Chapter 2: Switching

This chapter provides only a subset of Cisco products and part numbers. Also, you will see products listed multiple times because they have dual roles and are used differently in small, medium, and large networks.

Switching At-a-Glance

Product	Features	Page
CAMPUS LAN—CORE SWITCHES		
Cisco Catalyst 6500 Series Switches ***NEW UPDATES***	· Simplifies operations, reduces network costs, and increases resiliency through its Virtual Switch System 1440 technology · Automates network services, energy control and minimizes total cost of ownership with features such as GOLD, OBFL, SmartCallHome, Energywise · Delivers comprehensive features for operational management, integrated services, QoS, and high availability · Integrates services through its portfolio of service modules	2–4
Cisco Catalyst 4500 Series Switches	· Supports hardware acceleration for Layer-2 through -4 intelligent network services · Delivers high-availability with In-Service Software Upgrade and redundant supervisors · Integrates simultaneous IPv4 and IPv6 support · Provides flexible QoS, integrated security, and non-stop forwarding to maximize uptime and network resiliency	2–8
Cisco Catalyst 4900M Series Switches	· Optimized for small-to-medium aggregation · Supports up to 24 ports with 10 Gigabit Ethernet Fiber interfaces · Supports up to 16 ports with 10 Gigabit Ethernet copper interfaces · Supports up to 32 ports with 1 Gigabit Fiber Ethernet · Supports up to 40 ports with 1 Gigabit Ethernet copper interfaces · Provides up to 320 Gbps forwarding capacity · Supports critical routing protocols and IPv6 in hardware including multicast · Features hot-swappable, redundant power supply and fans	2–12
CAMPUS LAN—ACCESS SWITCHES		
Cisco Catalyst 4500 Series Switches	· Supports hardware acceleration for Layer-2 through -4 intelligent network services · Delivers high-availability with In-Service Software Upgrade and redundant supervisors · Integrates simultaneous IPv4 and IPv6 support on both Unicast and Multicast · Features hot-swappable, redundant power supply and fans · Delivers comprehensive set of services for intelligent campus access, Cisco Integrated Security framework, PoE+ with IEEE 8.02.at and flexible QoS	2–8
Cisco Catalyst 3750-X Series Switches ***NEW PRODUCT***	· Stackable fixed-configuration switches are ideal for campus and branch offices. · Investment protection is maximized during deployment of highly secure converged applications. · Cisco StackPower technology offers high-availability and operational efficiency.	2–14
Cisco Catalyst 3750-E Series Switches	· Stackable, fixed-configuration switches with Cisco StackWise Plus technology and a 64-Gbps interconnect provide a unified, resilient system of up to nine switches · Offers Layer 2–4 switching and intelligent services with dynamic IP routing and IPv6 · Offers up to forty-eight 10/100/1000 ports plus two 10-Gigabit Ethernet ports per stackable switch · Offers field-replaceable and upgradable power supplies and fan · Fully backward-compatible with the Cisco Catalyst 3750 Series Switches	2–17
Cisco Catalyst 3750 Series Switches	· Next-generation energy-efficient Layer 3 Fast Ethernet stackable switches support Cisco EnergyWise technology. · Consumes less power than their predecessors and are the ideal access layer switch for enterprise, retail, and branch-office environments · Maximizes productivity and provide investment protection	2–19
Cisco Catalyst 3560-X Series Switches ***NEW PRODUCT***	· Standalone fixed-configuration switches are ideal for campus environments and branch offices. · Maximizes investment protection during deployment of highly secure converged applications · Smart operations for automating infrastructure deployment	2–22
Cisco Catalyst 3560-E Series Switches	· Layer 2–4 switching and intelligent services with dynamic IP routing and IPv6 · Up to forty-eight 10/100/1000 ports plus two 10-Gigabit Ethernet ports per switch · Field-replaceable and -upgradable power supplies and fan	2–25
Cisco Catalyst 3560 Series Switches	· These switches offer Layer 2–4 switching and intelligent services with dynamic IP routing and IPv6. · They offer Fast Ethernet and Gigabit Ethernet connectivity. · They offer up to forty-eight 10/100/1000 ports plus 4 Small Form-Factor Pluggable (SFP) ports.	2–27
Cisco Catalyst 2975 Series Switches	· 48-port Gigabit Ethernet Power over Ethernet stackable switch enables intelligent LAN services for small enterprise LAN access or branch-office environments · Enhanced Layer 2 + LAN Base Cisco IOS Software delivers integrated security, quality of service (QoS), and availability to enable converged applications	2–29

Cisco Catalyst 2960-S Series Switches ***NEW PRODUCT***	· Cisco FlexStack technology in these stackable and standalone switches delivers enhanced LAN services for midsize enterprise and branch-office networks. · Cisco Catalyst 2960-S Switches offer Layer 2 switching with intelligent Layer 2–4 services. · Offers Power over Ethernet Plus for next-generation high-power devices · Cisco Catalyst smart operations automates infrastructure deployment.	2–30
Cisco Catalyst 2960 Series Switches	· These standalone fixed-configuration switches are ideal for midmarket and branch-office networks. · The switches offer Layer 2 switching with intelligent Layer 2–4 services. · They offer Fast Ethernet and Gigabit Ethernet connectivity. · Power over Ethernet (PoE) support includes 24 full PoE ports and 24-port configurations with PoE supported on 8 ports.	2–32
CAMPUS LAN—SMALL BUSINESS SWITCHES		
Cisco Catalyst 2960 Series Switches	· These standalone fixed-configuration switches are ideal for midmarket and branch-office networks. · The switches offer Layer 2 switching with intelligent Layer 2–4 services. · They offer Fast Ethernet and Gigabit Ethernet connectivity. · Power over Ethernet (PoE) support includes 24 full PoE ports and 24-port configurations with PoE supported on 8 ports.	2–32
Cisco ESW 500 Series Switches ***NEW PRODUCT***	· Ethernet switches small business networks · Provides Small Form-Factor Pluggable (SFP) expansion slots for fiber-optic or Gigabit Ethernet uplink connectivity · Supports an optional redundant power supply that provides uninterrupted failover to help ensure continuous operation	2–35
DATA CENTER SWITCHES		
Cisco Catalyst 6500 Series Switches ***NEW UPDATES***	· Simplifies operations, reduces network costs, and increases resiliency through its Virtual Switch System 1440 technology · Automates network services, energy control and minimizes total cost of ownership with features such as GOLD, OBFL, SmartCallHome · Delivers comprehensive features for operational management, integrated services, QoS, and high availability · Provides WAN connectivity through its MPLS capabilities and SIP modules	2–4
Cisco Catalyst 4900M Series Switches	· Optimized for small-to-medium aggregation · Supports up to 24 ports with 10 Gigabit Ethernet Fiber interfaces · Supports up to 16 ports with 10 Gigabit Ethernet copper interfaces · Supports up to 32 ports with 1 Gigabit Fiber Ethernet · Supports up to 40 ports with 1 Gigabit Ethernet copper interfaces · Provides up to 320 Gbps forwarding capacity · Supports critical routing protocols and IPv6 in hardware including multicast · Features hot-swappable, redundant power supply and fans	2–12
Cisco Catalyst 4900 Series Switches	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 4900 Series Switches are data center top-of-rack optimized switches with emphasis on buffering for high throughput and full mesh traffic profiles. They offer: · Layer 2–4 switching and intelligent services with dynamic IP routing · Up to 48 1 Gigabit copper ports and up to four 10GE ports for branch core aggregation · Up to 28 SFP ports and two 10GE ports for branch core aggregation · Dual, hot-swappable internal AC or DC power supplies · Hot-swappable fan trays	2–13
Cisco Nexus Switches	For product information, refer to Chapter 6, "Data Center."	See 6–1
SERVICE PROVIDER—AGGREGATION SWITCHES		
Cisco Catalyst 6500 Series Switches ***NEW UPDATES***	· Simplifies operations, reduces network costs, and increases resiliency through its Virtual Switch System 1440 technology · Automates network services, energy control and minimizes total cost of ownership with features such as GOLD, OBFL, SmartCallHome · Delivers comprehensive features for operational management, integrated services, QoS, and high availability · Provides WAN connectivity through its MPLS capabilities and SIP modules	2–4
Cisco Catalyst 4500 Series Switches	· Supports hardware acceleration for Layer-2 through -4 intelligent network services · Delivers high-availability with In-Service Software Upgrade and redundant supervisors · Integrates simultaneous IPv4 and IPv6 support · Provides extensive services for Carrier Ethernet networks such as Cisco Resilient Ethernet Protocol, Flexlink+, Ethernet Operation and Management, fault isolation and service verification, QoS, private VLANs, and PPPoE Snooping · Port density for triple-play FTTx networks and L2 aggregation networks	2–8

Cisco Catalyst 4900M Series Switches	· Optimized for small-to-medium aggregation · Supports up to 24 ports with 10 Gigabit Ethernet interfaces · Supports up to 32 ports with 1 Gigabit Ethernet · Provides up to 320 Gbps forwarding capacity · Supports critical routing protocols and IPv6 in hardware including multicast · Features hot-swappable, redundant power supply and fans	2–12
Cisco ME 4900 Series Ethernet Switches ***NEW TO GUIDE***	· Optimized for small aggregation · Integrates into small central offices with limited rack space · Meets the requirements of high performance Carrier Ethernet networks · Features hot-swappable, redundant power supply and fans · Support 2 ports with 10GE uplinks and 28 ports with GE SFP downlinks	2–36
Cisco ME 3800X Series Ethernet Switches ***NEW PRODUCT***	· Converged, full-featured aggregation platform designed specifically for the mobile, business, and residential markets · Complements the Cisco 7600 Series Routers and Cisco ASR 9000 Series Aggregation Services Routers by providing a rich and scalable feature set of Layer 2 and Layer 3 VPN services in a compact package	2–38
Cisco ME 6500 Series Ethernet Access Switches ***NEW TO GUIDE***	· Delivers high performance, reliability, and QoS for small and remote offices · Addresses triple-play implementations supporting voice, video, and data services · Promotes adoption of VPN services for ETTH, ETTB, and DSLAM deployments · Extends advanced MPLS, QoS, multicase, and IPv6 features into Ethernet access and aggregation networks	2–39
SERVICE PROVIDER—ETHERNET ACCESS SWITCHES		
Cisco Catalyst 4500 Series Switches	· Supports hardware acceleration for Layer-2 through -4 intelligent network services · Delivers high-availability with In-Service Software Upgrade and redundant supervisors · Integrates simultaneous IPv4 and IPv6 support · Provides extensive services for Carrier Ethernet networks such as Cisco Resilient Ethernet Protocol, Flexlink+, Ethernet Operation and Management, fault isolation and service verification, QoS, private VLANs, and PPPoE Snooping · Port density for triple-play FTTx networks and L2 aggregation networks	2–8
Cisco ME 3400 Series Ethernet Access Switches ***NEW TO GUIDE***	· Helps reduce total cost of ownership and operating expenses · Simplifies deployment with a compact form factor · Promotes continuous switch operation · Helps shield subscribers from malicious users and traffic	2–41
Cisco ME 3400E Series Ethernet Access Switches ***NEW TO GUIDE***	· Supports deployment of advanced Ethernet business services · Provides tools to deliver high service availability · Offers a path for flexible and differentiated services · Enhances network services security against malicious use	2–42
Cisco ME 4900 Series Ethernet Access Switches ***NEW TO GUIDE***	· Addresses next-generation residential services · Integrates into small central offices with limited rack space · Meets the requirements of high-performance Carrier Ethernet networks · Offers triple-play service support (voice, video, and data)	2–36
Cisco ME 3600X Series Ethernet Access Switches ***NEW TO GUIDE***	· Built specifically for the convergence of wireless and wireline services · Enables service providers to initiate Multiprotocol Label Switching (MPLS)-based VPN services from within the access layer	2–44
CONNECTED GRID SWITCHES		
Cisco 2500 Series Connected Grid Switches ***NEW PRODUCT***	· Rugged industrial design and substation compliance: IEC 61850-3 and IEEE 1613 for harsh utility substation environments · Tools for easy deployment, management, and replacement · Advanced quality of service (QoS) capabilities to support mission-critical substation applications such as supervisory control and data acquisition (SCADA) and IEC 61850 generic object oriented substation event (GOOSE) messaging	2–46
SERVICES		
Cisco Switching Services Assess overall readiness with planning services and reduce the risk, delays, and total cost of deployment with an implementation-ready design that you can use to engineer your network.		2–47

FOR MORE INFORMATION

Product Ordering
To place an order, visit: http://www.cisco.com/en/US/ordering/index.shtml.

End-of-Life and End-of-Sale
Please visit the end-of-life and end-of-sale website for a complete and up-to-date listing of products that are no longer being sold or supported, what replacement products are available, and information about product support.
http://www.cisco.com/en/US/products/prod_end_of_life.html

NOTE: This chapter provides only a subset of Cisco products and part numbers. For the most up-to-date and comprehensive information, refer to the Cisco website at http://www.cisco.com, the Cisco ordering website at http://www.cisco.com/en/US/ordering/index.shtml, or reference the URL listed in the "For More Information" section of each product.

For more information about Cisco's switching platforms, refer to the Cisco Catalyst Switch Guide at http://www.cisco.com/go/switchguide.

Cisco Catalyst 6500 Series Switches

Cisco is extending the Cisco Catalyst 6500 innovations with the introduction of several new features and enhancements for the campus backbone, 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.

- Catalyst 6500 virtualization—Extending virtual switch system to support MPLS and IPv6 for virtualized services with integrated service modules
- Collaboration—Quality of service optimization to enhance video quality and end user experience
- Operations—Increased collaboration traffic visibility with Network Management Module (NAM) enhancements
- IPv6 innovations—IPv6/IPv4 dual stack support. MPLS and MPLS VPN over IPv6 support
- Service Module Integration—Support for key services such as mobility and security through its WiSM and firewall modules

Ideal for Companies That Need These Features

Cisco Catalyst 6513	· High-capacity chassis for Ethernet connectivity · Spare slots for services modules providing network security and management
Cisco Catalyst 6509-E	· Use in the wiring closet, distribution, core, data center, and WAN edge
Cisco Catalyst 6509-V-E	· 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 6506-E	· Medium-form factor chassis for the wiring closet, distribution, core, data center, and WAN edge
Cisco Catalyst 6504-E	· 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	· Low-density wiring-closet chassis sharing interface modules and supervisor engines with larger chassis for common sparing
Cisco Catalyst 6500 Virtual Switching Supervisor Engine 720-10G	· High-bandwidth deployments: core, distribution, aggregation, and data center access · Compatibility 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 · Compatibility with all Cisco Catalyst 6500 chassis
Cisco Catalyst 6500 Series Supervisor Engine 32 PISA	· Wiring closet access and the WAN edge · Compatibility with all Cisco Catalyst 6500 chassis
Cisco Catalyst 6500 Series Supervisor Engine 32	· Wiring closet access · Compatibility with all Cisco Catalyst 6500 chassis

Key Features and Benefits

- Cisco IOS Software modularity—The Cisco Catalyst 6500 Series reduces planned and unplanned downtime while boosting operational efficiency. Faults within modular subsystems are isolated from all other processes, and can be restarted without losing state (stateful process restarts). While modular IOS image will continue to be supported in 12.2(33)SXI, software patches will no longer be provided starting 12.2(33)SXI3.
- 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 Mpps of centralized and 450 Mpps of distributed switching performance, building the foundation for the Cisco Catalyst 6500 Virtual Switching System 1440.
- Multichassis EtherChannel (MEC) Support—MEC provides redundancy for physical links and switches and can be deployed using VSS on the Cisco Catalyst 6500 Series Switches.
- 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 IPv6 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). This module is orderable only until Sept 2010.
- 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.
- Flexible configuration options—Modular 3-slot, 4-slot, 6-slot, 9-slot, and 13-slot chassis provide flexible configurations with 40-GB per-slot capacity.
- End-to-end security—Cisco Catalyst 6500 switches support Cisco Network Admission Control (NAC) and 802.1x, hardware-based Control Plane Policing (CoPP); DHCP, IPSG; NetFlow; access control lists (ACLs), Secure Shell (SSH) Protocol and FWSM to provide security for both users and network services.
- Cisco EnergyWise—Energywise helps monitor and reduce company-wide power consumption and carbon footprint by allowing IT operations and facilities to measure and fine-tune power usage to realize significant cost savings. EnergyWise focuses on reducing power utilization on all devices connected to a Cisco network ranging from PoE devices such as IP phones to PCs.

Specifications

Feature	Cisco 6503-E	Cisco 6504-E	Cisco 6506-E	Cisco 6509-E	Cisco 6509-VE	Cisco 6513
Modular Slots	3	4	6	9	9	13
Gigabit Ethernet SFP density	98	146	242	386	384	410
10 Gigabit Ethernet XENPAK/X2 port density	34	50	82	130	130	84
10 Gigabit Ethernet RJ45 port density	32	48	80	128	128	80
10/100/1000 density	97	145	241	385	385	577
10/100 density	192	288	480	768	768	1152
100BASE-FX density	98	146	242	386	386	578
Max. watt power consumption (redundant mode)						
AC Internal[1]	1,400	2,700	6,000	8,700	8,700	8,700
DC Internal	950	2,700	6,000	6,000	6,000	6,000
Max. number of 10/100/1000 Class 3 devices (15.4W) Max. power supplies						
AC Internal	48	110	240	384	384	265
WAN Interfaces	DS0 to OC-192					
Available Bandwidth	Scalable to 240 Gbps	Scalable to 320 Gbps	Scalable to 480 Gbps	Scalable to 720 Gbps	Scalable to 720 Gbps	Scalable to 720 Gbps
Throughput	Scalable to 126Mpps	Scalable to 1744Mpps	Scalable to 270Mpps	Scalable to 414Mpps	Scalable to 414Mpps	Scalable to 456Mpps

Redundant Supervisor	Yes					
Hot-Swappable Power Supplies	Yes					
VLAN Maximum	4096					
EtherChannel Capable	Yes; up to 8 links of Fast Ethernet, Gigabit Ethernet or 10GE.					
Management Capabilities	CiscoWorks 2000, RMON, Encapsulated Remote Switched Port Analyzer (ERSPAN), SNMP, Telnet, BOOTP, and Trivial File Transfer Protocol (TFTP), EEM, GOLD, Smart Call Home, Syslog					
Rack Unit (RU)	4	5	12	15	21	20
Dimensions (H x W x D)	7 x 17.5 x 21.7 in. (17.8 x 44.1 x 55.2 cm.)	8.7 x 17.5 x 21.6 in. (22.2 x 44.5 x 55.2 cm.)	19.2 x 17.5 x 18.2 in. (48.8 x 44.5 x 46.0 cm.)	24.5 x 17.5 x 18.2 in. (62.2 x 44.5 x 46.0 cm.)	36.75 x 17.2 x 20.7 in. (93.3 x 43.1 x 53.3 cm.)	33.3 x 17.3 x 18.1 in. (84.6 x 43.7 x 46.0 cm.)
Unit weight (chassis only)	33 lbs. (15.0 kgs.)	40 lbs. (18.1 kgs.)	50 lbs. (22.7 kgs.)	60 lbs. (27.3 kgs.)	121 lbs. (54.9 kgs.)	98 lbs. (45.0 kgs.)

Supervisor Engines	**Virtual Switching Supervisor Engine 720-10G (VS-S720-10G-3C=) (VS-S720-10G-3CXL=)**	**Supervisor Engine 720 (WS-SUP720-3BXL) (WS-SUP720-3B)**
Chassis supported	All (except 6503 non-E)	All
Bandwidth per slot	40 Gbps	40 Gbps
Total bandwidth	720 Gbps	720 Gbps
Packets per second	48 Mpps centralized; 456 Mpps distributed	30 Mpps centralized; 425 Mpps distributed
MAC addresses supported	96K Max./80K effective	64K Max./32K effective
Routes supported	256,000 (3C); 1,000,000 (3CXL)	256,000 (3B); 1,000,000 (3BXL)
Onboard memory (DRAM)	1 GB	Up to 1GB
Supervisor Engines	**Supervisor Engine 32-PISA (WS-S32-GE-PISA=) (WS-S32-10GE-PISA=)**	**Supervisor Engine 32 (WS-SUP32-10GE-3B) (WS-SUP32-GE-3B)**
Chassis supported	All	All
Hardware Accelerated Network Based Application Recognition (NBAR)	✓ (approx 2 Gbps)	N/A
Hardware Accelerated Flexible Packet Matching (FPM)	✓ (approx 2 Gbps)	N/A
Total bandwidth	32 Gbps	32 Gbps
Packets per second	15 Mpps	15 Mpps
MAC addresses supported	64K Max./32K effective	64K Max./32K effective
Routes supported	256,000	256,000
Onboard Memory (DRAM)	Up to 1GB	Up to 1 GB

Supervisor 720 Scalability (Unicast)				
Supervisor	**WS-SUP720-3B**	**WS-SUP720-3BXL**	**VS-S720-10G-3C**	**VS-S720-10G-3CXL**
IPv4 Routing	Up to 400 Mpps in hardware	Up to 400 Mpps in hardware	Up to 450 Mpps in hardware	Up to 450 Mpps in hardware
IPv6 Routing	Up to 200 Mpps in hardware	Up to 200 Mpps in hardware	Up to 225 Mpps in hardware	Up to 225 Mpps in hardware
IPv4 Routes	256,000	1,000,000	256,000	1,000,000
IPv6 Routes	128,000	500,000	128,000	500,000

1. Redundant mode

Selected Part Numbers and Ordering Information

Catalyst 6500 Chassis	
WS-C6503-E	Cisco Catalyst 6500 Enhanced 3-slot chassis,4RU,no PS, no Fan Tray

WS-C6504-E	Cisco Catalyst 6500 Enhanced 4-slot chassis,5RU,no PS, no Fan Tray
WS-C6506-E	Cisco Catalyst 6500 Enhanced 6-slot chassis,12RU,no PS, no Fan Tray
WS-C6509-E	Cisco Catalyst 6500 Enhanced 9-slot chassis,15RU,no PS, no Fan Tray
WS-C6509-V-E	Cisco Catalyst 6500 Enhanced 9-slot Chassis (Vertical), No PS, Fan
WS-C6513	Cisco Catalyst 6500 13-slot chassis,20RU,no PS, no Fan Tray
Virtual Switching Supervisor Engine 720-10G Bundles	
VS-C6504E-S720-10G	Cisco Catalyst Chassis+Fan Tray+Sup720-10G; IP Base ONLY; NO VSS
VS-C6506E-S720-10G	Cisco Catalyst Chassis+Fan Tray+Sup720-10G; IP Base ONLY; NO VSS
VS-C6509E-S720-10G	Cisco Catalyst Chassis+Fan Tray+Sup720-10G; IP Base ONLY; NO VSS
VS-C6509VE-S720-10G	Cisco Catalyst Chassis+Fan Tray+Sup720-10G; IP Base ONLY; NO VSS
VS-C6513-S720-10G	Cisco Catalyst Chassis+Fan Tray+Sup720-10G; IP Base ONLY; NO VSS
Supervisor Engine 32 Bundles	
WS-C6503E-S32-10GE	Cisco Catalyst 6503E chassis, WS-SUP32-10GE-3B, Fan Tray (req.P/S)
WS-C6504E-S32-10GE	Cisco Catalyst 6504-E Chassis + Fan Tray + Sup32-10GE
WS-C6506E-S32-10GE	Cisco Catalyst 6506E chassis, WS-SUP32-10GE-3B, Fan Tray (req.P/S)
WS-C6509E-S32-10GE	Cisco Catalyst 6509E chassis, WS-SUP32-10GE-3B, Fan Tray (req.P/S)
WS-C6513-S32-10GE	Cisco Catalyst 6513 chassis, WS-SUP32-10GE-3B, Fan Tray (req. P/S)
WS-C6503E-S32-GE	Cisco Catalyst 6503E, WS-SUP32-GE-3B, Fan Tray (req. P/S)
WS-C6504E-S32-GE	Cisco 6504-E Chassis + Fan Tray + Sup32-GE
WS-C6506E-S32-GE	Cisco Catalyst 6506E, WS-SUP32-GE-3B, Fan Tray (req. P/S)
WS-C6509E-S32-GE	Cisco Catalyst 6509E, WS-SUP32-GE-3B, Fan Tray (req. P/S)
WS-C6513-S32-GE	Cisco Catalyst 6513, WS-SUP32-GE-3B, Fan Tray (req. P/S)
Advanced Technology Bundles	
DSN09E-VS720-AC-K9	Cisco Catalyst 6509E Data Center Services Bundle (6509-E Chassis, Dual-AC pwr, Sup720-10G, 3x FWSM, 1x ACE, 6704)
DSN09E-VS720-DC-K9	Cisco Catalyst 6509E Data Center Services Bundle (6509-E Chassis, Dual-DC pwr, Sup720-10G, 3x FWSM, 1x ACE, 6704)
DSN06E-VS720-AC-K9	Cisco Catalyst 6506E Data Center Services Bundle (6506-E Chassis, Dual-AC pwr, Sup720-10G, 3x FWSM, 1x ACE, 6704)
DSN06E-VS720-DC-K9	Cisco Catalyst 6506E Data Center Services Bundle (6506-E Chassis, Dual-DC pwr, Sup720-10G, 3x FWSM, 1x ACE, 6704)
DSN9VE-VS720-AC-K9	Cisco Catalyst 6509VE Data Center Services Bundle (6509-VE Chassis, Dual-AC pwr, Sup720-10G, 3x FWSM, 1x ACE, 6704)
DSN9VE-VS720-DC-K9	Cisco Catalyst 6509VE Data Center Services Bundle (6509-VE Chassis, Dual-DC pwr, Sup720-10G, 3x FWSM, 1x ACE, 6704)
WS-C6504-E-VPN+-K9	Cisco Catalyst 6504E IPSec VPN SPA Security System
WS-C6506-E-VPN+-K9	Cisco Catalyst 6506E IPSec VPN SPA Security System
WS-C6509-E-VPN+-K9	Cisco Catalyst 6509E IPSec VPN SPA Security System
WS-C6513-VPN+-K9	Cisco Catalyst 6513 IPSec VPN SPA Security System
WS-C6503-E-FWM-K9	Cisco Catalyst 6503E Firewall Security System
WS-C6506-E-FWM-K9	Cisco Catalyst 6506E Firewall Security System
WS-C6509-E-FWM-K9	Cisco Catalyst 6509E Firewall Security System
WS-C6513-FWM-K9	Cisco Catalyst 6513 Firewall Security System
WS-C6504E-ACE20-K9	Cisco ACE20 6504E Bundle with 4 Gbps Throughput License
WS-C6509E-ACE20-K9	Cisco ACE20 6509E Bundle with 8 Gbps Throughput License
WS-C6504-E-WISM	Cisco Catalyst 6504-E WiSM bundle (SUP720-3B,WiSM, Fan Tray, (2) P/S)
WS-C6509-E-WISM	Cisco Catalyst 6509-E WiSM bundle (SUP720-3B,WiSM, Fan Tray, no P/S)

For More Information

http://www.cisco.com/go/catalyst6500

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 and FTTH access) for unified communications with intelligent network services, sophisticated quality of service (QoS), predictable performance, advanced security, up to 30 watts of PoE, up to 384 ports, 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 Engines Supervisor 6-E and Supervisor 6L-E are high performance intelligent modular access switches for unified communications networks.

Ideal for Companies That Need These Features

Supervisors

Cisco Catalyst 4500 Series Supervisor Engine 6L-E	· High performance Layer 2, 3, and 4 switching · Centralized 280-Gbps switching capacity (225 millions of packets per second throughput) · Advanced QoS support with up to eight queues per port, dynamic queue sizing, and hierarchical policing to provide flexibility and control · Flexibility to operate at 6 or 24 Gbps per line-card slot · Dual 10 Gigabit Ethernet uplinks (X2 optics) · Support for line-rate forwarding for IPv6 packets · Dynamic hardware forwarding table allocations for ease of IPv4-to-IPv6 migration
Cisco Catalyst 4500 Series Supervisor Engine 6-E	· Designed for high-density enterprise wiring closets, medium-sized core, distribution, and branch-office collapsed core · 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 · High-performance IPv6 in hardware · Optimized for simultaneous 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; · Supports high-performance Layer 2, 3, and 4 switching · Compatibility with future versions with two 10-Gigabit Ethernet and four Gigabit Ethernet uplinks · Supports integrated NetFlow · Supports all Cisco Catalyst 4500 chassis

Chassis

Cisco Catalyst 4510R-E	· High performance, port density, 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 three hundred eighty-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 up to 34 10-Gigabit Ethernet ports · Up to 320-Gbps nonblocking switching fabric, 250-Mpps forwarding rate using the Supervisor Engine 6-E, or up to 24-Gbps per-slot bandwidth except the last 3 slots, which provide 6 Gbps per slot
Cisco Catalyst 4507R-E	· 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 up to 34 10-Gigabit Ethernet ports · Up to 280-Gbps, 210-Mpps, or 24-Gbps per-slot bandwidth when used with the Supervisor Engine 6-E, and Supervisor Engine 6L-E

Cisco Catalyst 4506-E

- 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, and Supervisor Engine 6L-E

Cisco Catalyst 4503-E

- 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 14 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, and Supervisor Engine 6L-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 and Benefits

- 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-four 10-Gigabit Ethernet ports.
- IP communications—Cisco prestandard, up to 15.4w IEEE 802.3af support, 20w for 802.1 1n support and up to 30 watts per port for future applications
- Cisco EnergyWise on the Catalyst 4500 and Catalyst 4500 E-Series—Allows IT operations and facilities to measure and fine-tune power usage to realize significant cost savings. EnergyWise focuses on reducing power utilization on all devices connected to a Cisco network ranging from PoE devices such as IP phones and wireless access points to integration with IP-enabled building and lighting controllers. For more information, see the following URL: http://www.cisco.com/en/US/products/ps10195/index.html.
- Cisco Catalyst 4500 E-Series and Cisco Catalyst 4500 switches extend the warranty from the previously offered 90-day warranty to a limited lifetime warranty (LLW). For more information, see the following URL: http://www.cisco.com/en/US/prod/collateral/switches/ps5718/ps4324/product_bulletin_c25-533284.html.

Specifications

4500 E-Series Chassis	Cisco 4503-E	Cisco 4506-E	Cisco 4507R-E	Cisco 4510R-E
Slots	3	6	7	10
Redundant Supervisor Option	No	No	Yes	Yes
Gigabit Ethernet GBIC/SFP density	104	244	248 with Dual Sup 6-Es and 4xTwinGigs	392 with Dual Sup 6-Es and 4xTwinGigs
10 GE X2 port density	14	32	34	34
10/100/1000 density	96	240	240	384
10/100 density	96	240	240	384
100BASE-FX, LX-10, BX-D density	96	240	240	384
Rack Unit (RU)	7	10	11	14
Backplane Capacity using Supervisor 6-E	136 Gbps	280 Gbps	280 Gbps	320 Gbps
Stackable	No	No	No	No
Enhanced Power Over Ethernet (ePoE) Support	Up to 20W of PoE – 37 ports can be enabled @ 20W[1]	Up to 20W of PoE – 37 ports can be enabled @ 20W[1]	Up to 20W of PoE – 37 ports can be enabled @ 20W[1]	Up to 20W of PoE – 37 ports can be enabled @ 20W [1]
Power Over Ethernet Plus (PoEP) Support (after software upgrade on premium linecard)	Up to 30W of PoE – 25 ports can be enabled @ 30W[1]	Up to 30W of PoE – 25 ports can be enabled @ 30W [1]	Up to 30W of PoE – 25 ports can be enabled @ 30W [1]	Up to 30W of PoE – 25 ports can be enabled @ 30W[1]

1+1 Power Supply Protection	Yes	Yes	Yes	Yes
Hot-Swappable Power Supplies	Yes	Yes	Yes	Yes
Max. watt power consumption				
AC Internal	6000W	6000W	6000W	6000W
AC External with power shelf	1,400 + power shelf = 7,500	1,400 + power shelf = 7,500	1,400 + power shelf = 7,500	1,400 + power shelf = 7,500
DC Internal	1,400 + UPS = 7,500	1,400 + UPS = 7,500	1,400 + UPS = 7,500	1,400 + UPS = 7,500
Max. number of Class 3 devices (15.4W) Max. power supplies				
AC Internal	108	240	240	289
AC External with power shelf	108	240	240	364
DC Internal	108	240	240	384
Unit weight (with Fan Tray)	32.25 lbs. (14.63 kgs.)	40.50 lbs. (18.37 kgs)	44.50 lbs. (20.19 kgs)	54.50 lbs. (24.73 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)

Supervisor Engines	**Supervisor 6-E (WS-X45-Sup6-E)**	**Supervisor 6L-E (WS-X45-Sup6L-E)**	**Supervisor V-10GE (WS-X4516-10GE)**
Chassis supported	All	All	All
Enhanced Layer 3 option	yes	yes	yes
Total bandwidth (Gbps)	320	280	136
Packets per second (Mpps)	250 (IPv4) 125 (IPv6)	225 (IPv4) 110 (IPv6)	102
CPU MHz	1300	800	400
NetFlow	no	no	included
Onboard memory (DRAM)	512 MB upgradable to 1 GB	512 MB upgradable to 1 GB	512 MB
On-Board Flash	128 MB	64 MB 128 MB	64 MB
Compact Flash Support	Yes	Yes	Yes
Switching Capacity & Throughput	320 Gbps, 250 Mpps	280 Gbps, 225 Mpps	136 Gbps, 102 Mpps
Multilayer Switching	Enhanced L2/3/4 Services & Routing	Enhanced L2/3/4 Services & Routing	Enhanced L2/3/4 Services & Routing
(E)IGRP, OSPF, IS:IS, BGP	Yes	Yes	Yes
Supervisor Redundancy	4507R, 4510R, 4507R-E, 4510R-E, WS-C4507R, WS-C4507R+E, and WS-C4510R-E	4507R, 4507R-E, WS-C4507R-E, and WS-C4507R+E	4507R, 4510R, 4507R-E, 4510R-E, WS-C4507R-E, WS-C4507R+E, and WS-C4510R-E.
QoS	8Q/Port, MQC, Dynamic Tx Queue sizing, policing, shaping, congestion avoidance with DBL marking	8Q/Port, MQC, Dynamic Tx Queue sizing, policing, shaping, congestion avoidance with DBL marking	4Q/Port, policing, shaping, congestion avoidance
NetFlow Support	No	No	Yes (Built-in functionality; no Daughter Card Required)
ISL	No	No	No
ACLS	Yes	No	No
IP FIB entries	256K	57K	128K
MAC Addresses	32K Multicast	55K Unicast, 16K Multicast	32K Unicast, 16K Multicast

1. With a maximum 750W per slot

Selected Part Numbers and Ordering Information

Catalyst 4500 E-Series—Chassis, Supervisors	
WS-C4503-E	Cisco Catalyst 4500 E-Series 3-Slot Chassis, fan, no ps
WS-C4506-E	Cisco Catalyst 4500 E-Series 6-Slot Chassis, fan, no ps
WS-C4507R-E	Cisco Catalyst 4500 E-Series 7-Slot Chassis, fan, no ps, redundant supervisor capable
WS-C4510R-E	Cisco Catalyst 4500 E-Series 10-Slot Chassis, fan, no ps, redundant supervisor capable
WS-C4507R+E	Cisco Catalyst 4500 E Series 7-Slot 48G/slot capable chassis, fan, no ps, redundant supervisor capable
WS-C4503E-S6L-48V+	Cisco Catalyst 4503-E PoE Bundle, WS-C4503-E WS-X45-SUP6L-E WS-X4648-RJ45V+E
WS-C4506E-S6L-96V+	Cisco Catalyst 4506-E PoE Bundle WS-C4506-E WS-X45-SUP6L-E 2xWS-X4648-RJ45V+E
WS-C4507RES6L-96V+	Cisco Catalyst 4507R-E PoE Bundle WS-C4507R-E WS-X45-SUP6L-E 2xWS-X4648-RJ45V+E
WS-C4510RES6-96V+	Cisco Catalyst 4510R-E PoE Bundle WS-C4510R-E WS-X45-SUP6-E 2xWS-X4648-RJ45V+E
BN-CF2-SBA-K9	Cisco SBA Wireless Bundle 1x WS-X4624-SFP-E AIR-CT5508-50-K9 and 1x 4507R-E 1x Sup6L-E IP Base
WS-X45-SUP6-E (=)	Cisco Catalyst 4500 E-Series Sup6-E, 2x10GE(X2) w/ Twin Gig
WS-X45-SUP6L-E (=)	Cisco Catalyst 4500 E-Series Sup6-E Lite, 2x10GE(X2) w/ Twin Gig
WS-X4516-10GE (=)	Cisco Catalyst 4500 Supervisor V-10GE, 2x10GE(X2), 4x1GE (SFP)
WS-C4503E-S6L-1300	Cisco Catalyst 4503-E Chassis, One WS-X4648-RJ45V+E, Sup6L-E, 1300W PS
WS-C4506E-S6L-1300	Cisco Catalyst 4506-E Chassis, Two WS-X4648-RJ45V+E, Sup6L-E, 1300W PS
WS-C4506E-S6L-2800	Cisco Catalyst 4506-E Chassis, Two 24G PoEP Line Cards, Sup6L-E, 2800W PS
WS-C4506E-S6L-4200	Cisco Catalyst 4506-E Chassis, Two 24G PoEP Line Cards, Sup6L-E, 4200W PS
Catalyst 4500 and 4500-E Series Line Cards	
WS-X4624-SFP-E (=)	Catalyst 4500 E-Series 24-Port GE (SFP)
WS-X4148-FX-MT	Cisco Catalyst 4500 FE Switching Module, 48-100FX MMF(MTRJ)
WS-X4148-FX-MT=	Cisco Catalyst 4500 FE Switching Module, 48-100FX MMF(MTRJ) (Spare)
WS-X4148-RJ	Cisco Catalyst 4500 10/100 Auto Module, 48-Ports (RJ-45)
WS-X4148-RJ=	Cisco Catalyst 4500 10/100 Auto Module, 48-Ports (RJ-45)(Spare)
WS-X4248-RJ45V	Cisco Catalyst 4500 PoE 802.3af 10/100, 48-Ports (RJ45)
WS-X4248-RJ45V=	Cisco Catalyst 4500 PoE 802.3af10/100, 48-Ports (RJ45) (Spare)
WS-X4306-GB	Cisco Catalyst 4500 Gigabit Ethernet Module, 6-Ports(GBIC)
WS-X4306-GB=	Cisco Catalyst 4500 GigabitEthernet Module, 6-Ports(GBIC) (Spare)
WS-X4548-GB-RJ45	Cisco Catalyst 4500 Enhanced48-Port 10/100/1000 Base-T (RJ-45)
WS-X4548-GB-RJ45=	Cisco Catalyst 4500 Enhanced 48-Port 10/100/1000 Base-T (RJ-45) (spare)
WS-X4548-RJ45V+	Cisco Catalyst 4500 PoE+ Ready10/100/
WS-X4648-RJ45V+E	Cisco Catalyst 4500 E-Series 48-Port PoE+ Ready 10/100/1000(RJ45)
WS-X4548-RJ45V+=	Cisco Catalyst 4500 PoE+ Ready10/100/1000, 48-Port(RJ45)
WS-X4648-RJ45V+E=	Cisco Catalyst 4500 E-Series 48-Port PoE+ Ready 10/100/1000(RJ45)
WS-X4848-RJ45-E	Cisco Catalyst 4500 E-series 48 port 10/100/1000 data card

For More Information

http://www.cisco.com/go/catalyst4500

Cisco Catalyst 4900M Series Switch

The Cisco Catalyst 4900M Switch is a Layer 2–4 fixed-configuration switch that offers high performance for top-of-rack server switching and for small and midsize aggregation deployments. The switch offers high performance, deterministic low latency, full IPv6 hardware forwarding, and media flexibility in a compact 2RU form factor.

Ideal for Companies That Need These Features

Cisco Catalyst 4900M

- Flexibility of Gigabit Ethernet and 10 Gigabit Ethernet ports in the same switch
- Full media flexibility for Gigabit Ethernet and 10-Gigabit Ethernet fiber and copper connectivity
- Wire-speed L2 and L3 switching at speeds less than 3 microseconds
- Up to 24 ports of 10 Gigabit Ethernet and up to 40 ports of Gigabit Ethernet in 2RU with dual power supplies
- Nonblocking Layer 2, 3, and 4 10/100/1000 Gigabit Ethernet, 1000BASE-X, and 10-Gigabit Ethernet performance

Key Features and Benefits

- The Cisco Catalyst 4900M Switch provides packet-size independent low-latency and wire-speed switching.
- The switch provides up to 40 10/100/1000 ports and up to 24 10-Gigabit Ethernet ports (X2).
- The switch has redundant hot-swappable 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.
- Advanced IPv4 and IPv6 Unicast routing protocols (OSPF, EIGRP, IS-IS, and BGPv4) are supported for load balancing and constructing scalable networks.
- Advanced IPv4 and IPv6 Multicast routing protocols (including Multicast Listener Discovery Versions 1 and 2 [MLDv1 and v2] snooping) are supported.
- Intelligent QoS and traffic management, including sharing, shaping, and strict-priority configurations, determine scheduling of egress traffic.

Specifications

Feature	Cisco 4900M
Forwarding bandwidth (Gbps)	320
Maximum stack members	0
Packets per second (Mpps)	250
MAC addresses supported	55,000
Routes supported	256,000
Onboard memory (DRAM)	512MB
10 GbE density	24
Gigabit Ethernet SFP density	32
X2 port density	24
10/100/1000 density	40
10/100 density	0
AC/DC support	AC/DC
Dimensions (H x W x D)	3.5 x 17.2 x 17.9in (89 x 437 x 455 cm)
Unit weight	25 to 39 (11.3 to 17.6kgs)

Selected Part Numbers and Ordering Information

Cisco Catalyst 4900M Switch Series	
WS-C4900M	Cisco Catalyst 4900M 8-port wire speed 10GE base system
WS-X4904-10GE	4 port wire speed 10GE card
WS-X4908-10GE	8 port 2:1 10 GE card
WS-X4920-GB-RJ45	20 port wire speed 10/100/1000 RJ45 card
WS-X4908-10G-RJ45	8 port 2:1 10GE/1GE copper card[1]

PWR-C49M-1000AC	4900M AC power supply, 1000 watts
PWR-C49M-1000DC	4900M DC power supply 1000 watts

1. Expected FCS August 2010

For More Information

http://www.cisco.com/go/catalyst4900

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 4948E	· 48 ports of Gigabit Ethernet switching in 1RU with dual power supplies with four 10-Gigabit Ethernet uplinks · Nonblocking Layer 2, 3, and 4 10/100/1000 Gigabit Ethernet performance with 10-Gigabit Ethernet uplinks
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 two 10-Gigabit Ethernet uplinks
Cisco Catalyst 4948	· 48 ports of Gigabit Ethernet switching in 1RU with dual power supplies · Nonblocking Layer 2, 3, and 4 10/100/1000 Gigabit Ethernet performance
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 and Benefits

- Low-latency and wire-speed switching
- 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
- Optimized to handle microbursts with centralized buffer architecture
- Investment protection through data center design with dual-stack IP Version 4 and 6 (IPv4 and v6) support
- Advanced QoS with eight configurable queues for each port[1]
- Data center optimization with true front-to-back airflow[2]
- Enhanced manageability through bidirectional Switched Port Analyzer (SPAN) and Remote SPAN (RSPAN) sessions
- Packet-rate policer, control plane and packet policer, and dynamic buffer limiting (DBL) for increased security and network control

Specifications

Feature	Cisco 4948	Cisco 4948-10GE	Cisco 4928-10GE	Cisco 4948E
Forwarding bandwidth (Gbps)	96	136	96	179
Maximum stack members	0	0	0	0
Total stack bandwidth (Gbps)	0	0	0	0
Packets per second (Mpps)	72	102	72	131
MAC addresses supported	32,768	55,000	55,000	55,000
Routes supported	32,000	32,000	32,000	57,000
Onboard memory (DRAM)	256 MB	256 MB	256MB	512MB
10 GE density	0	2	2	4
Gigabit Ethernet GBIC/SFP density	4	0	28	48
10 GE XENPAK/X2 port density	0	2	2	4 SFP+

1. Catalyst 4948E feature
2. Catalyst 4948E feature

10/100/1000 density	48	48	0	48
10/100 density	0	0	0	0
Max. watt power consumption	300	300	300	300
AC/DC support	AC/DC	AC/DC	AC/DC	AC/DC
Dimensions (H x W x D)	1.75 x 17.3 x 16.1 in. (4.45 x 43.91 x 40.99 cm.)	1.75 x 17.3 x 16.1 in. (4.45 x 43.91 x 40.99 cm.)	1.75 x 17.3 x 16.1 in. (4.45 x 43.91 x 40.99 cm.)	1.75 x 17.5 x 19.4 in
Unit weight	16.5 (7.48 kgs.)	16.5 (7.48 kgs.)	16.5 (7.48 kgs.)	14 lbs

Selected Part Numbers and Ordering Information

Cisco Catalyst 4900 Switch Series	
WS-C4948E	Cisco Catalyst 4948E 48 10/100/1000(RJ45)+4 SFP+, opt sw, no p/s
WS-C4948E-S	Cisco Catalyst 4948E 48 10/100/1000(RJ45)+4 SFP+, IP Base IOS, AC p/s
WS-C4948E-E	Cisco Catalyst 4948E 48 10/100/1000(RJ45)+4 SFP+, Ent Ser IOS, AC p/s
WS-C4948E-BDL	Green Bundle 10x WS-C4948E
WS-C4948	Cisco Catalyst 4948, optnl sw, 48-Port 10/100/1000+4 SFP, no p/s
WS-C4948-S	Cisco Catalyst 4948, IPB s/w, 48-Port 10/100/1000+4 SFP, 1 AC p/s
WS-C4948-E	Cisco Catalyst 4948, ES s/w, 48-Port 10/100/1000+4 SFP, 1 AC p/s
WS-C4928-10GE	Cisco Catalyst 4928 10 Gigabit Ethernet Switch
WS-C4948-10GE	Cisco Catalyst 4948, optnl sw, 48*10/100/1000+2*10GE(X2), no p/s
WS-C4948-10GE-S	Cisco Catalyst 4948, IPB s/w, 48*10/100/1000+2*10GE(X2), 1 AC p/s
WS-C4948-10GE-E	Cisco Catalyst 4948, ES Image, 48*10/100/1000+2*10GE(X2), 1 AC p/s

For More Information

http://www.cisco.com/go/catalyst4900

Cisco Catalyst 3750-X Series Switch

The Cisco Catalyst 3750-X Series Switches are an enterprise-class line of stackable switches. These switches provide high availability, scalability, security, energy efficiency, and ease of operation with innovative features such as Cisco StackPower technology, IEEE 802.3at Power over Ethernet Plus (PoE+) configurations, optional network modules, redundant power supplies, and Media Access Control Security (MACsec) features.

The Cisco Catalyst 3750-X Series with Cisco StackWise Plus technology provides scalability, ease of management, and investment protection for evolving business needs. The Cisco Catalyst 3750-X enhances productivity by enabling applications such as IP telephony, wireless, and video for the borderless network experience.

Ideal for Companies That Need These Features

Cisco Catalyst 3750-X	· 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, and video
Cisco Catalyst 3750X-24T-L	· Low-density access with switch stacking capability, LAN Base feature set, and two 10-Gigabit Ethernet Small Form-Factor Pluggable Plus (SFP+) uplinks
Cisco Catalyst 3750X-48T-L	· Medium-density access with switch stacking capability, LAN Base feature set, and two 10-Gigabit Ethernet SFP+ uplinks
Cisco Catalyst 3750X-24P-L	· Low-density access with switch stacking capability, LAN Base feature set, PoE+, and two 10-Gigabit Ethernet SFP+ uplinks
Cisco Catalyst 3750X-48P-L	· Medium-density access with switch stacking capability, LAN Base feature set, PoE+, and two 10-Gigabit Ethernet SFP+ uplinks
Cisco Catalyst 3750X-48PF-L	· Medium-density access with switch stacking capability, LAN Base feature set, PoE+, two 10-Gigabit Ethernet SFP+ uplinks, and 1100 WAC power supply
Cisco Catalyst 3750X-24T-S	· Low-density access with switch stacking capability, IP Base feature set, and two 10-Gigabit Ethernet SFP+ uplinks

Cisco Catalyst 3750X-48T-S	· Medium-density access with switch stacking capability, IP Base feature set, and two 10-Gigabit Ethernet SFP+ uplinks
Cisco Catalyst 3750X-24P-S	· Low-density access with switch stacking capability, IP Base feature set, PoE+, and two 10-Gigabit Ethernet SFP+ uplinks
Cisco Catalyst 3750X-48P-S	· Medium-density access with switch stacking capability, IP Base feature set, PoE+, and two 10-Gigabit Ethernet SFP+ uplinks
Cisco Catalyst 3750X-48PF-S	· Medium-density access with switch stacking capability, IP Base feature set, PoE+, two 10-Gigabit Ethernet SFP+ uplinks, and 1100W AC power supply

Key Features and Benefits

- 24 and 48 10/100/1000 Power over Ethernet Plus (PoE+) and non-PoE models
- Optional four Gigabit Ethernet (GE) Small Form-Factor Pluggable (SFP) or two 10 GE SFP+ uplink network modules
- Industry-first PoE+ with 30W power on all ports in a 1 rack unit (1RU) form factor
- Dual redundant, modular power supplies and fans
- Media Access Control Security (MACsec) hardware-based encryption
- IPv4 and IPv6 routing, Multicast routing, advanced quality of service (QoS), and security features in hardware
- Enhanced limited lifetime warranty (LLW) with next-business-day (NBD) advance hardware replacement and 90-day access to Cisco Technical Assistance Center (TAC) support
- Enhanced Cisco EnergyWise technology for operational cost optimization by measuring actual power consumption of the PoE devices, reporting, and reducing energy consumption across the network
- USB Type-A and Type-B ports for storage and console, respectively, and an out-of-band Ethernet management port
- Cisco StackPower technology—An innovative feature and industry first for sharing power among stack members
- Cisco StackWise Plus technology for ease of use and resiliency with 64 Gbps of throughput
- Investment protection with backward compatibility with all other models of Cisco Catalyst 3750 Series Switches

Specifications

Feature	Cisco 3750X-24T-L	Cisco 3750X-48T-L	Cisco 3750X-24P-L	Cisco 3750X-48P-L	Cisco 3750X-48PF-L
Forwarding bandwidth (Gbps)	160	160	160	160	160
Maximum stack members	9	9	9	9	9
Total stack bandwidth (Gbps)	64	64	64	64	64
Packets per second (Mpps)	65.5	101.2	65.5	101.2	101.2
MAC addresses supported	12,000	12,000	12,000	12,000	12,000
Routes supported	11,000	11,000	11,000	11,000	11,000
10 GE density	2	2	2	2	2
10 GE SFP+	2	2	2	2	2
10/100/1000 density	24	48	24	48	48
10/100 density	24	48	24	48	48
100BASE-FX density	0	0	0	0	0
Measured 100% Throughput power consumption (without PoE loads, 1 Gps uplink module)	93.5	120.4	99.3	133.9	137.2
PoE: Max. 802.3af Class 3 devices (15.4W)	-	-	24	48	48
PoE: Max. 802.3af Class 2 devices (7.3W)	-	-	24	48	48
AC/DC support	AC and DC	AC and DC	AC and DC	AC and DC	AC and DC
Dimensions (H x W x D)	1.75 x 17.5 x 18.0 in (4.45 x 44.5 x 46.0 cm.)	1.75 x 17.5 x 18.0 in (4.45 x 44.5 x 46.0 cm.)	1.75 x 17.5 x 18.0 in (4.45 x 44.5 x 46.0 cm)	1.75 x 17.5 x 18.0 in (4.45 x 44.5 x 46.0 cm.)	1.75 x 17.5 x 19.5 in (4.45 x 44.5 x 49.5 cm.)

Unit weight	15.6 lbs. (7.1 kgs.)	16.3 lbs. (7.4 kgs.)	15.8 lbs. (7.2 kgs.)	16.5 lbs. (7.5 kgs.)	16.7 lbs. (7.6 kgs.)
	Cisco 3750X-24T-S	**Cisco 3750X-48T-S**	**Cisco 3750X-24P-S**	**Cisco 3750X-48P-S**	**Cisco 3750X-48PF-S**
Forwarding bandwidth (Gbps)	160	160	160	160	160
Maximum stack members	9	9	9	9	9
Total stack bandwidth (Gbps)	64	64	64	64	64
Packets per second (Mpps)	65.5	101.2	65.5	101.2	101.2
MAC addresses supported	12,000	12,000	12,000	12,000	12,000
Routes supported	11,000	11,000	11,000	11,000	11,000
10 GE density	2	2	2	2	2
10 GE XFP	2	2	2	2	2
10/100/1000 density	24	48	24	48	48
10/100 density	24	48	24	48	48
100BASE-FX density	0	24	0	0	0
Measured 100% Throughput power consumption (without PoE load, I Gbps uplink module)	93.5	120.4	99.3	133.9	137.2
PoE: Max. 802.3af Class 3 devices (15.4W)	-	-	24	48	48
PoE: Max. 802.3af Class 2 devices (7.3W)	-	-	24	48	48
AC/DC support	AC and DC	AC and DC	AC and DC	AC and DC	AC and DC
Dimensions (H x W x D)	1.75 x 17.5 x 18.0 in (4.45 x 44.5 x 46.0 cm.)	1.75 x 17.5 x 18.0 in (4.45 x 44.5 x 46.0 cm.)	1.75 x 17.5 x 18.0 in (4.45 x 44.5 x 46.0 cm.)	1.75 x 17.5 x 18.0 in (4.45 x 44.5 x 46.0 cm.)	1.75 x 17.5 x 19.5 in (4.45 x 44.5 x 49.5cm.)
Unit weight	15.6 lbs. (7.1 kgs.)	16.3 lbs. (7.4 kgs.)	15.8 lbs. (7.2 kgs.)	16.5 lbs. (7.5 kgs.)	16.7 lbs. (7.6 kgs.)

Selected Part Numbers and Ordering Information

Catalyst 3750-X Series 10/100/1000 Workgroup Switches[1]	
WS-C3750X-24T-L	Cisco 3750-X stackable 24 10/100/1000 Ethernet ports, with 350W AC power supply 1 RU, LAN Base feature set
WS-C3750X-48T-L	Cisco 3750-X stackable 48 10/100/1000 Ethernet ports, with 350W AC power supply 1 RU, LAN Base feature set
WS-C3750X-24P-L	Cisco 3750-X stackable 24 10/100/1000 Ethernet PoE+ ports, with 715W AC power supply 1 RU, LAN Base feature set
WS-C3750X-48P-L	Cisco 3750-X stackable 48 10/100/1000 Ethernet PoE+ ports, with 715W AC power supply 1 RU, LAN Base feature set
WS-C3750X-48PF-L	Cisco 3750-X stackable 48 10/100/1000 Ethernet PoE+ ports, with 1100W AC power supply 1 RU, LAN Base feature set
WS-C3750X-24T-S	Cisco 3750-X stackable 24 10/100/1000 Ethernet ports, with 350W AC power supply 1 RU, IP Base feature set
WS-C3750X-48T-S	Cisco 3750-X stackable 48 10/100/1000 Ethernet ports, with 350W AC power supply 1 RU, IP Base feature set
WS-C3750X-24P-S	Cisco 3750-X stackable 24 10/100/1000 Ethernet PoE+ ports, with 715W AC Power Supply 1 RU, IP Base feature set
WS-C3750X-48P-S	Cisco 3750-X stackable 48 10/100/1000 Ethernet PoE+ ports, with 715W AC Power Supply 1 RU, IP Base feature set
WS-C3750X-48PF-S	Cisco 3750-X stackable 48 10/100/1000 Ethernet PoE+ ports, with 1100W AC power supply 1 RU, LAN Base feature set

1. 1.L=LAN Base; S=IP Base

For More Information

http://www.cisco.com/go/3750x

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 3750-E	· 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	· 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	· Low-density access with switch stacking capability, Layer 2+ or Layer 3 features, PoE, and one or more 10-Gigabit Ethernet fiber uplinks
Cisco Catalyst 3750E-24TD-SD	· Low-density access with switch stacking capability, Layer 2+ or Layer 3 features, and one or more 10-Gigabit Ethernet fiber uplinks, DC power
Cisco Catalyst 3750E-48TD	· Medium-density access with switch stacking capability, Layer 2+ or Layer 3 features, and one or more 10-Gigabit Ethernet fiber uplinks
Cisco Catalyst 3750E-48TD-SD	· Medium-density access with switch stacking capability, Layer 2+ or Layer 3 features, and one or more 10-Gigabit Ethernet fiber uplinks, DC power
Cisco Catalyst 3750E-48PD	· 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 3750E-48PD	· 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 and Benefits

- Cisco StackWise Plus technology—One IP address and one command-line interface (CLI) simplify management. A 64-Gbps resilient architecture speeds convergence, and 1:N 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.
- Availability—The Cisco Catalyst 3750-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. Each port may support up to 20W of power.
- 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 (VRFLite) 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.
- Field-replaceable and -upgradable power supplies and fan.
- Cisco TwinGig Converter Module for migrating uplinks from 1 Gigabit Ethernet (Small Form-Factor Pluggable [SFP]) to 10 Gigabit Ethernet (X2).
- Cisco EnergyWise helps reduce company-wide power consumption and carbon footprint.
- Cisco limited lifetime warranty.

Specifications

Feature	Cisco 3750E-24TD	Cisco 3750E-24TD-SD	Cisco 3750E-48TD	Cisco 3750E-48TD-SD	Cisco 3750E-24PD	Cisco 3750E-48PD	Cisco 3750E-48PD Full Power
Forwarding bandwidth (Gbps)	128	128	128	128	128	128	128
Maximum stack members	9	9	9	9	9	9	9
Total stack bandwidth (Gbps)	64	64	64	64	64	64	64
Packets per second (Mpps)	6.5	6.5	13.1	13.1	6.5	13.1	6.5
MAC addresses supported	12,000	12,000	12,000	12,000	12,000	12,000	12,000
Routes supported	11,000	11,000	11,000	11,000	11,000	11,000	11,000
10 GE density	2	2	2	2	2	2	2
10 GE XFP	2	2	2	2	2	2	2
10/100/1000 density	24	24	48	48	24	48	48
10/100 density	24	24	48	48	24	48	48
100BASE-FX density	0	0	0	0	0	0	24
Measured 100% Throughput power consumption (with Max. 15.4 W PoE loads)	99	99	149	149	375	375	744
PoE: Max. 802.3af Class 3 devices (15.4W)	-	-	-	-	24	48	48
PoE: Max. 802.3af Class 2 devices (7.3W)	-	-	-	-	24	48	48
AC/DC support	AC and DC	DC power	AC and DC	DC power	AC and DC	AC and DC	AC and DC
Dimensions (H x W x D)	1.75 x 17.5 x 18.1 in.; (4.45 x 44.5 x 46.0 cm.)	1.75 x 17.5 x 18.1 in.; (4.45 x 44.5 x 46.0 cm.)	1.75 x 17.5 x 18.1 in: (4.45 x 44.5 x 46.0 cm.)	1.75 x 17.5 x 18.1 in: (4.45 x 44.5 x 46.0 cm.)	1.75 x 17.5 x 18.1 in: (4.45 x 44.5 x 46.0 cm.)	1.75 x 17.5 x 18.1 in: (4.45 x 44.5 x 46.0 cm.)	1.75 x 17.5 x 18.1 in: (4.45 x 44.5 x 46.0 cm.)
Unit weight	17.9 lbs. (8.1 kgs.)	17.9 lbs. (8.1 kgs.)	18.3 lbs. (8.3 kgs.)	18.3 lbs. (8.3 kgs.)	18.8 lbs. (8.6 kgs.)	19.2 lbs. (8.75 kgs.)	20.9 lbs. (9.5 kgs.)

Selected Part Numbers and Ordering Information

Catalyst 3750-E Series 10/100/1000 Workgroup Switches[1]	
WS-C3750E-24TD-S	Cisco Catalyst 3750E 24 10/100/1000+2*10GE(X2), 265W, IPB s/w
WS-C3750E-24TD-S D	Cisco Catalyst 3750E 24 10/100/1000+2*10GE(X2), 265W DC, IPB s/w
WS-C3750E-24TD-E	Cisco Catalyst 3750E 24 10/100/1000+2*10GE(X2), 265W, IPS s/w
WS-C3750E-48TD-S	Cisco Catalyst 3750E 48 10/100/1000+2*10GE(X2), 265W, IPB s/w
WS-C3750E-48TD-SD	Cisco Catalyst 3750E 48 10/100/1000+2*10GE(X2), 265W DC, IPB s/w
WS-C3750E-48TD-E	Cisco Catalyst 3750E 48 10/100/1000+2*10GE(X2), 265W, IPS s/w
WS-C3750E-24PD-S	Cisco Catalyst 3750E 24 10/100/1000 PoE+2*10GE(X2), 750W, IPB s/w
WS-C3750E-24PD-E	Cisco Catalyst 3750E 24 10/100/1000 PoE+2*10GE(X2), 750W, IPS s/w
WS-C3750E-48PD-S	Cisco Catalyst 3750E 48 10/100/1000 PoE+2*10GE(X2), 750W, IPB s/w
WS-C3750E-48PD-E	Cisco Catalyst 3750E 48 10/100/1000 PoE+2*10GE(X2), 750W, IPS s/w
WS-C3750E-48PD-SF	Cisco Catalyst 3750E 48 10/100/1000 PoE+2*10GE(X2), 1150W, IPB s/w
WS-C3750E-48PD-EF	Cisco Catalyst 3750E 48 10/100/1000 PoE+2*10GE(X2), 1150W, IPS s/w
Catalyst 3750-E Series Product Activation Keys	
3750E-IPS-LIC-B=	IP Services for 3750-E 24 ports, upgrade from IP Base
3750E48-IPS-LIC-B=	IP Services for 3750-E 48 ports, upgrade from IP Base

1. S=IP Base; E=IP Services

For More Information

http://www.cisco.com/go/catalyst3750E

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 3750	· Enhanced business productivity, resiliency, security, and scalability · Quick deployment and easy network management · Deployment of IP telephony, wireless, or Gigabit to the Desktop (GTTD)
Cisco Catalyst 3750V2-24TS	· Low-density access with switch stacking capability, Layer 2+ or Layer 3 features, and one or more fiber uplinks
Cisco Catalyst 3750V2-24PS	· Low-density access with switch stacking capability, Layer 2+ or Layer 3 features, PoE, and one or more fiber uplinks
Cisco Catalyst 3750V2-48TS	· Medium-density access with switch stacking capability, Layer 2+ or Layer 3 features, and one or more fiber uplinks
Cisco Catalyst 3750V2-48PS	· Medium-density access with switch stacking capability, Layer 2+ or Layer 3 features, PoE, and one or more fiber uplinks
Cisco Catalyst 3750G-24T	· Low-density Layer 2+ or Layer 3 GTTD or Ethernet aggregation with stacking capability without any uplinks
Cisco Catalyst 3750G-24TS-1U	· Low-density Layer 2+ or Layer 3 GTTD or Ethernet aggregation with switch stacking capability and fiber uplinks in a 1RU form factor
Cisco Catalyst 3750G-24PS	· Low-density Layer 2+ or Layer 3 GTTD or Ethernet aggregation with switch stacking capability, PoE, and fiber uplinks
Cisco Catalyst 3750G-48TS	· Medium-density Layer 2+ or Layer 3 GTTD or Ethernet aggregation with switch stacking capability and fiber uplinks
Cisco Catalyst 3750G-48PS	· Medium-density Layer 2+ or Layer 3 GTTD or Ethernet aggregation with switch stacking capability, PoE, and fiber uplinks
Cisco Catalyst 3750G-12S/SD	· Aggregation of wiring-closet switches with optical connectivity and stacking
Cisco Catalyst 3750-24FS	· 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-24WS-S25	· Integrated wireless LAN (WLAN) controller functions into Cisco Catalyst 3750G Series Switches (This switch supports 25 access points.)
Cisco Catalyst WS-C3750G-24WS-S50	· Integrated WLAN controller functions into Cisco Catalyst 3750G Series Switches (This switch supports 50 access points.)

Key Features and Benefits

- Cisco StackWise technology—One IP address and one command-line interface (CLI) simplify management. A 32-Gbps resilient architecture speeds convergence, and 1:N 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.
- Availability—These 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 (OPSF), 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 (VRFLite) 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 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.
- Wireless—The Switch models with 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.
- Cisco EnergyWise helps reduce company-wide power consumption and carbon footprint.
- Cisco limited lifetime warranty.

Specifications

Feature	Cisco 3750V2-24TS	Cisco 3750V2-48TS	Cisco 3750V2-24PS	Cisco 3750V2-48PS	Cisco 3750-24FS
Forwarding bandwidth (Gbps)	32	32	32	32	32
Maximum stack members	9	9	9	9	9
Total stack bandwidth (Gbps)	32	32	32	32	32
Packets per second (Mpps)	6.5	13.1	6.5	13.1	6.5
MAC addresses supported	12,000	12,000	12,000	12,000	12,000
Routes supported	11,000	11,000	11,000	11,000	11,000
10 GE density	0	0	0	0	0
Gigabit Ethernet GBIC/SFP density	2	4	2	4	2
10 GE XENPAK/X2 port density	0	0	0	0	0
10/100/1000 density	0	0	0	0	0
10/100 density	24	48	24	48	0
100BASE-FX density	0	0	0	0	24
Measured 100% Throughput power consumption (with max. 15.4 W PoE loads)	39	57	444	458	61
PoE: Max. 802.3af Class 3 devices (15.4W)	-	-	24	24	-
PoE: Max. 802.3af Class 2 devices (7.3W)	-	-	24	48	-
AC/DC support	AC only	AC only	AC only	AC only	AC only
Dimensions (H x W x D)	1.73 x 17.46 x 11.62 in. (4.4 x 44.3 x 29.5 cm.)	1.73 x 17.46 x 11.62 in. (4.4 x 44.3 x 29.5 cm.)	1.73 x 17.46 x 11.62 in. (4.4 x 44.3 x 29.5 cm.)	1.73 x 17.46 x 11.62 in. (4.4 x 44.3 x 29.5 cm.)	1.73 x 17.5 x 11.8 in. (4.4 x 44.5 x 30.1 cm.)
Unit weight	8.2 lbs. (3.7 kgs.)	9.2 lbs. (4.2 kgs.)	10 lbs. (4.6 kgs.)	11 lbs. (5.0 kgs.)	9.15 lbs. (4.15 kgs.)
Feature	**Cisco 3750G-24T**	**Cisco 3750G-24TS-1U**	**Cisco 3750G-48TS**	**Cisco 3750G-24PS**	**Cisco 3750G-48PS**
Forwarding bandwidth (Gbps)	32	32	32	32	32
Maximum stack members	9	9	9	9	9
Total stack bandwidth (Gbps)	32	32	32	32	32
Packets per second (Mpps)	35.7	38.7	38.7	38.7	38.7
MAC addresses supported	12,000	12,000	12,000	12,000	12,000
Routes supported	11,000	11,000	11,000	11,000	11,000
10 GE density	0	0	0	0	0
Gigabit Ethernet GBIC/SFP density	0	4	4	4	4
10 GE XENPAK/X2 port density	0	0	0	0	0

10/100/1000 density	24	24	48	24	48
10/100 density	0	0	0	0	0
100BASE-FX density	0	0	0	0	0
Measured 100% Throughput power consumption (with max. 15.4 W PoE loads)	98	94	152	492	541
PoE: Max. 802.3af Class 3 devices (15.4W)	-	-	-	24	24
PoE: Max. 802.3af Class 2 devices (7.3W)	-	-	-	24	48
AC/DC support	AC only	AC only	AC only	AC only	AC only
Dimensions (H x W x D)	1.73 x 17.5 x 12.8 in. (4.4 x 44.5 x 32.6 cm.)	1.73 x 17.5 x 14.9 in. (4.4 x 44.5 x 37.8 cm.)	1.73 x 17.5 x 16.1 in. (4.4 x 44.5 x 40.9 cm.)	1.73 x 17.5 x 14.9 in. (4.4 x 44.5 x 37.8 cm.)	1.73 x 17.5 x 16.1 in. (4.4 x 44.5 x 40.9 cm.)
Unit weight	10 lbs. (4.6 kgs.)	12 lbs. (5.5 kgs.)	14 lbs. (6.4 kgs.)	13.5 lbs. (6.1 kgs.)	15.5 lbs. (7.0 kgs.)

Feature	**Cisco 3750G-12S**	**Cisco 3750G-12S-SD**	**Cisco 3750G-24WS-S25**	**Cisco 3750G-24WS-S50**
Forwarding bandwidth (Gbps)	32	32	32	32
Maximum stack members	9	9	9	9
Total stack bandwidth (Gbps)	32	32	32	32
Packets per second (Mpps)	17.8	17.8	38.7	38.7
MAC addresses supported	12,000	12,000	12,000	12,000
Routes supported	20,000	20,000	11,000	11,000
Onboard memory (DRAM)	128 MB	128 MB	128 MB	128 MB
10 GE density	0	0	0	0
Gigabit Ethernet GBIC/SFP density	12	12	2	2
10 GE XENPAK/X2 port density	0	0	0	0
10/100/1000 density	0	0	24	24
10/100 density	0	0	0	0
Measured 100% Throughput power consumption (with max. 15.4 W PoE loads)	100	72	255	255
AC/DC support	AC only	DC only	AC only	AC only
Dimensions (H x W x D)	1.73 x 17.5 x 12.8 in. (4.4 x 44.5 x 32.6 cm.)	1.73 x 17.5 x 12.8 in. (4.4 x 44.5 x 32.6 cm.)	2.59 x 17.5 x 11.6 in. (6.6 x 44.5 x 29.5 cm)	2.59 x 17.5 x 11.6 in. (6.6 x 44.5 x 29.5 cm)
Unit weight	10 lbs. (4.6 kgs.)	9 lbs. (4.08 kgs.)	21 lbs. (9.5 kgs.)	21 lbs. (9.5 kgs.)

Selected Part Numbers and Ordering Information

Cisco Catalyst 3750 Series Gigabit Ethernet Switches	
WS-C3750G-24T-S	Cisco Catalyst 3750G-24 10/100/1000T Standard Multilayer Image
WS-C3750G-24T-E	Cisco Catalyst 3750G-24 10/100/1000T Enhanced Multilayer Image
WS-C3750G-24TS-S1U	Cisco Catalyst 3750G-24 10/100/1000 + 4 SFP Std Multilayer;1RU
WS-C3750G-24TS-E1U	Cisco Catalyst 3750G-24 10/100/1000 + 4 SFP Enh Multilayer;1RU
WS-C3750G-24PS-S	Cisco Catalyst 3750G-24 10/100/1000T PoE + 4 SFP Standard Image
WS-C3750G-24PS-E	Cisco Catalyst 3750G-24 10/100/1000T PoE + 4 SFP Enhanced Image

SWLC3750-25-K9	IP base w/o crypto with web-based dev mgr
WS-C3750G-48TS-S	Cisco Catalyst 3750G-48 10/100/1000T + 4 SFP Standard Multilayer
WS-C3750G-48TS-E	Cisco Catalyst 3750G-48 10/100/1000T + 4 SFP Enhanced Multilayer
WS-C3750G-48PS-S	Cisco Catalyst 3750G-48 10/100/1000T PoE + 4 SFP Standard Image
WS-C3750G-48PS-E	Cisco Catalyst 3750G-48 10/100/1000T PoE + 4 SFP Enhanced Image
WS-C3750G-12S-S	Cisco Catalyst 3750G-12 SFP Standard Multilayer Image
Wireless LAN	
WS-C3750G-24WS-S25	Cisco Catalyst 3750G Integrated Wireless LAN Controller
WS-C3750G-24WS-S50	Cisco Catalyst 3750G Integrated Wireless LAN Controller
Ethernet Switches	
WS-C3750G-48TS-S	Cisco Catalyst 3750G-48 10/100/1000T + 4 SFP Standard Multilayer
WS-C3750G-48TS-E	Cisco Catalyst 3750G-48 10/100/1000T + 4 SFP Enhanced Multilayer
WS-C3750G-48PS-S	Cisco Catalyst 3750G-48 10/100/1000T PoE + 4 SFP Standard Image
WS-C3750G-48PS-E	Cisco Catalyst 3750G-48 10/100/1000T PoE + 4 SFP Enhanced Image
WS-C3750G-12S-S	Cisco Catalyst 3750G-12 SFP Standard Multilayer Image
Cisco Catalyst 3750 Series 10/100 Workgroup Switches	
WS-C3750-24FS-S	Cisco Catalyst 3750v2-24 100BaseFX + 2 SFP Standard Multilayer Image
WS-C3750V2-24PS-S	Cisco Catalyst 3750v2-24 10/100 PoE + 2 SFP Standard Image
WS-C3750V2-24PS-E	Cisco Catalyst 3750v2-24 10/100 PoE + 2 SFP Enhanced Image
WS-C3750V2-24TS-S	Cisco Catalyst 3750v2-24 10/100 + 2 SFP Standard Multilayer Image
WS-C3750V2-24TS-E	Cisco Catalyst 3750v2-24 10/100 + 2 SFP Enhanced Multilayer Image
WS-C3750V2-48PS-S	Cisco Catalyst 3750v2-48 10/100 PoE + 4 SFP Standard Image
WS-C3750V2-48PS-E	Cisco Catalyst 3750v2-48 10/100 PoE + 4 SFP Enhanced Image
WS-C3750V2-48TS-S	Cisco Catalyst 3750v2-48 10/100 + 4 SFP Standard Multilayer Image
WS-C3750V2-48TS-E	Cisco Catalyst 3750v2-48 10/100 + 4 SFP Enhanced Multilayer Image

For More Information

http://www.cisco.com/go/catalyst3750

Cisco Catalyst 3560-X Series Switches

The Cisco Catalyst 3560-X Series Switches are an enterprise-class line of standalone switches. These switches provide high availability, scalability, security, energy efficiency, and ease of operation with innovative features such as IEEE 802.3at Power over Ethernet Plus (PoE+) configurations, optional network modules, redundant power supplies, and Media Access Control Security (MACsec) features. The Cisco Catalyst 3560-X enhances productivity by enabling applications such as IP telephony, wireless, and video for borderless network experience.

Ideal for Companies That Need These Features

Cisco Catalyst 3560-X Series	· 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, and video
Cisco Catalyst 3560X-24T-L	· Low-density access, LAN Base feature set, and two 10-Gigabit Ethernet SFP+ uplinks
Cisco Catalyst 3560X-48T-L	· Medium-density access, LAN Base feature set, and two 10-Gigabit Ethernet SFP+ uplinks
Cisco Catalyst 3560X-24P-L	· Low-density access, LAN Base feature set, PoE+, and two 10-Gigabit Ethernet SFP+ uplinks
Cisco Catalyst 3560X-48P-L	· Medium-density access, LAN Base feature set, PoE+, and two 10-Gigabit Ethernet SFP+ uplinks

Cisco Catalyst 3560X-48PF-L	• Medium-density access, LAN Base feature set, PoE+, two 10-Gigabit Ethernet SFP+ uplinks, and 1100 WAC power supply
Cisco Catalyst 3560X-24T-S	• Low-density access, IP Base feature set, and two 10-Gigabit Ethernet SFP+ uplinks
Cisco Catalyst 3560X-48T-S	• Medium-density access, IP Base feature set, and two 10-Gigabit Ethernet SFP+ uplinks
Cisco Catalyst 3560X-24P-S	• Low-density access, IP Base feature set, PoE+, and two 10-Gigabit Ethernet SFP+ uplinks
Cisco Catalyst 3560X-48P-S	• Medium-density access, IP Base feature set, PoE+, and two 10-Gigabit Ethernet SFP+ uplinks
Cisco Catalyst 3560X-48PF-S	• Medium-density access, IP Base feature set, PoE+, two 10-Gigabit Ethernet SFP+ uplinks, and 1100 WAC power supply

Key Features and Benefits

- 24 and 48 10/100/1000 Power over Ethernet Plus (PoE+) and non-PoE models
- Optional four Gigabit Ethernet (GE) Small Form-Factor Pluggable (SFP) or two 10-GE SFP+ uplink network modules
- Industry-first PoE+ with 30W power on all ports in 1 rack unit (1RU) form factor
- Dual redundant, modular power supplies and fans
- Media Access Control Security (MACsec) hardware-based encryption
- IPv4 and IPv6 routing, Multicast routing, advanced quality of service (QoS), and security features in hardware
- Enhanced limited lifetime warranty (LLW) with next-business-day (NBD) advance hardware replacement and 90-day access to Cisco Technical Assistance Center (TAC) support
- Enhanced Cisco EnergyWise technology for operational cost optimization by measuring actual power consumption of the PoE devices, reporting, and reducing energy consumption across the network
- USB Type-A and Type-B ports for storage and console, respectively, and an out-of-band Ethernet management port.

Specifications

Feature	Cisco 3560X-24T-L	Cisco 3560X-48T-L	Cisco 3560X-24P-L	Cisco 3560X-48P-L	Cisco 3560X-48PF-L
Forwarding bandwidth (Gbps)	160	160	160	160	160
Maximum stack members	0	0	0	0	0
Total stack bandwidth (Gbps)	-	-	-	-	-
Packets per second (Mpps)	65.5	101.2	65.5	101.2	101.2
MAC addresses supported	12,000	12,000	12,000	12,000	12,000
Routes supported	11,000	11,000	11,000	11,000	11,000
10 GE density	2	2	2	2	2
10 GE SFP+	2	2	2	2	2
10/100/1000 density	24	48	24	48	48
10/100 density	24	48	24	48	48
100BASE-FX density	0	0	0	0	0
Measured 100% Throughput power consumption (without PoE loads, 1 Gps uplink module)	93.5	120.4	99.3	133.9	137.2
PoE: Max. 802.3af Class 3 devices (15.4W)	-	-	24	48	48
PoE: Max. 802.3af Class 2 devices (7.3W)	-	-	24	48	48
AC/DC support	AC and DC	AC and DC	AC and DC	AC and DC	AC and DC
Dimensions (H x W x D)	1.75 x 17.5 x 18.0 in (4.45 x 44.5 x 46.0 cm.)	1.75 x 17.5 x 18.0 in (4.45 x 44.5 x 46.0 cm.)	1.75 x 17.5 x 18.0 in (4.45 x 44.5 x 46.0 cm)	1.75 x 17.5 x 18.0 in (4.45 x 44.5 x 46.0 cm.)	1.75 x 17.5 x 19.5 in (4.45 x 44.5 x 49.5 cm.)
Unit weight	15.4 lbs. (7.0 kgs.)	16.1 lbs. (7.3 kgs.)	15.7 lbs. (7.1 kgs.)	16.4 lbs. (7.4 kgs.)	16.6 lbs. (7.5 kgs.)

	Cisco 3560X-24T-S	Cisco 3560X-48T-S	Cisco 3560X-24P-S	Cisco 3560X-48P-S	Cisco 3560X-48PF-S
Forwarding bandwidth (Gbps)	160	160	160	160	160
Maximum stack members	0	0	0	0	0
Total stack bandwidth (Gbps)	-	-	-	-	-
Packets per second (Mpps)	65.5	101.2	65.5	101.2	101.2
MAC addresses supported	12,000	12,000	12,000	12,000	12,000
Routes supported	11,000	11,000	11,000	11,000	11,000
10 GE density	2	2	2	2	2
10 GE SFP+	2	2	2	2	2
10/100/1000 density	24	48	24	48	48
10/100 density	24	48	24	48	48
100BASE-FX density	0	24	0	0	0
Measured 100% Throughput power consumption (without PoE load, I Gbps uplink module)	93.5	120.4	99.3	133.9	137.2
PoE: Max. 802.3af Class 3 devices (15.4W)	-	-	24	48	48
PoE: Max. 802.3af Class 2 devices (7.3W)	-	-	24	48	48
AC/DC support	AC and DC	AC and DC	AC and DC	AC and DC	AC and DC
Dimensions (H x W x D)	1.75 x 17.5 x 18.0 in (4.45 x 44.5 x 46.0 cm.)	1.75 x 17.5 x 18.0 in (4.45 x 44.5 x 46.0 cm.)	1.75 x 17.5 x 18.0 in (4.45 x 44.5 x 46.0 cm.)	1.75 x 17.5 x 18.0 in (4.45 x 44.5 x 46.0 cm.)	1.75 x 17.5 x 19.5 in (4.45 x 44.5 x 49.5cm.)
Unit weight	15.4 lbs. (7.0 kgs.)	16.1 lbs. (7.3 kgs.)	15.7 lbs. (7.1 kgs.)	16.4 lbs. (7.4 kgs.)	16.6 lbs. (7.5 kgs.)

Selected Part Numbers and Ordering Information

Catalyst 3560-X Series 10/100/1000 Workgroup Switches[1]	
WS-C3560X-24T-L	Cisco 3560-X standalone 24 10/100/1000 Ethernet ports, with 350W AC power supply 1 RU, LAN Base feature set
WS-C3560X-48T-L	Cisco 3560-X standalone 48 10/100/1000 Ethernet ports, with 350W AC power supply 1 RU, LAN Base feature set
WS-C3560X-24P-L	Cisco 3560-X standalone 24 10/100/1000 Ethernet PoE+ ports, with 715W AC power supply 1 RU, LAN Base feature set
WS-C3560X-48P-L	Cisco 3560-X standalone 48 10/100/1000 Ethernet PoE+ ports, with 715W AC power supply 1 RU, LAN Base feature set
WS-C3560X-48PF-L	Cisco 3560-X standalone 48 10/100/1000 Ethernet PoE+ ports, with 1100W AC power supply 1 RU, LAN Base feature set
WS-C3560X-24T-S	Cisco 3560-X standalone 24 10/100/1000 Ethernet ports, with 350W AC power supply 1 RU, IP Base feature set
WS-C3560X-48T-S	Cisco 3560-X standalone 48 10/100/1000 Ethernet ports, with 350W AC power supply 1 RU, IP Base feature set
WS-C3560X-24P-S	Cisco 3560-X standalone 24 10/100/1000 Ethernet PoE+ ports, with 715W AC power supply 1 RU, IP Base feature set
WS-C3560X-48P-S	Cisco 3560-X standalone 48 10/100/1000 Ethernet PoE+ ports, with 715W AC power supply 1 RU, IP Base feature set
WS-C3560X-48PF-S	Cisco 3560-X standalone 48 10/100/1000 Ethernet PoE+ ports, with 1100W AC power supply 1 RU, IP Base feature set

1. 1.L=LAN Base; S=IP Base

For More Information

http://www.cisco.com/go/3560x

Cisco Catalyst 3560-E Series Switches

The 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	· Enhanced business productivity, resiliency, security, and scalability · Quick deployment and easy network management · Deployment of IP telephony, wireless, or Gigabit to the Desktop (GTTD) · 1- to 10-Gigabit Ethernet upgradable uplinks
Cisco Catalyst 3560E-24TD	· Low-density access, Layer 2+ or Layer 3 features, and one or more 10-Gigabit Ethernet fiber uplinks
Cisco Catalyst 3560E-24TD-SD	· Low-density access, Layer 2+ or Layer 3 features, and one or more 10-Gigabit Ethernet fiber uplinks, DC power
Cisco Catalyst 3560E-48TD	· Medium-density access, Layer 2+ or Layer 3 features, and one or more 10-Gigabit Ethernet fiber uplinks
Cisco Catalyst 3560E-48TD-SD	· Medium-density access, Layer 2+ or Layer 3 features, and one or more 10-Gigabit Ethernet fiber uplinks, DC power
Cisco Catalyst 3560E-24PD	· Low-density access, PoE, Layer 2+ or Layer 3 features, and one or more 10-Gigabit Ethernet fiber uplinks
Cisco Catalyst 3560E-48PD	· 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	· Medium-density access, Layer 2+ or Layer 3 features, and one or more 10-Gigabit Ethernet fiber uplinks
Cisco Catalyst 3560E-12SD	· 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	· Low-density 10-Gigabit Ethernet fiber aggregation and Layer 2+ or Layer 3 features

Key Features and Benefits

- 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 (OPSF), 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 (VRFLite) 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.
- Field-replaceable and -upgradable power supplies and fan.
- Cisco TwinGig Converter Module for migrating uplinks from 1 Gigabit Ethernet (Small Form-Factor Pluggable [SFP]) to 10 Gigabit Ethernet (X2).
- Cisco EnergyWise helps reduce company-wide power consumption and carbon footprint.
- Cisco limited lifetime warranty.

Specifications

Feature	Cisco 3560E-24TD	Cisco 3560E-24TD-SD	Cisco 3560E-48TD	Cisco 3560E-48TD-SD	Cisco 3560E-24PD	Cisco 3560E-48PD	Cisco 3560-48PD Full Power
Forwarding bandwidth (Gbps)	128	128	128	128	128	128	128
Packets per second (Mpps)	65.5	65.5	101.2	101.2	65.5	101.2	101.2
MAC addresses supported	12,000	12,000	12,000	12,000	12,000	12,000	12,000
Routes supported	11,000	11,000	11,000	11,000	11,000	11,000	11,000
Onboard memory (DRAM/ Flash)	128/32 MB	128/32 MB	128/32 MB	128/32 MB	128/16 MB	128/16 MB	128/16 MB
10/100/1000 density	24	24	48	48	24	48	48
10/100 density	24	24	48	48	24	48	48
PoE: Max. 802.3af Class 3 devices (15.4W)	-	-	-	-	24	48	48
PoE: Max. 802.3af Class 2 devices (7.3W)	-	-	-	-	24	48	48
AC/DC support	AC and DC	DC power	AC and DC	DC power	AC and DC	AC and DC	AC and DC
Dimensions (H x W x D)	1.73 x 17.5 x 18.1 in. (4.45 x 44.5 x 46.0 cm.)	1.73 x 17.5 x 18.1 in. (4.45 x 44.5 x 46.0 cm.)	1.73 x 17.5 x 18.1 in. (4.5 x 44.5 x 46.0 cm.)	1.73 x 17.5 x 18.1 in. (4.5 x 44.5 x 46.0 cm.)	1.73 x 17.5 x 18.1 in. (4.45 x 44.5 x 46.0 cm.)	1.73 x 17.5 x 18.1 in. (4.45 x 44.5 x 46.0 cm.)	1.73 x 17.5 x 21.7 in. (4.45 x 44.5 x 55.2 cm.)
Unit weight	17.9 lbs. (8.1 kgs.)	17.9 lbs. (8.1 kgs.)	18.8lbs. (8.6kgs.)	18.8lbs. (8.6kgs.)	18.3 lbs. (8.3kgs.)	19.2 lbs. 8.75kgs.)	20.9 lbs. (9.5 kgs.)

Selected Part Numbers and Ordering Information

Cisco Catalyst 3560-E Series 10/100/1000 Workgroup Switches[1]	
WS-C3560E-24TD-S	Cisco Catalyst 3560E 24 10/100/1000+2*10GE(X2),265W,IPB s/w
WS-C3560E-24TD-SD	Cisco Catalyst 3560E 24 10/100/1000+2*10GE(X2),DC,265W,IPB s/w
WS-C3560E-24TD-E	Cisco Catalyst 3560E 24 10/100/1000+2*10GE(X2),265W,IPS s/w
WS-C3560E-48TD-S	Cisco Catalyst 3560E 48 10/100/1000+2*10GE(X2),265W,IPB s/w
WS-C3560E-48TD-SD	Cisco Catalyst 3560E 48 10/100/1000+2*10GE(X2),265W DC,IPB s/w
WS-C3560E-48TD-E	Cisco Catalyst 3560E 48 10/100/1000+2*10GE(X2),265W,IPS s/w
WS-C3560E-24PD-S	Cisco Catalyst 3560E 24 10/100/1000 PoE+2*10GE(X2),750W,IPB s/w
WS-C3560E-24PD-E	Cisco Catalyst 3560E 24 10/100/1000 PoE+2*10GE(X2),750W,IPS s/w
WS-C3560E-48PD-S	Cisco Catalyst 3560E 48 10/100/1000 PoE+2*10GE(X2),750W,IPB s/w
WS-C3560E-48PD-E	Cisco Catalyst 3560E 48 10/100/1000 PoE+2*10GE(X2),750W,IPS s/w
WS-C3560E-48PD-SF	Cisco Catalyst 3560E 48 10/100/1000 PoE+2*10GE(X2),1150W,IPB s/w
WS-C3560E-48PD-EF	Cisco Catalyst 3560E 48 10/100/1000 PoE+2*10GE(X2),1150W,IPS s/w
WS-C3560E-12SD-S	Cisco Catalyst 3560E 12 SFP + 2*10GE(X2), IPB s/w
WS-C3560E-12SD-E	Cisco Catalyst 3560E 12 SFP + 2*10GE(X2), IPS s/w
WS-C3560E-12D-S	Cisco Catalyst 3560E 12*10GE(X2), IPB s/w
WS-C3560E-12D-E	Cisco Catalyst 3560E 12*10GE(X2), IPS s/w
Cisco Catalyst 3560-E Series Product Activation Keys	
3560E-IPSLCB-QTY	IP Services for 3560 E, upgrade from the IP Base Feature Set

1. S=IP Base; E=IP Services

For More Information

http://www.cisco.com/go/catalyst3560E

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	· Enhanced business productivity, resiliency, security, and scalability · Quick deployment and easy network management · Deployments of IP telephony, wireless, or Gigabit to the Desktop (GTTD)
Cisco Catalyst 3560-8PC Compact	· Small density PoE with compact form-factor and no fan for deployments in conference rooms and classrooms
Cisco Catalyst 3560-12PC Compact	· Small density PoE with compact form-factor and no fan for deployments in conference rooms and classrooms
Cisco Catalyst 3560V2-24TS	· Low-density access, Layer 2+ or Layer 3 features, and one or more fiber uplinks
Cisco Catalyst 3560V2-48TS	· Medium-density access, Layer 2+ or Layer 3 features, and one or more fiber uplinks
Cisco Catalyst 3560V2-24PS	· Low-density access, PoE, Layer 2+ or Layer 3 features, and one or more fiber uplinks
Cisco Catalyst 3560V2-48PS	· Medium-density access, PoE, Layer 2+ or Layer 3 features, and one or more fiber uplinks
Cisco Catalyst 3560V2-24TS-SD	· Low-density access, Layer 2+ or Layer 3 features, and one or more fiber uplinks, DC power supply
Cisco Catalyst 3560G-24TS	· Low-density 10/100/1000 access, Layer 2+ or Layer 3 features, and one or more fiber uplinks
Cisco Catalyst 3560G-24PS	· Low-density 10/100/1000 access, PoE, Layer 2+ or Layer 3 features, and one or more fiber uplinks
Cisco Catalyst 3560G-48TS	· Medium-density 10/100/1000 access, Layer 2+ or Layer 3 features, and one or more fiber uplinks
Cisco Catalyst 3560G-48PS	· Medium-density 10/100/1000 access, PoE, Layer 2+ or Layer 3 features, and one or more fiber uplinks

Key Features and Benefits

- 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 (OPSF), 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 (VRFLite) 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 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.
- Cisco EnergyWise helps reduce company-wide power consumption and carbon footprint.
- Cisco limited lifetime warranty.

Specifications

Feature	Cisco 3560V2-24TS	Cisco 3560V2-48TS	Cisco 3560V2-24PS	Cisco 3560V2-48PS	Cisco 3560V2-24TS-SD	Cisco 3560G-24TS
Forwarding bandwidth (Gbps)	32	32	32	32	32	32
Packets per second (Mpps)	6.5	13.1	6.5	13.1	6.5	38.7
MAC addresses supported	12,000	12,000	12,000	12,000	12,000	12,000
Routes supported	11,000	11,000	11,000	11,000	11,000	11,000
Onboard memory (DRAM/Flash)	128/32 MB	128/32 MB	128/16 MB	128/16 MB	128/32 MB	128/32 MB
Gigabit Ethernet GBIC/SFP density	2	4	2	4	2	4
10/100/1000 density	0	0	0	0	0	24
10/100 density	24	48	24	48	24	0
Measured 100% Throughput power consumption (with Max. 15.4 W PoE loads)	24	41	435	452	24	74
PoE: Max. 802.3af Class 3 devices (15.4W)	-	-	24	24	-	-
PoE: Max. 802.3af Class 2 devices (7.3W)	-	-	24	48	-	-
AC/DC support	AC only	AC only	AC only	AC only	DC power supply	AC only
Dimensions (H x W x D)	1.73 x 17.46 x 11.62 in.: (4.4 x 44.3 x 29.5 cm.)	1.73 x 17.46 x 11.62 in.: (4.4 x 44.3 x 29.5 cm.)	1.73 x 17.46 x 11.62 in.: (4.4 x 44.3 x 29.5 cm.)	1.73 x 17.46 x 11.62 in.: (4.4 x 44.3 x 29.5 cm.)	1.73 x 17.46 x 11.62 in.: (4.4 x 44.3 x 29.5 cm.)	1.73 x 17.5 x 14.9 in.: (4.4 x 44.5 x 37.8 cm.)
Unit weight	8.2 lbs. (3.7 kgs.)	9 lbs. (4 kgs.)	10 lbs. (4.6 kgs.)	11 lbs. (5 kgs.)	8 lbs. (3.7 kgs.)	12 lbs. (5.4 kgs.)

Feature	Cisco 3560G-48TS	Cisco 3560G-24PS	Cisco 3560G-48PS	Cisco 3560-12PC-S	Cisco 3560-8PC-S
Forwarding bandwidth (Gbps)	32	32	32	32	32
Packets per second (Mpps)	38.7	38.7	38.7	3.2	2.7
MAC addresses supported	12,000	12,000	12,000	12,000	12,000
Routes supported	11,000	11,000	11,000	11,000	11,000
Onboard memory (DRAM/Flash)	128/32 MB	128/32 MB	128/32 MB	128/32 MB	128/32 MB
Gigabit Ethernet GBIC/SFP density	4	4	4	1	1
10/100/1000 density	48	24	48	1	1
10/100 density	0	0	0	12	8
Measured 100% Throughput power consumption (with Max. 15.4 W PoE loads)	124	496	534	145	145
PoE: Max. 802.3af Class 3 devices (15.4W)	-	24	24	8	8
PoE: Max. 802.3af Class 2 devices (7.3W)	-	24	48	12	8
AC/DC support	AC only	AC only	AC only	AC only	AC only
Dimensions (H x W x D)	1.73 x 17.5 x 16.1 in.: (4.4 x 44.5 x 40.9 cm.)	1.73 x 17.5 x 14.9 in.: (4.4 x 44.5 x 37.8 cm.)	1.73 x 17.5 x 16.1 in.: (4.4 x 44.5 x 40.9 cm.)	1.73 x 10.6 x 9.1 in. (4.4 x 27 x 23 cm)	1.73 x 10.6 x 9.1 in. (4.4 x 27 x 23 cm)
Unit weight	13.5 lbs. (6.1 kgs.)	14 lbs. (6.4 kgs.)	15.5 lbs. (7.0 kgs.)	5 lb (2.3 kg)	5 lb (2.3 kg)

Selected Part Numbers and Ordering Information

Cisco Catalyst 3560 Series 10/100/1000 Workgroup Switches[1]	
WS-C3560G-48PS-S	Cisco Catalyst 3560G-48 10/100/1000T PoE + 4 SFP Standard Image
WS-C3560G-48PS-E	Cisco Catalyst 3560G-48 10/100/1000T PoE + 4 SFP Enhanced Image
WS-C3560G-24PS-S	Cisco Catalyst 3560G-24 10/100/1000T PoE + 4 SFP Standard Image
WS-C3560G-24PS-E	Cisco Catalyst 3560G-24 10/100/1000T PoE + 4 SFP Enhanced Image
WS-C3560G-48TS-S	Cisco Catalyst 3560G-48 10/100/1000T + 4 SFP Standard Image
WS-C3560G-48TS-E	Cisco Catalyst 3560G-48 10/100/1000T + 4 SFP Enhanced Image
WS-C3560G-24TS-S	Cisco Catalyst 3560G-24 10/100/1000T + 4 SFP Standard Image
WS-C3560G-24TS-E	Cisco Catalyst 3560G-24 10/100/1000T + 4 SFP Enhanced Image
Cisco Catalyst 3560V2 Series 10/100 Workgroup Switches	
WS-C3560V2-48PS-S	Cisco Catalyst 3560G v2-48 10/100 PoE + 4 SFP Standard Image
WS-C3560V2-48PS-E	Cisco Catalyst 3560G v2-48 10/100 PoE + 4 SFP Enhanced Image
WS-C3560V2-24PS-S	Cisco Catalyst 3560G v2-24 10/100 PoE + 2 SFP Standard Image
WS-C3560V2-24PS-E	Cisco Catalyst 3560G v2-24 10/100 PoE + 2 SFP Enhanced Image
WS-C3560V2-48TS-S	Cisco Catalyst 3560G v2-48 10/100 + 4 SFP Standard Image
WS-C3560V2-48TS-E	Cisco Catalyst 3560G v2-48 10/100 + 4 SFP Enhanced Image
WS-C3560V2-24TS-S	Cisco Catalyst 3560G v2-24 10/100 + 2 SFP Standard Image
WS-C3560V2-24TS-E	Cisco Catalyst 3560G v2-24 10/100 + 2 SFP Enhanced Image
WS-C3560V2-24TS-SD	Cisco Catalyst 3560G v2-24 10/100 + 2 SFP Standard Image with DC power supply
WS-C3560-8PC-S	Cisco Catalyst 3560G-8 10/100 PoE + 1 1000BT or 1 SFP Standard Image
WS-C3560-12PC-S	Cisco Catalyst 3560G-12 10/100 PoE + 1 1000BT or 1 SFP Standard Image

1. S=IP Base; E=IP Services

For More Information

http://www.cisco.com/go/catalyst3560

Cisco Catalyst 2975 Series Switches

The Cisco Catalyst 2975 is a 48-port 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

Cisco Catalyst 2975

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

Key Features and Benefits

- Stacking —One IP address and one command-line interface (CLI) simplify management. A 32-Gbps resilient architecture speeds convergence, and 1:N stack master redundancy 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.
- 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.
- Cisco EnergyWise helps reduce company-wide power consumption and carbon footprint.
- Cisco limited lifetime warranty.

Specifications

Feature	Cisco 2975-48PS-L
Forwarding bandwidth (Gbps)	32
Packets per second (Mpps)	3.8
MAC addresses supported	8,000
Onboard memory (DRAM)	128 MB
Gigabit Ethernet GBIC/SFP density	4
10/100/1000 density	48
100BASE-FX density	0
PoE: Max. 802.3af Class 3 devices	24
PoE: Max. 802.3af Class 2 devices	48
Measured 100% Throughput power consumption (with Max. PoE loads)	560W
AC/DC support	AC only
Dimensions (H x W x D)	1.73 x 17.5 x 16.1 in. (4.4 x 44.5 x 40.9 cm)
Unit weight	15.5 lbs. (7.0 kgs.)

Selected Part Numbers and Ordering Information

WS-C2975GS-48PS-L	48 Ethernet 10/100/1000 PoE ports and 4 SFP uplinks Two high speed stacking ports with 50cm stacking cable 1 RU fixed-configuration with rack mount included LAN Base Image installed
WS-C2975GS-96PS-LM	Two units of the WS-C2975GS-48PS-L for 96 access ports

For More Information

http://www.cisco.com/go/catalyst2975

Cisco Catalyst 2960-S Series Switches

The Cisco Catalyst 2960-S Series Switches are the leading Layer 2 edge switches providing improved ease of use, highly secure business operations, improved sustainability, and a borderless network experience. These switches include new Cisco FlexStack switch stacking capability with 1- and 10-Gigabit Ethernet connectivity and Power over Ethernet Plus (PoE+).

The Cisco Catalyst 2960-S Series Switches are fixed-configuration access switches designed for enterprise, midmarket, and branch-office networks to provide lower total cost of ownership.

Ideal for Companies That Need These Features

Cisco Catalyst 2960-S

- Intelligent services at entry-level functions
- Quality of service (QoS), enhanced security, and availability
- Easy deployment and network management
- Small footprint

Key Features and Benefits

- 1- and 10-Gigabit Ethernet uplink flexibility with Small Form-Factor Pluggable Plus (SFP+), providing business continuity and fast transition to 10 Gigabit Ethernet
- 24 or 48 ports of Gigabit Ethernet desktop connectivity
- Cisco FlexStack stacking module with 40 Gbps of throughput, allowing ease of operation with single configuration and simplified switch upgrade
- Power over Ethernet Plus (PoE+) with up to 30W per port that allows you to support the latest PoE+ capable devices

- Power-supply options, with 740W or 370W fixed power supplies for PoE+ switches
- USB storage for file backup, distribution, and simplified operations
- A wide range of software features to provide ease of operation, highly secure business operations, sustainability, and a borderless network experience
- Limited lifetime hardware warranty, including next-business-day replacement with 90-day service and support

Specifications

Feature	Cisco 2960S-48FPD-L	Cisco 2960S-48LPD-L	Cisco 2960S-24PD-L	Cisco 2960S-48TD-L	Cisco 2960S-24TD-L	Cisco 2960S-48FPS-L
Forwarding bandwidth (Gbps)	88	88	88	88	88	88
Maximum Stack Members	4	4	4	4	4	4
Total Bandwidth of Stack (Gbps)	40	40	40	40	40	40
Packets per second (Mpps)	101.2	101.2	65.5	101.2	65.5	77.4
MAC addresses supported	8,000	8,000	8,000	8,000	8,000	8000
Onboard memory (DRAM)	128 MB	128 MB	128 MB	128 MB	128 MB	128 MB
10 GE SFP+ Density	2	2	2	2	2	0
Gigabit Ethernet GBIC/SFP density	1	1	1	1	1	4
10/100/1000 density	48	48	24	48	24	48
10/100 density	-	-	-	-	-	-
100BASE-FX density	-	-	-	-	-	-
PoE: Max. 802.3af Class 3 devices (15.4W)	48	48	24	0	0	48
PoE: Max. 802.3af Class 2 devices (7.3W)	48	48	24	0	0	48
Measured 100% Throughput power consumption (Watts)	81	71	55	55	39	79
AC/DC support	AC only	AC only	AC only	AC only	AC only	AC only
Dimensions (H x W x D)	1.75 x 17.5 x 15.2 in. (4.5 x 44.5 x 38.6 cm.)	1.75 x 17.5 x 15.2 in. (4.5 x 44.5 x 38.6 cm.)	1.75 x 17.5 x 15.2 in. (4.5 x 44.5 x 38.6 cm.)	1.75 x 17.5 x 11.8 in. (4.5 x 44.5 x 29.9 cm.)	1.75 x 17.5 x 11.8 in. (4.5 x 44.5 x 29.9 cm.)	1.75 x 17.5 x 15.2 in. (4.5 x 44.5 x 38.6 cm.)
Unit weight	13 lbs. (5.9 kgs.)	12.5 lbs. (5.7 kgs.)	12.5 lbs. (5.7 kgs)	9.5 lbs. (4.3 kgs.)	9.5 lbs. (4.3 Kgs.)	13 lbs. (5.9 kgs.)
Feature	**Cisco 2960S-48LPS-L**	**Cisco 2960S-24PS-L**	**Cisco 2960S-48TS-L**	**Cisco 2960S-24TS-L**	**Cisco 2960S-48TS-S**	**Cisco 2960S-24TS-S**
Forwarding bandwidth (Gbps)	88	88	88	88	88	88
Maximum Stack Members	4	4	4	4	4	4
Total Bandwidth of Stack (Gbps)	40	40	40	40	40	40
Packets per second (Mpps)	77.4	41.7	77.4	41.7	74.4	38.7
MAC addresses supported	8,000	8,000	8,000	8,000	8,000	8000
Onboard memory (DRAM)	128 MB	128 MB	128 MB	128 MB	128 MB	128 MB
10 GE SPF+ Density	0	0	0	0	0	0
Gigabit Ethernet GBIC/SFP density	4	4	4	4	2	2
10/100/1000 density	48	24	48	24	48	24

10/100 density	-	-	-	-	-	-
100BASE-FX density	-	-	-	-	-	-
PoE: Max. 802.3af Class 3 devices (15.4W)	48	24	0	0	0	0
PoE: Max. 802.3af Class 2 devices (7.3W)	48	24	0	0	0	0
Measured 100% Throughput power consumption (Watts)	71	55	52	40	53	36
AC/DC support	AC only	AC only	AC only	AC only	AC only	AC only
Dimensions (H x W x D)	1.75 x 17.5 x 15.2 in. (4.5 x 44.5 x 38.6 cm.)	1.75 x 17.5 x 15.2 in. (4.5 x 44.5 x 38.6 cm.)	1.75 x 17.5 x 11.8 in. (4.5 x 44.5 x 29.9 cm.)	1.75 x 17.5 x 11.8 in. (4.5 x 44.5 x 29.9 cm.)	1.75 x 17.5 x 11.8 in. (4.5 x 44.5 x 29.9 cm.)	1.75 x 17.5 x 11.8 in. (4.5 x 44.5 x 29.9 cm.)
Unit weight	12.5 lbs. (5.7 kgs.)	12.5 lbs. (5.7 kgs.)	10.5 lbs. (4.8 kgs.)	10 lbs. (4.5 kgs.)	10.5 lbs. (4.8 kgs.)	10 lbs. (4.5 kgs.)

Selected Part Numbers and Ordering Information

Cisco Catalyst 2960-S Series LAN Base Switches	
WS-C2960S-48FPD-L	Cisco Catalyst 2960-S 48 Ethernet 10/100/1000 PoE+ ports, 740W PoE capacity, 2 10 Gigabit Ethernet or 2 1 Gigabit Ethernet SFP+ uplink ports, optional Cisco FlexStack stacking support, LAN Base image
WS-C2960S-48LPD-L	Cisco Catalyst 2960-S 48 Ethernet 10/100/1000 PoE+ ports, 370W PoE capacity, 2 10 Gigabit Ethernet or 2 1 Gigabit Ethernet SFP+ uplink ports, optional Cisco FlexStack stacking support, LAN Base image
WS-C2960S-24PD-L	Cisco Catalyst 2960-S 24 Ethernet 10/100/1000 PoE+ ports, 370W PoE capacity, 2 10 Gigabit Ethernet or 2 1 Gigabit Ethernet SFP+ uplink ports, optional Cisco FlexStack stacking support, LAN Base image
WS-C2960S-48TD-L	Cisco Catalyst 2960-S 48 Ethernet 10/100/1000 ports, 2 10 Gigabit Ethernet or 2 1 Gigabit Ethernet SFP+ uplink ports, optional Cisco FlexStack stacking support, LAN Base image
WS-C2960S-24TD-L	Cisco Catalyst 2960-S 24 Ethernet 10/100/1000 ports, 2 10 Gigabit Ethernet or 2 1 Gigabit Ethernet SFP+ uplink ports, optional Cisco FlexStack stacking support, LAN Base image
WS-C2960S-48FPS-L	Cisco Catalyst 2960-S 48 Ethernet 10/100/1000 PoE+ ports, 740W PoE capacity, 4 1 Gigabit Ethernet SFP uplink ports, optional Cisco FlexStack stacking support, LAN Base image
WS-C2960S-48LPS-L	Cisco Catalyst 2960-S 48 Ethernet 10/100/1000 PoE+ ports, 370W PoE capacity, 4 1 Gigabit Ethernet SFP uplink ports, optional Cisco FlexStack stacking support, LAN Base image
WS-C2960S-24PS-L	Cisco Catalyst 2960-S 24 Ethernet 10/100/1000 PoE+ ports, 370W PoE capacity, 4 1 Gigabit Ethernet SFP uplink ports, optional Cisco FlexStack stacking support, LAN Base image
WS-C2960S-48TS-L	Cisco Catalyst 2960-S 48 Ethernet 10/100/1000 ports, 4 1 Gigabit Ethernet SFP uplink ports, optional Cisco FlexStack stacking support, LAN Base image
WS-C2960S-24TS-L	Cisco Catalyst 2960-S 24 Ethernet 10/100/1000 ports, 4 1 Gigabit Ethernet SFP uplink ports, optional Cisco FlexStack stacking support, LAN Base image
WS-2960S-48TS-S	Cisco Catalyst 2960-S 48 Ethernet 10/100/1000, 2 One Gigabit Ethernet SFP uplink ports, LAN Lite software
WS-C2960S-24TS-S	Cisco Catalyst 2960-S 24 Ethernet 10/100/1000, 2 One Gigabit Ethernet SFP uplink ports, LAN Lite software

For More Information

http://www.cisco.com/go/catalyst2960

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

Cisco Catalyst 2960 Series

- Intelligent services at entry-level functions
- QoS, enhanced security, and availability
- Easy deployment and network management
- Small footprint

Key Features and Benefits

- 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.
- Cisco EnergyWise helps reduce company-wide power consumption and carbon footprint.
- Cisco limited lifetime warranty.

Specifications

Feature	Cisco 2960-8TC-S	Cisco 2960-8TC-L	Cisco 2960-24TC-L	Cisco 2960-24TT-L	Cisco 2960-48TC-L
Forwarding bandwidth (Gbps)	16	16	16	16	16
Packets per second (Mpps)	2.7	2.7	6.6	6.6	10.1
MAC addresses supported	8,000	8,000	8,000	8,000	8,000
Onboard memory (DRAM)	64 MB	64 MB	64 MB	64 MB	64 MB
Gigabit Ethernet GBIC/SFP density	1	1	2	0	2
10/100/1000 density	1	1	2	2	2
10/100 density	8	8	24	24	48
100BASE-FX density	0	0	0	0	0
PoE: Max. 802.3af Class 3 devices (15.4W)	-	-	-	-	-
PoE: Max. 802.3af Class 2 devices (7.3W)	-	-	-	-	-
Measured 100% Throughput power consumption (with Max. PoE loads)	12	12	27	28	39
AC/DC support	AC only	AC only	AC only	AC only	AC only
Dimensions (H x W x D)	1.73 x 10.6 x 6.4 in. (4.4 x 27 x 16.3 cm)	1.73 x 10.6 x 6.4 in. (4.4 x 27 x 16.3 cm)	1.73 x 17.5 x 9.3 in. (4.4 x 44.5 x 23.6 cm.)	1.73 x 17.5 x 9.3 in. (4.4 x 44.5 x 23.6 cm.)	1.73 x 17.5 x 9.3 in. (4.4 x 44.5 x 23.6 cm.)
Unit weight	3 lbs. (1.4 kgs.)	3 lbs. (1.4 kgs.)	8 lbs. (3.6 kgs.)	8 lbs. (3.6 kgs.)	8 lbs. (3.6 kgs.)

Feature	Cisco 2960G-8TC-L	Cisco 2960-48TT-L	Cisco 2960G-24TC-L	Cisco 2960G-48TC-L	Cisco 2960-24-S
Forwarding bandwidth (Gbps)	32	16	32	32	16
Packets per second (Mpps)	11.9	10.1	35.7	39	3.6
MAC addresses supported	8,000	8,000	8,000	8,000	8,000
Onboard memory (DRAM)	64 MB	64 MB	64 MB	64 MB	64 MB
Gigabit Ethernet GBIC/SFP density	1	0	4	4	0

10/100/1000 density	7	2	24	48	0
10/100 density	0	48	0	0	24
100BASE-FX density	0	0	0	0	0
PoE: Max. 802.3af Class 3 devices (15.4W)	-	-	-	-	-
PoE: Max. 802.3af Class 2 devices (7.3W)	-	-	-	-	-
Measured 100% Throughput power consumption (with Max. PoE loads)	22	42	72	123	22
AC/DC support	AC only	AC only	AC only	AC only	AC only
Dimensions (H x W x D)	1.73 x 10.6 x 8.1 in. (4.4 x 27 x 20.5 cm)	1.73 x 17.5 x 9.3 in. (4.4 x 44.5 x 23.6 cm.)	1.73 x 17.5 x 12.9 in. (4.4 x 44.5 x 32.8 cm.)	1.73 x 17.5 x 12.9 in. (4.4 x 44.5 x 32.8 cm.)	1.73 x 17.5 x 9.3 in. (4.4 x 44.5 x 23.6 cm)
Unit weight	3 lbs. (1.4 kgs.)	8 lbs. (3.6 kgs.)	10 lbs. (4.5 kgs.)	12 lbs. (5.4 kgs.)	8 lbs. (3.6 kgs.)
Feature	**Cisco 2960-24TC-S**	**Cisco 2960-48TC-S**	**Cisco 2960-48TT-S**	**Cisco 2960-48PST-L**	**Cisco 2960-48PST-S**
Forwarding bandwidth (Gbps)	16	16	16	16	16
Packets per second (Mpps)	6.5	10.1	10.1	6.5	13.3
MAC addresses supported	8,000	8,000	8,000	8,000	8,000
Onboard memory (DRAM)	64 MB	64 MB	64 MB	64 MB	64 MB
Gigabit Ethernet GBIC/SFP density	2	2	0	2	2
10/100/1000 density	2	22	2	2	2
10/100 density	24	48	48	48	48
100BASE-FX density	0	0	0	0	0
PoE: Max. 802.3af Class 3 devices (15.4W)	-	-	-	24	24
PoE: Max. 802.3af Class 2 devices (7.3W)	-	-	-	48	48
Measured 100% Throughput power consumption (with Max. PoE loads)	27	39	42	460	460
AC/DC support	AC only	AC only	AC only	AC only	AC only
Dimensions (H x W x D)	1.73 x 17.5 x 9.3 in. (4.4 x 44.5 x 23.6 cm.)	1.73 x 17.5 x 9.3 in. (4.4 x 44.5 x 23.6 cm.)	1.73 x 17.5 x 9.3 in. (4.4 x 44.5 x 23.6 cm.)	1.73 x 17.5 x 12.9 in. (4.4 x 44.5 x 32.8 cm.)	1.73 x 17.5 x 13 in. (4.4 x 44.5 x 33.2 cm.)
Unit weight	8 lbs. (3.6 kgs.)	8 lbs. (3.6 kgs.)	8 lbs (3.6 kgs.)	12 lbs. (5.4 kgs.)	12 lbs. (5.4 kgs.)
Feature	**Cisco 2960PD-8TT-L**	**Cisco 2960-24LT-L**	**Cisco 2960-24PC-L**	**Cisco 2960-24LC-S**	**Cisco 2960-24PC-S**
Forwarding bandwidth (Gbps)	16	16	16	16	16
Packets per second (Mpps)	2.7	6.5	6.5	6.5	6.5
MAC addresses supported	8,000	8,000	8,000	8,000	8,000
Onboard memory (DRAM)	64 MB	64 MB	64 MB	64 MB	64 MB
Gigabit Ethernet GBIC/SFP density	0	0	2	2	2
10/100/1000 density	1	2	2	2	2
10/100 density	8	24	24	24	24
100BASE-FX density	0	0	0	0	0
PoE: Max. 802.3af Class 3 devices (15.4W)	0	8	24	8	24

PoE: Max. 802.3af Class 2 devices (7.3W)	0	8	24	8	24
Measured 100% Throughput power consumption (with Max. PoE loads)	11	162	433	162	433
AC/DC support	No internal power supply; DC input	AC only	AC only	AC only	AC only
Dimensions (H x W x D)	1.73 x 10.6 x 8.1 in. (4.4 x 27 x 20.5 cm)	1.73 x 17.5 x 9.3 in. (4.4 x 44.5 x 23.6 cm.)	1.73 x 17.5 x 12.9 in. (4.4 x 44.5 x 32.8 cm.)	1.73 x 17.5 x 13 in (4.4 x 44.5 x 33.2 cm)	1.73 x 17.5 x 13 in. (4.4 x 44.5 x 33.2 cm)
Unit weight	3 lbs. (1.4 kgs.)	8 lbs. (3.6 kgs.)	10 lbs. (4.5 kgs.)	10 lbs. (4.5 kgs.)	12 lbs. (5.4 kgs.)

Selected Part Numbers and Ordering Information

Cisco Catalyst 2960 Series LAN Base Switches	
WS-C2960PD-8TT-L	Cisco Catalyst 2960-8 10/100 + 1 1000BT (PoE input) LAN Base Image
WS-C2960-8TC-L	Cisco Catalyst 2960-8 10/100 + 1 T/SFP LAN Base Image
WS-C2960-24PC-L	Cisco Catalyst 2960-24 10/100 PoE + 2T/SFP LAN Base Image
WS-C2960-48PST-L	Cisco Catalyst 2960-48 10/100 PoE + 2 1000BT + 2 SFP LAN Base Image
WS-C2960-24TC-L	Cisco Catalyst 2960-24 10/100 + 2T/SFP LAN Base Image
WS-C2960-24LT-L	Cisco Catalyst 2960-24 10/100 (8 PoE) + 2 1000BT LAN Base Image
WS-C2960-24TT-L	Cisco Catalyst 2960-24 10/100 + 2 1000BT LAN Base Image
WS-C2960-48TC-L	Cisco Catalyst 2960-48 10/100 + 2 T/SFP LAN Base Image
WS-C2960-48TT-L	Cisco Catalyst 2960-48 10/100 + 2 1000BT LAN Base Image
WS-C2960G-8TC-L	Cisco Catalyst 2960G-8 10/100/1000, 1 T/SFP LAN Base Image
WS-C2960G-24TC-L	Cisco Catalyst 2960G-24 10/100/1000, 4 T/SFP LAN Base Image
WS-C2960G-48TC-L	Cisco Catalyst 2960G-48 10/100/1000, 4 T/SFP LAN Base Image
Cisco Catalyst 2960 Series LAN Lite Switches	
WS-C2960-8TC-S	Cisco Catalyst 2960-8 10/100 +1 T/SFP LAN Lite Image
WS-C2960-24-S	Cisco Catalyst 2960-24 10/100 LAN Lite Image
WS-C2960-24TC-S	Cisco Catalyst 2960-24 10/100 + 2T/SFP LAN Lite Image
WS-C2960-48TT-S	Cisco Catalyst 2960-48 10/100 +2 1000BT LAN Lite Image
WS-C2960-48TC-S	Cisco Catalyst 2960-48 10/100 + 2T/SFP LAN Lite Image
WS-C2960-24LC-S	Cisco Catalyst 2960-24 10/100 (8 PoE) + 2T/SFP LAN Lite Image
WS-C2960-24PC-S	Cisco Catalyst 2960-24 10/100 PoE + 2T/SFP LAN Lite Image
WS-C2960-48PST-S	Cisco Catalyst 2960-48 10/100 PoE + 2 1000BT + 2 SFP LAN Lite Image

For More Information

http://www.cisco.com/go/catalyst2960

Cisco ESW 500 Series Switches

The Cisco ESW 500 Series switches are designed to integrate easily with Cisco Small Business products and with the Cisco Smart Business Communications System, to provide a complete data, voice, video, and wireless networking solution for small businesses. These switches are cost-effective, easy to use, and deliver the performance and reliability needed by small businesses. They can be supported by a Cisco partner or by in-house networking support staff.

Key Features and Benefits

- Uses QoS to prioritize delay-sensitive and high-bandwidth network traffic, enhance network performance, and support demanding services, such as real-time voice and video

- Offers enhanced security, including IEEE 802.1X port security to limit access to authorized users and applications, access control lists (ACLs) to restrict access to sensitive portions of the network and guard against attacks, and virtual LANs (VLANs) to segment traffic and workgroups
- Provides Small Form-Factor Pluggable (SFP) expansion slots for fiber-optic or Gigabit Ethernet uplink connectivity
- Supports an optional redundant power supply that provides uninterrupted failover to help ensure continuous operation
- Offers a choice of two simple graphical user interfaces (GUIs) for easier configuration, management, and troubleshooting. (Cisco ESW 500 Series Switches include an embedded web-based configuration utility designed specifically for setting up the switch, and can also be configured with Cisco Configuration Assistant version 2.0 or later for system deployments)

Specifications

Product	Product Number	Copper FE ports	Copper GigE ports	SFP GigE ports	Combo SFP GigE ports[1]	PoE support	PoE ports @7.5 Watts	PoE ports @15.4 Watts
Gigabit Ethernet Switches with PoE	ESW-540-8P	N/A	8	None	1	Yes	8	
	ESW-540-24P	N/A	24	None	4	Yes	24	
Gigabit Ethernet Switches without PoE	ESW-540-24	N/A	24	None	4	No	N/A	N/A
	ESW-540-48	N/A	48	None	4	No	N/A	N/A
Fast Ethernet Switches with PoE	ESW-520-8P	8	None	None	1	Yes	8	4
	ESW-520-24P	24	4	None	2	Yes	24	12
	ESW-520-48P	48	2	2	None	Yes	48	24
Fast Ethernet Switches without PoE	ESW-520-24	24	4	None	2	No	N/A	N/A
	ESW-520-48	48	2	2	None	No	N/A	N/A

1. Combo SFP slots include one 10/100/1000BASET Ethernet port and 1 SFP-based Gigabit Ethernet slot for fiber, 1 port active at a time.

Selected Part Numbers and Ordering Information

ESW-520-8P-K9	Cisco ESW 500 Eight 10/100 PoE ports; 1 expansion port: One 10/100/1000BASE-T and 1 combo* SFP slot
ESW-520-24-K9	Cisco ESW 500 Twenty-four 10/100 Ethernet ports; 4 expansion ports: Two 10/100/1000BASE-T and 2 combo* SFP slots
ESW-520-24P-K9	Cisco ESW 500 24 10/100 PoE ports; 4 expansion ports: Two 10/100/1000BASE-T and 2 combo* SFP slots
ESW-520-48-K9	Cisco ESW 500 Forty-eight 10/100 Ethernet ports; 4 expansion ports: Two 10/100/1000BASE-T and 2 SFP slots
ESW-520-48P-K9	Cisco ESW 500 Forty-eight 10/100 PoE ports; 4 expansion ports: Two 10/100/1000BASE-T and 2 SFP slots
ESW-540-8P-K9	Cisco ESW 500 Eight 10/100/1000 PoE ports; 1 expansion port: One 10/100/1000BASE-T and 1 combo* SFP slot
ESW-540-24-K9	Cisco ESW 500 Twenty-four 10/100/1000 Ethernet ports; 4 expansion ports: 4 combo* SFP slots
ESW-540-24P-K9	Cisco ESW 500 Twenty-four 10/100/1000 PoE ports; 4 expansion ports: 4 combo* SFP slots
ESW-540-48-K9	Cisco ESW 500 Forty-eight 10/100/1000 Ethernet ports; 4 expansion ports: 4 combo* SFP slots

For More Information

http://www.cisco.com/go/esw500

Cisco ME 4900 Series Ethernet Switches

The Cisco ME 4924-10GE Switch (ME4924-10GE) is a Layer 2–4 fixed-configuration switch that offers high-performance for small and midsize aggregation deployments. The switch offers high performance and low latency in a compact 1-rack unit (1RU) form factor.

Ideal for Companies That Need These Features

Cisco ME 4900 Series	• 28 ports of Small Form-Factor Pluggable (SFP) Gigabit Ethernet and 2 ports of 10-Gigabit Ethernet uplinks for switching in 1RU with dual power supplies • Nonblocking Layer 2, 3, and 4 Gigabit Ethernet performance switch

Key Features and Benefits

- The switch offers low-latency and wire-speed performance in all directions regardless of the number of route entries or Layer 3 and Layer 4 services enabled.
- The switch offers up to 28 SFP Gigabit Ethernet ports and two 10-Gigabit Ethernet ports.
- The switch has redundant hot-swappable AC or DC power supplies with a hot-swappable fan tray.
- SFP on downlink and SFP+ or X2 on uplink flexibility for fiber port interfaces cover a wide range of cabling distances.
- A compact form factor (1RU) allows for deployment in space-constrained areas.
- IP Unicast routing protocols (Open Shortest Path First [OSPF], Enhanced IGRP [EIGRP], Intermediate System-to-Intermediate System [IS-IS], and Border Gateway Protocol Version 4 [BGPv4]) are supported for load balancing and designing scalable networks.
- IP Multicast routing protocols (Protocol Independent Multicast dense mode [PIM-DM], PIM sparse mode [PIM-SM], Source Specific Multicast [SSM], and Internet Group Management Protocol Versions 2 and 3 [IGMPv2 and v3]) are supported.
- Intelligent quality of service (QoS) and traffic management, including sharing, shaping, and strict-priority configurations, determine scheduling of egress traffic.

Specifications

Feature	Cisco ME- 4924-10GE
Forwarding bandwidth (Gbps)	96
Maximum stack members	0
Total stack bandwidth (Gbps)	0
Packets per second (Mpps)	72
MAC addresses supported	55,000
Routes supported	32,000
Onboard memory (DRAM)	256MB
10 GE density	2
Gigabit Ethernet SFP density	28
X2 port density	2
10/100/1000 density	0
10/100 density	0
AC/DC support	AC/DC
Dimensions (H x W x D)	1.75 x 17.3 x 16.1 in. (4.45 x 43.91 x 40.99 cm.)
Unit weight	16.5 (7.48 kgs.)

Selected Part Numbers and Ordering Information

Cisco ME 4900 Switch Series	
ME-4924-10GE	Cisco ME 4924 Switch - 24x 1GE SFP + 4x SFP or 2x 10GE X2, no PS
PWR-C49-300DC	Cisco Catalyst 4900 300-watt DC power supply
PWR-C49-300AC	Cisco Catalyst 4948 300-watt AC power supply

For More Information

http://www.cisco.com/en/US/products/ps7009/index.html

Cisco ME 3800X Series Carrier Ethernet Switch Router

The Cisco ME 3800X Series Carrier Ethernet Switch Router is a converged, full-featured aggregation platform designed specifically for the mobile, business, and residential markets. With low power consumption and high service scale, this 1-rack-unit (1RU) switch router is optimized for small aggregation and remote point-of-presence (POP) applications, making it a highly cost-effective option. The Cisco ME 3800X Series expands the Cisco Carrier Ethernet aggregation portfolio while complementing the Cisco 7600 Series Routers and Cisco ASR 9000 Series Aggregation Services Routers by providing a rich and scalable feature set of Layer 2 and Layer 3 VPN services in a compact package.

Ideal for Companies That Need These Features

Cisco ME 3800X-24FS

- 24 Gigabit Ethernet Small Form-Factor Pluggable (SFP) ports with two 10 Gigabit Ethernet SFP Plus (SFP+) uplinks
- Modular AC and DC power supply
- Small footprint aggregation device

Key Features and Benefits

The Cisco ME 3800X Series helps service providers deliver advanced services for residential broadband, mobile, and Metro Ethernet applications. The highlights of this aggregation platform are as follows:

- Cisco Carrier Ethernet application-specific integrated circuit (ASIC)—Powered by Cisco's Carrier Ethernet ASIC, designed specifically for the needs of service providers, the Cisco ME 3800X Series delivers essential Carrier Ethernet technologies including: hierarchical QoS (H-QoS), Multiprotocol Label Switching (MPLS), and Hierarchical Virtual Private LAN Services (H-VPLS). The ASIC provides line-rate performance and enables advanced services including access control list (ACL) and H-QoS without affecting performance. This Carrier Ethernet ASIC incorporates innovative traffic-management capabilities while providing intelligent packet switching and routing operations.
- Service richness—With the Cisco ME 3800X Series, each service is assigned enhanced QoS and security attributes. The Cisco ME 3800X Series accomplishes advanced per-traffic-class metering and offers bidirectional packets and bytes statistics. The service offering is enhanced with rich operations, administration, and management (OAM) functions including: Layer 2 Connectivity Fault Management (CFM), IP service-level agreement (IP SLA) for Layer 3, and MPLS OAM.
- Service scale—The Cisco ME 3800X Series delivers unmatched service scalability in a 1RU footprint. With support for 256,000 MAC addresses and 8000 bridge domains, this switch router delivers high performance and high scale for point-to-point and multipoint VPN services. A total buffer size of 256 MB is available to provide per-service advanced QoS capabilities. This amount of buffer is required when stringent applications such as financial or video must be protected against the effect of 10- to 1-Gbps speed mismatch. The quantity of statistical counters enables the Cisco ME 3800X Series to provide a high level of service metering and monitoring throughout its range of scale.
- High-performance hardware—The Cisco ME 3800X Series provides two slots for hot-swappable and redundant power supplies. Three fans are integrated into each power supply, providing fan redundancy. High availability is also achieved on the Cisco ME 3800X Series through proactive diagnostic tools including Generic On-Line Diagnostics (GOLD) and Onboard Failure Logging (OBFL). These tools help service providers avoid potential problems before they occur and troubleshoot and diagnose after they are identified.
- Advanced SLAs—Service-aware QoS allows service providers to expand and differentiate their services portfolio with highly advanced and differentiating SLAs. The hierarchical QoS capabilities of the Cisco ME 3800X Series scale to eight queues per service, three levels of scheduling, and buffer volumes capable of accommodating today's most demanding wireline and wireless applications.
- Mobile timing and synchronization services—The Cisco ME 3800X Series provides the timing services required in today's converged access network to support mobile solutions, including Radio Access Network (RAN) applications, and offers integrated support for the Building Integrated Timing Supply (BITS) interface. The Cisco ME 3800X Series also supports synchronous Ethernet (SyncE) and can source network clocking information.

Specifications

Features	Cisco ME 3800X-24FS
Forwarding bandwidth (Gbps)	44 (full duplex)
Packets per second (Mpps)	65
MAC addresses supported	256,000
Routes supported	80,000
GE density	24
10GE density	2
AC/DC support	AC and DC modular and redundant
Dimensions (H x W x D)	1.72-in. x 17.50-in. x 20.33-in. (4.47cm x 44.45cm x 51.6cm)

Unit weight	14.50 lb (6.57 kg)

Selected Part Numbers and Ordering Information

Cisco ME 3800X Series Ethernet Access Switches	
ME-3800X-24FS-M	Cisco ME 3800X 24FS Switch Router
PWR-ME3KX-AC	AC power supply and fan module for ME-3800X-24FS-M
PWR-ME3KX-DC	DC power supply and fan module for ME-3800X-24FS-M
ME-FANTRAY	Fan tray module for ME-3800X-24FS-M. The fan tray is required in the second slot when only one power supply is in the system.
Cisco ME 3800X Series License Options	
METROETHERNETSERVICES	Layer 2 feature license targeted for Layer 2 aggregation · Enhanced QoS, with deep buffers and Hierarchical QoS · Layer 2 features for L2 VPN including EVC framework · Ethernet OAM · Synchronous Ethernet
METROIPSERVICES	Layer 3 feature license targeted for Layer 3 aggregation · IP routing (OSPF, ISIS, EIGRP,BGP) · Layer 3 multicast PIM SM and SSM · Bidirectional Forwarding Detection (BFD) · Multi-VRF CE (VRF lite) with service awareness (ARP, ping, SNMP, syslog, traceroute, FTP, TFTP)
METROAGGREGATIONSERVICES	MPLS feature license targeted for MPLS aggregation · MPLS label imposition/disposition · MPLS Traffic Engineering (TE) and Fast Reroute (FRR) · Ethernet over MPLS (EoMPLS) · MPLS VPN · MPLS OAM
SERVICESCALABILITY	· Enables full scalability for Layer 2, IP routing, and MPLS resources

For More Information

http://www.cisco.com/en/US/products/ps10965/index.html

Cisco ME 6500 Series Ethernet Switches

The Cisco ME 6500 Series Ethernet Switch is a next-generation, fixed-configuration switch built for space-optimized and power-constrained networks. Based on groundbreaking and industry-leading Cisco Catalyst 6500 technology, the Cisco ME 6500 Series cost-effectively delivers on the stringent performance, reliability, and quality-of-service (QoS) requirements of next-generation enterprise WAN edge deployments in a space- and power-optimized 1.5-rack unit (1.5RU) package. The Cisco ME 6500 Series extends the most advanced Multiprotocol Label Switching (MPLS), QoS, multicast, and IPv6 features into Ethernet access and aggregation networks, enabling scalable and service-rich Gigabit Ethernet access for both fiber and copper deployments. It is equipped standard with the Policy Feature Card 3C (PFC3C) and Multilayer Switch Feature Card 2A (MSFC2A).

Ideal for Companies That Need These Features

Cisco ME 6524 with 24 Gigabit Ethernet SFP downlinks	· 24 Gigabit Ethernet Small Form-Factor Pluggable (SFP) downlinks · 8 Gigabit Ethernet SFP uplinks · Redundant power supplies (product ID ME-C6524GS-8S)
Cisco ME 6524 with 24 Ethernet 10/100/1000 downlinks	· 24 Ethernet 10/100/1000 downlinks · 8 Gigabit Ethernet SFP uplinks · Redundant power supplies (product ID ME-C6524GT-8S)

Key Features and Benefits

- Optimal Gigabit Ethernet density—With up to 32 Gigabit Ethernet ports, all fiber-based, the Cisco ME 6524 can aggregate multiple customers who require Gigabit Ethernet connectivity. The uplink interfaces offer flexible connectivity options by accommodating a broad range of Small Form-Factor Pluggable (SFP) optics, including coarse wavelength-division multiplexing (CWDM) and dense wavelength-division multiplexing (DWDM) optics.
- Flexible network deployment options—The switch features highly scalable Layer 2 services with features such as intelligent 802.1Q tunneling and Layer 2 Protocol Tunneling. The PFC3C daughter card enables in-hardware Multiprotocol Label Switching (MPLS) technologies for MPLS VPNs, and Ethernet over MPLS

(EoMPLS). For service offerings facing an increasing demand for IP address space, hardware-enabled IPv6 protocols provide a scalable and high-performance end-to-end IP service delivery.

- Optimal performance and scalability—The Cisco ME 6524 offers high-performance CPU for Layer 2 and Layer 3 protocol convergence and stability. The switch features scalable Layer 2 switching, IP routing, and MPLS functions in hardware without affecting performance.
- Increased service availability—The Cisco ME 6524 helps ensure service and network uptime with its support of Cisco EtherChannel protocols, rapid convergence protocols such as IEEE 802.1w/802.1s and Flexlink, and gateway load-balancing protocols. In order to minimize service outage due to a power supply failure, the Cisco ME 6524 can be configured with redundant AC or DC or a combination of AC and DC power supplies that are field-replaceable and hot-swappable.
- Integrated security—The Cisco ME 6524 offers a comprehensive set of security features to mitigate denial-of-service (DoS) attacks, to restrict access to the network, and to safeguard network resources. Port- and VLAN-based access control lists (ACLs) restrict the unwanted traffic based on traffic and users; CPU rate limiters and control plane policing (CoPP) limit the amount of traffic that enters the network; Port Security limits the number of MAC addresses that can be learned; Dynamic Host Configuration Protocol (DHCP) Snooping and dynamic Address Resolution Protocol (ARP) inspection prevent threats from the DHCP server, default gateways, or address spoofing attacks. These integrated security features are hardware-enabled so they can be enabled concurrently without jeopardizing the system performance as the traffic level increases.

Specifications

Feature	Cisco ME 6524 GS-8S	Cisco ME 6524 GT-8S
Forwarding bandwidth (Gbps)	32	32
Packets per second (Mpps)	15	15
MAC addresses supported	96,000	96,000
Routes supported IPv4	256,000	256,000
Routes supported IPv6	128,000	128,000
EoMPLS Tunnels	4096	4096
MPLS VPNs	512	512
NetFlow Entries	128,000	128,000
Onboard memory (DRAM/ Flash)	• Switch processor—256 MB of default DRAM upgradeable to 512 MB or 1 GB / 128MB boot flash • Route processor—512 MB of default DRAM upgradeable to 1 GB / 64-MB boot flash	• Switch processor—256 MB of default DRAM upgradeable to 512 MB or 1 GB / 128MB boot flash • Route processor—512 MB of default DRAM upgradeable to 1 GB / 64-MB boot flash
10/100/1000 density		24
Gigabit SFP density	24 Downlinks and 8 Uplinks	8 (Uplinks)
AC/DC support	AC and DC	AC and DC
Dimensions (H x W x D)	2.625 x 17.45 x 19 in. (6.7 x 44.3 x 48.3 cm)	2.625 x 17.45 x 19 in. (6.7 x 44.3 x 48.3 cm)
Unit weight	29.13 lb (13.21 Kg)	29.13 lb (13.21 Kg)

Selected Part Numbers and Ordering Information

Cisco ME 6500 Series Switches[1]	
ME-C6524GS-8S	24 Gigabit Ethernet SFP interfaces + 8 Gigabit Ethernet SFP uplinks, 1 Fan Tray
ME-C6524GT-8S	24 Ethernet 10/100/1000 interfaces + 8 Gigabit Ethernet SFP uplinks, 1 Fan Tray
PWR-400W-DC	400W DC Power Supply for the Cisco ME 6524
PWR-400W-AC	400W AC Power Supply for the Cisco ME 6524
MEM-XCEF720-256M	Default Memory on the Cisco ME 6524 Switch Processor
MEM-XCEF720-512M	512-MB Memory Upgrade Option for the Switch Processor on the Cisco ME 6524
MEM-XCEF720-1GB	1-GB Memory Upgrade Option for the Switch Processor on the Cisco ME 6524
EM-MSFC2-512MB	Default Memory on the Cisco ME 6524 Router Processor
MEM-MSFC3-1GB	1-GB Memory Upgrade Option for the Router Processor on the Cisco ME 6524
MEM-C6K-CPTFL512M	Optional External Compact Flash memory 512 MB
Cisco ME 6500 Series Product Activation Keys	
S523IBL	12218ZU Cisco ME 6524 IOS IP BASE LAN only

S523IBK9L	12218ZU Cisco ME 6524 IOS IP BASE SSH LAN only
S523AIK9L	12218ZU Cisco IOS Advanced IP Services

1. S=IP Base; E=IP Services

For More Information

http://www.cisco.com/en/US/products/ps6845/index.html

Cisco ME 3400 Series Ethernet Access Switches

The Cisco ME 3400 Series Ethernet Access Switches are a series of next-generation Layer 2 and Layer 3 customer-located devices for service providers. Both software and hardware are built to meet the requirements for residential and business Ethernet access services.

Ideal for Companies That Need These Features

Cisco ME-3400-24TS	· 24 10/100 ports with two Small Form-Factor Pluggable (SFP) uplinks · AC and DC versions available · Business and residential access
Cisco ME-3400-24FS	· Twenty-four 100-MB SFP ports with two SFP uplinks · AC version only · Fiber-to-the-home application
Cisco ME-3400G-2CS	· Two dual-purpose (10/100/1000 and SFP) ports with two SFP uplinks · AC version only · Single-tenant unit access
Cisco ME-3400G-12CS	· 12 dual-purpose (10/100/1000 and SFP) ports with 4 SFP uplinks · Redundant AC and DC versions available · Gigabit access · Small Layer 2 aggregation

Key Features and Benefits

Service provider-friendly hardware

- Small form factor—The Cisco ME 3400 Series Switches are designed with a compact form factor to accommodate deployment in small spaces. Combined with various mounting options, the switches can be deployed in space-constrained places.
- Industry-standard certifications—The Cisco ME 3400 Series is certified for both Network Equipment Buildings Standards Level 3 (NEBS3) and European Telecommunications Standards Institute (ETSI) standards.

Metro-specific software

- User-Network Interface (UNI), Enhanced Network Interface (ENI), and Network-Node Interface (NNI) port types—The Cisco ME 3400 Series software introduces the concepts of UNI, ENI, and NNI for Ethernet access switches. Because the software can identify the application of each port, it can provide many powerful default behaviors, thereby simplifying deployment, troubleshooting, and provisioning of the Cisco ME 3400 Series.
- QoS—The Cisco ME 3400 Series supports the Cisco Modular QoS CLI (MQC) to provide a modular and highly extensible framework for deploying QoS. By using an application-specific integrated circuit (ASIC)-based QoS solution, the Cisco ME 3400 Series provides policing, marking, shaping, and scheduling without affecting performance.
- Comprehensive security solution—As Metro Ethernet networks expand, it is a challenge to provide the same level of security as other access technologies. Cisco ME 3400 Series Switches provide a comprehensive security solution for Ethernet access networks by addressing their security features with respect to each of three areas: subscriber, switch, and network security.
- Ethernet operations, administration, and maintenance (Ethernet OAM)—The Cisco ME 3400 Series supports industry-standard OAM&P tools including IEEE 802.1ag Connectivity Fault Management (CFM) and the Ethernet Local Management Interface (E-LMI) protocols. IEEE 802.1ag allows operators to monitor and troubleshoot end-to-end Ethernet networks and allows service providers to check connectivity, isolate network issues, and identify customers affected by network problems. The E-LMI protocol, developed by the Metro Ethernet Forum (MEF), enables service providers to automatically configure the customer-edge device to match the subscribed service. This automatic provisioning not only reduces the effort to set up the service, but also reduces the amount of coordination required between the service provider and enterprise customer. In addition, the Cisco ME 3400 Series supports the IEEE 802.3ah Ethernet in the First Mile standard for service providers to perform link monitoring, fault isolation/detection, and loopback on the link between the customer equipment and the service provider network.

Specifications

Feature	Cisco ME 3400-24TS	Cisco ME 3400-24FS	Cisco ME 3400G-2CS	Cisco ME 3400G-12CS
Forwarding bandwidth (Gbps)	8.8	8.8	8.8	32
Packets per second (Mpps)	6.5	6.5	6.5	26
MAC addresses supported	8,000	8,000	8,000	8,000
Routes supported	5,000	5,000	5,000	5,000
GE density	2	2	4	16
FE density	24	24	0	0
AC/DC support	AC and DC	AC power	AC	Redundant AC and DC
Dimensions (H x W x D)	1.73 x 17.5 x 9.52 in. (4.4 x 44.5 x 24.2 cm)	1.73 x 17.5 x 9.52 in. (4.4 x 44.5 x 24.2 cm)	1.73 x 10.6 x 7.1 in. (4.4 x 26.9 x 18.2 cm)	1.73 x 17.5 x 11.0 in. (4.4 x 44.5 x 27.9 cm)
Unit weight	6.9 lb (2.9 kg)	7.5 lb (2.9 kg)	3.5 lb (1.6 kg)	AC: 9.3 lb (4.2 kg); DC: 9.0 lb (4.1 kg)

Selected Part Numbers and Ordering Information

Cisco ME 3400 Series Ethernet Access Switches	
ME-3400-24TS-A	Cisco ME 3400 24 10/100 +2 SFP, AC PS
ME-3400-24TS-D	Cisco ME 3400 24 10/100 +2 SFP, DC PS
ME-3400-24FS-A	Cisco ME 3400 24 100mb SFP +2 SFP, AC PS
ME-3400G-2CS-A	Cisco ME 3400 2 dual-purpose +2 SFP, AC PS
ME-3400G-12CS-A	Cisco ME 3400 12 dual-purpose +4 SFP, redundant AC PS
ME-3400G-12CS-D	Cisco ME 3400 12 dual-purpose +4 SFP, redundant DC PS
Cisco ME 3400 Series Software Options	
METROBASE	· Standard Layer 2 feature image targeted for triple play services · Advanced QoS—Ingress policing, egress shaping · Robust multicast—IGMP filtering/throttling, MVR · Complete security—UNI/NNI, Control Plane Security, Configuration File Security
METROACCESS	· Enhanced Layer 2 feature images targeted for premium triple player services and Layer 2 VPN services · Advanced L2 tunneling—802.1q Tunneling, Layer 2 Protocol Tunneling · Enhanced scalability—Configurable Per VLAN MAC Learning · Fast convergence—Flex Link
METROIPACCESS	· Layer 3 feature images targeted for Layer 3 VPN services · IP routing (RIPv1/v2, EIGRP, OSFP, BGPv4) · Secured Layer 3—Multi-VRF CE · Enhanced routing—Policy-based routing (PBR)

For More Information

http://www.cisco.com/en/US/products/ps6580/

Cisco ME 3400E Series Ethernet Access Switches

The Cisco ME 3400E Series Ethernet Access Switches are a series of next-generation Layer 2 and Layer 3 customer-located devices for service providers. The Cisco ME 3400E Series helps service providers deliver four important attributes that are essential to next-generation Carrier Ethernet service: availability, flexibility, manageability, and security.

Ideal for Companies that Need These Features

Cisco ME-3400E-24TS-M	· 24 10/100 ports with two dual-purpose (10/100/1000 and Small Form-Factor Pluggable [SFP]) uplinks · Two modular power-supply slots; AC and DC power supplies available · Business and residential access
Cisco ME-3400EG-2CS	· Two dual-purpose (10/100/1000 and SFP) ports with two SFP uplinks · AC version only · Single-tenant unit access

Cisco ME-3400EG-12CS

- 12 dual-purpose (10/100/1000 and SFP) ports with four SFP uplinks
- Two modular power-supply slots; AC and DC power supplies available
- Gigabit access
- Small Layer 2 aggregation and mobile pre-aggregation

Key Features and Benefits

Service provider-friendly hardware

- Small form factor—The Cisco ME 3400E Series is designed with a compact form factor to accommodate deployment in small spaces. Combined with various mounting options, these switches can be deployed in space-constrained places.
- Industry-standard certifications—The Cisco ME 3400E Series is certified for both Network Equipment Buildings Standards Level 3 (NEBS3) and European Telecommunications Standards Institute (ETSI) standards.
- Flexible power options—The Cisco ME 3400E Series supports modular power options. Both the 24- and 12-port models (ME-3400E-24TS-M and ME-3400EG-12CS-M, respectively) support dual AC, dual DC, and a mix of AC and DC power-supply configurations. In addition, the Cisco ME 3400E Series DC power supply supports 24-VDC options needed for cell-tower deployments.
- Remote management—To help service providers reduce operating expenses (OpEx), the Cisco ME 3400E Series supports features such as dying gasp for loss of power, external alarm inputs, and port or VLANB-based traffic loopback. These features help reduce the necessity for expensive truck rolls to the equipment site by enabling remote troubleshooting and diagnostic.
- Extended temperature range—The Cisco ME 3400E Series can operate at up to 65 degrees Celsius, depending on model type and configuration.

Metro-specific software

- User-Network Interface (UNI), Enhanced Network Interface (ENI), and Network-Node Interface (NNI) port types—The Cisco ME 3400E Series software introduces the concepts of UNI, ENI, and NNI for Ethernet access switches. Because the software can identify the application of each port, it can provide many powerful default behaviors, thereby simplifying deployment, troubleshooting, and provisioning of the Cisco ME 3400E Series.
- VLAN flexibility—The Cisco ME 3400E Series offers 1:1 VLAN translation and selective QinQ. These features allow service providers to expand their Layer 2 service offerings, and they provide robust control of VLAN tags for both customers and service providers.
- Quality of service (QoS)—The Cisco ME 3400E Series supports the Cisco Modular QoS CLI (MQC) to provide a modular and highly extensible framework for deploying QoS. By using an application-specific integrated circuit (ASIC)-based QoS solution, the Cisco ME 3400E Series provides policing, marking, shaping, and scheduling without affecting performance. In addition, the Cisco ME 3400E Series also supports advanced QoS features such as two-rate three-color ingress policing and class-of-service (CoS) mapping. These features enable service providers to offer more granular services.
- Comprehensive security solution—As Metro Ethernet networks expand, it is a challenge to provide the same level of security as other access technologies. Cisco ME 3400E Series Switches provide a comprehensive security solution for Ethernet access networks by addressing their security features with respect to each of three areas: subscriber, switch, and network security.
- Ethernet operations, administration, and maintenance (Ethernet OAM)—The Cisco ME 3400 Series supports industry-standard OAM&P tools including IEEE 802.1ag Connectivity Fault Management (CFM) and the Ethernet Local Management Interface (E-LMI) protocols. IEEE 802.1ag allows operators to monitor and troubleshoot end-to-end Ethernet networks and allows service providers to check connectivity, isolate network issues, and identify customers affected by network problems. The E-LMI protocol, developed by the Metro Ethernet Forum (MEF), enables service providers to automatically configure the customer-edge device to match the subscribed service. This automatic provisioning not only reduces the effort to set up the service, but also reduces the amount of coordination required between the service provider and enterprise customer. In addition, the Cisco ME 3400 Series supports the IEEE 802.3ah Ethernet in the First Mile standard for service providers to perform link monitoring, fault isolation/detection, and loopback on the link between the customer equipment and the service provider network.

Specifications

Feature	Cisco ME 3400E-24TS	Cisco ME 3400EG-2CS	Cisco ME 3400EG-12CS
Forwarding bandwidth (Gbps)	8.8	8.8	32
Packets per second (Mpps)	6.5	6.5	26
MAC addresses supported	8,000	8,000	8,000
Routes supported	5,000	5,000	5,000
GE density	2	4	16
FE density	24	0	0
AC/DC support	Redundant AC and DC	AC	Redundant AC and DC

Dimensions (H x W x D)	1.75 x 17.5 x 9.3 in. (4.45 x 44.5 x 23.6 cm)	1.73 x 10.6 x 7.2 in. (4.4 x 26.9 x 18.3 cm)	1.75 x 17.5 x 12.0 in. (4.45 x 44.5 x 30.5 cm)
Unit weight	6.4 lb (2.9 kg)	3.4 lb (1.5 kg)	8.5 lb (3.9 kg)

Selected Part Numbers and Ordering Information

Cisco ME 3400E Series Ethernet Access Switches	
ME-3400E-24TS-M	Cisco ME-3400E 24 10/100 +2 dual-purpose, 2 PS slots
ME-3400EG-2CS-A	Cisco ME-3400E 2 dual-purpose +2 SFP, AC PS
ME-3400EG-12CS-M	Cisco ME-3400E 12 dual-purpose +4 SFP, 2 PS slots
ME34X-PWR-AC	AC power supply
ME34X-PWR-DC	DC power supply
Cisco ME-3400E Series Software Options	
METROACCESS	· Enhanced Layer 2 feature images targeted for premium triple player services and Layer 2 VPN services · Advanced L2 tunneling—802.1q Tunneling, Layer 2 Protocol Tunneling · Enhanced scalability—Configurable Per VLAN MAC Learning · Fast convergence—Flex Link
METROIPACCESS	· Layer 3 feature images targeted for Layer 3 VPN services · IP routing (RIPv1/v2, EIGRP, OSFP, BGPv4) · Secured Layer 3—Multi-VRF CE · Enhanced routing—Policy based routing (PBR)

For More Information

http://www.cisco.com/en/US/products/ps9637/index.html

Cisco ME 3600X Series Ethernet Switches

The Cisco ME 3600X Series Ethernet Access Switches represent Cisco's first series of switches built specifically for the convergence of wireless and wireline services. A natural evolution to Cisco's Carrier Ethernet portfolio, the Cisco ME 3600X Series extends the transport speed of the portfolio to 10 Gbps in the access layer for business and mobile applications. It also enables service providers to initiate Multiprotocol Label Switching (MPLS)-based VPN services from within the access layer. Designed around critical Carrier Ethernet features that simplify network operation, the Cisco ME 3600X Series enables premium services with enhanced service-level agreement (SLA) capabilities. An optional "pay-as-you-grow" feature and service activation model gives service providers a flexible, cost-effective solution.

Ideal for Companies that Need These Features

Cisco ME 3600X-24TS	· Twenty-four 10/100/1000 ports with two 10 Gigabit Ethernet Small Form-Factor Pluggable Plus (SFP+) uplinks · Modular AC and DC power supply · Premium services for wireline and wireless
Cisco ME 3600X-24FS	· 24 Gigabit Ethernet SFP ports with two 10 Gigabit Ethernet SFP+ uplinks · Modular AC and DC power supply · Premium services for wireline and wireless

Key Features and Benefits

- Cisco Carrier Ethernet ASIC

  Powered by the Cisco Carrier Ethernet application-specific integrated circuit (ASIC)—designed specifically with service providers in mind—the Cisco ME 3600X Series delivers essential Carrier Ethernet technologies, including: Hierarchical quality of service (HQoS), MPLS, and Hierarchical Virtual Private LAN Service (H-VPLS). This custom and advanced ASIC design provides uninterrupted line-rate performance while delivering complex and taxing services such as access control list (ACL) and HQoS. The Carrier Ethernet ASIC integrates Cisco traffic-management innovation to deliver intelligent packet switching and routing operations.

- MPLS in the access layer

  The Cisco ME 3600X Series extends MPLS into the access layer by enabling service providers to initiate MPLS-based Layer 2 and Layer 3 VPN services from within the access layer. The Cisco ME 3600X Series gives service providers the ability to expand MPLS toward their network edge to gain the advantages of a single unified MPLS control plane across their network.

- "Pay-as-you-grow" investment model

  The use of licensing to activate features on the Cisco ME 3600X Series allows service providers to customize and schedule their investment in access features for a time when network growth and customer demand

justify the investment. Unlike investments in the core and edge, where the physical location of network assets has minimal effect on their accessibility and usage, the return on investment (ROI) on an access element is heavily influenced by its location in the network and proximity to customers. The ability to deploy the Cisco ME 3600X Series and later activate features as demand and growth dictate, with little if any need for service calls, delivers highly measurable investment protection. This allows flexible timing for migrating from 1 Gbps to 10 Gbps, deploying MPLS services, and boosting service capacity.

- Advanced service-level agreements

  Service-aware quality of service (QoS) allows service providers to expand and differentiate their services portfolio with highly advanced and differentiating SLAs. The HQoS capabilities of the Cisco ME 3600X Series scale to eight queues per service, three levels of scheduling, and buffer volumes capable of accommodating today's most demanding wireline and wireless applications.

- Mobile timing and synchronization services

  The Cisco ME 3600X Series provides the timing services required in today's converged access network to support mobile solutions, including Radio Access Network (RAN) applications, and offers integrated support for the Building Integrated Timing Supply (BITS) interface. The Cisco ME 3600X Series also supports synchronous Ethernet (SyncE) and can source network clocking information.

- Operational efficiency for Carrier Ethernet access deployments

  The Cisco ME 3600X Series features important enhancements that help service providers simplify and facilitate the management of their network, resulting in diminishing operational costs. This unique feature set enables deployment of the Cisco ME 3600X Series in a variety of applications, including business service with 10 Gigabit Ethernet User Network Interface (UNI) and Ethernet mobile backhaul. These features enhance performance awareness, facilitate troubleshooting, and simplify service turn-up and restoration, ultimately reducing operational cost. "Dying gasp" for power indicators and four external alarm inputs to detect changes in remote sites further help service providers manage the health of network elements.

Specifications

Feature	Cisco ME 3600X-24TS	Cisco ME 3600X-24FS
Forwarding bandwidth (Gbps)	44 (full duplex)	44
Packets per second (Mpps)	65	65
MAC addresses supported	16,000	16,000
Routes supported	20,000	20,000
GE density	24	24
10GE density	2	2
AC/DC support	AC and DC modular and redundant	AC and DC modular and redundant
Dimensions (H x W x D)	1.72-in. x 17.50-in. x 20.33-in. (4.47cm x 44.45cm x 51.6cm)	1.72-in. x 17.50-in. x 20.33-in. (4.47cm x 44.45cm x 51.6cm)
Unit weight	14.15 lb (6.41 kg)	14.50 lb (6.57 kg)

Selected Part Numbers and Ordering Information

Cisco ME 3600X Series Ethernet Access Switches	
ME-3600X-24TS-M	Cisco ME 3600X 24TS Switch
ME-3600X-24FS-M	Cisco ME 3600X 24FS Switch
PWR-ME3KX-AC	AC power supply and fan module for ME-3600X-24TS-M and ME-3600X-24FS-M
PWR-ME3KX-DC	DC power supply and fan module for ME-3600X-24TS-M and ME-3600X-24FS-M
ME-FANTRAY	Fan tray module for ME-3600X-24TS-M and ME-3600X-24FS-M. The fan tray is required in the second slot when only one power supply is in the system.
Cisco ME 3600X Series license options	
METROIPACCESS	• Layer 2 and Layer 3 feature license targeted for Layer 2 and Layer 3 premium Services • Enhanced QoS, with deep buffers and Hierarchical QoS • Layer 2 features for L2 VPN including EVC framework • Layer 3 features for advanced IP routing protocols including IP Routing protocols like RIPv1/v2, EIGRP, OSFP, BGPv4, HSRP,VRRP • Secured Layer 3: Multi-VRF CE

ADVANCEDMETROIPACCESS	· MPLS features license targeted for MPLS deployment in the access and MPLS based VPN Services · MPLS label imposition / Disposition on all ports · MPLS Traffic engineering and Fast Reroute · Ethernet over MPLS (EoMPLS) · MPLS VPN · MPLS OAM
10GEUPGRADE	The 10GE Upgrade license allows service providers to enable 10 Gigabit Ethernet on the uplink only when required, supporting a pay-as-you-grow strategy.

For More Information

http://www.cisco.com/en/US/products/ps10956/index.html

Cisco 2500 Series Connected Grid Switches

The Cisco 2500 Series Connected Grid Switch is a rugged switch optimized for use in transmission and distribution (T&D) power substations.

The Cisco 2520 Connected Grid Switch (CGS 2520) is designed for substation networks to meet the harsh environments common in transmission and distribution substations. The CGS 2520 uses Cisco IOS Software, the operating system that powers millions of Cisco switches worldwide.

Ideal for Utilities That Need These Features

Cisco 2500 Series	· Rugged industrial design and substation compliance: IEC 61850-3 and IEEE 1613 · QoS, enhanced security, and availability · Easy deployment and network management

Key Features and Benefits

- Rugged design for substation compliance—In addition to IEC 61850-3 and IEEE 1613 compliance, convection cooled with no moving parts or fans for maximum reliability and reduced network outages.
- Network security—Advanced Cisco IOS Software features such as 802.1x, Layer 2-Layer 4 access control lists (ACLs), port security, protected port/private VLAN, UNI/ENI default control traffic shut down and configuration file security to prevent unauthorized network access and reduce operational costs of securing the network.
- High availability and redundancy—Advanced features such as REP and Flexlink provide fast reconvergence in ring and hub-and-spoke topologies, minimizing network downtime and associated costs. In addition, field replaceable components such as power supplies and SFPs reduce redeployment time. Finally, optional redundant, hot-swappable power supply provides additional redundancy.
- Ease of use—Intuitive graphical user interface (GUI) in Cisco Configuration Professional simplifies configuration of switches and reduces training time and costs. Utility-focused enhancements have been added to further increase ease of use. Smartport templates provide one-touch global and port-level macros to simplify switch deployments.

Specifications

Feature	Cisco 2520-24TC	Cisco 2520-16S-8PC
Forwarding bandwidth (Gbps)	8	8
Forwarding rate (mpps)	6.5	6.5
MAC addresses supported	8,000	8,000
Onboard memory (DDR2 SDRAM)	256 MB	256 MB
Gigabit Ethernet density	2 (dual-purpose ports: 100/1000 fiber SFP and/or 10/100/1000 Gigabit copper)	2 (dual-purpose ports: 100/1000 fiber SFP and/or 10/100/1000 Gigabit copper)
10/100 density	24	8
100BASE-FX density	-	16-port fiber SFP
PoE: Max. 802.3af Class 3 devices (15.4W)	-	8 max
Power Consumption	28.6W	40.3W
Power Supply	External high AC/DC and low DC power supply options available for redundant power supply support	External high AC/DC and low DC power supply options available for redundant power supply support

Dimensions (H x W x D)	1.75 x 1.75 x 14 in. (4.45 x 44.5 x 35.6 cm)	1.75 x 1.75 x 14 in. (4.45 x 44.5 x 35.6 cm)
Unit weight	9.1 lbs. (4.1 kg)	10 lbs. (4.5 kg)

Selected Part Numbers and Ordering Information

Cisco 2500 Series Connected Grid Switches	
CGS-2520-24TC	Cisco 2520 Connected Grid Switch-24 10/100 + 2 dual purpose Gigabit Ethernet ports LAN Base Image
CGS-2520-16S-8PC	Cisco 2520 Connected Grid Switch-16 100FX SFP ports + 2 dual purpose Gigabit Ethernet ports LAN Base Image

For More Information

http://www.cisco.com/go/cgs2500

Cisco Switching Services

The enterprise network becomes a strategic asset through effective architecture, deployment, and operations.

Realize the full business value of your technology investments faster with intelligent, personalized services from Cisco and our partners. Backed by deep networking expertise and a broad ecosystem of partners, Cisco Services enable you to successfully plan, build, and run your network as a powerful business platform. Whether you are looking to quickly seize new opportunities to meet rising customer expectations, improve operational efficiency to lower costs, mitigate risk, or accelerate growth, we have a service that can help you.

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