



MSDP Compliance with IETF RFC 3618

First Published: November 11, 2003

Last Updated: June 1, 2006

The MSDP Compliance with IETF RFC 3618 feature enables you to configure compliance with the Internet Engineering Task Force (IETF) RFC 3618 specifications for Multicast Source Discovery Protocol (MSDP). Compliance provides the following benefits:

- You can use Border Gateway Protocol (BGP) route reflectors without running MSDP on them.
- You can use an Interior Gateway Protocol (IGP) for the reverse path forwarding (RPF) check and thereby run peerings without BGP or multiprotocol BGP (MBGP).
- You can have peerings between routers in nondirectly connected autonomous systems (that is, with one or more autonomous systems between them). This capability helps in confederation configurations and for redundancy.

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 MSDP Compliance with RFC 3618” section on page 11](#).

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.



Corporate Headquarters:
Cisco Systems, Inc., 170 West Tasman Drive, San Jose, CA 95134-1706 USA

© 2003–2006 Cisco Systems, Inc. All rights reserved.

Contents

- [Information About MSDP Compliance with IETF RFC 3618, page 2](#)
- [How to Configure MSDP Compliance with IETF RFC 3618, page 4](#)
- [Configuration Examples for MSDP Compliance with IETF RFC 3618, page 5](#)
- [Additional References, page 5](#)
- [Command Reference, page 7](#)
- [Feature Information for MSDP Compliance with RFC 3618, page 11](#)

Information About MSDP Compliance with IETF RFC 3618

To configure the MSDP Compliance with IETF RFC 3618 feature, you should understand the following concepts:

- [Benefits of MSDP Compliance with IETF RFC 3618, page 2](#)
- [Original MSDP Peer-RPF Forwarding Rules, page 2](#)
- [IETF MSDP-Compliant Peer-RPF Forwarding Rules, page 3](#)

Benefits of MSDP Compliance with IETF RFC 3618

Compliance with IETF RFC 3618 provides the following benefits:

- You can use BGP route reflectors without running MSDP on them.
- You can use an IGP for the RPF check and thereby run peerings without BGP or MBGP.
- You can have peerings between routers in nondirectly connected autonomous systems (that is, with one or more autonomous systems between them). This capability helps in confederation configurations and for redundancy.

Original MSDP Peer-RPF Forwarding Rules

If you do not configure the MSDP Compliance with IETF RFC 3618 feature, the following MSDP peer-RPF forwarding rules apply:

- If the MSDP neighbor (N) is a member of a mesh group, the RPF check is not performed.
- If N is the only peer, the router accepts the Source-Active (SA) message from N.
- If N is the rendezvous point (RP), the router accepts the SA message from N.
- If the RP is a local address, the router does not accept the SA message.
- If there is a configured MSDP default peer that is configured for an RP address range that includes the RP, the router accepts the SA message if it was received from the MSDP default peer and rejects the SA message if it was not received from the MSDP default peer.
- If BGP or MBGP is not running, the RPF check fails.
- If the MBGP route for the RP is not found, the router looks up the BGP route for the RP. If neither the MBGP route nor the BGP route for the RP is found, the RPF check fails.

- If the BGP neighbor that announces the best path for the route (the best BGP neighbor) matches, the following rules apply:
 - If the MSDP neighbor is an internal BGP (iBGP) peer, the MSDP RPF check succeeds if the MSDP neighbor is the iBGP neighbor announcing the best MBGP or BGP path toward the RP. If the MSDP neighbor is not the iBGP neighbor, the RPF check fails.
 - If the MSDP neighbor is an external BGP (eBGP) peer, the MSDP RPF check succeeds if the MSDP neighbor is in the same autonomous system as the neighbor announcing the best MBGP or BGP path towards the RP. The MSDP RPF check fails if the MSDP neighbor is in a different autonomous system.
 - If the MSDP neighbor is neither an iBGP peer nor an eBGP peer, but RP is reachable through BGP with an autonomous system, then check if the MSDP neighbor is in the autonomous system. If the MSDP neighbor is in the autonomous system, the MSDP RPF check succeeds. If it is not, the MSDP check fails.

IETF MSDP-Compliant Peer-RPF Forwarding Rules

When the MSDP Compliance with IETF RFC 3618 feature is configured, the peer-RPF forwarding rules defined in IETF RFC 3618 are applied to MSDP peers.

IETF RFC 3618 provides peer-RPF forwarding rules that are used for forwarding SA messages throughout an MSDP-enabled internet. Unlike the RPF check used when forwarding data packets, which compares a packet's source address against the interface upon which the packet was received, the peer-RPF check compares the RP address carried in the SA message against the MSDP peer from which the message was received. Except when MSDP mesh groups are being used, SA messages from an RP address R will be accepted from only one MSDP peer to avoid looping SA messages, which could cause MSDP SA messages to stay in the network. The MSDP peer is called the *MSDP peer-RPF neighbor* for RP R.

The MSDP peer-RPF rules depend on routing information to determine the peer-RPF neighbor for RP R. MSDP performs route lookups against the RP and against the MSDP neighbors of the router. MSDP consults two sources of route information: the Reverse Path Forwarding Routing Information Base (RPF-RIB) and the Multicast BGP Routing Information Base (MBGP-RIB). The RPF-RIB represents the paths that are used for Protocol Independent Multicast (PIM) sparse mode (PIM-SM) RPF forwarding on the router.

RPF-RIB merges the information from multiple routing sources by local policy to determine which routing source is providing paths for each individual address prefix for PIM-SM. Routing sources for the RPF-RIB include those that are determined by local policy to be usable for both IP unicast and IP multicast (congruent routing information) and those specific to IP multicast (incongruent routing information). Congruent routing sources specifically include IGP protocol information representing a topology where IP multicast is run congruently with IP unicast. Incongruent routing sources specifically include multicast BGP (MBGP) Subsequent Address Family Identifier (SAFI) 2 paths, static routes that are only to be used for IP multicast RPF forwarding, and multiprotocol IGP information specific to IP multicast.

The MBGP-RIB contains all BGP routing information applicable to IP multicast that is known to this router. It contains MBGP (RFC 2858) SAFI 2 and SAFI 3 paths, and it may also contain MBGP SAFI 1 paths or BGP (non-MBGP) paths for prefixes for which no better MBGP SAFI 2 or SAFI 3 path is available. The relationship between routes in the MBGP-RIB and the RPF-RIB is typically that the RPF-RIB will contain all external routes from the MBGP-RIB, but not internal ones, because those are usually in the RPF-RIB learned via an IGP. For the purpose of the MSDP peer-RPF rules, MBGP routes

and BGP routes in the RPF-RIB are irrelevant because MBGP-RIB entries take precedence over entries in the RPF-RIB and a BGP route in the RPF-RIB will already have been considered by a prior lookup into the MBGP-RIB.

How to Configure MSDP Compliance with IETF RFC 3618

This section contains the following procedure:

- [Configuring MSDP Compliance with IETF RFC 3618, page 4](#) (required)

Configuring MSDP Compliance with IETF RFC 3618

Perform this task to configure MSDP compliance with IETF RFC 3618.

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **ip msdp peer** {*peer-name* | *peer-address*} [**connect-source** *type number*] [**remote-as** *as-number*]
4. **ip msdp description** {*peer-name* | *peer-address*} *text*
5. **ip msdp** [**vrf** *vrf-name*] **rpf rfc3618**
6. **exit**
7. **show ip msdp** [**vrf** *vrf-name*] **rpf-peer** *rp-address*

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	ip msdp peer { <i>peer-name</i> <i>peer-address</i> } [connect-source <i>type number</i>] [remote-as <i>as-number</i>] Example: Router(config)# ip msdp peer 192.168.1.5 connect-source loopback 0	Enables MSDP and configures an MSDP peer as specified by the Domain Name System (DNS) name or IP address. • If you specify the connect-source keyword, the primary address of the specified local interface <i>type</i> and <i>number</i> values is used as the source IP address for the TCP connection. • The connect-source keyword is recommended, especially for MSDP peers on a border that peer with a router inside the remote domain.

	Command or Action	Purpose
Step 4	<pre>ip msdp description {peer-name peer-address} text</pre> <p>Example: Router (config) ip msdp description 192.168.1.5 peer1</p>	(Optional) Configures a description for a specified peer to make it easier to identify in a configuration or in show command output.
Step 5	<pre>ip msdp [vrf vrf-name] rpf rfc3618</pre> <p>Example: Router(config)# ip msdp vrf vrfl rpf rfc3618</p>	Enables compliance with the peer-RPF forwarding rules specified in IETF RFC 3618.
Step 6	<pre>exit</pre> <p>Example: Router(config)# exit</p>	Exits global configuration mode.
Step 7	<pre>show ip msdp [vrf vrf-name] rpf-peer rp-address</pre> <p>Example: Router# show ip msdp rpf-peer 192.168.1.5</p>	(Optional) Displays the unique MSDP peer information from which a router will accept SA messages originating from the specified RP.

Configuration Examples for MSDP Compliance with IETF RFC 3618

This section provides the following configuration example:

- [MSDP Compliance with IETF RFC 3618: Example, page 5](#)

MSDP Compliance with IETF RFC 3618: Example

The following example shows how to configure MSDP peers 10.10.2.4 and 10.20.1.2 to be compliant with peer-RPF forwarding rules specified in IETF RFC 3618:

```
ip msdp peer 10.10.2.4
ip msdp peer 10.20.1.2
ip msdp rpf rfc3618
```

Additional References

The following sections provide references related to the MSDP Compliance with IETF RFC 3618 feature.

Related Documents

Related Topic	Document Title
MSDP configuration	“Configuring Multicast Source Discovery Protocol” chapter in the “IP Multicast” section of the <i>Cisco IOS IP Configuration Guide</i> , Release 12.2

Standards

Standards	Title
No new or modified standards are supported by this feature and support for existing standards has not been modified by this feature.	—

MIBs

MIBs	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 IOS releases, and feature sets, use Cisco MIB Locator found at the following URL: http://www.cisco.com/go/mibs

RFCs

RFCs	Title
RFC 3618	<i>Multicast Source Discovery Protocol (MSDP)</i> http://www.ietf.org/rfc/rfc3618.txt

Technical Assistance

Description	Link
The Cisco Technical Support & Documentation website contains thousands of pages of searchable technical content, including links to products, technologies, solutions, technical tips, and tools. Registered Cisco.com users can log in from this page to access even more content.	http://www.cisco.com/techsupport

Command Reference

This section documents modified commands only.

- [ip msdp rpf rfc3618](#)
- [show ip msdp rpf-peer](#)

ip msdp rpf rfc3618

To enable Internet Engineering Task Force (IETF) RFC 3618-compliant MSDP Peer-RPF forwarding rules, use the **ip msdp rpf rfc3618** command in global configuration mode. To revert to non-IETF compliant rules, use the **no** form of this command.

ip msdp [vrf *vrf-name*] rpf rfc3618

no ip msdp [vrf *vrf-name*] rpf rfc3618

Syntax Description

vrf	(Optional) Supports the multicast Virtual Private Network (VPN) routing and forwarding (VRF) instance.
<i>vrf-name</i>	(Optional) Name assigned to the VRF.

Command Default

The peer-RPF forwarding rules that are compliant with IETF MSDP RFC 3618 are not enabled.

Command Modes

Global configuration

Command History

Release	Modification
12.3(4)T	This command was introduced.
12.0(27)S	This command was integrated into Cisco IOS Release 12.0(27)S.
12.2(25)S	This command was integrated into Cisco IOS Release 12.2(25)S.
12.2(27)SBC	This command was integrated into Cisco IOS Release 12.2(27)SBC.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.

Usage Guidelines

Use this command to be compliant with IETF MSDP RFC 3618. Such compliance allows you to use BGP route reflectors without running MSDP on them. It also allows you to use an IGP for the RPF check and thereby run peerings without BGP or MBGP.

Examples

The following example shows how to enable MSDP peer-RPF forwarding rules that are compliant with IETF MSDP RFC 3618:

```
ip msdp rpf rfc3618
```

Related Commands

Command	Description
show ip msdp rpf-peer	Displays the unique MSDP peer information from which the router will accept SA messages originating from the specified RP.

show ip msdp rpf-peer

To display the unique Multicast Source Discovery Protocol (MSDP) peer information from which a router will accept Source-Active (SA) messages originating from the specified rendezvous point (RP), use the **show ip msdp rpf-peer** command in user EXEC or privileged EXEC mode.

```
show ip msdp [vrf vrf-name] rpf-peer rp-address
```

Syntax Description	Parameter	Description
	vrf	(Optional) Supports the multicast virtual private network (VPN) routing and forwarding (VRF) instance.
	<i>vrf-name</i>	(Optional) Name assigned to the VRF.
	<i>rp-address</i>	Address of the rendezvous point (RP).

Command Modes	Mode
	User EXEC Privileged EXEC

Command History	Release	Modification
	12.3(4)T	This command was introduced.
	12.0(27)S	This command was integrated into Cisco IOS Release 12.0(27)S.
	12.2(25)S	This command was integrated into Cisco IOS Release 12.2(25)S.
	12.2(27)SBC	This command was integrated into Cisco IOS Release 12.2(27)SBC.
	12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.

Usage Guidelines Use this command when you need MSDP information about a peer from which the router will accept SA messages that originated from an RP. The **ip msdp rfc-3618 rpf-rules** command must be configured for the **show ip msdp rpf-peer** command to work.

Examples The following is sample output from the **show ip msdp rpf-peer** command:

```
Router# show ip msdp rpf-peer 172.16.10.13

RPF peer information for ? (172.16.10.13)
RPF peer: ? (172.16.121.10)
RPF route/mask: 172.16.0.0/255.255.0.0
RPF rule: Peer is IGP next hop of best route
RPF type: unicast (rip)
```

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

Table 1 *show ip msdp rpf Field Descriptions*

Field	Description
RPF peer information for	RPF peer address for the specified RP address. A question mark (?) indicates that the system does not find a hostname for that particular address.
RPF peer:	Peer address from which this device would accept MSDP SAs originated by the specified RP address. A question mark (?) indicates that the system does not find a hostname for that particular address.
RPF route/mask:	Network and mask of the RP address that the system determines from the route lookups that it used to choose the RPF peer.
RPF rule:	Rule used to determine the RPF peer for the specified RP address.
RPF type:	Route lookup or protocol used to choose the RPF peer for the specified RP address.

Related Commands

Command	Description
ip msdp rpf rfc3618	Enables IETF RFC 3618-compliant MSDP peer-RPF forwarding rules.

Feature Information for MSDP Compliance with RFC 3618

Table 2 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 2 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 2 Feature Information for MSDP Compliance with IETF RFC 3618

Feature Name	Releases	Feature Information
MSDP Compliance with IETF RFC 3618	12.3(4)T 12.0(27)S 12.2(25)S 12.2(27)SBC 12.2(33)SRA	The MSDP Compliance with IETF RFC 3618 feature enables you to configure compliance with the Internet Engineering Task Force (IETF) specifications for Multicast Source Discovery Protocol (MSDP) RFC 3618. In 12.3(4)T, this feature was introduced. The following commands were introduced by this feature: ip msdp rpf rfc3618, show ip msdp rpf-peer.

a service mark of Cisco Systems, Inc.; and Access Registrar, Aironet, Catalyst, CCDA, CCDP, CCIE, CCIP, CCNA, CCNP, CCSP, 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, Follow Me Browsing, FormShare, GigaDrive, HomeLink, Internet Quotient, IOS iPhone, IP/TV, iQ Expertise, the iQ logo, iQ Net Readiness Scorecard, iQuick Study, LightStream, Linksys, MeetingPlace, MGX, Networkers Networking Academy, Network Registrar, PIX, ProConnect, ScriptShare, SMARTnet, StackWise, 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. (0711R)

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

© 2003-2006 Cisco Systems, Inc. All rights reserved.

