



# MTR Support for Multicast

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The MTR Support for Multicast feature provides Multitopology Routing (MTR) support for multicast and allows you to control the path of multicast traffic in the network. This module describes how to configure MTR support for multicast.

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## Finding Feature Information

Your software release may not support all the features documented in this module. For the latest caveats and feature information, see [Bug Search Tool](#) and 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 module.

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](http://www.cisco.com/go/cfn). An account on Cisco.com is not required.

## Restrictions for MTR Support for Multicast

Only a single multicast topology can be configured, and only the **topology base** command can be entered when the multicast topology is created.

# Information About MTR Support for Multicast

## Overview of Multicast MTR in VRF

Cisco software supports legacy (pre-Multitopology Routing (MTR) IP multicast behavior by default. MTR support for IP multicast must be explicitly enabled. Legacy IP multicast uses reverse path forwarding (RPF) on routes in the unicast Routing Information Base (RIB) to build multicast distribution trees (MDTs).

MTR introduces a multicast topology that is completely independent from the unicast topology. MTR integration with multicast allows you to control the path of multicast traffic in the network.

The multicast topology maintains separate routing and forwarding tables. The following list summarizes MTR multicast support that is integrated into Cisco software:

- Conventional longest match support for multicast routes.
- RPF support for Protocol Independent Multicast (PIM).
- Border Gateway Protocol (BGP) MDT subaddress family identifier (SAFI) support for Inter-AS VPNs (SAFI number 66).
- Support for static multicast routes integrated into the **ip route topology** command (modifying the **ip mroute** command).

As in pre-MTR software, you enable multicast support by configuring the **ip multicast-routing** command in global configuration mode. You enable MTR support for multicast by configuring the **ip multicast rpf multitopology** command. After the device enters global address family configuration mode, you then enter the **topology** command with the **base** keyword; global topology configuration parameters are applied in this mode.

# How to Configure MTR Support for Multicast

## Configuring a Multicast Topology for MTR

### SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **ip multicast-routing** [*vrf name*]
4. **ip multicast rpf multitopology**
5. **global-address-family ipv4** [**multicast** | **unicast**]
6. **topology** {**base** | *topology-name*}
7. **route-replicate from** {**multicast** | **unicast**} [**topology** {**base** | *name*}] *protocol* [**route-map** *name* | **vrf** *name*]
8. **use-topology unicast** {**base** | *topology-name*}
9. **shutdown**
10. **end**
11. **show topology** [**cache** [*topology-id*] | **ha** [**detail** | **interface** | **lock** | **router**] [**all** | **ipv4** | **ipv6** | **vrf** *vpn-instance*]]

### DETAILED STEPS

	Command or Action	Purpose
<b>Step 1</b>	<b>enable</b>  <b>Example:</b> Device> enable	Enables privileged EXEC mode.  <ul style="list-style-type: none"> <li>• Enter your password if prompted.</li> </ul>
<b>Step 2</b>	<b>configure terminal</b>  <b>Example:</b> Device# configure terminal	Enters global configuration mode.
<b>Step 3</b>	<b>ip multicast-routing</b> [ <i>vrf name</i> ]  <b>Example:</b> Device(config)# ip multicast-routing	Enables IP multicast routing.

	Command or Action	Purpose
Step 4	<b>ip multicast rpf multitopology</b>  <b>Example:</b> <pre>Device(config)# ip multicast rpf multitopology</pre>	Enables Multitopology Routing (MTR) support for IP multicast routing.
Step 5	<b>global-address-family ipv4 [multicast   unicast]</b>  <b>Example:</b> <pre>Device(config)# global-address-family ipv4 multicast</pre>	<p>Enters global address family configuration mode to configure the global topology.</p> <ul style="list-style-type: none"> <li>The address family for the class-specific topology is specified in this step. The subaddress family can be specified. Unicast is the default if no subaddress family is entered.</li> </ul>
Step 6	<b>topology {base   topology-name}</b>  <b>Example:</b> <pre>Device(config-af)# topology base</pre>	<p>Configures the global topology instance and enters address family topology configuration mode.</p> <ul style="list-style-type: none"> <li>Only the <b>base</b> keyword can be accepted for a multicast topology.</li> </ul>
Step 7	<b>route-replicate from {multicast   unicast} [topology {base   name}] protocol [route-map name   vrf name]</b>  <b>Example:</b> <pre>Device(config-af-topology)# route-replicate from unicast topology VOICE ospf route-map map1</pre>	<p>(Optional) Replicates (copies) routes from another multicast topology Routing Information Base (RIB).</p> <ul style="list-style-type: none"> <li>The <i>protocol</i> argument is configured to specify the protocol that is the source of the route. Routes can be replicated from the unicast base topology or a class-specific topology.</li> </ul> <p><b>Note</b> However, route replication cannot be configured from a class-specific topology that is configured to forward the base topology (incremental forwarding). You can replicate routes from a multicast RIB to a multicast RIB or replicate routes from a unicast RIB to a multicast RIB, but you cannot replicate routes from a multicast RIB to a unicast RIB.</p> <ul style="list-style-type: none"> <li>Replicated routes can be filtered through a route map before they are installed into the multicast RIB.</li> </ul>
Step 8	<b>use-topology unicast {base   topology-name}</b>  <b>Example:</b> <pre>Device(config-af-topology)# use-topology unicast VIDEO</pre>	<p>(Optional) Configures a multicast topology to perform reverse path forwarding (RPF) computations using a unicast topology RIB.</p> <ul style="list-style-type: none"> <li>The base or a class-specific unicast topology can be configured. When this command is configured, the multicast topology uses routes in the specified unicast topology table to build multicast distribution trees.</li> </ul> <p><b>Note</b> This multicast RIB is not used when this command is enabled, even if the multicast RIB is populated and supported by a routing protocol.</p>

	Command or Action	Purpose
Step 9	<b>shutdown</b>  <b>Example:</b> Device(config-af-topology)# shutdown	(Optional) Temporarily disables a topology instance without removing the topology configuration (while other topology parameters are configured and other devices are configured with MTR).
Step 10	<b>end</b>  <b>Example:</b> Device(config-af-topology)# end	(Optional) Exits address family topology configuration mode and enters privileged EXEC mode.
Step 11	<b>show topology [cache [topology-id]   ha [detail   interface   lock   router] [all   ipv4   ipv6   vrf vpn-instance]]</b>  <b>Example:</b> Device# show topology detail	(Optional) Displays information about class-specific and base topologies.

## What to Do Next

The topology is not activated until classification is configured. See the “QoS-MQC Support for MTR” feature module to configure classification for a class-specific topology.

# Configuration Examples for MTR Support for Multicast

## Examples: Route Replication Configuration

The following example shows how to enable multicast support for Multitopology Routing (MTR) and to configure a separate multicast topology:

```
ip multicast-routing
ip multicast rpf multitopology
!
global-address-family ipv4 multicast
  topology base
end
```

The following example shows how to configure the multicast topology to replicate Open Shortest Path First (OSPF) routes from the VOICE topology. The routes are filtered through the VOICE route map before they are installed in the multicast routing table.

```
ip multicast-routing
ip multicast rpf multitopology
!
access-list 1 permit 192.168.1.0 0.0.0.255
!
```

```

route-map VOICE
 match ip address 1
 exit
!
global-address-family ipv4 multicast
 topology base
 route-replicate from unicast topology VOICE ospf route-map VOICE

```

## Example: Using a Unicast RIB for Multicast RPF Configuration

The following example shows how to configure the multicast topology to perform reverse path forwarding (RPF) calculations on routes in the VIDEO topology Routing Information Base (RIB) to build multicast distribution trees:

```

ip multicast-routing
ip multicast rpf multitopology
!
global-address-family ipv4 multicast
 topology base
 use-topology unicast VIDEO
 end

```

## Example: Multicast Verification

The following example shows that the multicast topology is configured to replicate routes from the Routing Information Base (RIB) of the VOICE topology:

```

Device# show topology detail

Topology: base
 Address-family: ipv4
 Associated VPN VRF is default
 Topology state is UP
 Associated interfaces:
  Ethernet0/0, operation state: UP
  Ethernet0/1, operation state: DOWN
  Ethernet0/2, operation state: DOWN
  Ethernet0/3, operation state: DOWN
  Loopback0, operation state: UP

Topology: VIDEO
 Address-family: ipv4
 Associated VPN VRF is default
 Topology state is UP
 Topology fallback is enabled
 Topology maximum route limit 1000, warning limit 90% (900)
 Associated interfaces:

Topology: VOICE
 Address-family: ipv4
 Associated VPN VRF is default
 Topology state is UP
 Topology is enabled on all interfaces
 Associated interfaces:
  Ethernet0/0, operation state: UP
  Ethernet0/1, operation state: DOWN
  Ethernet0/2, operation state: DOWN
  Ethernet0/3, operation state: DOWN
  Loopback0, operation state: UP

Topology: base
 Address-family: ipv4 multicast
 Associated VPN VRF is default
 Topology state is DOWN
 Multicast multi-topology mode is enabled.
 Route Replication Enabled:

```

```

from unicast topology VOICE all route-map VOICE
Associated interfaces:

```

## Additional References

### Related Documents

Related Topic	Document Title
Cisco IOS commands	<a href="#">Cisco IOS Master Command List, All Releases</a>
Multitopology Routing (MTR) commands	<a href="#">Cisco IOS Multitopology Routing Command Reference</a>
IP multicast commands	<a href="#">Cisco IOS Multicast Command Reference</a>
IP multicast concepts and tasks	<i>IP Multicast Configuration Guide Library</i>

### 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.	<a href="http://www.cisco.com/cisco/web/support/index.html">http://www.cisco.com/cisco/web/support/index.html</a>

## Feature Information for MTR Support for Multicast

The following table provides release information about the feature or features described in this module. This table lists only the software release that introduced support for a given feature in a given software release train. Unless noted otherwise, subsequent releases of that software release train also support that feature.

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**Table 1: Feature Information for MTR Support for Multicast**

Feature Name	Releases	Feature Information
MTR Support for Multicast	12.2(33)SRB 15.0(1)M 15.0(1)SY 15.1(1)SY	<p>This feature provides Multitopology Routing (MTR) support for multicast and allows you to control the path of multicast traffic in the network.</p> <p>The following commands were introduced or modified: <b>clear ip route multicast</b>, <b>ip multicast rpf multitopology</b>, <b>show ip route multicast</b>, <b>use-topology</b>.</p>