

# manager

To specify that an interface is the Manager for Multicast Routing Monitor (MRM), and to specify the multicast group address the Test Receiver will listen to, use the **manager** command in manager configuration mode. To remove the Manager or group address, use the **no** form of this command.

**manager** *interface-type interface-number group ip-address*

**no manager** *interface-type interface-number group ip-address*

## Syntax Description

<i>interface-type</i> <i>interface-number</i>	Interface type and number of the Manager. The IP address associated with this interface is the source address of the Manager.
<b>group</b> <i>ip-address</i>	Specifies the IP multicast group address that the Test Receiver will listen to.

## Defaults

There is no MRM Manager.

## Command Modes

Manager configuration

## Command History

Release	Modification
12.0(5)S	This command was introduced.

## Usage Guidelines

This command identifies the interface that acts as the Manager, and therefore is required in order to run MRM.

## Examples

The following example configures Ethernet interface 0 as the Manager. It also configures the Test Receiver to listen to multicast group 239.1.1.1.

```
ip mrm manager test1
manager ethernet 0 group 239.1.1.1
```

## Related Commands

Command	Description
<b>beacon</b>	Changes the frequency, duration, or scope of beacon messages that the Manager sends to Test Senders and Test Receivers during an MRM test.
<b>ip mrm accept-manager</b>	Configures a Test Sender or Test Receiver to accept requests only from Managers that pass an access list.
<b>show ip mrm manager</b>	Displays test information for MRM.

# mdt data

To configure the multicast group address range for data multicast distribution tree (MDT) groups, use the **mdt data** command in VRF configuration mode. To disable this function, use the **no** form of this command.

**mdt data** *group-address-range wildcard-bits* [**threshold** *threshold-value*] [**list** *access-list*]

**no mdt data** *group-address-range wildcard-bits* [**threshold** *threshold-value*] [**list** *access-list*]

## Syntax Description

<i>group-address-range</i>	Multicast group address range. The range is from 224.0.0.1 to 239.255.255.255.
<i>wildcard-bits</i>	Wildcard bits to be applied to the multicast group address range.
<b>threshold</b> <i>threshold-value</i>	(Optional) Defines the bandwidth threshold value. The range is from 1 through 4294967.
<b>list</b> <i>access-list</i>	(Optional) Defines the access list name or number.

## Defaults

The command is disabled.

## Command Modes

VRF configuration

## Command History

Release	Modification
12.0(23)S	This command was introduced.
12.2(13)T	This command was integrated into Cisco IOS Release 12.2(13)T.

## Usage Guidelines

A data MDT group can include a maximum of 256 multicast groups per Virtual Private Network (VPN). Multicast groups used to create the data MDT group are dynamically chosen from a pool of configured IP addresses.

This command configures a range of alternative multicast destination addresses for the tunnel header. The destination address chosen depends on the traffic profile (that is, the source and destination match the specified access list and the rate of the traffic has exceeded the bandwidth threshold value).

## Examples

In the following example, Protocol Independent Multicast (PIM) Source Specific Multicast (SSM) is configured in the backbone. Therefore, the default and data MDT groups are configured within the SSM range of IP addresses. Inside the VPN, PIM sparse mode (PIM-SM) is configured and only the Auto-RP announcements are accepted.

```
ip vrf vrf1
 rd 1:1
 route-target export 1:1
 route-target import 1:1
 mdt default 232.0.0.1
 mdt data 232.0.1.0 0.0.0.255 threshold 500 list 101
```

```
!  
ip pim ssm default  
ip pim vrf vrf1 accept-rp auto-rp
```

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**Related Commands**

Command	Description
<b>mdt default</b>	Configures a default MDT group for a VPN VRF.

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## mdt default

To configure a default multicast distribution tree (MDT) group for a Virtual Private Network (VPN) routing and forwarding (VRF) instance, use the **mdt default** command in VRF configuration mode. To disable this function, use the **no** form of this command.

**mdt default** *group-address*

**no mdt default** *group-address*

<b>Syntax Description</b>	<i>group-address</i>	IP address of the default MDT group. This address serves as an identifier for the community in that provider-edge (PE) routers configured with the same group address become members of the group, allowing them to receive packets sent by each other.
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<b>Defaults</b>	The command is disabled.
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<b>Command Modes</b>	VRF configuration
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<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	12.0(23)S	This command was introduced.
	12.2(13)T	This command was integrated into Cisco IOS Release 12.2(13)T.

<b>Usage Guidelines</b>	<p>The default MDT group must be the same group configured on all PE routers that belong to the same VPN.</p> <p>If Source Specific Multicast (SSM) is used as the protocol for the default MDT, the source IP address will be the address used to source the Border Gateway Protocol (BGP) sessions.</p> <p>A tunnel interface is created as a result of this command. By default, the destination address of the tunnel header is the <i>group-address</i> argument.</p>
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<b>Examples</b>	<p>In the following example, Protocol Independent Multicast (PIM) SSM is configured in the backbone. Therefore, the default and data MDT groups are configured within the SSM range of IP addresses. Inside the VPN, PIM sparse mode (PIM-SM) is configured and only the Auto-RP announcements are accepted.</p>
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```

Router(config)# ip vrf red
Router(config-vrf)# rd 1:1
Router(config-vrf)# route-target export 1:1
Router(config-vrf)# route-target import 1:1
Router(config-vrf)# mdt default 232.0.0.1
Router(config-vrf)# mdt data 232.0.1.0 0.0.0.255 threshold 500 list 101
Router(config-vrf)# exit
Router(config)# ip pim ssm default
Router(config)# ip pim vrf red accept-rp auto-rp

```

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**Related Commands**

Command	Description
<b>mdt data</b>	Configures the multicast group address range for data MDT groups.

# mdt log-reuse

To enable the recording of data multicast distribution tree (MDT) reuse, use the **mdt log-reuse** command in VRF configuration mode. To disable this function, use the **no** form of this command.

**mdt log-reuse**

**no mdt log-reuse**

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

**Defaults** The command is disabled.

**Command Modes** VRF configuration

Command History	Release	Modification
	12.0(23)S	This command was introduced.
	12.2(13)T	This command was integrated into Cisco IOS Release 12.2(13)T.

**Usage Guidelines** The **mdt log-reuse** command generates a syslog message whenever a data MDT is reused.

**Examples** In the following example, the MDT log reuse function is enabled.

```
mdt log-reuse
```

Related Commands	Command	Description
	<b>mdt data</b>	Configures the multicast group address range for data MDT groups.
	<b>mdt default</b>	Configures a default MDT group for a VPN VRF.

# mrinfo

To query which neighboring multicast routers are “peering” with the local router, use the **mrinfo** command in user EXEC or privileged EXEC mode.

**mrinfo** [*host-name* | *host-address*] [*source-address* | *interface*]

Syntax Description		
<i>host-name</i>   <i>host-address</i>	(Optional) The Domain Name System (DNS) name or IP address of the multicast router to query. If omitted, the router queries itself.	
<i>source-address</i>	(Optional) Source address used on multicast routing information (mrinfo) requests. If omitted, the source is based on the outbound interface for the destination.	
<i>interface</i>	(Optional) Source interface used on mrinfo requests. If omitted, the source is based on the outbound interface for the destination.	

**Defaults** The command is disabled.

**Command Modes** Use EXEC  
Privileged EXEC

Command History	Release	Modification
	11.0	This command was introduced.

**Usage Guidelines** The **mrinfo** command is the original tool of the multicast backbone (MBONE) to determine which neighboring multicast routers are peering with a multicast router. Cisco routers have supported responding to mrinfo requests since Cisco IOS Release 10.2.

Now you can query a multicast router using this command. The output format is identical to the multicast routed version of Distance Vector Multicast Routing Protocol (DVMRP). (The mrouterd software is the UNIX software that implements DVMRP.)

**Examples** The following is sample output from the **mrinfo** command:

```
Router# mrinfo
192.31.7.37 (barnnet-gw.cisco.com) [version cisco 11.1] [flags: PMSA]:
  192.31.7.37 -> 192.31.7.34 (sj-wall-2.cisco.com) [1/0/pim]
  192.31.7.37 -> 192.31.7.47 (dirtylab-gw-2.cisco.com) [1/0/pim]
  192.31.7.37 -> 192.31.7.44 (dirtylab-gw-1.cisco.com) [1/0/pim]
  131.119.26.10 -> 131.119.26.9 (su-pr2.bbnplanet.net) [1/32/pim]
```

The flags indicate the following:

- P: prune-capable
- M: mtrace-capable

- S: SNMP-capable
- A: Auto-RP-capable

# mrm

To start or stop a Multicast Routing Monitor (MRM) test, use the **mrm** command in privileged EXEC mode.

```
mrm test-name {start | stop}
```

Syntax Description		
	<i>test-name</i>	Name of the MRM test, as defined by the <b>ip mrm manager</b> command.
	<b>start</b>	Starts the MRM test specified by the <i>test-name</i> argument.
	<b>stop</b>	Stops the MRM test specified by the <i>test-name</i> argument.

**Defaults** The command is disabled.

**Command Modes** Privileged EXEC

Command History	Release	Modification
	12.0(5)S	This command was introduced.

**Usage Guidelines** You must use this command to run an MRM test. When the test runs, the Test Sender sends User Datagram Protocol (UDP) or UDP/Real-Time Transport Protocol (RTP) packets (depending on the **senders** command) to the Test Receiver.

**Examples** The following example starts the MRM test named test1:

```
mrm test1 start
```

Related Commands	Command	Description
	<b>ip mrm manager</b>	Identifies an MRM test and enters the mode in which you specify the test parameters.
	<b>senders</b>	Configures Test Sender parameters used in MRM.
	<b>show ip mrm status-report</b>	Displays MRM status reports of errors in the circular cache buffer.

# mstat

To display IP multicast packet rate and loss information, use the **mstat** command in user EXEC or privileged EXEC mode.

```
mstat {source-name | source-address} [destination-name | destination-address] [group-name | group-address]
```

## Syntax Description

<i>source-name</i>   <i>source-address</i>	Domain Name System (DNS) name or the IP address of the multicast-capable source.
<i>destination-name</i>   <i>destination-address</i>	(Optional) DNS name or address of the destination. If omitted, the command uses the system at which the command is typed.
<i>group-name</i>   <i>group-address</i>	(Optional) DNS name or multicast address of the group to be displayed. Default address is 224.2.0.1 (the group used for multicast backbone [MBONE] Audio).

## Defaults

The command is disabled.

## Command Modes

User EXEC  
Privileged EXEC

## Command History

Release	Modification
11.0	This command was introduced.

## Usage Guidelines

If no arguments are entered, the router will interactively prompt you for them.  
This command is a form of UNIX mtrace that reports packet rate and loss information.

## Examples

The following is sample output from the **mstat** command in user EXEC mode:

```
Router> mstat lwei-home-ss2 172.16.0.1 224.0.255.255
```

```
Type escape sequence to abort.
```

```
Mtrace from 172.16.0.0 to 172.16.0.10 via group 224.0.255.255
```

```
>From source (lwei-home-ss2.cisco.com) to destination (lwei-ss20.cisco.com)
```

```
Waiting to accumulate statistics.....
```

```
Results after 10 seconds:
```

```

Source          Response Dest   Packet Statistics For   Only For Traffic
172.16.0.0      172.16.0.10 All Multicast Traffic From 172.16.0.0
|              / rtt 48 ms Lost/Sent = Pct Rate To 224.0.255.255
v             / hop 48 ms -----
172.16.0.1      lwei-cisco-isdn.cisco.com
|              ^ ttl 1
v             | hop 31 ms 0/12 = 0% 1 pps 0/1 = --% 0 pps
172.16.0.2
172.16.0.3      eng-frmt12-pri.cisco.com
```

```

      | ^      ttl  2
      v |      hop -17 ms   -735/12 = --%    1 pps    0/1 = --%  0 pps
172.16.0.4
172.16.0.5      eng-cc-4.cisco.com
      | ^      ttl  3
      v |      hop -21 ms   -678/23 = --%    2 pps    0/1 = --%  0 pps
172.16.0.6
172.16.0.7      eng-ios-2.cisco.com
      | ^      ttl  4
      v |      hop  5   ms    605/639 = 95%    63 pps    1/1 = --%  0 pps
172.16.0.8
172.16.0.9      eng-ios-f-5.cisco.com
      | \      ttl  5
      v \      hop  0   ms      4          0 pps      0      0 pps
172.16.0.0      172.16.0.10
Receiver      Query Source

```

Table 2 describes the significant fields shown in the display.

**Table 2** mstat Field Descriptions

Field	Description
Source	Traffic source of packet.
Response Dest	Place where the router sends the results of the <b>mstat</b> command.
ttl	Number of hops required from the traffic source to the current hop.
hop	Number of milliseconds of delay.
Only For Traffic From	0 packets dropped out of 2 packets received. If, for example, -2/2 was indicated, then there are 2 extra packets, which could indicate a loop condition.

#### Related Commands

Command	Description
<b>mtrace</b>	Traces the path from a source to a destination branch for a multicast distribution tree.

# mtrace

To trace the path from a source to a destination branch for a multicast distribution tree, use the **mtrace** user command in user EXEC or privileged EXEC mode.

```
mtrace {source-name | source-address} [destination-name | destination-address] [group-name | group-address]
```

## Syntax Description

<i>source-name</i>   <i>source-address</i>	Domain Name System (DNS) name or the IP address of the multicast-capable source. This is a unicast address of the beginning of the path to be traced.
<i>destination-name</i>   <i>destination-address</i>	(Optional) DNS name or address of the unicast destination. If omitted, the mtrace starts from the system at which the command is typed.
<i>group-name</i>   <i>group-address</i>	(Optional) DNS name or multicast address of the group to be traced. Default address is 224.2.0.1 (the group used for multicast backbone [MBONE] Audio). When address 0.0.0.0 is used, the software invokes a weak mtrace. A weak mtrace is one that follows the RPF path to the source, regardless of whether any router along the path has multicast routing table state.

## Defaults

The command is disabled.

## Command Modes

User EXEC  
Privileged EXEC

## Command History

Release	Modification
11.0	This command was introduced.

## Usage Guidelines

The trace request generated by the **mtrace** command is multicast to the multicast group to find the last hop router to the specified destination. The trace then follows the multicast path from destination to source by passing the mtrace request packet via unicast to each hop. Responses are unicast to the querying router by the first hop router to the source. This command allows you to isolate multicast routing failures.

If no arguments are entered, the router will interactively prompt you for them.

This command is identical in function to the UNIX version of **mtrace**.

## Examples

The following is sample output from the **mtrace** command in user EXEC mode:

```
Router> mtrace 172.16.0.0 172.16.0.10 239.254.254.254
```

```
Type escape sequence to abort.
```

```
Mtrace from 172.16.0.0 to 172.16.0.10 via group 239.254.254.254
```

```
From source (?) to destination (?)
```

```
Querying full reverse path...
```

```
0 172.16.0.10
```

```

-1 172.16.0.8 PIM thresh^ 0 0 ms
-2 172.16.0.6 PIM thresh^ 0 2 ms
-3 172.16.0.5 PIM thresh^ 0 894 ms
-4 172.16.0.3 PIM thresh^ 0 893 ms
-5 172.16.0.2 PIM thresh^ 0 894 ms
-6 172.16.0.1 PIM thresh^ 0 893 ms

```

Table 3 describes the significant fields shown in the display.

**Table 3** *mtrace Field Descriptions*

Field	Description
Mtrace from 172.16.0.0 to 172.16.0.10 via group 239.254.254.254	Name and address of source, destination, and group for which routes are being traced.
-3 172.16.0.5	Hops away from destination (-3) and address of intermediate router.
PIM thresh^ 0	Multicast protocol in use on this hop, and time-to-live (TTL) threshold.
893 ms	Time taken for trace to be forwarded between hops.

#### Related Commands

Command	Description
<b>mstat</b>	Displays IP multicast packet rate and loss information.

# receivers

To establish Test Receivers for Multicast Routing Monitor (MRM), use the **receivers** command in manager configuration mode. To restore the default values, use the **no** form of this command.

**receivers** {*access-list*} [**sender-list** {*access-list*} [*packet-delay*]] [**window** *seconds*] [**report-delay** *seconds*] [**loss** *percentage*] [**no-join**] [**monitor** | **poll**]

**no receivers** {*access-list*} [**sender-list** {*access-list*} [*packet-delay*]] [**window** *seconds*] [**report-delay** *seconds*] [**loss** *percentage*] [**no-join**] [**monitor** | **poll**]

Syntax Description	
<i>access-list</i>	IP named or numbered access list that establishes the Test Receivers. Only these Test Receivers are subject to the other keywords and arguments specified in this command.
<b>sender-list</b> <i>access-list</i>	(Optional) Specifies the sources that the Test Receiver should monitor. If the named or numbered access list matches any access list specified in the <b>senders</b> command, the associated <b>packet-delay</b> <i>milliseconds</i> keyword and argument of that <b>senders</b> command are used in this command. Otherwise, the <i>packet-delay</i> argument is required in this <b>receivers</b> command.
<i>packet-delay</i>	(Optional) Specifies the delay between test packets (in milliseconds). If the <b>sender-list</b> access list matches any access list specified in the <b>senders</b> command, the associated <b>packet-delay</b> <i>milliseconds</i> keyword and argument of that <b>senders</b> command are used in this command. Otherwise, the <i>packet-delay</i> argument is required in this <b>receivers</b> command.
<b>window</b> <i>seconds</i>	(Optional) Specifies the duration (in seconds) of a test period. This is a sliding window of time in which packet count is collected, so that the loss percentage can be calculated. Default is 5 seconds.
<b>report-delay</b> <i>seconds</i>	(Optional) Specifies the delay (in seconds) between staggered status reports from multiple Test Receivers to the Manager. The delay prevents multiple receivers from sending status reports to the Manager at the same time for the same failure. Receiver 1 sends status, <i>seconds</i> later Receiver 2 sends status, <i>seconds</i> later Receiver 3 sends status, and so on. This value is relevant only if there are multiple Test Receivers. The default is 1 second.
<b>loss</b> <i>percentage</i>	(Optional) Specifies the threshold percentage of packet loss required before a status report is triggered. The default is 0 percent, which means that a status report is sent for any packet loss. (This value is not applied to packet duplication; a fault report is sent for any duplicated packets.) Loss percentage calculation is explained in the “Usage Guidelines” section of this command.
<b>no-join</b>	(Optional) Specifies that the Test Receiver does not join the monitored group. The default is that the Test Receiver joins the monitored group.
<b>monitor</b>   <b>poll</b>	(Optional) Specifies whether the Test Receiver monitors the test group or polls for receiver statistics. The <b>monitor</b> keyword means the Test Receiver reports only if the test criteria are met. The <b>poll</b> keyword means the Test Receiver sends status reports regularly, whether test criteria are met or not. The default is the <b>monitor</b> keyword.

**Defaults**

**window** *seconds*: 5 seconds  
**report-delay** *seconds*: 1 second  
**loss percentage**: 0 percent  
**monitor**

**Command Modes** Manager configuration

Command History	Release	Modification
	12.0(5)S	This command was introduced.

**Usage Guidelines**

This command is required for MRM to work; the **receivers** keyword and the first access list must be specified. The rest of the command is optional.

Loss percentage is calculated based on the **packet-delay** value of the **senders** command, which defaults to 200 milliseconds, or 5 packets per second. If the **window** keyword defaults to 5 seconds, then the Test Receiver expects 5 packets per second for 5 seconds = 25 packets. If the Test Receiver receives only 15 packets, then  $25 - 15 = 10$  lost packets. Lost packets divided by packets expected equals loss percentage;  $10/25$  equals a loss percentage of 40 percent.

**Examples**

In the following example, the test2 group has the proxy-sender address 10.1.1.10, and the corresponding **receivers** command has an explicit packet delay configured to match the default packet delay of the sender:

```
Router(config)# ip mrm manager test1
Router(config-mrm-manager)# manager e4/0/1 group 239.1.1.1
Router(config-mrm-manager)# senders 1
Router(config-mrm-manager)# receivers 2 sender-list 1
Router(config-mrm-manager)# exit
Router(config)# ip mrm manager test2
Router(config-mrm-manager)# manager e4/0/1 group 239.1.1.1
Router(config-mrm-manager)# senders 1 10.1.1.10
Router(config-mrm-manager)# receivers 2 sender-list 3 200
Router(config-mrm-manager)# udp-port test-packet 16386 status-report 65533
Router(config-mrm-manager)# exit
Router(config)# access-list 1 permit 10.1.1.2
Router(config)# access-list 2 permit 10.1.4.2
Router(config)# access-list 3 permit 10.1.1.10
```

Related Commands	Command	Description
	<b>senders</b>	Configures Test Sender parameters used in MRM.