

Cisco Catalyst 3750 Metro Series Switches

Product Overview

Q. What are Cisco® Catalyst® 3750 Metro Series Switches?

A. The Cisco Catalyst 3750 Metro Series is a new line of premier, customer-located switches that bring greater intelligence for Metro Ethernet access, enabling the delivery of more differentiated Metro Ethernet services. These fixed configuration switches feature hierarchical quality of service (QoS) and Traffic Shaping, intelligent 802.1Q tunneling, VLAN translation, Multiprotocol Label Switching (MPLS), and Ethernet over MPLS (EoMPLS) support and redundant AC or DC power. They are ideal for service providers seeking to deliver profitable business services, such as Layer 2, Layer 3, and MPLS VPNs, in a variety of bandwidths and with different service-level agreements (SLAs). With flexible software options, the Cisco Catalyst 3750 Metro Series offers a cost-effective path for meeting current and future service requirements from service providers.

Table 1 shows the complete list of Cisco Catalyst 3750 Metro Series Switches, power options, and software licenses.

Table 1. Cisco Catalyst 3750 Metro Series Switches

Product Name	Part Number	Description
Cisco Catalyst 3750 Metro Switch	ME-C3750-24TE-M	24 10/100 ports plus two Small Form-Factor Pluggable (SFP)-based Gigabit Ethernet ports and two SFP-based Enhanced Services (ES) ports; AC or DC power required; integrated redundant power option; IP Base feature license
Cisco Catalyst 3750 Metro Switch Primary AC power supply	PWR-ME3750-AC	Primary AC power supply
Cisco Catalyst 3750 Metro Switch Primary DC power supply	PWR-ME3750-DC	Primary DC power supply
Cisco Catalyst 3750 Metro Switch Redundant AC power supply (optional)	PWR-ME3750-AC-R	Redundant AC power supply option
Cisco Catalyst 3750 Metro Switch Redundant DC power supply (optional)	PWR-ME3750-DC-R	Redundant DC power supply option
Cisco Catalyst 3750 Metro IP Services Feature License	ME3750-IPSVCLIC=	Provides additional IP service features such as Border Gateway Protocol (BGP), Enhanced Interior Gateway Protocol (EIGRP), Open Shortest Path First (OSPF), Intermediate System-to-Intermediate System (IS-IS), policy-based routing (PBR), HSRP, PIM, DVMRP tunneling, and Multi-Virtual Routing Forwarding Customer Edge (Multi-VRFC E); also includes IP Base license
Cisco Catalyst 3750 Metro Advanced IP Feature License	ME3750-ADVIP-LIC=	Provides advanced IP features such as EoMPLS, MPLS VPN, and MPLS. Also includes IP Services feature license and IP Base license.
Cisco Catalyst 3750 Metro IP Services to Advanced IP Upgrade License	ME3750-UPGRD-LIC=	Provides upgrade from IP Services Feature License to Advanced IP Feature License; requires IP Services Feature license.
Cisco Catalyst 3750 Metro Switch AC power supply (spare)	PWR-ME3750-AC=	AC power supply for spare or integrated redundancy option
Cisco Catalyst 3750 Metro Switch DC power supply (spare)	PWR-ME3750-DC=	DC power supply for spare or integrated redundancy option

Q. What software images do Cisco Catalyst 3750 Metro Series Switches support?

A. Cisco Catalyst 3750 Metro Series Switches are shipped with the IP Base feature license and are upgradable through additional software upgrade licenses. The IP Base feature license includes several metro-specific service features that support “triple-play” voice, video, and data services as well as Layer 2 VPNs. Three software upgrade licenses offer a cost-effective path for meeting current and future service requirements. The software license options are as follows:

- Cisco Catalyst 3750 Metro IP Services Feature License—Provides additional IP service features including BGP, EIGRP, OSPF, IS-IS, PBR, HSRP, PIM, DVMRP tunneling, and multi-VRF CE.
- Cisco Catalyst 3750 Metro Advanced IP Feature License—Provides advanced IP features including MPLS, EoMPLS, and MPLS VPN. Also includes IP Services Feature License and IP Base License.
- Cisco Catalyst 3750 Metro IP Services to Advanced IP Upgrade License—Provides upgrade from IP Services Feature License to Advanced IP Feature License; requires IP Services License.

Q. What is the difference between the Cisco Catalyst 3750 Metro Series and the Cisco Catalyst 3750 Series?

A. The Cisco Catalyst 3750 Metro Series is built for Metro Ethernet access in a customer location, enabling the delivery of more differentiated Metro Ethernet services. These switches feature bidirectional hierarchical QoS and Traffic Shaping, intelligent 802.1Q tunneling with class-of-service (CoS) mutation, VLAN translation, MPLS, EoMPLS, and Hierarchical Virtual Private LAN Service (H-VPLS) support, and redundant AC or DC power. They are ideal for service providers seeking to deliver profitable business services, such as Layer 2, Layer 3, and MPLS VPNs, in a variety of bandwidths and with different SLAs. With flexible software options, the Cisco Catalyst 3750 Metro Series offers a cost-effective path for meeting current and future service requirements from service providers.

The standard Cisco Catalyst 3750 Series is an innovative product line for midsize organizations and enterprise branch offices. Featuring Cisco StackWise® technology, Cisco Catalyst 3750 Series products improve LAN operating efficiency by combining industry-leading ease of use and high resiliency for stackable switches.

Q. What is the Metro Ethernet positioning of the Cisco Catalyst 3750 Metro Series, the Cisco Catalyst 3550 Series, and the Cisco Catalyst 2950 Series?

A.

Cisco Catalyst 3750 Metro Series Switches

Cisco Catalyst 3750 Metro Series Switches are a new line of premier, customer-located switches that bring greater intelligence for Metro Ethernet access, enabling the delivery of more differentiated Metro Ethernet services. These fixed configuration switches feature bidirectional hierarchical QoS and Traffic Shaping, intelligent 802.1Q tunneling, VLAN translation, MPLS, EoMPLS, and H-VPLS support, and redundant AC or DC power. They are ideal for service providers seeking to deliver profitable business services, such as Layer 2, Layer 3, and MPLS VPNs, in a variety of bandwidths and with different SLAs. With flexible software options, the Cisco Catalyst 3750 Metro Series offers a cost-effective path for meeting current and future service requirements from service providers.

Cisco Catalyst 3550 Series Switches

With a range of Fast Ethernet, Gigabit Ethernet, DC power, and fiber configurations, the Cisco Catalyst 3550 Series is an intelligent metro access switch for service providers serving the enterprise and small and medium-sized business markets. Featuring 802.1Q tunneling, high-performance IP routing, and subsecond Spanning Tree Protocol convergence, this line of powerful, cost-effective, fixed-configuration switches enables Metro Ethernet services such as Transparent LAN services and business-class Internet access.

Cisco Catalyst 2950 Series Switches

Ideal for Metro Ethernet access in residential markets, the Cisco Catalyst 2950 Series is an affordable line of fixed-configuration Fast Ethernet and Gigabit Ethernet switches. Featuring advanced rate limiting, voice VLAN support, and multicast management, these switches enable residential Metro Ethernet services such as Internet access, voice over IP (VoIP), and broadcast video.

Q. What are the Enhanced Services (ES) ports?

A. The Cisco Catalyst 3750 Metro Series includes two SFP-based ES ports. The ES ports support Metro Ethernet features that are vital for delivering profitable business services, such as Layers 2 and 3 and MPLS VPNs, in several bandwidths and with different SLAs. Supported features on the ES ports include EoMPLS, MPLS, MPLS VPNs, bidirectional hierarchical QoS, intelligent 802.1Q tunneling (Q-in-Q) with CoS mutation, and VLAN ID translation.

Q. Can Cisco Catalyst 3750 Metro Series Switches stack with the Cisco Catalyst 3750 Series, Cisco Catalyst 3550 Series, or Cisco Catalyst 2950 Series Switches?

A. No. At this time, the Cisco Catalyst 3750 Metro Series does not include StackWise stacking capability and cannot stack with other Cisco Catalyst 3750 Series Switches. The Cisco Catalyst 3750 Metro Series does contain StackWise stack ports, but they are not supported.

Q. Does the Cisco Catalyst 3750 Metro Series have Cisco StackWise technology?

A. Yes. The Cisco Catalyst 3750 Metro Series does have Cisco StackWise technology, but there is no plan to support this feature.

Q. Can I enable static IP routing using the IP Base feature license?

A. Yes. Routing Initiation Protocol (RIP) and static routing are supported on the IP Base feature license. Dynamic IP routing protocols (BGP, OSPF, EIGRP, and IGRP) are available only on the Cisco Catalyst 3750 Metro IP Services feature license and the Cisco Catalyst 3750 Metro Advanced IP feature license.

Q. Are software upgrade licenses required to allow Layer 3 and Layer 4 lookups for QoS and security?

A. No. The IP Base feature license allows for Layer 3 and Layer 4 lookups for QoS and security.

Technology Overview

Q. What are SFPs?

A. SFPs are transceivers that provide Gigabit Ethernet connectivity from Cisco Catalyst 3750 Metro Series Switches to aggregation switches, routers, and optical equipment. They are functionally equivalent to gigabit interface converters (GBICs), but are much smaller.

Q. What SFPs are supported on the Cisco Catalyst 3750 Metro Series?

A. Cisco Catalyst 3750 Metro Series Switches support 1000BASE-LX, 1000BASE-SX, 1000BASE-ZX, 1000BASE-T, coarse wavelength-division multiplexing (CWDM), and dense wavelength-division multiplexing (DWDM) SFPs. The non-ES SFP ports also support GLC-GE-100FX= SFP.

Q. Can the 1000BASE-T SFP support 10/100/1000 speeds?

A. Yes. The 1000BASE-T SFP can support 10/100/1000 speeds on the Cisco Catalyst 3750 Metro Series, except for the ES ports, which support only 1000 speeds.

Q. Do Cisco Catalyst 3750 Metro Series Switches have redundant-power-supply support?

A. Yes. The Cisco Catalyst 3750 Metro Series comes equipped with dual hot-swappable power supply bays for redundant AC or DC power. Spare and redundant AC and DC power supplies are available (Table 1).

Intelligence at the Metro Access Edge**Q. Why do I need greater intelligence at the metro access edge?**

A. Enterprises and commercial businesses want customizable and differentiated services, such as Layer 2 and Layer 3 VPNs, from their service providers. They not only expect higher bandwidth connections for their demanding applications, but also want the bandwidth at greater levels of granularity, depending on the situation. Also, businesses no longer want service providers to treat all traffic the same way, but instead want them to support the varying needs of corresponding voice, video, and data traffic across multiple locations. Greater intelligence at the metro access edge can help a service provider meet the service needs of its customers and provide competitive differentiation. Greater intelligence at the edge can also create a more efficient network by reducing processing complexity in the core. Intelligent features such as MPLS VPN, Traffic Shaping, and hierarchical QoS help enable new customizable and differentiated Metro Ethernet business services.

More Differentiated Services with SLAS**Q. How do I provide Layer 3 VPN services with SLAs using the Cisco Catalyst 3750 Metro Series?**

A. Depending on the service provider and customer requirements, Layer 3 VPN services can be enabled through features such as Multi-VRF CE and MPLS VPN. With support for the hierarchical queuing framework, service providers can deliver robust SLAs that consider attributes such as packet loss, latency, and jitter.

Q. How do I provide Layer 2 VPN services with SLAs using the Cisco Catalyst 3750 Metro Series?

A. Depending on the service provider and customer requirements, Layer 2 VPN services can be enabled using features such as intelligent 802.1Q tunneling, Layer 2 protocol tunneling, and EoMPLS. With support for the hierarchical queuing framework, service providers can deliver robust SLAs that consider attributes such as packet loss, latency, and jitter.

Q. What is MPLS?

A. Cisco IOS® Software MPLS fuses the intelligence of routing with the performance of switching. It provides significant benefits to networks with a pure IP architecture, as well as those with IP and ATM or a mix of other Layer 2 technologies. MPLS technology is critical to scalable VPNs and end-to-end QoS, enabling efficient use of existing networks to meet future growth and rapid fault correction of link and node failure. The technology also helps deliver highly

scalable, differentiated end-to-end services with simpler configuration, management, and provisioning for both service providers and their customers.

Q. What is EoMPLS?

A. EoMPLS is a tunneling mechanism that allows the service provider to tunnel customer Layer 2 traffic through a Layer 3 MPLS network. In the initial release of the Cisco Catalyst 3750 Metro Series, point-to-point tunnels are supported.

Q. What are VPLS and H-VPLS?

A. VPLS is a multipoint Layer 2 VPN technology that allows multiple sites to be connected over a simulated Ethernet broadcast domain that is supported across a provider-provisioned MPLS network. H-VPLS is one of IETF's VPLS standards that provides MPLS-based distributed-PE architecture. H-VPLS offers two design options:

- Ethernet access network—Access networks are 802.1Q networks, and the core network is MPLS.
- MPLS access network—Access networks and the core network are both MPLS.
- The Cisco Catalyst 3750 Metro Series supports both architecture options as the PE-CLE switch in the H-VPLS access network.

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

A. 802.1Q tunneling is a feature that allows a service provider's switch to tag a second 802.1Q tag on top of a customer's 802.1Q tag. This feature is sometimes referred to as "Q-in-Q" or "tag stacking." 802.1Q tunneling is currently under discussion by the IEEE and will be part of the 802.1ad provider bridge standard.

Q. Does the 802.1Q tunneling feature work with EoMPLS?

A. Yes. The Cisco Catalyst 3750 Metro Series is able to map each 802.1Q tagged frame into an EoMPLS tunnel.

Q. Is there a way to integrate Metro Ethernet Layer 2 services with an existing Frame Relay/ATM network?

A. Yes. Using the Cisco 7600 Series and Cisco Catalyst 6500 Series, service providers will be able to integrate Frame Relay/ATM networks with Cisco Metro Ethernet switching.

Security

Q. How will the security needs of a Metro Ethernet network be handled?

A. With the rise in threats to a Metro Ethernet network, Cisco Ethernet switches enhance security through numerous features, including Secure Shell (SSH) Protocol and Simple Network Management Protocol Version 3 (SNMPv3), access control lists (ACLs), 802.1x, port security, private VLAN edge, Dynamic Host Configuration Protocol (DHCP) snooping, MAC address notification, and RADIUS/TACACS+.

Q. For security purposes, how can I prevent unauthorized users from accessing my network?

A. The Cisco Catalyst 3750 Metro Series supports 802.1x, which works in conjunction with a RADIUS server to authenticate users as they access a network. Additionally, using ACLs can restrict portions of the network. Access can be denied based on MAC addresses, IP addresses, or TCP/User Datagram Protocol (UDP) ports. ACL lookups are done in hardware—forwarding and routing performance is not compromised when implementing ACL-

based security. An additional protection method is to use port security, which helps ensure the appropriate user is on the network by limiting access to the port based on MAC addresses.

Q. For security purposes, how can I monitor or track activities in my network?

A. Intrusion detection systems are customized to monitor and track activities in a network. The Cisco Catalyst 3750 Metro Series can complement this through features such as MAC address notification, which sends an alert to a management station so that network administrators know when and where users came onto the network and can take appropriate actions. The DHCP Snooping feature tracks where a user is physically connected on a network by providing both switch and port ID to a DHCP server.

Q. How do I protect my network from denial-of-service (DoS) attacks?

A. Features on the Cisco Catalyst 3750 Metro Series such as Port Security, hard-based security ACLs, bridge protocol data unit (BPDU) filtering, and Storm Control help prevent DoS attacks.

Management

Q. What are the management capabilities of the Cisco Catalyst 3750 Metro Series?

A. The Cisco Catalyst 3750 Metro Series supports numerous management features. SNMPv1, v2c, and v3 and Telnet interface support deliver comprehensive in-band management, and a command-line interface (CLI)-based management console provides detailed out-of-band management. The Cisco Catalyst 3750 Metro Series also supports the Cisco CNS 2100 Series Intelligence Engine.

The Cisco CNS 2100 Series Intelligence Engine is 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 intelligence engines—Fault, configuration, accounting, performance, and security (FCAPS) engines and a subscriber policy server tightly coupled with the device agents
- Cisco CNS Integration Bus—Provides a single, open, and programmatic interface to the entire network

Additional management support for the Cisco Catalyst Switch Manager, CiscoWorks, and the Cisco Internet Solution Center (ISC) is planned for a future software release.

Service and Warranty

Q. What is the warranty for Cisco Catalyst 3750 Metro Series Switches?

A. Cisco Catalyst 3750 Metro Series Switches include the Cisco 1-Year Limited Hardware Warranty. In addition to the Cisco 1-Year Limited Hardware Warranty, Cisco is offering ongoing Cisco IOS Software updates free of charge for Cisco Catalyst 3750 Metro Series Switches. For the life of the product, updates within the release and feature set purchased are available to customers through the Cisco Software Center at <http://www.cisco.com/public/sw-center/sw-switching.shtml>.

Updates are applicable only for releases that Cisco makes available. This statement supersedes any previous warranty or software statement and is subject to change without notice.

Q. What types of service and support are available for Cisco Catalyst 3750 Metro Series Switches?

- A.** A full complement of lifecycle service and support is available for the Cisco Catalyst 3750 Metro Series. From implementation to operation and optimization, Cisco offers Technical Support Services and Advanced Services delivered either directly or through one of its best-in-class partners.

Cisco Technical Support Services are available through Cisco SP Base, Cisco SP Base Onsite, Cisco SMARTnet[®], and Cisco SMARTnet Onsite support. Cisco SP Base support offers innovative customer-solution services that are specifically designed to address the needs of Cisco service provider customers and that provide enhancement and maintenance support resources during the operational lifetime of your Cisco network. Cisco SMARTnet support augments the resources of your operations staff by providing them with access to expertise, both online and on the telephone, and several hardware advance replacement options. Cisco SMARTnet Onsite complements the hardware advance replacement feature by adding the services of a field engineer, which can be critical for locations where staffing is insufficient or unavailable to perform parts replacement activities.

For more information about Cisco SP Base support, visit

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

For information about Cisco SMARTnet support, visit

http://www.cisco.com/en/US/products/svcs/ps3034/ps2827/ps2978/serv_home.html.

For More Information

For more information about the Cisco Catalyst 3750 Metro Series, contact your local account representative or visit <http://www.cisco.com/go/catalyst3750metro>.



Americas Headquarters
Cisco Systems, Inc.
170 West Tasman Drive
San Jose, CA 95134-1706
USA
www.cisco.com
Tel: 408 526-4000
800 553-NETS (6387)
Fax: 408 527-0883

Asia Pacific Headquarters
Cisco Systems, Inc.
168 Robinson Road
#28-01 Capital Tower
Singapore 068912
www.cisco.com
Tel: +65 6317 7777
Fax: +65 6317 7799

Europe Headquarters
Cisco Systems International BV
Haarlerbergpark
Haarlerbergweg 13-19
1101 CH Amsterdam
The Netherlands
www-europe.cisco.com
Tel: +31 0 800 020 0791
Fax: +31 0 20 357 1100

Cisco has more than 200 offices worldwide. Addresses, phone numbers, and fax numbers are listed on the Cisco Website at www.cisco.com/go/offices.

CCVP, the Cisco logo, and the Cisco Square Bridge logo are trademarks of Cisco Systems, Inc.; Changing the Way We Work, Live, Play, and Learn is a service mark of Cisco Systems, Inc.; and Access Registrar, Aironet, BPX, Catalyst, CCDA, CCDP, CCIE, CCIP, CCNA, CCNP, CCSP, Cisco, the Cisco Certified Internetwork Expert logo, Cisco IOS, Cisco Press, Cisco Systems, Cisco Systems Capital, the Cisco Systems logo, Cisco Unity, Enterprise/Solver, EtherChannel, EtherFast, EtherSwitch, Fast Step, Follow Me Browsing, FormShare, GigaDrive, HomeLink, Internet Quotient, IOS, iPhone, IP/TV, iQ Expertise, the iQ logo, iQ Net Readiness Scorecard, iQuick Study, LightStream, Linksys, MeetingPlace, MGX, Networking Academy, Network Registrar, Packet, PIX, ProConnect, ScriptShare, SMARTnet, StackWise, The Fastest Way to Increase Your Internet Quotient, and TransPath are registered trademarks of Cisco Systems, Inc. and/or its affiliates in the United States and certain other countries.

All other trademarks mentioned in this document or Website are the property of their respective owners. The use of the word partner does not imply a partnership relationship between Cisco and any other company. (0705R)