

Cisco ME 3400 Series Ethernet Access Switches

Product Overview

Q. What are the Cisco® ME 3400 Series Ethernet Access Switches?

A. Cisco ME 3400 Series Ethernet Access Switches are a series of next-generation Layer 2 and Layer 3 customer-located devices for service providers. Their design is based on the experience learned from today's most widely deployed access switches, the Cisco Catalyst® 2950 and 3550 Series. The Cisco ME 3400 Series is the first access switch optimized for both Ethernet-to-the-Home (ETTH) converged data, voice, and video (triple-play) services and Ethernet-to-the-Business (ETTB) VPN services. It provides a comprehensive security solution for Metro Ethernet access that includes subscriber, switch, and network protection. The Cisco ME 3400 Series supports multiple software images for added flexibility in your deployment model.

Q. Is the Cisco ME 3400 Series certified to support industry-standard services?

A. Yes, the Cisco ME 3400 Series has Metro Ethernet Forum (MEF) 9 and 14 certification to support standard Layer 2 services and quality of service (QoS).

Q. Who should buy the Cisco ME 3400 Series?

A. The Cisco ME 3400 Series is intended as the customer-located equipment (CLE) for both the ETTH and ETTB markets. It is the successor for the Cisco Catalyst 2950 and 3550 Series in the Metro Ethernet access market.

Q. How is the Cisco ME 3400G-2CS Switch, as an intelligent Ethernet demarcation device, different from a network interface device (NID)?

A. A NID is a simple device designed to provide media conversation or distance extension function. However, as a carrier-grade Ethernet demarcation device, it lacks much essential functionality. The Cisco ME 3400G-2CS Switch supports industry-standard operations, administration, maintenance, and provisioning (OAM&P) functions for end-to-end network monitoring and troubleshooting. In addition, the Cisco ME 3400G-2CS offers advanced functions such as Flex-Links for link redundancy, QoS for differentiated services, and Layer 3 routing for advanced IP services.

Q. How is the Cisco ME 3400G-12CS Switch positioned?

A. The primary positioning of the Cisco ME 3400G-12CS Switch is for Gigabit Ethernet access. With both enterprise and residential applications demanding higher bandwidth, service providers are planning services above 100 Mbps. With advanced QoS functionalities, the Cisco ME 3400G-12CS allows service providers to offer bandwidth from 1 to 1000 Mbps on a single platform. The Cisco ME 3400G-12CS is also positioned as an in-building aggregator for high-density buildings where multiple access devices are needed.

Q. Are the Cisco Catalyst 3750, 3560, 2970, and 2960 Series also positioned for the Metro Ethernet market?

A. No, the Cisco ME 2400 and ME 3400 Series and the Cisco Catalyst 3750 Metro Series are the only products positioned for the Metro Ethernet market, and only they are planned to have new Metro Ethernet features in the future.

Q. How does the market positioning of the Cisco ME 3400 Series differ from that of the Cisco Catalyst 3750 Metro Series and the Cisco ME 2400 Series?

A. The Cisco Catalyst 3750 Metro Series will continue to be the premier access product for premium services. The Cisco ME 3400 Series is the successor product for the Cisco Catalyst 2950 and 3550 Series in both ETTH and ETTB markets. The Cisco ME 2400 Series is the non-upgradeable, ETTH-only solution in cost-sensitive markets.

Q. Will the Cisco Catalyst 3750 Metro Series be replaced by the Cisco ME 3400 Series?

A. No, the Cisco Catalyst 3750 Metro Series, with Cisco Hierarchical Queuing Framework (HQF) and Multiprotocol Label Switching (MPLS) access, will continue to be the premier access product for service providers that deploy premium services. It will continue to receive new Metro Ethernet features.


Q. Does the Cisco ME 3400 Series support HQF or MPLS features?




A. No; however, those features are supported on the Cisco Catalyst 3750 Metro Series Switches.

Q. What configuration options are available for the Cisco ME 3400 Series?

A. Table 1 shows the complete list of Cisco ME 3400 Series Ethernet Access Switches and options.

Table 1. Cisco ME 3400 Series Ethernet Access Switches

Product Name (Part Number)	Description
Cisco ME 3400-24FS AC Ethernet Access Switch (ME-3400-24FS-A) 	<ul style="list-style-type: none"> • 24 Ethernet 100-Mbps Small Form-Factor Pluggable (SFP) ports • 2 SFP-based Gigabit Ethernet and 100BASE-X ports • AC power supplies • 6.5-mpps forwarding rate • 1-rack unit (RU) multilayer switch • Ethernet access switch for lowdensity FTTH deployments • 3 Cisco IOS® Software feature image options (METROBASE, METROACCESS, and METROIACCESS)
Cisco ME 3400G-12CS AC Ethernet Access Switch (ME-3400G-12CS-A)	<ul style="list-style-type: none"> • 12 dual-purpose (10/100/1000 and SFP) ports • 4 SFP-based Gigabit Ethernet and 100BASE-X ports • Dual fixed redundant AC power supplies • 26-mpps forwarding rate • 1-RU multilayer switch • Gigabit Ethernet access switch for the Metro Ethernet market • 3 Cisco IOS Software feature image options (METROBASE, METROACCESS, and METROIACCESS)
Cisco ME 3400G-12CS DC Ethernet Access Switch (ME-3400G-12CS-D)	<ul style="list-style-type: none"> • 12 dual-purpose (10/100/1000 and SFP) ports • 4 SFP-based Gigabit Ethernet and 100BASE-X ports • Dual fixed redundant DC power supplies • 26-mpps forwarding rate • 1-RU multilayer switch • Gigabit Ethernet access switch for the Metro Ethernet market • 3 Cisco IOS Software feature image options (METROBASE, METROACCESS, and METROIACCESS)
Cisco ME 3400G-2CS AC Ethernet Access Switch (ME-3400G-2CS-A)	<ul style="list-style-type: none"> • 2 dual-purpose (10/100/1000 and SFP) ports • 2 SFP-based Gigabit Ethernet and 100BASE-X ports • AC power supplies • 6.5-mpps forwarding rate • 1-RU small-form factor multilayer switch • Intelligent Ethernet demarcation switch • 3 Cisco IOS Software feature image options (METROBASE, METROACCESS, and METROIACCESS)

Product Name (Part Number)	Description
Cisco ME 3400-24TS AC Ethernet Access Switch (ME-3400-24-TS-A)	<ul style="list-style-type: none"> • 24 Ethernet 10/100 ports • 2 SFP-based Gigabit Ethernet and 100BASE-X ports • AC power supply • 6.5-mpps forwarding rate • 1-RU multilayer switch • Ethernet access switch for the Metro Ethernet market • 3 Cisco IOS Software feature image options (METROBASE, METROACCESS, and METROIPACCESS)
Cisco ME 3400-24TS DC Ethernet Access Switch (ME-3400-24-TS-D)	<ul style="list-style-type: none"> • 24 Ethernet 10/100 ports • 2 SFP-based Gigabit Ethernet and 100BASE-X ports • DC power supply • 6.5-mpps forwarding rate • 1-RU multilayer switch • Ethernet access switch for the Metro Ethernet market • 3 Cisco IOS Software feature image options (METROBASE, METROACCESS, and METROIPACCESS)
Cisco ME 3400 Series METROBASE Software Feature Image (S340XB-12237SE) 	<ul style="list-style-type: none"> • Standard Layer 2 feature image targeted for triple-play services • Advanced QoS: Ingress policing and egress shaping • Robust multicast: IGMP filtering and throttling, and Multicast VLAN Registration (MVR) • Complete security solution: UNI/NNI, Control Plane Security, and Configuration File Security
Cisco ME 3400 Series METROACCESS Software Feature Image (S340XA-12237SE) 	<ul style="list-style-type: none"> • Enhanced Layer 2 feature images targeted for premium triple-play services and Layer 2 VPN services • Advanced Layer 2 Tunneling: 802.1q tunneling and Layer 2 Protocol Tunneling (L2PT) • Industry-standard Layer 2 management: 802.1ag (CFM) and E-LMI • Fast convergence: Flex-Link, Link-State Tracking, Resilient Ethernet Protocol (REP)
Cisco ME 3400 Series METROIPACCESS Software Feature Image (S340XI-12237SE) 	<ul style="list-style-type: none"> • Layer 3 feature images targeted for Layer 3 VPN services • IP routing (RIP versions 1 and 2, EIGRP, OSFP, IS-IS, and BGPv4) • Secured Layer 3: Multi-VRF CE • Enhanced routing: Policy Based Routing
Upgrade Kit for METROACCESS from METROBASE (CD-ME3400-B2A=)	METROACCESS image upgrade kit from METROBASE image
Upgrade Kit for METROIPACCESS from METROBASE (CD-ME3400-B2I=)	METROIPACCESS image upgrade kit from METROBASE image
Upgrade Kit for METROIPACCESS from METROACCESS (CD-ME3400-A2I=)	METROIPACCESS image upgrade kit from METROACCESS image

Q. What Cisco IOS Software feature images does the Cisco ME 3400 Series support?

A. The Cisco ME 3400 Series supports three different Cisco IOS Software feature images: METROBASE, METROACCESS, and METROIPACCESS. The METROBASE feature image includes features for converged triple-play services. The METROACCESS includes these, plus features for premium triple-play services or Layer 2 VPN services. The METROIPACCESS image contains all the preceding plus features for Layer 3 VPN services. Upgrade options are also available for future service requirements.

Q. Do I have options to select the software version?

A. The Cisco ME 3400 Series supports the Assemble To Order (ATO) fulfillment process. This enables you to select the version of software you want to be loaded on the switch. In addition, you can select the type of accessories that come with the switch.

Technology Overview

Q. What hardware features are available on the Cisco ME 3400 Series?

A. Cisco ME 3400 Series hardware is designed to simplify deployment and troubleshooting in the field. It features a compact design and flexible mounting options for deployment where space is limited. The Cisco ME 3400 Series also has all connectors in the front of the chassis for easier cable access. In addition, the switch operates reliably at temperatures up to 122°F (50°C).

Q. What certifications has the Cisco ME 3400 Series obtained?

A. The Cisco ME 3400-24TS switches has obtained both the Network Equipment Building Systems Level 3 (NEBS3) certification and European Telecommunications Standards Institute (ETSI) certifications. The Cisco ME 3400G switches also have NEBS3 certification. These certifications ensure that the Cisco ME 3400 Series conforms to telecommunications industry standards.

Q. What are the key features in each software feature image?

A. The key features in each software feature image are listed in Table 2.

Table 2. Key Features for Each Software Feature Image

METROBASE	METROACCESS	METROIPACCESS
UNI/NNI	All METROBASE features	All METROACCESS features
Internet Group Management Protocol (IGMP) Filtering and Throttling	802.1Q Tunneling, L2PT	Static routing
Multicast VLAN Registration (MVR)	Ethernet OAM (802.1ag, 802.3ah, E-LMI)	Multi-VRF CE (VRF-lite)
Advanced QoS	Configurable per VLAN MAC Learning	PBR
Control Plane Security	Flex-Link	RIP versions 1 and 2
Configuration File Security	Dynamic ARP Inspection, IP Source Guard	EIGRP, OSPF, and IS-IS
DHCP Snooping	Per Port Per VLAN Ingress Policing	BGPv4
Private VLAN	Link-State Tracking	NNI Configurable on All Ports
Configuration Rollback	Resilient Ethernet Protocol	Source Specific Multicast
MAC address learning and aging notifications	Ethernet IP SLA	Multicast support for VRF (mVRF-Lite)
	Embedded Event Manager	VRF-aware Services (ARP, Ping, SNMP, HSRP, uRPF Syslog, Traceroute, FTP, and TFTP)
		IGMP Proxy

Q. What is UNI/NNI?

A. UNI/NNI is the classification of port types designed for the Metro Ethernet market to simplify deployment, management, and troubleshooting. UNI, User Network Interface, is the interface that faces the subscriber, and NNI, Network Node Interface, is the interface that faces the service provider network. By labeling each port as UNI or NNI, the software can optimize each port for the role. Table 3 lists some default behaviors for each port type and the benefits.

Table 3. UNI/NNI Default Behaviors and Benefits

Default Behaviors	Benefits
UNI Default: Down	Ports are activated only when the service provider configures all the parameters and turns on the port, helping prevent unauthorized access to services.
UNI Default: No Local Switching	Creates circuit-like behavior to separate customers' traffic from each other.
UNI Default: Control Plane Security Enabled	Control plane packet ingresses from UNI are dropped in hardware to protect against denial-of-service (DoS) attacks.
NNI Default: Up	Helps enable automated configuration of the switch through the Dynamic Host Configuration Protocol (DHCP)/BOOTP server.

Q. What is the Control Plane Security feature?

A. This feature protects the switch CPU by dropping control protocols on UNI interfaces. It is enabled on the UNI by default. Some of the control protocols dropped are bridge protocol data unit (BPDU), Cisco Discovery Protocol, VLAN Trunking Protocol (VTP), Unidirectional Link Detection Protocol (UDLD), and Link Aggregation Protocol (LACP). Users can turn on L2PT for those features on a per-port basis. Users can also rate-limit ingress on the UNI for some of the control protocols.

Q. What multicast features are supported on the Cisco ME 3400 Series?

A. The Cisco ME 3400 Series offers both granular IGMP control features and efficient multicast distribution features to support robust video services. For fine control of IGMP messages, the Cisco ME 3400 Series supports the IGMP Fast Leaves feature for quick channel changing, IGMP filtering for control of which groups users can access, and IGMP throttling for control of how many groups users can access. The Cisco ME 3400 Series provides efficient multicast distribution features such as Multicast VLAN Registration (MVR) and Protocol Independent Multicast (PIM) routing. The MVR feature reduces duplication of multicast traffic across multiple VLANs in Layer 2 ring networks by centralizing the distribution of multicast traffic in a single video VLAN. PIM routing provides intelligent multicast routing by building a distribution tree base on Layer 3 information.

Q. What QoS features are available on the Cisco ME 3400 Series?

A. The Cisco ME 3400 Series provides advanced QoS features to provide differentiated services and the ability to police ingress and shape egress traffic. Each packet that is transmitted through the switch goes through four stages of QoS:

- **Stage 1**, Ingress classification: Each packet is classified based on Layer 2–4 information, including 802.1p Class of Service (CoS), differentiated services code point (DSCP), MAC address, IP address, and Layer 4 socket information.
- **Stage 2**, Ingress policing: Classified packets are rate-limited to the peak information rate (PIR). In-profile traffic is transmitted while out-of-profile traffic is either dropped or re-marked.
- **Stage 3**, Egress queuing: Classified packets are placed in one of the four queues available on each port (three user-configurable queues and one default queue).
- **Stage 4**, Shaping and sharing: Queues are serviced by the Shaped Round Robin (SRR) algorithm. They can be shared by the weight configured on the queue or shaped by the bandwidth configured on the queue. One of the queues can be configured as the low-latency queue (LLQ) to provide the shortest delay possible. The LLQ can also have an optional rate-limiting parameter to control the amount of traffic allowed into the queue. This feature provides queue starvation protections in case of misconfiguration.

Q. What Ethernet OAM&P features are supported on the Cisco ME 3400 Series?

- A.** The Cisco ME 3400 Series supports both 802.1ag Connectivity Fault Management and Ethernet Local Management Interface (E-LMI) with the S340XA-12225SEG1 software release. The 802.1ag feature provides the tools to monitor and troubleshoot end-to-end Ethernet networks. It allows service providers to check for end-to-end connectivity, isolate network issues, and identify customers affected by network issues. E-LMI enables service providers to automatically configure customer-edge devices 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.

Q. What security features are available on the Cisco ME 3400 Series?

- A.** The Cisco ME 3400 Series provides a comprehensive security solution for Ethernet access products. By dividing security into three areas – subscriber security, switch security, and network security – and providing features for each, the Cisco ME 3400 Series can deliver a highly secure solution at the edge of the service provider network.

Subscriber security helps prevent one user from affecting another one on their shared network. The Cisco ME 3400 Series provides the UNI/NNI feature to create a circuit-like behavior to separate users' traffic streams. It also provides DHCP Snooping, Dynamic ARP Inspection, and IP Source Guard to help service providers identify each user's MAC address, IP address, and port information, thereby preventing malicious users from unauthorized access.

Switch security is about protecting the switch from attacks. The Cisco ME 3400 Series offers features to protect the CPU and configuration files from DoS attacks, when dropped process control protocol packets could result in network outage. Features such as Control Plane Security and Storm Control help protect the CPU against malicious attacks. Port Security allows service providers to control how many MAC addresses are allowed from each subscriber. This protects switch memory from being overwhelmed.

Network security consists of features that filter all incoming traffic to ensure that only valid traffic is allowed through the switch. The Cisco ME 3400 Series uses features such as access control lists (ACLs) and IEEE 802.1x to identify users that are allowed to transmit traffic through the switch.

Q. Can the Cisco ME 3400G-12CS Switch run on one power supply?

- A.** The Cisco ME 3400G-12CS Switch supports two fixed-configuration power supplies. Only one power supply is needed for operation of the switch. When both power supplies are used, power redundancy and load sharing are also available.

Q. What SFP modules are supported on the Cisco ME 3400 Series?

- A.** Cisco ME 3400 Series Switches support both 100- and 1000-Mbps SFP modules. The options include Cisco 100BASE-LX, 100BASE-FX, 100BASE-BX, 1000BASE-LX, 1000BASE-SX, 1000BASE-ZX, and 1000BASE-T SFP modules plus coarse wavelength-division multiplexing (CWDM) SFP modules.

Q. What is a dual-purpose port?

- A.** A dual-purpose port is a combination of one 10/100/1000-TX copper port and one SFP-based Gigabit Ethernet port. One of these two ports can be used at a time. This added flexibility allows cost-effective use of interfaces to customers at various distances.

Q. What is 802.1Q Tunneling? Is it an IEEE standard?

- A.** With 802.1Q Tunneling, a service provider's switch can tag on a second 802.1Q tag on top of the customer's 802.1Q tag. This feature is sometimes referred to as "Q-in-Q." The Cisco implementation is proprietary and does not interoperate with other implementations. There is currently no effort to make this into a standard.
- Q. Is there a way to integrate Metro Ethernet Layer 2 service with an existing Frame Relay/ATM network?**
- A.** Yes, by using Cisco 7600 Series and Cisco Catalyst 6500 Series equipment, service providers can integrate Frame Relay/ATM networks with Cisco Metro Ethernet switching.

Management Overview

- Q. What are the management capabilities of the Cisco ME 3400 Series?**
- A.** The Cisco ME 3400 Series supports numerous management features. Support for Simple Network Management Protocol (SNMP) versions 1, 2c, and 3 and Telnet interface support deliver comprehensive in-band management, and a command-line-based management console provides detailed out-of-band management. The Cisco ME 3400 Series also supports the Cisco CNS 2100 Series Intelligence Engine, a hardware appliance supporting a suite of Cisco CNS products (intelligent agents) that function with device agents to create a programmable network. Cisco CNS extends the management plane of Cisco devices to a shared "programmable network" composed of three functional areas:
- **Cisco CNS Intelligent Peer:** Network provisioning and monitoring
 - **Cisco CNS Intelligent Engines:** Fault, configuration, accounting, performance, and security (FCAPS) engines and a subscriber policy server tightly coupled with the device agents
 - **Cisco CNS Integration Bus:** A single open, programmatic interface to the entire network
- CiscoWorks network management software provides management capabilities to the Cisco ME 3400 Series on a per-port and per-switch basis, providing a common management interface for Cisco routers, switches, and hubs.

Warranty and Service

- Q. What is the warranty for the Cisco ME 3400 Series?**
- A.** The Cisco ME 3400 Series includes the Cisco 90-Day Limited Warranty.
- Q. What types of services and support packages are available for the Cisco ME 3400 Series?**
- A.** A full complement of lifecycle services and support is available for the Cisco ME 3400 Series. From implementation to operation and optimization, Cisco offers technical support services and advanced services delivered either directly or through one of its partners.

Cisco SP Base support, offered for service providers as part of Cisco Technical Support Services, is designed to provide enhancement and maintenance support resources during the operational lifetime of your Cisco network. It extends and enhances the operational lifetime of your Cisco networking devices and Cisco IOS Software, and it protects your network investment with Cisco Technical Support Services. Cisco SP Base support helps improve productivity and increase your operational efficiency by complementing your in-house resources with Cisco networking expertise. Cisco SP Base support can also help maximize availability and minimize risks for systems running mission-critical applications by delivering:

- Ongoing Cisco IOS Software updates
- Rapid technical problem resolution with 24-hour global access to expert technical engineers, online or on the telephone
- Knowledge transfer of Cisco expertise, enhancing in-house technical skills
- Advance hardware replacement, reducing the risk of network downtime
- Registered access to an array of powerful online tools, allowing you to more quickly address common network problems
- 24-hour access to comprehensive technical information and a collection of configuration, installation, troubleshooting, and service request management tools
- A broad base of expertise in networking technology, including data, voice, and video communications

For more information about Cisco SP Base support, visit:

http://www.cisco.com/en/US/products/svcs/ps3034/ps2827/ps2960/serv_datasheet09186a0080234131.html

For More Information

For detailed product information about the Cisco ME 3400 Series Ethernet Access Switches, refer to the product data sheets at:

http://www.cisco.com/en/US/prod/collateral/switches/ps6568/ps6580/product_data_sheet0900aecd8034fef3.html.



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