

Catalyst 8540 16-Port Fast Ethernet Interface Modules

THE CISCO CATALYST® 8540 16-PORT FAST ETHERNET INTERFACE MODULES ARE IDEAL FOR SUPPORTING LAYER 3 BACKBONE APPLICATIONS THAT REQUIRE NON-BLOCKING, WIRE-SPEED PERFORMANCE. THESE FAST ETHERNET INTERFACE MODULES ARE AVAILABLE IN 16-PORT 10/100 BASE-TX AND 16-PORT 100 BASE-FX (FULL DUPLEX ONLY) VERSIONS. THE 16-PORT FAST ETHERNET INTERFACE MODULES ARE SUPPORTED BY THE CATALYST 8540 PLATFORM, A HIGH-END MULTISERVICE SWITCH THAT PROVIDES LARGE ENTERPRISES AND SERVICE PROVIDERS WITH BOTH L3 AND ASYNCHRONOUS TRANSFER MODE (ATM) SWITCHING IN ONE INTEGRATED PLATFORM.

Product Description

The 16-port Fast Ethernet interface modules provide full wire-speed Layer 3 switching and support 16K or 64K IP/IPX entries depending on the size routing table required. Both 10/100 Base-TX and 100 Base-FX (full duplex only) versions are available. A version of Fast Ethernet cards is available with a pre-installed access control list (ACL) daughter card when data path ACL functionality is required. The primary application for these modules is non-blocking, wire-speed Fast Ethernet aggregation.

Figure 1 Catalyst 8540 16-Port 10/100 Base-TX Interface Module with ACL Daughter Card



Figure 2 Catalyst 8540 16-Port 100 Base-FX Module with ACL Daughter Card



Features

Industry Standards Support

The 16-port 10/100Base-TX interface module supports industry-standard IEEE 802.3 and 802.3u ensuring vendor compatibility and long-term investment protection. Auto-negotiation is also supported for detection of connectivity to either a 10Base-TX or 100Base-TX device.

The 16-port 100Base-FX interface module supports industry-standard IEEE 802.3u ensuring vendor compatibility and long-term investment protection.

Fast EtherChannel Support

The Fast EtherChannel[®] is based on proven EtherChannel technology pioneered by Cisco with thousands of Fast EtherChannel ports deployed in production networks. Fast EtherChannel technology enables critical backbone trunks to be scaled to high throughput as backbone traffic continues to grow. By combining four Fast Ethernet links into one logical link, up to 800 Mbps of throughput is possible between devices. Customers can take advantage of the new multimodule channeling feature that combines ports from the same module or from different modules into a Fast EtherChannel link. Furthermore, Fast EtherChannel technology provides an unmatched level of resiliency. If one physical port on a Fast EtherChannel link goes down, all traffic on that port is automatically redirected and load balanced to the remaining ports. This redirection happens without operator intervention, assuring maximum backbone throughput and availability.

Fast Ethernet Interface Module OIR Support for Maximum Uptime

Catalyst 8540 supports advanced technology enabling online insertion and removal (OIR) of the 16-port Fast Ethernet interface modules without powering down the switch. When a Fast Ethernet module is removed or inserted while the switch is powered on and operating, the system:

- Determines whether there is sufficient power for the module
- Scans the backplane for configuration changes
- Initializes all newly inserted switching modules
- Places any previously configured interfaces on the switching module back to the state they were in when they were removed

The ability to OIR the Fast Ethernet modules in the Catalyst 8540 switches enables maximum system uptime in addition to the configuration flexibility many customers want and need.

Access Control Lists

The following ACL features are supported without the optional daughter cards:

- All Cisco IOS[®] ACLs for control-plane traffic
- Source/destination Media Access Control (MAC)-based ACLs (exact match or no wildcard)

Using the optional ACL daughter card, dataplane access lists are implemented in hardware, providing line-rate and near-line-rate performance. The ACL daughter card supports the following features:

- Standard/extended IP access lists (1–99; 1301–1999/100–199; 2000–2699) in hardware; both inbound and outbound
- Named access lists
- Standard IPX access lists (800–899) without source node; both inbound and outbound
- An ACL daughter card is required for each existing line card that implements dataplane ACLs.
- The same Catalyst 8540 ACL daughter card (C8540-ACL=) is supported on the 16-port 10/100BaseTX, 16-port 100BaseFX, and two-port Gigabit Ethernet interface modules.

Multiprotocol Routing

The Catalyst 8540 provides forwarding and routing support for IP and IPX[®] switches. IP routing support includes Routing Information Protocol (RIP) versions 1 and 2, Open Shortest Path First (OSPF), Interior Gateway Routing Protocol (IGRP) and Enhanced IGRP, and Border Gateway Protocol (BGP) version 4. IPX routing support includes RIP and Enhanced IGRP.

Cisco Express Forwarding

The 16-port Fast Ethernet interface module features Cisco express forwarding (CEF), a new paradigm for route distribution and forwarding by distributing routing information from the central processor to the individual interface modules. This technology, used within the Internet, provides for scalability in large campus core networks. CEF provides Layer 3 forwarding based on a “shadow” of the routing table, resulting in very high-speed routing table lookups and forwarding. This feature provides for wire-speed IP and IPX forwarding for all ports.

Layer-2 VLAN and Switching

Ports may be configured as access ports (no VLAN tagging) or trunk ports (tagging using 802.1 Q or Inter-Switch Link encapsulation). Access ports are used for direct server connectivity. Trunk ports are used for high-density wiring-closet aggregation with the Catalyst 8540 providing inter-VLAN routing as well as server network interface cards (NICs) that support dot1Q or ISL encapsulation. In addition, IEEE 802.1d Spanning Tree protocol is supported.

Integrated Routing and Bridging Support

Integrated routing and bridging (IRB) provides a means to route a given protocol between routed and bridged interfaces. IRB also enables routing a protocol between bridge groups.

Internet Group Management Protocol and Cisco Group Management Protocol

The Catalyst 8540 supports both Internet Group Management Protocol (IGMP) and Cisco Group Management Protocol (CGMP) to enable the deployment of scalable multicast networks. IGMP uses the IP transport that enables hosts to join a multicast group dynamically. IGMP queries joins and leaves (IGMPv.2) are supported. CGMP provides a way for Layer-2 switches to provide Layer-2 multicast control.

Hot Standby Router Protocol

Hot Standby Router Protocol (HSRP) is designed to provide high network availability by routing IP traffic from hosts on Ethernet networks without relying on the availability of any single router. This feature is particularly useful for hosts that do not support a router discovery protocol such as IRDP and do not have the functionality to switch to a new router when their selected router reloads or loses power. Without this functionality, a router that loses its default gateway because of a router failure is unable to communicate with the network.

Cisco Discovery Protocol

Cisco Discovery Protocol (CDP) is a Cisco-specific protocol that runs on all Cisco devices so that these devices can learn about neighboring devices and exchange information. CDP uses a well-known multicast MAC address. During system initialization, the hardware will be configured to forward these packets to the Cisco IOS software CPU, which will process them.

Table 1 Feature and Benefit Summary

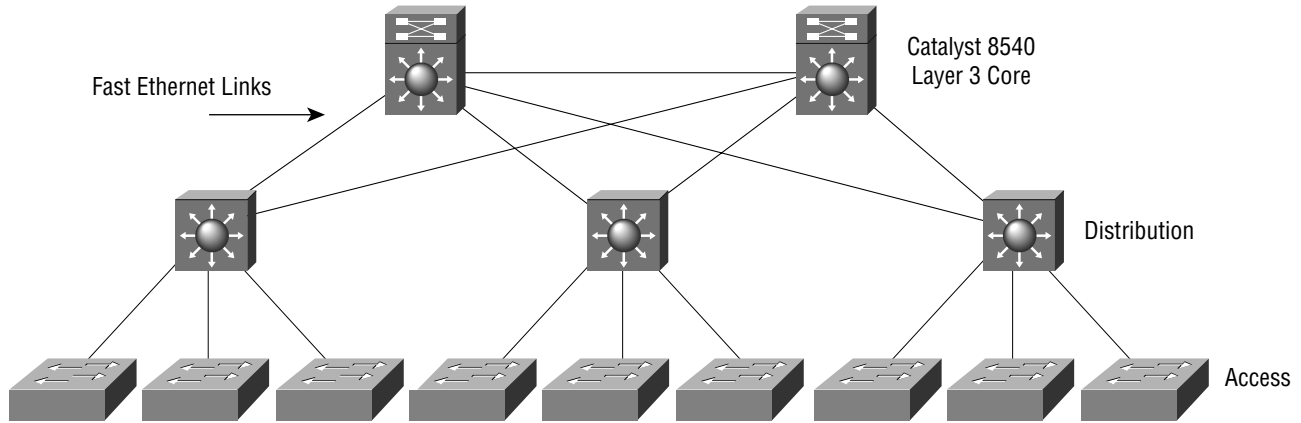
Feature	Benefit
IEEE 802.3 and 802.3u Standards Compliant	Ensures vendor interoperability and long-term investment protection
Fast EtherChannel Support	Provides a logical link between two devices with up to 800 Mbps throughput
Standard 10/100Base-TX and 100Base-FX Interfaces	Provides flexibility in network design with reach capability up to 2km
On-line Insertion and Removal	The 16-port Fast Ethernet modules can be inserted or removed without powering down the system, enabling maximum system uptime.
Access Control Lists	Allows configurable, hardware-based security filtering of the data path.
Multiprotocol Routing Support	Allows for the deployment of scalable networks based on OSPF, IGRP, EIGRP, or BGPv4.
Cisco Express Forwarding (CEF)	Provides for wire-speed IP and IPX forwarding by using a "shadow" of the routing table which is maintained in hardware on the interface module.
Layer 2 VLAN and Switching	Layer 2 switching is supported directly on the interface module. In addition, the IEEE 802.1D Spanning Tree is supported.
Integrated Routing and Bridging	Supports both bridging and routing at the same time.
Internet Group Management Protocol, Cisco Group Management Protocol	Supports the deployment of robust, large- scale multicast networks
Hot Standby Router Protocol (HSRP)	Provides high network availability.
Cisco Discovery Protocol (CDP)	Provides a mechanism to automatically discover neighboring devices and exchange network configuration information
CiscoWorks Network Management and SNMP Support	Makes it easy to configure and monitor network configurations

Applications

The 16-port Fast Ethernet interface module is designed specifically to meet the demanding needs of large enterprise and service provider networks.

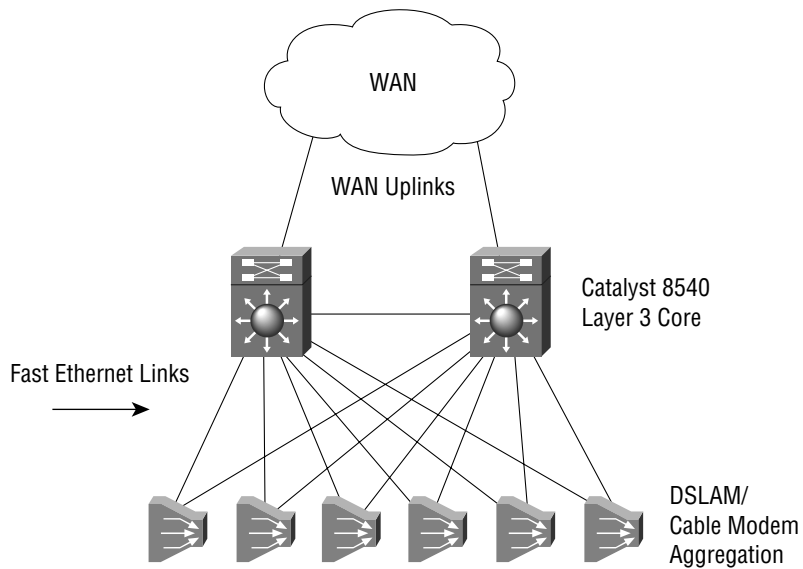
Up to eight of the 16-port Fast Ethernet line cards may be placed in a Catalyst 8540 chassis providing 128-ports of non-blocking, wire-speed Fast Ethernet capacity in the core of an enterprise network. See Figure 3 below.

Figure 3 Enterprise Core Network



Service Providers can use the non-blocking, wire-speed 16-port Fast Ethernet interface module to aggregate Fast Ethernet traffic before it is sent out over a WAN uplink. See Figure 4 below.

Figure 4 Service Provider Aggregation



Specifications

Standard Network Protocols

- Ethernet: IEEE 802.3, 10Base-T
- Fast Ethernet: IEEE 802.3u and 100Base-FX

Physical Specification

- Occupies one slot in the Catalyst 8540 platform
- Dimensions (H x W x D): 1.2 x 14.4 x 16.0 inches (3.0 x 36.6 x 40.6 cm)

Safety Compliance

Catalyst 8540 16-port Fast Ethernet interface modules, when installed in a system, comply with the following compliance and safety standards:

- UL 1950
- CSA C22.2 No.950
- EN 60825-1
- EN60950
- IEC 950
- IEC 60825-1
- TS 001
- CE marking
- AS/NZS 3260
- 21CFR1040
- Network Equipment Building Systems (NEBS) Level 3

EMC Compliance

Catalyst 8540 16-port Fast Ethernet interface modules, when installed in a system, comply with the following EMI standards:

- FCC Part 15 (CFR 47) Class A
- VCCI Class B
- EN55022 Class B
- CISPR 22 Class B
- CE marking
- AS/NZS 3548 Class B

LED Indicators

10/100 Base-TX Cards:

- LK—Link active (on), Link idle (off)
- SP—Speed:10 Base-TX (on), 100 Base-TX (off)

100 Base-FX Cards:

- LK—Link active (on), Link idle (off)
- Tx (transmit) activity: active (on), idle (off)
- Rx (receive) activity: active (on), idle (off)

Interfaces

- 10/100Base-TX Fast Ethernet: RJ-45
- 100Base-FX Fast Ethernet: MT-RJ connector

Maximum Station-to-Station Cabling Distance

- 10/100Base-TX Fast Ethernet: Category 5 UTP: 328 ft. (100m), 100-ohm STP: 328 ft. (100m) half or full duplex
- 100Base-FX Fast Ethernet: 62.5/125-micron multimode fiber: 2km full duplex

Network Management

- CiscoWorks
- Simple Network Management Protocol (SNMP)
- ETHERLIKE-MIB (RFC 1643)
- IF-MIB (RFC 1573)
- MIB-II (RFC 1213)
- Bridge MIB (RFC 1493)
- CISCO-CDP-MIB
- ENTITY-MIB (RFC 2037)

Ordering Information

Required Software

Part Number	Cisco IOS Software	Part Number
Catalyst 8540 MSR	12.0(4a)W5(11a) or higher	S854R2-12.0.4W or higher
Catalyst 8540 CSR	12.0(4a)WX5(11a) or higher	S854R3-12.0.4W or higher

Product Availability and Part Numbers

Part Number	Product Description	Availability
C85FE-16T-16K	C8540 16-port 10/100 Base-TX 16K	Now
C85FE-16T-64K	C8540 16-port 10/100 Base-TX 64K	Now
C85FE-16TACL-16K	C8540 16-port 10/100 Base-TX 16K with ACL	Now
C85FE-16TACL-64K	C8540 16-port 10/100 Base-TX 64K with ACL	Now
C85FE-16F-16K	C8540 16-port 10/100 Base-FX 16K	Now
C85FE-16F-64K	C8540 16-port 10/100 Base-FX 64K	Now
C85FE-16FACL-16K	C8540 16-port 10/100 Base-FX 16K with ACL	Now
C85FE-16FACL-64K	C8540 16-port 10/100 Base-FX 64K with ACL	Now
C8540-ACL=	C8540 ACL daughter card (spare)	Now

Note: The 16-port 100 Base-FX interface modules support “full duplex only” mode.



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