Multicast VPN MIB

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The Multicast VPN MIB feature introduces the capability for Simple Network Management Protocol (SNMP) monitoring of a Multicast VPN (MVPN) using the MVPN MIB (CISCO-MVPN-MIB).

Finding Feature Information in This Module

Your Cisco IOS software release may not support all of the features documented in this module. To reach links to specific feature documentation in this module and to see a list of the releases in which each feature is supported, use the "Feature Information for Multicast VPN MIB" section on page 9.

Finding Support Information for Platforms and Cisco IOS and Catalyst OS Software Images

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

Prerequisites for Multicast VPN MIB

- Before performing the tasks in this module, you must configure MVPN. For information, see the "Configuring Multicast-VPN" chapter in the *Cisco IOS Multicast Configuration Guide*.
- You must configure SNMP on the routers on which the MVPN MIB is to be used. See the "Configuring the Router to Send MVRF Trap Notifications" task for more information. For more information about configuring an SNMP server, see the "Configuring SNMP Support" chapter in the *Cisco IOS Network Management Configuration Guide*.

Restrictions for Multicast VPN MIB

- Currently only IPv4 is supported.
- For all MIB objects with "read-create" access privileges, currently only "read-only" access is supported.

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Information About Multicast VPN MIB

To configure the Multicast VPN MIB feature, you should understand the following concepts:

Overview of the MVPN MIB

In an MVPN network, a Provider Edge (PE) router has a multicast routing table and a Protocol Independent Multicast (PIM) instance associated with every VPN routing and forwarding (VRF) table that is used to define the VPN membership of customer sites attached to the router. There is one global multicast routing table and a table per multicast VRF (MVRF) used to route multicast packets received from a Customer Edge (CE) router. A set of MVRFs form a multicast domain (MD) when they are connected to potential sources and receivers of multicast traffic. A distinct group address, also known as the Multicast Distribution Tree (MDT) group address, obtained from an administrative pool, is assigned to each multicast domain. MDT groups are used by Provider Edge (PE) routers to encapsulate and transport multicast traffic within an MD through multicast tunnel interfaces (MTIs).

Initially all multicast data is forwarded using preconfigured MDT default groups. When certain multicast streams exceed a configured bandwidth threshold on the PE router, the multicast data is moved to an MDT data group that is dynamically chosen from an available pool of multicast addresses.

Using the MVPN MIB, network administrators can access MVRF information from PE routers for VPN traffic across multiple CE sites in real time. SNMP operations can be performed to monitor the MVRFs on the PE routers using **get** and **set** commands entered on the network management system (NMS) workstation for which SNMP has been implemented. The NMS workstations is also known as the SNMP manager.

MVPN Information Retrieval Using SNMP and the MVPN MIB

SNMP has historically been used to collect network information. SNMP permits retrieval of critical information from network elements such as routers, switches, and workstations. The MVPN MIB uses SNMP to configure MVRF trap notifications and to gather useful MVPN information in real time.

The MVPN MIB allows MVPN data for the managed devices on your system to be retrieved by SNMP. You can specify the retrieval of MVPN information from a managed device (for example, a router) either by entering commands on that managed device or by entering SNMP commands from the NMS workstation to gather MVPN information. MVPN MIB requests for information are sent from an NMS workstation to the router using SNMP and is retrieved from the router. This information can then be stored or viewed, thus allowing MVPN information to be easily accessed and transported across a multivendor programming environment.

MVPN MIB Objects

The MVPN MIB defines managed objects that enable a network administrator to remotely monitor the following MVPN information:

- The state of the MVRFs including the name of the MVRF, whether they are active, and the number of active multicast-enabled interfaces

- MDT default group address and encapsulation information
- Next hop information used to receive Border Gateway Protocol (BGP) MDT updates for Source Specific Multicast (SSM) mode
- Traffic threshold that determines switchover to an MDT data group
- Type of MDT group being used for a given (S, G) multicast route entry that exists on each configured MVRF, source address, and group address of the multicast route entry
- Source and group address used for encapsulation
- Information on MDT data groups currently joined
- Information on MVPN-specific MDT tunnels present in the device
- Trap notifications enabled on the router

Note For a complete description of the objects supported by the MVPN MIB, see the CISCO_MVPN_MIB.my file, available on Cisco.com at http://www.cisco.com/go/mibs.

How to Configure Multicast VPN MIB

This section contains the following required procedure:

- Configuring the Router to Send MVRF Trap Notifications, page 3 (required)

Configuring the Router to Send MVRF Trap Notifications

Perform this task to configure the router to use SNMP to send MVRF trap notifications.

MVRF Trap Notifications

An MVPN router can be configured to send MVRF (ciscoMvpnMvrfChange) trap notifications. A ciscoMvpnMvrfChange trap notification signifies a change about an MVRF in the device. The change event can be the creation of an MVRF, the deletion of an MVRF, or an update on the default or data multicast distribution tree (MDT) configuration of an MVRF. The change event is indicated by the ciscoMvpnGenOperStatusChange object embedded in the trap notification.

Note Before the MVPN MIB can be used, the SNMP server for the router must be configured. To enable the SNMP server on the router, perform Steps 3 and 4. If an SNMP server is already available, omit Steps 3 and 4 and proceed to Step 5.

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **snmp-server community** *string* **ro**
   or
   snmp-server community *string* **rw**

4. **snmp-server host** {*hostname* | *ip-address*} **version 2c** *community-string*
5. **snmp-server enable traps mvpn**
6. **end**

DETAILED STEPS

	Command or Action	Purpose
Step 1	**enable** **Example:** `Router> enable`	Enables privileged EXEC mode. • Enter your password if prompted.
Step 2	**configure terminal** **Example:** `Router# configure terminal`	Enters global configuration mode.
Step 3	**snmp-server community** *string* **ro** or **snmp-server community** *string* **rw** **Example:** `Router(config)# snmp-server community public ro` or `Router(config)# snmp-server community public rw`	Sets up the community access string to permit access to SNMP. • The *string* argument is a community string that consists of from 1 to 32 alphanumeric characters and functions much like a password, permitting access to the SNMP protocol. Blank spaces are not permitted in the community string. • Specifying the **snmp-server community** command with the **ro** keyword configures read-only access. SNMP management stations using this string only can retrieve MIB objects. or • Specifying the **snmp-server community** command with the **rw** keyword configures read-write access. SNMP management stations using this string can retrieve and modify MIB objects.
Step 4	**snmp-server host** {*hostname* | *ip-address*} **version 2c** *community-string* **Example:** `Router(config)# snmp-server host 192.168.1.1 version 2c public`	Specifies the recipient of an SNMP notification operation.
Step 5	**snmp-server enable traps mvpn** **Example:** `Router(config)# snmp-server enable traps mvpn`	Enables the router to send MVRF trap notifications.
Step 6	**end** **Example:** `Router(config)# end`	Exits the current configuration mode and returns to privileged EXEC mode.

Configuration Examples for Multicast VPN MIB

This section provides the following configuration example:

- Configuring the Router to Send MVRF Trap Notifications: Example, page 5

Configuring the Router to Send MVRF Trap Notifications: Example

The following example shows how to configure a router to use SNMP to send MVRF trap notifications:

```
!
snmp-server community public RW
snmp-server enable traps mvpn
snmp-server host 10.3.32.154 version 2c public
!
```

Additional References

The following sections provide references related to the Multicast VPN MIB feature.

Related Documents

Related Topic	Document Title
MVPN commands: complete command syntax, command mode, command history, defaults, usage guidelines, and examples	• *Cisco IOS IP Multicast Command Reference*, Release 12.2SR • *Cisco IOS IP Multicast Command Reference*, Release 12.2SX • *Cisco IOS IP Multicast Command Reference*, Release 12.4T
Conceptual and configuration details for MVPN tasks.	• *Cisco IOS IP Multicast Configuration Guide*, Release 12.4 • *Cisco IOS IP Multicast Configuration Guide*, Release 12.4T
SNMP commands: complete command syntax, command mode, command history, defaults, usage guidelines, and examples	• *Cisco IOS Network Management Command Reference*, Release 12.2SR • *Cisco IOS Network Management Command Reference*, Release 12.2SX • *Cisco IOS Network Management Command Reference*, Releaese 12.4T
Configuration tasks for SNMP support.	• *Cisco IOS Network Management Configuration Guide*, Release 12.4 • *Cisco IOS Network Management Configuration Guide*, Release 12.4T

Standards

Standard	Title
No new or modified standards are supported by this feature.	—

MIBs

MIB	MIBs Link
• CISCO-MVPN-MIB.my	To locate and download MIBs for selected platforms, Cisco IOS 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 by this feature.	—

Technical Assistance

Description	Link
The Cisco Support website provides extensive online resources, including documentation and tools for troubleshooting and resolving technical issues with Cisco products and technologies. To receive security and technical information about your products, you can subscribe to various services, such as the Product Alert Tool (accessed from Field Notices), the Cisco Technical Services Newsletter, and Really Simple Syndication (RSS) Feeds. Access to most tools on the Cisco Support website requires a Cisco.com user ID and password.	http://www.cisco.com/techsupport

Command Reference

This section documents only commands that are new or modified.

- **snmp-server enable traps mvpn**

snmp-server enable traps mvpn

To enable Multicast Virtual Private Network (MVPN) routing and forwarding (MVRF) trap notifications, use the **snmp-server enable traps mvpn** command in global configuration mode. To disable MVRF trap notifications, use the **no** form of this command.

snmp-server enable traps mvpn

no snmp-server enable traps mvpn

Syntax Description

This command has no arguments or keywords.

Command Default

MVRF traps are disabled.

Command Modes

Global configuration (config)

Command History

Release	Modification
12.0(29)S	This command was introduced.
12.3(14)T	This command was integrated into Cisco IOS Release 12.3(14)T.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2(33)SXH	This command was integrated into Cisco IOS Release 12.2(33)SXH.

Usage Guidelines

SNMP notifications can be sent as traps or informs. This command enables trap notification requests only.

This command controls (enables or disables) MVRF (ciscoMvpnMvrfChange) trap notifications. A ciscoMvpnMvrfChange trap notification signifies a change about a MVRF in the device. The change event can be the creation of an MVRF, the deletion of an MVRF, or an update on the default or data multicast distribution tree (MDT) configuration of an MVRF. The change event is indicated by the ciscoMvpnGenOperStatusChange object embedded in the trap notification.

MVRF trap notifications are defined by the ciscoMvpnMvrfChange object in the MVPN MIB. When this object is queried from a network management system (NMS) workstation, one of the following values is appended to the object to indicate the configuration state of MVRF trap notifications:

- true(1)—MVRF trap notifications are enabled.
- false(2)—MVRF trap notifications are disabled.

The following MVPN MIB tables can be queried to gather details about MVRF change events:

- ciscoMvpnGenericTable
- ciscoMvpnMdtDefaultTable
- ciscoMvpnMdtDataTable

Note For a complete description of the ciscoMvpnMvrfChange trap notification and MVPN MIB tables, see the CISCO_MVPN_MIB.my file, available on Cisco.com at http://www.cisco.com/go/mibs.

The **snmp-server enable traps mvpn** command is used in conjunction with the **snmp-server host** command. Use the **snmp-server host** command to specify which host or hosts receive SNMP notifications. To send SNMP notifications, you must configure at least one **snmp-server host** command.

Examples

The following example shows how to enable MVRF traps to the host at IP address 10.3.32.154 using the community string defined as public:

```
snmp-server enable traps mvpn
snmp-server host 10.3.32.154 version 2c public
```

Related Commands

Command	Description
snmp-server community	Enables SNMP and sets the community string and access privileges.
snmp-server host	Specifies the recipient of an SNMP notification operation.

Feature Information for Multicast VPN MIB

Table 1 lists the release history for this feature.

Not all commands may be available in your Cisco IOS software release. For release information about a specific command, see the command reference documentation.

Use Cisco Feature Navigator to find information about platform support and software image support. Cisco Feature Navigator enables you to determine which Cisco IOS and Catalyst OS software images support a specific software release, feature set, or platform. To access Cisco Feature Navigator, go to http://www.cisco.com/go/cfn. An account on Cisco.com is not required.

Note Table 1 lists only the Cisco IOS software release that introduced support for a given feature in a given Cisco IOS software release train. Unless noted otherwise, subsequent releases of that Cisco IOS software release train also support that feature.

Table 1 Feature Information for Multicast VPN MIB

Feature Name	Releases	Feature Information
Multicast VPN MIB	12.0(29)S 12.3(14)T 12.2(33)SRA 12.2(33)SXH	The Multicast VPN MIB feature introduces the capability for SNMP monitoring of an MVPN using the MVPN MIB (CISCO-MVPN-MIB). The following command was introduced by this feature: **snmp server enable traps mvpn**