



Configuring RSVP Support for Frame Relay

Last Updated: July 25, 2011

This chapter describes the tasks for configuring the RSVP Support for Frame Relay feature.

- [Finding Feature Information, page 1](#)
- [How to Configure RSVP Support for Frame Relay, page 1](#)
- [Configuration Examples for Configuring RSVP Support for Frame Relay, page 8](#)
- [Additional References, page 11](#)

Finding Feature Information

Your software release may not support all the features documented in this module. For the latest feature information and caveats, see the release notes for your platform and software release. To find information about the features documented in this module, and to see a list of the releases in which each feature is supported, see the Feature Information Table at the end of this document.

Use Cisco Feature Navigator to find information about platform support and Cisco software image support. To access Cisco Feature Navigator, go to www.cisco.com/go/cfn. An account on Cisco.com is not required.

How to Configure RSVP Support for Frame Relay

- [Enabling Frame Relay Encapsulation on an Interface, page 2](#) (Required)
- [Configuring a Virtual Circuit, page 3](#) (Required)
- [Enabling Frame Relay Traffic Shaping on an Interface, page 3](#) (Required)
- [Enabling Enhanced Local Management Interface, page 3](#) (Optional)
- [Enabling RSVP on an Interface, page 3](#) (Required)
- [Specifying a Traffic Shaping Map Class for an Interface, page 3](#) (Required)
- [Defining a Map Class with WFQ and Traffic Shaping Parameters, page 3](#) (Required)
- [Specifying the CIR, page 4](#) (Required)

- [Specifying the Minimum CIR, page 4](#) (Optional)
- [Enabling WFQ, page 4](#) (Required)
- [Enabling FRF.12, page 4](#) (Required)
- [Configuring a Path, page 4](#) (Optional)
- [Configuring a Reservation, page 5](#) (Optional)
- [Verifying RSVP Support for Frame Relay, page 5](#) (Optional)
- [Monitoring and Maintaining RSVP Support for Frame Relay, page 7](#) (Optional)
- [Enabling Frame Relay Encapsulation on an Interface, page 2](#)
- [Configuring a Virtual Circuit, page 3](#)
- [Enabling Frame Relay Traffic Shaping on an Interface, page 3](#)
- [Enabling Enhanced Local Management Interface, page 3](#)
- [Enabling RSVP on an Interface, page 3](#)
- [Specifying a Traffic Shaping Map Class for an Interface, page 3](#)
- [Defining a Map Class with WFQ and Traffic Shaping Parameters, page 3](#)
- [Specifying the CIR, page 4](#)
- [Specifying the Minimum CIR, page 4](#)
- [Enabling WFQ, page 4](#)
- [Enabling FRF.12, page 4](#)
- [Configuring a Path, page 4](#)
- [Configuring a Reservation, page 5](#)
- [Verifying RSVP Support for Frame Relay, page 5](#)
- [Monitoring and Maintaining RSVP Support for Frame Relay, page 7](#)

Enabling Frame Relay Encapsulation on an Interface

SUMMARY STEPS

1. Router(config)# **interface s3/0**
2. Router(config-if)# **encapsulation frame-relay[cisco|ietf]**

DETAILED STEPS

	Command or Action	Purpose
Step 1	Router(config)# interface s3/0	Enables an interface (for example, serial interface 3/0) and enters configuration interface mode.
Step 2	Router(config-if)# encapsulation frame-relay[cisco ietf]	Enables Frame Relay and specifies the encapsulation method.

Configuring a Virtual Circuit

Command	Purpose
Router(config-if)# frame-relay interface-dlci <i>dlci</i>	Assigns a data-link connection identifier (DLCI) to a specified Frame Relay subinterface on a router or access server.

Enabling Frame Relay Traffic Shaping on an Interface

Command	Purpose
Router(config-if)# frame-relay traffic-shaping	Enables traffic shaping and per-VC queueing for all permanent virtual circuits (PVCs) and switched virtual circuits (SVCs) on a Frame Relay interface.

Enabling Enhanced Local Management Interface

Command	Purpose
Router(config-if)# frame-relay lmi-type	Selects the LMI type.

Enabling RSVP on an Interface

Command	Purpose
Router(config-if)# ip rsvp bandwidth	Enables RSVP on an interface.

Specifying a Traffic Shaping Map Class for an Interface

Command	Purpose
Router(config-if)# frame-relay class <i>name</i>	Associates a map class with an interface or subinterface.

Defining a Map Class with WFQ and Traffic Shaping Parameters

Command	Purpose
Router(config)# map-class frame-relay <i>map-class-name</i>	Defines parameters for a specified class.

Specifying the CIR

Command	Purpose
Router(config-map-class)# frame-relay cir {in out} <i>bps</i>	Specifies the maximum incoming or outgoing CIR for a Frame Relay VC.

Specifying the Minimum CIR

Command	Purpose
Router(config-map-class)# frame-relay mincir {in out} <i>bps</i>	Specifies the minimum acceptable incoming or outgoing CIR for a Frame Relay VC.
	Note If the minCIR is not configured, then the admission control value is the CIR/2.

Enabling WFQ

Command	Purpose
Router(config-map-class)# frame-relay fair-queue	Enables WFQ on a PVC.

Enabling FRF.12

Command	Purpose
Router(config-map-class)# frame-relay fragment <i>fragment-size</i>	Enables Frame Relay fragmentation on a PVC.

Configuring a Path

Command	Purpose
Router(config)# ip rsvp sender	Specifies the RSVP path parameters, including the destination and source addresses, the protocol, the destination and source ports, the previous hop address, the average bit rate, and the burst size.

Configuring a Reservation

Command	Purpose
Router(config)# ip rsvp reservation	Specifies the RSVP reservation parameters, including the destination and source addresses, the protocol, the destination and source ports, the next hop address, the next hop interface, the reservation style, the service type, the average bit rate, and the burst size.

Verifying RSVP Support for Frame Relay

- [Multipoint Configuration, page 5](#)
- [Point-to-Point Configuration, page 6](#)

Multipoint Configuration

To verify RSVP support for Frame Relay in a multipoint configuration, perform the following steps:

SUMMARY STEPS

1. Enter the **show ip rsvp installed** command to display information about interfaces and their admitted reservations. The output in the following example shows that serial subinterface 3/0.1 has two reservations:
2. Enter the **show ip rsvp installed detail** command to display additional information about interfaces, subinterfaces, DLCI PVCs, and their current reservations.

DETAILED STEPS

- Step 1** Enter the **show ip rsvp installed** command to display information about interfaces and their admitted reservations. The output in the following example shows that serial subinterface 3/0.1 has two reservations:

Example:

```
Router# show ip rsvp installed
RSVP:Serial3/0
BPS    To          From          Protoc DPort  Sport  Weight Conversation
RSVP:Serial3/0.1
BPS    To          From          Protoc DPort  Sport  Weight Conversation
40K    145.20.22.212  145.10.10.211 UDP     10     10     0       24
50K    145.20.21.212  145.10.10.211 UDP     10     10     6       25
```

Note Weight 0 is assigned to voice-like flows, which proceed to the priority queue.

- Step 2** Enter the **show ip rsvp installed detail** command to display additional information about interfaces, subinterfaces, DLCI PVCs, and their current reservations.

Note In the following output, the first flow gets a reserved queue with a weight > 0, and the second flow gets the priority queue with a weight = 0.

Example:

```

Router# show ip rsvp installed detail
RSVP:Serial3/0 has the following installed reservations
RSVP:Serial3/0.1 has the following installed reservations
RSVP Reservation. Destination is 145.20.21.212, Source is 145.10.10.211,
  Protocol is UDP, Destination port is 10, Source port is 10
  Reserved bandwidth:50K bits/sec, Maximum burst:1K bytes, Peak rate:50K bits/sec
QoS provider for this flow:
  WFQ on FR PVC dlci 101 on Se3/0: RESERVED queue 25. Weight:6
  Data given reserved service:0 packets (0M bytes)
  Data given best-effort service:0 packets (0 bytes)
  Reserved traffic classified for 68 seconds
  Long-term average bitrate (bits/sec):0M reserved, 0M best-effort
RSVP Reservation. Destination is 145.20.22.212, Source is 145.10.10.211,
  Protocol is UDP, Destination port is 10, Source port is 10
  Reserved bandwidth:40K bits/sec, Maximum burst:1K bytes, Peak rate:40K bits/sec
QoS provider for this flow:
  WFQ on FR PVC dlci 101 on Se3/0: PRIORITY queue 24. Weight:0
  Data given reserved service:0 packets (0M bytes)
  Data given best-effort service:0 packets (0 bytes)
  Reserved traffic classified for 707 seconds
  Long-term average bitrate (bits/sec):0M reserved, 0M best-effort

```

Point-to-Point Configuration

To verify RSVP support for Frame Relay in a point-to-point configuration, perform the following steps:

SUMMARY STEPS

1. Enter the **show ip rsvp installed** command to display information about interfaces and their admitted reservations. The output in the following example shows that serial subinterface 3/0.1 has one reservation, and serial subinterface 3/0.2 has one reservation.
2. Enter the **show ip rsvp installed detail** command to display additional information about interfaces, subinterfaces, DLCI PVCs, and their current reservations.

DETAILED STEPS

- Step 1** Enter the **show ip rsvp installed** command to display information about interfaces and their admitted reservations. The output in the following example shows that serial subinterface 3/0.1 has one reservation, and serial subinterface 3/0.2 has one reservation.

Example:

```

Router# show ip rsvp installed
RSVP:Serial3/0
BPS    To      From      Protoc DPort  Sport
RSVP:Serial3/0.1
BPS    To      From      Protoc DPort  Sport
50K    145.20.20.212  145.10.10.211  UDP    10     10
RSVP:Serial3/0.2
BPS    To      From      Protoc DPort  Sport
10K    145.20.21.212  145.10.10.211  UDP    11     11

```

Note Weight 0 is assigned to voice-like flows, which proceed to the priority queue.

Step 2

Enter the **show ip rsvp installed detail** command to display additional information about interfaces, subinterfaces, DLCI PVCs, and their current reservations.

Note In the following output, the first flow with a weight > 0 gets a reserved queue and the second flow with a weight = 0 gets the priority queue.

Example:

```
Router# show ip rsvp installed detail
RSVP:Serial3/0 has the following installed reservations
RSVP:Serial3/0.1 has the following installed reservations
RSVP Reservation. Destination is 145.20.20.212, Source is 145.10.10.211,
  Protocol is UDP, Destination port is 10, Source port is 10
  Reserved bandwidth:50K bits/sec, Maximum burst:1K bytes, Peak rate:50K bits/sec
QoS provider for this flow:
  WFQ on FR PVC dlci 101 on Se3/0: RESERVED queue 25. Weight:6
  Data given reserved service:415 packets (509620 bytes)
  Data given best-effort service:0 packets (0 bytes)
  Reserved traffic classified for 862 seconds
  Long-term average bitrate (bits/sec):4724 reserved, 0M best-effort
RSVP Reservation. Destination is 145.20.20.212, Source is 145.10.10.211,
  Protocol is UDP, Destination port is 11, Source port is 11
  Reserved bandwidth:10K bits/sec, Maximum burst:1K bytes, Peak rate:10K bits/sec
QoS provider for this flow:
  WFQ on FR PVC dlci 101 on Se3/0: PRIORITY queue 24. Weight:0
  Data given reserved service:85 packets (104380 bytes)
  Data given best-effort service:0 packets (0 bytes)
  Reserved traffic classified for 875 seconds
  Long-term average bitrate (bits/sec):954 reserved, 0M best-effort
RSVP:Serial3/0.2 has the following installed reservations
RSVP Reservation. Destination is 145.20.21.212, Source is 145.10.10.211,
  Protocol is UDP, Destination port is 11, Source port is 11
  Reserved bandwidth:10K bits/sec, Maximum burst:1K bytes, Peak rate:10Kbits/sec
QoS provider for this flow:
  WFQ on FR PVC dlci 101 on Se3/0:PRIORITY queue 24. Weight:0
  Data given reserved service:85 packets (104380 bytes)
  Data given best-effort service:0 packets (0 bytes)
  Reserved traffic classified for 875 seconds
  Long-term average bitrate (bits/sec):954 reserved, 0M best-effort
```

Monitoring and Maintaining RSVP Support for Frame Relay

Command	Purpose
Router# show ip rsvp installed	Displays information about interfaces and their admitted reservations.
Router# show ip rsvp installed detail	Displays additional information about interfaces, DLCIs, and their admitted reservations.
Router# show queueing	Displays all or selected configured queueing strategies.

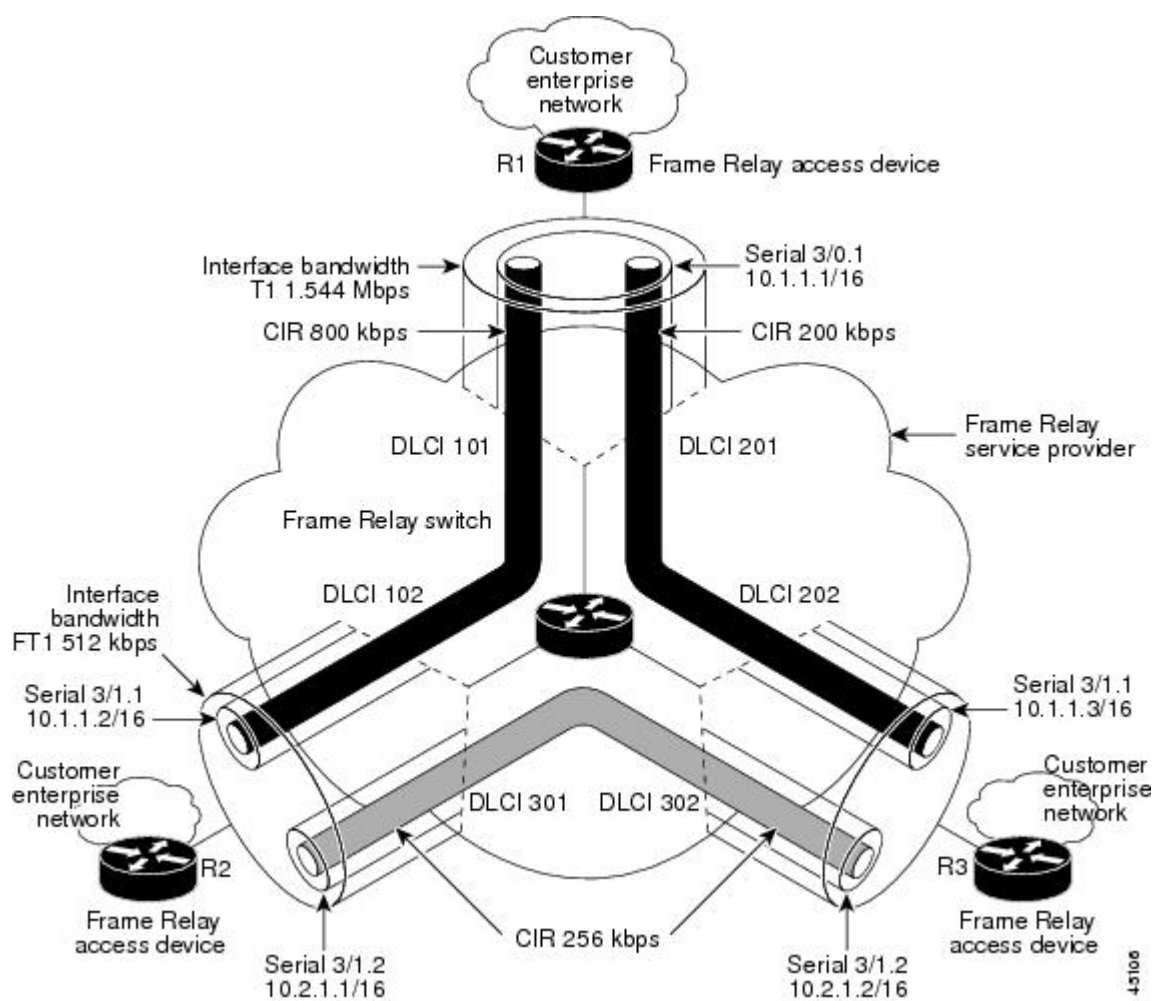
Configuration Examples for Configuring RSVP Support for Frame Relay

- [Example Multipoint Configuration, page 8](#)
- [Example Point-to-Point Configuration, page 10](#)
- [Example Multipoint Configuration, page 8](#)
- [Example Point-to-Point Configuration, page 10](#)

Example Multipoint Configuration

The figure below shows a multipoint interface configuration commonly used in Frame Relay environments in which multiple PVCs are configured on the same subinterface at router R1.

Figure 1



RSVP performs admission control based on the minCIR of DLCI 101 and DLCI 201. The congestion point is not the 10.1.1.1/16 subinterface, but the CIR of DLCI 101 and DLCI 201.

The following example is a sample output for serial interface 3/0:

```
interface Serial3/0
  no ip address
  encapsulation frame-relay
  no fair-queue
  frame-relay traffic-shaping
  frame-relay lmi-type cisco
  ip rsvp bandwidth 350 350
!
interface Serial3/0.1 multipoint
  ip address 10.1.1.1 255.255.0.0
  frame-relay interface-dlci 101
    class fr-voip
  frame-relay interface-dlci 201
    class fast-vcs
  ip rsvp bandwidth 350 350
ip rsvp pq-profile 6000 2000 ignore-peak-value
!
!
map-class frame-relay fr-voip
  frame-relay cir 800000
  frame-relay bc 8000
  frame-relay mincir 128000
  frame-relay fragment 280
  no frame-relay adaptive-shaping
  frame-relay fair-queue
!
map-class frame-relay fast-vcs
  frame-relay cir 200000
  frame-relay bc 2000
  frame-relay mincir 60000
  frame-relay fragment 280
  no frame-relay adaptive-shaping
  frame-relay fair-queue
!
```

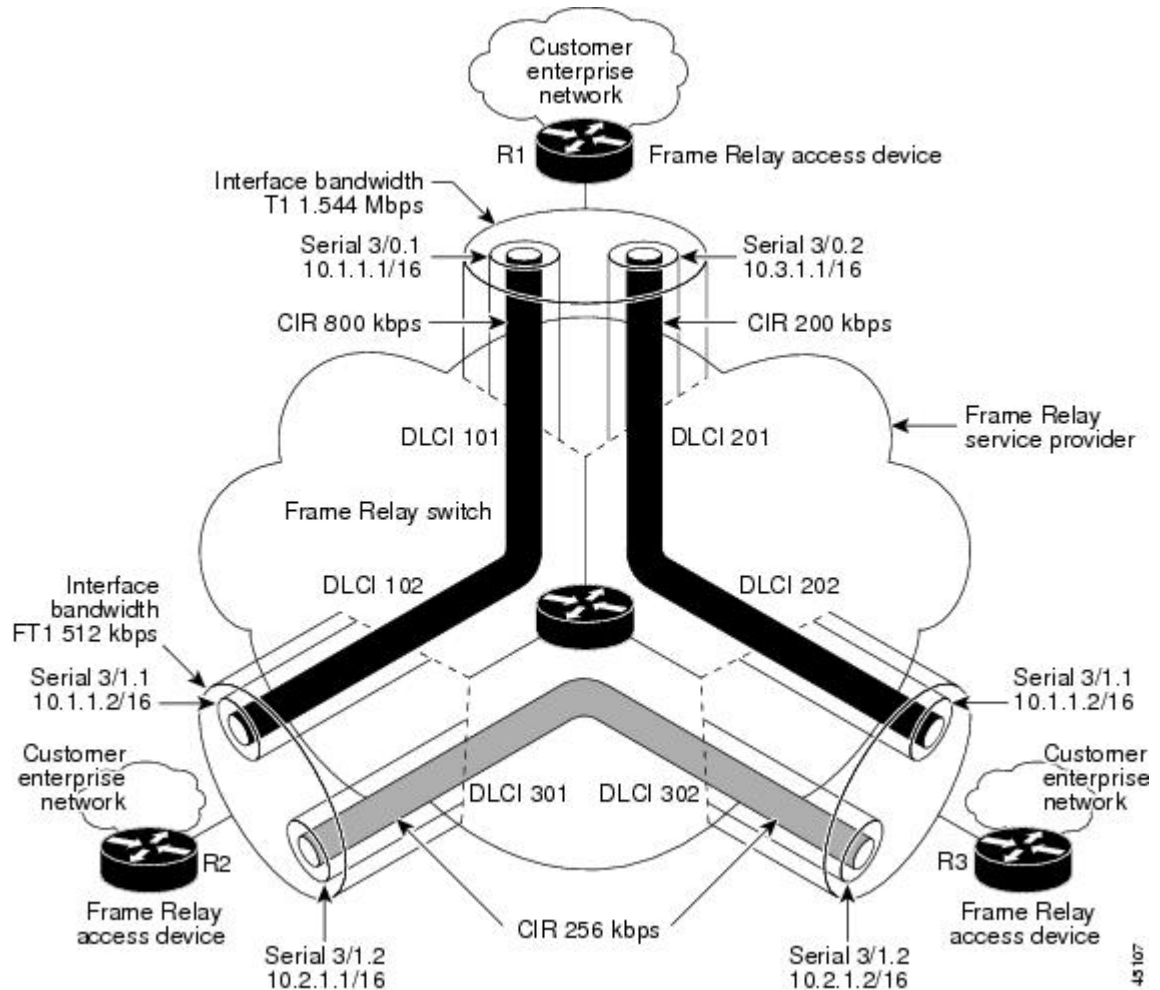
**Note**

When FRTS is enabled, the Frame Relay Committed Burst (Bc) value (in bits) should be configured to a maximum of 1/100th of the CIR value (in bits per second). This configuration ensures that the FRTS token bucket interval (Bc/CIR) does not exceed 10 Ms, and that voice packets are serviced promptly.

Example Point-to-Point Configuration

The figure below shows a point-to-point interface configuration commonly used in Frame Relay environments in which one PVC per subinterface is configured at router R1.

Figure 2



Notice that the router interface bandwidth for R1 is T1 (1.544 Mbps), whereas the CIR value of DLCI 201 toward R3 is 256 kbps. For traffic flows from R1 to R3 over DLCI 201, the congestion point is the CIR for DLCI 201. As a result, RSVP performs admission control based on the minCIR and reserves resources, including queues and bandwidth, on the WFQ system that runs on each DLCI.

The following example is sample output for serial interface 3/0:

```
interface Serial3/0
  no ip address
  encapsulation frame-relay
  no fair-queue
  frame-relay traffic-shaping
  frame-relay lmi-type cisco
  ip rsvp bandwidth 500 500
!
```

```

interface Serial3/0.1 point-to-point
 ip address 10.1.1.1 255.255.0.0
 frame-relay interface-dlci 101
   class fr-voip
 ip rsvp bandwidth 350 350
!
interface Serial3/0.2 point-to-point
 ip address 10.3.1.1 255.255.0.0
 frame-relay interface-dlci 201
   class fast-vcs
 ip rsvp bandwidth 150 150
 ip rsvp pq-profile 6000 2000 ignore-peak-value
!
!
map-class frame-relay fr-voip
 frame-relay cir 800000
 frame-relay bc 8000
 frame-relay mincir 128000
 frame-relay fragment 280
 no frame-relay adaptive-shaping
 frame-relay fair-queue

```

**Note**

When FRTS is enabled, the Frame Relay Committed Burst (Bc) value (in bits) should be configured to a maximum of 1/100th of the CIR value (in bits per second). This configuration ensures that the FRTS token bucket interval (Bc/CIR) does not exceed 10 Ms, and that voice packets are serviced promptly.

Additional References

Related Documents

Related Topic	Document Title
Cisco IOS commands	Cisco IOS Master Commands List, All Releases
RSVP commands: complete command syntax, command mode, command history, defaults, usage guidelines, and examples	<i>Cisco IOS Quality of Service Solutions Command Reference</i>
Overview on RSVP	<i>Signalling Overview</i>

Standards

Standard	Title
No new or modified standards are supported by this feature, and support for existing standards has not been modified by this feature.	--

MIBs

MIB	MIBs Link
No new or modified MIBs are supported by this feature, and support for existing MIBs has not been modified by this feature.	To locate and download MIBs for selected platforms, Cisco software releases, and feature sets, use Cisco MIB Locator found at the following URL: http://www.cisco.com/go/mibs

RFCs

RFC	Title
No new or modified RFCs are supported, and support for existing RFCs has not been modified.	--

Technical Assistance

Description	Link
The Cisco Support and Documentation website provides online resources to download documentation, software, and tools. Use these resources to install and configure the software and to troubleshoot and resolve technical issues with Cisco products and technologies. Access to most tools on the Cisco Support and Documentation website requires a Cisco.com user ID and password.	http://www.cisco.com/cisco/web/support/index.html

Cisco and the Cisco Logo are trademarks of Cisco Systems, Inc. and/or its affiliates in the U.S. and other countries. A listing of Cisco's trademarks can be found at www.cisco.com/go/trademarks. Third party trademarks mentioned 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. (1005R)

Any Internet Protocol (IP) addresses and phone numbers used in this document are not intended to be actual addresses and phone numbers. Any examples, command display output, network topology diagrams, and other figures included in the document are shown for illustrative purposes only. Any use of actual IP addresses or phone numbers in illustrative content is unintentional and coincidental.