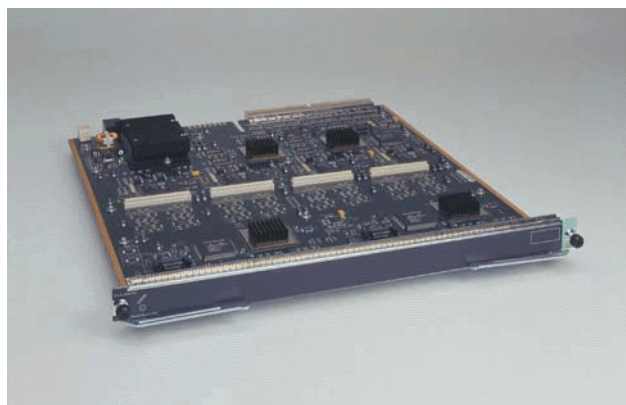


ATM Router Module for the Catalyst 8540 MSR

THE CATALYST® 8540 MSR ATM ROUTER MODULE (ARM) PROVIDES HIGH-SPEED INTERWORKING BETWEEN THE ASYNCHRONOUS TRANSFER MODE (ATM) AND LAYER 3 INTERFACES IN A SINGLE CHASSIS. THE ARM IS SUPPORTED BY THE CATALYST 8540 MSR PLATFORM, A HIGH-END MULTISERVICE SWITCH THAT PROVIDES LARGE ENTERPRISES AND SERVICE PROVIDERS WITH A WIDE RANGE OF LAYER 3 AND ATM INTERFACES FOR BUILDING INTEGRATED SOLUTIONS.

Catalyst 8540 ATM Router Module



Feature Support

The following features and capabilities are supported on the ARM module:

Table 1: Feature Summary

Feature	Description
Integrated Layer 3 and ATM	Layer 3 traffic can be seamlessly passed between Layer 3 and ATM interfaces on the Catalyst 8540 MSR
RFC 1483	IETF specification for providing an interworking between Layer 3 and ATM networks
LANE	ATM Forum specification for LAN Emulation (LANE) provides interworking between Layer 3 and ATM networks

Feature	Description
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 ARM
Online Insertion and Removal	Enables maximum system uptime
Cisco IOS®	Feature-rich software for advanced networking applications

Integrated Layer 3 and ATM

The ARM is unique in that it allows Layer 3 traffic to pass seamlessly between ATM and Layer 3 interfaces. The benefit to the customer is that wire-speed Layer 3 switching between frame (Gigabit Ethernet/Fast Ethernet) ports, ATM switching between ATM ports, and high-speed frame/ATM interworking are combined in a single chassis. The result is fewer products in the network, simplified network designs, and a lower total cost of ownership.

The ARM can be configured to support either Request for Comments (RFC) 1483 or LANE for providing integrated Layer 3 and ATM services.

RFC 1483

ARM support of the Internet Engineering Task Force (IETF) specification RFC 1483, "Multiprotocol Encapsulation over ATM Adaptation Layer 5" on the 8540 MSR includes:

- LLC/SNAP encapsulation
- IP/IPX
- IP multicast

- Appletalk
- Bridging
- PVC support
- Up to 4K VCs per ARM
- RFC 1577 support for PVCs

LANE

The ARM provides a seamless connection between ATM and Ethernet interfaces by supporting ATM Forum LANE. ARM support for LANE on the 8540 MSR includes:

- LANE LEC (LAN Emulation Client)
- Simple Server Redundancy Protocol (SSRP)
- Layer 3 forwarding supported:
 - IP/IPX forwarding between Ethernet and ATM ports
 - IP multicast forwarding between Ethernet and ATM ports
- IP precedence-based quality of service (QoS)
- Layer 3-based load sharing
- Layer 2 forwarding supported:
 - Bridging between ATM and Ethernet ports
 - Bridging between ATM and ATM ports

Interface Support

The ARM can be used with the Catalyst 8540 ATM (T1 up to OC-48) and Layer 3 (Gigabit Ethernet, Fast Ethernet) interfaces.

Cisco Express Forwarding

ARM 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. Used within the Internet, this technology 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 switching.

ARM OIR Support for Maximum Uptime

The Catalyst 8540 supports advanced technology that enables online insertion and removal (OIR) of the ARM module without powering-down the switch. When the ARM 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 prior to removal

The ability to perform OIR on the modules in the Catalyst 8540 MSR enables maximum system uptime in addition to the configuration flexibility many customers want and need.

Multiprotocol Routing

The Catalyst 8540 MSR provides support for IP and IPX forwarding and routing. 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 (EIGRP), and Border Gateway Protocol (BGP) Version 4. IPX routing support includes RIP and EIGRP.

Layer 2 Switching

Using LANE, ARM supports emulated LAN (ELAN) to ELAN bridging. When RFC 1483 is used, Layer 2 traffic can be bridged between ATM permanent virtual connections (PVCs). In addition, the Institute of Electrical and Electronic Engineers (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. Bridged Virtual Interfaces (BVIs) configured with IRB can be used for 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) server 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 (IGMPv2) 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 Internet Control Message Protocol (ICMP) Router Discovery Protocol (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) runs on all Cisco devices so that these devices can learn about neighboring devices and exchange information. CDP uses a well-known multicast Media Access Control (MAC) address. During system

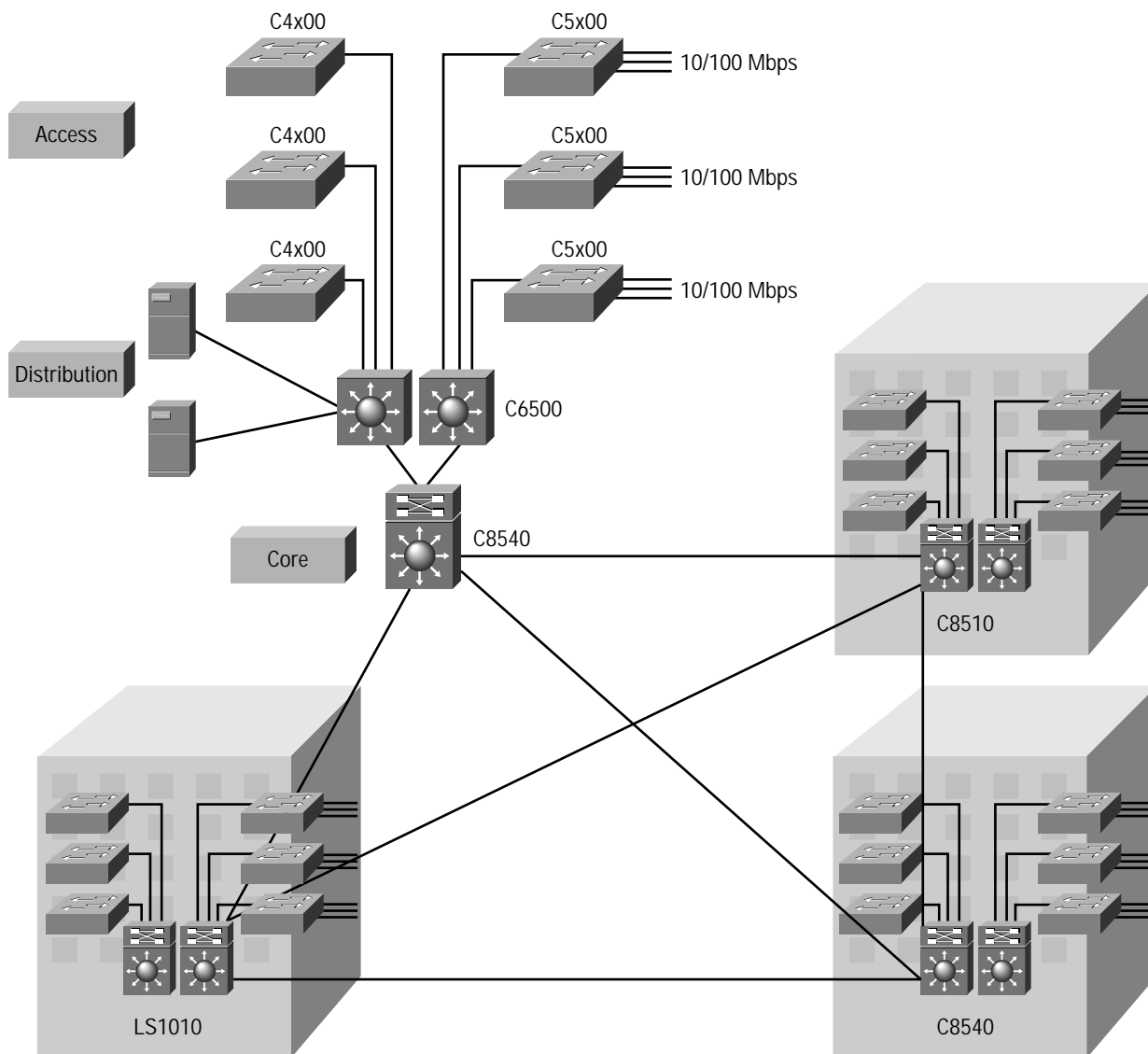
initialization, the application-specific integrated circuit (ASIC) will be configured to forward these packets to the Cisco IOS software CPU, which will process them.

Applications

The ATM Router Module is designed specifically to meet the demanding needs of large enterprise and service provider networks.

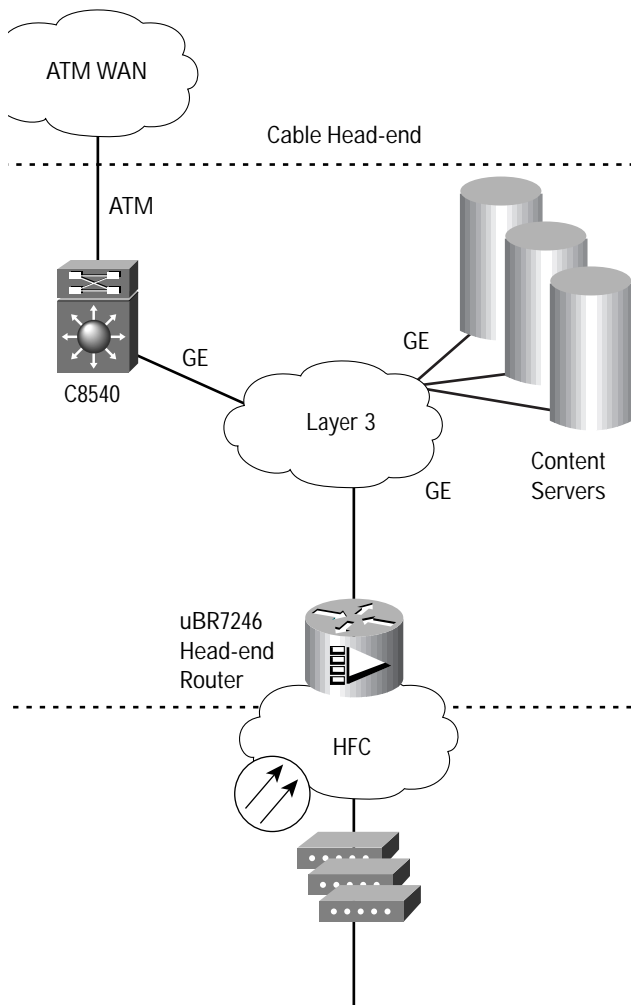
Up to two of the ARM modules may be placed in a Catalyst 8540 chassis, each providing more than two Gbps of Layer 3 to ATM throughput in the core of an enterprise network.

Figure 1 High-Speed Enterprise Campus



At a service provider's point of presence, the ATM Router Module can be used to aggregate Layer 3 traffic on Gigabit Ethernet/Fast Ethernet ports and seamlessly interwork this traffic over an ATM backbone network.

Figure 2 Service Provider Point-of-Presence



Specifications

Physical Specification

- Occupies one slot in the Catalyst 8540 MSR platform
- Maximum number of ARM modules supported in an 8540 MSR chassis: 2
- Dimensions (H x W x D): 1.2 x 14.4 x 16.0 in. (3.0 x 36.6 x 40.6 cm)

Safety Compliance

Catalyst 8540 MSR ATM Router Module, when installed in a system, complies 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 MSR ATM Router Module, when installed in a system, complies 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

- Status: link active (on), link idle (off)

Network Management

CiscoWorks

Simple Network Management Protocol (SNMP)

ETHERLIKE-MIB (RFC 1643)

MIB II (RFC 1213)

IF-MIB (RFC 1573)

Bridge MIB (RFC 1493)

CISCO-CDP-MIB

ENTITY-MIB (RFC 2037)

Ordering Information

Table 2: Required Software

Platform	Features	Minimum IOS Software Image	Software Product Number
Catalyst 8540 MSR	LANE	12.0(4a)W5(11a) or higher	S854R2-12.0.4W or higher
Catalyst 8540 MSR	RFC 1483	12.0(10)W5(18) or higher	S854R2-12.0.10W or higher

Table 3: Product Code and Availability

Product Number	Description	Availability
C8540-ARM-64K	C8540 ATM Router Module 64K	Now



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