



# Selective MVRF Download Feature on Cisco 12000 Series Routers

Part Number OL-11099-01 Rev. A0 August 28, 2006

## Feature History

Release	Modification
12.0(32)SY	This feature was introduced on the Cisco 12000 series routers.

This feature module contains the following sections:

- [Selective Multicast Virtual Route Forwarding \(MVRF\) Downloading Feature Overview](#)
- [Supported Platforms](#)
- [Supported Standards, MIBs, and RFCs](#)
- [Prerequisites](#)
- [Configuration Tasks](#)
- [Verifying and Monitoring the Selective Multicast Virtual Route Forwarding \(MVRF\) Downloading Feature](#)
- [Configuring and Verifying Selective Multicast Virtual Route Forwarding \(MVRF\) Downloading](#)
- [Command Reference](#)
- [Glossary](#)

## Selective Multicast Virtual Route Forwarding (MVRF) Downloading Feature Overview

The selective Multicast Virtual Route Forwarding (MVRF) downloading feature disables the automatic downloading of VRF multicast routes for a specific VRF to any line card that does not have a forwarding interface in that VRF. Starting with Release 12.0(32)SY, this is the default behavior.

The selective MVRF Download feature allows Multicast Virtual Routing and Forwarding (MVRF) routing instances to be downloaded to line cards as needed instead of downloading to all line cards. The advantage is that this action saves line card memory by reducing the number of mroutes configured and lowers the use of the CPU by the line card.

This feature is set by default so the **ip multicast** command is modified with the addition of new keywords to bypass the feature if needed. The modified command is **ip multicast mdfs download all**. Two new commands **show ip mds vrf vpn download interface slot** and **show ip mds vrf vpn download slot-list** are added to monitor this feature.

Two show commands have been changed. For monitoring the MDFS Route Processor, use the **show ip multicast** command. For monitoring the MDFS line card, use the **show ip mds vrf vrf\_name summary** command to display the multicast routes configured on a line card in the context of a VRF. This show command displays a flag indicating the feature is in effect on the line card.

## Restrictions

In this release, the following limitation and restriction applies:

- The **ip multicast-routing distributed** command must be executed before using the **ip multicast mdfs download all** command to configure non-selective Multicast Virtual Route Forwarding (MVRF) downloading.



### Note

Changing the configuration of the selective Multicast Virtual Route Forwarding (MVRF) downloading feature by executing the **ip multicast mdfs download all** command or the **no ip multicast mdfs download all** command will cause MDFS to reload on all line cards.

## Related Documents

For information on configuring Cisco 12000 series routers, refer to the following documents:

- *Modular Quality of Service Command-Line Interface*
- *Stacked VLAN Processing*
- *Cisco IOS Quality of Service Solutions Command Reference*
- *Cisco 12000 Series Router Configuration Guide for Cisco IOS*
- *Any Transport over MPLS*
- *Any Transport over MPLS (AToM): Layer 2 QoS (Quality of Service)*
- *MPLS VPNs over IP Tunnels*

## Supported Platforms

The Selective Virtual Route Forwarding (SVRF) downloading feature is supported in Cisco IOS Release 12.0(32)SY on the following Integrated Services Engine (ISE) line cards and SPAs:

### Edge Cards

- Ethernet Line Cards
  - 4-port Gigabit Ethernet ISE Line Card (Minimum 512 Megabytes memory)

## Core Cards

- POS Line Cards
  - 4-port OC-12c POS MM (Minimum 512 Megabytes memory)
  - 1-port OC-48 (Minimum 512 Megabytes memory)
  - 16-port OC-3 (Minimum 512 Megabytes memory)
- Cisco 12000 SIP-600 SPAs
  - 1-port 10-Gigabit Ethernet SPA
  - 5-port Gigabit Ethernet SPA
  - 10-port Gigabit Ethernet SPA
  - 1-port OC-192c/STM-64 POS SPA
  - 2-port OC48-POS/RPR SPA
- Cisco 12000 SIP-401/501/601 SPAs
  - 8-port FastEthernet SPA
  - 8-port FastEthernet SPA Version 2 (12.0(32)SY)
  - 1-port 10-Gigabit Ethernet SPA
  - 1-port 10-Gigabit Ethernet SPA Version 2 (12.0(32)SY)
  - 2-port Gigabit Ethernet SPA
  - 2-port Gigabit Ethernet SPA hiVersion 2 (12.0(32)SY)
  - 5-port Gigabit Ethernet SPA
  - 5-port Gigabit Ethernet SPA Version 2 (12.0(32)SY)
  - 10-port Gigabit Ethernet SPA
  - 10-port Gigabit Ethernet SPA Version 2 (12.0(32)SY)
  - 1-port OC-192c/STM-64 POS SPA
  - 2-port OC48-POS/RPR SPA

## Supported Standards, MIBs, and RFCs

The selective Multicast Virtual Route Forwarding (MVRF) downloading on Cisco 12000 Series Routers feature supports the following standards, MIBs, and RFCs.

### Standards

Standards	Title
IEEE 802.1Q	—

## MIBs

MIBs	MIBs Link
PWE3-MIB VPDN-MIB IF-MIB No other 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 IOS releases, and feature sets, use Cisco MIB Locator found at the following URL: <a href="http://www.cisco.com/go/mibs">http://www.cisco.com/go/mibs</a>

## RFCs

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

## Prerequisites

Before you configure the selective Multicast Virtual Route Forwarding (MVRF) downloading feature, ensure that the network is configured as follows:

- The **ip multicast-routing distributed** command must be executed before using the **ip multicast mdfs download all** command to configure non-selective Multicast Virtual Route Forwarding (MVRF) downloading.

## Configuration Tasks

See the following sections for configuration tasks for the selective Multicast Virtual Route Forwarding (MVRF) feature.

- [Configuring the Selective Multicast Virtual Route Forwarding \(MVRF\) Downloading Feature](#)
- [Verifying and Monitoring the Selective Multicast Virtual Route Forwarding \(MVRF\) Downloading Feature](#)

## Configuring the Selective Multicast Virtual Route Forwarding (MVRF) Downloading Feature

You must execute the **ip multicast-routing distributed** command before using the **ip multicast mdfs download all** command to configure non-selective Multicast Virtual Route Forwarding (MVRF) downloading.

Refer to the steps below to disable the selective Multicast Virtual Route Forwarding (MVRF) downloading feature.

**Steps for Disabling the Selective Multicast Virtual Route Forwarding (MVRF) Downloading Feature**

	<b>Command</b>	<b>Purpose</b>
<b>Step 1</b>	<code>Router#config t</code> <code>Router(config)#</code>	Enters configuration mode.
<b>Step 2</b>	<code>Router(config)#ip multicast-routing distributed</code> <code>Router(config)#</code>	Enables MDS globally. For example: <code>Router(config)#ip multicast-routing distributed</code>
<b>Step 3</b>	<code>Router(config)#ip multicast mdfs download all</code>	Disables the selective Multicast Virtual Route Forwarding (MVRF) downloading feature. For example: <code>Router(config)#ip multicast mdfs download all</code>

## Verifying and Monitoring the Selective Multicast Virtual Route Forwarding (MVRF) Downloading Feature

To verify and monitor the selective Multicast Virtual Route Forwarding (MVRF) downloading feature, use the following **show** commands:

Command	Purpose
Router# <b>show ip mds vrf vpn1 summary</b>	Shows the status of the Selective Multicast Virtual Route Forwarding (MVRF) downloading feature. For example:  Router# <b>show ip mds vrf vpn1 summary</b> Master lc: 1, number of ifs in master lc: 1 Selective MVRF download is in effect 0 routes IP multicast MDFS forwarding information and statistics: Flags: D - Dense, S - Sparse, B - Bidir Group, s - SSM Group N - Not MDFS switchable, F - Not all MDFS switchable, O - OIF Null V - MVPN packets not MDFS switchable R - In-ratelimit, A - In-access, M - MTU mismatch, P - Register set C - In-CAR, J - Join SPT, L - Local Z - Multicast Tunnel Y - Joined MDT-data group, y - Sending to MDT-data group Interface state: Interface, Next-Hop, Mac header
Router# <b>show ip mds vrf &lt;vpn&gt; download interface &lt;slot&gt;</b>	Shows the list of IDBs that are in the MVRF on the specified line card slot. For example:  Router# <b>show ip mds vrf &lt;vpn&gt; download interface &lt;slot&gt;</b> List of IDBs on slot 3 in <vpn>  Idx     Interface name 19     GigabitEthernet3/1.1
Router# <b>show ip mds vrf &lt;vpn&gt; download linecard</b>	Shows the line cards that have mroutes downloaded for a given mVRF. For example:  Router# <b>show ip mds vrf &lt;vpn&gt; download linecard</b> Mroutes Downloaded to following line cards 3

# Configuring and Verifying Selective Multicast Virtual Route Forwarding (MVRF) Downloading

This section provides the following examples for configuring and verifying Selective Multicast Virtual Route Forwarding (MVRF) downloading on provider edge routers:

- [Example of Configuring the Selective Multicast Virtual Route Forwarding \(MVRF\) Downloading Feature](#)
- [Example of Verifying a Selective Multicast Virtual Route Forwarding \(MVRF\) Configuration](#)

## Example of Configuring the Selective Multicast Virtual Route Forwarding (MVRF) Downloading Feature

```
Router#config t
Router(config)#ip multicast-routing distributed
Router(config)#ip multicast mdfs download all
```

## Example of Verifying a Selective Multicast Virtual Route Forwarding (MVRF) Configuration

Display the interfaces enabled for PIM on a line card for the vrf vpn1.

```
PE2#sh ip pim vrf vpn1 int co

State: * - Fast Switched, D - Distributed Fast Switched
       H - Hardware Switching Enabled
Address      Interface      FS  Mpackets In/Out
71.0.0.1     Tunnel0        D   0/0
66.0.0.1     POS1/0.1       D   0/0
```

Display the multicast route summary for the vrf vpn1 on the line card in slot on 1.

```
LC-Slot1#sh ip mds vrf vpn1 sum
Master lc: 1, number of ifs in master lc: 1
3 routes
IP multicast MDFS forwarding information and statistics:
Flags: D - Dense, S - Sparse, B - Bidir Group, s - SSM Group
       N - Not MDFS switchable, F - Not all MDFS switchable, O - OIF Null
       V - MVPN packets not MDFS switchable
       R - In-ratelimit, A - In-access, M - MTU mismatch, P - Register set
       C - In-CAR, J - Join SPT, L - Local
       Z - Multicast Tunnel
       Y - Joined MDT-data group, y - Sending to MDT-data group
```

Interface state: Interface, Next-Hop, Mac header

```
(*, 227.0.1.1),
  Incoming interface: Null
  Pkts: 0, uptime: 00:33:19, last used: never, Kbps: 0, fast-flags: DNMM
(*, 227.0.1.2),
  Incoming interface: Null
  Pkts: 0, uptime: 00:33:19, last used: never, Kbps: 0, fast-flags: DNMM
(*, 224.0.1.40),
  Incoming interface: Null
  Pkts: 0, uptime: 00:33:19, last used: never, Kbps: 0, fast-flags: DNML
```

Display the multicast route summary for the vrf vpn1 on the line card in slot on 6.

```
LC-Slot6#sh ip mds vrf vpn1 sum
Master lc: 1, number of ifs in master lc: 1
Selective MVRF download is in effect
0 routes
IP multicast MDFS forwarding information and statistics:
Flags: D - Dense, S - Sparse, B - Bidir Group, s - SSM Group
      N - Not MDFS switchable, F - Not all MDFS switchable, O - OIF Null
      V - MVPN packets not MDFS switchable
      R - In-ratelimit, A - In-access, M - MTU mismatch, P - Register set
      C - In-CAR, J - Join SPT, L - Local
      Z - Multicast Tunnel
      Y - Joined MDT-data group, y - Sending to MDT-data group

Interface state: Interface, Next-Hop, Mac header

LC-Slot6#
```

## Command Reference

This section documents new commands for the selective Multicast Virtual Route Forwarding (MVRF) feature. All other commands used with this feature are documented in the Cisco IOS Release 12.0 command reference publications.

# ip multicast mdfs download all

To disable the selective Multicast Virtual Route Forwarding (MVRF) downloading feature, use the **ip multicast mdfs download all** global configuration command. To re-enable the selective Multicast Virtual Route Forwarding (MVRF) downloading feature, use the **no** form of this command.

**ip multicast mdfs download all**

**no ip multicast mdfs download all**

## Syntax Description

This command has no arguments or keywords.

## Defaults

Disabled

## Command Modes

Global configuration

## Command History

Release	Modification
12.0(32)SY	This command was introduced.

## Usage Guidelines

The selective Multicast Virtual Route Forwarding (MVRF) downloading feature is enabled by default. The selective MVRF Download feature allows Multicast Virtual Routing and Forwarding (MVRF) routing instances to be downloaded to line cards as needed instead of downloading to all line cards. The advantage is that this action saves line card memory by reducing the number of mroutes configured and lowers the use of the CPU by the line card.



### Note

Changing the configuration of the selective Multicast Virtual Route Forwarding (MVRF) downloading feature by executing the **ip multicast mdfs download all** command or the **no ip multicast mdfs download all** command will cause MDFS to reload on all line cards.

Use the **show ip mds summary** command to display the status of the selective MVRF download feature.

## Examples

The following example disables the selective MVRF download feature:

```
ip multicast mdfs download all
```

---

**Related Commands**

<b>Command</b>	<b>Description</b>
<b>show ip mds summary</b>	Displays the status of the selective MVRF download feature.

---

# show ip mds summary

To display a summary of the MFIB table for multicast distributed switching (MDS), use the **show ip mds summary** EXEC command.

```
show ip mds summary
```

**Syntax Description** This command has no arguments or keywords.

**Command Modes** EXEC

Command History	Release	Modification
	11.2(11)GS	This command was introduced.
	12.0(32)SY	The selective download status line was added to the output for this command.

**Usage Guidelines** Use this command on a line card. On a Cisco 12000 series router only, line card commands can be executed from the RP using the following syntax:

```
execute [slot slot-number | all] command
```

The *command* is any of the line card **show** commands, such as **show ip mds summary** and **show ip mds forward**.

**Examples** The following is sample output from the **show ip mds summary** command:

```
Router# show ip mds summary

Master lc: 1, number of ifs in master lc: 1
  Selective MVRF download is in effect
  0 routes

IP multicast MDFS forwarding information and statistics:
Flags: N - Not MDFS switchable, F - Not all MDFS switchable, O - OIF Null
       R - In-ratelimit, A - In-access, M - MTU mismatch, P - Register set

Interface state: Interface, Next-Hop, Mac header

(*, 224.2.170.73),
  Incoming interface: Null
  Pkts: 0, last used: never, Kbps: 0, fast-flags: N
(128.97.62.86, 224.2.170.73) [31]
  Incoming interface: Fddi3/0/0
  Pkts: 3045, last used: 00:00:03, Kbps: 0, fast-flags: M
(128.223.3.7, 224.2.170.73) [334]
  Incoming interface: Fddi3/0/0
  Pkts: 0, last used: never, Kbps: 0, fast-flags: M
```

[Table 1](#) describes the fields in the display.

**Table 1** *show ip mds summary Field Descriptions*

<b>Field</b>	<b>Description</b>
(128.97.62.86, 224.2.170.73) [31]	Source and group addresses. Number in [ ] is the hash bucket for the route.
Incoming interface	Expected interface for a multicast packet from the source. If the packet is not received on this interface, it is discarded.
Pkts	Total number of packets switched by that entry.
last used	Time when this MFIB entry was used to switch a packet.
Kbps	Kilobits per second of the switched traffic.

# Glossary

ACL	Access Control List
BPDU	Bridge Protocol Data Unit
CE	Customer Edge
CDP	Cisco Discovery Protocol
EVCS	Ethernet Virtual Connection Service
L2PT	Layer 2 Protocol Tunneling
MAC	Media Access Control
MPLS	Multi Protocol Label Switching
PE	Provider Edge
QoS	Quality of Service
Split Horizon	A packet forwarding technique that prevents packets received from an emulated VC from being forwarded to another emulated VC. This technique is important for creating loop-free paths in a full-meshed network.
STP	Spanning-Tree Protocol
TLS	Transparent LAN Service
VC	Virtual Connection
VFI	Virtual Forwarding Instance
VPLS	Virtual Private LAN Service
VPN	Virtual Private Network
VRF	A Virtual Private Network (VPN) routing/forwarding instance.
VTP	Virtual Terminal Protocol

CCSP, CCVP, the Cisco Square Bridge logo, Follow Me Browsing, and StackWise are trademarks of Cisco Systems, Inc.; Changing the Way We Work, Live, Play, and Learn, and iQuick Study are service marks of Cisco Systems, Inc.; and Access Registrar, Aironet, BPX, Catalyst, CCDA, CCDP, CCIE, CCIP, CCNA, CCNP, Cisco, the Cisco Certified Internetwork Expert logo, Cisco IOS, Cisco Press, Cisco Systems, Cisco Systems Capital, the Cisco Systems logo, Cisco Unity, Enterprise/Solver, EtherChannel, EtherFast, EtherSwitch, Fast Step, FormShare, GigaDrive, GigaStack, HomeLink, Internet Quotient, IOS, IP/TV, iQ Expertise, the iQ logo, iQ Net Readiness Scorecard, LightStream, Linksys, MeetingPlace, MGX, the Networkers logo, Networking Academy, Network Registrar, *Packet*, PIX, Post-Routing, Pre-Routing, ProConnect, RateMUX, ScriptShare, SlideCast, SMARTnet, The Fastest Way to Increase Your Internet Quotient, and TransPath are registered trademarks of Cisco Systems, Inc. and/or its affiliates in the United States and certain other countries.

All other trademarks mentioned in this document or Website 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. (0601R)

©2006 Cisco Systems, Inc. All rights reserved.