break into small groups to work on projects, role-play, or develop case studies. Instructors can roam from group to group to provide guidance and support.
- Provide remote learners with hands-on access to software training with Cisco WebEx Hands-On Labs. Accelerate the roll-out of software applications by providing students with access to remote lab computers for hands-on training through the Internet.
- Assess the understanding and ability of your learners to apply your training with the integrated Cisco WebEx Testing Engine. Deliver tests before, after, or during live training sessions.
- Take full advantage of Cisco WebEx Integrated Audio to simplify the scheduling and management of audio sessions for your live online training programs. Innovative features such as Active Talker allow instructors and students to see who is speaking, promoting personal interactions and enabling instructors to "spot" audio distractions (hold music) and mute the line to minimize interruptions.
- Deliver live interactive training to learners regardless of their computing platform, with multiplatform support for Windows, Mac, Linux, Solaris, and UNIX.

Cisco WebEx Sales Center

Cisco WebEx Sales Center is a sales collaboration application that enables sales organizations to engage prospects more effectively and more frequently, extend their geographical reach, collaborate with prospects and sales-team members, and shorten their sales cycle. Including online selling into your sales cycle can help your sales representatives avoid wasting time on bad deals, and spend their time engaging with their best prospects to close more deals faster.

Ideal for Companies that Need These Features
- Ability to conduct sales meetings online with presentations and demos
- Team selling with silent monitoring and attention indicator
- Software-as-a-service (SaaS) delivery model that allows them to deploy a web conferencing solution over the web, eliminating the need for hardware and resources to maintain the infrastructure
- Secure and reliable method to conduct events both inside and outside the firewall

Key Features
- Collaboration designed for the sales organization and team selling—Meetings focused on specific accounts and opportunities; sales team role to allow communication among distributed team members; subject-matter-expert (SME) locator to bring the people you need to move the deal along into the meeting instantly; attention indicator helps you know when you need to reengage your prospect’s interest.
- Prospect engagement between meetings—Personalized sales portals for every opportunity are easy to set up; they allow representatives to provide their prospect teams with the latest information, documents, and other relevant information. You can track usage and allow prospects to invite their peers to identify cross-sell opportunities.
- No challenges with technology—A simplified prospect interface gives prospects a full-screen view of your presentation; no instructions are needed. Your prospect can completely focus on your presentation.
• Management tools for training and development—The solution offers complete reporting tools for managers. Sales team managers can drop in on representatives' meetings (either as a sales team member or silently) to help the representative move the deal along or to provide training and coaching to improve the representative's selling skills.
• Customer-relationship-management (CRM) integration—Cisco WebEx Sales Center has full integration to several market-leading on-demand CRM products to tie meetings and activity to your prospects and opportunities, and eliminate time wasted on duplicate data entry by your representatives.
• Platform you can trust—All Cisco WebEx meetings run on the Cisco WebEx MediaTone Network, ensuring security, reliability, and performance.
• Cross-platform—Let your prospects join your meeting on either the Windows or Macintosh platform.

For More Information
For more information about Cisco WebEx Sales Center visit: http://webex.com/enterprise/sales-center.html.

Cisco WebEx Support Center
Cisco WebEx Support Center enables IT and customer support to reduce costs, increase the productivity of their technical support representatives, reduce customer downtime, and increase customer satisfaction by improving the efficiency and effectiveness of remote support.

Ideal for Companies that Need These Features
• Ability to remotely deliver technical support as if onsite
• Reduced support time and cost with anywhere, secure access for the customer and the agent
• Software-as-a-service (SaaS) delivery model that allows them to deploy a web conferencing solution over the web, eliminating the need for hardware and resources to maintain the infrastructure
• Secure and reliable method to conduct events both inside and outside the firewall

Key Features
• View and control at application and desktop level—When providing support, customers can decide if they want to share a single application versus their entire desktop. This feature is very important from the security perspective.
• Cisco WebEx Network Based Recording (NBR)—All support interactions can be recorded for auditing, tracking, and security purposes. Both audio and visual support session details are recorded.
• Performance, reliability, security, and 24-hour support—All Cisco WebEx support sessions run on the Cisco WebEx MediaTone Network, which offers better than 99.99-percent reliability and provides exceptional security. Information is never stored on our servers; we use 128-bit Secure Sockets Layer (SSL) and Advanced Encryption Standard (AES) encryption, and Cisco WebEx meeting applications are SAS 70 and WebTrust certified.
• Remotely access and manage computers—Through the use of Cisco WebEx Remote Support and Remote Access, you can remotely support and provide proactive support to computers anywhere in the world through the Internet, without the need to access firewalls and open ports on the customer site.
• Cross-platform compatibility—You can support your customers on multiple platforms, Windows, Mac, Linux, and UNIX, using Cisco WebEx Remote Support. Cisco WebEx Remote Access is Windows-only.

Cisco WebEx Support Center Remote Support gives customer support representatives the ability to view and take control of a customer's desktop or applications over the Internet. The support center increases the productivity of support staff, improving first call closure rates and eliminating site visits. With Cisco WebEx Support Center Remote Support, you can:
• Resolve concerns quickly with powerful interactive capabilities, with two-way desktop and application sharing, file transfer, chat, and streaming video.
• Bring in subject matter experts easily, and transfer the session or conference in others.
• Launch a support session directly from a browser or trouble-ticket system.
• Sign on to a client's machine using firewall-friendly technology.
• Measure and improve support organization performance with detailed reporting.
• Integrate out of the box with salesforce.com and Remedy; application programming interfaces (APIs) are available for other technologies.

For More Information
For more information about Cisco WebEx Support Center visit: http://webex.com/enterprise/customer-support.html.
## Security

### Security At a Glance

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<td><strong>ENDPOINT SECURITY</strong></td>
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<tr>
<td>Cisco IOS Security</td>
<td>Cisco IOS software delivers a sophisticated set of security capabilities for a comprehensive, layered security approach throughout the network infrastructure. Cisco IOS security technologies help to defend critical business processes against attack and disruption, protect privacy and support policy and regulatory compliance controls.</td>
<td>5–4</td>
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<tr>
<td>Cisco Security Agent</td>
<td>Cisco Security Agent protects endpoints from all types of malware and confidential data loss with a lower total cost of ownership.</td>
<td>5–4</td>
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<tr>
<td>Cisco NAC Appliance</td>
<td>This easily deployed network-admission-control (NAC) solution accesses network administrators to authenticate, authorize, validate, quarantine, and remediate wired, wireless, and remote users and their machines prior to allowing access to the network.</td>
<td>5–5</td>
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<td><strong>NETWORK SECURITY</strong></td>
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<tr>
<td>Cisco ASA 5500 Series Adaptive Security Appliances</td>
<td>Cisco ASA 5500 Series Adaptive Security Appliances are easy-to-deploy solutions that integrate world-class firewall, unified communications (voice and video) security SSL and IPsec VPN, intrusion prevention systems (IPSs), content security services, and secure unified communications in a flexible, modular product family.</td>
<td>5–8</td>
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<tr>
<td>Cisco Intrusion Prevention Systems (IPS)</td>
<td>Cisco Intrusion Prevention System (IPS) solutions accurately identify, classify, and stop malicious traffic, including worms, spyware, adware, network viruses, and application abuse, before they affect business resiliency.</td>
<td>5–12</td>
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<td>Cisco Catalyst 6500 Series Firewall Services Module</td>
<td>The Cisco Catalyst 6500 Series Firewall Services Module is a high-speed, integrated firewall module for Cisco Catalyst 6500 Switches and Cisco 7600 Series Routers that provides some of the fastest firewall data rates in the industry. 5–Gbps throughput, 100,000 cells per second (CPS), and 1 million concurrent connections. Up to four FWSMs can be installed in a single chassis, providing scalability to 20 Gbps per chassis. Based on Cisco PIX Firewall technology, the Cisco Catalyst 6500 FWSM offers large enterprises and service providers excellent security, reliability, and performance.</td>
<td>5–14</td>
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<tr>
<td>Cisco Catalyst 6500 Series/7600 Series WebVPN Services Module</td>
<td>The Cisco Catalyst 6500 Series/7600 Series WebVPN Services Module is a high-speed, integrated SSL VPN services module for Cisco Catalyst 6500 Series Switches and Cisco 7600 Series Routers that addresses the scalability, performance, application support, and security required for large-scale, remote-access SSL VPN deployments. Taking advantage of the broad, industry-proven application support and endpoint security provided by Cisco VPN 3000 Series Concentrators, the Cisco WebVPN Services Module is ideally suited to meet the secure connectivity demands of any organization.</td>
<td>5–16</td>
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<tr>
<td>Cisco SSL VPN Solutions</td>
<td>Cisco SSL VPN solutions offer a flexible and secure way to extend networking resources to virtually any remote user with access to the Internet and a Web browser. The Cisco Adaptive Security Appliance SSL VPN functions let organizations cost-effectively and securely extend the reach of their network resources to telecommuters, partners, and mobile workers.</td>
<td>5–16</td>
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<tr>
<td><strong>E-MAIL AND WEB SECURITY</strong></td>
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<td>Cisco IronPort E-mail Security Appliances</td>
<td>Cisco IronPort E-mail Security Appliances provide a multi-layer approach to stopping e-mail-based threats.</td>
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<td>Cisco IronPort Secure Web Gateway Appliances</td>
<td>Designed to meet the needs of the most demanding organizations, the Cisco IronPort Secure Web Gateway appliance protects the network perimeter against spyware and a wide variety of web-based threats.</td>
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<td><strong>APPLICATION SECURITY</strong></td>
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<tr>
<td>Cisco ACE Web Application Firewall</td>
<td>Cisco ACE, WAF protects Web applications and helps organizations comply with regulatory requirements.</td>
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<td><strong>SYSTEM MANAGEMENT AND CONTROL</strong></td>
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<tr>
<td>Cisco Security Manager</td>
<td>Cisco Security Manager provides centralized management of security solutions for larger deployments, and with increased accuracy. The application is cost-effective for small networks, and offers scalability for large enterprises.</td>
<td>5–24</td>
</tr>
<tr>
<td>Cisco Enterprise Policy Manager</td>
<td>Cisco Enterprise Policy Manager (EPM) is a feature-rich, XACML-based policy management and authorization product that helps secure enterprise applications and data. Cisco Security Manager centrally manages firewall, VPN, and intrusion prevention systems (IPSs) (configuration, changes, and updates).</td>
<td>5–25</td>
</tr>
<tr>
<td>Cisco Security Monitoring, Analysis and Response System (MARS)</td>
<td>The Cisco Security Monitoring, Analysis, and Response System (MARS) is a centralized monitoring, event-correlation, attack mitigation, and compliance reporting system.</td>
<td>5–26</td>
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</table>
CiscoWorks Network Compliance Manager
- This solution is part of the Cisco PMU solution.
- It tracks and regulates configuration and software changes throughout a multivendor network infrastructure (including Cisco routers, switches, firewalls, load balancers, and wireless access points).
- It provides unparalleled visibility into network changes and can track compliance with a broad variety of regulatory, IT, corporate governance, and technology best practices.

PHYSICAL SECURITY
Cisco Physical Access Gateway
*NEW*
The Cisco Physical access gateway is the primary means for the Cisco Physical Access Control solution to connect door hardware, such as locks and readers, to your IP network. One gateway can control up to two doors.

Cisco Physical Access Manager
*NEW*
Cisco Physical Access Manager is the management application for the Cisco Physical Access Control solution. Its easy-to-use interface lets you configure Cisco Physical Access gateways and modules, monitor activity, enroll users, and integrate with IT applications and data stores.

Cisco Video Surveillance 2500 Series IP Cameras—Standard Definition
*NEW*
The Cisco video surveillance 2500 series IP cameras are feature-rich, professional digital cameras designed for superior performance in a wide variety of environments. The cameras have an enhanced, progressive scan imager for excellent video and color even in the most demanding lighting conditions. They use MPEG-4 compression to produce DVD-quality video. These fully featured high-resolution cameras include automatic daylight/mode, dual streams, bidirectional audio, motion detection, alarm inputs and outputs, and an analog BNC for ease of installation.

Cisco Video Surveillance 4000 Series IP Cameras—High Definition
*NEW*
The Cisco video surveillance 4000 series IP cameras are true high-definition (HD) video surveillance IP digital cameras designed for superior performance in a wide variety of video surveillance applications. These cameras provide efficient network usage with the highest-quality video. Contact closures and two-way audio allow integration with microphones, speakers, and access control systems. With their open, standards-based design, the cameras provide an ideal platform for integration and operation as independent devices or as part of a Cisco Video Surveillance network.

Cisco Video Surveillance Stream Manager Software
*NEW*
Cisco Video Surveillance Stream Manager software is the packetizing and reconstructing software used in Cisco Video Surveillance IP Gateways, Convergence Chassis, Service Nodes, and gateways. The software provides virtual matrix switching to connect cameras, keyboards, and monitors, plus video storage and recall for display on analog monitors or PCs. Cisco Video Surveillance Stream Manager Software provides powerful features for the operation and management of a video surveillance solution.

Cisco Video Surveillance Media Server Software
*NEW*
As the core component of the Cisco network-centric video surveillance software portfolio, the Cisco Video Surveillance Media Server offers the power and flexibility to meet a diverse range of video surveillance requirements.

Cisco Video Surveillance Operations Manager Software
*NEW*
Quickly and effectively configure and manage video throughout your enterprise with the Cisco Video Surveillance Operations Manager. Working in conjunction with the Cisco Video Surveillance Media Server, it meets the diverse needs of administrators, systems integrators, and operators.

Cisco Physical Security Multiservices Platform
*NEW*
The Cisco Physical Security Multiservices Platform encompasses a suite of three server models that offer organizations innovative choices for network digital recording and playback. With built-in analog video encoder cards and Fibre Channel interfaces, the multiservices platform enables direct connectivity from analog closed-circuit television (CCTV) cameras and for IP video directed from the network, and allows playback of the recordings over an IP network. Viewing recorded video streams is possible anytime, anywhere.

Cisco IPICS Server Software
*NEW*
The Cisco IPICS server is a security-enhanced, Linux-based platform installed on select Cisco 7800 Series Media Convergence Servers, a family of proven and reliable hardware platforms that you can deploy in mobile command units or in headquarters, branch offices, or operations centers. Other Cisco IPICS system components include the Cisco IPICS Push-to-Talk Management Center (PMC), Cisco IPICS Phone Client, Cisco IPICS Operational Views (Ops Views), Cisco Land Mobile Radio (LMR) gateways, Router Media Service (RMS), and Session Initiation Protocol (SIP) telephony gateways.

SERVICES
Cisco Security Services
This integrated security services portfolio provides solutions for threat management, event management, vulnerability management, and compliance support across a broad range of industries and advanced technologies, including unified communications, storage networking, and wireless networks.

Product Ordering Website
To place an order or for more part numbers, visit: http://www.cisco.com/en/US/ordering/index.shtml
This chapter only provides a small subset of all part numbers available. See the URL listed in the “For More Information” section of each product to get a complete list of part numbers.
Cisco IOS Security

Cisco IOS Software routers ship with the industry's most comprehensive security services, intelligently embedding data, security, voice, and wireless in the platform portfolio for fast, scalable delivery of mission-critical business applications. The Cisco 800 Series Routers and Cisco 1800, 2800, and 3800 Series Integrated Services Routers are ideal for small businesses and enterprise branch offices, delivering a rich, integrated solution for connecting remote offices, mobile users, and partner extranets or service provider-managed customer premises equipment (CPE). The Cisco 7200 Series and 7301 Routers and the Cisco ASR 1000 Series Aggregation Services Routers are ideal for aggregation of WAN security services in campus and enterprise environments.

Cisco IOS Security software routers include security services that address customer concerns regarding threat management, VPN and secure communications, integrated network solutions, and security management. With the convergence of features such as advanced firewall, VPN services, intrusion prevention system (IPS), Cisco Network Access Control (NAC), and content filtering, the Cisco IOS Security routers give customers flexibility to choose a solution that meets their bandwidth, LAN and WAN density, and multiservice requirements while benefiting from advanced security.

Ideal for Companies that Need These Features

- An integrated security solution that includes firewall, VPN, remote access, IPS, and content-filtering technologies
- Low total cost of ownership by taking advantage of the existing infrastructure for modular and flexible deployment options
- An integrated stateful inspection firewall with powerful security and multiprotocol routing all on the same routing platform
- Scalability options from the Cisco 800 Series up to the Cisco 7200 Series, the Cisco 7301, and the Cisco ASR 1000 Series Aggregation Services Routers
- Integrated, secure network solutions including secure unified communications and secure mobility
- Secure extranet and intranet perimeters and Internet connectivity for secure branch and remote offices
- Ability to meet compliance regulations such as Payment Card Industry (PCI), Health Insurance Portability and Accountability Act (HIPAA), or Sarbanes-Oxley Act of 2002 (SOX) that require firewall or data-encryption services

Key Features

- Cisco IOS Security offers an advanced firewall that includes zone-based firewall, which provides secure, stateful, application-based packet inspection to support the latest protocols and advanced applications.
- Cisco IOS Firewall offers a threat-management foundation to deploy secure access policies at all network interfaces.
- Cisco IOS Intrusion Prevention System (IPS) is an inline, deep-packet inspection feature that effectively mitigates a wide range of network attacks. Supporting thousands of attack signatures, it provides the network intelligence to accurately identify, classify, and stop or block malicious traffic in real time.
- Cisco IOS Content Filtering helps your organization protect itself from known and new Internet threats, improve employee productivity, and enforce business policies for regulatory compliance.
- Cisco IOS IP Security (IPsec) and Secure Sockets Layer (SSL) VPN offer services for site-to-site VPN and unified remote-access security. These services include standards-based IPsec VPN, Cisco Group Encrypted Transport VPN, Dynamic Multipoint VPN (DMVPN), Easy VPN, and SSL VPN.
- Dynamic, per-user authentication and authorization for LAN, WAN, and VPN clients.
- Cisco Network Admission Control (NAC) support extends the ability of the network to enforce organizational security policies on devices seeking network access by delivering NAC services on an integrated services module.

Specifications

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<thead>
<tr>
<th>Supported Network Interfaces</th>
<th>All network interfaces on supported platforms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supported Platforms</td>
<td>Cisco 1800, 2800, 3800, 7200 Series and 7301 Series router platforms; Cisco 800 supports all features except Dynamic Multipoint VPN (DMVPN) and Maximum IPsec Tunnels.</td>
</tr>
<tr>
<td>Max IPsec Tunnel</td>
<td>Cisco 800—Up to 20; Cisco 1800—Up to 80; Cisco 2800—Up to 150; Cisco 3800—Up to 2500; 7200/7301 Bundles—Up to 5000</td>
</tr>
<tr>
<td>Cisco IOS Firewall Performance</td>
<td>Cisco 800: 6 Mbps; Cisco 1800: 12 Mbps; Cisco 2800: 250 Mbps; Cisco 3800: 855 Mbps; Cisco 3845: 1 Gbps; Cisco 7200/7301 Bundles—1 Gbps; ASR 1000-20 Gbps</td>
</tr>
</tbody>
</table>

1 UDP traffic on

Selected Part Numbers and Ordering Information

The Cisco IOS Security router bundles are based on the Cisco 800 Series Routers, Cisco 1800, 2800, and 3800 Series Integrated Services Routers, and Cisco 7200 Series and 7301 routers providing a full range of security features. These bundles include entry security bundles, enhanced security bundles for added performance and scale, and entry voice (Voice Security [VSEC]) and premier voice (H-VSEC) bundles for combined security and unified communications. These bundles are orderable through a single part number at a reduced price compared to ordering each component separately.
Cisco Security Agent

Businesses are under intense pressure to protect their IT assets from attacks that are increasing in frequency and sophistication. At the same time they need to address stringent compliance requirements and minimize expenses and complexity.

Cisco Security Agent 6.0 is the first endpoint security solution that integrates behavioral-based intrusion protection, data-loss prevention, and signature-based antivirus into a single, manageable agent. This exceptional blend of capabilities defends servers and desktops against sophisticated zero-day attacks and enforces acceptable-use and compliance policies within a simplified management infrastructure.

Ideal for Companies that Need These Features

- Real-time protection from persistent & evolving threats
- Device malware scanning and deletion
- Identification & control of sensitive information to prevent data loss
- Regulatory-compliance monitoring and enforcement

Key Features

- Provides industry-leading protection for laptops, desktops, servers, and POS devices.
- Prevents against data loss at the endpoint, including preventing clipboard abuse (for example, copying sensitive information and pasting to IM, blogs, etc.).
- Prevents sensitive information from being copied, written to network drives, accessing the network (TCP/UDP), or written to USB devices, CDs, and other removable media.
- Allows only authorized applications to access the sensitive information (for example, not allowing uploads of sensitive files via Outlook).
- Imposes restrictions for wireless and remote users (i.e. cannot copy sensitive information to removable media while off the corporate network).
- Provides behavioral-based protection from known and unknown threats.
- Integrates antivirus protection with automatic, no-cost updates.
- Imposes restrictions for wireless and remote users (i.e. cannot copy sensitive information to removable media while off the corporate network).
- Offers network collaboration that strengthens the security posture of the organization.
- Offers comprehensive management, visibility, and reporting.
- Is the critical endpoint component of the Cisco Self-Defending Network architecture.

Specifications

<table>
<thead>
<tr>
<th>Feature</th>
<th>Cisco Security Server Agent</th>
<th>Cisco Security Desktop Agent</th>
<th>Cisco Security Agent Management Console</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Windows 2000 Server and Advanced Server</td>
<td>Windows Embedded Point of Service (WEP0S)</td>
<td>Windows XP Professional</td>
</tr>
<tr>
<td></td>
<td>Solaris 8 SPARC architecture (64-bit kernel)</td>
<td>Windows 2000 Professional</td>
<td>Red Hat Enterprise Linux 4.0 WS</td>
</tr>
<tr>
<td></td>
<td>Red Hat Enterprise 6.0 ES and AS</td>
<td>Red Hat Enterprise Linux 3.0 ES and AS</td>
<td>Red Hat Enterprise Linux 3.0 WS</td>
</tr>
</tbody>
</table>

Selected Part Numbers and Ordering Information

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CSA-100-SVR-K9</td>
<td>Cisco Security Agent [10 Server Agent Bundle]</td>
</tr>
<tr>
<td>CSA-200-SVR-K9</td>
<td>Cisco Security Agent [20 Server Agent Bundle]</td>
</tr>
<tr>
<td>CSA-200-UOP-K9</td>
<td>Cisco Security Agent [200 Desktop Agent Bundle]</td>
</tr>
<tr>
<td>CSA-500-SVR-K9</td>
<td>Cisco Security Agent [500 Server Agent Bundle]</td>
</tr>
<tr>
<td>CSA-500-UOP-K9</td>
<td>Cisco Security Agent [500 Desktop Agent Bundle]</td>
</tr>
<tr>
<td>CSA-1000-SVR-K9</td>
<td>Cisco Security Agent [1,000 Server Agent Bundle]</td>
</tr>
<tr>
<td>CSA-1000-UOP-K9</td>
<td>Cisco Security Agent [1,000 Desktop Agent Bundle]</td>
</tr>
<tr>
<td>CSA-UCP25-K9</td>
<td>Cisco Security Agent [25 ULP Desktop Agent Upgrade]</td>
</tr>
<tr>
<td>CSA-UCP100-K9</td>
<td>Cisco Security Agent [100 ULP Desktop Agent Upgrade]</td>
</tr>
<tr>
<td>CSA-UCP250-K9</td>
<td>Cisco Security Agent [250 ULP Desktop Agent Upgrade]</td>
</tr>
<tr>
<td>CSA-UCP1000-K9</td>
<td>Cisco Security Agent [1,000 ULP Desktop Agent Upgrade]</td>
</tr>
</tbody>
</table>
The Cisco NAC Appliance is an easily deployed network-admission-control (NAC) solution that allows network administrators to authenticate, authorize, evaluate, and remediate wired, wireless, and remote users and their devices prior to granting access to the network. It prevents unauthorized access to the network by requiring proper user credentials as they connect to the network. It determines whether devices are compliant with security policies and remediates vulnerabilities before network access is allowed. To enhance its ease of use, the NAC appliance comes preinstalled with rule sets for operating system updates, antivirus software updates, and antispyware software updates from all major vendors, simplifying the task of determining which policies to enforce and how to enforce them.

Customers will need at least one Cisco NAC Server, which performs device compliance checks as users attempt to access the network. It can be deployed as a virtual gateway or as a real IP gateway. Customers also need at least one Cisco NAC Manager to define access policies and to manage the Cisco NAC Server(s). The Cisco NAC Appliance is an optional client software component for more stringent vulnerability assessment. The Cisco NAC Appliance is an optional device that provides device profiling service. It keeps a real-time, contextual inventory of all devices in a network, including nonauthenticating devices such as IP phones and printers. The Cisco NAC Guest Server is another optional device that provides secure guest access service.

The Cisco NAC Appliance is ideal for midsize and large enterprises that are looking for a client policy enforcement solution. It complements wireless deployments, remote-access deployments, and other security products, such as Cisco Security Agent and Cisco Security Monitoring, Analysis and Response System (MARS). The Cisco NAC Appliance is the market’s most widely deployed NAC solution.

The appliance is available with 100, 250, 500, and 1500-user license-based Cisco NAC Server seats. The number of users is defined as online, concurrent users. The appliance is available either as a “standard” manager, which can support up to 20 NAC servers, or as a manager “lite,” which can support up to 3 NAC servers.

The Cisco NAC Profiler facilitates the deployment and management of Cisco NAC by discovering, tracking, and monitoring the location, types, and behavior of all LAN-attached endpoints. It also uses the information about the device to apply appropriate Cisco NAC policies.

The Cisco NAC Guest Server vastly simplifies the provisioning, notification, management, and reporting of guest users on wired and wireless networks.

For More Information
For more information about Cisco Security Agent, visit http://www.cisco.com/go/csa.

Cisco NAC Appliance
The Cisco NAC Appliance is an easily deployed network-admission-control (NAC) solution that allows network administrators to authenticate, authorize, evaluate, and remediate wired, wireless, and remote users and their devices prior to granting access to the network. It prevents unauthorized access to the network by requiring proper user credentials as they connect to the network. It determines whether devices are compliant with security policies and remediates vulnerabilities before network access is allowed. To enhance its ease of use, the NAC appliance comes preinstalled with rule sets for operating system updates, antivirus software updates, and antispyware software updates from all major vendors, simplifying the task of determining which policies to enforce and how to enforce them.

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The Cisco NAC Guest Server vastly simplifies the provisioning, notification, management, and reporting of guest users on wired and wireless networks.

Ideal for Companies that Need These Features
- A client policy enforcement solution
- License-based server seats for 100, 250, 500, up to 3500 users
- Support for up to 20 NAC servers
- Simplified provisioning, notification, management, and reporting of guest users on wired and wireless networks

Key Features
- Vulnerability assessment—The Cisco NAC Appliance supports scanning of all Windows-based operating systems, Mac OS, Linux machines, and non-PC networked devices such as Xbox, PlayStation 2, and personal digital assistants. It conducts network-based scans or can use custom-built scans as required. In a managed domain, it can also conduct scans of Windows registries without client software.
- Device quarantine—The Cisco NAC Appliance faces noncompliant machines into quarantine, preventing the spread of infection while maintaining access to remediation resources; it quarantines these machines by using subnets as small as /30, or by using a quarantine VLAN
- Automatic security policy updates—The Cisco NAC Appliance provides predefined policies for the most common network access criteria, including policies that check for critical operating system updates and common antivirus software virus definition updates. It eases the management cost on network administrators, who can rely on the Cisco NAC Appliance system to constantly maintain updated policies.
- Centralized management—The web-based management console allows administrators to define the types of scans required for each role as well as the related remediation packages necessary for recovery. One Cisco NAC Manager management console can manage up to 20 NAC servers.
- Remediation and repair—The Cisco NAC Appliance gives devices access to remediation servers during quarantine that can provide operating system patches and updates, virus-definition files, or endpoint security solutions such as Cisco Security Agent. Administrators have the option of automatically installing these fixes using the Cisco NAC Appliance enforcement agent.
- Single Sign On (SSO)—The appliance supports SSO with VPN clients, Microsoft Windows, and wireless deployments.
- Solution for major customer pain points—This appliance supports identity-based access control, Guest Access, and managed and unmanaged assets.
Cisco NAC Appliance

- Flexibility—The appliance is ideal for flexible deployment scenarios; it supports wireless, remote-access (VPN), branch offices (WAN), and main campus (LAN) environments. Both in-and out-of-band deployments are possible.
- Autoremediation for Windows
- Device profiling service—The Cisco NAC profiler discovers, tracks, and monitors the location, types, and behavior of all LAN-attached endpoints, thereby providing automation, intelligence, and visibility for the customers.
- Guest access service—The Cisco NAC Guest Server provides full secure guest access life cycle support, including provisioning, notification, management, and reporting of guest users on wired and wireless networks.

Specifications

### Cisco NAC Servers and NAC Managers

<table>
<thead>
<tr>
<th>Feature</th>
<th>Cisco NAC Appliance 3310</th>
<th>Cisco NAC Appliance 3350</th>
<th>Cisco NAC Appliance 3390</th>
</tr>
</thead>
<tbody>
<tr>
<td>Product</td>
<td>- Cisco NAC server for 250, 500 and 1000 users&lt;br&gt;- Cisco NAC Lite Manager&lt;br&gt;- Cisco NAC Standard Manager</td>
<td>- Cisco NAC server for 1000, 2500, and 5000 users&lt;br&gt;- Cisco NAC Super Manager</td>
<td>- Cisco NAC server for 1500, 2500, 3500 users&lt;br&gt;- Cisco NAC Standard Manager&lt;br&gt;- Cisco NAC Super Manager</td>
</tr>
<tr>
<td>Processor</td>
<td>Dual-core Intel Xeon 2.33-GHz&lt;br&gt;2 x dual-core Intel Xeon 2.33-GHz</td>
<td>Dual-core Intel Xeon 3.0-GHz&lt;br&gt;2 x dual-core Intel Xeon 3.0-GHz</td>
<td>2 x dual-core Intel Xeon 3.0-GHz&lt;br&gt;2 x dual-core Intel Xeon 3.0-GHz</td>
</tr>
<tr>
<td>Memory bus clock</td>
<td>1333-MHz FSB</td>
<td>1333-MHz FSB</td>
<td>1333-MHz FSB</td>
</tr>
<tr>
<td>Controller</td>
<td>Embedded SA T A RAID Controller</td>
<td>Smart Array E200i Controller</td>
<td>Smart Array E200i Controller</td>
</tr>
<tr>
<td>Hard disk</td>
<td>80-GB NPH SA T A drive</td>
<td>2 x 72-GB SFF SAS RAID drives&lt;br&gt;4 x 72-GB SFF SAS RAID drives</td>
<td>2 x 72-GB SFF SAS RAID drives&lt;br&gt;4 x 72-GB SFF SAS RAID drives</td>
</tr>
<tr>
<td>Removable media</td>
<td>CD/DVD-ROM drive</td>
<td>CD/DVD-ROM drive</td>
<td>CD/DVD-ROM drive</td>
</tr>
</tbody>
</table>

### NETWORK CONNECTIVITY

<table>
<thead>
<tr>
<th>Ethernet network interface cards (NICs)</th>
<th>Cisco NAC Appliance 3310</th>
<th>Cisco NAC Appliance 3350</th>
<th>Cisco NAC Appliance 3390</th>
</tr>
</thead>
<tbody>
<tr>
<td>TOBASE-T cable support</td>
<td>Category 5 (Cat) 3, 4, or 5 UTP up to 328 ft. (100m)</td>
<td>Cat 5 UTP up to 328 ft. (100m)</td>
<td>Cat 5 UTP up to 328 ft. (100m)</td>
</tr>
<tr>
<td>10/100/100BASE-TX cable support</td>
<td>Cat 5 UTP up to 328 ft. (100m)</td>
<td>Cat 5 UTP up to 328 ft. (100m)</td>
<td>Cat 5 UTP up to 328 ft. (100m)</td>
</tr>
</tbody>
</table>

### Secure Sockets Layer (SSL) accelerator card
- Cisco NAC Appliance 3310: Cavium CN 1120-NHB-E
- Cisco NAC Appliance 3350: Cavium CN 1120-NHB-E
- Cisco NAC Appliance 3390: Cavium CN 1120-NHB-E

### INTERFACES

| Serial ports | 1 | 1 | 1 |
| USB 2.0 ports | 4 (two front, two rear) | 4 (one front, one internal, two rear) | 4 (one front, one internal, two rear) |
| Keyboard port | 1 | 1 | 1 |
| Video port | 1 | 1 | 1 |
| Mouse port | 1 | 1 | 1 |
| External SCSI port | None | None | None |

### SYSTEM UNIT

<table>
<thead>
<tr>
<th>Form factor</th>
<th>Rack-mount 1 RU</th>
<th>Rack-mount 1 RU</th>
<th>Rack-mount 1 RU</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight</td>
<td>36 lb (16.36 kg) fully configured</td>
<td>36 lb (16.36 kg) fully configured</td>
<td>36 lb (16.36 kg) fully configured</td>
</tr>
<tr>
<td>Dimensions</td>
<td>17.78 x 16.78 x 27.64 cm</td>
<td>17.78 x 16.78 x 27.64 cm</td>
<td>17.78 x 16.78 x 27.64 cm</td>
</tr>
<tr>
<td>Power supply</td>
<td>650W auto-switching, PFC</td>
<td>Dual 700W (redundant)</td>
<td>Dual 700W (redundant)</td>
</tr>
<tr>
<td>Cooling fans</td>
<td>6, non-hot plug, nonredundant</td>
<td>5, redundant</td>
<td>5, redundant</td>
</tr>
<tr>
<td>BTU rating</td>
<td>2910 BTU/hr (at 120 VAC), 2870 BTU/hr (at 240 VAC)</td>
<td>2910 BTU/hr (at 120 VAC), 2870 BTU/hr (at 240 VAC)</td>
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### Cisco NAC Appliance

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</tr>
</tbody>
</table>

###Cisco NAC Appliance

5-6 Cisco NAC Appliance
Chapter 5

Cisco NAC Appliance      5-7

Selected Part Numbers and Ordering Information

Removable media
CD-ROM/CD-ROM drive
CD-ROM/CD-ROM drive

NETWORK CONNECTIVITY

Ethernet network interface cards (NICs)
- 2 x Integrated Broadcom 10/100/1000 5708 NICs
- 2 x Intel e1000 Gigabit NICs (PCI-X)

TOBASE-T cable support
Cat 5e or 6 UTP up to 328 ft (100m)

10/100/1000BASE-T cable support
Cat 5e UTP up to 328 ft (100m)

INTERFACES

Serial ports
1

USB 2.0 ports
4 (two front, one internal, two rear)

Keyboard ports
1

Video ports
1

Mouse ports
1

External SCSI ports
None

SYSTEM UNIT

Form factor
Rack-mount 1 RU

Weight
35 lb (15.87 kg) fully configured

Dimensions
1.70 x 16.78 x 27.75 in. (4.32 x 42.62 x 70.49 cm)

Power supply
Dual 700W (redundant) 650W auto switching, PFC

Cooling fans
9; redundant 6; non-hot plug, nonredundant

BTU rating
2910 BTUs per hour (at 120 VAC); 2870 (at 240 VAC)

Cisco NAC Server

NAC3310-100-K9 NAC Appliance 3310 Server—Max 100 users
NAC3310-100FB-K9 NAC Appliance 3310 Server Failover Bundle—Max 100 users
NAC3310-100FBUL NAC Appliance 3310 FB License Upgrade—100 to 250 users
NAC3310-250-K9 NAC Appliance 3310 Server—Max 250 users
NAC3310-250FB-K9 NAC Appliance 3310 Server Failover Bundle—Max 250 users
NAC3310-250FBUL NAC Appliance 3310 FB License Upgrade—250 to 500 users
NAC3310-500-K9 NAC Appliance 3310 Server—Max 500 users
NAC3310-500FB-K9 NAC Appliance 3310 Server Failover Bundle—Max 500 users
NAC3350-1500-K9 NAC Appliance 3350 Server—Max 1500 users
NAC3350-1500FB-K9 NAC Appliance 3350 Server Failover Bundle—Max 1500 users
NAC3350-1500FBUL NAC Appliance 3350 FB License Upgrade—1500 to 2500 users
NAC3350-2500-K9 NAC Appliance 3350 Server—Max 2500 users
NAC3350-2500FB-K9 NAC Appliance 3350 Server Failover Bundle—Max 2500 users
NAC3350-2500FBUL NAC Appliance 3350 FB License Upgrade—2500 to 3500 users
NAC3350-3500-K9 NAC Appliance 3350 Server—Max 3500 users
NAC3350-3500FB-K9 NAC Appliance 3350 Server Failover Bundle—Max 3500 users

Cisco NAC Manager

NACMGR-3-K9 NAC Appliance 3310 Manager—Max 3 servers
NACMGR-3FB-K9 NAC Appliance 3310 Manager Failover Bundle—Max 3 servers
NACMGR-20-K9 NAC Appliance 3350 Manager—Max 20 servers
NACMGR-20FB-K9 NAC Appliance 3350 Manager Failover Bundle—Max 20 servers
NACMGR-40-K9 NAC Appliance 3350 Manager—Max 40 servers
NACMGR-40FB-K9 NAC Appliance 3350 Manager Failover Bundle—Max 40 servers

Cisco NAC Profiler

NAC3350-PROF-K9 NAC 3350 Profiler—Max up to 40K devices
NAC3350-PROF-FB-K9 NAC 3350 Profiler Failover Bundle—Max up to 40K devices
NAC3350-CL-T K9= NAC3350 Collector—Up to NAC Srv user count
Cisco ASA 5500 Series Adaptive Security Appliances

Cisco ASA 5500 Series Adaptive Security Appliances are purpose-built solutions that combine best-in-class security and VPN services with an innovative, extensible services architecture. Designed as a core component of the Cisco Self-Defending Network, the Cisco ASA 5500 Series provides proactive threat defense that stops attacks before they spread through the network, controls network activity and application traffic, and delivers flexible VPN connectivity. The result is a powerful multifunction network security appliance family that provides the security breadth and depth for protecting home-office, branch-office, small and medium-sized business, enterprise, and data center networks while reducing the overall deployment and operations costs and complexities associated with providing this new level of security.

Ideal for Companies that Need These Features

• Cisco ASA 5500 Series Firewall Edition—Ability to deploy new applications securely while protecting valuable assets from unauthorized access.
• Flexible, reliable deployment options—This appliance provides a wide range of services such as transparent firewall, virtualization, and intelligent network integration; Comprehensive management solutions to lower operational costs: Flexible centralized management solutions provide full-featured provisioning and monitoring services.
• Cisco ASA 5500 Series IPS Edition—Customers that need to meet compliance mandates, existing Cisco ASA customers looking to enhance their security with intrusion prevention, growing customers that require their security solution to scale as they grow.
• Accurate inline prevention technologies—Provides unparalleled ability to take preventive action against a broader range of threats without the risk of dropping legitimate traffic. These unique technologies offer intelligent, automated, contextual analysis of your data and help ensure you are getting the most out of your intrusion prevention solution.
• Multivector threat identification—Protects your network from policy violations, vulnerability exploitations, and anomalous activity through detailed inspection of traffic in Layers 2 through 7.
• Unique network collaboration—Enhances scalability and resiliency through network collaboration, including efficient traffic capture techniques, load-balancing capabilities, and visibility into encrypted traffic.
• Cisco ASA 5500 Content Security Edition—Trusted firewall technology; Market-leading content security capabilities, including antivirus and antispyware, URL, and content filtering, antiphishing, and antispam.
• Threat-protected VPN
• Easy deployment and management
• Cisco ASA 5500 Series SSL/IPsec VPN Edition—SSL and IPsec VPN for any deployment environment: Clientless and full network VPN access delivers superior customizability for diverse requirements.

Key Features

• Market-proven security and VPN capabilities—Full-featured, high-performance firewall, intrusion prevention system (IPS), content security, and SSL/IPsec VPN technologies deliver robust application security, user-and application-based access control, worm and virus mitigation, malware protection, content filtering, and remote user-site connectivity.
• Extensible services architecture—Taking advantage of a modular services processing and policy framework offered by the Cisco ASA 5500 Series Adaptive Security Appliances, businesses can apply specific security and network services on a per-traffic flow basis, delivering highly granular policy controls and a wide range of protective services with streamlined traffic processing. The efficiencies of this policy framework, as well as software and hardware extensibility through user-installable security services modules (SSMs) and security services cards (SSCs), advance the evolution of existing services and the deployment of new services without requiring a platform replacement or performance compromise. With these capabilities, the Cisco ASA 5500 Series provides the foundation for highly customizable security policies and exceptional services extensibility to help protect against the fast-evolving threat environment.
• Reduced deployment and operations costs—The multifunction Cisco ASA 5500 Series allows for platform configuration and management standardization, helping to decrease the costs of deployment and ongoing operations.
### Specifications

<table>
<thead>
<tr>
<th></th>
<th>5505</th>
<th>5510</th>
<th>5520</th>
<th>5540</th>
<th>5550</th>
<th>5580-20</th>
<th>5580-40</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Network location</strong></td>
<td>Small Business, Branch Office, Enterprise, Teleworker</td>
<td>Internet Edge</td>
<td>Internet Edge</td>
<td>Internet Edge</td>
<td>Campus</td>
<td>Data Center</td>
<td>Data Center</td>
</tr>
</tbody>
</table>

#### Performance Summary

| **Maximum firewall and IPS throughput (Mbps)** | 150 Mbps | 300 Mbps | 450 Mbps | 650 Mbps | 860 Mbps | 2 Gbps | 5 Gbps (real-world HTTP), 10 Gbps (jumbo frames) |
| Maximum firewall connections | 10000 | 25000 | 50000 | 100000 | 200000 | 100000 | 250000 |
| **Maximum firewall connections/second (46 byte)** | 4000 | 8000 | 20000 | 50000 | 90000 | 130000 | 190000 |
| **Packets per second (64 byte)** | 85000 | 190000 | 250000 | 300000 | 500000 | 650000 | 2000000 |
| **Maximum 3DES/AES VPN throughput (Mbps)** | 100 Mbps | 170 Mbps | 225 Mbps | 325 Mbps | 425 Mbps | 1 Gbps | 1 Gbps |
| **Maximum site-to-site and remote access VPN sessions** | 10 | 25 | 250 | 750 | 2500 | 5000 | 10000 |
| **Maximum SSL VPN user sessions** | 25 | 250 | 750 | 2500 | 5000 | 10000 | 10000 |
| **Bundled SSL VPN user session** | 2 | 2 | 2 | 2 | 2 | 2 | 2 |

#### Technical Summary

| **Memory** | 256 MB | 256 MB | 512 MB | 1 GB | 4 GB | 8 GB | 12 GB |
| **Minimum system flash** | 64 MB | 64 MB | 64 MB | 64 MB | 64 MB | 1 GB | 1 GB |
| **Integrated ports** | 8 port 10/100 switch with 2 Power over Ethernet ports, 2 port 10/100 / 1000, 3/10/100 / 1000, 4 GE SSM | 4-10/100 / 1000, 1/10/100 / 1000, 4 SFP (with 4 GE SSM) | 4-10/100 / 1000, 1/10/100 / 1000, 4 SFP (with 4 GE SSM) | 4-10/100 / 1000, 1/10/100 / 1000, 4 SFP (with 4 GE SSM) | 4-10/100 / 1000, 1/10/100 / 1000, 4 SFP (with 4 GE SSM) | 4-10/100 / 1000, 1/10/100 / 1000, 4 SFP (with 4 GE SSM) | 4-10/100 / 1000, 1/10/100 / 1000, 4 SFP (with 4 GE SSM) |
| **Maximum virtual interfaces (VLANs)** | 3 (trunking disabled) / 20 (trunking enabled) | 60 / 100 | 150 | 200 | 250 | 100 (250) | 100 (250) |

#### Expansion Capabilities

| **SSC/SSM/IC Expansion** | 1-SSC | 1-SSM | 1-SSM | 1-SSM | Not Available | 6-IC | 6-IC |
| **SSC/SSM/ICs supported** | 1-SSC | 1-SSM | 1-SSM | 1-SSM | Not Available | 6-IC | 6-IC |
| **Intrusion Prevention** | Not Available | Yes (with AIP SSM) | Yes (with AIP SSM) | Yes (with AIP SSM) | Not Available | Not Available | Not Available |
| **Concurrent threat mitigation throughput (Mbps) (firewall + IPS services)** | Not available | Yes (with AIP SSM-10) | Yes (with AIP SSM-40) | Not Available | Not Available | Not Available | Not Available |
### Content Security
- **anti-virus, anti-spyware, file blocking**
  - 5505: Not available
  - 5510: Yes (with CSC SSM)
  - 5520: Yes (with CSC SSM)
  - 5540: Not available
  - 5550: Not available
  - 5580-20: Not available
  - 5580-40: Not available

### Maximum number of users for anti-virus, anti-spyware, file blocking (CSC SSM only)
- 5505: Not available
- 5510: 500 (CSC-SSM-10)
- 5520: 1000 (CSC-SSM-20)
- 5540: 1000 (CSC-SSM-20)
- 5550: Not available
- 5580-20: Not available
- 5580-40: Not available

### Content Security Plus License features
- 5505: Not available
- 5510: Anti-spam, anti-phishing, URL filtering
- 5520: Anti-spam, anti-phishing, URL filtering
- 5540: Anti-spam, anti-phishing, URL filtering
- 5550: Not available
- 5580-20: Not available
- 5580-40: Not available

### Features
- **Cisco Adaptive Security Appliance Software Version (latest)**
  - 5505: 8.0
  - 5510: 8.0
  - 5520: 8.0
  - 5540: 8.0
  - 5550: 8.1
  - 5580-20: 8.1
  - 5580-40: 8.1

- **Application-layer firewall services**
  - Yes

- **Layer 2 transparent firewalling**
  - Yes

- **Security contexts (included/maximum)**
  - 5505: 0/0
  - 5510: 0/20
  - 5520: 2/20
  - 5540: 2/50
  - 5550: 2/50
  - 5580-20: 2/50
  - 5580-40: 2/50

- **GTP/GPRS inspection**
  - Not available

- **High availability support**
  - Not supported

- **SSL and IPsec VPN services**
  - Yes

- **VPN clustering and load balancing**
  - Not available

- **Advanced endpoint assessment**
  - Yes

---

1. Beginning with Cisco ASA Software v7.1, SSL VPN (Web VPN) capability requires a license. Systems include 2 SSL VPN users by default for evaluation and remote management purposes.
2. Beginning with Cisco ASA Software v7.2.3, the ASA 5510 Security Plus license enables 2 10/100/1000 interfaces and 3 10/100 interfaces.
4. Licensed features.
5. A/S = Active/Standby; A/A = Active/Active

### Selected Part Numbers and Ordering Information

#### Cisco ASA 5500 Series Firewall Edition Bundles

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASA5505-BUN-K9</td>
<td>Cisco ASA 5505 10-User Bundle includes 8-port Fast Ethernet switch, 10 IPsec VPN peers, 2 SSL VPN peers, Triple Data Encryption Standard/Advanced Encryption Standard (3DES/AES) license</td>
</tr>
<tr>
<td>ASA5505-K8</td>
<td>Cisco ASA 5505 includes 8-port Fast Ethernet switch, 10 IPsec VPN peers, 2 SSL VPN peers, Data Encryption Standard (DES) license</td>
</tr>
<tr>
<td>ASA5505-10-DUN-K9</td>
<td>Cisco ASA 5505 10-User Bundle includes 8-port Fast Ethernet switch, 10 IPsec VPN peers, 2 SSL VPN peers, 3DES/AES license</td>
</tr>
<tr>
<td>ASA5505-UL-BUN-K9</td>
<td>Cisco ASA 5505 Unlimited-User Bundle includes 8-port Fast Ethernet switch, 10 IPsec VPN peers, 2 SSL VPN peers, 3DES/AES license</td>
</tr>
<tr>
<td>ASA5505-SEC-BUN-K9</td>
<td>Cisco ASA 5505 Unlimited-User Security Bundle includes 8-port Fast Ethernet switch, 25 IPsec VPN peers, 2 SSL VPN peers, 3DES/AES license</td>
</tr>
<tr>
<td>ASA5510-UL-BUN-K9</td>
<td>Cisco ASA 5510 Unlimited-User Security Bundle includes 4 10Gbps Ethernet interfaces, 10 IPsec VPN peers, 2 SSL VPN peers, 3DES/AES license</td>
</tr>
<tr>
<td>ASA5510-10-K8</td>
<td>Cisco ASA 5510 Firewall Edition includes 1 10Gbps Ethernet interface, 250 IPsec VPN peers, 2 SSL VPN peers, DES license</td>
</tr>
<tr>
<td>ASA5510-SEC-BUN-K9</td>
<td>Cisco ASA 5510 Security Plus Firewall Edition includes 2 10Gbps Ethernet + 1 10Gbps Ethernet interfaces, 250 IPsec VPN peers, 2 SSL VPN peers, Active/Standby high availability, 3DES/AES license</td>
</tr>
<tr>
<td>ASA5520-UL-BUN-K9</td>
<td>Cisco ASA 5520 Unlimited-User Bundle includes 8-port Fast Ethernet switch, 750 IPsec VPN peers, 2 SSL VPN peers, Active/Active and Active/Standby high availability, DES license</td>
</tr>
<tr>
<td>ASA5520-K8</td>
<td>Cisco ASA 5520 Firewall Edition includes 4 10Gbps Ethernet interfaces + 1 10Gbps Ethernet interface, 750 IPsec VPN peers, 2 SSL VPN peers, Active/Active and Active/Standby high availability, DES license</td>
</tr>
</tbody>
</table>
### ASA5580 Series

**ASA5580-20-4GE-K9**: Cisco ASA 5580-20 Firewall Edition includes 4 Gigabit Ethernet interfaces + 1 Fast Ethernet interface, 1000 IPsec VPN peers, 2 SSL VPN peers, 3DES/AES license

**ASA5580-20-K8**: Cisco ASA 5580-20 Firewall Edition includes 2 management interfaces, 5000 IPsec VPN peers, 2 SSL VPN peers, DES license

**ASA5580-20-8GE-K9**: Cisco ASA 5580-20 Firewall Edition Bundle includes 8 Gigabit Ethernet interfaces, 2 management interfaces, 5000 IPsec VPN peers, 2 SSL VPN peers, 3DES/AES license

**ASA5580-40-K9**: Cisco ASA 5580-40 Firewall Edition includes 2 management interfaces, 5000 IPsec VPN peers, 2 SSL VPN peers, Dual AC power, 3DES/AES license

**ASA5580-40-8GE-K9**: Cisco ASA 5580-40 Firewall Edition includes 8 Gigabit Ethernet interfaces, 2 management interfaces, 5000 IPsec VPN peers, 2 SSL VPN peers, Dual AC power, 3DES/AES license

### ASA5550 Series

**ASA5550-K8**: Cisco ASA 5550 Firewall Edition includes 8 Gigabit Ethernet interfaces + 1 Fast Ethernet interface, 4 Gigabit SFP interfaces, 5000 IPsec VPN peers, 2 SSL VPN peers, DES license

**ASA5550-BUN-K9**: Cisco ASA 5550 Firewall Edition includes 2 management interfaces, 5000 IPsec VPN peers, 2 SSL VPN peers, DES license

### Cisco ASA 5500 Series SSL/IPsec VPN Edition Bundles

**ASA5505-SSL25-K9**: Cisco ASA 5505 SSL/IPsec VPN Edition includes 25 IPsec VPN peers, 500 SSL VPN peers, firewall services, 8-port Fast Ethernet switch

**ASA5510-SSL50-K9**: Cisco ASA 5510 SSL/IPsec VPN Edition includes 50 IPsec VPN peers, 250 SSL VPN peers, firewall services, 3 Fast Ethernet interfaces

**ASA5520-SSL100-K9**: Cisco ASA 5520 SSL/IPsec VPN Edition includes 100 IPsec VPN peers, 100 SSL VPN peers, 4 Gigabit Ethernet interfaces, 1 Fast Ethernet interface

**ASA5540-SSL250-K9**: Cisco ASA 5540 SSL/IPsec VPN Edition includes 250 IPsec VPN peers, 250 SSL VPN peers, firewall services, 4 Gigabit Ethernet interfaces, 1 Fast Ethernet interface

**ASA5550-SSL500-K9**: Cisco ASA 5550 SSL/IPsec VPN Edition includes 500 IPsec VPN peers, 500 SSL VPN peers, firewall services, 8 Gigabit Ethernet interfaces, 1 Fast Ethernet interface

### Cisco ASA 5500 Series IPS Edition Bundles

**ASA5505-AIP10-K9**: Cisco ASA 5505 IPS Edition includes 10 IPsec VPN peers, 5 SSL VPN peers, 1-year subscription, firewall services, 10-port Fast Ethernet switch

**ASA5510-AIP20-K9**: Cisco ASA 5510 IPS Edition includes 20 IPsec VPN peers, 20 SSL VPN peers, 1-year subscription, firewall services, 10-port Fast Ethernet switch

**ASA5520-AIP40-K9**: Cisco ASA 5520 IPS Edition includes 40 IPsec VPN peers, 40 SSL VPN peers, 1-year subscription, firewall services, 10-port Fast Ethernet switch

**ASA5540-AIP80-K9**: Cisco ASA 5540 IPS Edition includes 80 IPsec VPN peers, 80 SSL VPN peers, 1-year subscription, firewall services, 10-port Fast Ethernet switch

### Cisco ASA 5500 Series Content Security Edition Bundles

**ASA5510-CSC10-K9**: Cisco ASA 5510 Content Security Edition includes CSC-SSM-10, 50-user antivirus/anti-spyware with 1-year subscription, firewall services, 10-port Fast Ethernet switch

**ASA5520-CSC20-K9**: Cisco ASA 5520 Content Security Edition includes CSC-SSM-20, 100-user antivirus/anti-spyware with 1-year subscription, firewall services, 20-port Fast Ethernet switch

**ASA5540-CSC40-K9**: Cisco ASA 5540 Content Security Edition includes CSC-SSM-40, 400-user antivirus/anti-spyware with 1-year subscription, firewall services, 40-port Fast Ethernet switch

### Chapter 5

Cisco ASA 5500 Series Adaptive Security Appliances 5-11
Cisco Intrusion Prevention System

For More Information


Cisco Intrusion Prevention System

Business networks of all sizes now face increasingly sophisticated attacks that can impede productivity, obstruct access to applications and resources, and cause significant communications disruption. In addition, because of compliance regulations and consumer privacy laws, business priorities now include minimizing legal liability, protecting brand reputation, and safeguarding intellectual property.

A core component of Cisco Self-Defending Network, Cisco IPS collaborates with other key network components for end-to-end network-wide protection. Threat information is shared between Cisco IPS and host-based IPS Cisco Security Agent and Cisco wireless controller. Available as a dedicated appliance, Cisco IPS is also integrated into Cisco firewall, switch, and router platforms for maximum protection and deployment flexibility.

This inline, network-based defense can identify, classify, and stop known and unknown threats, including worms, network viruses, application threats, system-intrusion attempts, and application misuse. Cisco IPS Sensors and Cisco IPS Sensor Software deliver high-performance, intelligent detection with precision response from the network edge to the data center. This technology provides metrics in both multimedia and transactional environments, so organizations can anticipate true IPS performance tailored to their business. The sensors can be deployed widely and incrementally on servers and endpoints, as dedicated appliances and as service modules on routers, switches, and firewalls. They collaborate and adapt in real time to emerging threats.

In addition, with Cisco Services for IPS, organizations easily manage their IPS deployment with near-real time updates to the most recent threats.

Ideal for Companies that Need These Features

- Cisco IPS 4200 Series Sensor—A dedicated hardware appliance platform with these performance levels: 80 Mbps—Cisco IPS 4210 Sensor; 250 Mbps—Cisco IPS 4240 Sensor; 600 Mbps—Cisco IPS 4253 Sensor; 1 Gbps—Cisco IPS 4260 Sensor; 4 Gbps—Cisco IPS 4270 Sensor

ASA5580-20-UC-K9 Cisco ASA 5580 Adaptive Security Appliance UC Security Edition; includes 4 Gigabit Ethernet interfaces, 10,000 UC proxy sessions, 10,000 IPSec VPN peers, 2 SSL VPN peers, 3DES/AES license

ASA5580-20-UC-K8 Cisco ASA 5580 Adaptive Security Appliance UC Security Edition; includes 4 Gigabit Ethernet interfaces, 10,000 UC proxy sessions, 10,000 IPSec VPN peers, 2 SSL VPN peers, DES license

ASA5580-UC-BUN-K9 Cisco ASA 5580 Adaptive Security Appliance for Unified Communications Security; includes 4 Gigabit Ethernet interfaces, 1 Fast Ethernet interface, 1000 UC proxy sessions, 750 IPSec VPN peers, 2 SSL VPN peers, Active/Active and Active/Standby high availability, Triple Data Encryption Standard/Advanced Encryption Standard (3DES/AES) license

ASA5580-UC-BUN-K8 Cisco ASA 5580 Adaptive Security Appliance for Unified Communications Security; includes 4 Gigabit Ethernet interfaces, 1 Fast Ethernet interface, 1000 UC proxy sessions, 750 IPSec VPN peers, 2 SSL VPN peers, Active/Active and Active/Standby high availability, DES license
Cisco Intrusion Prevention System

- Cisco Advanced Inspection and Prevention Services Module (AIP-SSM)—IPS security module for the Cisco ASA 5500 Series Adaptive Security Appliance is for companies that want to manage IPS with their firewall in one appliance.
- Cisco IPS Advanced Integration Module (AIM)—IPS AIM for the Cisco 1841, 2800, and 3800 Series Integrated Services Routers with this performance level: 45 Mbps
- Cisco IDS Services Module 2 (ISDM-2)—IPS security module for Cisco Catalyst 6500 Series Switches with up to 500 Mbps performance
- Cisco IDS Network Module (NM-CIDS)—Cisco network module that provides IDS capability for Cisco access routers with this performance level: 45 Mbps
- Cisco IOS IPS—Focused set of IPS capabilities using Cisco IOS Software on the router with varying performance levels.

Key Features
- Pervasive network integration—Cisco Intrusion Prevention System (IPS) solutions defeat threats from multiple vectors, including network, server, and desktop endpoints. The solutions extend across Cisco platforms, from purpose-built appliances to services modules integrated into firewall and routers and switches. A Cisco IPS solution protects the network from policy violations, vulnerability exploitations, and anomalous activity through detailed inspection of traffic at Layers 2 through 7 across the entire network.
- Collaborative threat prevention—A Cisco IPS solution employs a unique, system-wide security ecosystem that assesses and reacts to threats, delivering exceptional network scalability and resiliency. This ubiquitous alliance includes cross-solution feedback linkages, common policy management, multivendor event correlation, attack-path identification, passive-active fingerprinting, and host-based (Cisco Security Agent) IPS collaboration.
- Proactive posture adaptation—As an organization’s network threat posture changes, a Cisco IPS solution evolves and adapts to stay ahead of the security landscape, mitigating threats by both known and unknown attacks. Extensive behavioral analysis, anomaly detection, policy adjustments, and rapid threat-response techniques save time, resources, and most importantly, the organization’s assets and productivity.

NOTE: IPS technology strategically deployed throughout the network provides excellent end-to-end, zero-day protection. A Cisco IPS solution protects an organization’s infrastructure and business.

Specifications

<table>
<thead>
<tr>
<th>Feature</th>
<th>IPS-4240</th>
<th>IPS-4255</th>
<th>IPS-4260</th>
<th>IPS-4270</th>
<th>IPS Module (IDSM-2)</th>
<th>IPS Network Module (NM-CIDS)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Performance</td>
<td>250 Mbps</td>
<td>500 Mbps</td>
<td>1 Gbps</td>
<td>2 Gbps</td>
<td>500 Mbps</td>
<td>45 Mbps</td>
</tr>
<tr>
<td>Monitoring Interface</td>
<td>Four 10/100/1000 Base-TX</td>
<td>Four 10/100/1000 Base-TX</td>
<td>Autosensing 10/100/1000 Base-TX</td>
<td>Four 10/100/1000 Base-TX or Four 10-00Base-SX</td>
<td>PCI</td>
<td>Internal 10-100 Mbps Ethernet and external 10-100 Mbps Ethernet</td>
</tr>
<tr>
<td>Optional Interface</td>
<td>PCI 10/1010/100 Base-TX</td>
<td>PCI 10/1010/100 Base-TX</td>
<td>Two onboard 10/100/1000 Base-TX</td>
<td>Two onboard 10/100/1000 Base-TX</td>
<td>Two onboard 10/100/1000 Base-TX</td>
<td>Two onboard 10/100/1000 Base-TX</td>
</tr>
<tr>
<td>Command and Control Interface</td>
<td>Two onboard 10/100/1000 Base-TX</td>
<td>Two onboard 10/100/1000 Base-TX</td>
<td>Two onboard 10/100/1000 Base-TX</td>
<td>Two onboard 10/100/1000 Base-TX</td>
<td>Two onboard 10/100/1000 Base-TX</td>
<td>Two onboard 10/100/1000 Base-TX</td>
</tr>
</tbody>
</table>

Selected Part Numbers and Ordering Information

**IPS 4200 Appliances**

- IPS-4240-K9—Cisco IPS 4240 Sensor (chassis, software, SSH, four 10/100/1000BASE-TX interfaces with RJ-45 connector)
- IPS-4240-DC-K9—Cisco IPS 4240 NEBS Compliant Sensor with DC power (chassis, software, SSH, four 10/100/1000BASE-TX interfaces with RJ-45 connector)
- IPS-4255-K9—Cisco IPS 4255 Sensor (chassis, software, SSH, four 10/100/1000BASE-TX interfaces with RJ-45 connector)
- IPS-4260-K9—Cisco IPS 4260 Sensor (chassis, software, SSH, two onboard 10/100/1000BASE-TX interfaces with RJ-45 connector)
- IPS-4260-4GE-BP-K9—Cisco IPS 4260 Sensor with an included 4-GE copper NIC with hardware bypass (chassis, software, SSH, two onboard 10/100/1000BASE-TX interfaces with RJ-45 connector and four 10/100/1000BASE-TX interfaces with built-in bypass)
- IPS-4260-2SX-K9—Cisco IPS 4260 Sensor with an included NIC card (chassis, software, SSH, two onboard 10/100/1000BASE-TX interfaces with RJ-45 connector and two fiber interfaces)
- IPS-4270-20-K9—Cisco IPS 4270 Sensor (chassis, redundant power, software, SSH, two onboard 10/100/1000BASE-TX interfaces with RJ-45 connector)
Cisco Catalyst 6500 Series Firewall Services Module

The Cisco Catalyst 6500 Series Firewall Services Module (FWSM) is a high-speed, integrated firewall module for Cisco Catalyst 6500 Switches and Cisco 7600 Series Routers. It provides one of the fastest firewall data rates in the industry: 5-Gbps throughput, 100,000 cells per second (CPS), and 1 million concurrent connections. Up to four FWSMs can be installed in a single chassis, providing scalability to 20 Gbps per chassis. Based on Cisco PIX Firewall technology, the Cisco FWSM offers large enterprises and service providers exceptional security, reliability, and performance.

The Cisco FWSM includes numerous advanced features that help reduce costs and operational complexity while allowing organizations to manage multiple firewalls from the same management platform. Features such as resource manager help organizations limit the resources allocated to any security context at any time, thus helping ensure that one security context does not interfere with another. The transparent firewall feature configures the FWSM to act as a Layer 2 bridging firewall, resulting in minimal changes to network topology.

Ideal for Companies that Need These Features

- Ability to add an integrated firewall module for Cisco Catalyst 6500 Switches and Cisco 7600 Series Routers

Key Features

- An integrated module—Installed inside a Cisco Catalyst 6500 Series Switch or Cisco 7600 Internet Router, the Cisco Catalyst 6500 Series Firewall Services Module (FWSM) allows any port on the device to operate as a firewall port and integrates firewall security inside the network infrastructure.
- Compatibility with future versions—The FWSM can handle up to 5 Gbps of traffic, providing exceptional performance to meet future requirements without requiring a system overhaul. Up to three additional FWSMs can be added to the Cisco Catalyst 6500 to achieve better than 10-Gigabit Ethernet scalability.
- Enhanced reliability—The FWSM is based on Cisco PIX technology and uses the same time-tested Cisco PIX Operating System, a secure, real-time operating system.
- Lower cost of ownership—The FWSM offers among the best price-to-performance ratios of any firewall. Because FWSM is based on the Cisco PIX Firewall, the cost of training and management is lower, and because it is integrated in the chassis, there are fewer boxes to manage.
- Ease of use—The intuitive GUI of the Cisco PIX Device Manager can be used to manage and configure the features within the FWSM. The FWSM can now be managed using the Cisco ASA 5500 Series Adaptive Security Device Manager (ASDM) v5.2 as well.
- Efficiency and productivity gains—Virtualized FWSM delivers multiple firewalls on one physical hardware platform. Network administrators can configure, deploy, and manage these functions as if they were separate devices. Using virtualization to reduce the number of physical devices in a network significantly reduces the cost and complexity of managing network infrastructure.

Specifications

| Performance | 5.5 Gbps throughput per service module; Up to four FWSMs per Catalyst 6500 chassis with static VLAN or IOS Policy-based Routing; 2.8 Mpps; 1 million concurrent connections; 100,000 connection setups and teardowns per second; 256,000 concurrent NAT or PAT translations; Jumbo Ethernet packets (8500 bytes) supported |
| VLAN Interfaces | 1000 total per service module; 260 VLANs per security context in routed mode; 8 VLAN pairs per security context in transparent mode |
| Access Lists | Up to 60,000 access control entries in single context mode |
| Virtual Firewalls (Security Contexts) | 20, 50, 100, 250; Virtual firewall licenses, virtual firewalls and 1 administrative context are provided for testing purposes. |

For More Information

For more information about Cisco Intrusion Prevention System, visit: [http://www.cisco.com/go/ips](http://www.cisco.com/go/ips)
Cisco Catalyst 6500 Series/7600 Series WebVPN Services Module

The Cisco Catalyst 6500 Series/7600 Series WebVPN Services Module is a high-speed, integrated SSL VPN services module for Cisco Catalyst 6500 Series Switches and Cisco 7600 Series Routers that addresses the scalability, performance, application support, and security required for large-scale, remote-access SSL VPN deployments. Supporting up to 32,000 SSL VPN users and 128,000 connections per chassis, the Cisco WebVPN Services Module can cost-effectively meet the capacity requirements of large enterprises. The innovative virtualization capabilities integrated into the module simplify the policy creation and enforcement for diverse enterprise user communities and make it an ideal solution for managed service providers. Taking advantage of the broad, industry-proven application support and endpoint security provided by Cisco VPN 3000 Series Concentrators, the Cisco WebVPN Services Module is ideally suited to meet the secure connectivity demands of any organization.

Ideal for Companies that Need These Features

- Ability to add a high-speed, integrated SSL VPN services module for Cisco Catalyst 6500 Series Switches and Cisco 7600 Series Routers

Key Features

- Integration with network infrastructure—Incorporating VPN into the Cisco Catalyst 6500 Series Switches and Cisco 7600 Series Internet Routers helps secure the network without the need for extra overlay equipment or network alterations.
- Virtualization and Virtual Route Forwarding (VRF) awareness—Virtualization technology is a way to pool resources while masking the physical attributes and boundaries of the resources from the resource users. Up to 128 VRF-aware virtual contexts are supported per module.
- Advanced endpoint security—A primary component of the Cisco WebVPN Services Module, Cisco Secure Desktop offers preconnection security posture assessment and a consistent and reliable means of eliminating all traces of sensitive data.
- Scalability—A single module is capable of supporting up to 8000 simultaneous users and up to 32,000 concurrent connections. Up to four modules can be supported in a single chassis to support up to 32,000 simultaneous SSL VPN users and 128,000 connections.
- Ease of deployment—The Cisco Catalyst 6500 Series/7600 Series WebVPN Services Module comes with integrated device-manager support. This support helps configure and provision the module without the need for an external element management system, providing a ready-to-deploy solution.

Specifications

<table>
<thead>
<tr>
<th>Scalability</th>
<th>Up to 8000 users, Up to 300 Mbps, Up to 64 SSL VPN virtual contexts and 64 gateways, Up to 4 modules in a chassis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Virtualization</td>
<td>Ability to divide into multiple contexts, with each context as a complete logical representation of the WebVPN Services Module, complete with separate policies and configuration</td>
</tr>
<tr>
<td>VRF-Aware</td>
<td>VRF mapping, single-IP model (URL-based or login-name-based), Multiple-IP model, Per-VRF AAA server, Per-VRF DNS server, Per-VRF gateway, Per-VRF number of users</td>
</tr>
<tr>
<td>User Authentication</td>
<td>RADIUS, Windows NT, Active Directory, UNIX NIS, group-based access control using Cisco Secure Access Control Server (ACS)</td>
</tr>
</tbody>
</table>

For More Information


NOTE: Cisco Firewall Services Module Software 1.1 has reached end-of-sale status. Customers are encouraged to upgrade or purchase FWSM Software 2.3 or 2.3.

Cisco Catalyst 6500 Series/7600 Series WebVPN Services Module

Chapter 5
Cisco SSL VPN Solutions

Today's remote-access VPN deployments require the ability to safely and easily extend corporate network access beyond managed desktops to different users, devices, and endpoints. The Cisco SSL VPN Client with Cisco ASA 5500 Series SSL and IPSec VPN Edition allows organizations to securely provide network access to a broad array of users, including mobile and fixed endpoints, remote offices, contractors, and business partners. Supporting a wide range of deployment and application environments, the Cisco ASA 5500 Series SSL/IPsec VPN Edition delivers maximum value to organizations with its exceptionally comprehensive set of Secure Sockets Layer (SSL) and IP Security (IPsec) VPN features, performance, and scalability. The Cisco ASA 5500 Series SSL/IPsec VPN Edition also allows organizations to use a powerful combination of multiple market-proven firewall, intrusion-prevention-system (IPS), and content-security technologies on a single, unified platform.

Ideal for Companies that Need These Features
- A feature-rich solution that offers a comprehensive breadth of platform and endpoint support in a simple-to-manage, flexible, easy-to-deploy, cost-effective solution
- Concurrent user scalability from 10–10,000 sessions per device and tens of thousands of sessions per cluster
- Combined SSL and true IPSec remote-access capability, coupled with industry-leading firewall, intrusion-prevention-system (IPS), and content-security capabilities
- A comprehensive, performance-optimized solution that offers high-quality application support, namely for delay-sensitive applications such as voice and video

Key Features
- Deployment flexibility—The Cisco SSL VPN with Cisco ASA 5500 Series Adaptive Security Appliance extends the appropriate SSL VPN technology, either clientless or full-network access, on a resource-granular per-session basis, depending on the user group or endpoint accessing the network.
- Comprehensive network access—Broad application and network resource access is provided through the Cisco AnyConnect VPN Client, an automatically downloadable network-tunneling client that provides access to virtually any application or resource.
- Optimized network performance—The Cisco AnyConnect VPN Client provides an optimized VPN connection for latency-sensitive traffic such as voice-over-IP (VoIP) traffic or TCP-based application access.
- Ubiquitous clientless access—The solution delivers secure remote access to authenticated users on both managed and unmanaged endpoints, facilitating increased productivity by providing "anytime access" to the network.
- Granular control—The solution empowers network and IT management with additional tools to provide controlled access to corporate network resources and applications.
- Exceptional management flexibility—The application simplifies the complexity of managing diverse, remote-access connectivity requirements common in today's enterprise.
- Low total cost of ownership (TCO)—The solution reduces expensive help-desk calls associated with network connectivity problems and eliminates the administration costs of managing VPN client software on every endpoint.

End-System Integrity (Cisco Secure Desktop integration)
- Antivirus check, personal firewall check, seeks to minimize risk of temporary and downloaded files and cookies from remaining on system

Redundancy and Load Sharing
- Stateless failover, Cisco ASA secure server load balancing (SSL) and content switching module integration within the chassis, Active/Active failover

Application Support
- Web access, file services, e-mail, file transfer, legacy applications, specialized applications

Browser Support
- Netscape, Internet Explorer, Firefox

Protocols
- SSL 3.0 and TLS 1.0

Configuration and Management
- Console CLI, HTTP, HTTPS, Telnet, secure shell (SSH)

Syslog Support
- Console display, external server, internal buffer

Cipher Suites
- SSL_RSA_WITH_RC4_128_MD5, SSL_RSA_WITH_RC4_128_SHA, SSL_RSA_WITH_3DES_EDE_CBC_SHA, SSL_RSA_WITH_DES_CBC_SHA

Network Access Control
- IP address, differentiated services code point (DSCP), type of service (CoS), TCP/UDP port, per-user, per-group

Selected Part Numbers and Ordering Information
- WS-SVC-WSVPN-K9 WebVPN Services Module for Cisco Catalyst 6500 Series and Cisco 7600 Series
- WS-SVC-WVPN-11-K9 WebVPN Services Module Software 1.1

For More Information
Specifications

<table>
<thead>
<tr>
<th>ASA 5505</th>
<th>ASA 5510</th>
<th>ASA 5520</th>
<th>ASA 5540</th>
<th>ASA 5550</th>
<th>ASA 5580-20</th>
<th>ASA 5580-40*</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Maximum VPN Throughput</strong>&lt;br&gt;100 Mbps</td>
<td>170 Mbps</td>
<td>250 Mbps</td>
<td>400 Mbps</td>
<td>480 Mbps</td>
<td>1 Gbps</td>
<td>1 Gbps</td>
</tr>
<tr>
<td><strong>Maximum Concurrent SSL VPN Sessions</strong>&lt;br&gt;25</td>
<td>250</td>
<td>750</td>
<td>2500</td>
<td>5000</td>
<td>10,000</td>
<td>10,000</td>
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<tr>
<td><strong>Maximum Concurrent IPsec VPN Sessions</strong>&lt;br&gt;25</td>
<td>250</td>
<td>750</td>
<td>2500</td>
<td>5000</td>
<td>10,000</td>
<td>10,000</td>
</tr>
<tr>
<td><strong>Profile</strong>&lt;br&gt;Desktop</td>
<td>1 RU</td>
<td>1 RU</td>
<td>1 RU</td>
<td>1 RU</td>
<td>4 RU</td>
<td>4 RU</td>
</tr>
<tr>
<td><strong>Stateful Failover</strong>&lt;br&gt;No</td>
<td>Licensed feature²</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td><strong>VPN Load Balancing</strong>&lt;br&gt;No</td>
<td>Licensed feature²</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td><strong>Interfaces</strong>&lt;br&gt;Eight 10/100 copper Ethernet ports with dynamic port grouping (include two Power over Ethernet ports), three USB ports</td>
<td>Four 10/100 copper Ethernet ports, two USB ports</td>
<td>Four 10/100/1000 copper Ethernet ports, one out-of-band management port, two USB ports</td>
<td>Four 10/100/1000 copper Ethernet ports, one out-of-band management port, two USB ports</td>
<td>Eight Gigabit Ethernet ports, four SFP fiber ports, one Fast Ethernet port</td>
<td>Two USB ports, Two RJ-45 Gigabit Ethernet Management ports, Two Gigabit Ethernet Management ports With Interface Expansion Cards -Up to Twelve 10 Gigabit Ethernet (10GE) ports -Up to Twenty-Four Gigabit Ethernet ports -Up to Twenty-Four 10/100/1000 Ethernet ports</td>
<td>Two USB ports, Two RJ-45 Gigabit Ethernet Management ports, Two Gigabit Ethernet Management ports With Interface Expansion Cards -Up to Twelve 10 Gigabit Ethernet (10GE) ports -Up to Twenty-Four Gigabit Ethernet ports -Up to Twenty-Four 10/100/1000 Ethernet ports</td>
</tr>
</tbody>
</table>

1. Devices include a license for two SSL VPN users for evaluation and remote management purposes. The total concurrent IPsec and SSL (clientless and tunnel-based) VPN sessions may not exceed the maximum concurrent IPsec session count shown in the chart. The SSL VPN session number may also not exceed the number of licensed sessions on the device. The ASA 5580 Series supports greater simultaneous users than the ASA 5550 Series at comparable overall SSL VPN throughput as the ASA 5550 Series. These items should be taken into consideration as part of your capacity planning.

2. Upgrade is available with Cisco ASA 5510 Security Plus license.

Selected Part Numbers and Ordering Information

The following tables provide a subset of ordering information for the Cisco ASA 5500 Series SSL/IPsec VPN Edition. All Cisco ASA 5500 Series appliances include maximum IPsec concurrent users in the base configuration of the chassis. All SSL VPN features are included under a single feature license. Every Cisco ASA 5500 Series model can support SSL VPN through the purchase of an SSL VPN license. SSL VPN on the Cisco ASA 5500 Series may be purchased under a single part number as an edition bundle, or the chassis and SSL VPN feature license may be purchased separately, as indicated in Table 3. SSL VPN Users licenses are not additive. Upgrade Licenses paths are available for migration to higher Concurrent SSL users counts. To place an order, visit the Cisco Ordering Home Page.

Edition Bundles

| ASA5505-SSL-K9 | Cisco ASA 5505 SSL/IPsec VPN Edition for 10 concurrent SSL VPN users |
| ASA5510-SSL-K9 | Cisco ASA 5510 SSL/IPsec VPN Edition for 25 concurrent SSL VPN users |
| ASA5515-SSL-K9 | Cisco ASA 5515 SSL/IPsec VPN Edition for 50 concurrent SSL VPN users |
| ASA5515CSSL100-K9 | Cisco ASA 5515 SSL/IPsec VPN Edition for 100 concurrent SSL VPN users |
| ASA5510SSL250-K9 | Cisco ASA 5510 SSL/IPsec VPN Edition for 250 concurrent SSL VPN users |
| ASA5520-SSL-K9 | Cisco ASA 5520 SSL/IPsec VPN Edition for 500 concurrent SSL VPN users |
| ASA5520CSSL100-K9 | Cisco ASA 5520 SSL/IPsec VPN Edition for 1000 concurrent SSL VPN users |
| ASA5540SSL250-K9 | Cisco ASA 5540 SSL/IPsec VPN Edition for 2500 concurrent SSL VPN users |
| ASA5540CSSL500-K9 | Cisco ASA 5540 SSL/IPsec VPN Edition for 5000 concurrent SSL VPN users |
| ASA5580-20-10K-K9 | Cisco ASA 5580-20 SSL/IPsec VPN Edition for 10,000 concurrent SSL VPN users |
Cisco IronPort E-mail Security Appliances

The Cisco IronPort E-mail Security Appliances are some of the most sophisticated systems available today. In production at eight of the ten largest Internet service providers (ISPs) and more than 20 percent of the world's largest enterprises, these systems have a demonstrated record of unparalleled security and reliability. The same code base that powers the most sophisticated customers is available in all of IronPort e-mail security appliances to protect enterprises of all sizes. By reducing the downtime associated with spam, viruses, and a wide variety of other threats, these products facilitate the administration of corporate mail systems and reduce the burden on technical staff. IronPort e-mail security appliances support and protect organizations' e-mail systems, not only from today's threats, but from those certain to evolve in the future.

Ideal for Companies that Need These Features

- Anti-spam and anti-virus solution—IronPort offers multiple layers of defense against spam and viruses with a 99 percent catch rate and an industry-low false-positive rate of one in one million.
- Data loss prevention (DLP)—IronPort delivers high-performance, comprehensive data loss prevention for data in motion — helping organizations both large and small prevent leaks, enforce compliance, and protect their brand and reputation. IronPort believes that a holistic solution for monitoring and data loss across all communication channels is vital to ensure the integrity of an organization's policies. Leadership within the Internet security market, together with its partnerships with industry-leading DLP vendors, puts IronPort in the unique position to offer a single vantage point to enterprises for this critical functionality.
- Regulatory compliance—IronPort's predefined content filters for Health Insurance Portability and Accountability Act (HIPAA), Gramm-Leach-Bliley (GLB), Sarbanes-Oxley Act of 2002 (SOX), and other regulations automatically scan e-mail messages for protected financial and health information. Easily extensible lexicons allow companies to customize these rules to meet specific requirements.
- E-mail encryption—IronPort PXE technology provides secure, policy-based e-mail encryption that is simple for both senders and receivers, and accessible from any e-mail platform. It meets compliance requirements and protects confidential information without the cost and complexity of the public key infrastructure (PKI).
- Organization size requirements—IronPort offers various appliances to meet the needs of companies of all sizes. The following list offers a general description for each product: IronPort Blocker— 1 –200 email users; IronPort C150—For small to midsize organizations; IronPort C350—For midsize enterprises; IronPort C650—For enterprises; IronPort X1050—For large enterprises and Internet service providers (ISPs)

Key Features

- IronPort AsycnOS—IronPort AsycnOS is a unique, high-performance software architecture engineered from the ground up to address concurrency-based communications bottlenecks and the limitations of file-based queuing.
- IronPort Reputation Filters—IronPort Reputation Filters perform a real-time e-mail threat assessment and then identify suspicious e-mail senders. Suspicious senders are rate-limited or blocked, preventing malicious traffic from entering the network. As the first line of defense on the IronPort e-mail security appliances, Reputation Filters dispose of up to 90 percent of incoming spam at the connection level — saving bandwidth, conserving system resources, and yielding the very highest levels of security for critical messaging systems. A proven preventive solution, IronPort Reputation Filters defend the largest Internet service provider (ISP) and enterprise networks, as well as small and medium-sized businesses (SMBs), in production environments around the world.

Cisco ASA Chassis and Applicable SSL VPN Licenses

<table>
<thead>
<tr>
<th>SSL VPN User Requirements</th>
<th>ASA 5505</th>
<th>ASA 5510</th>
<th>ASA 5520</th>
<th>ASA 5540</th>
<th>ASA 5550</th>
<th>ASA 5580-20</th>
<th>Part Number</th>
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<tbody>
<tr>
<td>10 SSL VPN users</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>ASA5500-SSL-10</td>
</tr>
<tr>
<td>25 SSL VPN users</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>ASA5500-SSL-25</td>
</tr>
<tr>
<td>50 SSL VPN users</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>ASA5500-SSL-50</td>
</tr>
<tr>
<td>100 SSL VPN users</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>ASA5500-SSL-100</td>
</tr>
<tr>
<td>250 SSL VPN users</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>ASA5500-SSL-250</td>
</tr>
<tr>
<td>500 SSL VPN users</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>ASA5500-SSL-500</td>
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<tr>
<td>750 SSL VPN users</td>
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<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>ASA5500-SSL-750</td>
</tr>
<tr>
<td>1000 SSL VPN users</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>ASA5500-SSL-1000</td>
</tr>
<tr>
<td>2500 SSL VPN users</td>
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<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>ASA5500-SSL-2500</td>
</tr>
<tr>
<td>5000 SSL VPN users</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>ASA5500-SSL-5000</td>
</tr>
<tr>
<td>10,000 SSL VPN users</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>ASA5500-SSL-10K</td>
</tr>
</tbody>
</table>

For More Information

For more information about the Cisco SSL VPN Client with Cisco ASA 5500 Series Adaptive Security Appliance, visit: http://www.cisco.com/go/asa
• IronPort Anti-Spam—The catch rate of IronPort Anti-Spam is 97 to 99 percent. Its false positive rate is less than 1 in 1 million. To eliminate the broadest range of known and emerging e-mail threats, IronPort Anti-Spam combines best-of-class conventional techniques with breakthrough context-sensitive detection technology.

• IronPort Virus Outbreak Filters—IronPort Virus Outbreak Filters detect new virus outbreaks in real time, and then quarantine suspicious messages—offering protection up to 42 hours before traditional anti-virus solutions.

• IronPort PXY—IronPort PXY encryption technology revolutionizes e-mail encryption, meeting compliance requirements while delivering powerful new business-class e-mail features.

• IronPort Data Loss Prevention (DLP)—IronPort delivers high-performance, comprehensive data loss prevention for data in motion, helping organizations both large and small prevent leaks, enforce compliance, and protect their brand and reputation.

• The IronPort SenderBase Network—SenderBase collects data from more than ten times the networks of competing monitoring systems, with data on more than 30 percent of the world's e-mail and Web traffic. This volume provides a very statistically significant sample size, resulting in immediate and accurate detection of even low-volume mail senders. A highly diverse group of more than 100,000 organizations, including some of the largest networks in the world, contribute data to IronPort's SenderBase on a remarkable 3 billion messages per day. SenderBase gives mail administrators excellent real-time visibility into security threats from around the world.

• The IronPort Threat Operations Center—The 24-hour IronPort Threat Operations Center (TOC) provides a view into global traffic activity, enabling IronPort to analyze anomalies, uncover new threats, and track traffic trends.

Specifications

<table>
<thead>
<tr>
<th>Chassis/Processor</th>
<th>C150</th>
<th>C350</th>
<th>C360</th>
<th>X1050</th>
</tr>
</thead>
<tbody>
<tr>
<td>Form Factor</td>
<td>17&quot; 1U rack-mounted chassis</td>
<td>19&quot; Rack-Mountable, 2U rack height</td>
<td>19&quot; Rack-Mountable, 2U rack height</td>
<td>19&quot; Rack-Mountable, 2U rack height</td>
</tr>
<tr>
<td>Dimensions</td>
<td>1.7&quot; (h) x 17&quot; (w) x 22&quot; (d)</td>
<td>3.5&quot; (h) x 19&quot; (w) x 29&quot; (d)</td>
<td>3.5&quot; (h) x 19&quot; (w) x 29&quot; (d)</td>
<td>3.5&quot; (h) x 19&quot; (w) x 29&quot; (d)</td>
</tr>
<tr>
<td>CPU</td>
<td>Single Intel processor</td>
<td>One Intel Xeon processor</td>
<td>Two Intel Multi-Core Processors</td>
<td>Two Intel Multi-Core Processors</td>
</tr>
<tr>
<td>Power Supplies</td>
<td>Hot-plug redundant, 700 watts, 100/240 volts</td>
<td>Hot-plug redundant, 700 watts, 100/240 volts</td>
<td>Hot-plug redundant, 700 watts, 100/240 volts</td>
<td>Hot-plug redundant, 700 watts, 100/240 volts</td>
</tr>
<tr>
<td>RAID</td>
<td>RAID 1 configuration</td>
<td>RAID 1 configuration</td>
<td>RAID 1+0 configuration</td>
<td>RAID 1+0 configuration</td>
</tr>
<tr>
<td>Drives</td>
<td>Two 2.5&quot; 7200 RPM SATA drives</td>
<td>Four hot-swappable, 146GB Ultra 3 SCSI</td>
<td>Four hot-swappable, 146GB Ultra 3 SCSI</td>
<td>Four hot-swappable, 146GB Ultra 3 SCSI</td>
</tr>
<tr>
<td>Capacity</td>
<td>3TB effective capacity, 45GB non-mail (e.g. log) capacity</td>
<td>70GB queue capacity, 110 GB discretionary capacity (reporting data, logs, configuration, archives)</td>
<td>70GB queue capacity, 110 GB discretionary capacity (reporting data, logs, configuration, archives)</td>
<td>70GB queue capacity, 110 GB discretionary capacity (reporting data, logs, configuration, archives)</td>
</tr>
<tr>
<td>Ethernet</td>
<td>Two Embedded Intel Gigabit NICs</td>
<td>One Intel 10/100 BaseT and two Broadcom Gigabit BaseT Ethernet ports</td>
<td>Two Broadcom Gigabit BaseT and One Intel 10/100 BaseT Ethernet ports</td>
<td>Two Broadcom Gigabit BaseT and One Intel 10/100 BaseT Ethernet ports</td>
</tr>
<tr>
<td>Serial</td>
<td>1 DB-9 Serial Port</td>
<td>One RJ-25D (DB-8) Serial Port</td>
<td>One RJ-25D (DB-8) Serial Port</td>
<td>One RJ-25D (DB-8) serial port (Two-port fiber-optic NIC)</td>
</tr>
<tr>
<td>Mail Operations</td>
<td>SMTP/ESMTP Secure SMTP over TLS</td>
<td>SMTP/ESMTP Secure SMTP over TLS</td>
<td>SMTP/ESMTP Secure SMTP over TLS</td>
<td>SMTP/ESMTP Secure SMTP over TLS</td>
</tr>
<tr>
<td>Mail Injection Protocols</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mail Delivery Protocols</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DNS</td>
<td>Internal resolver/cache. Can resolve using local DNS or Internet DNS servers</td>
<td>Internal resolver/cache. Can resolve using local DNS or Internet DNS servers</td>
<td>Internal resolver/cache. Can resolve using local DNS or Internet DNS servers</td>
<td>Internal resolver/cache. Can resolve using local DNS or Internet DNS servers</td>
</tr>
<tr>
<td>LDAP</td>
<td>Integrates with Active Directory, Domino and OpenLDAP servers</td>
<td>Integrates with Active Directory, Domino and OpenLDAP servers</td>
<td>Integrates with Active Directory, Domino and OpenLDAP servers</td>
<td>Integrates with Active Directory, Domino and OpenLDAP servers</td>
</tr>
</tbody>
</table>
Selected Part Numbers and Ordering Information
Information below pertains to IronPort’s bundle offerings. For a-la-carte, government, or educational pricing, contact an IronPort sales representative at sales@ironport.com.

- **AS** = Anti-Spam; **AV** = Anti-Virus; **VOF** = Virus Outbreak Filters; **ENCR** = IronPort E-mail Encryption

<table>
<thead>
<tr>
<th>Single Appliance 1 year</th>
<th>Single Appliance 3 year</th>
<th>Dual Appliance 1 year</th>
<th>Dual Appliance 3 year</th>
</tr>
</thead>
<tbody>
<tr>
<td>AS</td>
<td>AS+AV</td>
<td>AS+AV+VOF</td>
<td>AS+AV+VOF+ENCR</td>
</tr>
<tr>
<td>EBUN-TA-EN-S-S1Y</td>
<td>EBUN-TA-EN-SQ-S1Y</td>
<td>EBUN-TA-EN-SQR-S1Y</td>
<td>EBUN-TA-EN-SQRT-S1Y</td>
</tr>
<tr>
<td>AS+AV+VOF</td>
<td>AS+AV+VOF+ENCR</td>
<td>EBUN-2A-EN-SQ-S2Y</td>
<td>EBUN-2A-EN-SQRT-S2Y</td>
</tr>
</tbody>
</table>

For More Information

Cisco IronPort Secure Web Gateway Appliance
Designed to meet the needs of the most demanding organizations, the Cisco IronPort S-Series Secure Web Gateway appliance protects the network perimeter against spyware and a wide variety of web-based threats. The appliance combines multiple layers of web security technology such as deep application content inspection, the Cisco IronPort Layer 4 Traffic Monitor, Cisco IronPort Web Reputation Filters, and multiple malware signatures.

Ideal for Companies that Need These Features
- A secure web gateway, with multiple layers of defense against malware—With Cisco IronPort appliances, these layers run concurrently on a single, integrated appliance.
- High security and high performance—Unlike other solutions on the market (for example, Blue Coat and Websense), security was not developed as an afterthought on the Cisco IronPort S-Series.
- Consolidated security Acceptable Use Policy (AUP), application control, and content caching features, all on a single, integrated appliance—The solution offers ease of management and low total cost of ownership (TCO).
- HTTPS decryption and scanning—Most similar solutions cannot scan HTTPS traffic, leaving the user exposed to web-based threats.

Cisco IronPort Secure Web Gateway Appliance
Specifications

- Malware Filtering—This solution is the first solution on the market that offers multiple antimalware scanning engines on a single, integrated appliance.
- Web Reputation—This feature provides a powerful outer layer of malware defense. Taking advantage of the Cisco IronPort SenderBase Network, Cisco IronPort Web Reputation Filters analyze more than 50 different web traffic- and network-related parameters to accurately evaluate the trustworthiness of a URL or IP address.
- Integrated Layer 4 Traffic Monitor—This monitor scans all ports at wire speed, detecting and blocking spyware “phone-home” activity.
- Web Reputation Filters—This solution is the first solution on the market that offers multiple antimalware scanning engines on a single, integrated appliance.

**Multilayer, Multivendor Defense in Depth**

- Cisco IronPort URL Filters offer broad reach and exceptional accuracy rate in controlling web content. The Cisco IronPort database contains more than 20 million sites (corresponding to more than 3 billion pages), with global coverage across 70 languages and 200 countries.
- The industry’s first and best web reputation filters provide a powerful outer layer of malware defense. Using the Cisco IronPort SenderBase Network, Cisco IronPort Web Reputation Filters analyze more than 50 different web traffic- and network-related parameters to accurately evaluate the trustworthiness of a URL or IP address.
- Cisco IronPort Web Reputation Filters are the industry’s only reputation system to include botsite protection, URL outbreak detection, and exploit filtering—protecting users from exploits delivered through cross-site scripting (XSS), cross-site request forgery, Structured Query Language (SQL) injections, or invisible iFrames.
- The Cisco IronPort Anti-Malware System enables the Cisco IronPort S-Series to be the first solution on the market that offers multiple antimalware scanning engines on a single, integrated appliance. Moreover, an administrator can run these scanning engines simultaneously to offer greater protection against malware threats, with little to no performance degradation. This system takes full advantage of the Cisco IronPort Dynamic Vectoring and Streaming (DVS) Engine, and verdict engines from Webroot and McAfee, to provide best-of-class protection against a wide variety of web-based threats.
- The Cisco IronPort DVS Engine was built to provide an integrated single-appliance solution with multiple antimalware scanning engines from different vendors. It employs sophisticated object parsing and streaming techniques to provide all of the Cisco IronPort AUP and security features for web traffic. Simultaneously, it takes full advantage of hardware optimizations (such as multicore scanning) to distribute these parallel operations and fully use the system resources.
- HTTPS decryption enables the Cisco IronPort S-Series to enforce acceptable use and security policies over HTTPS-decrypted data. The Cisco IronPort Web Security solution is the first to use web reputation and URL filtering to make HTTPS decryption decisions.

**Comprehensive Management and Reporting Capabilities**

- Cisco IronPort Web Security Manager provides a single, easy-to-understand view of all access and security policies configured on the appliance. Administrators manage all web access policies (including URL filtering, time-based policies, reputation filtering, and malware filtering) from a single location.
- Cisco IronPort Web Security Monitor provides valuable insight into overall web activity, as well as threat identification and prevention, within corporate networks. These on- and off-box reports are designed to provide actionable information as well as historical trends.
- Multiple deployment modes enable flexibility within a corporate network. Deployment modes include deployment as an explicit forward proxy for the network or transparent deployment off a Layer 4 switch or a Web Cache Communication Protocol (WCCP) router within the network. The Cisco IronPort S-Series appliance can be configured as a standalone proxy or to coexist with other proxies (such as in a proxy hierarchy for conditional routing, failover, and load balancing).
- Enterprise-grade Simple Network Management Protocol (SNMP) facilitates hands-off monitoring and alerting for critical system metrics, including hardware, performance, and availability. Support for SNMPv1, 2, and 3, along with a comprehensive enterprise-class alert engine, ensures oversight for all system parameters—including hardware, security, performance, and availability.
- Integrated authentication through standard directories (such as Lightweight Directory Access Protocol [LDAP] or Active Directory) and the ability to implement multiple authentication schemes (such as Microsoft NT LAN Manager [NTLM] or Basic) lets enterprises deploy the Cisco IronPort S-Series transparently, while taking advantage of preexisting authentication and access control policies within their networks.
- Extensive logging allows enterprises to keep track of all web traffic, benign and malware-related. Standard log formats include Apache, Squid or Squid-detailed, along with the ability to specify custom log formats consistent with enterprise logging policies.

### Key Features

- Fast Web proxy—This feature allows for deep content analysis, which is critical for accurate detection of devious and rapidly mutating web-based malware.
- Acceptable Use Policy (AUP)—URL filtering from Cisco IronPort appliances enables the enforcement of corporate Internet usage policies.
- Web Reputation—This feature provides a powerful outer layer of malware defense. Taking advantage of the Cisco IronPort SenderBase Network, Cisco IronPort Web Reputation Filters analyze more than 50 different web traffic- and network-related parameters to accurately evaluate the trustworthiness of a URL or IP address.
- Integrated Layer 4 Traffic Monitor—This monitor scans all ports at wire speed, detecting and blocking spyware “phone-home” activity.
- Web Reputation Filters—This solution is the first solution on the market that offers multiple antimalware scanning engines on a single, integrated appliance.

### Web Reputation Filters

- Cisco IronPort Web Reputation Filters are the industry’s only reputation system to include botsite protection, URL outbreak detection, and exploit filtering—protecting users from exploits delivered through cross-site scripting (XSS), cross-site request forgery, Structured Query Language (SQL) injections, or invisible iFrames.
- The Cisco IronPort Anti-Malware System enables the Cisco IronPort S-Series to be the first solution on the market that offers multiple antimalware scanning engines on a single, integrated appliance. Moreover, an administrator can run these scanning engines simultaneously to offer greater protection against malware threats, with little to no performance degradation. This system takes full advantage of the Cisco IronPort Dynamic Vectoring and Streaming (DVS) Engine, and verdict engines from Webroot and McAfee, to provide best-of-class protection against a wide variety of web-based threats.
- The Cisco IronPort DVS Engine was built to provide an integrated single-appliance solution with multiple antimalware scanning engines from different vendors. It employs sophisticated object parsing and streaming techniques to provide all of the Cisco IronPort AUP and security features for web traffic. Simultaneously, it takes full advantage of hardware optimizations (such as multicore scanning) to distribute these parallel operations and fully use the system resources.
- HTTPS decryption enables the Cisco IronPort S-Series to enforce acceptable use and security policies over HTTPS-decrypted data. The Cisco IronPort Web Security solution is the first to use web reputation and URL filtering to make HTTPS decryption decisions.

### Comprehensive Management and Reporting Capabilities

- Cisco IronPort Web Security Manager provides a single, easy-to-understand view of all access and security policies configured on the appliance. Administrators manage all web access policies (including URL filtering, time-based policies, reputation filtering, and malware filtering) from a single location.
- Cisco IronPort Web Security Monitor provides valuable insight into overall web activity, as well as threat identification and prevention, within corporate networks. These on- and off-box reports are designed to provide actionable information as well as historical trends.
- Multiple deployment modes enable flexibility within a corporate network. Deployment modes include deployment as an explicit forward proxy for the network or transparent deployment off a Layer 4 switch or a Web Cache Communication Protocol (WCCP) router within the network. The Cisco IronPort S-Series appliance can be configured as a standalone proxy or to coexist with other proxies (such as in a proxy hierarchy for conditional routing, failover, and load balancing).
- Enterprise-grade Simple Network Management Protocol (SNMP) facilitates hands-off monitoring and alerting for critical system metrics, including hardware, performance, and availability. Support for SNMPv1, 2, and 3, along with a comprehensive enterprise-class alert engine, ensures oversight for all system parameters—including hardware, security, performance, and availability.
- Integrated authentication through standard directories (such as Lightweight Directory Access Protocol [LDAP] or Active Directory) and the ability to implement multiple authentication schemes (such as Microsoft NT LAN Manager [NTLM] or Basic) lets enterprises deploy the Cisco IronPort S-Series transparently, while taking advantage of preexisting authentication and access control policies within their networks.
- Extensive logging allows enterprises to keep track of all web traffic, benign and malware-related. Standard log formats include Apache, Squid or Squid-detailed, along with the ability to specify custom log formats consistent with enterprise logging policies.

### Specifications

<table>
<thead>
<tr>
<th>Model</th>
<th>$660</th>
<th>$360</th>
<th>$160</th>
</tr>
</thead>
<tbody>
<tr>
<td>User Targets</td>
<td>5000+</td>
<td>500-5000</td>
<td>&lt; 500</td>
</tr>
<tr>
<td>Chassis</td>
<td></td>
<td></td>
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</tbody>
</table>
Selected Part Numbers and Ordering Information

The following information pertains to Cisco IronPort bundle offerings. For a-la-carte, government, or educational pricing please contact a Cisco IronPort sales representative at sales@ironport.com.

Note: All bundles include Platinum Support, Rails (4-Post Square), and Sawmill Software for Cisco IronPort URL Filtering, Web Reputation Filters, and Anti-Malware System; the Cisco IronPort Anti-Malware System includes signatures from Webroot and McAfee.

Note the following abbreviations:

URL = URL Filtering; ASPY = Antispyware; WEBREP = Cisco IronPort Web Reputation Filters; AV = Antivirus and antimalware

Cisco ACE Web Application Firewall

Companies are increasing efficiency and profitability with the implementation of new Web 2.0 and service-oriented-architecture (SOA) application solutions. Unfortunately, criminals are increasingly exploiting these

<table>
<thead>
<tr>
<th>Form Factor</th>
<th>2RU</th>
<th>2RU</th>
<th>1RU</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dimensions</td>
<td>3.5&quot; (h) x 17.5&quot; (w) x 29.5&quot; (d)</td>
<td>3.5&quot; (h) x 17.5&quot; (w) x 29.5&quot; (d)</td>
<td>1.75&quot; (h) x 17.5&quot; (w) x 21.5&quot; (d)</td>
</tr>
<tr>
<td>Power Supply</td>
<td>750 watts, 100-240 volts</td>
<td>750 watts, 100-240 volts</td>
<td>245 watts, 100-240 volts</td>
</tr>
<tr>
<td>Redundant Power Supply</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
</tr>
</tbody>
</table>

Processor, Memory, and Disks

<table>
<thead>
<tr>
<th>CPUs</th>
<th>2x4 (2 Quad Core) XEONs</th>
<th>1x1 (1 Quad Core) XEONs</th>
<th>1x2 (1 Dual Core) Pentium</th>
</tr>
</thead>
<tbody>
<tr>
<td>Memory</td>
<td>4 GB</td>
<td>4 GB</td>
<td>4 GB</td>
</tr>
<tr>
<td>Disk Space</td>
<td>4x300 GB SAS</td>
<td>4x300 GB SAS</td>
<td>2x250 GB SAT</td>
</tr>
<tr>
<td>Hot Swappable Hard Drives</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>RAID</td>
<td>RAID 1c battery-backed 256MB cache</td>
<td>RAID 1d battery-backed 256MB cache</td>
<td>RAID 1d battery-backed 256MB cache</td>
</tr>
</tbody>
</table>

Interfaces

<table>
<thead>
<tr>
<th>Ethernet</th>
<th>1x10Gbps Nics, RJ-45</th>
<th>1x1Gbps Nics, RJ-45</th>
<th>2x1Gbps Nics, RJ-45</th>
</tr>
</thead>
<tbody>
<tr>
<td>Serial</td>
<td>1xRS-232 (DB-9) serial</td>
<td>1xRS-232 (DB-9) serial</td>
<td>1xRS-232 (DB-9) serial</td>
</tr>
<tr>
<td>Fiber</td>
<td>Optional</td>
<td>No</td>
<td>No</td>
</tr>
</tbody>
</table>

Configuration, Logging, and Monitoring

<table>
<thead>
<tr>
<th>Web Interface</th>
<th>GUI-based (HTTP or HTTPS)</th>
<th>GUI-based (HTTP or HTTPS)</th>
<th>GUI-based (HTTP or HTTPS)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Command Line Interface</td>
<td>Standard or custom (CLI-based)</td>
<td>Standard or custom (CLI-based)</td>
<td>Standard or custom (CLI-based)</td>
</tr>
<tr>
<td>Logging</td>
<td>Squid, Apache, syslog</td>
<td>Squid, Apache, syslog</td>
<td>Squid, Apache, syslog</td>
</tr>
<tr>
<td>Centralized Reporting</td>
<td>Supported</td>
<td>Supported</td>
<td>Supported</td>
</tr>
<tr>
<td>File Transfer</td>
<td>SCP, FTP</td>
<td>SCP, FTP</td>
<td>SCP, FTP</td>
</tr>
<tr>
<td>Configuration Files</td>
<td>XML-based</td>
<td>XML-based</td>
<td>XML-based</td>
</tr>
<tr>
<td>Centralized Configuration</td>
<td>Supported</td>
<td>Supported</td>
<td>Supported</td>
</tr>
<tr>
<td>Monitoring</td>
<td>SNMP v1-3, e-mail alerts</td>
<td>SNMP v1-3, e-mail alerts</td>
<td>SNMP v1-3, e-mail alerts</td>
</tr>
</tbody>
</table>

Single Appliance Bundles (1 Year)

<table>
<thead>
<tr>
<th>URL Bundle</th>
<th>URL+WEB</th>
<th>URL+WEB+WEBREP</th>
<th>URL+WEB+WEBREP+ASPY+AV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single Appliance Bundles (3 Year)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Single Appliance Bundles (5 Year)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Single Appliance Bundles (1 Year)

<table>
<thead>
<tr>
<th>URL Bundle</th>
<th>URL+WEB</th>
<th>URL+WEB+WEBREP</th>
<th>URL+WEB+WEBREP+ASPY+AV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dual Appliance Bundles (1 Year)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dual Appliance Bundles (3 Year)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dual Appliance Bundles (5 Year)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

For More Information

applications for identity theft, data theft, application disruption, and fraud, accelerating compliance efforts focused on application security as seen with the PCI DSS (Payment Card Industry Data Security Standard) 1 mandate.

The Cisco ACE Web Application Firewall provides full compliance with the latest PCI requirements. It combines deep Web application analysis with high-performance Extensible Markup Language (XML) inspection and management to address the full range of threats associated with Web application services. The result is dramatically reduced business exposure to attacks on modern mission-critical applications, protection of sensitive customer and corporate information, and enhanced availability.

Ideal for Companies that Need These Features
- A firewall with deep web application analysis with high-performance Extensible Markup Language (XML) inspection
- Compliance with sections 6.5 and 6.6 of the PCI DSS (Payment Card Industry Data Security Standard) 1 standard
- A comprehensive Layer 7 security solution to complement existing network firewalls (for customers hosting Web applications)

Key Features
- Secure—Built upon a proven understanding of XML, Cisco ACE WAF secures and protects Web applications from common attacks such as identity theft, data theft, application disruption, fraud, and targeted attacks.
- Scalable—With gigabit throughput, unparalleled support for concurrent transactions, and the ability to scale to the largest of data centers, Cisco ACE WAF enables uninterrupted collaboration in high-paced environments with fewer appliances to store and manage.
- Simple—With centralized enterprise-ready management, including pre-defined compliance and security profiles, Cisco ACE WAF can be simply deployed and easily managed, even with no prior application experience.
- Compliant—With out-of-the-box PCI customizable policies, Cisco ACE WAF allows you to protect your backend databases and demonstrate compliance through securing, auditing, and reporting on web application activity.

Specifications

<table>
<thead>
<tr>
<th>Item</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transport Security</td>
<td>Full transport support with configurable cipher suites. FIPS 1.2-Level 5 platforms available</td>
</tr>
<tr>
<td>Cryptographic Support</td>
<td>Cryptography algorithms including: Advanced Encryption Standard (AES); Data Encryption Standard (DES); Triple DES (3DES); Blowfish; RSA; Diffie-Hellman; Digital Signature Algorithm (DSA); Secure Hash Algorithm 1 (SHA-1) and Message-Digest 5 (MD5)</td>
</tr>
<tr>
<td>Web Application Security</td>
<td>Full reverse proxy; Monitor mode deployment; Buffer overflow; HTTP parameter manipulation; Protocol compliance; Null byte blocking; Input encoding normalization; Response filtering and rewriting; Flexible firewall actions; Cookie and session tampering; Cross-site scripting (XSS); Command injection; SQL injection; Privacy enforcement by preventing information leak; Cryptography enforcement; Application and server error message cloaking; Referer enforcement; Positive and negative security models; Custom rules and signatures; PCI compliance profiles</td>
</tr>
<tr>
<td>Administration</td>
<td>Web user interface; Command-line interface; SSH; Simple Network Management Protocol (SNMP); Role-based access control (RBAC); Delegated administration; Central policy management and distributed enforcement; Import and export of configuration, statistics, and logs</td>
</tr>
<tr>
<td>Logging, Monitoring, and Auditing</td>
<td>syslog and message and event log; Traffic and service-level agreement (SLA) monitoring and reporting; Statistics for monitoring and various alerts and triggers; Audit trail of administrative operations</td>
</tr>
</tbody>
</table>

Selected Part Numbers and Ordering Information

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Product Name</th>
<th>Product Options</th>
<th>Support and Services</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACE-XML-K9</td>
<td>Cisco ACE Web Application Firewall Appliance</td>
<td>Options</td>
<td>CON-SNT-ACEXMLK9 or CON-SNT-ACEXMLNK9</td>
</tr>
<tr>
<td>ACE-XML-NF-K9</td>
<td>Cisco ACE Web Application Firewall Appliance</td>
<td>Options</td>
<td>CON-SNT-ACEXMLK9 or CON-SNT-ACEXMLNK9</td>
</tr>
<tr>
<td>ACE-WAF-XMLFIPS</td>
<td>FIPS-compliant SSL acceleration</td>
<td>Cryptography</td>
<td>CON-SNT-ACEWAFFIPS or CON-SNT-ACEWAFNFIP</td>
</tr>
<tr>
<td>ACE-WAF-XML-NONFIPS</td>
<td>Non-FIPS-compliant SSL acceleration</td>
<td>Cryptography</td>
<td>CON-SNT-ACEWAFFIPS or CON-SNT-ACEWAFNFIP</td>
</tr>
<tr>
<td>ACE-WAF-GW-LICFX</td>
<td>Cisco ACE Web Application Firewall license</td>
<td>Licensing</td>
<td>CON-SAU-ACEWAFGW or CON-SAU-ACEWAFMG</td>
</tr>
<tr>
<td>ACE-WAF-MGT-LICFX</td>
<td>Cisco ACE Web Application Firewall Manager license</td>
<td>Licensing</td>
<td>CON-SAU-ACEWAFMG</td>
</tr>
</tbody>
</table>

NOTE: Cisco ACE Web Application Firewall is now available for ordering.

For More Information
For more information about the Cisco ACE Web Application Firewall, visit: http://www.cisco.com.
Cisco Security Manager

Cisco Security Manager is a highly scalable, comprehensive solution for provisioning and policy administration of Cisco firewalls, VPNs, and intrusion prevention systems (IPSs). This powerful, easy-to-use tool efficiently scales for managing networks with fewer than 10 devices to very large networks consisting of thousands of devices. The GUI increases the speed and accuracy of policy definitions and deployment. An integral component of the Cisco Security Management Suite, Cisco Security Manager Collaborates with Cisco Security MARS to provide a complete security management solution.

Ideal for Companies that Need These Features

- Scalable network management of centrally provisioned Cisco firewalls, VPNs, and IPSs
- Multiproduct, multitechnology security provisioning for a unified management system
- Configuration wizards to reduce complexity
- Enhanced visibility through customized views: Device, Groups, and Topology
- Advanced decision-support workflow

Key Features

- Cisco Security Manager supports a single integrated application for managing firewall, VPN, and intrusion-prevention-system (IPS) security services on Cisco security appliances and modules, routers, and switches.
- The solution reduces operational expenses while at the same time improving provisioning accuracy and consistency.
- The solution collaborates with Cisco Security Monitoring, Analysis and Response System MARS to form a comprehensive security management solution encompassing security provisioning, event monitoring, threat detection, and mitigation.
- The solution allows faster response to threats; it defines and assigns new security policies to thousands of devices in a few simple steps.
- Cisco Security Manager supports superior ease of use with a rich GUI.
- It supports true enterprise-class operational environments with support for multiple simultaneous security administrators with fine-grained control of access permissions; an optional "workflow" mode allows the security and network operations staff to work together effectively with the appropriate division of responsibilities.

Specifications

Server Requirements

<table>
<thead>
<tr>
<th>Component</th>
<th>Minimum requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>System hardware</td>
<td>IBM PC-compatible with a 2-GHz or faster processor; Color monitor with at least 1024 x 768 resolution and a video card capable of 16-bit colors; DVD-ROM drive; 100Base-T (100 Mbps) or faster network connection; single interface only; Keyboard and mouse</td>
</tr>
<tr>
<td>File system</td>
<td>NTFS</td>
</tr>
<tr>
<td>Memory (RAM)</td>
<td>2 GB</td>
</tr>
<tr>
<td>System Software</td>
<td>Microsoft Windows 2000 Server—Enterprise Edition with SP1; Standard edition with SP1; Microsoft Windows 2000—Advanced Server with SP4; Server with SP4; Professional with SP4</td>
</tr>
<tr>
<td>Browser</td>
<td>Microsoft Internet Explorer EU (E.U.2800); or with SP1 (E.U.2800); Mozilla 17 or 1.75</td>
</tr>
<tr>
<td>Compression software</td>
<td>Winzip 9.0 or compatible</td>
</tr>
<tr>
<td>Hard drive space</td>
<td>20 GB</td>
</tr>
<tr>
<td>IP Address</td>
<td>One static IP address</td>
</tr>
<tr>
<td>Component</td>
<td>Minimum requirement</td>
</tr>
</tbody>
</table>

Client requirements

<table>
<thead>
<tr>
<th>Component</th>
<th>Minimum requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>System hardware</td>
<td>IBM PC-compatible with a 1-GHz or faster processor; color monitor with video card set to 24-bit color depth; Keyboard; Mouse</td>
</tr>
<tr>
<td>Memory (RAM)</td>
<td>1 GB</td>
</tr>
<tr>
<td>Virtual memory/swap space</td>
<td>512 MB</td>
</tr>
<tr>
<td>Hard drive space</td>
<td>10 GB</td>
</tr>
<tr>
<td>Operating system</td>
<td>Microsoft Windows XP Professional with SP1 or higher; Microsoft Windows 2000—Server Edition with SP1; Microsoft Windows 2000—Advanced Server with SP4; Professional with SP4</td>
</tr>
<tr>
<td>Browser</td>
<td>Microsoft Internet Explorer EU (E.U.2800); or with SP1 (E.U.2800); Mozilla 17 or 1.75</td>
</tr>
<tr>
<td>Java</td>
<td>Includes an embedded and completely isolated version of Java</td>
</tr>
</tbody>
</table>

1. Supports only the U.S. English and Japanese versions of Windows. CS Manager does not support any other language version. Server only: Microsoft ODBC Driver Manager 3.510 or later is also required to work with Sybase database files.
Cisco Enterprise Policy Manager (EPM)

Cisco Enterprise Policy Manager (EPM) is a feature-rich, XACML based, policy management and authorization product that helps secure enterprise applications and data. Cisco EPM centralizes application entitlement across multiple enterprise applications allowing secured and differentiated access to sensitive applications and information throughout the enterprise.

Cisco EPM is packed with innovative, fine-grained controls, exceptional policy visibility and excellent application and infrastructure support to allow organizations to better meet their security and compliance requirements. Organizations leveraging Cisco EPM can now administer, enforce, and audit sophisticated authorization policies across heterogeneous application and IT environments, all with centralized management and visibility. This streamlining of application security and policy results in reducing budgets and implementation schedules by up to 30%.

Cisco EPM is made of three distinct but transparently integrated components.

- Cisco Policy Administration Point (PAP) - provides centralized administration, management, and monitoring of entitlement policies. It then delegates these policies and integrates them with enterprise information repositories.
- Cisco Policy Decision Point (PDP) - provides run-time resolution of role-based and rule-based authorization policies.
- Policy Enforcement Points (PEP) - enforces policy decisions made by the PDPs on a wide range of applications and environments.

Ideal for Companies that Need These Features

- Highest levels of application access and usage controls.
- Centralized application policy (a.k.a. Entitlement) management and enforcement.
- Centralized audit of application access policies.
- Persistent compliance of enterprise-wide application policy, visibility and control.
- Activation of new, more agile and complex enterprise business scenarios.
- Compared to other Cisco solutions Cisco EPM is a project-oriented, software-driven solution. It is targeted at the CISOs, Line-of-Business Managers and Enterprise IT Architects of enterprises.

Key Features

- Streamline application security:
  - Consistently define and enforce fine-grained access control per application, across the infrastructure, and across the enterprise.
  - Rich, rule-based contextual entitlements take advantage of multiple distributed roles, rules, and attribute repositories.
  - The solution offers snap-on integration with existing identity and authentication management infrastructure.
  - Powerful delegation and modeling capabilities (subject and resource hierarchies, inheritance, exceptions, and scoping) offer ease of administration.
  - There is no need to serialize behind identity management, single sign-on, or corporate role reconciliation initiatives.

- Ensure consistent compliance:
  - The solution offers centralized and automated audit review across applications regardless of enforcement mechanism.
  - The solution offers audit capabilities within applications and across the enterprise.
  - The solution provides real-time report and alerts on who can access what, who accessed what, and who made what administration change.
  - You can easily create "Chinese Walls", and enforce and audit segregation of duties.
  - Forecast "What If?" scenarios to help security administrators understand the ramifications of policy changes.

- Empower new business scenarios:
  - Rich entitlement policies are configured, deployed, and updated without application modification - allowing organizations to begin reaping the benefits of a service-oriented architecture (SOA).

For More Information

For more information about Cisco Security Manager, visit: http://www.cisco.com/go/csmanager.

Selected Part Numbers and Ordering Information

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CSMPRLIC-50</td>
<td>CS Mgr Enterprise Pro - Incremental 50 Device License</td>
</tr>
<tr>
<td>CSMPRLIC-100</td>
<td>CS Mgr Enterprise Pro - Incremental 100 Device License</td>
</tr>
<tr>
<td>CSMPRLIC-500</td>
<td>CS Mgr Enterprise Pro- Incremental 500 Device License</td>
</tr>
<tr>
<td>CSMPRLIC-1000</td>
<td>CS Mgr Enterprise Pro- Incremental 1000 Device License</td>
</tr>
</tbody>
</table>

2. If the server has more than one IP address, disable all but one address. The CS Manager installer displays a warning if it detects any dynamic IP addresses on the target server. Dynamic addresses are not supported.
3. Opening IPS Manager without required version of Java results in CS Manager server displaying a message to install the required Java version. This Java version does not interfere with browser settings or with other Java-based applications.
- Maximum flexibility is achieved through central and application-specific role-based, attribute-based, and rule-based entitlements.
- Increased organizational agility is achieved through delegation to business users, removing IT as the bottleneck for urgent business-process changes.
- The solution offers time- and cost-effective deployment, including 45-minute installation and rapid realization of return on investment (ROI).

For More Information
For more information about Cisco Enterprise Policy Manager please visit: http://www.cisco/go/policy.

Cisco Security Monitoring, Analysis, and Response System (MARS)
Cisco Security Monitoring, Analysis, and Response System (MARS) is a family of high-performance, scalable appliances for threat management, monitoring, and mitigation that enable customers to make more effective use of network and security devices by combining traditional security event monitoring with network intelligence, context correlation, vector analysis, anomaly detection, hotspot identification, and automated mitigation capabilities. By combining network intelligence, an understanding of network topology, and automated mitigation capabilities, Cisco Security MARS helps companies accurately identify and eliminate network attacks while maintaining network compliance.

Ideal for Companies that Need These Features
- Cisco Security MARS 25—Low-end device to plot network topology and gain insight into network topology; Analysis of up to 750 events per second; Analysis of up to 15,000 NetFlow flows per second; 250-GB storage (Cisco Security MARS 25 is ideal for small offices, test labs, departments, small retail establishments, DMZs, and customer premises equipment [CPE].)
- Cisco Security MARS 25R—Low-end device to plot network topology and gain insight into network topology; Analysis of up to 750 events per second; Analysis of up to 15,000 NetFlow flows per second; 250-GB storage (Cisco Security MARS 25R is ideal for small offices, test labs, departments, small retail establishments, DMZs, and CPE.)
- Cisco Security MARS 55—Consolidation of firewall and intrusion detection system (IDS) with network events and network flows in a small network; Analysis of up to 1500 events per second; Analysis of up to 30,000 NetFlow flows per second; 500-GB storage (Cisco Security MARS 55 is ideal for small to medium-sized offices, remote branch offices, retail establishments, small businesses, DMZs, and CPE.)
- Cisco Security MARS 110—Analysis of up to 7500 events per second; Analysis of up to 150,000 NetFlow flows per second; 1500-GB Redundant Array of Independent Disks (RAID) storage (Cisco Security MARS 110 is ideal for second-generation appliances for large offices and CPE.)
- Cisco Security MARS 110R—Analysis of up to 4500 events per second; Analysis of up to 15,000 NetFlow flows per second; 1000-GB RAID storage (Cisco Security MARS 110R is ideal for large enterprises, central offices, and large firewalls; that is, firewall services modules [FWSMs].)
- Cisco Security MARS 210—Analysis of up to 15,000 events per second; Analysis of up to 30,000 NetFlow flows per second; 2000-GB RAID storage (Cisco Security MARS 210 is ideal for second-generation appliances for large enterprises, central offices, and large firewalls [FWSMs].)
- Cisco Security MARS GC—Preservation of WAN. Consolidation of reports from distributed “local” controller [Cisco Security MARS GC is ideal for large distributed environments [large enterprises or service provider companies] and multiservice switching platforms [MSSPs]. It is also useful for autonomous business units that are rolling activities to global teams and for state and federal governments for consolidating activities from various agencies.]
- Cisco Security MARS GC2—Preservation of WAN. Cisco Security MARS GC2 is ideal for second-generation appliances in large distributed environments [large enterprises or service provider companies] and MSSPs. It is also useful for autonomous business units that are rolling activities to global teams and for state and federal governments for consolidating activities from various agencies.

Key Features
- Centralized monitoring—Cisco Security MARS provides detailed information about the network infrastructure, including routers, switches, firewalls, VPN concentrators, and endpoint devices, through a variety of device logs, alerts, and NetFlow communication. It also provides process threat information down to the IP and MAC address, nearest attached switch port, as well as the attack path through the network.
- Central event repository—The central event repository serves as a central repository for all events generated by security devices, such as firewalls, authentication servers, network intrusion prevention systems (IPSs) and intrusion detection systems (IDSs) and proxy servers. All collected events are cross-correlated in real time.
- Data reduction—Cisco Security MARS can reduce millions of security events to a handful of actual reported network incidents.
- Timely attack mitigation—Built-in expertise recognizes and recommends mitigation for attacks before they can bring down an entire network.
- End-to-end network awareness—The application integrates Network Address Translation (NAT), Port Address Translation (PAT), and MAC address information to identify attackers, targets, and network hotspots in graphical form for quick action. It uses the full configurations of all types of network devices and end systems. Pre- and post-NAT addresses can be displayed.
Integrated vulnerability assessment—This solution determines whether a possible network attack is genuine or a false positive, reducing the number of alarms and the time needed to take action.

Reduced deployment and operation cost—Cisco Security MARS discovers and then maps the topology of a network and becomes operational in a very short period of time.

Standard 802.1x support—The application facilitates authentication of a host connecting to the switch port before obtaining an IP address.

Cisco Distributed Threat Mitigation (DTM) and CICS support—This collaborative solution proactively identifies the most active signatures from the IPS appliance deployed in the network and, based on the most active threats detected on the network, distributes the same IPS signatures to the user-defined Cisco IOS IPS devices.

Case management—Administrators can escalate an incident by creating a case and forwarding the case with notes to other users and security administrators.

NetFlow analysis—Cisco IOS NetFlow data is collected and analyzed by Cisco Security MARS, at speeds as high as 300,000 flows per second.

Specifications

<table>
<thead>
<tr>
<th>Feature</th>
<th>CS-MARS-25R-K9</th>
<th>CS-MARS-25-K9</th>
<th>CS-MARS-55-K9</th>
<th>CS-MARS-110-K9</th>
</tr>
</thead>
<tbody>
<tr>
<td>Storage</td>
<td>120 GB (non-RAID)</td>
<td>120 GB (non-RAID)</td>
<td>240 GB RAID 0</td>
<td>1000 GB RAID 10</td>
</tr>
<tr>
<td>Form Factor</td>
<td>1RU x 16</td>
<td>1RU x 16</td>
<td>1RU x 26.6</td>
<td>2RU x 27 3/4 (D), 3.44 (H), 19” (W)</td>
</tr>
<tr>
<td>Power Supply</td>
<td>300W, 120/240V autoswitch</td>
<td>300W, 120/240V autoswitch</td>
<td>300W, 120/240V autoswitch</td>
<td>2 x 750W dual-redundant 120/240V autoswitch</td>
</tr>
</tbody>
</table>

Performance

| Events/sec. | 50 | 500 | 1000 | 7500 |
| Netflows/sec. | 1500 | 15,000 | 30,000 | 100,000 |

<table>
<thead>
<tr>
<th>Feature</th>
<th>CS-MARS-210-K9</th>
<th>CS-MAR-GC-K9</th>
<th>CS-MARS-GC2-K9</th>
</tr>
</thead>
<tbody>
<tr>
<td>Storage</td>
<td>2000 GB RAID 10</td>
<td>1 TB RAID 10</td>
<td>2 TB RAID 10</td>
</tr>
<tr>
<td>Form Factor</td>
<td>2RU x 29.6</td>
<td>2RU x 29.6</td>
<td>2RU x 29.6</td>
</tr>
<tr>
<td>Power Supply</td>
<td>2 x 750W dual-redundant 120/240V autoswitch</td>
<td>600W dual-redundant 120/240V autoswitch</td>
<td>2 x 750W dual-redundant 120/240V autoswitch</td>
</tr>
<tr>
<td>Events/sec.</td>
<td>15,000</td>
<td>30,000</td>
<td></td>
</tr>
<tr>
<td>Netflows/sec.</td>
<td>80,000</td>
<td>Not restricted</td>
<td>Not restricted</td>
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</table>

Maximum Connections

Cisco SMARTnet Service Part Number

<table>
<thead>
<tr>
<th>Cisco SMARTnet Service Part Number</th>
<th>Cisco SMARTnet Service Part Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>CS-MARS-25R-K9</td>
<td>CON-SNT-MARS25R</td>
</tr>
<tr>
<td>CS-MARS-55-K9</td>
<td>CON-SNT-MARS55</td>
</tr>
<tr>
<td>CS-MARS-110R-K9</td>
<td>CON-SNT-MARS110R</td>
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<tr>
<td>CS-MARS-110-K9</td>
<td>CON-SNT-MARS110</td>
</tr>
<tr>
<td>CS-MARS-GC2R-K9</td>
<td>CON-SNT-MARSGC2R</td>
</tr>
<tr>
<td>CS-MARS-GC2-K9</td>
<td>CON-SNT-MARSGC2</td>
</tr>
</tbody>
</table>

For More Information


CiscoWorks Network Compliance Manager

CiscoWorks Network Compliance Manager (NCM) tracks and regulates configuration and software changes throughout a multivendor network infrastructure. It provides superior visibility into network changes and can track compliance with a broad variety of regulatory, IT, corporate governance, and technology requirements. CiscoWorks NCM helps IT staff identify and correct trends that could lead to problems such as network instability and service interruption.
Ideal for Companies that Need These Features

- Increased visibility of policy noncompliance
- Decreased network downtime
- Automated network discovery and remediation
- Consolidation and expansion of the data center

Key Features

- CiscoWorks Network Compliance Manager (NCM) simplifies the ordering, licensing, and install processes, helping enable customers to get their NCM systems operational more easily.
- The application provides the ability to automate compliance on an “as-running” basis as well as the traditional “as-configured” basis.
- It dramatically reduces the need for regular expressions for creating rules.
- The solution provides up-to-date information about devices and modules that have reached end-of-sale or end-of-life status in the network (currently supports Cisco devices only).
- It facilitates automated software image management with recommendation, validation, synchronization, automatic image download, and automatic rollback on error.
- It eliminates manual administration of devices.
- The solution facilitates role-based access control and lock down.
- It includes centralized access-control-list (ACL) management.
- Subscription services complement the NCM software offering. CiscoWorks NCM Alert Center content, such as security-compliance policies in NCM format and product extensions, is uploaded into CiscoWorks NCM Alert Center and is hosted at a Cisco.com URL for subscribers to download into CiscoWorks NCM.
- The solution supports thousands of device models or versions from Cisco and 35 other vendors.
- Frequent and easy-to-deploy device driver releases are available.
- The solution facilitates real-time process enforcement, increases uptime, eases audit of configuration changes, and improves control of network resources.

For More Information

For more information about CiscoWorks Network Compliance Manager (NCM), visit:

Cisco Physical Access Gateway

An integral component of the Cisco Physical Access Control solution, the Cisco Physical Access Gateway is the primary module used to connect door hardware (readers, locks, etc.) to the IP network. The gateway can connect to a maximum of two doors and associated inputs and outputs.

The Cisco Physical Access Gateway is a mandatory component of any access-control deployment. The following optional modules may be connected to the Cisco Physical Access Gateway to control additional doors, inputs, and outputs:

- Cisco Physical Access Gateway Reader Module
- Cisco Physical Access Gateway Input Module
- Cisco Physical Access Gateway Output Module

Key Features

- Doors managed—The Cisco Physical Access Gateway can manage up to two doors.
- Additional module support—Up to 15 additional modules can be connected to and managed by the Cisco Physical Access Gateway. You can connect these modules on a three-wire controller-area-network (CAN) bus. All modules must be within 40 meters (130 feet) of the Cisco Physical Access Gateway.
- Reader and lock power—External devices such as readers or locks can be powered by the Cisco Physical Access Gateway. The maximum current draw is limited to 650 mA at 12 VDC.
- Credential cache—The gateway can cache and encrypt 250,000 credentials.
- Event cache—The door can buffer 150,000 events.
- Encryption—All communication is 128-bit Advanced Encryption Standard (AES) encrypted.

Specifications

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Housing</td>
<td>Aluminum</td>
</tr>
<tr>
<td>Dimensions (LxWxH)</td>
<td>5 x 7 x 2.14 in. 127 x 178 x 54.6 mm</td>
</tr>
<tr>
<td>Weight</td>
<td>Weight Without Plugs and Brackets</td>
</tr>
<tr>
<td></td>
<td>With Plugs</td>
</tr>
<tr>
<td></td>
<td>With Brackets</td>
</tr>
<tr>
<td></td>
<td>With Plugs and Brackets</td>
</tr>
<tr>
<td>165 lb (74.9 kg)</td>
<td>18 lb (8.11 kg)</td>
</tr>
<tr>
<td>18 lb (8.11 kg)</td>
<td>18 lb (8.11 kg)</td>
</tr>
<tr>
<td>18 lb (8.11 kg)</td>
<td>19.7 lb (9.91 kg)</td>
</tr>
<tr>
<td>Certifications</td>
<td>UL</td>
</tr>
<tr>
<td></td>
<td>CE</td>
</tr>
<tr>
<td>Operating Temperature</td>
<td>Indoors only</td>
</tr>
<tr>
<td></td>
<td>32 to 122°F (0 to 50°C)</td>
</tr>
</tbody>
</table>
Cisco Physical Access Manager

Cisco Physical Access Manager (Version 1.0) is the management application for the Cisco Physical Access Control solution. It comes installed on hardware, and is sold as an appliance. This application is used to configure Cisco Physical Access Gateways and Modules, monitor activity, enroll users, and integrate with IT applications and data stores.

Key Features

- Thin clients—Cisco Physical Access Manager supports a thin-client model. Clients from computers running the Windows operating system can contact Cisco Physical Access Manager and download and install an application that allows interaction with the Cisco Physical Access Manager for administrative purposes.
- Microsoft Active Directory integration—You can configure administrative users of Cisco Physical Access Manager to use Microsoft Active Directory for authentication.
- Badging and enrollment—An optional licensable module enables the creation of badge templates, badge printing, taking user photographs, and enrolling users into the Cisco Physical Access Manager user database.
- Device configuration—You can configure Cisco Physical Access Gateway hardware using Cisco Physical Access Manager. The access gateway contacts Cisco Physical Access Manager, to download pre-provisioned configuration information.
- Access policies—You can assign areas (comprising a group of doors) and users entry permission based on schedules.
- User rights—You can assign permissions to administrative users of the Cisco Physical Access Manager and you can tailor user profiles very specifically.
- Credential management—You can edit cardholder credentials, including system wide card formats.
- Alarm and event management—Cisco Physical Access Manager provides a view of events and alarms in the system. You can filter alarm and event views based on several criteria.
- Global I/O—You can associate events (contact closure inputs or card access denied, for example) to actions (activate output contact closures, send an e-mail message, etc.).
- Reporting—You can create standard and custom reports with Cisco Physical Access Manager.
- Audit trails—Cisco Physical Access Manager provides a log of all administrative uses of the system, arranged by user.
- Enterprise application integration—An optional licensable component allows Cisco Physical Access Manager data to be either imported or exported to external databases or CSV files.
- Cisco Video Surveillance Manager integration—Cisco Physical Access Manager dynamically acquires camera inventory from Cisco Video Surveillance Manager and associates cameras to doors; you can view recorded or live video for every event from the door.
- License management—You can add license files (capacity upgrades or feature additions) to the application.
- Server administration—You can administer the Cisco Physical Access Manager appliance by performing tasks such as IP address assignment.
- Access gateway image management—You can upgrade Cisco Physical Access Gateway images using the Cisco Physical Access Manager.
- Configuration backup—You can back up the entire configuration to an external server.
- System restore—You can restore previously backed up configuration from an external server.
- High availability—You can configure two Cisco Physical Access Manager appliances as a pair to provide warm standby redundancy; you must install the secondary appliance with a high-availability license.

Specifications

The following table lists the hardware specifications of the Appliance on which Cisco Physical Access Manager Version 1.0 is installed.

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CPU</strong></td>
<td>Intel Core2 Duo 2.13 GHz processor with a 1066-MHz front side bus (FSB) and 2 MB of Level 2 cache</td>
</tr>
<tr>
<td><strong>Memory</strong></td>
<td>4 GB PC2-5300 DDR2 SDRAM ECC</td>
</tr>
<tr>
<td><strong>Hard Drive</strong></td>
<td>250 GB SATA 7200 RPM</td>
</tr>
<tr>
<td><strong>Ethernet</strong></td>
<td>2 X 10/100/1000 RJ-45, 10BASE-T, 100BASE-TX, 1000BASE-T</td>
</tr>
</tbody>
</table>
Cisco Video Surveillance 2500 Series IP Cameras

The Cisco Video Surveillance 2500 Series IP Cameras are high-resolution, feature-rich digital cameras designed for superior performance in a wide variety of environments. The cameras employ MPEG-4 compression to stream 30 frames per second (fps) at D1 NTSC resolution (720 x 480) or 25 fps at D1 PAL resolution (720 x 576), offering efficient network usage while providing high-quality video. Contact closures and two-way audio allow integration with microphones, speakers, and access control systems. (Note: Not all features are supported when using the camera with Cisco Video Surveillance Manager.) With their open, standards-based design, the cameras provide an ideal platform for integration and operation as independent devices or as part of a Cisco Video Surveillance network.

Key Features

- Wide dynamic range—The cameras employ powerful digital imaging technology, allowing them to capture high-quality images in a wide variety of indoor and outdoor lighting conditions. They use a progressive scan image sensor with global electronic shuttering to ensure natural color rendition, zero blooming and smear, and minimal motion blurring.
- Embedded security and networking*—The cameras provide 802.1X authentication and hardware-based Advanced Encryption Standard (AES). For enhanced bandwidth management, the cameras support IP Multicast.
- Event notification* —The cameras can examine designated areas for activity and notify users or other applications when they detect activity that exceeds a predefined threshold. The cameras also provide two digital inputs and two digital outputs that you can use to initiate specific actions when an alarm is detected.
- Flexible power options—The cameras support Power over Ethernet (PoE) 802.3af or DC power through an optional external power supply.
- Mounting options*—You can install the cameras with a fixed mount or with an optional external pan or tilt mount and motorized zoom lens.
- Wireless capabilities—The wireless IP camera model supports 1 x 2 multiple input multiple output (MIMO) communication, which provides better data throughput and higher link range than single-antenna designs. The wireless IP camera offers strong wireless security using Wi-Fi Protected Access (WPA)/WPA2 and supports various network protocols for 802.1x authentication.

* Not supported when the camera is used with Cisco Video Surveillance Manager.

Specifications

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Imaging Device</td>
<td>1/3-in. complementary metal oxide semiconductor (CMOS) with wide dynamic range</td>
</tr>
<tr>
<td>Image Control</td>
<td>Automatic white balance (AWB), automatic back lighting, automatic gain control (AGC), auto/manual iris, sharpness, image quality, time stamp, and camera ID</td>
</tr>
<tr>
<td>Dynamic Range</td>
<td>102 dB typical/100 dB maximum</td>
</tr>
<tr>
<td>Minimum Illumination</td>
<td>- Color mode: F/1.4 @ 0.4 lux (0.4 fc)</td>
</tr>
<tr>
<td></td>
<td>- Black and white mode: F/1.4 @ 0.04 lux (0.004 fc)</td>
</tr>
<tr>
<td>Signal-to-Noise Ratio (SNR)</td>
<td>&gt;48 dB</td>
</tr>
<tr>
<td>Lens Selection</td>
<td>Accepts manual or DC auto iris lenses</td>
</tr>
<tr>
<td>Video Compression</td>
<td>MP:104 x 104 SP level 0 to 4, ASP level 0 to 6</td>
</tr>
<tr>
<td>Audio Compression*</td>
<td>12 bit A/D analog to 11 bit U/L 4x 12 bit</td>
</tr>
<tr>
<td>Resolution and Frame Rate</td>
<td>- NTSC/PAL</td>
</tr>
<tr>
<td></td>
<td>- 720 x 480/576 @ 30/25 fps (D1)</td>
</tr>
<tr>
<td></td>
<td>- 704 x 480/576 @ 30/25 fps (4CIF)</td>
</tr>
<tr>
<td></td>
<td>- 352 x 240/288 @ 30/25 fps (CIF)</td>
</tr>
</tbody>
</table>
Selected Part Numbers and Ordering Information

The Cisco Video Surveillance IP Camera is available through Cisco Authorized Technology Provider (ATP) Partners.

CIVS-IPC-2500 Cisco Video Surveillance IP Camera, Wired
CIVS-IPC-2500W Cisco Video Surveillance IP Camera, Wireless
CIVS-PWRPAC-12V 12 VDC @ 1.6A Power Supply

For More Information
For more information about the Cisco Video Surveillance 2500 Series IP Cameras, visit:

Cisco Video Surveillance 4000 Series IP Cameras

Cisco® Video Surveillance 4000 Series IP Cameras are feature-rich digital cameras designed for superior performance in a wide variety of video surveillance applications. The cameras employ true high-definition (HD) video and H.264 compression, streaming up to 30 frames per second (fps) at 1080p (1920 x 1080) resolution, and 80 fps at 720p (1280 x 720) resolution, offering efficient network usage with the highest-quality video. Contact closures and two-way audio allow integration with microphones, speakers, and access control systems. With their open, standards-based design, the cameras provide an ideal platform for integration and operation as independent devices or as part of a Cisco Video Surveillance network.

The Cisco Video Surveillance 4300 Series and 4500 Series IP Cameras (CIVS-IPC-4300 and CIVS-IPC-4500) have identical feature sets, with the exception of the additional digital signal processor (DSP) capabilities specifically designed to support real-time video analytics at the edge on the Cisco Video Surveillance 4500 Series IP Cameras. On these cameras, applications and end users have the option to run multiple analytics packages without compromising video streaming performance on the cameras. This highly flexible computing platform that will be compatible with future versions is ideal for next-generation video analytics applications.

Key Features

- True high-definition (HD) video—The cameras stream crisp and clear 1080p (1920 x 1080) video at 30 frames per second while maintaining surprisingly low network bandwidth. For fast-motion applications, you can set the cameras to stream 720p (1280 x 720) video at 80 frames per second.
- Progressive scan video—The cameras capture each frame at its entire resolution using progressive scan rather than interlaced video capture, which captures each field of video. This feature allows for better detail for video of moving objects such as faces and license plates on automobiles.
- Embedded security and networking—The cameras provide hardware-based Advanced Encryption Standard (AES). For enhanced bandwidth management, they support IP Multicast.
- Event notification—The cameras can examine designated areas for activity and notify users or other applications when they detect activity that exceeds a predefined sensitivity and threshold. The cameras also provide two digital inputs and two digital outputs that you can use to initiate specific actions when an alarm is detected.
- Day and night operation—The cameras provide true day and night functions including an automatic infrared (IR) filter in low-light scenes. With the appropriate IR-corrected lenses and IR illumination, the cameras can provide HD video in low-light environments.
• Optional USB memory card—The cameras support an optional USB memory card for onboard storage of video and other data.
• Flexible power options—The cameras support Power over Ethernet (PoE) 802.3af, 12-VDC, or 24-VAC power through an optional external power supply.
• Mounting options—You can install the cameras with a fixed mount or with an optional external pan or tilt mount and motorized zoom lens.

Specifications

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Imaging Device</td>
<td>1/3-in. complementary metal oxide semiconductor (CMOS)</td>
</tr>
<tr>
<td>Image Control</td>
<td>Automatic white balance (AWB), automatic backlighting, automatic gain control (AGC), auto/manual iris, sharpness, image quality, time stamp, and camera ID</td>
</tr>
<tr>
<td>Dynamic Range</td>
<td>56 dB</td>
</tr>
</tbody>
</table>
| Minimum Illumination | - Color mode: F1.4 @ 0.04 lux (0.004 fc) 
- Black and white mode: F1.4 @ 0.4 lux (0.04 fc) |
| Signal-to-Noise Ratio (SNR) | 53 dB |
| Lens Selection | Accepts manual or DC auto iris lens |
| Video Compression | H.264, MJPEG |
| Audio Compression | G.711 A-Law, G.711 U-Law, AAC |
| Resolution and Frame Rate H.264 | - 1920 x 1080 @ 30 fps (1080p) 
- 1280 x 720 @ 60 fps (720p) 
- 720 x 480/576 @ 30/25 fps (D1) 
- 704 x 480/576 @ 30/25 fps (4CIF) 
- 352 x 240/288 @ 30/25 fps (CIF) |
| Resolution and Frame Rate MJPEG | - 720 x 480/576 @ 30/25 fps (D1) 
- 704 x 480/576 @ 30/25 fps (4CIF) 
- 352 x 240/288 @ 30/25 fps (CIF) |
| Video Streaming | - Single stream H.264 up to 1080p (1920 x 1080) @ 30 fps 
- Dual-stream H.264 and MJPEG 
- H.264 Primary stream programmable up to 1280 x 720 @ 25/20 fps 
- MJPEG Secondary stream programmable up to 720 x 576 @ 25/20 fps |
| Memory | 64 MB flash, 128 MB SDRAM |
| Housing | Aluminum |
| LEDs | Power, Ethernet link, and activity |
| Dimensions | - 3.1 x 2 x 4.8 in. 
- 80 x 50 x 122 mm |
| Weight | - 1.15 lb 
- 0.52 kg |
| Certifications | FCC, CE, and UL |
| Operating Temperature | Indoors: 
- 32 to 122°F 
- 0 to 50°C 
Outdoors (when installed in an appropriate outdoor enclosure with heating and cooling): 
- -40 to 158°F 
- -40 to 70°C |

Selected Part Numbers and Ordering Information

The Cisco 4000 Series Video Surveillance IP Camera is available through Cisco Authorized Technology Provider (ATP) Partners.

CIVS-IPC-4300 Cisco Video Surveillance 4300 IP Camera Full HD, Day/Night
CIVS-IPC-4500 Cisco Video Surveillance 4500 IP Camera, HD, DSP, Day/Night
CIVS-PWRPAC-12V 12V DC Head Power supply

For More Information

For more information about the Cisco Video Surveillance 4000 Series IP Cameras, visit: http://www.cisco.com/go/physicalsecurity
Cisco Video Surveillance Stream Manager Software

The Cisco Video Surveillance Stream Manager software application is a collection of discrete software modules that provide advanced and flexible configuration, management, and operation of video surveillance networks and solutions. With intuitive GUIs and comprehensive features, Cisco Video Surveillance Stream Manager Software modules function as an integrated platform for security systems and enable true convergence of closed circuit television (CCTV) and the enterprise LAN. Stream manager applications provide digital video, audio, and serial data management across any IP network.

Cisco Video Surveillance Stream Manager Software modules combine the capabilities of many standalone hardware and software systems into one product, including features provided by digital video recorders, matrix switching systems, video multiplexers, and transmission systems. These system functions are available wherever and whenever there is network connectivity. Whether used in an enterprise network or a small or medium-sized business, the stream manager provides a managed distributed digital video system.

- The Cisco Video Surveillance Stream Manager Configuration Module identifies and programs Cisco Video Surveillance IP Gateway encoders, decoders, and storage devices.
- The Cisco Video Surveillance Stream Manager Administration and Monitoring Module enables monitoring of network, server use, and dynamic system health, and provides status reporting.
- The Cisco Video Surveillance Stream Manager Administration and Monitoring with Failover Module provides all the features of the Administration and Monitoring Module, with the addition of failover management.
- The Cisco Video Surveillance Stream Manager Client Viewing Module provides access to all system operations, including camera control, stored video review, and alarm notifications. This application is the primary PC application for viewing live or stored video from the network.
- The Cisco Video Surveillance Stream Manager Upgrade Module (included in the Cisco Video Surveillance Stream Manager Configuration Module) upgrades firmware in video surveillance hardware.

Key Features

- All-in-one video management solution
- User-friendly setup and operation
- IP virtual matrix switch functions
- Complete and secure video storage management
- Distributed processing on Cisco Video Surveillance devices, eliminating the need for a centralized server
- Activity detection and search
- Export video with authentication capabilities
- Advanced network visibility
- Sophisticated playback features, including trick replay functions

Specifications

<table>
<thead>
<tr>
<th></th>
<th>Client Viewing Module</th>
<th>All Other Modules</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPU</td>
<td>Pentium dual-core 2.8 GHz</td>
<td>Pentium IV 2.8 GHz</td>
</tr>
<tr>
<td>RAM</td>
<td>1 GB</td>
<td>512 MB</td>
</tr>
<tr>
<td>Hard Drive</td>
<td>40 GB</td>
<td>40 GB</td>
</tr>
<tr>
<td>Audio Card</td>
<td>Optional, for listening to audio provided by an encoder</td>
<td>Optional, for listening to system alerts</td>
</tr>
<tr>
<td>Video Card</td>
<td>ATI X1600XT 512MB PCI-e or NVIDIA GEFORCE 7800GT CO 256MB DDR PCI-e</td>
<td>Standard PC video card</td>
</tr>
<tr>
<td>Network Card</td>
<td>10BASE-T, 100BASE-T, 1000BASE-T</td>
<td>10BASE-T, 100BASE-T, 1000BASE-T</td>
</tr>
<tr>
<td>Operating System</td>
<td>Microsoft Windows XP Pro with Service Pack 2 or Microsoft Windows Vista Business with Service Pack 1 (supported in Stream Manager 5.3)</td>
<td>Microsoft Windows XP Pro with Service Pack 2 or Microsoft Windows Vista Business with Service Pack 1 (supported in Stream Manager 5.3)</td>
</tr>
<tr>
<td>Web Services</td>
<td>Microsoft Net 2.0</td>
<td>Microsoft Net 2.0</td>
</tr>
</tbody>
</table>

Selected Part Numbers and Ordering Information

- CIVS-SM-CFG50= Cisco Video Surveillance Stream Manager Configuration Module
- CIVS-SM-CL50= Cisco Video Surveillance Stream Manager Client Viewing Module
- CIVS-SM-AS50= Cisco Video Surveillance Stream Manager Administration and Monitoring Module
- CIVS-SM-ASF50= Cisco Video Surveillance Stream Manager Administration and Monitoring with Failover Module

For More Information

For more information about the Cisco Video Surveillance Stream Manager, visit: http://www.cisco.com/go/physicalsecurity.

Cisco Video Surveillance Media Server Software

Cisco offers network-centric video surveillance software and hardware that supports video transmission, monitoring, recording, and management. Cisco Video Surveillance solutions work with the advanced features and functions of the IP network infrastructure—switches, routers, and other network security devices—to enable secure, policy-based access to live or recorded video. With support for many surveillance cameras,
encoders, and applications. Cisco Video Surveillance solutions allow you to build high-quality video surveillance systems that optimize cost, performance, and capability.

The core component of the Cisco Video Surveillance Manager Cisco Video Surveillance Media Server 6.0 performs the following networked video surveillance system functions:

- Collection and routing of video from a wide range of cameras and encoders over an IP network
- Secure local, remote, and redundant video archiving
- Event tagging for review and archival purposes
- Bandwidth management for both live distribution and historical recording

Cisco Video Surveillance Media Server is fully compatible with other Cisco Video Surveillance Manager applications that provide video display control and distribution (virtual matrix switching), a customizable web-based user interface for roles-based operation and management, system configuration, and options to support storage area networks (SANs) and network- and direct-attached storage (NAS and DAS). The media server and other Cisco Video Surveillance software applications run on Linux-based servers. As a result, you can upgrade your investment to include new features, address your evolving requirements, and support a diverse range of deployment scenarios.

**Key Features**

By using the power and advanced capabilities of IP networks, Cisco Video Surveillance Media Server Software allows you to add applications, users, cameras, and storage over time. As a result, the software provides exceptional video surveillance system flexibility and scalability to support:

- Deployments that range from small systems to those with thousands of cameras
- Hundreds of simultaneous users, cameras, and storage over time
- Standard video codecs such as Motion JPEG, MPEG-2, MPEG-4, and H.264 simultaneously in a single Cisco Video Surveillance Media Server
- Conservation of storage using events, clipping, record-on-motion, and loop-based archival options
- Integration with other security and IT applications using open, standards-based API and Real-Time Transport Protocol (RTP) and Real-Time Streaming Protocol (RTSP) streaming
- IT-caliber fault-tolerant storage for greater efficiency and easier maintenance

**Specifications**

The table below lists the minimum system requirements for server and client hardware for Media Server.

<table>
<thead>
<tr>
<th>Server System</th>
<th>Client System</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPU</td>
<td>Intel Pentium 4</td>
</tr>
<tr>
<td>RAM</td>
<td>1 GB</td>
</tr>
<tr>
<td>Hard Drive</td>
<td>200 GB hard drive</td>
</tr>
<tr>
<td>Video Card</td>
<td>nVidia or ATI AGP graphics adapter with 128 MB RAM</td>
</tr>
<tr>
<td>Network Connection</td>
<td>10/100 Ethernet Interface</td>
</tr>
<tr>
<td>Operating System</td>
<td>SUSE Linux Enterprise Server (SLES) version 9 SP 3 or version 10 SP 1 (recommended)</td>
</tr>
<tr>
<td>Rack Space</td>
<td>1 to 5 RU</td>
</tr>
</tbody>
</table>

**Selected Part Numbers and Ordering Information**

CIVS-MS-SW6.0= Cisco Video Surveillance Media Server 6.0

**For More Information**

For more information about the Cisco Video Surveillance Media Server, visit: [http://www.cisco.com/go/physicalsecurity](http://www.cisco.com/go/physicalsecurity)
Cisco Physical Security Multiservices Platform

The Cisco Physical Security Multiservices Platform encompasses a suite of three server platforms for network digital recording and playback. The servers include built-in analog video encoder cards and options and Fibre Channel interfaces, and they enable direct connectivity from analog closed-circuit television (CCTV) cameras and for IP video directed from the network. Fully integrated with the Cisco Video Surveillance Manager software, each multiservices platform can provide high-quality MPEG-4 encoding and offers a wide array of features in a single, easy-to-use and easy-to-deploy component. Each device offers robust, scalable, and flexible options for replacing traditional analog or digital video recorders in a variety of video surveillance deployments.

- A 1-rack-unit (RU) multiservices platform—An entry-level device that supports up to four 750-GB or 1-TB Serial Advanced Technology Attachment (SATA) hard drives; it also supports one video-encoding PCI-e card or one PCI-X card.
- A 2RU multiservices platform—Supports up to twelve 750-GB or 1-TB SATA hard drives; it also supports PCI-e video-encoding cards.
- A 4RU multiservices platform—Supports up to twenty-four 750-GB or 1-TB SATA hard drives; it also supports video-encoding PCI-e and PCI-X cards.

Key Features
- Support for dual processor and dual-core Xeon processors
- 900W high-efficiency power supplies with redundancy option
- High-performance fans with built-in redundancy for optimized cooling
- PCI-X and PCI-e expansion slots that support Fibre Channel interfaces and video-encoding cards
- Hot-swappable hard-disk drives that you can remove without powering down the server; these drives support SAF-TE (Small Computer System Interface [SCSI]) and SES2 (single attachment station/SATA [SAS/SATA])
- System health and management features, including redundant cooling fans, a convenient power switch, reset button, and LED indicators
- Redundant Array of Independent Disks 5 (RAIDS) for 2RU and 4RU platforms
- Efficient field serviceability

Specifications

1 RU Mechanical Specifications

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Housing</td>
<td>1 RU x 19 in., 4 x SATA drive bays</td>
</tr>
<tr>
<td>Motherboard</td>
<td>Intel Xeon® 3200 Series, 2GB DDR2 SDRAM, one universal (x8) PCI-Express or one 34-bit PCI-X 133MHz/64-bit slot</td>
</tr>
<tr>
<td>LEDs</td>
<td>Power, hard-drive activity, network activity, system overheat/fan fail</td>
</tr>
<tr>
<td>Weight</td>
<td>38 lb (17kg)</td>
</tr>
<tr>
<td>Dimension</td>
<td>1.7 in. (43 mm) x 17.2 in. (437mm) x 19.8 in. (503 mm)</td>
</tr>
</tbody>
</table>
Cisco IPICS Server Software

The Cisco IPICS Server supports the management of the Cisco IPICS system. First responders and safety and security personnel use the Cisco IPICS system to enable rapid incident response, collaborative crisis communications, notification, and comprehensive interoperable communications. The Cisco IPICS Server is used to create virtual talk groups (VTGs) to facilitate push-to-talk (PTT) communications between users of multiple types and technologies of Land Mobile Radios with users of PCs, landline phones, cellular and Nextel phones, and Cisco Unified IP Phones.

Cisco IPICS Server Software

The Cisco IPICS Server is a security-enhanced, Linux-based platform installed on select Cisco 7800 Series Media Convergence Servers, a family of proven and reliable hardware platforms that you can deploy in mobile command units or in headquarters, branch offices, or operations centers. Other Cisco IPICS system components include the Cisco IPICS Push-to-Talk Management Center (PMC), Cisco IPICS Phone Client, Cisco IPICS Operational Views (Ops Views), Cisco Land Mobile Radio (LMR) gateways, Router Media Service (RMS), and Session Initiation Protocol (SIP) telephony gateways.

Cisco IPICS is a systems-level, network-based solution for voice interoperability. It takes full advantage of open IP standards and IP network infrastructure for greater resiliency, scaling, and security, and is part of a complete communications solution for organizations of all sizes.

Key Features

- All-in-one safety and security incident response, communications, and collaboration solution
- User-friendly setup and operation
- Centralized, remote, or distributed administration across locations, agencies, networks, and jurisdictions
- Complete and secure Virtual Push to Talk communications and management
- Support for secure incident management, response, notification, and messaging
- Customizable secure voice dial-in and dial-out access to radio channels and incident virtual talk groups
- Role-based user, dispatch console, operator, and system administrator management
- Support for radio resources, desktop PC clients, and Cisco Unified Communications IP Phone PTT clients
- Integrated support and management of Cisco integrated services routers and Land Mobile Radio gateways

For More Information


### Selected Part Numbers and Ordering Information

The Multiservices Platform is available through Cisco Authorized Technology Provider (ATP) Partners.

**CIVS-MSP-2RU**

- 2RU chassis with motherboard, RAID controller, one 900 W power supply, one CPU (no drives or option cards)

**CIVS-MSP-4RU**

- 4RU chassis with motherboard, RAID controller, two 900 W power supplies, one CPU (no drives or option cards)

**CIVS-MSP-1RU**

- 1RU chassis with motherboard and power supply (no drives or option cards)
Cisco Security Services

Cisco and our partners can help you accelerate business transformation, operational maturity, and agility through consultative planning, solution development, and full deployment, creating network architectures that can optimize IT services and enhance your business.

Based on a lifecycle approach, the broad portfolio of Cisco Security Services helps maintain intelligent defenses against information security threats. The lifecycle approach is based on proven methodologies and best practices for designing, deploying, operating, and optimizing network solutions and technologies. This integrated security services portfolio provides solutions for threat management, event management, vulnerability management, and compliance support across a broad range of industries and advanced technologies, including unified communications, storage networking, and wireless networks.

Cisco has a portfolio of technical services that help maintain the health and performance of every Cisco product. These services range from traditional maintenance to proactive and predictive services that use smart services capabilities. Cisco’s Security Services provide detailed diagnostics and real-time alerts on core network devices to help resolve concerns quickly and improve network availability. The Cisco Technical Services portfolio is built on foundational capabilities and expanded performance capabilities to meet the changing technology needs of our customers.

- To find the right technical service for any Cisco product, use the Service Finder tool at http://www.cisco-servicefinder.com. Enter a product description or part number or search by product series family for a list of suggested services and support coverage options.
- For more information about Cisco Security planning, design, and optimization services, visit http://www.cisco.com/go/services/security.
- For more information about all services, refer to Chapter 10, “Services”.

Selected Part Numbers and Ordering Information

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CIS-IPICS2.0-K9(=)</td>
<td>Cisco IPICS 2.0 Server software and licenses, including licenses for: 50 Cisco IPICS Virtual Talk Groups, 4 Cisco IPICS Channel/radio ports, 4 Cisco IPICS PMC clients, 10 Cisco IPICS IP Phone clients, 2 Cisco IPICS Operational Views.</td>
</tr>
<tr>
<td>CIS-IPICS-PN-K9(=)</td>
<td>Cisco IPICS Policy Engine Dial Port for Cisco IPICS 2.1 or Higher.</td>
</tr>
<tr>
<td>CIS-VIP-PM-K9(=)</td>
<td>Cisco IPICS Virtual Talk Group (VTG) for Cisco IPICS 2.1 or Higher.</td>
</tr>
<tr>
<td>CIS-VIP-CHNL(=)</td>
<td>Cisco IPICS Channel/Radio Port for Cisco IPICS 2.1 or Higher.</td>
</tr>
<tr>
<td>CIS-PHI-K9(=)</td>
<td>Cisco IPICS IP Phone Client License for Cisco IPICS 2.1 or Higher.</td>
</tr>
<tr>
<td>CIS-PMC-K9(=)</td>
<td>Cisco IPICS PMC Client for Cisco IPICS 2.1 or Higher.</td>
</tr>
<tr>
<td>CIS-OPSVIEWS(=)</td>
<td>Cisco IPICS Operational Views for IPICS 2.1 or Higher.</td>
</tr>
</tbody>
</table>

For More Information

For more information about the Cisco IPICS Server, visit: http://www.cisco.com/go/physicalsecurity.
# Data Center

## Data Center At a Glance

<table>
<thead>
<tr>
<th>Product</th>
<th>Features</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>APPLICATION DELIVERY NETWORKING</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| Cisco Application Control Engine (ACE) Product Series | The Cisco ACE Family of application control engines simplify the way applications and business services are deployed, secured, and managed across the enterprise. The Cisco ACE products provide greater control over the application infrastructure, allowing organizations to quickly deploy and migrate applications to deliver more responsive services to the end user while simplifying the overall management of the data center. The application delivery products within the ACE family include:  
- Cisco ACE Module for Cisco Catalyst 6500 Series Switches and Cisco 7600 Series Routers  
- Cisco ACE 4710 Appliance  
- Cisco ACE XML Gateway  
- Cisco ACE Global Site Selector (GSS) 4400 Series  
- Cisco CSS 11500 Series Content Services Switch | 6-2 |
| Cisco Wide Area Application Services (WAAS) Product Series | The Cisco WAAS Family of products are a comprehensive set of WAN optimization solutions that accelerate applications over the WAN, delivers video to the branch office, and provides local hosting of branch-office IT services. The WAN optimization products within the WAAS family include:  
- Cisco Wide Area Application Services (WAAS)  
- Cisco Wide Area Application Services (WAAS) Mobile  
- Cisco Wide Area Application Engines (WA E512, WA E612). These can ship with ACNS, WAFS, or WAAS software installed on them.  
- Cisco Wide Area Virtualization Engine (WAVE)  
- Cisco Application and Content Networking System (ACNS) | 6-6 |
| Cisco SSL Services Module for the Catalyst 6500 and 7600 Series | The Cisco SSL Services Module for the Catalyst 6500 and 7600 Series switches offers the following features:  
- Off-loading of SSL encryption and decryption  
- Scalable performance | 6-10 |
| **DATA CENTER SECURITY** | | |
| Cisco ASA 5580 Adaptive Security Appliance | The Cisco ASA 5580-20 and 5580-40 Adaptive Security Appliances deliver multigigabit security services. It supports both high-density copper and optical interfaces with scalability from Fast Ethernet to 10 Gigabit Ethernet | See 5-8 |
| Cisco Catalyst 6500 Series Firewall Services Module (FWSM) | The Cisco Catalyst 6500 Series Firewall Services Module (FWSM) is a high-speed, integrated firewall that supports 5-Gbps data throughput rates, 100,000 cells per second (CPS), and 1 million concurrent connections. Based on Cisco PIX Firewall technology, the Cisco Catalyst 6500 FWSM offers excellent security, reliability and performance. | See 5-14 |
| **DATA CENTER SWITCHING** | | |
| Cisco Nexus 7000 Series Switches | The Cisco Nexus 7000 Family of switches are designed specifically for the data center. This new platform offers exceptional scalability, continuous systems operation, and transport flexibility. It is a modular data center-class switching system designed for 10-Gigabit Ethernet networks. The Cisco Nexus architecture scales beyond 15 terabits per second, with future availability of 40- and 100-Gigabit Ethernet and unified fabric I/O modules. | 6-10 |
| Cisco Nexus 5000 Series Switches | The Cisco Nexus 5000 Series of data center-class switches delivers an architecture built on high-performance Ethernet unified fabric. The platform consolidates separate Local Area Network (LAN), Storage Area Network (SAN) and server cluster network environments into a single unified fabric. | 6-11 |
| Cisco Nexus 2000 Series Switches "NEW" | The Cisco Nexus 2000 Series Fabric Extender (FEX) provides a universal server-access platform that scales across a range of Gigabit Ethernet, 10 Gigabit Ethernet, unified fabric, rack, and blade-server environments. | 6-12 |
| Cisco Nexus 1000V Series Switches "NEW" | The Cisco Nexus 1000V Series Switch is an intelligent software virtual switch implementation for VMware ESX hypervisor environments. It supports Cisco VN-Link server virtualization technology and provides:  
- Policy-based virtual-machine (VM) connectivity  
- Mobile virtual-machine security and network policy  
- Non-disruptive operational model for server virtualization and networking teams | 6-12 |
| Cisco Catalyst 6509 Enhanced Vertical Series Switch (6509-V-E) | The Cisco Catalyst 6509-V-E is a 19 slot chassis that supports bandwidth capacity (80 Gbps per slot) up to 1440 Gbps and enhanced cable management capabilities. It offers customers investment protection through its support of all existing Cisco Catalyst 6500 Series modules. | See 2-2 |
The Cisco ACE Application Control Engine Module for Cisco Catalyst 6500 Series Switches and Cisco 7600 Series Routers is a next-generation load-balancing and application-delivery solution. These products ensure application availability, accelerate application performance, and protect applications while reducing data center costs. Cisco ACE also defends servers and applications in data centers. The Cisco ACE Module performs deep packet inspection and blocks malicious attacks. Highly Scalable Integrated Security enables IT professionals to comprehensively secure high-value applications in the data center and facilitates consolidation in the data center.

**Key Features**

- **Maximized application availability**—Ensures end users can access network services in an efficient, reliable and consistent manner. Cisco ACE takes advantage of highly scalable Layer 4 load balancing and Layer 7 content switching to optimize the transmission of network services.
- **Accelerated application performance**—Cisco ACE uses patented technologies to accelerate and compress application data, improving application responsiveness. Offloading and caching Secure Sockets Layer (SSL), TCP and Extensible Markup Language (XML) each help improve server performance.
- **Comprehensive application security**—The Cisco ACE protects against application threats and denial-of-service (DoS) attacks with features such as Deep Packet Inspection, network and protocol security, highly scalable access-control capabilities, and a powerful XML firewall.
Cisco ACE 4710 Appliance

The Cisco ACE 4710 supports multimedia load balancing for RTSP and SIP protocols, allowing customers to deploy a wider range of applications via the common application infrastructure. Services are delivered over a virtualized architecture to minimize power and cooling needs, as well as reduce provisioning time and capital expense. Cisco ACE 4710 Appliance provides application acceleration using patented flash forward, delta encoding, and compression technologies. It uses a full range of Cisco application switching technologies, including Layer 4 load balancing and Layer 7 content switching, server offload with SSL, caching, and TCP processing. It reduces the volume of data transferred, thus enhancing the overall end-user experience.

Ideal for Companies that Need These Features
- The Cisco ACE Application Control Engine 4710 is a next generation application switch for maximizing the availability, acceleration, and security of data center applications.
- Secure the data center and critical business applications
- Facilitate data center consolidation through the use of fewer servers, load balancers, and firewalls

Selected Part Numbers and Ordering Information

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>WS-C6509-E-ACE-K9</td>
<td>Cisco ACE10 Service Module for Cisco Catalyst 6500 Series and Cisco 7600 Series—Includes 16 Gbps Throughput License and 5 Virtual Devices</td>
</tr>
<tr>
<td>WS-C6504-E-ACE-K9</td>
<td>Cisco ACE10 Bundle with 4 Gbps Throughput License (I/O module sold separately)</td>
</tr>
<tr>
<td>WS-C6509-E-ACE-K9</td>
<td>Cisco ACE10 Bundle with 8 Gbps Throughput License (I/O module sold separately)</td>
</tr>
<tr>
<td>WS-C6504-E-ACE-K9</td>
<td>Cisco ACE10 Bundle with 4 Gbps Throughput License (I/O module sold separately)</td>
</tr>
<tr>
<td>ACE20-MOD-K9</td>
<td>Cisco ACE20 Service Module for Cisco Catalyst 6500 Series and Cisco 7600 Series—Includes 1000 SSL TPS and 5 Virtual Devices</td>
</tr>
<tr>
<td>ACE10-6500-K9</td>
<td>Cisco ACE10 Service Module for Cisco Catalyst 6500 Series and Cisco 7600 Series, Includes 1000 SSL TPS and 5 Virtual Devices</td>
</tr>
<tr>
<td>ACE-16G-LIC</td>
<td>16Gbps Throughput License for Cisco ACE10</td>
</tr>
<tr>
<td>ACE-08G-LIC</td>
<td>8Gbps Throughput License for Cisco ACE10</td>
</tr>
<tr>
<td>ACE-04G-LIC</td>
<td>4Gbps Throughput License for Cisco ACE10 and Cisco ACE20</td>
</tr>
<tr>
<td>ACE-VRT-250</td>
<td>250 Virtual Contexts License for Cisco ACE10 and Cisco ACE20</td>
</tr>
<tr>
<td>ACE-VRT-100</td>
<td>100 Virtual Contexts License for Cisco ACE10 and Cisco ACE20</td>
</tr>
<tr>
<td>ACE-VRT-050</td>
<td>50 Virtual Contexts License for Cisco ACE10 and Cisco ACE20</td>
</tr>
<tr>
<td>ACE-VRT-020</td>
<td>20 Virtual Contexts License for Cisco ACE10 and Cisco ACE20</td>
</tr>
<tr>
<td>ACE-4710-1F-K9</td>
<td>License Bundle: ACE 4710, 1 Gbps Throughput, 5,000 SSL TPS, 500 Mbps Compression, 5 Virtual Devices, Application Acceleration License, Embedded Device Manager</td>
</tr>
<tr>
<td>ACE-4710-2F-K9</td>
<td>License Bundle: ACE 4710, 2 Gbps Throughput, 7,500 SSL TPS, 1Gbps Compression, 5 Virtual Devices, Application Acceleration License, Embedded Device Manager</td>
</tr>
<tr>
<td>ACE-4710-4F-K9</td>
<td>License Bundle: ACE 4710, 4 Gbps Throughput, 7,500 SSL TPS, 2Gbps Compression, 5 Virtual Devices, Application Acceleration License, Embedded Device Manager</td>
</tr>
<tr>
<td>ACE-AP-SW-3.1</td>
<td>Software Version 3.1</td>
</tr>
</tbody>
</table>

Cisco ACE XML Gateway

The Cisco ACE XML Gateway brings application intelligence into the network and facilitates deployment of secure, reliable, and accelerates Extensible Markup Language (XML) applications and Web services. It simplifies access to XML information while reducing the potential introduction of new vulnerabilities. It allows the auto-provisioning of Web services between the Universal Description Discovery and Integration (UDDI) registry and application servers, and provides message-level security for XML-based network traffic. It improves XML application responsiveness by offloading computationally intensive operations to the network infrastructure. This dramatic performance improvement helps eliminate Web services deployment barriers.

Ideal for Companies that Need These Features
- The Cisco ACE XML Gateway provides high speed XML traffic throughput by processing 30,000 schema validations per second on a 1-KB message and handling up to 40,000 concurrent connections in a single appliance. It reduces service latency and improves server usage by implementing a highly parallel event-led
architecture. IT benefits by being able to better manage unpredictable service outages because a shared infrastructure actively enforces service latency agreements.

- The Cisco ACE XML Gateway delivers an integrated XML firewall that provides services protection between different trust zones. This firewall differs from network firewalls in that it focuses on the application layer and works with the payload of the XML message. In the perimeter defense role, it guards against malicious XML payloads, XML denial-of-service (XDoS) attacks, and other security functions.
- The Cisco ACE XML Gateway reduces the time to deployment of Web services solutions by offering sophisticated rollback and versioning capabilities. A centralized policy system allows configuration security, integration, and routing policies, without programming and auto-discovery of web services.

**Selected Part Numbers and Ordering Information**

**Note:** The minimum software required is Cisco ACE XML Gateway Software Version 5.1.

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACE-XML-K9</td>
<td>Chassis—Cisco ACE XML Gateway Appliance</td>
</tr>
<tr>
<td>ACE-XML-SW-5.2</td>
<td>Software—Cisco ACE XML Gateway Software</td>
</tr>
<tr>
<td>ACE-XML-GATE-LIC</td>
<td>Licensing—ACE XML Gateway License</td>
</tr>
</tbody>
</table>

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**Cisco ACE Global Site Selector (GSS) 4400 Series**

The Cisco ACE GSS (Global Site Selector) 4400 Series, along with Cisco ACE Modules, represents the next generation of application switches and Domain Name System (DNS) appliances. Together these devices form an application-fluent networking solution that maximizes availability, acceleration, and security for data center applications.

The Cisco GSS 4492R Global Site Selector is part of the Cisco ACE Application Control Engine product line and a crucial component of any data center architecture that requires an appliance-based, security-focused, universal global load balancer. Using a special protocol (Keepalive Application Protocol [KAL-AP]) facilitates the exchange of application load and availability between the Cisco ACE GSS 4492R and the Cisco ACE Application Control Engine Modules. It is deployed on a Cisco ACE Application Control Engine Modules.

**Key Features**

- Provides resilient architecture critical for disaster recovery and multisite web applications deployments.
- Optional software supports full Domain Name System (DNS) and Dynamic Host Configuration Protocol (DHCP) services, allowing the GSS to be deployed as a DNS appliance.
- Offers advanced traffic management for multisite Web application deployments.
- Offers innovative DNS-focused distributed denial-of-service (DDoS) protection software to mitigate the effects of DNS-based DDoS attacks.
- Provides a centralized command and control of DNS resolution process for direct and precise control of global load-balancing processes.
- Offers site persistence for e-commerce applications.
- Supports a web-based GUI, role-based access, and a DNS wizard to simplify the DNS command and control.

**Specifications**

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Ports</td>
<td>Two 10/100/1000 Fast Ethernet autosensing, one console port</td>
</tr>
<tr>
<td>Port Description</td>
<td>Network ports—two 10/100Base TX, Console port</td>
</tr>
<tr>
<td>DNS requests per second</td>
<td>Up to 30,000 depending on configuration</td>
</tr>
<tr>
<td>Network Management</td>
<td>Console port—CLI, Access to system through Telnet, Secure copy (SCP) or FTP/SSL—Secure HTTP (HTTPS) for Internet Explorer and Netscape Navigator, Network management MIBs; Read-only monitoring of network and device status, including RFC 1213 (MIB-II) and RFC 1514 (HOST-RESOURCES-MIB)</td>
</tr>
<tr>
<td>Storage</td>
<td>One 80-GB hard drive, Software image SF-GSS-V1.3-K9, 2 GB RAM, Pentium CPU</td>
</tr>
<tr>
<td>Physical</td>
<td>One-rack unit size chassis, 1 GB RAM, Prescott 3.2-GHz CPU</td>
</tr>
<tr>
<td>Power</td>
<td>Integrated 48V power (autosensing 110V/60Hz)</td>
</tr>
<tr>
<td>Weight</td>
<td>28 lbs (12.7 kg)</td>
</tr>
<tr>
<td>Temperature</td>
<td>Operational—50 to 95F (10 to 35C), Storage—40 to 140F (-40 to 60C)</td>
</tr>
<tr>
<td>Dimensions (H x W x D)</td>
<td>16.7 x 16.9 x 20 in. (42.4 x 429 x 508 mm)</td>
</tr>
</tbody>
</table>

**Selected Part Numbers and Ordering Information**

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>GSS4492R-K9</td>
<td>Cisco GSS 4492R Global Site Selector</td>
</tr>
<tr>
<td>SF-GSS-V2.0-K9</td>
<td>Cisco Global Site Selector Software 2.0</td>
</tr>
</tbody>
</table>

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6-4  Cisco ACE Global Site Selector (GSS) 4400 Series
Cisco CSS 11500 Series Content Services Switches

The Cisco CSS 11500 Series Content Services Switch offers a modular architecture for Web infrastructures. It runs the Cisco Web Network Services Software that helps businesses build global Web networks optimized for content delivery and e-commerce. By activating HTTP headers, the CSS 11500 Series helps to ensure availability, optimize utilization, reduce latency, increase scalability, and enhance security for websites, server farms, cache clusters, and firewall systems. The Cisco CSS 11500 Series Content Services Switch is suitable for both enterprises and service providers seeking to reduce data center costs, boost e-business application performance, offer enhanced services, ensure online transaction integrity, and provide the best possible online experience for customers, business partners, and internal workers.

The Cisco CSS 11500 is available in the following configurations:
- Cisco CSS 11501 and CSS 11501S—Standalone, fixed-configuration switching platform with up to 8 Fast Ethernet ports and 1 optional Gigabit Ethernet port.
- Cisco CSS 11503—Compact, high-performance, modular content switching platform with up to 32 Fast Ethernet ports or up to 6 Gigabit Ethernet ports.
- Cisco CSS 11506—Compact, high-performance, modular content switching platform with up to 32 Fast Ethernet ports or up to 6 Gigabit Ethernet ports.

Key Features
- The Cisco CSS 11500 introduces an intelligent, distributed architecture.
- The Cisco CSS 11500 delivers customized combinations of ports, performance, and services.
- Server offloads are accomplished through an integrated, high-capacity SSL module along with HTTP compression (WebNS 8.10), facilitating content switching functions.
- The Cisco CSS 11500 protects investment by facilitating upgrades of performance, ports, and services through modularity.
- Cisco CSS 11500 I/O modules deliver port density and flow performance.
- Fast Ethernet ports are 10/100BASE-TX with standard RJ-45 connectors, whereas the Gigabit Ethernet ports require Small Form-Factor Pluggable (SFP) gigabit interface converters (GBICs) (1000BASE-SX, 1000BASE-LX, or 1000BASE-T).

Specifications

<table>
<thead>
<tr>
<th>Feature</th>
<th>Cisco CSS 11501</th>
<th>Cisco CSS 11503</th>
<th>Cisco CSS 11506</th>
</tr>
</thead>
<tbody>
<tr>
<td>Modular Slots</td>
<td>N/A</td>
<td>2</td>
<td>6</td>
</tr>
<tr>
<td>Base Configuration</td>
<td>Switch Control with 8 10/100 Ethernet, 1 Gigabit Ethernet (GBIC) port</td>
<td>Switch Control Module, 2 GBIC ports</td>
<td>Switch Control Module, 2 GBIC ports</td>
</tr>
<tr>
<td>Max GB Ethernet Ports</td>
<td>1</td>
<td>6</td>
<td>12</td>
</tr>
<tr>
<td>Max 10/100 Ethernet Ports</td>
<td>8</td>
<td>32</td>
<td>80</td>
</tr>
<tr>
<td>Number of 2, 8, or 16 port GB Ethernet I/O Module</td>
<td>Max—2</td>
<td>Max—5</td>
<td></td>
</tr>
<tr>
<td>SSL Module and HTTP Compression</td>
<td>CSS 11501/SSL only</td>
<td>Max—2</td>
<td>Max—4</td>
</tr>
<tr>
<td>Session Accelerator Modules</td>
<td>Max—2</td>
<td>Max—5</td>
<td></td>
</tr>
<tr>
<td>Redundancy features</td>
<td>Active-active Layer 5 ASR Virtual IP Address (VIP) redundancy</td>
<td>Active-active Layer 5 ASR VIP redundancy</td>
<td>Active-active Layer 5 ASR VIP redundancy; Active-standby SCM; Redundant switch fabric module; and power supplies</td>
</tr>
<tr>
<td>Height</td>
<td>1.75 in. (1 rack unit)</td>
<td>3.5 in. (2 rack units)</td>
<td>8.75 in. (6 rack units)</td>
</tr>
<tr>
<td>Bandwidth</td>
<td>Aggregate 6 Gbps</td>
<td>Aggregate 20 Gbps</td>
<td>Aggregate 40 Gbps</td>
</tr>
<tr>
<td>Storage</td>
<td>1 GB flash memory</td>
<td>1 GB flash memory</td>
<td>1 GB flash memory</td>
</tr>
<tr>
<td>Power</td>
<td>Integrated AC</td>
<td>Integrated AC or DC</td>
<td>Up to 3 AC or 3 DC</td>
</tr>
</tbody>
</table>

For More Information

For more information about the Cisco GSS 4492R, visit: http://www.cisco.com/go/gss.
Cisco Wide Area Application Services (WAAS)

Cisco Wide Area Application Services (WAAS) is a powerful application-acceleration and WAN-optimization solution that facilitates branch-office server consolidation, performance improvements for centralized applications and services, and LAN-like service levels for remote users.

Key Features
- Cisco WAAS allows preservation of existing network policies, automatic discovery across any network topology, and end-to-end application traffic visibility for ease of monitoring, control, and troubleshooting.
- Cisco WAAS can facilitate consolidation of remote-office server infrastructure, including file servers, Web servers, e-mail servers, application servers, and database servers. The software minimizes deployment, operational, and management costs; improves data availability; and facilitates compliance with regulatory mandates.
- LAN-like performance—Cisco WAAS incorporates application-specific acceleration (Cisco WAAS Enterprise License) as well as WAN optimization that enable near-LAN performance for accessing centralized applications over the WAN, increasing employee productivity and collaboration across all branch-office application services including Web, file, video, e-mail, and enterprise applications.
- Simplified data protection—Cisco WAAS facilitates protection of application data during standard backup, retention, storage-management, and recovery procedures.
- Transparent integration—The solution integrates transparently with existing client, server, storage, and network infrastructure. It requires no changes to the infrastructure, and provides WAN-optimization capabilities without manipulating information that is vital for enabling value-added services that are hosted within the network infrastructure.

Selected Part Numbers and Ordering Information

CSS11506-2AC Cisco 11506 Content Services Switch including SCM with 2 GE ports, flash drive, 2 switch modules, 2 AC power supplies, and a fan (requires SFP GBICs)
CSS11506-2DC Cisco 11506 Content Services Switch including SCM with 2 GE ports, flash drive, 2 switch modules, 2 DC power supplies, and a fan (requires SFP GBICs)
CSS11503-AC Cisco 11503 Content Services Switch including SCM with 2 GE ports, flash drive, and Integrated AC power supply, integrated fan, and integrated switch module (requires SFP GBICs)
CSS11503-DC Cisco 11503 Content Services Switch including SCM with 2 GE ports, flash drive, and Integrated DC power supply, integrated fan, and integrated switch module (requires SFP GBICs)
CSS11501 Cisco 11501 Content Services Switch including SCM with 8 10/100 and 1 GE ports, flash drive, and integrated AC power supply, integrated fan, and integrated switch module (optional SFP GBICs)
CSS11501S-C-K9 Cisco 11501 Content Services Switch with SSL termination and HTTP compression including 8 10/100 and 1 GE ports, flash drive, and integrated AC power supply, integrated fan, and integrated switch module (optional SFP GBICs)
CSSS-SCM-2GE Cisco CSS 11500 System Control Module with 2 GE ports and hard disk (requires SFP GBICs)
CSSS-IOM-8FE Cisco CSS 11500 Fast Ethernet I/O Module—8 port 1X
CSSS-IOM-16FE Cisco CSS 11500 Fast Ethernet I/O Module—16 port 1X
CSSS-IOM-2GE Cisco CSS 11500 Gigabit Ethernet I/O Module—2 port (requires SFP GBICs)
CSSS-SAM Cisco CSS 11500 Session Accelerator Module
CSSS-SSL-C-K9 Cisco CSS 11500 SSL and HTTP Compression Module

For More Information
For more information about Cisco Wide Area Application Services (WAAS), visit: http://www.cisco.com/go/WAAS.
Cisco Wide Area Application Services (WAAS) Mobile

Cisco Wide Area Application Services (WAAS) Mobile extends Cisco WAAS software application acceleration benefits to mobile employees who travel outside the branch office. It provides good performance under the most challenging network connectivity conditions. Designed with a small PC software footprint, WAAS mobile offers low total cost of ownership (TCO) and helps reduce the costs normally associated with installation of client software on mass-user PCs.

Key Features

- Support for lower-quality network connections not traveling over a dedicated branch-to-corporate-WAN leased line. Cisco WAAS Mobile allows remote users connecting via public Internet connections such as DSL, Wi-Fi, satellite, dial-up, cable and cellular high-quality access to business applications. These connections have lower bandwidth, higher packet loss and latency, and correct for additional challenges such as time-slicing delay in cellular environments.
- Cisco WAAS Mobile provides high application throughput improvement even under the most challenging network conditions that experience very high latency and packet loss. Typical end-user response time of throughput can be increased by 11 times even when encountering 10 percent packet loss.

Selected Part Numbers and Ordering Information

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>WAAS-MBL-SRV-5W</td>
<td>Cisco WAAS Mobile Server Software</td>
</tr>
<tr>
<td>WAAS-MBL-LC25</td>
<td>Cisco WAAS Mobile 25 Concurrent User License</td>
</tr>
<tr>
<td>WAAS-MBL-LC100</td>
<td>Cisco WAAS Mobile 100 Concurrent User License</td>
</tr>
<tr>
<td>WAAS-MBL-UC500</td>
<td>Cisco WAAS Mobile 500 Concurrent User License</td>
</tr>
</tbody>
</table>

For More Information

For more information about Cisco Wide Area Application Services (WAAS) mobile, visit:

Cisco Wide Area Application Engine (WAE) Appliances

The Cisco Wide Area Application Engine (WAE) Appliances offer a single, unified platform to host Cisco WAN-optimization and application-acceleration products, including Cisco Wide Area Applications Services (WAAS) Software and Cisco Application and Content Networking System (ACNS) Software that facilitate the consolidation of remote-office application infrastructure and services in the data center while providing LAN-like service levels to remote users. When deployed with Cisco WAAS, it overcomes the performance barriers created by the WAN through a sophisticated combination of application-acceleration and WAN-optimization techniques that mitigate application and transport latency, improve throughput, and minimize WAN bandwidth consumption for any TCP-based application. When deployed with Cisco ACNS Software, Cisco WAE Appliances address the need to distribute and receive high-bandwidth, media-rich content across the Internet or an intranet without performance losses or content-delivery delays.

Cisco WAE Family of Products

- Cisco WAE-512 Wide Area Application Engine—This engine is designed for small to medium-sized branch-office edge deployments. It is a low-cost, high-performance platform that is easy integration into existing branch-office network infrastructure, both logically and physically.
- Cisco WAE-612 Wide Area Application Engine—This engine is designed for large enterprise branches and regional offices deployments as well as core installations in medium-sized data centers.
- Cisco WAE-7326 Wide Area Application Engine—This engine is designed for deployment as a core WAN optimization and application-acceleration device in large enterprise data centers. It offers application-acceleration, maximum WAN optimization performance and very high scalability.

Key Features

- The Cisco WAE Appliance provides a solution for performance and scalability constraints imposed by the WAN.
- The Cisco WAE delivers increasingly rich application content and services to remote users.
- The Cisco WAE provides ways to control the explosive growth in bandwidth requirements generated by new applications and business processes; it transparently improves throughput and responsiveness for existing applications.
- The appliance centralizes distributed application and file-services infrastructure into corporate data centers, and facilitates collaborative applications.
- When the Cisco WAE-7326 is deployed using the Web Cache Communication Protocol Version 2 (WCCPv2), up to 32 Cisco WAE-7326 Appliances can be grouped together in a service group to support the largest enterprise deployments.
With Cisco ACNS, the appliance can accelerate video-streaming solutions deployed at remote branches and help customers manage content caching and distribution.

### Specifications

<table>
<thead>
<tr>
<th>Feature</th>
<th>Cisco WAE-512</th>
<th>Cisco WAE-612</th>
<th>Cisco WAE-7326</th>
</tr>
</thead>
<tbody>
<tr>
<td>RAM configurations</td>
<td>1 GB (2 GB optional)</td>
<td>2 GB (4 GB optional)</td>
<td>4 GB max</td>
</tr>
<tr>
<td>Maximum storage</td>
<td>Two 250-GB SATA hard drives</td>
<td>Two 300-GB SAS hard drives</td>
<td>Six 300-GB SCSI hard drives</td>
</tr>
<tr>
<td>Network Interfaces</td>
<td>Two 10/100/1000</td>
<td>Two 10/100/1000</td>
<td>Two 10/100/1000</td>
</tr>
<tr>
<td>Power</td>
<td>One 250W AC</td>
<td>One 350W AC</td>
<td>One 350W AC</td>
</tr>
<tr>
<td>Rack units</td>
<td>One</td>
<td>One</td>
<td>One</td>
</tr>
<tr>
<td>MPEG decoder (optional)</td>
<td>Yes (support only with Cisco ACNS software)</td>
<td>Yes (support only with Cisco ACNS software)</td>
<td>No</td>
</tr>
<tr>
<td>Flash memory</td>
<td>128 MB of Compact Flash memory</td>
<td>128 MB of Compact Flash memory</td>
<td>128 MB of Compact Flash memory</td>
</tr>
<tr>
<td>External SCSI connector</td>
<td>No</td>
<td>No</td>
<td>Dual-channel U320 SCSI</td>
</tr>
<tr>
<td>Dimensions (H x W x D)</td>
<td>1.75 x 17.2 x 22.1 in. (43 x 440 x 559 mm)</td>
<td>1.75 x 17.2 x 22.1 in. (43 x 440 x 559 mm)</td>
<td>3.36 x 17.5 x 29.84 in. (85.4 x 443.6 x 702.0 mm)</td>
</tr>
<tr>
<td>Maximum weight</td>
<td>28 lb (12.7 kg)</td>
<td>28 lb (12.7 kg)</td>
<td>64 lb (29.03 kg)</td>
</tr>
<tr>
<td>Universal input</td>
<td>Input voltage—low range 100 to 127 VAC; high range 200 to 240 VAC</td>
<td>Input voltage—low range 100 to 127 VAC; high range 200 to 240 VAC</td>
<td>Input voltage—low range 100 to 127 VAC; high range 180 to 265 VAC</td>
</tr>
<tr>
<td></td>
<td>Input kVA approx—Min 0.102 kVA, Max 0.55 kVA</td>
<td>Input kVA approx—Min 0.102 kVA, Max 0.55 kVA</td>
<td>Input kVA approx—Min 0.36 kVA, Max 0.83 kVA</td>
</tr>
<tr>
<td>Operating temperature</td>
<td>50 to 95F (10 to 35C)</td>
<td>50 to 95F (10 to 35C)</td>
<td>50 to 95F (10 to 35C)</td>
</tr>
<tr>
<td>Nonoperating temperature</td>
<td>-40 to 140F (-40 to 60C)</td>
<td>-40 to 140F (-40 to 60C)</td>
<td>-40 to 140F (-40 to 60C)</td>
</tr>
<tr>
<td>Humidity</td>
<td>Nonoperating—8 to 80%</td>
<td>Nonoperating—8 to 80%</td>
<td>Nonoperating—8 to 80%</td>
</tr>
<tr>
<td>Altitude</td>
<td>Max altitude—6500 ft (2000 cm)</td>
<td>Max altitude—6500 ft (2000 cm)</td>
<td>Max altitude—7000 ft (2133 cm)</td>
</tr>
<tr>
<td>Compliance</td>
<td>CE marking</td>
<td>CE marking</td>
<td>CE marking</td>
</tr>
</tbody>
</table>

### Selected Part Numbers and Ordering Information

**WAE-512-K9**
- Software and license options—Cisco WAAS or Cisco ACNS Software
- Storage options—One or two 250-GB SATA drives (part number DISK-SATA-250GB)
- Memory options—Additional 1-GB memory (part number MEM-WAE-1GB)
- Optional 4-port network interface card (NIC) to support in-path (inline) deployments using Cisco WAAS (WAE-INLN-4CG)

**WAE-612-K9**
- Software and license options—Cisco WAAS Software or Cisco ACNS Software
- Storage options—Two 300-GB SAS drives (part number DISK-SAS-300GB)
- Memory options—Additional 2-GB memory (part number MEM-WAE-2GB)
- Optional 4-port NIC to support in-path (inline) deployments using Cisco WAAS (PN# WAE-INLN-4CG)

**WAE-674-K9**
- The WAE-674-K9 SKU includes 3 X 300 GB HDD and 4 GB RAM; no other HDD options are available
- Software and license options—Cisco WAAS Software or Cisco ACNS Software
- Memory options—Additional 4-GB memory (part number MEM-WAE-4GB) supported with Cisco WAAS only
- Power and fan option—Additional (redundant) power and fan available (PN# MRED-PWR-FAN-674)
- Optional 4-port NIC to support in-path (inline) deployments using Cisco WAAS (PN# WAE-INLN-4CG)

**WAE-7326-K9**
- Cisco WAE-7326 Wide Area Application Engine

**WAE-7341-K9**
- The WAE-7341-K9 SKU includes 4 X 300 GB HDD and 12 GB RAM; no other RAM or HDD options are available
- Software and license options—Cisco WAAS Software or Cisco ACNS Software
- Optional 4-port NIC to support in-path (inline) deployments using Cisco WAAS (PN# WAE-INLN-4CG)

**WAE-7371-K9**
- The WAE-7371-K9 SKU includes 6 X 300 GB HDD and 24 GB RAM; no other RAM or HDD options are available
- Software and license options—Cisco WAAS Software or Cisco ACNS Software
- Optional 4-port NIC to support in-path (inline) deployments using Cisco WAAS (PN# WAE-INLN-4CG)
Cisco Wide Area Virtualization Engine (WAVE)

The Cisco Wide Area Virtualization Engine (WAVE) is a branch-office appliance that provides WAN optimization, embedded virtualization for local hosting, and branch-office video delivery. It allows IT organizations to centralize applications and storage in the data center while maintaining LAN-like application performance and delivering local branch-office IT services. Cisco WAVE appliances are designed to enable local hosting of branch-office IT services using a network-embedded virtualization architecture. This architecture maintains native performance for WAN optimization while using the same hardware platform for additional hosted services and reducing the branch-office device footprint.

Key Features

- Improve employee productivity by enhancing the user experience for important business applications delivered over the WAN.
- Reduce the cost of branch-office operations by centralizing IT resources in the data center and lowering the cost of WAN bandwidth.
- Increase IT agility by reducing the time and resources required to deliver new IT services to the branch office.
- Simplify branch data protection for regulatory compliance purposes.

Selected Part Numbers and Ordering Information

For More Information
For more information about the Cisco Wide Area Virtualization Engine (WAVE), visit: http://www.cisco.com/go/WAVE.

Cisco Application and Content Networking System (ACNS)

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 can deliver effective and large-scale corporate communications, on-demand training, and digital signage to remote branch offices, schools, and stores, with high-quality and minimal effect 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 effect over the WAN.

Key Features

- Cisco ACNS provides live broadcasts and video on demand (VoD). Stream splitting at the edge delivers streams to hundreds of user desktops or TV displays.
- Cisco ACNS integrates with the Cisco Digital Media System (DMS).
- Cisco ACNS offers unicast and IP Multicast delivery for delivering only one unicast video stream per digital media streaming source.
- Cisco ACNS offers continuous and transparent media content distribution with policy-based bandwidth throttling.
- Cisco ACNS has a multilayer hierarchy for high scalability and redundancy across the delivery path to thousands of user desktops, digital signs, kiosks, and so on.
- Cisco ACNS supports multi video formats, including Microsoft Windows Media, Real, Flash, H.264, and QuickTime.

Selected Part Numbers and Ordering Information

For More Information
For more information about Cisco ACNS, visit: http://www.cisco.com/go/acns.
Cisco SSL Services Module for the Cisco Catalyst 6500 and Cisco 7600 Series

The SSL Services Module for the Catalyst 6500 and Cisco 7600 Series is an integrated services module for the Cisco Catalyst 6500 Series that offloads the processor-intensive tasks related to securing traffic with Secure Sockets Layer (SSL) and increases the number of secure connections supported by a website.

Ideal for Companies that Need These Features

- Designed for the Cisco Catalyst 6500 and 7200 Switches to provide integrated SSL encryption and decryption security services for web connections.

Key Features

- The SSL Services Module performs all Secure Sockets Layer (SSL)-related tasks, allowing servers to handle high-speed plaintext traffic.
- The SSL Services Module provides a simple means of addressing increased performance requirements by installing additional SSL modules in a Cisco Catalyst 6500 Switch. The module offers scalable SSL processing—2500 connection setups per second per module; and 10,000 per chassis fully populated with SSL modules.
- It maintains persistence even when clients request new session IDs in integrated mode with the Cisco Content Services Module (CSM).
- The SSL Services Module provides cost savings by requiring only a single certificate copy versus a copy for each server subject to customer and certificate authority agreement.

Specifications

| System Capacity and Performance | 2500 connection setups/sec per module—10K per chassis; 60K concurrent client connections—240K per chassis; 300 Mbps bulk rate encryption—12 Gbps per chassis; 256 key pairs; 256 key certificates; Up to 25 key sizes—256 proxy servers |
| Scalability | Up to four SSL modules in the same Catalyst 6500 |
| Integration with Server | Tightly integrated in the Cisco Catalyst 6500 Switch with the CSM |

For More Information


Cisco Nexus 7000 Series Switches

The Cisco Nexus 7000 Series are the first switches designed specifically to meet data center-class requirements. Built to meet the most mission-critical data center requirements, it delivers continuous system operation and virtualized, pervasive services. The Cisco Nexus 7000 Series is a modular line of switches designed for highly scalable end-to-end 10-Gigabit Ethernet data center networks. It features a fabric architecture that scales beyond 15 terabits per second (Tbps), with future support for 40 and 100 Gigabit Ethernet.

The Cisco Nexus 7000 Series is based on a proven operating system (Cisco NX-Os), with enhanced features to deliver real-time system upgrades with exceptional manageability and serviceability. Its innovative design is built to support end-to-end data center connectivity, consolidating IP, storage, and interprocess communication (IPC) networks on a single Ethernet fabric.

Ideal for Companies that Need These Features

- Infrastructure scalability—The system is designed for future scalability to more than 15 Tbps for investment protection. It is built to support the emerging 40- and 100-Gigabit Ethernet standards.
- Its multicore, multithreaded OS optimizes CPU resources and offloads tasks to processors distributed across the modules.
- Cisco Trusted Security (TrustSec) offers scalable security with link-layer encryption, security-group access control lists, and role-based access control.
- Flexible NetFlow optimizes the network infrastructure, and thereby reduces operating costs and improves capacity planning.
- The switch offers operational continuity for lossless, nondisruptive upgrades and zero service downtime.
- A connectivity management processor (CMP) provides integrated out-of-band management access.
- Transport flexibility—It has a flexible foundation for unified fabrics and unified I/O.
- Virtualized control-plane and data-plane forwarding results in optimized performance.
Virtual device contexts (VDCs) maximize software and hardware resource usage while providing strong security and software fault isolation.

**Key Features**

- The Cisco Nexus 7000 supports up to two hundred fifty-six 10-Gigabit Ethernet or three hundred eighty-four 10/100/1000 Ethernet ports in a single 10-slot chassis.
- The Cisco Nexus 7000 has a fully modular and fully redundant 10-slot chassis with front-to-back airflow and integrated cable management.
- Dual dedicated supervisor modules provide exceptional high-availability features with no service interruptions, even during hardware and software upgrades.
- A highly scalable fabric architecture supports up to five fabric modules for load-balanced, fault-tolerant operation; the switch is designed to deliver 230 Gbps per slot of bandwidth at release, with future support for more than 500 Gbps per slot.
- The switch provides virtual output queuing and fabric arbitration, delivers quality of service (QoS) and fairness across all ports, even during congestion, and provides the basis for future unified I/O.
- The switch offers integrated security hardware support for Cisco TrustSec, providing data confidentiality while simplifying and scaling access control.
- The switch has fully distributed forwarding engines, providing scalable packet processing and forwarding.
- Three load-sharing power supply modules allow either 110- or 220-VAC inputs. With 220-VAC inputs these power supplies will deliver fault tolerance for a fully loaded chassis with worst-case N+1 and grid redundancy.

**Selected Part Numbers and Ordering Information**

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>N7K-C7010</td>
<td>Cisco Nexus 7000 Series 10 Slot Chassis-includes cable management and Fans, does not include Power Supplies</td>
</tr>
<tr>
<td>N7K-C7010-FAB-1</td>
<td>Cisco Nexus 7000 10 Slot Fabric Module-460Gbps per slot</td>
</tr>
<tr>
<td>N7K-C7018</td>
<td>Cisco Nexus 7000 Series 18 Slot chassis including Fan Trays, No Power Supply</td>
</tr>
<tr>
<td>N7K-SUP1</td>
<td>Cisco Nexus 7000 Series Supervisor Module-includes external 8GB Log Flash, does not include optional external 2GB Expansion Flash</td>
</tr>
<tr>
<td>N7K-AC-6KW</td>
<td>Cisco Nexus 7000 Series 460Gbps AC Power Supply</td>
</tr>
<tr>
<td>N7K-M16G-12</td>
<td>Cisco Nexus 7000 Series 12 Port 10Gb Ethernet Module (requires SFP+ Optic Modules)</td>
</tr>
<tr>
<td>N7K-M14G-11</td>
<td>Cisco Nexus 7000 Series 48 Port 10/100/1000 Ethernet Module</td>
</tr>
</tbody>
</table>

For More Information


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**Cisco Nexus 5000 Series Switches**

The Cisco Nexus 5000 Series is a family of line-rate, low-latency, lossless 10 Gigabit Ethernet, Cisco Data Center Ethernet, and Fibre Channel over Ethernet (FCoE) switches for data center applications. With low latency, front-to-back cooling, and rear-facing ports, the Cisco Nexus 5000 Series is designed for data centers transitioning to 10 Gigabit Ethernet as well as for those ready to deploy a unified fabric that can handle their LAN, SAN and server cluster networking all over a single link (or dual links for redundancy).

**Key Features**

- High-performance, low-latency 10 Gigabit Ethernet, delivered by a cut-through switching architecture, for 10 Gigabit Ethernet server access in next-generation data centers.
- Cisco Data Center Ethernet, a main component of Cisco Data Center 3.0 architecture, with features, including Layer 2 multipathing, which increases scalability in the data center.
- Unified fabric with Fibre Channel over Ethernet (FCoE) for I/O consolidation, reducing power and cabling requirements and simplifying data center networks especially for SAN consolidation Fibre Channel.
- Virtual machine optimized services for higher asset utilization, simplified server connections, rapid server provisioning, security, and quality of service (QoS).

**Selected Part Numbers and Ordering Information**

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>N5K-C5010P-F</td>
<td>Cisco Nexus 5000 TRU Chassis no PS, 2 Fan Modules, 20 ports [req SFP+]</td>
</tr>
<tr>
<td>N5K-C5020P-F</td>
<td>Cisco Nexus 5000 2RU Chassis no PS, 5 Fan Modules, 40 ports [req SFP+]</td>
</tr>
<tr>
<td>N5K-C5010-FAN</td>
<td>Cisco Nexus 5010 Fan Module, Spare</td>
</tr>
<tr>
<td>N5K-C5020-FAN</td>
<td>Cisco Nexus 5020 Fan Module, Spare</td>
</tr>
<tr>
<td>N5K-PAC-1200W</td>
<td>Cisco Nexus 5020 PSU module, A/C, 208v 1200W</td>
</tr>
<tr>
<td>N5K-M16GE</td>
<td>Cisco Nexus 5000 10GE Module 6-port 10GE (req SFP+)</td>
</tr>
<tr>
<td>N5K-M16GLMK</td>
<td>Cisco Nexus 5000 10GE Series Expansion Module Blank</td>
</tr>
<tr>
<td>N5KUK9-400N</td>
<td>Cisco Nexus 5000 Base OS Software Release 4.0</td>
</tr>
</tbody>
</table>
Cisco Nexus 2000 Series Switches

The Cisco Nexus 2000 Series Fabric Extender (FEX) is a new category of data center products that provide a universal server-access platform that scales across a range of Gigabit Ethernet, 10 Gigabit Ethernet, unified fabric, rack, and blade-server environments. It is designed to simplify data center architecture and operations. The Cisco Nexus 2000 virtualizes the access layer of the network and extends the capabilities of Cisco Nexus switches to Gigabit Ethernet, 10 Gigabit Ethernet, and unified I/O environments.

Key Features

• The combination of the Cisco Nexus 2148T and Cisco Nexus 5000 Series Switches offers a highly cost-effective access layer solution for Gigabit Ethernet and mixed gigabit and 10 Gigabit Ethernet server environments.
• The Cisco Nexus 2148T provides scalability for supporting Gigabit Ethernet environments with flexible control over oversubscription.
• Building the access layer on Cisco Nexus 5000 Series Switches protects investment into the future, providing an easy migration path to low-latency 10 Gigabit Ethernet and a unified network fabric that supports LAN, storage area network (SAN), and high-performance computing (HPC) networks, all over a single access layer connection.
• Standardizing on Cisco Nexus 5000 Series Switches allows data centers to support the same switch features across the entire access layer with a single point of management.

Selected Part Numbers and Ordering Information

For More Information


Cisco Nexus 1000V Series Switches

The Cisco Nexus 1000V virtual machine access switch is an intelligent software switch implementation for VMware ESX environments. Running inside of the VMware ESX hypervisor, the Cisco Nexus 1000V supports Cisco VN-Link server virtualization technology, providing:

• Policy-based virtual machine (VM) connectivity
• Mobile VM security and network policy
• Non-disruptive operational model for your server virtualization, and networking teams

With the Cisco Nexus 1000V Series Switches, you can have a consistent networking feature set and provisioning process all the way from the virtual machine (VM) to the access, aggregation, and core switches. Your virtual servers can use the same network configuration, security policy, tools, and operational models as physical servers. Virtualization administrators can leverage predefined network policy that follows the nomadic VM and focus on virtual machine administration. This comprehensive set of capabilities helps you to deploy server virtualization faster and realize its benefits sooner.

The Cisco Nexus 1000V switch has two major components: the Virtual Ethernet Module (VEM) that executes inside the hypervisor, and the external Virtual Supervisor Module (VSM) that manages the VEMs.

For More Information

For more information about the Cisco Nexus 1000V Series, visit: http://www.cisco.com/go/datacenter.

Cisco MDS 9000 Multilayer Directors and Fabric Switches

The Cisco MDS 9000 Multilayer Directors and Fabric Switches are storage area network (SAN) switches that deliver multiple layers of integrated intelligence, including multiprotocol integration (Fibre Channel, Small Computer System Interface over IP [iSCSI], Fibre Channel over IP [FCIP], and IBM Fiber Connection [FICON]), intelligent network services (virtual SANs [VSANs] and InterSAN Routing, embedded diagnostics, role-based security and encryption), and an open platform for hosting intelligent storage services and comprehensive, integrated management.

Cisco MDS 9000 Product Family of Products

• Cisco MDS 9500 Series Multilayer Directors—Offer up to five hundred twenty-eight 1-, 2-, and 4-Gbps autosensing Fibre Channel ports and up to forty-four 10-Gbps Fibre Channel ports in a single 13-slot chassis. Chassis are also available in 9- and 6-slot configurations. High availability—The directors offer nondisruptive software upgrades, stateful processor restart and failover, and redundancy of all major components; High
performance—The directors offer up to 2.2 terabits per second (Tbps) per system, with each crossbar providing 100-percent system throughput; Multiprotocol support—The directors integrate Fibre Channel, FICON, FCIP, and iSCSI in single platform for optimal consolidation and SAN extension; Hosting of intelligent storage applications (network-based virtualization, volume management, data replication, data migration, storage media encryption, backup, and snapshot capabilities); Data center consolidation needs; Modularity and flexibility for future growth

- Cisco MDS 9200 Multilayer Fabric Switches—Moderate port densities—The switches offer up to 66 Fibre Channel ports in a single 2-slot chassis; Multiprotocol support—The switches integrate Fibre Channel, FCIP, and iSCSI in single platform for optimal consolidation and SAN extension; Hosting of intelligent storage applications (network-based virtualization, volume management, data replication, data migration, storage media encryption, backup, and snapshot capabilities); Modularity and flexibility for future growth

- Cisco MDS 9100 Series Multilayer Fabric Switch—Low base port count with pay-as-you-grow port licensing for up to 64.4-Gbps Fibre Channel ports—The base configuration has eight 4-Gbps Fibre Channel ports on the Cisco MDS 9124, and sixteen 4-Gbps Fibre Channel ports on the Cisco MDS 9134. Small form factor—The switch occupies 1 rack unit (1RU), so is ideal for space-constrained environments; Fibre Channel-only connectivity; Entry-level SAN where price per port is more important than future modularity and flexibility

Key Features

- Flexibility and investment protection—Share common switching modules across all Cisco MDS 9500 Series products, including the Cisco MDS 9020 Series. The chassis provide a 3RU base system consisting of eighteen 1-, 2-, and 4-Gigabit Ethernet ports; they are expandable with a variety of optional modules.
- Sophisticated diagnostics—The Cisco MDS 9000 provides intelligent diagnostics, protocol, decoding, and network analysis tools as well as integrated call-home capability for added reliability, faster problem resolution, and reduced service costs.
- Configurable—The Cisco MDS 9000 provides embedded Cisco Fabric Manager, open application programming interfaces (APIs), and integration and third-party SAN and network management platforms.
- Open platform—The platform is ideal for hosting intelligent storage services such as network-based volume management, data replication, and Cisco MDS 9000 Network-Accelerated Serverless Backup.
- Integrated mainframe support—Mainframe-ready, the Cisco MDS 9000 supports cascaded FICON fabrics, as well as intermix of FICON and open systems Fibre Channel Protocol (FCP) traffic on the same switch.

Specifications

<table>
<thead>
<tr>
<th>Feature</th>
<th>MDS 9513 Director</th>
<th>MDS 9509 Director</th>
<th>MDS 9506 Director</th>
</tr>
</thead>
<tbody>
<tr>
<td>Modular Slots</td>
<td>13 slots, 2 for supervisors, 11 for connectivity</td>
<td>9 slots, 2 for supervisors, 7 for connectivity</td>
<td>6 slots, 2 for supervisors, 4 for connectivity</td>
</tr>
<tr>
<td>Maximum Number of Ports per Switch</td>
<td>528 1/2/4-Gbps Fibre Channel ports</td>
<td>336 1/2/4-Gbps Fibre Channel ports</td>
<td>192 1/2/4-Gbps Fibre Channel ports</td>
</tr>
<tr>
<td>Multiprotocol/ Multitransport</td>
<td>Yes; Fibre Channel, FICON, FCIP, IP-FC, and iSCSI</td>
<td>Yes; Fibre Channel, FICON, FCIP, IP-FC, and iSCSI</td>
<td>Yes; Fibre Channel, FICON, FCIP, IP-FC, and iSCSI</td>
</tr>
<tr>
<td>Dimensions (H x W X D)</td>
<td>24.5 x 17.37 x 28.0 in. (62.23 x 44.12 x 71.12 cm)</td>
<td>24.5 x 17.37 x 18.4 in. (62.23 x 44.12 x 46.74 cm)</td>
<td>12.25 x 17.37 x 21.75 in. (31.12 x 44.12 x 55.25 cm)</td>
</tr>
<tr>
<td>Max Buffer Credits per port</td>
<td>4096</td>
<td>4096</td>
<td>4096</td>
</tr>
<tr>
<td>Port Channel</td>
<td>Up to 16 ports per Port Channel across switching modules</td>
<td>Same as MDS 9509 Director</td>
<td>Stateful failover, process re-start ability, system health monitoring, hot swap, optics, power supplies, fans, switching and services modules</td>
</tr>
<tr>
<td>High Availability</td>
<td>Non-disruptive software upgrades, stateful failover process re-start ability, system health monitoring, hot swap, optics, power supplies, fans, supervisors, crossbars, switching, and services modules</td>
<td>Same as MDS 9509 Director</td>
<td>Stateful failover, process re-start ability, system health monitoring, hot swap, optics, power supplies, fans, switching and services modules</td>
</tr>
<tr>
<td>Optics Support</td>
<td>Fibre Channel, Ethernet, CWDM and DWDM</td>
<td>Fibre Channel, Ethernet, CWDM and DWDM</td>
<td>Fibre Channel, Ethernet, CWDM and DWDM</td>
</tr>
<tr>
<td>HW-Enforced Zoning Support</td>
<td>N Port WWN, F Port WWN, N Port FCID, Port Broadcast</td>
<td>N Port WWN, F Port WWN, N Port FCID, Port Broadcast</td>
<td>N Port WWN, F Port WWN, N Port FCID, Port Broadcast</td>
</tr>
<tr>
<td>Default, LUN, Read Only</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Security</td>
<td>Role-based access control, VSAN-based access control, Port security, RADIUS, TACACS+, SNMP v3, FC-SP, SSH, SSL, SFTP, and IPSec</td>
<td>Role-based access control, VSAN-based access control, Port security, RADIUS, TACACS+, SNMP v3, FC-SP, SSH, SSL, SFTP, and IPSec</td>
<td>Role-based access control, VSAN-based access control, Port security, RADIUS, TACACS+, SNMP v3, FC-SP, SSH, SSL, SFTP, and IPSec</td>
</tr>
<tr>
<td>Feature</td>
<td>MDS 9124 Fabric Switch</td>
<td>MDS 9134 Fabric Switch</td>
<td>MDS 9222i Fabric Switch</td>
</tr>
</tbody>
</table>
Selected Part Numbers and Ordering Information

### MDS 9500 Base Configuration
- DS-C9506 = MDS 9506 Chassis
- DS-C9509 = MDS 9509 Chassis
- DS-C9513 = MDS 9513 Chassis
- DS-X9520-SF2-K9 = MDS 9500 Supervisor/Fabric 2

### MDS 9000 Modules
- DS-X9032-SSM = MDS 9000 Storage Services Module
- DS-X9112 = MDS 9000 12-port 1/2/4-Gbps FC Module
- DS-X9124 = MDS 9000 24-port 1/2/4-Gbps FC Module
- DS-X9148 = MDS 9000-48 port 1/2/4-Gbps FC Module
- DS-X9304-1K9 = MDS 9000 4-port FC and 4-port FC Module
- DS-X9304-10K9 = MDS 9000 4-port 4-port FC and 10-Gbps FC Module
- DS-X908-8MP = MDS 9000 8-port 1 GE IP Storage Services Module
- DS-X9084 = MDS 9000 4-port 10-Gbps FC Module
- DS-SFP-FC2G-SW = 1/2-Gbps Fibre Channel-SW SFP, LC
- DS-SFP-FC2G-LW = 1/2-Gbps Fibre Channel-LW SFP, LC
- DS-SFP-FC4G-SW = 1/2/4-Gbps Fibre Channel-Shortwave SFP, LC
- DS-SFP-FC4G-LW = 1/2/4-Gbps Fibre Channel-Longwave SFP, LC
- DS-SFP-FC4G-EW = 1/2-4-Gbps EtherChannel-SW, SFP, LC
- DS-SFP-FC4G-EW = 1/2-4-Gbps EtherChannel-LW, SFP, LC
- DS-X2-FC10G-SR = 10-Gbps Fibre Channel-Shortwave, SC
- DS-X2-FC10G-LR = 10-Gbps Fibre Channel-Longwave, SC
- DS-SFP-GE-T = Gigabit Ethernet Copper, SFP-RJ-45

### MDS 9500 Memory Options
- MEM-MDS-FLD512M = MDS 9500 Sup Compact Flash Disk, 512 MB, Spare
Cisco MDS Data Mobility Manager (DMM)

The Cisco Data Mobility Manager (DMM), a fabric-based data migration solution that transfers block data non-disruptively across heterogeneous storage volumes and across distances, irrespective of whether the host is online or offline, is such a solution. With no host components to deploy, the time-consuming, costly, and sensitive task of installing and licensing hardware and software on servers is avoided. In addition, host CPU and bandwidth cycles are available to the application in their entirety, so applications do not experience any deterioration in performance.

For More Information
For more information about the Cisco MDS DMM, visit: http://www.cisco.com/go/storagenetworking.

Cisco MDS 9000 Storage Media Encryption

Cisco Storage Media Encryption (SME) protects data at rest on heterogeneous tape drives and Velocity Template Languages (VTLs) in a storage-area-network (SAN) environment using secure IEEE-standard Advanced Encryption Standard (AES) algorithms. Supported natively on the Cisco MDS 9000 18/4-Port Multiservice Module, and the Cisco MDS 9222i Multiservice Modular Switch, Cisco SME capabilities are provided as a fabric service so that traffic between any host and storage device on the fabric can use the Cisco SME services. Furthermore, these encryption and compression capabilities are transparent to the hosts and storage devices and are available for devices in all virtual SANs (VSANs) in the fabric without the need for reconfiguration or rewiring, eliminating downtime for deployment. Cisco SME provisioning and key management are both integrated into Cisco Fabric Manager; no additional software is required.

Selected Part Numbers and Ordering Information

For More Information
For more information about the Cisco MDS 9000 Storage Media Encryption, visit: http://www.cisco.com/go/storagenetworking.

Cisco MDS 9000 Optical Modules

The Cisco MDS 9000 optical interface modules operate with the following platforms:

- Cisco ONS 15530 DWDM Multiservice Aggregation Platform
- Cisco ONS 15540 ESP Extended Services Platform
- Cisco ONS15454 SDH Multiservice Provisioning Platform (MSPP)

The Cisco MDS 9000 optical interface modules offer a broad range of storage-area-network (SAN) connectivity solutions for both local and extended reach. Small Form-Factor Pluggable (SFP) modules for the Cisco MDS 9000 are available in either short- or long-wave options to support Fibre Channel and Gigabit Ethernet connections over distances of up to 500 meters and 10 kilometers, respectively. Cisco Coarse Wavelength-
Division Multiplexing (CWDM) SFPs and passive add/drop multiplexers provide cost-effective, multiprotocol, extended-distance connectivity by optimizing the use of the existing optical infrastructure.

For More Information
For more information about the Cisco MDS 9000 Optical Modules, visit: http://www.cisco.com/go/storagenetworking.

Cisco Catalyst Blade Switch 3000 and 3100 Series
Cisco Catalyst Blade Switch 3100 Series and the Cisco Catalyst Blade Switch 3000 Series are specifically designed to meet the rigors of blade server application infrastructure. The Cisco Catalyst Blade Switch 3000 Series provides cost-effective gigabit Ethernet connectivity, while the Cisco Catalyst Blade Switch 3100 series provides high performance 10Gb Ethernet connectivity and innovative Virtual Blade Switch (VBS) technology. The Cisco Catalyst Blade Switches help address the problems of server sprawl within the data center infrastructure. These servers allow mixing and matching of Gigabit Ethernet and 10 Gigabit Ethernet switches, providing customers with a cost-effective migration path. Switch capacity can be incrementally upgraded as server needs demand. Cisco blade switches are optimized for IBM, HP, Dell, and FSC storage environments.

These products introduce an innovative new technology called the virtual blade switch (VBS), which allows up to 8 physical switches to be combined into a single logical switch. These products represent the foundation of the many additional functions that the Cisco Catalyst Blade Switch 3100 Series delivers.

Key Features
• The VBS is self-managing and self-configuring. When switches are added or removed, the master switch automatically loads the Cisco IOS Software version running on the VBS to the new switch, loads the global configuration parameters, and updates all the routing tables to reflect changes. Upgrades are applied universally and simultaneously to all members of the VBS.
• The VBS is highly resilient. Each switch can operate both as master controller and as forwarding processor. Each switch in the VBS can serve as a master creating a 1:N availability scheme for network control. In the unlikely event of a single-unit failure, all other units continue to forward traffic and maintain operation.
• The VBS offers industry-leading mechanisms for marking, classification, and scheduling to deliver superior performance for data, voice, and video traffic, all at wire speed.
• The VBS supports a comprehensive set of security features for connectivity and access control, including access control lists (ACLs), authentication, port-level security, and identity-based network services with IEEE 802.1x and extensions. This set of features not only helps prevent external attacks, but also defends the network against “man-in-the-middle” attacks. The VBS-enabled switch also supports the Cisco Network Admission Control (NAC) security framework.
• The VBS-enabled switch is managed as a single object and has a single IP address.

Selected Part Numbers and Ordering Information

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>WS-CBS3120G-S</td>
<td>Cisco Catalyst Blade Switch 3120G for HP w/ IP Base</td>
</tr>
<tr>
<td>WS-CBS3120X-S</td>
<td>Cisco Catalyst Blade Switch 3120X for HP w/ IP Base</td>
</tr>
<tr>
<td>WS-CBS3020-HPQ</td>
<td>Cisco Catalyst Blade Switch 3020 for HP</td>
</tr>
<tr>
<td>WS-CBS3130G-S</td>
<td>Cisco Catalyst Blade Switch 3130G for Dell M1000e with IP Base</td>
</tr>
<tr>
<td>WS-CBS3130X-S</td>
<td>Cisco Catalyst Blade Switch 3130X for Dell M1000e with IP Base</td>
</tr>
<tr>
<td>WS-CBS3030-DEL-S</td>
<td>Cisco Catalyst Blade Switch 3030 for Dell</td>
</tr>
<tr>
<td>WS-CBS3030-DEL-F</td>
<td>Cisco Catalyst Blade Switch Module 3030 for Dell</td>
</tr>
<tr>
<td>WS-CBS3012-IBM-I</td>
<td>Cisco Catalyst Switch Module 3012 for IBM</td>
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<tr>
<td>WS-CBS3110G-S-I</td>
<td>Cisco Catalyst Switch Module 3110G for IBM BladeCenter w/ IP Base</td>
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<tr>
<td>WS-CBS3110X-S-I</td>
<td>Cisco Catalyst Switch Module 3110X for IBM BladeCenter w/ IP Base</td>
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<tr>
<td>WS-CBS3040-FSC</td>
<td>Cisco Catalyst Blade Switch 3040 for FSC</td>
</tr>
</tbody>
</table>

For More Information
For more information about the Cisco Catalyst Blade Switches, visit: http://www.cisco.com/go/bladeswitch.
Cisco Data Center Services

Accelerate Data Center Transformation
Cisco Data Center Services help you more effectively consolidate, virtualize, and automate your data centers so you can better meet your business goals, increase efficiency, and lower operating costs.

Enable the Agile Business
Agility and innovative new business models are vital in today’s business environment, where your customers increasingly expect a personalized experience above and beyond your product or service, and your competition can come from anyone, anywhere around the globe.

Success in this fast-paced marketplace requires effective collaboration and efficient use of resources. Business and information technology are inseparable, and the network is what brings them together; it alone touches all people, locations, resources, and applications.

Achieve Business Success Through an Architectural Approach
In collaboration with your team and our partner ecosystem, we take an architectural approach to helping you create a more intelligent, responsive, integrated data center infrastructure. Through a robust portfolio of services, we can help you align IT to the needs of your business, unify data center silos, and create a flexible architecture optimized for your organization. We can help you assess readiness to support proposed solutions, integrate new capabilities, and help keep the data center secure, available, and operating reliably.

- For more information about Cisco Data Center Services, visit http://www.cisco.com/go/dcservices.
- To find the right technical service for any Cisco product, use the Service Finder tool at http://www.cisco-servicefinder.com. Enter a product description or part number or search by product family.
- For more information about all services, refer to Chapter 10, “Services”.
# Video and Broadband Cable

## Video and Broadband Cable At a Glance

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<th>Features</th>
<th>Page</th>
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<tbody>
<tr>
<td><strong>VIDEO</strong></td>
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<td></td>
</tr>
<tr>
<td>Cisco Digital Media System</td>
<td>The Cisco Digital Media System (DMS) is a comprehensive suite of digital signage, Enterprise TV, and desktop video applications that allows companies to use digital media to increase sales, enhance customer experience and facilitate learning. Support from Cisco's broad partner ecosystem of deployment, solution development, and content creation partners ensures a successful digital media implementation.</td>
<td>7–2</td>
</tr>
<tr>
<td>Cisco Digital Media Encoders</td>
<td>Cisco Digital Media Encoders (DMEs) are integrated components of the Cisco Digital Media System for desktop video. They provide live and on-demand streaming digital media across an IP network. The Cisco Digital Media Encoder 1100 is a portable encoder, and the Cisco Digital Media Encoder 2200 is a multiprocessor, studio-quality audio and video encoding appliance.</td>
<td>7–2</td>
</tr>
<tr>
<td>Cisco Digital Media Manager</td>
<td>Cisco Digital Media Manager (DMM) is an integrated component of the Cisco Digital Media System for digital signage, Enterprise TV, and desktop video. This Web-based application allows content authors to easily manage and publish content to the Cisco Video Portal or other end devices.</td>
<td>7–3</td>
</tr>
<tr>
<td>Cisco Digital Media Players</td>
<td>Cisco Digital Media Players (DMPs) are highly reliable, IP-based hardware endpoints that enable digital signage and Enterprise TV through the ability to play high-definition live and on-demand video, motion graphics, Web, and dynamic content on digital displays.</td>
<td>7–4</td>
</tr>
<tr>
<td>Cisco LCD Professional Series Displays <em>NEW</em></td>
<td>Cisco LCD Professional Series Displays are large-format professional-quality displays ideally suited for digital signage and enterprise TV solutions. They are available in 40- and 52-inch models and offer full 1080p resolution.</td>
<td>7–5</td>
</tr>
<tr>
<td>Cisco Video Portal</td>
<td>Cisco Video Portal is an integrated component of the Cisco Digital Media System for desktop video. The Cisco Video Portal and Reporting Tool is a web-based video portal that audiences can use to browse, search, and view digital media interactively; it includes a Web-based reporting tool.</td>
<td>7–6</td>
</tr>
<tr>
<td>Cisco Media Processing</td>
<td>Cisco Media Processing provides media conversion, real-time post production, editing, formatting, and network distribution capabilities in a single networked solution to help businesses develop more targeted and effective visual communications that drive intimacy with employees and customers.</td>
<td>7–7</td>
</tr>
<tr>
<td>Cisco Media Experience Engine 3000 <em>NEW</em></td>
<td>Cisco Media Experience Engine 3000 (MXE 3000) is a media processing platform that allows users to adapt and customize content for different video experiences. Media files can easily be shared between digital signage, desktop video, mobile devices, and other applications.</td>
<td>7–8</td>
</tr>
</tbody>
</table>

## BROADBAND CABLE

<table>
<thead>
<tr>
<th>Product</th>
<th>Features</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cisco uBR7225 Series Universal Broadband Router</td>
<td>The Cisco uBR7225VXR Universal Broadband Router is a low-cost entry and midlevel cable modem termination system (CMTS), offering cable operators, multiunit businesses, and Internet service providers (ISPs) an excellent and cost-effective platform for the delivery of high-speed data, voice, and video services.</td>
<td>7–8</td>
</tr>
<tr>
<td>Cisco uBR10012 Universal Broadband Router</td>
<td>This broadband router delivers the services, performance, scale, and carrier-class reliability that large cable operators and Internet service providers (ISPs) demand.</td>
<td>7–10</td>
</tr>
<tr>
<td>Cisco uBR3x10 RF Switch</td>
<td>This broadband router delivers the services, performance, scale, and carrier-class reliability that large cable operators and Internet service providers (ISPs) demand.</td>
<td>7–12</td>
</tr>
</tbody>
</table>

## SERVICES

Cisco and our partners offer a portfolio of technical services that help you maintain the health and performance of every Cisco product. | 7–13 |
Cisco Digital Media System

The Cisco Digital Media System (DMS) is a comprehensive suite of digital signage, Enterprise TV, and desktop video applications that allows companies to use digital media to increase sales, enhance customer experience and facilitate learning. Support from Cisco’s broad partner ecosystem of deployment, solution development, and content creation partners ensures a successful digital media implementation.

Digital Signage

Cisco Digital Signage provides scalable, centralized management and publishing of high-quality content to networked, on-premise digital signage displays. Built on the power of the Cisco Digital Media System, Cisco Digital Signage leverages the same hardware and management platform as and can interoperate with Cisco Enterprise TV, or can operate as a standalone application.

To provide assistance in content creation, Cisco has developed the Academy of Digital Signage, which is a global qualification program that trains media professionals to create and optimize media content for digital signage so that businesses may quick-start digital signage deployments. For more information visit: www.cisco.com/go/dms/ads

Enterprise TV

Cisco Enterprise TV is an interactive application that enables organizations to deliver on-demand video and broadcast live TV channels over an IP network to digital displays. On-screen menus and program guides give users access to Enterprise TV content, and organizations can customize lineups and create their own content libraries. Users can navigate through channel menus and select from on-demand content with a remote control or other remote devices.

Built on the power of the Cisco Digital Media System, Cisco Enterprise TV leverages the same hardware and management platform as and can interoperate with Cisco Digital Signage, or can operate as a standalone application.

Desktop Video

Built on the power of the Cisco Digital Media System, Cisco Desktop Video gives customers, employees, partners, and students access to high-quality and compelling videos on demand and live webcasts at their desktops. Digital Media can be browsed, searched, and viewed over the network through a unique, easy-to-use Cisco Video Portal experience—anywhere, anytime.

Key Features

- Communicate richly and effectively with targeted customers, investors, partners, and media. In addition, they can deliver crucial information and training to employees, suppliers, and partners.
- Target consumers with tailored content directly to their desktop or other IP-enabled devices.
- Offer live and on-demand events and content to geographically dispersed audiences.
- The Cisco Digital Media System provides applications and solutions for a variety of industries, including financial services, retail, and education.

Integrated Components of the Cisco Digital Media System

The Cisco Digital Media System includes five product lines:

- Creation with Cisco Digital Media Encoders (DMEs)
- Management with the Cisco Digital Media Manager (DMM)
- Publishing to the Cisco Digital Media Players (DMPs)
- Access through the Cisco Video Portal
- Display with the Cisco LCD Professional Series Displays

In addition to the five products in the DMS product line, the Cisco Media Experience Engine 3000 (MXE 3000) allows users to further extend the reach of their media content. As a complimentary solution to your DMS deployment, the MXE 3000 enables any-to-any media transformation in the network, enabling users to create content once to be played on all DMS applications as well as mobile devices. Please refer to “Cisco Media Experience Engine 3000” on page 8 for more information on the MXE 3000.

Cisco Digital Media Encoders

Cisco Digital Media Encoders provide live and on-demand streaming digital media across an IP network. Organizations can schedule and manage live events from multiple encoders from a single administration interface. The encoders can be locally managed or remotely managed through the Cisco Digital Media Manager. The Cisco Digital Media Encoder can be used as a standalone encoder or as an integrated component of the overall Cisco Digital Media System for Desktop Video.

The studio-level (Cisco DME 2200) and portable (Cisco DME 1100) encoders provide live and on-demand streaming digital media across an IP network in a variety of encoding formats, inputs, and monitoring functions.

Key Features

The Cisco Digital Media Encoder 1100 offers the following features:
• Designed for both professionals and novices, the rugged-design, lightweight encoder is ideal for outdoor venues, classrooms, and conference rooms because it can extend Webcasting “outside of the studio”.
• Lightweight, single channel
• Encoding of video live for live network distribution
• Local management; or remote management through the Cisco Digital Media Manager

The Cisco Digital Media Encoder 2200 offers the following features:
• Designed for advanced users who require multiple audio and video input options and a variety of encoding formats and functions.
• Studio-level, dual channel—a good choice for the corporate office or data center
• Live encoding/transcoding of media from analog and digital sources into standard formats (WMV, FLV, H.264, and so on.)
• Local management via an embedded LCD; or remote management through the Cisco Digital Media Manager

Specifications

<table>
<thead>
<tr>
<th>Feature</th>
<th>Cisco Digital Media Encoder 1100</th>
<th>Cisco Digital Media Encoder 2200</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supported live streaming formats</td>
<td>Windows Media 9, MPEG-4/H.264</td>
<td>Windows Media 9, MPEG-4/H.264</td>
</tr>
<tr>
<td>Video inputs</td>
<td>Composite, S-Video</td>
<td>2 composite, 2 S-Video, 2 SDI (SMPTE-259M) video with embedded audio inputs (AES/EBU)</td>
</tr>
<tr>
<td>Audio inputs</td>
<td>1 balanced stereo (XLR3), Unbalanced stereo (RCA)</td>
<td>2 balanced stereo (XLR), 2 Unbalanced stereo (RCA), 2 digital audio (AES/EBU) inputs through SDI inputs</td>
</tr>
<tr>
<td>Ethernet ports</td>
<td>1 GB, 10/100 Mb</td>
<td>2 GB/10/100/1000 Mbps</td>
</tr>
<tr>
<td>Hard disk space</td>
<td>100 GB</td>
<td>100 GB</td>
</tr>
<tr>
<td>RAM</td>
<td>1 GB</td>
<td>4 GB</td>
</tr>
<tr>
<td>Processor</td>
<td>Single 2.11GHz Intel Core i7 CPU</td>
<td>Dual core AMD Opteron, 2.2 GHz</td>
</tr>
<tr>
<td>Additional ports</td>
<td>2 USB 2.0 and VESA monitor</td>
<td>2 USB 2.0 and VESA monitor</td>
</tr>
<tr>
<td>Dimensions (H x W x D)</td>
<td>4.5 x 7.5 x 12 in. (114 x 191 x 30.48 cm)</td>
<td>3.5 x 9 x 23 in. (88.9 x 48.26 x 58.42 cm)</td>
</tr>
<tr>
<td>Weight</td>
<td>75 lb. (3.41 kg)</td>
<td>48.62 lb. (19.05 kg)</td>
</tr>
<tr>
<td>Power</td>
<td>110-220V, 50-60 Hz, 110-220V, 50-60 Hz</td>
<td>110-220V, 50-60 Hz, 110-220V, 50-60 Hz</td>
</tr>
</tbody>
</table>

Selected Part Numbers and Ordering Information

- DMS-DME-1100 Cisco Digital Media Encoder 1100
- DMS-DME-2200 Cisco Digital Media Encoder 2200

For More Information

For more information on Cisco Digital Media Encoders, visit: http://www.cisco.com/go/dms.

Cisco Digital Media Manager

The Cisco Digital Media Manager allows content authors to manage, schedule, and publish compelling digital media for live or on-demand playback across digital signage displays for Cisco Digital Signage and Enterprise TV, and to the Cisco Video Portal for Cisco Desktop Video. An integrated part of the Cisco Digital Media System, the web–based Cisco Digital Media Manager is the single, central management application for all Cisco Digital Media System products.

Content managers can:
• Manage content assets and create playlists for digital signage and desktop video
• Schedule instant and future content deployments and playback schedules for digital signage, Enterprise TV, and desktop video
• Report on playback schedules for digital signage and on video usage for desktop video
• Manage Q&A for live desktop video broadcasts
• Synchronize slides for both live and video on demand desktop video events

Content designers can:
• Customize signage screen layouts and zones for digital signage
• Customize and brand Enterprise TV skins and menus
• Customize and brand the Cisco Video Portal interface for desktop video
IT users can:
• Manage user accounts for role-based access control, and configure user-specific content restrictions for desktop video users via LDAP/Active Directory
• Configure and manage Cisco Digital Media Encoders for desktop video
• Remotely configure, manage, and monitor digital signage networks
• Manage event-based alerts and server appliances

Specifications
Cisco Digital Media Manager Features

<table>
<thead>
<tr>
<th>Product compatibility</th>
<th>Compatible with Cisco Application and Content Networking System (ACNS), the Cisco Video Portal and Cisco Video Portal Reports tool, Cisco Digital Media Players, and Cisco Digital Media Encoders</th>
</tr>
</thead>
<tbody>
<tr>
<td>Programming interface</td>
<td>Web-based management</td>
</tr>
</tbody>
</table>

Cisco Digital Media Manager Client Requirements

| Browser                      | Microsoft Windows—Internet Explorer 6.0 or later; Mozilla 1.8 or later; Firefox 1.5 or later recommended; Linux or UNIX—Mozilla 1.0 or Firefox 1.0 minimum; Mozilla 1.8 or later or Firefox 1.5 or later recommended; Apple Macintosh—Safari 2.0 minimum; Safari 2.0 or Firefox 1.5 or later recommended |

Cisco Live Event Module

| Browser                      | Microsoft Windows—Internet Explorer 6.0 or later; Apple Macintosh—Mac OS X, VMware Fusion, Windows XP or Vista—Internet Explorer v6.0 or later |

Selected Part Numbers and Ordering Information

<table>
<thead>
<tr>
<th>Software on Server Appliance</th>
<th>DMM-BASE-K9</th>
<th>DMM-VPM5.0-K9</th>
<th>DMM-DSM5.0-K9</th>
<th>DMM-FL-100</th>
<th>DMM-FL-1000</th>
<th>DMM-LEMS5.0-K9</th>
<th>DMM-ETVM5.0-K9</th>
<th>DMM-SNMP5.0-K9</th>
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<tbody>
<tr>
<td>DMM5.0-BASE-K9 Cisco Digital Media Manager Base V5.0 Perpetual Software License</td>
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<td>DMM-VPM5.0-K9 Cisco Digital Media Manager Video Portal Manager V5.0 Perpetual Software License</td>
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<td>DMM-DSM5.0-K9 Cisco Digital Media Manager Digital Signage Module V5.0 Perpetual Software License</td>
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<td>DMM-FL-100 Cisco Digital Media Manager Digital Signage Feature License for Up to 10 DMPs</td>
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<td>DMM-FL-1000 Cisco Digital Media Manager Digital Signage Feature License for Up to 100 DMPs</td>
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<td>DMM-LEMS5.0-K9 Cisco Digital Media Manager Video Portal Module Live Event Module V5.0 Perpetual Software License</td>
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<td>DMM-ETVM5.0-K9 Cisco Digital Media Manager Video Portal Module Live Event Module V5.0 Perpetual Software License</td>
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<td>DMM-SNMP5.0-K9 Digital Media Manager Ver 5.0 SNMP Module Perpetual Software License</td>
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</tbody>
</table>

For More Information

For more information about the Cisco Digital Media System, visit: http://www.cisco.com/go/dms.

Cisco Digital Media Players

Cisco Digital Media Players (DMPs) are highly reliable, IP-based hardware endpoints that enable digital signage and Enterprise TV through the ability to play high-definition live and on-demand video, motion graphics, Web, and dynamic content on digital displays. The DMP hardware options include support for standard-definition and high-definition MPEG-2 and MPEG-4/H.264, Flash, RSS, and other Web formats and dynamic data.

Using the Cisco Digital Media System’s Cisco Digital Media Manager, organizations can flexibly and remotely publish centralized content over the Web to networked digital signs. Cisco Digital Media Players can be attached to virtually any on-premise digital signage display at any location, including branch-office banks, retail stores, break rooms, or lobbies, helping organizations reach their primary audiences anywhere, anytime.

Cisco Digital Media Players deliver flexible and real-time publishing; low ongoing operational costs and ease of use; speed of deployment; and leverage the scalability and power of the network.

The Cisco Digital Media Player 4305G includes such features as:
• Support for MPEG 1/2/4 Part 2 video in standard definition and high definition as well as graphics, Web content, Adobe Flash 7 or less, animation and tickers.
• 2-GB local storage for reliability and performance
• Small form factor: 7.5 x 5 x 1.5 in. at 1 lb
• Low power consumption
• IP-enabled delivery of live broadcasting and on-demand video content

The Cisco Digital Media Player 4400G includes such features as:
• Support for MPEG 1/2/4 Part 10 video in standard definition and high definition as well as graphics, Web content, and Adobe Flash 9 animation, and tickers.
• 4-GB local storage for reliability and performance
• Small form factor: 10 x 8 x 2 in., weighs 4.5 lb.
Low power consumption
IP-enabled delivery of live broadcasting and on-demand video content
Integrated with the Cisco Digital Media Manager, the Cisco Digital Media Players provide:
Remote management of display (on and off, volume, contrast, and brightness)
Full-screen video playback or "on-screen zoning" of multiple content types on a single display
Customizable onscreen presentation templates and playlists

Specifications

<table>
<thead>
<tr>
<th>Feature</th>
<th>Cisco Digital Media Player 4305G</th>
<th>Cisco Digital Media Player 4400G</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supported protocols</td>
<td>FTP, HTTP, MPEG2-Transport Stream, User Datagram Protocol (UDP)</td>
<td>FTP, HTTP, MPEG2-Transport Stream, User Datagram Protocol (UDP)</td>
</tr>
<tr>
<td>Video codecs</td>
<td>Video MPEG 1, Video MPEG 2: Main Profile at High Level, Video MPEG 4 part 2, Advanced Simple Profile at Level 5, Aspect ratio: 4:3 and 16:9, HD up to 1080i at 16:9 progressive and interface video resolution, Video data rate up to 12 Mbps, Overall delay 1-3 sec</td>
<td>Video MPEG 1, Video MPEG 2: Main Profile at High Level, Video MPEG 4 part 10, Aspect ratio: 4:3 and 16:9, HD up to 1080p at 16:9 progressive and interface video resolution, Video data rate up to 12 Mbps, Overall delay 1-3 sec</td>
</tr>
<tr>
<td></td>
<td>Note: Please consult other Cisco documentation or your Cisco representative for exact audio codec, video codec, resolution, bit rate, and encapsulation combinations.</td>
<td>Note: Please consult other Cisco documentation or your Cisco representative for exact audio codec, video codec, resolution, bit rate, and encapsulation combinations.</td>
</tr>
<tr>
<td>Audio codecs</td>
<td>Audio MPEG 1 Layers 1 and 2, MPEG 4 AAC Low Complexity, AC-3, Audio data rate: 64-320 kbps</td>
<td>Audio MPEG 1 Layers 1 and 2, MPEG 4 AAC Low Complexity, AC-3, Audio data rate: 64-320 kbps</td>
</tr>
<tr>
<td>Physical connectors</td>
<td>Ethernet copper 10/100 BASE-T, RCA Video, S-Video, RCA Audio Left, RCA Audio Right, HDMI and RS-232 and USB</td>
<td>Ethernet copper 10/100 BASE-T, RCA Video, S-Video, Mini 3.5 mm Stereo Audio Jack, HDMI, and RS-232 and USB</td>
</tr>
<tr>
<td></td>
<td>Cable Type and Maximum Supported Length—Composite/RCA cable, 10 ft.; HDMI 1.1, 16 ft.; S-Video, 10 ft.</td>
<td>Cable Type and Maximum Supported Length—Composite/RCA cable, 10 ft.; HDMI 1.1, 16 ft.; S-Video, 10 ft.; USB 2.0 (2), 15 ft.; SPDIF, 10 ft.</td>
</tr>
<tr>
<td></td>
<td>* Cable quality can be a factor.</td>
<td>* Cable quality can be a factor.</td>
</tr>
<tr>
<td></td>
<td>**An HDMI extender product can be used to extend the cable to 150 ft.</td>
<td>**An HDMI extender product can be used to extend the cable to 150 ft.</td>
</tr>
<tr>
<td>Remote Control</td>
<td>Transmitter Type and Maximum Supported Distance—Infrared (IR), 15 ft.</td>
<td>Transmitter Type and Maximum Supported Distance—Infrared (IR), 15 ft.</td>
</tr>
<tr>
<td>Functional</td>
<td>Video input—MPEG 1, MPEG 2, and MPEG 4 part 2</td>
<td>Video input—MPEG 1, MPEG 2, and MPEG 4 part 10</td>
</tr>
<tr>
<td></td>
<td>Audio input—Transport stream: Up to 6 audio packet IDs (part numbers) in transport stream</td>
<td>Audio input—Transport stream: Up to 6 audio packet IDs (part numbers) in transport stream</td>
</tr>
<tr>
<td></td>
<td>Video output—Analog video (composite, S-Video), Digital video (HDMI)</td>
<td>Video output—Analog video (composite, S-Video), Digital video (HDMI)</td>
</tr>
<tr>
<td></td>
<td>Audio output—Analog unbalanced audio (mono and stereo), MPEG 1 Layer 2, Selected packet IDs in transport stream (1 of 6)</td>
<td>Audio output—Analog unbalanced audio (mono and stereo), MPEG 1 Layer 2, Selected packet IDs in transport stream (1 of 6)</td>
</tr>
<tr>
<td></td>
<td>MPEG 4 AAC and AC-3—Selected elementary audio (1 of 6)</td>
<td>MPEG 4 AAC and AC-3—Selected elementary audio (1 of 6)</td>
</tr>
<tr>
<td>Power</td>
<td>Input voltage—5V</td>
<td>Input voltage—12V</td>
</tr>
<tr>
<td></td>
<td>Input current—3 ADC</td>
<td>Input current—3 ADC</td>
</tr>
<tr>
<td></td>
<td>Power consumption—Peak: 12W, average: 5W</td>
<td>Power consumption—Peak: 30W, average: 15W</td>
</tr>
<tr>
<td>Flash memory</td>
<td>32 MB for OS, 2 GB for internal storage</td>
<td>4 GB CF card with endurance of 10,000 Write/Erase Cycles for OS and application storage</td>
</tr>
<tr>
<td>Environmental</td>
<td>Operating temperature—41°F to 122°F (5 to 50°C) Passed 500-hour test of the uninterrupted video playback in 125°F (52°C) dry heat environment Humidity—0 to 80% noncondensing</td>
<td>Operating temperature—41°F to 104°F (5 to 50°C) Passed 500-hour test of the uninterrupted video playback in 125°F (52°C) dry heat environment Humidity—20 to 80% noncondensing</td>
</tr>
</tbody>
</table>

Selected Part Numbers and Ordering Information

<table>
<thead>
<tr>
<th>Cisco Digital Media Players 4305G and 4400G</th>
</tr>
</thead>
<tbody>
<tr>
<td>DMP-4305G-K9 Cisco Digital Media Player 4305G (Note: Includes Cables Accessory Kit)</td>
</tr>
<tr>
<td>DMP-SW5.0-K9 Digital Signage User Lic. for DMP 4305G</td>
</tr>
<tr>
<td>DMP-4400G-K9 Cisco Digital Media Player 4400G (Note: Includes Cables Accessory Kit)</td>
</tr>
<tr>
<td>DMP-SW5.0-K9 Digital Signage User Lic. for DMP 4400G</td>
</tr>
</tbody>
</table>
Cisco LCD Professional Series Displays

Cisco LCD Professional Series Displays form an integral part of the overall Cisco Digital Media System (DMS) suite of products. Offering a complete end-to-end solution for digital signage and Enterprise TV, these displays are available in 40- and 52-inch models and offer full 1080p resolution.

Cisco LCD Professional Series Displays offer:
- An end-to-end Cisco solution
- Centralized, remote management through the Cisco Digital Media Manager (on and off, volume, contrast, and brightness)
- Cisco support and service offerings

Specifications

<table>
<thead>
<tr>
<th>Feature</th>
<th>Cisco LCD 110 Pro 52S</th>
<th>Cisco LCD 100 Pro 40N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diagonal Size</td>
<td>52 inches</td>
<td>40 inches</td>
</tr>
<tr>
<td>Native Resolution</td>
<td>1080p (1920*1080)</td>
<td>1080p (1920*1080)</td>
</tr>
<tr>
<td>Resolutions Supported</td>
<td>180p, 1080i, 720p</td>
<td>180p, 1080i, 720p</td>
</tr>
<tr>
<td>Brightness</td>
<td>700 cd/m2</td>
<td>470 cd/m2</td>
</tr>
<tr>
<td>Contrast Ratio</td>
<td>2000:1</td>
<td>3000:1</td>
</tr>
<tr>
<td>Viewing Angle (H/V)</td>
<td>178/178 degrees</td>
<td>178/178 degrees</td>
</tr>
<tr>
<td>Response Time (G-to-G)</td>
<td>8 ms</td>
<td>8 ms</td>
</tr>
<tr>
<td>Video Inputs</td>
<td>CVBS/Component/HDMI</td>
<td>CVBS/HDMI</td>
</tr>
<tr>
<td>Power Supply</td>
<td>AC 100 - 240 V- (+/- 10%), 50/60 Hz</td>
<td>AC 100 - 240 V- (+/- 10%), 50/60 Hz</td>
</tr>
<tr>
<td>VESA Mount</td>
<td>800*400 mm</td>
<td>600*400 mm</td>
</tr>
<tr>
<td>Weight (Set/Package)</td>
<td>36.8/47 Kg</td>
<td>190/225 Kg</td>
</tr>
<tr>
<td>Dimension</td>
<td>1211 X 713 X 137.1 mm</td>
<td>971 X 582.0 X 118.5 mm</td>
</tr>
<tr>
<td>Bezel Width</td>
<td>22 mm</td>
<td>40 mm</td>
</tr>
</tbody>
</table>

Selected Part Numbers and Ordering Information

- LCD-110-PRO-52S: Cisco LCD Pro 110, 52 inch, 1080p, Bezel S, w/Remote Control
- LCD-100-PRO-STD: Leg Stand for Displays (Note: Optional)
- LCD-100-PRO-40S: Cisco LCD Pro 100, 40 inch, 1080p, Bezel N, w/Remote Control

Cisco Video Portal

An integrated component of the Cisco Digital Media System for Cisco Desktop Video, the Cisco Video Portal helps users browse, search, and view digital media interactively at the desktop. Platform-independent, the Cisco Video Portal fits easily into an organization's existing network and IT infrastructure and supports major video formats such as Windows Media, Flash, and MPEG-4/H264, QuickTime.

The Cisco Video Portal provides the following features:
- Customizable interface, program guide, and keyword search
- Personalized and featured playlists
- Advanced player controls: Full-screen video playback, fast forward, rewind
- Slide synchronization with video
- Submission and management of questions during live webcasts
- Video sharing
- Secure log in and access to user-specific content based on Active Directory/LDAP
- Detailed content and user access reporting: Who, what, when and how often

For More Information

For more information about the Cisco LCD Professional Series Displays, visit: http://www.cisco.com/go/dms.

For more information about the Cisco Digital Media System, visit: http://www.cisco.com/go/dms.
Cisco Media Processing: Specifications

Cisco Video Portal and Cisco Video Portal Reports Tool Features

Product compatibility: Compatible with Cisco Application and Content Networking System (ACNS) Software, Cisco Digital Media Manager, Cisco Digital Media Players, and Cisco Media Encoders.


Supported encoder file types: Microsoft Windows Media, Adobe Flash (.flv), Apple QuickTime (.mov), and MPEG/H.264 – up to a maximum of 2 GB per file.

 Cisco Video Portal and Cisco Video Portal Reports Tool Product Sizing Matrix

<table>
<thead>
<tr>
<th>Product</th>
<th>Maximum Number of Connections</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cisco Video Portal 5.0 Perpetual Software License with Cisco 7825 Media Convergence Server</td>
<td>Up to 500 concurrent initial user access within the first minute</td>
</tr>
<tr>
<td>Cisco Video Portal 5.0 Perpetual Software License with Cisco 7835 Media Convergence Server</td>
<td>Up to 1000 initial user access within the first minute</td>
</tr>
</tbody>
</table>

Cisco Video Portal Client Requirements

Browser:
- Windows—Internet Explorer 6.0 or later, Mozilla 1.8 or later, or Firefox 1.5 or later recommended.
- Linux or UNIX support for Flash VoD files only—Mozilla 1.0 or Firefox 1.0 minimum.
- Mozilla 1.8 or later or Firefox 1.5 or later recommended.
- Apple Macintosh support for Flash and QuickTime VoD files—Safari 2.0 minimum; Safari 2.0 or Firefox 1.5 or later recommended.

Adobe Flash plug-in: Adobe Flash 8 plug-in or later recommended.

Windows Media plug-in: Windows Media 9 or later (required if Windows Media content is offered).

QuickTime plug-in: QuickTime Player 7 or later recommended.

Cisco Digital Media Manager Live Event Module 1.0:
- Windows—Internet Explorer 6.0 or later; Internet Explorer 6 or later recommended.
- Apple Macintosh—VMware Fusion.
- Windows XP or Vista—Internet Explorer 6 or later recommended.

Minimum supported resolution: 1024 x 788.

Cisco Video Portal Reports Tool Client Requirements

Browser:
- Windows—Internet Explorer 5.5 or Firefox 1.5 minimum; Internet Explorer 6.0 or later or Firefox 1.5 or later recommended.
- Linux or UNIX—Firefox 1.5 or later.
- Apple Macintosh—Firefox 1.5 or later.

Adobe Scalable Vector Graphics (SVG) plug-in: Adobe SVG 3.0 plug-in minimum; Adobe SVG 3.03 or later recommended (required only for Internet Explorer).

Selected Part Numbers and Ordering Information

Software on Server Appliance:

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>VP5.0-500-K9</td>
<td>Cisco Video Portal V5.0 for MCS-7825-H3 for up to 500 concurrent viewers</td>
</tr>
<tr>
<td>VPR5.0-K9</td>
<td>Cisco Video Portal Live Event Module 1.0 for MCS-7825-H3 for up to 500 concurrent viewers</td>
</tr>
<tr>
<td>MCS-7825H3-K9-VPS</td>
<td>Cisco Media Processor Live Event Module 1.0 for up to 500 concurrent viewers</td>
</tr>
</tbody>
</table>

The DMS V4.1 to V5.0 Upgrade is available to all Cisco customers with a current Software Application Support (SAS) contract via http://www.cisco.com. Access to the DMS upgrades is available from this website by selecting the Support: Download Software: Video and Content Delivery: Cisco Digital Media System web page selections.

For More Information

For more information about the Cisco Digital Media System, visit: http://www.cisco.com/go/dms.

Cisco Media Processing

Collaboration and video are continuing to drive new business models for enterprises. Businesses need an effective solution to expand the reach of their video content to multiple devices. Cisco Media Processing provides media conversion, real-time post production, editing, formatting, and network distribution capabilities in a single networked solution to help businesses develop more targeted and effective visual communications that drive intimacy with employees and customers.
Cisco Media Experience Engine 3000

The Cisco Media Experience Engine 3000 (MXE 3000) is the first Cisco Media Processing product. The Cisco MXE 3000 can be either a standalone solution or a complementary solution for Cisco DMS deployment, enabling any-to-any media transformation in the network so that users can create content once to be played on all Cisco DMS applications as well as mobile devices.

The media adaptation function enables users to view any media content on any endpoint device. Media files can easily be shared between digital signage, desktop video, mobile devices, and other applications. Editing and production capabilities allow users to customize and enhance their viewing experience. Examples include inserting company logo overlays, creating transitions, clipping files to desired length, and enhancing color and video quality, allowing for a customized content piece.

Specifications

Cisco MXE 3000 Product Specifications

| Supported Input Formats | Editing Systems, Avid, Final Cut Pro, Adobe Premiere AVI, DVD, VoD files, Quick Time, All supported formats, MPEG-1, Elementary Stream, System Stream, Layer II Audio, AC3 Audio, MPEG-4, 3GPP, 3GPP2 |
| Supported Output Formats | Windows Media V7, V8, V9, MPEG-4, 3GPP4, 3GPP2, Windows Media Audio, V2/V7/V8 ACELP H.264, RealVideo 8, RealVideo 9, RealVideo 8, RealAudio 10, RealAudio 8, QuickTime, All supported codecs, MPEG-4, and Flash 8, MP3, WAV |
| Preprocessing and Media Preparation | Video: blur, bumpers & trailers, color space conversion, contrast enhancement, cropping, de-interlacing and interlacing, fade-in & fade-out |
| | In/Out trimming: Field frame control, gamma correction, hue rotation, inverse telecine, noise reduction, saturation, support for 16x9 and other aspect ratios, add/remove letter boxing and curtaining, temporal smoothing, video frame rate conversion and resizing with anti-alias filtering, watermarking, automated, thumbnail extraction |
| Workflow Automation | Job Submission |
| | Profile building—An automated system that allows users to quickly apply customized processing setting to new jobs |
| | Monitoring—A summary screen that provides insight into the status of queued jobs |
| | Automated Folder Attendant—A program that facilitates integration between external systems and the Cisco MXE 3000 platform |
| System Features | Auto job restart |
| | File distribution |
| | Status notification |

Selected Part Numbers and Ordering Information

Media Experience Engine 3000

MXE-3000 Cisco MXE 3000 Media Experience Engine Appliance (hardware only)

MXE-3000-LIC Cisco MXE 3000 Media Experience Engine Software Version 2.0 (software only)

For More Information

For more information about the Cisco Media Experience Engine, visit: http://www.cisco.com/go/mxe.

Cisco uBR7225 Universal Broadband Router

The Cisco uBR7225VXR Universal Broadband Router is the successor to the Cisco uBR7100 and uBR7223 Series CMTS. The Cisco uBR7225VXR is a low-cost entry to midlevel CMTS in a 2RU modular chassis, offering cable operators, multiunit businesses, and Internet service providers (ISPs) an excellent and cost-effective platform for the delivery of high-speed data, voice, and video services. This new CMTS platform requires exceptionally low capital investment and minimal setup time, and it supports up to 5000 subscribers. The Cisco uBR7225VXR Universal Broadband Router is a service-enabling, communications-grade CMTS that offers carrier-class reliability, modular scalability, and significant investment protection.

Ideal for Companies that Need These Features

- 2RU modular CMTS offering with low entry-level pricing, while maintaining modularity for capacity growth and exceptionally minimal setup time
- A higher-capacity platform, without the need for the additional capacity of the Cisco uBR10012 or the larger form factor of the Cisco uBR7246VXR

Key Features

- The Cisco uBR7225 Universal Broadband Router supports PacketCable 1.1, DOCSIS 1.1, Euro-DOCSIS 2.0, and PacketCable Multimedia, increasing return on investment for converged services and speeding deployment of advanced IP services.
- The new low-cost line cards (part numbers UBR-E-28U and UBR-E-16U) lead to lower capital expenditures.
This low-cost entry-level CMTS makes efficient use of capital expenditures while maintaining modularity for capacity growth.

- The Cisco uBR7225 provides up to 4 downstream and 16 upstream ports in a 2RU form factor.
- The router provides DOCSIS, Euro-DOCSIS, and J-DOCSIS support on one line card for operational savings and lower capital expenditures.

### Specifications

#### Compact design suitable for rack-mount (2-1RU) or desktop installation
- Dimensions: 35.5 x 173.2 x 21.8 in. (899 x 444 x 55 cm) (H x W x D), 46 lb (20.4 kg).
- Front, mid, and rear mountable in a 19 in. EIA standard rack.
- Depth fully loaded from the tip of cable management bracket to the tip of the UBR-NPE-G1 handle is 261 in. (66 cm).

#### Modulation

#### Cisco uBR7246VXR Universal Broadband Router
- A member of the Cisco uBR7200 Series,
- Provides a single, Layer 3 routing, multiservice, scalable platform that gives cable companies the ability to deliver IP data, voice, and video services to DOCSIS, Euro-DOCSIS, and PacketCable-compliant cable modems, set-top boxes, and multimedia terminal adapters.

### Ideal for Companies that Need These Features
- Flexible port expansion for multiservice deployment options.
- Service support for up to 10,000 subscribers per chassis with 3.2 Gbps back plane (numbers are for reference only. Actual numbers for specific systems will vary depending on network/service loading, traffic, and other parameters).
- Powerful processor and edge intelligence; field-proven and carrier-class reliability.
- Support for multimedia services.
- High tolerance to hybrid fiber coaxial (HFC) network and spectrum noise.

### Key Features
- Modular design—1000 to 10,000 subscribers supported based on different configurations.
- Five 9s availability for low cost maintenance.
- Advanced physical layer (PHY).
- A-TDMA and DOCSIS compliant: Euro-DOCSIS 2.0 (A-TDMA only), DOCSIS 11 qualified, and PacketCable 11 qualified; ComLabs qualified to Euro-DOCSIS 1.0, 11, and 2.0 (A-TDMA only) specifications; also supports Advanced Mode DSG.
- Powerful Layer 3 routing intelligence and sophistication.

### Software Compatibility
- The Cisco uBR7225VXR is supported in Cisco IOS Software Release 12.2SB, which includes PacketCable Multimedia Specification (PCMM), admission control, advanced-mode DOCSIS Set-Top Gateway (DSG), and Cisco Service Independent Intercept (SII) features.

### For More Information
Cisco uBR10012 Universal Broadband Router

The Cisco uBR10012 Universal Broadband Router addresses the volume, capacity, and complexity of large cable headends or distribution hubs. The router delivers the highest level of service availability and capacity of any production cable modem termination system (CMTS) available today. It employs a mix of distributed, centralized, and parallel processing to facilitate consistently high, real-world performance. The Cisco uBR10012 is CableLabs qualified to PacketCable 1.1 and DOCSIS 1.0 and 1.1 specifications. The product is also qualified for EuroDOCSIS 1.0, 1.1, 2.0, and 3.0 Bronze specifications.

The Cisco uBR10012 Universal Broadband Router powers the world’s largest DOCSIS 3.0 downstream channel bonding install base, with more than 1 million revenue-generating subscribers and counting. The combination of the 5 downstream cards, 20 upstream RF cards, the 24 downstream channel bonding cards (wideband shared port adapter [SPA]), and the DOCSIS Timing Interface (DTI) card on the Cisco uBR10012, allows the deployment of DOCSIS 1.1 and 2.0 modems along with the new DOCSIS 3.0 modems for downstream channel bonding over low-cost video-on-demand (VoD) edge quadrature-amplitude-modulation (QAM) ports.

With new hardware support of the Cisco 10000 Performance Routing Engine 4 (PRE4) processor, the 10 Gigabit Ethernet WAN card, and the 6-wideband SPA carrier starting in January 2009, the Cisco uBR10012 Universal Broadband Router provides a maximum of 184 downstream ports per chassis to meet ever-increasing IP data, voice, and video bandwidth needs.

Ideal for Companies that Need These Features
- Large subscriber bases
- Edge routing or aggregation of DOCSIS traffic handling
- High-end throughput, capacity, and service scalability
- Advanced multimedia service delivery
- Sophisticated Layer 3 routing intelligence
- Complex network interface configurations
- Scalable performance
- A-TDMA and DOCSIS 2.0 support
- Advanced intelligence features

Specifications
- Number of Cable Line Card Slots: 4
- Supported Cable Line Cards (Cable Plant Interfaces): uBR7200 Series MC28U, MC28X, MC16U, and MC16X Broadband Processing Engines
- Port Adapter Slots (LAN/WAN Interfaces): 2
- Supported PA categories: Ethernet Serial, HSSI, ATM, POS, DPT
- Power Supply Slots: 2
- Input/Output (I/O) controller: uBR7200-IO-2FE/1E, not required if UBR7200-NPE-G1 or UBR-NPE-G2 are installed in the system
- I/O flash options for PCMCIA slots: Flash disk (48 MB), Flash disk (128 MB)
- Network Processing Engines (NPE): UBR7200-NPE-G2, UBR7200-NPE-G1, and NPE-400
- Add-on processor memory options: 128 MB, 256 MB, or 512 MB for NPE-400
  - 256 MB, 512 MB, or 1 GB for UBR7200-NPE-G1
- Router Bandwidth: 3.2 Gbps

For More Information
Selected Part Numbers and Ordering Information

Cisco uBR10012 Series Chassis Bundles
- U10012-ID5X20H-C: UBR10012 with PRE-2, DTCC and 1 MC5X20H card
- U10012-ID5X20H-C: UBR10012 with PRE-2, DTCC and 1 MC5X20H cards
- U10012-ID5X20H-2M5X20H-HA: UBR10012 with 2 PRE-2, 2 TCC and 2 MC5X20 Cards
- U10012-ID5X20H-HA: UBR10012 with 2 PRE-2, 2 DTCC and 2 MC5X20H cards

Cisco uBR10012 Series Line Cards
- SPA-24DS-SPF=: 24-port uBR10012 Wideband Downstream Shared Port Adapter
- SPA-24DS-SPF=: Cisco uBR10012 Wideband Downstream only SPA Carrier Card
- SPA-4MC5X20H-D: 4 UBR10012 MC5X20H-D Line cards
- 10000-SIP-600: Cisco 10000 Series SPA Interface Processor-600
- 10000-SIP-600+: Cisco 10000 Series SPA Interface Processor-600
- SPA-5X1GE-V2=: Cisco 5-Port Gigabit Ethernet Shared Port Adapter
- SPA-1X1GE-L-V2: Cisco 1-Port 10GE LAN-PHY Shared Port Adapter
- SPA-1X1GE-L-V2+: Cisco 1-Port 10GE LAN-PHY Shared Port Adapter

Cisco uBR10012 Series Processors
- ESR-PRE2/R: Performance Routing Engine, 1GB DRAM, 64MB Flash
- ESR-PRE2+: Performance Routing Engine
Cisco uBR 3x10 RF Switch

The Cisco uBR 3x10 RF Switch is an integral part of the Cisco uBR10012 High Availability solution. It offers a fully redundant system that helps cable operators exceed PacketCable system availability, minimize service disruptions, and simplify operations.

Ideal for Companies that Need These Features

- Advanced services such as voice over IP (VoIP), DOCSIS Set-Top Gateway (DSG) set-top box (STB) deployments, and highly available commercial services
- Carrier-class N+1 network and service architecture
- High-density high-availability service support
- Scalability to tens of thousands of subscribers

Key Features

- N+1 redundancy
- Hot swap capability of all RF switch modules with no RF service disruption
- Support for DOCSIS and Euro-DOCSIS RF performance specifications
- Comprehensive set of high availability features
- Redundancy Readiness Verification, for proactive redundancy health monitoring and reporting
- Fully passive working path
- Position-sensing latching relays
- Unmatched port density and flexibility

Specifications

**Input Power Requirements**

- AC:— 100 to 240 VAC, 50 to 60 Hz, operating range: 90 to 254 VAC; DC—-48 to -60 VDC, operating range: 140.5 to -72 VDC, 200 mVpp ripple/noise

**Unit Control**

- 10BaseT Ethernet—SNMP; Switching time from active (working) to standby (protect)—150 ms maximum after SNMP command

**Connectors**

- RF connectors—MCX; AC power—IETC320 type; DC power—Three terminal block; Ethernet—RJ-45; RS-232 Bus—9 pin male D

**Reliability**

- 41,000 MTBF @ +50C as calculated by BellCore 5, 80 percent confidence factor

**Dimensions (H x W x D)**

- 5.25 x 17.5 x 14.8 in. (13.335 x 44.45 x 37.592 cm)

**Environmental**

- Operational temperature range—0 to +40C; Operating temperature range—-5 to +55C

**Weight**

- 36 lbs.

**RF Requirements**

- Input/output impedance: 75 ohms; maximum RF input power: +15 dBm (63.75 dBmV); Switch type: Electro-mechanical, absorptive for working path, non-absorptive on the protect path; Switch setting time per switch module: 20 ms maximum; Downstream frequency range: 54 to 860 MHz; Typical downstream insertion loss: +/- 11 dB from CMTS to cable plant; +/- 1 dB from CMTS to cable plant; 5.5 dB from working to output; 8.0 dB from protect to output; Downstream insertion loss flatness: +/- 1 dB from CMTS to cable plant; +/- 2 dB from protect to cable plant; Downstream output return loss: > 15.0 dB at <450 MHz, > 12.0 dB at >= 450 MHz; Downstream input return loss: > 15.0 dB; Downstream isolation: > 60 dB from channel to channel in working mode; > 52 dB from CMTS to protect when in protect mode; Upstream frequency range: 5 to 70 MHz; Typical upstream insertion loss: 41 dB from cable plant to CMTS; 5.2 dB from cable plant to protect; Upstream insertion loss flatness: +/- 0.4 dB from cable plant to CMTS; +/- 0.5 dB from cable plant to CMTS; Upstream return loss: > 16 dB; Upstream isolation > 60 dB from channel to channel in working mode: > 60 dB from CMTS to protect when in protect mode; Protect mode: CMTS return loss > 10 dB; Cable plant return loss > 10 dB

**Selected Part Numbers and Ordering Information**

**Cisco RF Switch Series**

- UCS-RFSW-3X10 N+1 RF Switch for Cable Headend CMTS Routers
- UCS-RFSW N+1 RF Switch for CMTS Routers

**Cisco RF Switch Series Cables**

- CAB-RFSW-3X10-T RF Switch cable bundle, 1.2m, MCX to F terminated
- CAB-RFSW-3X10-1= RF Switch cable bundle, 1.2m, MCX to F terminated
- CAB-RFSW-3X10-1T RF Switch cable bundle, 1.0m, MCX to F terminated
For More Information


Cisco Services

Cisco and our partners offer a portfolio of technical services that help you maintain the health and performance of every Cisco product. Offerings range from traditional maintenance to proactive and predictive services. To find the right technical service for any Cisco product, use the Service Finder tool at http://www.cisco-servicefinder.com. Enter a product description or SKU or search by product series family. For more information about Cisco Technical Services, go to http://www.cisco.com/go/ts.

In addition, Cisco and our partners accelerate business transformation, operational maturity, and agility through consultative planning, solution development, and full deployment, creating network architectures that optimize IT services and enhance your business. For more information about Cisco Advanced Services, visit http://www.cisco.com/go/techservices.

For more information about all services, refer to Chapter 10, “Services”.

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAB-RFSW-3X10-10T=</td>
<td>RF Switch cable bundle, 10m, MGX to F, terminated</td>
</tr>
<tr>
<td>CAB-RFSW520QTPMF=</td>
<td>Quad-shield RF cable bundle, MC5x20/RFSW/RFGW to HFC plant, 3m</td>
</tr>
<tr>
<td>CAB-RFSW520QTIMM=</td>
<td>Quad-shield RF cable bundle, MC5x20 to RF switch, 1m, term</td>
</tr>
<tr>
<td>CAB-RFSW520QTPMF Quad-shield RF cable bundle, MC520/RFSW/RFGW to HFC plant, 3m</td>
<td></td>
</tr>
<tr>
<td>CAB-RFSW520QTIMM Quad-shield RF cable bundle, MC5x20 to RF switch, 1m, term</td>
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</tbody>
</table>
Optical Networking At a Glance

**Product Features Page**

**METRO CORE**

**Cisco ONS 15600 SONET/SDH Multiservice Switching Platform**
- This solution allows service providers to transparently integrate their metropolitan (metro) core and metro edge networks while dramatically reducing initial turn-up costs.
- It provides 320 gigabits of switching, grooming, aggregation, and bandwidth-management capacity in a single shelf.
- The platform supports 32 OC-192/STM-64 (XFP) or 128 OC-48/STM-16, OC-12/STM-4, OC-3/STM-1, or Gigabit Ethernet (SFP pluggable) optical interfaces in a single shelf.
- The platform offers any service, any port (ASAP) service cards that hold up to four pluggable I/O (ASAP 4-PIO or ASAP-1-PIO modules, each capable of supporting up to four 2.5-Gbps SFP optics or one 10-Gbps XFP optics capable of both fixed-rate and multirate formats.
- The platform combines the functions of multiple metro systems, including SONET/SDH multiplexers and digital cross-connect network elements.
- It provides carrier-class availability, serviceability, and management.
- This scalable, easy-to-use platform supports all metro topologies.

** Cisco ONS 15454 SONET/SDH Multiservice Provisioning Platform**
- This platform integrates the functions of traditional SONET or SDH network elements with next-generation SONET/SDH transport and multiservice interfaces:
  - SONET/SDH aggregated services (SFP/XFP-based) include: 144 x OC-3/STM-1, 80 x OC-12/STM-4, 24 x OC-48/STM-16, 4 x OC-192/STM-64
  - SONET/SDH aggregated services include: 224 x DS-1, 224 x E-1, 96 x E-3
  - Data services include: Private-line, switched, Layer 2, and Layer 3, including 10/100BASE-T, Gigabit Ethernet, and Resilient Packet Ring (RPR)
  - Storage services include: 1 Gbps, 2 Gbps Fibre Channel, IBM Fibre Connection (FICON)
- The solution combines multiplexing, optical networking, and switching functions in one easy-to-use platform that supports all metro topologies.

**METRO, REGIONAL, AND LONG-HAUL DWDM**

**Cisco ONS 15454 Multiservice Transport Platform (MSTP)**
- This solution delivers integrated, intelligent dense wavelength-division multiplexing (DWDM) functions, including fully reconfigurable optical add/drop multiplexer (ROADM) technology for metropolitan, regional networks, and long-haul networks (from 32 to 80 wavelengths per node).
  - It offers multiservice time-division multiplexing (TDM) and data aggregation over 2.5- and 10-Gbps wavelengths.
  - SONET/SDH wavelength and aggregated services include: OC-3/STM-1, OC-12/STM-4, OC-48/STM-16, OC-192/STM-64
  - ROADM 2-degree functions include: Zero to 32 or 40 channels of pass-through or add/drop multiplexer (ADM), A-to-Z wavelength provisioning, and full, real-time power monitoring of each individual wavelength.
  - ROADM 8-degree functions include: Mesh Ring Interconnection up to 8 degrees with full 0 to 320 wavelengths, ROADM pass or ADM
  - Omni-Directional Add/Drop at Multi-Degree Node
  - Data services include: Private-line, switched, and wavelength-based, including 10/100BASE-T, Gigabit Ethernet, 10 Gigabit Ethernet (LAN), and 10 Gigabit Ethernet (WAN)
  - Storage services include: 1 Gbps, 2 Gbps, 4 Gbps Fibre Channel, 10 Gbps Fibre Channel, IBM Fibre Connection (FICON), Enterprise Systems Connection (ESCON), ETR/CLO, ISC-1-ISC-3
- Video services include D1 and high-definition television (HDTV).

**Cisco ONS 15216 Metropolitan/Regional DWDM System and Transmission Families**
- The Cisco ONS 15216 Metropolitan/Regional DWDM System supports 32 ITU-grid wavelengths launched by the Cisco ONS 15454 MSTP, ONS MSPP, ONS 15600, ONS 15310, or alien wavelengths and creates a more desirable per-wavelength cost.
  - It offers:
    - Optical add/drop multiplexer (OADM)
    - Cisco ONS 15216 Erbium-Doped Fiber Amplifier (EDFA)-3 Optical Amplification
    - Compact, modular design
The Cisco ONS SONET/SDH 15600 Multiservice Switching Platform (MSSP) provides flexibility in designing next-generation metropolitan (metro) networks. Fully engineered and optimized for metro applications, the Cisco ONS 15600 MSPP simplifies and revolutionizes bandwidth management in the metro core by allowing service providers to transparently integrate their metro core and metro edge networks, while dramatically reducing initial turn-up costs. The any service, any port (ASAP) interface cards of the Cisco ONS 15600 provide 1 to 16 ports of capacity per slot to aggregate and transport mission-critical regional and metro-area traffic using a modular, flexible, and scalable design that allows single- and multiple-rate optics from OC-3/STM-1 to OC-192/STM-64, including Gigabit Ethernet SFP optics. Delivering scalability to 960 Gbps of traffic in a single rack, it complements the market-leading Cisco ONS 15454 MSSP by taking advantage of the Cisco Transport Manager 9.0.
advantage of its proven architecture and operating software, allowing service providers to dramatically simplify their metro networks and realize immediate cost, space, and operational benefits. The Cisco ONS 15600 MSPP provides complete integration of metro core and edge networks for service provisioning and network management.

For More Information
For more information about the Cisco ONS 15600 platforms, visit: http://www.cisco.com/go/ons15600.

Cisco ONS 15454 SONET/SDH Multiservice Provisioning Platform

The Cisco ONS 15454 Multiservice Provisioning Platform (MSPP) provides key building blocks in optical networks because of its unprecedented transport performance and economics. It offers supercharged transport capability by combining the best of traditional SONET/SDH time-division multiplexing (TDM) and statistical multiplexing in single units. The Cisco ONS 15454 aggregates traditional facilities such as E-1/DS-1, E-3/DS-3, VC-3/VC-4/STM-1, STM-1/OC-3, STM-4/OC-12, and STM-16/OC-48, including multi-wavelength dense wavelength-division multiplexing (DWDM) optics, and also supports data interfaces for 10 Gigabit Ethernet, 100 Gigabit Ethernet, and Gigabit Ethernet data and video. This drastically improved efficiencies in the transport layer and breakthrough cost savings for initial and life-cycle deployment. A single Cisco ONS 15454 shelf can support combinations of STM-1/OC-3/c, STM-4/OC-12/c, STM-16/OC-48/c, and STM-64/OC-192. It also offers an international optical transport solution that combines the best of traditional SONET/SDH time-division multiplexing (TDM) and statistical multiplexing in a single platform.

For More Information
For more information about the Cisco ONS 15454 platforms, visit: http://www.cisco.com/go/ons15454.

Cisco ONS 15454 Multiservice Transport Platform (MSTP)

The Cisco ONS 15454 Multiservice Transport Platform (MSTP) sets the industry benchmark for metropolitan and regional dense wavelength-division multiplexing (DWDM) solutions by using proven Cisco MSPP networking technologies to deliver simple, fast, and intelligent DWDM (IPoDWDM) solutions that provide lower capital expenditures (CapEx) and operating expenses (OpEx). A metropolitan network, being close to or on a customer’s premises -- unlike its long-haul counterpart -- requires support for a great diversity of service interfaces. The service interfaces allow network providers to offer new tariffs and allow enterprise customers to natively transport a wide variety of services over a common transport network without unnecessary conversion stages and equipment. Additionally, a wide service mix simplifies the planning for services. The Cisco ONS 15454 MSTP with its multiservice provisioning platform (MSPP) capabilities, supports a broad range of standards-based services in a single platform.

Critical to offering a wide service mix is the ability of a DWDM system to offer the level of transparency required by the service. The ultimate in network-management flexibility is achieved through an industry-leading, fully reconfigurable optical add/drop multiplexer (ROADM) that allows 0 to 32, 40, 72, or 80 channels of pass-through or add/drop, A-to-Z wavelength provisioning, and full, real-time power monitoring of each individual wavelength. The Cisco ONS 15454 MSTP solution offers the choice of multiservice aggregation, wavelength aggregation, and wavelength transport, combined with integrated, intelligent DWDM transmission, in a single platform to optimize network costs for any mix of service types. Using digital-wrapping technology (defined in ITU-T G.709), the solution facilitates transparency while still allowing enhanced wavelength management and providing extended optical reach with integrated Forward Error Correction (FEC). The Cisco ONS 15454 MSTP is also used to build IP over DWDM (PoDWDM) architectures. Cisco routers with integrated optics such as the Cisco CRS-1 Carrier Routing System (10 Gigabit Ethernet and OC-768), Cisco 12000 Series (10 Gigabit Ethernet), and Cisco 7600 Series (10 Gigabit Ethernet) have integrated, ITU-grid optics that allow for direct connection to the Cisco ONS 15454 MSTP without using external transponders.

For More Information
For more information about the Cisco ONS 15454 platforms, visit: http://www.cisco.com/go/ons15454.

Cisco ONS 15216 Metropolitan/Regional DWDM System

The Cisco ONS 15216 Metropolitan/Regional DWDM System supercharges wavelength services by supporting up to 32 ITU-grid wavelengths, and provides unprecedented transport flexibility with optical filtering, optical add/drop multiplexer (OADM), optical performance monitoring, and amplification. It allows service providers to deliver more services per wavelength and more wavelengths per fiber.

The Cisco ONS 15216 Metropolitan Dense Wavelength-Division Multiplexing (DWDM) FlexLayer filter solution is an ultraflexible filter architecture that allows multiple system operators and service providers to build “pay-as-you-grow” networks with the flexibility to upgrade in service without preprovisioning channels that are not required. This approach creates a more desirable per-wavelength cost.

The FlexLayer architecture allows for deployment of point-to-point, point-to-multipoint, ring, bus, and tree-and-branch architectures. These networks can be deployed as unprotected or protected networks, and they can also be deployed in transmit-only applications for broadcast networks. This flexibility is inherent in the design of the FlexLayer architecture.

For More Information
For more information about the Cisco ONS 15216 platforms, visit: http://www.cisco.com/go/ons15600.

Cisco ONS 15454 SONET/SDH Multiservice Provisioning Platform
Cisco ONS 15310-MA SONET Multiservice Platform

The Cisco ONS 15310-MA SONET Multiservice Platform is a compact but high-density SONET device capable of multiservice time-division multiplexing (TDM) and data aggregation and transport. The Cisco ONS 15310-MA offers tremendous service flexibility, supporting DS-1, DS-3/EC-1 Layer 1, and Layer 2/3 Ethernet (10, 100, and 1000 Mbps) and Small Form-Factor Pluggable (SFP)-enabled optics for OC-3, OC-12, and OC-48. The Cisco ONS 15310-MA is a hardened design, and supports up to 99.999-percent reliability for both access and edge networks. The Cisco ONS 15310-MA is a carrier-class multiservice provisioning platform (MSPP) that efficiently switches Ethernet and TDM traffic for use in metropolitan and regional optical networks. The Cisco ONS 15310-MA can be managed using the Cisco Transport Controller element management system and Cisco Transport Manager for network management.

Cisco ONS 15310-MA SDH Multiservice Platform

The Cisco ONS 15310-MA SONET Multiservice Platform is a compact but high-density SDH device capable of multiservice time-division multiplexing (TDM) and data aggregation and transport. The Cisco ONS 15310-MA SDH offers tremendous service flexibility, supporting E-1, E-3/DS-3, Layer 1, and Layer 2/3 Ethernet (10, 100, and 1000 Mbps), and Small Form-Factor Pluggable (SFP)-enabled optics for STM-1, STM-4, and STM-16. The Cisco ONS 15310-MA SDH is a hardened design, and supports up to 99.999-percent reliability for both access and edge networks. The Cisco ONS 15310-MA is a carrier-class multiservice provisioning platform (MSPP) that efficiently switches Ethernet and TDM traffic for use in metropolitan and regional optical networks. The Cisco ONS 15310-MA can be managed using the Cisco Transport Controller element management system and Cisco Transport Manager for network management.

Cisco ONS 15310-CL SONET Multiservice Platform

By extending the metropolitan (metro) edge to customer premises and providing direct high-speed LAN connectivity, the Cisco ONS 15310-CL SONET Multiservice Platform allows service providers to cost-effectively offer scalable, high-speed data services over their transport networks. For the enterprise, the Cisco ONS 15310-CL offers the efficiency, scalability, and high availability to meet the bandwidth demands of the mission-critical e-business infrastructure. These features are available without implementing new technology or upgrading the existing transport network infrastructure. Optimized for the customer location, this evolutionary platform is based on the same technology as the industry-leading Cisco ONS 15454, Cisco ONS 15600, and ONS 15310-MA, supporting high optical bandwidth, and it can support DS-1, DS-3, and Layer 1/2 10/100 Ethernet. The Cisco ONS 15310-CL also provides comprehensive STS- and VT-level bandwidth management and integrated data switching. The integrated multiservice optical networking functions of the Cisco ONS 15310-CL dramatically reduce service-delivery costs. Packaged in a 1-rack unit (1RU), industrially temperature-hardened Network Equipment Building Standards (NEBS) 3-compliant assembly, the Cisco ONS 15310-CL delivers fast provisioning and low initial cost, while maintaining a small footprint and low operational cost throughout the life of the product. It can be managed using the Cisco Transport Controller element management system and Cisco Transport Manager for network management.

Cisco ONS 15305 SDH Multiservice Provisioning Platform

The Cisco ONS 15305 Multiservice Provisioning Platform (MSPP) customer premises equipment (CPE) and aggregation solution is an ultra-compact, integrated system that offers cost-effective solutions. The platform provides native multiservice capabilities (that is, time-division multiplexing [TDM] interfaces, multiplexing, and Ethernet data interfaces). The Cisco ONS 15305 aggregation platform provides the following TDM interfaces: protected or unprotected optical interfaces (8-port S-1.1 optical module, 2-port S-4.1 optical module, 1-port S-16.1 optical module, 1+1 MSP, SNCP and 2F MS-SPRing for STM-16) and electrical customer interfaces (8- and 63-port E1 modules and a 6-port E3/DS-3 module). This product also provides native Ethernet customer access through an 8-port 10/100BASE-T and a 2-port Gigabit Ethernet module (supports full Layer 2 capacity bridging, VLANs, spanning tree, and priority management). An optional WAN module is available for point-to-multipoint applications.
Cisco Transport Manager 9.0
Cisco Transport Manager is an integrated optical element management system for Cisco ONS 15000 optical networking platforms. The software manages configuration, fault isolation, performance, and security for Cisco optical network elements. With integrated support for SDH, dense wavelength-division multiplexing (DWDM) and Ethernet, along with open interfaces to operations support systems (OSSs), Cisco Transport Manager delivers the full power of the wide range of advanced optical systems that Cisco offers today's network operators and enterprises.

Cisco Transport Manager is a powerful tool that increases the productivity of the network operations staff. The system provides GUI-based point-and-click network management. As such, the solution has a low learning curve while providing advanced management capabilities such as A-to-Z circuit provisioning. Explorer-style navigation, the extensive use of wizards, tool tips, legends, and online help make it easy for an operator to perform tasks quickly and efficiently. Many otherwise tedious, time-consuming, and error-prone tasks can be fully streamlined using the features of this software.

Cisco Transport Manager works for small networks, but can also scale up to 4000 network elements and 100 concurrent clients per server. This solution is appropriate for small enterprise networks as well as large service provider networks. Cisco Transport Manager is extremely cost-effective (uses industry-standard platforms such as Sun Solaris, Oracle, and Microsoft Windows). It fits smoothly into most companies information technology environments. Using scalable Sun server platforms, customers can minimize initial investment, but still accommodate growth by adding additional processors, memory, and disk space.

For More Information

Cisco Services
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In addition, Cisco and our partners accelerate business transformation, operational maturity, and agility through consultative planning, solution development, and full deployment, creating network architectures that optimize IT services and enhance your business. For more information about Cisco Advanced Services, visit http://www.cisco.com/go/techservices.

For more information about all services, refer to Chapter 10, "Services".
Network Management

Network Management At a Glance

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<td><strong>NETWORK MANAGEMENT SOLUTIONS</strong></td>
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<tr>
<td>Cisco Network Application Performance Analysis (NAPA) Solution</td>
<td>This set of tools and services empowers enterprise IT to ensure delivery of consistent and optimized application performance levels across the network: - Advanced application performance analytics - Exceptional network and application performance visibility - Faster problem detection, isolation and troubleshooting - Open instrumentation - Access to Cisco advanced services</td>
<td>9–4</td>
</tr>
<tr>
<td>Cisco Proactive Automation of Change Execution (PACE) Solution</td>
<td>This solution offers products and services that accelerate operational success by helping IT organizations securely automate and control network changes and configurations. It helps enterprises meet compliance requirements, accelerate growth, ensure business continuity, and increase user productivity.</td>
<td>9–4</td>
</tr>
<tr>
<td>Cisco Video Assurance Management Solution (VAMS)</td>
<td>Cisco VAMS provides real-time, centralized monitoring of video transport over core, distribution, and aggregation networks. - Monitors any changes in the multicast trees that might affect video performance - Actively manages network events to help you maintain video service uptime and quality - Supports correlation and aggregation of events in the core, distribution, and aggregation networks - When video probes are placed at demarcation points along the video path in the network, they help identify, isolate, and troubleshoot video errors. Supported video probes include: Tektronix MTM400, Ineoquest, and Mixed Signals.</td>
<td>9–4</td>
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<td><strong>NETWORK MANAGEMENT SERVICES MODULES</strong></td>
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<tr>
<td>Cisco Catalyst 6500/Cisco 7600 Series Network Analysis Modules (NAMs) 1 and 2</td>
<td>The Cisco NAM is network-aware performance management instrumentation integrated in the Cisco Catalyst 6500 Series Switches and Cisco 7600 Series Routers that delivers exceptional visibility into network traffic. It provides granular insight into how the network is being used and how users experience the services the network offers to help improve application and network performance. With its built-in Traffic Analyzer GUI, the Cisco NAM provides quick access to the configuration menus and presents easy-to-read performance reports on voice, video, and TCP-based traffic.</td>
<td>9–5</td>
</tr>
<tr>
<td>Cisco Branch Routers Series Network Analysis Module (NAM)</td>
<td>The Cisco Branch Routers Series NAM is a services module integrated in the Cisco 2800 and 3800 Series Integrated Services Routers that provides application performance monitoring, traffic analysis, and troubleshooting in the empowered branch. It includes the Traffic Analyzer web interface, which can be accessed anywhere at any time, eliminating the need to send personnel to remote sites or to haul large amounts of data over WAN links to the central site.</td>
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<td>Cisco NAM 2200 Series Appliances</td>
<td>An extension of the Cisco NAM blades, the new Cisco NAM 2220 Series Appliances offer next-generation performance, industry-leading scalability, and maximum deployment flexibility, yet also include all of the world-class performance-monitoring, traffic-analysis, and troubleshooting features of the blades. The NAM appliances increase the reach of the NAM in places in the network not currently served by the blades or where high performance monitoring is essential.</td>
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<td><strong>OPTICAL MANAGEMENT</strong></td>
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<tr>
<td>Cisco Transport Manager</td>
<td>The industry's most advanced optical transport domain manager. Cisco Transport Manager helps deliver the full power of the Cisco ONS 15000 Series and the Cisco MGX Voice Gateway products to a customer's operations personnel and back office systems.</td>
<td>8–5</td>
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<tr>
<td><strong>ROUTING AND SWITCHING MANAGEMENT</strong></td>
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<td>Cisco Active Network Abstraction</td>
<td>This flexible and powerful multivendor network resource-management system provides an enabling platform for value-added network and service-management applications in a multitechnology, multiservice network environment.</td>
<td>9–5</td>
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<tr>
<td>Product Name</td>
<td>Description</td>
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<tr>
<td><strong>Cisco IP Solution Center</strong></td>
<td>This family of intelligent network management applications help reduce network operational costs by:</td>
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<td>- Providing automated resource management and rapid profile-based provisioning capabilities that speed deployment and time-to-market of Multiprotocol Label Switching (MPLS) and Metro Ethernet technologies</td>
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<td>- Working with Cisco MPLS Diagnostics Expert to provide automated, workflow-based troubleshooting and diagnostic capabilities for MPLS VPN networks</td>
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<td><strong>Cisco Multicast Manager</strong></td>
<td>Cisco Multicast Manager offers the following capabilities:</td>
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<td>- Automated multicast discovery</td>
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<td>- Proactive polling engine</td>
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<td>- Real-time multicast diagnostics</td>
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<td>- Alerting and reporting</td>
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<td><strong>CiscoWorks LAN Management Solution (LMS)</strong></td>
<td>Part of the Cisco NAPA and Cisco RACE solutions, CiscoWorks LMS provides critical applications needed to manage Cisco switch-based enterprise campus networks:</td>
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<td>- CiscoWorks Campus Manager</td>
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<td>- CiscoWorks Device Fault Manager</td>
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<td>- CiscoWorks Resource Manager Essentials and CiscoView</td>
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<td>- CiscoWorks Internetwork Performance Manager</td>
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<td>- CiscoWorks Portal and CiscoWorks Advisor</td>
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<td><strong>CiscoWorks Health and Utilization Manager (HUM)</strong></td>
<td>This Simple Network Management Protocol (SNMP)-based MIB polling application monitors network elements (such as CPU, memory, and interfaces, and links) for their availability and usage levels and provides historical reporting.</td>
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<td>- CiscoWorks HUM is offered separately and integrates with the CiscoWorks LAN Management Solution (LMS)</td>
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<td><strong>ENTERPRISE UNIFIED COMMUNICATIONS MANAGEMENT</strong></td>
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<td><strong>Cisco Unified Communications Management Suite</strong></td>
<td>- This sophisticated toolset eases provisioning of Cisco Unified Communications network elements and services.</td>
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<td>- It monitors communications traffic across the network, to manage the servers and network elements providing the services to troubleshoot any events that might threaten the user experience, and to provide statistical analysis and trending of performance.</td>
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<td>- The suite is designed to address the specific needs of voice and video communications across a network.</td>
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<td><strong>Cisco Unified Operations Manager</strong></td>
<td>Part of the Cisco Unified Communications Management Suite, Cisco Unified Operations Manager provides contextual diagnostic tools to facilitate trouble isolation and thereby increase the productivity of an organization's network managers. It also provides a real-time, service-level view of the entire Cisco Unified Communications System and presents the current operational status of each element.</td>
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<td><strong>Cisco Unified Service Monitor</strong></td>
<td>Part of the Cisco Unified Communications Management Suite, Cisco Unified Service monitor provides a low-cost, reliable method of monitoring and evaluating voice quality in Cisco Unified Communications Solutions.</td>
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<tr>
<td><strong>Cisco Unified Provisioning Manager</strong></td>
<td>Part of the Cisco Unified Communications Management Suite, Cisco Unified Provisioning Manager:</td>
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<td>- Provides provisioning for Cisco Unified Communications initial deployments and implementations.</td>
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<td>- It remains in place to provide ongoing operational provisioning and activation services for individual subscriber changes.</td>
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<tr>
<td><strong>Cisco Unified Service Statistics Manager</strong></td>
<td>Part of the Cisco Unified Communications Management Suite, Cisco Unified Service Statistics Manager provides advanced statistics analysis and reporting capabilities.</td>
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<tr>
<td><strong>CiscoWorks QoS Policy Manager</strong></td>
<td>CiscoWorks QoS Policy Manager supports centralized management of network quality of service (QoS). It provides comprehensive QoS provisioning and monitoring capabilities so you can manage, tune, and optimize the performance characteristics of your Cisco network.</td>
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<tr>
<td><strong>Cisco Media Gateway Controller Node Manager</strong></td>
<td>Cisco Media Gateway Controller Node Manager is an element manager for the fault, configuration, performance, and security management of the Cisco PGW 2200 Softswitch gateway.</td>
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<td><strong>SMALL BUSINESS NETWORK MANAGEMENT</strong></td>
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<td><strong>Cisco netManager for IP Infrastructure</strong></td>
<td>This solution provides simple, ready-to-use monitoring and diagnostics for small business network deployments (up to 100 devices and 100 wireless access points).</td>
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<td>- It supports Cisco and third-party network devices, printers, servers, and workstations.</td>
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<td><strong>Cisco netManager for Unified Communications</strong></td>
<td>This solution manages small voice and data networks (up to 1000 phones or users).</td>
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<td>- It provides easy-to-use, out-of-the-box monitoring and diagnostics.</td>
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Cisco Broadband Access Center
This centralized, automated platform controls and configures residential gateways and IP devices. It provides:
- Recognition of all devices coming into the service provider network
- Generation and distribution of the appropriate IP lease and configuration files based on the service provider business policies

Cisco Broadband Troubleshooter
Cisco Broadband Troubleshooter provides a diagnostic tool for RF technicians to quickly and easily isolate problems in the cable plant. It performs the following functions:
- Analyzes and sorts RF conditions into specific categories such as attenuation, provisioning, and noise or packet corruption (cyclic redundancy check [CRC]) errors
- Provides dashboard views of network health, cable modem termination system (CMTS), and cable modem statistic and snapshots
- Correlates cable modem to subscriber information
- Works with an optional tool to map cable modems and status to subscriber street-level views

Cisco Security Management Suite
- Cisco Security Management Suite offers best-of-class management applications as part of a self-defending network including, Cisco Security Manager, a policy-based configuration-management system designed to efficiently provision small-to-large-scale Cisco firewall, VPN, and intrusion-prevention-system (IPS) deployments and Cisco Security Monitoring, Analysis and Response System (MARS), which delivers sophisticated monitoring, analysis, and mitigation functions for multivendor networks.
- Together, these two products form the Cisco Security Management Suite that delivers security administration and enforcement for the Cisco Self-Defending Network.

Cisco Security Monitoring, Analysis, and Response System (MARS)
This appliance-based, all-inclusive solution provides exceptional insight into and control of an organization’s existing security deployment.
See 5-26

CiscoWorks Wireless LAN Solution Engine and CiscoWorks Wireless LAN Solution Express
- These applications provide centralized, systems-level application for managing and controlling an entire Cisco Aironet wireless LAN (WLAN) infrastructure.
- They facilitate Cisco Aironet WLAN deployments, enhance network security, maximize network availability, and reduce operating expenses.
See 3-34

Cisco Network Registrar
- Cisco Network Registrar provides scalable naming and addressing services for service provider and enterprise networks.
- Cisco CNS Address and Name Registrar dramatically improves the reliability of naming and addressing services for enterprise networks.
- The Cisco CNS Address and Name Registrar Dynamic Host Configuration Protocol (DHCP) server supports DHCP Safe Failover (redundant DHCP servers), dynamic Domain Name Server (DNS) updates, DOCSIS cable modems, and integration with directory services using Lightweight Directory Access Protocol Version 3 (LDAPv3).

Cisco Mobile Wireless Transport Manager
Cisco Mobile Wireless Transport Manager performs real-time updates of any system changes such as inventory events, and performance counters. It:
- Accelerates time to service by providing GUI-based editing
- Allows the operator to immediately view events from the Cisco Radio Access Network (RAN) Optimization solution and Cisco IP Transfer Point (ITP) networks
- Improves network serviceability by allowing operators to proactively assess the readiness and general health of Cisco RAN and Cisco ITP
- Enables easier network problem identification and troubleshooting
- Provides northbound XML application programming interfaces (APIs)
- Helps maintain system integrity by preventing accidental or malicious operations from unauthorized users
Cisco Network Application Performance Analysis Solution

The Cisco Network Application Performance Analysis (NAPA) solution is a set of tools and services that empowers enterprise IT to ensure delivery of consistent and optimized application performance levels across the network.

Key Features

- Faster identification and resolution of problems—Cisco NAPA helps identify whether a problem is related to the network, servers, or applications. When the problem is diagnosed, the Cisco NAPA solution provides the insight required to fix it.
- Significantly enhanced network planning capabilities—Cisco NAPA helps with predictive planning and optimization for successful deployment of new applications and network services.
- Reduced risk—By modeling network scenarios, this solution reduces the risks associated with new network deployments and provides better network performance.
- Access to Cisco Advanced Services

For More Information

For more information about the Cisco NAPA solution, visit: http://www.cisco.com/go/napas.

Cisco Proactive Automation of Change Execution (PACE) Solution

The Cisco Proactive Automation of Change Execution solution combines products and services that accelerate operational success by helping IT organizations securely automate and control network changes and configurations. This solution helps enterprises meet compliance requirements, accelerate growth, ensure business continuity, and increase user productivity. The solution is optimized to help medium-sized to large enterprises with challenges relating to compliance, in-house expertise, network complexity, and growth.

Solution Overview

- Cisco Configuration Assurance Solution
- CiscoWorks Network Planning Solution
- Cisco Secure Access Control Server
- CiscoWorks LAN Management Solution
- Cisco Advanced Services

Key Features

- As part of the Cisco Proactive Automation of Change Execution solution, scalability of the CiscoWorks Network Compliance Manager (NCM) software across geographies protects the software investment of high-growth companies.
- The solution prevents revenue loss by reducing network downtime due to misconfigurations.
- It reduces costs by identifying network inconsistencies that would require labor-intensive diagnosis.
- Configuration automation in the Cisco Proactive Automation of Change Execution solution saves money by allowing fewer administrators to manage large, complex networks.
- The solution helps prevent the potentially expensive repercussions of noncompliance.

For More Information

For more information about the Cisco PACE solution, visit: http://www.cisco.com/go/pace.

Cisco Video Assurance Management Solution

Get real-time centralized monitoring of your core, distribution, and aggregation networks for broadcast video transport. The Cisco Video Assurance Management Solution (VAMS) provides the framework for a flexible end-to-end assurance management platform for video.

The Cisco Video Assurance Management Solution comprises the following building blocks:

- Cisco Multicast Manager—Monitors any changes in the multicast trees that might affect video performance.
- Cisco Info Center—Actively manages network events to help you maintain video service uptime and quality.
- Cisco Active Network Abstraction—Supports correlation and aggregation of events in the core, distribution, and aggregation networks.

Product Ordering Website

To place an order or for more part numbers, visit: http://www.cisco.com/en/US/ordering/index.shtml. This chapter only provides a small subset of all part numbers available. See the URL listed in the “For More Information” section of each product to get a complete list of part numbers.
Cisco Catalyst 6500 Series/Cisco 7600 Series Network Analysis Modules 1 and 2

Ideal for Companies that Need These Features

- Reduced mean time to repair (MTTR)
- Proactive video-transport monitoring
- Enhanced video quality of experience
- Increased operational efficiency

Key Features

- Third-party video probes—Help you identify, isolate, and troubleshoot video errors at demarcation points along the video path in the network; supported video probes include Tektronix MTM400, Ineoquest, and Mixed Signals

For More Information

For more information about Cisco VAMS, visit: http://www.cisco.com/go/vams.

Cisco Catalyst 6500 Series/Cisco 7600 Series Network Analysis Modules 1 and 2

Cisco Branch Series Routers Network Analysis Module

Ideal for Companies that Need These Features

- Managed consistent and efficient delivery of applications and services to end users
- Improved operational effectiveness of switch, server, and application resources
- Quantification of the "before and after" of a business change on networks and applications
- Assurance of smooth delivery of voice-over-IP (VoIP) services
- Visibility into WAN-optimized (Cisco Wide Area Application Services [WAAS]) networks

Key Features

- Intelligent Application Performance (IAP) provides granular application performance metrics in both WAAS and non-WAAS environments to accurately characterize and improve the end user experience
- Application classification enables the identification of hundreds of protocols and flow-based monitoring provides real-time and historical performance reports on hosts, applications, and conversations using critical network resources
- Web-based captures provide deep, insightful data analysis to help resolve acute problems before they affect users
- Superior voice-quality monitoring uses mean opinion score (MOS) and critical performance indicators such as packet loss and jitter to help improve the quality of voice service. Both integrated blades and high-performance appliances provide exceptional visibility into network and application performance throughout the enterprise.

For More Information

For more information about the Cisco NAM, visit: http://www.cisco.com/go/nam.

Cisco Active Network Abstraction

Cisco Active Network Abstraction (ANA) is a flexible and powerful multivendor network resource management system. Cisco ANA enables value-added network and service management applications in a multitechnology, multiservice network environment.

The core technology of Cisco ANA includes a unique Virtual Network Element abstraction model that dynamically discovers and identifies basic network components, while obtaining end-to-end visibility of network resources, connections, and dependencies. The building blocks of this model are autonomous, virtual software-based network devices, each one cloning the characteristics and properties of its real-world counterpart. The aggregation of these devices creates the virtual model in the same way an aggregation of network elements creates a real-world network.

For More Information

For more information about Cisco ANA, visit: http://www.cisco.com/go/ana.
Ideal for Companies that Need These Features

- Multivendor network resource management
- A common device management infrastructure that will be compatible with future versions
- Simplified integration of operations-support-system (OSS) applications from one authoritative source
- Vendor-neutral management platform
- Consistent procedures and interfaces for all network elements
- Standards-based access to near real-time device and network information
- Integration software development kit for developers

Key Features

- Cisco Configurable Device Management Platform—The device management platform provides a single solution for multidevice, multitechnology, and multivendor element management. The platform features unified monitoring and configuration, and comes complete with prepackaged, commonly used element-management-system (EMS) functions.
- Cisco Network Fault Isolation and Service Fault Isolation—This technology provides extensive fault-analysis capabilities for quick and accurate fault detection, isolation, and correlation. It reduces trouble-ticket flooding by analyzing the structure, configuration, and dependencies (logical and physical) of the virtual network to track down the virtual source of the fault to accurately reveal the real problem. With this technology, no costly rule maintenance is required.
- Cisco Network Discovery and Service Discovery—This technology provides accurate, real-time discovery of the network inventory, topology, and services. It allows users to view physical network aspects and topological relationships, and it accurately displays the logical inventory, complete with a service view, that spans network layers.
- Cisco Service Activation—This feature facilitates automatic configuration of any device regardless of vendor, model, or software version. The combined activation and configuration process dramatically quickens deployment, while eliminating unnecessary and error-prone manual processes. All activation and configuration activities are done in parallel with no single point of congestion.

For More Information

For more information about Cisco Active Network Abstraction, visit: http://www.cisco.com/go/ana.

Cisco IP Solution Center

Cisco IP Solution Center is a family of intelligent network-management applications that help reduce administration, management, and network operational costs

Ideal for Companies that Need These Features

- Scalable and reliable architecture for large-scale operations
- Single server solution and web GUI
- Open application programming interfaces (APIs) and operations-support-system (OSS) interfaces that help:
  - Integrate IP VPN services into existing infrastructure
  - Integrate Cisco fault-management products with independent software vendor products for VPN-aware performance reporting
- Tracking of Layer 3 and Layer 2 resources
- Rapid profile-based provisioning
- Autodiscovery of Layer 3 VPN and Layer 2 VPN services
- Ability to recognize incorrect service configuration
- Investment protection from Cisco IOS Software and Cisco IOS XR Software and line card changes

For More Information

For more information about Cisco IP Solution Center, visit: http://www.cisco.com/go/isc.

Cisco Multicast Manager

Cisco Multicast Manager is a web-based network-management application that simplifies the holistic discovery, visualization, monitoring, and troubleshooting of multicast networks to help ensure business continuity. This solution is appropriate for enterprise customers that employ multicast for financial market data for multiple system operators (MSOs) use multicast to transport video over IP, and for service providers that need to manage their multicast VPN (MVPN) environment.

Ideal for Companies that Need These Features

- As enterprise customers, the ability to employ multicast for financial market data
- As a cable operator, the ability to use multicast to transport video over IP
- As a service provider, the ability to manage multicast VPN (MVPN) environment

Key Features

- Automated multicast discovery—Cisco Multicast Manager discovers complete multicast topology from a single seed device, along with the multicast VPN (MVPN) provider and provider-edge devices and Virtual
CiscoWorks LAN Management Solution
CiscoWorks LAN Management Solution (LMS) is an integrated suite of management tools that simplify the configuration, administration, monitoring, and troubleshooting of Cisco networks. Built on popular, Internet-based standards, CiscoWorks LMS applications help network operators manage the network through a browser-based interface that can be accessed anytime and from anywhere within the network. CiscoWorks LMS maintains a centralized list of all Cisco network devices and their credentials. The list serves as a single repository for all CiscoWorks applications, whether they are installed locally or distributed in a multiserver deployment. CiscoWorks LMS Portal facilitates functional views that can be tailored to meet the needs of an individual or group of network operations staff, simplifying integration and navigation between Cisco network products and other third-party application functions.

For More Information
For more information about CiscoWorks LMS, visit: http://www.cisco.com/go/lms.

CiscoWorks Health and Utilization Manager (HUM)
CiscoWorks Health and Utilization Manager is a Simple Network Management Protocol (SNMP)-based MIB polling application that monitors network elements (such as CPU, memory, and interfaces or links) for their availability and usage levels and provides historical reporting. The application is offered separately and integrates with the CiscoWorks LAN Management Solution (LMS).

Ideal for Companies that Need These Features
- An add-on to CiscoWorks LMS for monitoring the health and usage of critical MIB parameters, such as CPU usage, interface and port availability, and so on, with historical trending and reporting

Key Features
- Monitors CPUs, memory, and interfaces and ports for usage and availability levels
Cisco Unified Communications Management Suite

Cisco Unified Communications Management Suite is a comprehensive portfolio of communications applications integrated with a secure network infrastructure. To take full advantage of such a system, organizations need a communications-management solution that provides a dashboard view of the entire system status.

**Solution Overview**

- Cisco Unified Provisioning Manager
- Cisco Unified Operations Manager

**Key Features**

- Collect, analyze, and report statistical information from the network
- Manage moves, adds, and changes
- Track and report on user experience and mean opinion scores
- Monitor network elements, including Cisco Unified Communications Manager, the Cisco Unity system, gateways, and endpoints, including the underlying network

**For More Information**


Cisco Unified Operations Manager

Part of the Cisco Unified Communications Management Suite, Cisco Unified Operations Manager provides a real-time, service-level view of the entire Cisco Unified Communications System and presents the current operational status of each element. It continuously monitors the current operational status of elements such as Cisco Unified Communications Manager, Cisco Unified Communications Manager Express, Cisco Unity unified messaging, Cisco Unity Express, Cisco Unified Contact Center Enterprise, Cisco Unified Contact Center Express, and Cisco Unified MeetingPlace Express, as well as Cisco gateways, routers, switches, and IP phones. Cisco Unified Operations Manager also provides an integrated set of diagnostic capabilities for faster trouble isolation and resolution.

**Ideal for Companies that Need These Features**

- Real-time notifications and reports about the status of the network monitored to a higher-level entity (typically a manager of managers)
- Ability to manage multisite and multiclient unified communications environments
- Reduced administrative overhead through sharing device and credential information with other CiscoWorks tools deployed in the enterprise

**Key Features**

- Service-level view—A real-time, auto-refresh display provides status information about all the Cisco Unified Communications clusters and the elements of the clusters in the deployment. Drill-down views show the operational status of each element of the unified communications cluster and its interrelationships with other elements.
- Real-time alerts—Built-in intelligence monitors every device in a Cisco Unified Communications deployment for faults or outages, providing instant access to signaling-related and IP connectivity-related outage information. Alerts present the most up-to-date status.
- Diagnostic tests—A rich set of diagnostic tests can be used for trouble isolation and resolution. Synthetic tests serve to replicate user activity. Phone-status tests can be used to determine the current operational status of the IP phones in terms of signaling and IP connectivity. Administrators can use an IP test service-level agent to simulate traffic in the network and then determine network characteristics, such as reachability status, response time, latency, jitter, packet loss, and network quality.
- Service-quality reporting—Service-quality reporting monitors and provides detailed information about devices to enable further troubleshooting. With this feature, administrators can initiate a probable path trace.
between the endpoints to identify any potential problems in intermediate nodes that could influence service
quality.
• Reports—Reports provide historical alert, event, and service-quality reports for up to 30 days. Customizable
reports can be reviewed through e-mail messages or the Cisco Unified Communications Operations Manager
GUI.

For More Information
For more information about Cisco Unified Operations Manager, visit: http://www.cisco.com/go/cuom.

Cisco Unified Service Monitor
Part of the Cisco Unified Communications Management Suite, the Cisco Unified Service Monitor 1.1 provides a
low-cost, reliable method of monitoring and evaluating voice quality in Cisco Unified Communications Solutions.
It continuously monitors active calls supported by the Cisco Unified Communications System and provides
near-real time notification when the voice quality of a call fails to meet a user-defined quality threshold. The end-
user experience is expressed as mean opinion score (MOS), which is calculated based on the ITU G.107
standard.

Ideal for Companies that Need These Features
• Real-time management information and diagnostic tools to help ensure an efficient deployment and
subscriber satisfaction
• Immediate monitoring and assessment of the quality of IP-based calls without elaborate setup or complicated
installation problems

Key Features
• Cisco Unified Service Monitor evaluates the performance of the actual Real-Time Transport Protocol (RTP)
data streams of the monitored calls.
• Cisco Unified Service Monitor uses the standards-based ITU G.107 R-factor to evaluate and score the
monitored call. It supports IEEE 802.3af Power over Ethernet (PoE). FCC Class B-compliant, the application can
be installed in any office environment.
• The phone-based Cisco Voice Transmission Quality (VTQ) solution (for Cisco Unified CallManager Version 4.2
and Cisco Unified Communications Manager Versions 4.3, 5.0, 5.1, or later) provides user-experience metrics,
expressed as an MOS, at the end of all active calls in the network.
• Cisco Unified Service Monitor provides a distributed, scalable solution to facilitate cost-effective quality-of-
voice monitoring.
• Voice-quality alerts present the information in a specialized Service Quality Alerts display that provides a
launching point for diagnostic tools and processes

For More Information

Cisco Unified Provisioning Manager
Cisco Unified Provisioning Manager provides a reliable and scalable web-based solution for managing a
company’s crucial, next-generation communications services. It manages Cisco Unified Communications
services in an integrated IP telephony, voicemail, and messaging environment that includes Cisco Unified
Communications Manager (formerly known as Cisco Unified CallManager), Cisco Unified Communications
Manager Express (formerly known as Cisco Unified CallManager Express), Cisco Unity, Cisco Unity Express, and
Cisco Unity Connection systems.

Ideal for Companies that Need These Features
• Ability to perform initial installation and deployment of Cisco Unified Communications network elements and
services
• Ability to perform ongoing operational provisioning and activation of services and subscriber changes
• Cost control for deployments and ongoing service provisioning
• Ability to expedite “time to dial tone”
• Policy control of management and services

Key Features
• A simple, wizard GUI for service ordering—Cisco Unified Provisioning Manager provides simple, flexible
ordering. Orders can be scheduled to run at a later time. A single batch order may contain multiple types of
orders (add, change, or cancel) and multiple types of services, such as phone and voicemail additions or
changes.
• Comprehensive policy and service parameter definition—Policy and service parameters can be defined by
domains, service areas, and locations, and can be applied by configuration templates during initial
deployment and rollout of new offices, locations, remote sites, and organizational overlays.
• User role-defined access—User roles define access to certain functions exposed through the web interface
to the system users. The subscriber role dictates the services to which the subscriber is entitled.
• Inventory tracking—The tracking capabilities of the Cisco Unified Provisioning Manager allow users to track
information about all services and subscribers in an internal asset-management and inventory system. Users
Cisco Unified Service Statistics Manager

Cisco Unified Service Statistics Manager is an easy-to-use, web-based software product that features a variety of advanced reports for executive, operations, and capacity-planning functions. Cisco Unified Service Statistics Manager offers both out-of-the-box reports and customizable reports that provide visibility into critical metrics, including call volume, service availability, call quality, resource usage, and capacity across the Cisco Unified Communications System, including across multiple clusters, gateways, and related devices. It facilitates viewing of information based on network, service, business, and user criteria and defining of service-level agreement (SLA) constructs as well as measuring and verifying them based on unified communications statistics collected.

Ideal for Companies that Need These Features

- Statistical reporting, trending, and analysis for small, medium, and large Cisco Unified Communications deployments

Key Features

- Cisco Unified Statistics Manager integrates with and uses the data-collection capabilities of Cisco Unified Operations Manager and Cisco Unified Service Monitor to harvest and consolidate statistics information from a variety of Cisco devices and systems.
- The collected data is stored in a consolidated database that can be partitioned based on a variety of network, service, user, and business criteria for detailed analysis and reporting.
- Cisco Unified Statistics Manager provides out-of-the-box reports on critical metrics. Reports include IP phone and inventory reports; service-level agreement (SLA) reports; and customizable reports with data export in HTML, PDF, and CSV format. Reports on specific call metrics include reports about call volume, call duration, service availability, service quality, call completion, and MOS, as well as top numbers called, users, endpoints, and called numbers. Gateway and trunk traffic and usage reports with capacity trending are also available.
- Cisco Unified Statistics Manager also provides automatic report scheduling, generation, and distribution.
- The application provides call-failure analysis including cause code information.
- Cisco Unified Statistics Manager provides IP telephony testing.

For More Information

For more information about Cisco Unified Service Statistics Manager, visit: http://www.cisco.com/go/cussm.

CiscoWorks QoS Policy Manager

CiscoWorks QoS Policy Manager (QPM) allows administrators to centrally define and administer Cisco IOS Software and Cisco Catalyst Operating System parameters needed for differentiating network traffic. This application helps to ensure high availability and predictable performance for business-critical applications that rely on advanced voice and video services.

Ideal for Companies that Need These Features

- End-to-end quality-of-service (QoS) configuration and automated, reliable policy deployment, while eliminating device-by-device command streams
- Rules-based policies that combine static and dynamic port applications and host system traffic filters
- Cisco QoS Policy Manager services, including congestion management and avoidance and traffic shaping
- Ability to efficiently translate policies to specific QoS configuration commands to ensure consistency across domains
- Ability to validate policies quickly and reliably to LAN and WAN policy domains prior to deploying them
- Ability to generate web-based reports on QoS policies deployed in the network

Key Features

- Cisco QPM measures traffic throughput for top applications and service classes and troubleshoots problems with real-time and historical quality-of-service (QoS) feedback.
- Cisco QPM centrally defines roles and permissions for use with the Cisco Secure Access Control Server (ACS) privilege control. Policy views can be modified and deployed for different device groups.
- The application partitions the network into administrative and deployment domains and uses policy libraries for global QoS configuration. It modifies, scales, and monitors Cisco IOS AutoQoS voice policies on routers.
- Cisco QPM uses the secure, web-based GUI for accurate end-to-end QoS configuration and automated, reliable policy deployment, while eliminating device-by-device command streams. The Setup wizard intelligently determines QoS policies and properties at each network point that requires IP telephony QoS configuration based on Cisco design recommendations.
- Cisco QPM exposes QoS policy conflicts, uploads existing device configurations, presents command-line-interface (CLI) syntax that corresponds to policies, allows previewing of configuration changes before deployment, supports incremental access-control-list (ACL) updates, defines ACL ranges, and restores or applies a previous version of a policy database and backup to a remote server.

For More Information

For more information about Cisco Unified Service Statistics Manager, visit: http://www.cisco.com/go/cussm.
An integral part of Cisco content networking, Cisco QPM Version 3.2 delivers the appropriate service levels to business-critical applications by supporting the extension of IP packet classification to include application signature, web URLs, and negotiated ports.

* Cisco QPM facilitates congestion management, congestion avoidance, and bandwidth control by selectively activating QoS mechanisms on intelligently grouped LAN and WAN interfaces and providing support for external application programming interfaces (APIs) to trigger event-based policy distribution.
* The application extends security by defining access-control policies to permit or deny transport of packets into or out of device interfaces.
* Cisco QPM supports device inventory import from CiscoWorks Resource Manager Essentials, shortening configuration time for devices targeted for policy enforcement and QoS monitoring.

For More Information
For more information about Cisco QPM, visit: http://www.cisco.com/go/qpm.

Cisco Media Gateway Controller Node Manager
Cisco Media Gateway Controller (MGC) Node Manager is a Cisco element manager for fault, configuration, and performance management of the Cisco PGW 2200 Softswitch. It integrates management access to all node components, effectively representing them as a single entity to the network operator. The software provides views of individual managed devices and logical objects, such as trunk groups and signaling links, making it easier to manage the components that make up a voice-over-IP (VoIP) media gateway control node.

Ideal for Companies that Need These Features
* Network surveillance
* Cisco MGC Node Manager Diagnostic Tools
* Provisioning and configuration
* User access and performance

For More Information

Cisco netManager for IP Infrastructure
Cisco netManager for IP Infrastructure provides a simple, ready-to-use, monitoring and diagnostics application for small and medium-sized network deployments (up to 100 devices and 100 wireless access points) comprising Cisco and third-party network devices, printers, servers, and workstations. A single Windows-based server or workstation running Cisco netManager software can monitor a network with up to 10 remote branches.

Ideal for Companies that Need These Features
* Ability to monitor IP infrastructure with up to 100 devices and 1000 wireless access points, including Cisco and third-party network devices plus servers or workstations and printers

Key Features
* Cisco netManager monitors and evaluates the status of the Cisco Unified Communications System, including the underlying transport infrastructure.
* Cisco netManager presents the current operational status of the Cisco Unified Communications System through service-level views of the network.
* The application provides contextual tools to view current alert status, real-time physical connectivity, and historical information for performance and active monitoring and to determine the service effects of any outages.
* Cisco netManager monitors and evaluates the status of network devices and desktop office devices such as printers, servers, and workstations.
* Cisco netManager supports a broad range of Cisco network devices and third-party network devices.
* The application increases network-manager productivity and speeds troubleshooting by providing diagnostic tools and easy one-click access to embedded device-management systems.
* Cisco netManager deploys no agent software on the devices being monitored, so will not disrupt system operations.

For More Information
For more information about Cisco netManager for IP Infrastructure, visit: http://www.cisco.com/go/netmanager.

Cisco netManager for Unified Communications
Cisco netManager for Unified Communications monitors all components of small and medium-sized Cisco Unified Communications Systems, including the underlying IP transport infrastructure (functions of Cisco netManager for IP Infrastructure) and provides the current operational status of all the elements in the network through a real-time, service-level view.

For More Information
For more information about Cisco netManager for Unified Communications, visit: http://www.cisco.com/go/netmanager.
Ideal for Companies that Need These Features
- Ability to monitor Cisco Unified Communications deployments for up to 1000 users

Key Features
- Cisco netManager monitors and evaluates the status of the Cisco Unified Communications System, including the underlying transport infrastructure.
- Cisco netManager presents current operational status of the Cisco Unified Communications System through service-level views of the network.
- The application provides contextual tools to view current alert status, real-time physical connectivity, and historical information for performance and active monitoring and to determine the service effects of any outages.
- Cisco netManager facilitates faster trouble isolation by providing contextual diagnostic tools and easy one-click access to embedded device-management systems.
- Cisco netManager provides performance metrics of different Cisco Unified Communications elements, such as resource usage (for example, CPU and memory) through real-time trend charts.
- The application provides current information about connectivity- and registration-related outages affecting all the Cisco Unified IP Phones (phones based on both Session Initiation Protocol [SIP] and Skinny Client Control Protocol [SCCP]).
- Cisco netManager creates a variety of reports that conveniently summarize move, add, and change operations on IP phones in the network.
- The application deploys no agent software on the devices being monitored, so will not disrupt system operations.
- Rules and thresholds are built in.
- Automatic device identification and data collection facilitate easy setup and immediate monitoring of the managed network.

For More Information
For more information about Cisco netManager for Unified Communications, visit: http://www.cisco.com/go/netManager.

Cisco Broadband Access Center
Cisco Broadband Access Center (BAC) allows service providers to centralize the provisioning and management of subscriber devices through fully redundant and distributed product architecture.

Ideal for Companies that Need These Features
- As a service provider, the ability to manage subscribers with network services using cable and DSL customer-premises equipment (CPE) devices

Key Features
- Cisco BAC automatically recognizes end-user devices coming onto the service provider network. It assigns an appropriate class of service, dynamically generates device configuration files, and activates subscribers.
- Cisco BAC supports both preprovisioning of devices (giving customers a ready-to-use experience) and autoprovisioning so that service providers can easily support self-registration of customer-provided cable and DSL access devices.
- The solution provides embedded, high-performance data storage, optimized for device provisioning.
- Cisco BAC requires no additional external database.
- The solution provides an integrated Kerberos Protocol server for CableLabs PacketCable voice service provisioning.
- Cisco BAC has a Java-based provisioning application programming interface (API).
- Cisco BAC appliance-based distributed information caching and processing servers offer true scalability.

For More Information

Cisco Broadband Troubleshooter
Cisco Broadband Troubleshooter is an easy-to-use tool that gives network administrators and technicians a GUI that streamlines RF problem resolution. The tool dynamically monitors RF characteristics on a per-modem or per-upstream basis, provides a measurement interface for the upstream that looks and feels like a spectrum analyzer, decentralizes RF monitoring and analysis, and automatically sorts and categorizes RF problem conditions. The product provides a fault-analysis tool that facilitates isolation of performance, cable plant, and Cisco Unified Communications Manager problems and characterizes upstream and downstream trouble patterns. Operators can quickly discern customer-premises-equipment (CPE) connectivity impairments by identifying noise, attenuation, provisioning, and packet-corruption problems.

For More Information
The Cisco Security Management Suite is a framework of next-generation security-management tools designed for the operational management and policy administration of the Cisco Self-Defending Network. This suite of integrated applications simplifies the management process by automating tasks associated with the functional areas of security management: configuration, monitoring, analysis, mitigation, identity, and auditing. The result is an increased level of security assurance, better organizational productivity, and lower overall total cost of ownership (TCO).

The primary components of the Cisco Security Management Suite include the Cisco Security Manager and the Cisco Security Monitoring, Analysis, and Response System (MARS). With a powerful set of applications, an integrated architecture, and a comprehensive partnering strategy, the Cisco Security Management Suite is positioned to provide organizations with a best-of-class management solution for their security networks. This solution gives administrators tools that automate and simplify operational tasks.

The Cisco Security Management Suite delivers increased security, better organizational productivity, and lower overall TCO.

**Ideal for Companies that Need These Features**

- Policy consistency and security assurance—Cisco Security Manager allows organizations to deploy consistent security policies across thousands of security devices in a short span of time.
- Rapid threat mitigation for improved company network uptime—Cisco Security MARS allows organizations to quickly identify and respond to network and security threats such as worms and viruses, preventing widespread outbreaks and significant downtime.
- Better control of and access to security information for forensics analysis and reporting—The applications in the Cisco Security Management Suite can collect information that is instrumental for organizational compliance reporting.
- Accounting and tracking of user network access and authorization—Cisco Secure ACS provides a central policy engine to control user access and privilege levels for network access.

**Key Features**

- Provides a single integrated application for managing for managing firewall, VPN, and intrusion-prevention-system (IPS) security services on Cisco security appliances and modules, routers, and switches.
- Reduces operational expenses while at the same time improving provisioning accuracy and consistency.
- Collaborates with Cisco Security MARS to form a comprehensive security management solution encompassing security provisioning, event monitoring, threat detection, and mitigation.
- Allows faster response to threats by defining and assigning new security policies to thousands of devices in a few simple steps.
- Provides ease-of-use with a rich GUI.
- Supports true enterprise-class operational environments with support for multiple simultaneous security administrators with fine-grained control of access permissions; an optional “workflow” mode allows the security and network operations staff to work together effectively with the appropriate division of responsibilities.

**For More Information**

For more information about the Cisco Security Management Suite, visit:


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**Cisco Network Registrar**

Cisco Network Registrar is a full-featured Domain Name Server/ Dynamic Host Configuration Protocol (DNS/ DHCP) system that provides scalable naming and addressing services for service provider and enterprise networks. The application dramatically improves the reliability of naming and addressing services for enterprise networks.

**Ideal for Companies that Need These Features**

- Usability, better lease reservation performance, and an enhanced IPv6 capability to facilitate DOCSIS 3.0 deployment.

**Key Features**

- Real-time server status dashboard
- Carrier-class lease reservation performance
- Sanity check before installation
- Configuration wizard—A configuration wizard helps users navigate through different Cisco Network Registrar configuration steps
- Searching capability improvement
- Installation wizard
- Lease query conformance
- Enhanced error reporting
- DHCPv6 enhancements
Cisco Mobile Wireless Transport Manager

With the Cisco Mobile Wireless Transport Manager (MWTM), Cisco offers monitoring and management capabilities for the Cisco Global System for Mobile Communications (GSM) Radio Access Network (RAN) Optimization solution, Cisco IP Transfer Point (ITP) networks, and Cisco Mobile Service Exchange Framework (mSEF).

Ideal for Companies that Need These Features

- Easy navigation through the various management and troubleshooting tasks required to support the GSM backhaul infrastructure.

Key Features

- Event monitoring
- Performance reporting
- Troubleshooting
- Operations-support-system (OSS) integration
- Wizard-based provisioning
- Autodiscovery and topology
- Security
- Client/server architecture and OS support

For More Information

For more information about Cisco Mobile Wireless Transport Manager, visit: http://www.cisco.com/go/mwtm.

Lifecycle Services for Network Management Products and Solutions

Cisco and our authorized partners provide a comprehensive portfolio of services for your network management solutions across the planning, design, implementation, and operate phases of the Cisco Lifecycle Services approach.

Planning, Design, and Implementation Services

Cisco and our global network of partners help you increase your success through world-class professional services delivery. Proven methodologies and leading practices help you better understand and improve the state of your operations and your Cisco network management solutions and processes. In addition to increased customer satisfaction, these services help reduce the complexities of deploying network services and reduce excess operating costs for your business. These innovative service programs are delivered through a unique combination of consulting engineers, processes, tools, and partners to address your planning needs. Implementation service activities are delivered primarily through Cisco Certified Partners.

Cisco Services for Operations and Network Management

- Accelerate your design and implementation of network management solutions
- Increase the accuracy and efficiency of your Cisco Operations and Network Management solution deployment by providing expertise and methodologies
- Help to ensure the Cisco Operations and Network Management solution delivers expected features and functions through involvement in all aspects of the plan, design, and implementation activities
- Improve your operations staff's productivity by enhancing staff skills to support the Cisco Operations and Network Management solution

For More Information


Technical Services for Operating Network Management Products

Cisco and our authorized partners offer technical support services that help you maximize the availability, security, and performance of your Cisco network management products. These services are available through your Cisco account manager or your local authorized partner.

Application Support

Application software support services are essential to keeping business-critical applications available, secure, and operating at optimal performance. They can help you reduce security, operational, and business risk by simplifying the process of keeping software releases current and supporting your staff with Cisco expertise and online tools.

Cisco Application Support for Network Management products include Software Application Support (SAS) and Software Application Support plus Upgrades (SASU).
Cisco Software Application Support provides:
• Around-the-clock, global access to certified Cisco Technical Assistance Center (TAC) engineers with specialized expertise in application software problems
• Unrestricted access to the extensive Cisco.com knowledge base, automated troubleshooting tools, and online support communities
• Access to ongoing application software updates for your licensed applications
• Access to major software application upgrades on your licensed applications, which can include significant new features and network update functions

**Hardware Support**
Cisco SMARTnet Service and SP Base provide:
• Around-the-clock, global access to the Cisco TAC
• Registered access to the extensive Cisco.com knowledge base and tools
• Next-business-day advance hardware replacement (premium options available for business-critical devices, such as 2-hour replacement and onsite parts replacement and installation)
• Access to ongoing operating system software updates and upgrades
• Cisco operating system (Cisco IOS Software) software support to extend the life of Cisco devices with improved security, increased performance, bandwidth management, new protocol support, and greater interoperability
• Proactive diagnostics and real-time alerts on select devices with Smart Call Home

**For More Information**
For more information about Cisco Application Support, including SAS and SASU, visit: http://www.cisco.com/go/services/applicationsupport.
For more information about Cisco SMARTnet Service, visit: http://www.cisco.com/go/smartnet.
To find the specific technical services available for your hardware product or software application, visit the Cisco Service Finder tool at http://www.cisco-servicefinder.com.
To find a Cisco partner near you, visit: http://www.cisco.com/go/partnerlocator.

**Technical Support Offerings for Network Management Products**

<table>
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<tr>
<th>Technical Support Offerings for Network Management Products</th>
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<td>Cisco Video Assurance Management Solution (VAMS)</td>
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<td>CiscoWorks QoS Policy Manager</td>
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<tr>
<td>Product</td>
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<td>Cisco Media Gateway Controller Node Manager</td>
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<td>Cisco Broadband Access Center</td>
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<td>Cisco Broadband Policy Manager</td>
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<td>Cisco Broadband Troubleshooter</td>
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<tr>
<td>Cisco Secure Access Control Server (ACS)</td>
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<td>Cisco Security Management Suite-Cisco Security Manager</td>
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<tr>
<td>Cisco Mobile Wireless Transport Manager</td>
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*Products with SAS and Cisco SMARTnet or SP Base Service have hardware devices and software applications. Cisco SMARTnet or SP Base Service is the support for the hardware and SAS is the support for the software application. Both are required to ensure that the device is completely covered.*
Services

Cisco and our partners provide award-winning services to assist our customers with the planning, design, implementation, operation, and optimization of their technology investment. A well-designed and healthy network is vital to keeping your business running in real time and connected to customers, employees, and suppliers.

The Cisco Lifecycle Services approach defines the requisite activities at each phase of the network lifecycle, offering a services framework that is independent of who performs the service activities—Cisco, partners, or customer’s themselves—and enabling multiple parties to provide the support needed in a coordinated manner. Based on industry best practices and methodologies, the lifecycle approach aligns service and support activities with the customer’s unique business and technology requirements.

Planning and Design Services
Planning
Early preparation, planning, and sound design are critical—whether you are revamping your architecture or integrating new technologies.
Cisco and our partners can work with you to explore your business opportunities and challenges, craft a solution architecture, and develop a strategy and architecture roadmap tied to your business goals.

Design
A detailed design is essential to reducing risk, delays, and the total cost of network deployments. Cisco and our partners can work with you to develop a design aligned with business goals and technical requirements and plans for staging, configuring, testing, and validating network operations prior to migration or implementation. We help you identify and resolve potential problems so you can integrate devices and systems without compromising network availability or performance.
These upfront services available from Cisco and our partners can:
• Reduce cost and optimize performance
• Effectively manage change
• Smoothly integrate new technologies
• Enhance design and implementation value of migrations and ongoing operations
• Meet business requirements with proven tools and methodologies
• Deploy fully tested network solutions

Technical Services for Operating Your Network
Cisco and our partners have a portfolio of technical services that help maintain the health and performance of every Cisco product. These services range from traditional maintenance to proactive and predictive services that utilize smart services capabilities. Cisco’s smart services provide detailed diagnostics and real-time alerts on core network devices to help resolve issues quickly and improve network availability.
Cisco’s Technical Services portfolio is built on foundational capabilities and expanded performance capabilities to meet the changing technology needs of our customers. Cisco’s industry leading support is recognized by industry awards and consistently high customer satisfaction ratings.
Cisco Technical Services help:

- Gain critical insight into network performance
- Maintain business continuity
- Increase network uptime, operational efficiency, and reliability
- Strengthen IT security and compliance
- Lower operational costs
- Extend the value of your IT investments
- Extend the value of your IT investments
- Gain critical insight into network performance
- Strengthen IT security and compliance
- Lower operational costs
- Extend the value of your IT investments
- Increase network uptime, operational efficiency, and reliability

Services to Optimize Your Network

Cisco and our partners can help you make sure your network remains optimized to support your business objectives. We share knowledge and leading practices, complementing your team's experience.

Cisco Network Optimization Service combines network assessment, network support, and network learning in a tightly integrated, comprehensive package focused on optimizing your core routing and switching network to meet future needs and helping your team succeed with new technologies. Aspects of this service focused on architectural enhancement include:

- Review of your architecture and/or design to resolve application performance problems
- Analysis of resiliency requirements for strategic locations within the IP infrastructure
- Review of your network management architecture, goals, and capabilities
- Review of your design priorities, goals, and requirements for modifying your existing architecture or design
- Ongoing design support for incremental changes to the network or architecture

Advanced technology optimization services are also available to help improve the performance of all the technologies on your network.

For More Information

- Cisco Customers—Contact your Cisco representative or authorized Cisco partner to discuss recommended services to protect and extend your technology investment. To learn more about Cisco Services visit http://www.cisco.com/go/services
- Locate a Cisco Partner—For customers looking for a Cisco Partner who will help you with specialized network design, consultation, installation and support services visit http://www.cisco.com/go/partnerlocator
- Cisco Authorized Partners—If you are an authorized partner find information and resources to help you develop, sell and/or deliver services for Cisco products and solutions at http://www.cisco.com/go/partnerservices

Figure 10-1: Technical Services Industry-leading Capabilities

Finding the Right Service:

To find the right technical service for any Cisco product, use the Service Finder tool at www.cisco-servicefinder.com. Enter a product description or SKU or search by product series family for a list of suggested services and support coverage options.