

ATM Router Module II for the Cisco Catalyst **8540** MSR



The Cisco Catalyst® 8540 MSR ATM Router Module II (ARM II) provides high-speed interworking between the asynchronous transfer mode (ATM) and Layer 3 functions in a single chassis. The ARM II is supported on 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.

Feature Support

The ARM II module supports the following features and capabilities:

Table 1 Feature Summary

Feature	Description
Integrated Layer 3 and ATM	Enables seamless integration of Layer 3 and ATM interfaces on the Catalyst 8540 MSR
RFC 1483 and RFC 1577	Provides interworking between Layer 3 and ATM networks
256K built-in memory	Supports up to 256 routing table entries, critical for large networks today and future migration to IP quality of service (QoS) and Multiprotocol Label Switching (MPLS)
Integrated access control lists (ACLs)	Extends traffic control and security capabilities of the Catalyst 8540
Jumbo frame support	Supports a maximum MTU of 9K bytes via Request For Comments (RFC) 1483 and RFC 1577
Cisco Express Forwarding (CEF)	Provides for wire-speed IP and IPX® forwarding by using a “shadow” of the routing table, which is maintained in ARM II hardware
Online insertion and removal	Enables maximum system up time
Cisco IOS® Software	Provides rich features for advanced networking applications

Integrated Layer 3 and ATM

The ARM II is unique in its ability to seamlessly integrate Layer 3 and ATM interfaces. The benefit to the customer is that wire-speed Layer 3 switching between frame (Gigabit Ethernet and Fast Ethernet) ports, ATM switching between ATM ports, and high-speed frame and 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 II can be configured to support either RFC 1483 or RFC 1577.

Data Encapsulation (RFC 1483 and RFC 1577)

ARM II support of the Internet Engineering Task Force (IETF) specification RFC 1483, "Multiprotocol Encapsulation over ATM Adaptation Layer 5," and RFC 1577, "Classical IP over ATM," on the Catalyst 8540 MSR includes:

RFC 1483

- Logical Link Control (LLC) and SubNetwork Attachment Point (SNAP) encapsulation
- IP/IPX
- IP multicast
- AppleTalk
- Bridging
- Support for permanent virtual circuit (PVC) and switched virtual circuit (SVC)
- Up to 4K virtual circuits (VCs)

RFC 1577

- Support for PVC and SVC
- ARP Server
- Redundant ARP Server
- ARP Client

Integrated ACL

By integrating ACLs in the data-plane, ARM II provides traffic control and security capabilities at near-line-rate performance. The following ACL features are supported:

- Standard/Extended IP access lists
- Named access lists
- Standard IPX access lists
- Source/Destination-based ACL

Jumbo Frame Support

Jumbo Frame support enables you to customize and transfer frames with frame sizes up to 9K MTU. The use of a larger frame size increases the efficiency of the data transfer and optimizes server to server performance. Features include:

- Jumbo frame support via RFC 1483 and RFC 1577
- Jumbo frame support of up to maximum of 9K bytes
- Configurable through the command line interface (CLI)

Cisco Express Forwarding

ARM features Cisco Express Forwarding (CEF), which is 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.

Interface Support

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

ARM II OIR Support for Maximum Uptime

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

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

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 (BVI) 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.

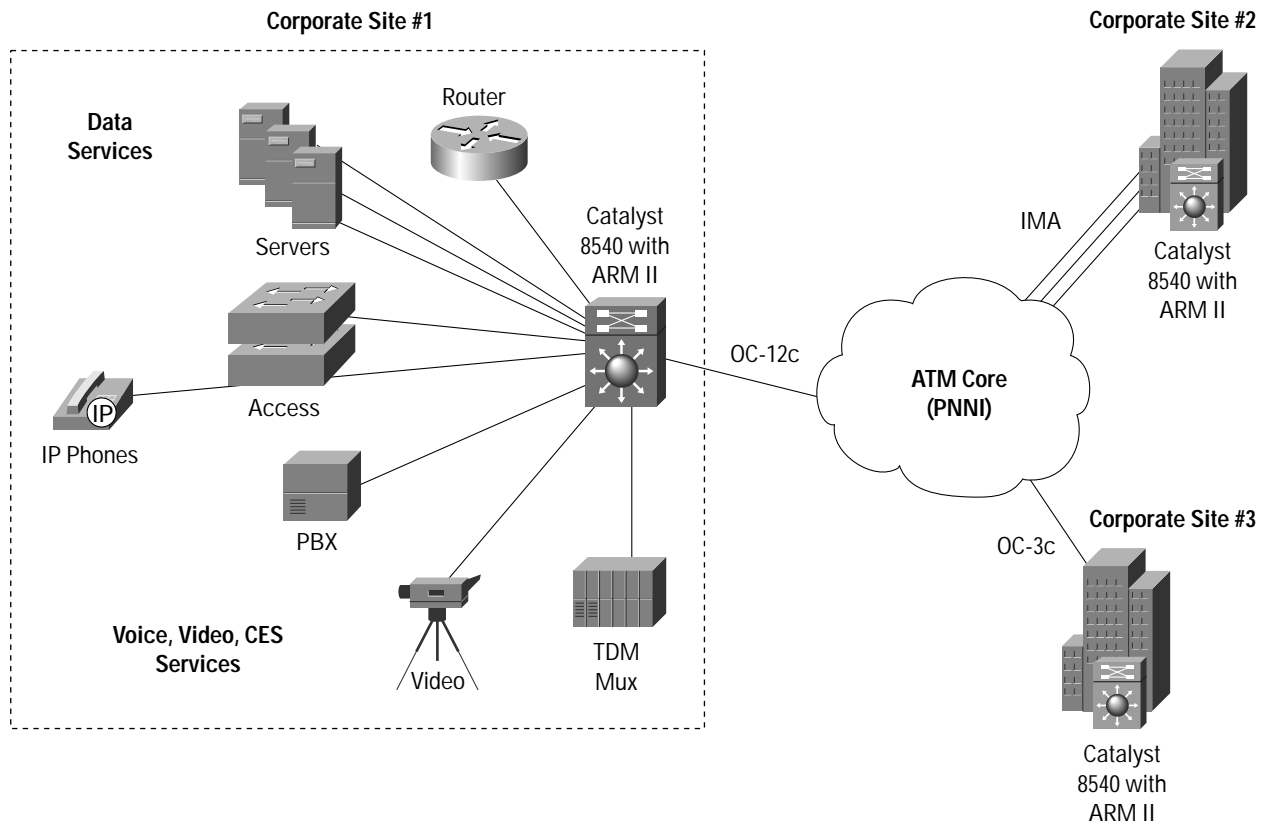
Cisco Discovery Protocol

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) is configured to forward these packets to the Cisco IOS Software CPU, which processes the packets.

Applications

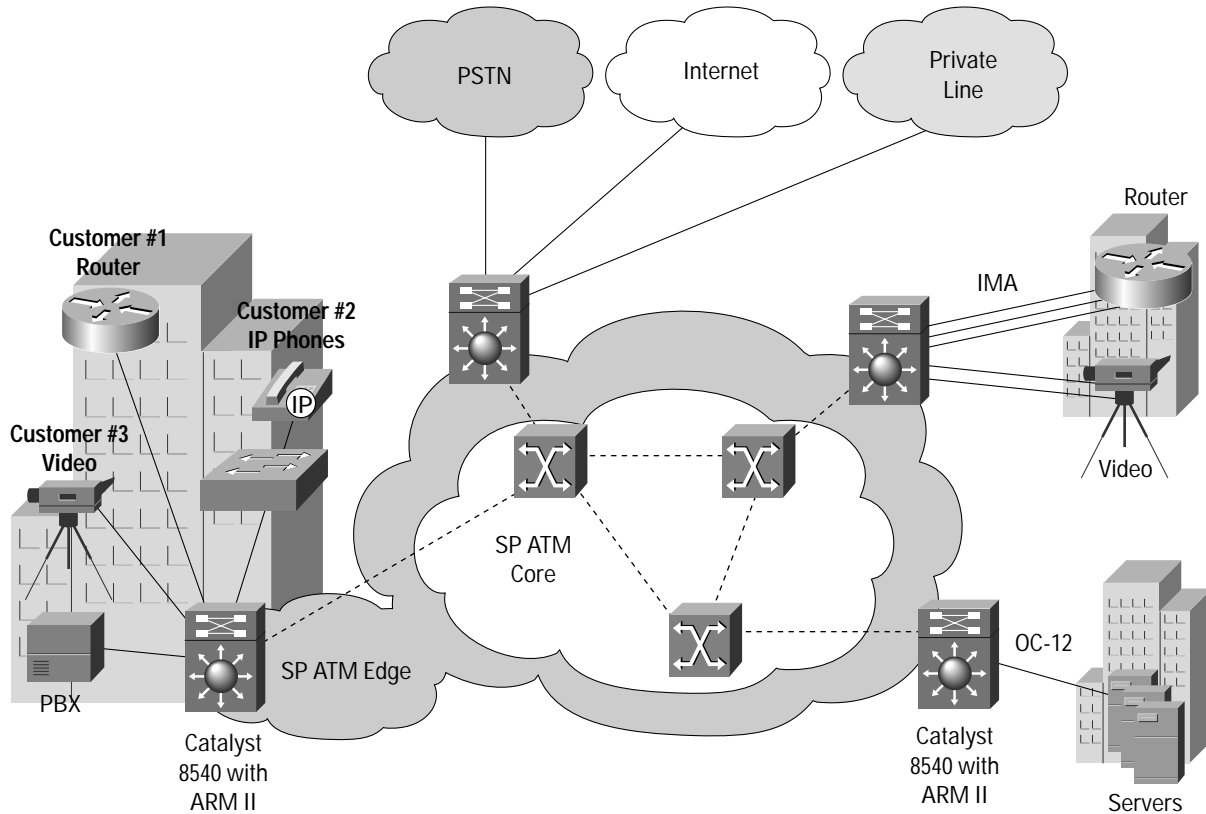
The ATM Router Module is designed specifically to meet the demanding needs of large enterprise and service provider networks that require high capacity multiservice links.

Figure 1 High-Speed Enterprise Campus



In an enterprise campus environment, you can use the Catalyst 8540 MSR with ARM II interface module to aggregate various Layer 3 and ATM services. You can either exchange data with other corporate sites or gain access to the public Internet, leveraging a public ATM infrastructure or private lines.

Figure 2 Service Provider Point of Presence



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

Specifications

Physical Specification

- Number of slots occupied in the Catalyst 8540 MSR platform: 1
- Maximum number of ARM II modules supported in an 8540 MSR chassis: 2
- Dimensions: 1.2 x 14.4 x 16.0 in. (3.0 x 36.6 x 40.6 cm) (H x W x D)

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 II, 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	Minimum IOS Software Image	Software Product Number
Catalyst 8540 MSR	12.1(5) or higher	S854R2-12.1.5W

Table 3 Product Code and Availability

Product Number	Description	Availability
C8540-ARM2	C8540 ATM Router Module II with 256K	Q1CY'01

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