

# Route Switch Module

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Catalyst 5000 family switches support the Route Switch Module (RSM) and the RSM/Versatile Interface Processor 2 (VIP2). This chapter describes the RSM and consists of these sections:

- Route Switch Module (WS-X5302), page 7-1
- Route Switch Module/VIP2 Module, page 7-6

For detailed RSM installation and configuration information, refer to the *Catalyst 5000 Family Route Switch Module Installation and Configuration Note* and the *Software Configuration Guide* for your switch. For detailed RSM/VIP2 installation and configuration information, refer to the *Route Switch Module Catalyst VIP2-15 and VIP2-40 Installation and Configuration Note*.

## Route Switch Module (WS-X5302)

The RSM is a router module running IOS router software that plugs directly into the Catalyst 5000 family switch backplane, providing multiprotocol routing for the Catalyst 5000 family Ethernet interfaces.

The RSM requires Catalyst 5000 family supervisor engine module software release 2.3(1) or later and IOS software release 11.2(7)P or later.

From the perspective of the Catalyst 5000 family switches, the RSM appears as a module with a single trunked port and one Media Access Control (MAC) address. From the perspective of the user, the RSM has one port. This port is unlike other Catalyst 5000 family module ports in that it has no external attributes, such as media type or speed.



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**Table 7-1 RSM (WS-X5302) Status LED Descriptions (continued)**

LED	State	Description
CPU HALT		Indicates the RSM status.
	On	Normal operation.
	Off	The system detected a processor hardware failure.
ENABLED		Indicates the RSM operational status.
	On	The IP microcode is loaded and the RSM is operational.
PCMCIA SLOT 0 and SLOT 1		Indicates when slot 1 and slot 0 PCMCIA devices are accessed by the RSM.
	On	Device in PCMCIA slot is accessed by RSM.
TX <sup>1</sup>		Indicates the port transmits.
	Green	The port is transmitting a packet (LED is lit for approximately 50 ms).
RX <sup>2</sup>		Indicates the port receives.
	Green	The port is receiving a packet (LED is lit for approximately 50 ms <sup>3</sup> ).

1 TX=transmit

2 RX=receive

3 ms = milliseconds

The RSM provides multiprotocol routing for the Catalyst 5000 family switch Ethernet interfaces. Table 7-2 lists the IOS features available for the RSM.

**Note** The RSM supports all media types that are supported by the Catalyst 5000 family switches.

## Route Switch Module (WS-X5302)

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**Table 7-2 IOS Features Available for the RSM**

Item	Feature
LAN support (routed protocols)	IP, IPX/SPX <sup>1</sup> , and AppleTalk
<b>IP</b>	
Routing protocols	Routing Information Protocol Hot Standby Router Protocol Address Resolution Protocol services Reverse Address Resolution Protocol Bootstrap Protocol Interior Gateway Routing Protocol Enhanced Interior Gateway Routing Protocol Open Shortest Path First
Routing features	Static routing Route filtering NetFlow Random early discard IP helper addressing User Datagram Protocol broadcasts IP broadcasts Access lists UDP flooding Passive interfaces IP multicast support: Internet Group Management Protocol Protocol Independent Multicast Cisco Group Management Protocol
IP control and management services	Internet Control Message Protocol services Domain Naming System services IP Path Maximum Transmission Unit Discovery Cisco Discovery Protocol
Files transfers	Trivial File Transfer Protocol
<b>IPX/SPX</b>	
Routing protocols	Routing Information Protocol Service Advertisement Protocol filters Netware Link Services Protocol

**Table 7-2 IOS Features Available for the RSM (continued)**

<b>Item</b>	<b>Feature</b>
Routing features	Get Nearest Server Novell-compliant IPX ping Novell helper addressing Novell output SAP <sup>2</sup> delays Filters (Routing Information Protocol, SAP)
Encapsulation techniques	802.3 (Novell-ether) 802.2 (ISO 1) Ethernet II (arpa) Ethernet-snap (LLC <sup>3</sup> /SNAP <sup>4</sup> ) Multiple Novell encapsulations on each VLAN <sup>5</sup>
<b>AppleTalk (Phases 1 and 2)</b>	
Routing protocols	AppleTalk ARP <sup>6</sup> Datagram Delivery Protocol Routing Table Maintenance Protocol Name Binding Protocol Zone Information Protocol AppleTalk Echo Protocol AppleTalk Transaction Protocol AppleTalk Simple Multicast Routing Protocol
Routing features	Packet filters Route filters Mac IP address assignment Dynamic interface configuration Variable RTMP <sup>7</sup> update timers Variable AARP <sup>8</sup> timers Variable AARP cache timeout timers Variable ZIP <sup>9</sup> query intervals GetZoneList filters AppleTalk ZIP reply filters AppleTalk Update-Based Routing Protocol

## Route Switch Module/VIP2 Module

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**Table 7-2**      **IOS Features Available for the RSM (continued)**

Item	Feature
DECnet	Phase IV and Phase V
Banyan VINES	N/A
1	IPX/SPX=Internetwork Packet Exchange/Sequenced Packet Exchange
2	SAP=service access point
3	LLC=Logical Link Control
4	SNAP=Subnetwork Access Protocol
5	VLAN=virtual LAN
6	ARP=Address Resolution Protocol
7	RTMP=Routing Table Maintenance Protocol
8	AARP=AppleTalk Address Resolution Protocol
9	ZIP=Zone Information Protocol

## Route Switch Module/VIP2 Module

You can use the RSM as a standalone interVLAN router or you can enhance it by adding a Catalyst VIP2 module to provide direct external network connections through a variety of media with the same port adapters used on Cisco 7500 series routers. The RSM/VIP2 combination provides routing between Catalyst VIP2 port adapters and between VLANs and Catalyst VIP2 port adapters. The Catalyst VIP2 module supports any combination of available Catalyst VIP2 port adapter-based network interface types. When you use the RSM with the Catalyst VIP2 module, the combination is a double-wide module that occupies two contiguous slots in the chassis.

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**Note** You can install the RSM/VIP2 module combination in Catalyst 5000, Catalyst 5505, Catalyst 5509, and Catalyst 5500 switches.

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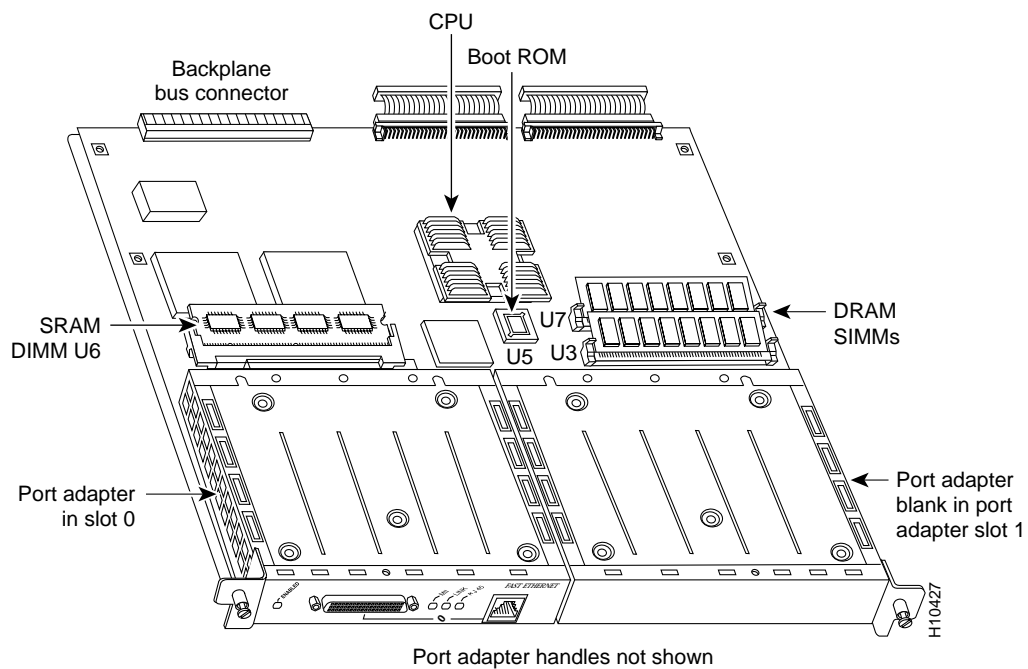
**Note** Earlier versions of the RSM have a slot restriction that you should take into consideration when installing the RSM in a Catalyst 5500 switch. Refer to the *Catalyst 5000 Family Route Switch Module Installation and Configuration Note* that shipped with the RSM for detailed information.

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The Catalyst VIP2 module requires that the RSM runs IOS release 11.2(9)P or later, and that the supervisor engine runs Catalyst 5000 family software release 2.3(1) or later.

Figure 7-2 shows a Catalyst VIP2 module with a port adapter installed.

**Figure 7-2 Catalyst VIP2 Module with Port Adapter**



## Configuration Options

The Catalyst VIP2 module uses a single motherboard with up to two port adapters. The Catalyst VIP2 port adapters provide WAN or LAN/WAN interface ports for the Catalyst 5000, Catalyst 5505, Catalyst 5509, and Catalyst 5500 switches. You can remove the RSM/VIP2 module combination from the switch chassis while power is on and the system is operating.

The current Catalyst VIP2 products have the following dynamic random-access memory (DRAM) and static random-access memory (SRAM) configurations:

- Catalyst VIP2-15(=)—1 MB of SRAM and 16 MB of DRAM
- Catalyst VIP2-40(=)—2 MB of SRAM and 32 MB of DRAM

The Catalyst VIP2-15 upgrade option (Catalyst VIP215/40-UPG=) allows you to upgrade to 2-MB SRAM and 32-MB DRAM.

Software licenses are included to use Distributed Switching and Distributed Services.

## Port Adapter Hardware

The port adapters attach to the Catalyst VIP2 motherboard. (See Figure 7-2.) Each port adapter contains the physical connections for the Catalyst VIP2 interface types to connect to your network. For the available electrical interface supported by the Catalyst VIP2 module, refer to the *Cisco Products Catalog*.



**Caution** Catalyst VIP2 modules with a single port adapter *must* have a blank port adapter installed to maintain compliance with electromagnetic interference (EMI) emissions standards and chassis airflow requirements. Each port adapter has one Phillips-head screw that secures it to its port adapter slot.

For detailed information on installing and configuring the RSM/VIP2 modules, refer to the *Route Switch Module Catalyst VIP2-15 and VIP2-40 Installation and Configuration Note*.