



Management Plane Protection Commands

This module describes the commands used to configure management plane protection (MPP).

For detailed information about keychain management concepts, configuration tasks, and examples, see the *Implementing Management Plane Protection on the Cisco ASR 9000 Series Router* module in the *System Security Configuration Guide for Cisco ASR 9000 Series Routers* .

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address ipv4 (MPP)

To configure the peer IPv4 address in which management traffic is allowed on the interface, use the **address ipv4** command in interface peer configuration mode. To remove the IP address that was previously configured on this interface, use the **no** form of this command.

```
address ipv4 {peer-ip-address | peer-ip-address/ length}
```

Syntax Description

peer-ip-address Peer IPv4 address in which management traffic is allowed on the interface. This address can effectively be the source address of the management traffic that is coming in on the configured interface.

peer ip-address/length Prefix of the peer IPv4 address.

- IPv4—*A.B.C.D/length*

Command Default

If no specific peer is configured, all peers are allowed.

Command Modes

Interface peer configuration

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

No specific guidelines impact the use of this command.

Task ID

Task ID	Operations
system	read, write

Examples

The following example shows how to configure the peer IPv4 address 10.1.0.0 with a prefix of 16 for management traffic:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router (config)# control-plane
RP/0/RSP0/CPU0:router (config-ctrl)# management-plane
RP/0/RSP0/CPU0:router (config-mpp)# inbandout-of-band
RP/0/RSP0/CPU0:router (config-mpp-inbandoutband)# interface GigabitEthernet POS 0/16/10/12
RP/0/RSP0/CPU0:router (config-mpp-inbandoutband-GigabitEthernet0_1_1_1POS0_6_0_2)# allow
Telnet TFTP peer
RP/0/RSP0/CPU0:router (config-telnettftp-peer)# address ipv4 10.1.0.0/16ipv6 33::33
```

Related Commands

Command	Description
address ipv6 (MPP), on page 4	Configures the peer IPv6 address in which management traffic is allowed on the interface.

Command	Description
allow, on page 6	Configures an interface as an inband or out-of-band interface to allow all peer addresses for a specified protocol or all protocols.
control-plane, on page 10	Configures the control plane.
inband, on page 11	Configures an inband interface or protocol.
interface (MPP), on page 12	Configures a specific inband or out-of-band interface or all inband or out-of-band interfaces.
management-plane, on page 14	Configures management plane protection to allow and disallow protocols.
out-of-band, on page 15	Configures out-of-band interfaces or protocols and enters management plane protection out-of-band configuration mode.
show mgmt-plane, on page 17	Displays the management plane.

address ipv6 (MPP)

To configure the peer IPv6 address in which management traffic is allowed on the interface, use the **address ipv6** command in interface peer configuration mode. To remove the IP address that was previously configured on this interface, use the **no** form of this command.

```
address ipv6 {peer-ip-address | peer-ip-address/length}
```

Syntax Description	<i>peer-ip-address</i>	Peer IPv6 address in which management traffic is allowed on the interface. This address can effectively be the source address of the management traffic that is coming in on the configured interface.
	<i>peer ip-address/length</i>	Prefix of the peer IPv6 address.
Command Default	If no specific peer is configured, all peers are allowed.	
Command Modes	Interface peer configuration	
Command History	Release	Modification
	Release 3.7.2	This command was introduced.
Usage Guidelines	No specific guidelines impact the use of this command.	
Task ID	Task ID	Operations
	system	read, write
Examples	The following example shows how to configure the peer IPv6 address 33::33 for management traffic:	

```
RR/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# control-plane
RP/0/RSP0/CPU0:router(config-ctrl)# management-plane
RP/0/RSP0/CPU0:router(config-mpp)# out-of-band
RP/0/RSP0/CPU0:router(config-mpp-outband)# interface
GigabitEthernet 0/1/1/2
```

```
RP/0/RSP0/CPU0:router(config-mpp-outband-GigabitEthernet0_1_1_2)# allow TFTP peer
RP/0/RSP0/CPU0:router(config-tftp-peer)# address ipv6 33::33
```

Related Commands	Command	Description
	address ipv4 (MPP), on page 2	Configures the peer IPv4 address in which management traffic is allowed on the interface.
	allow, on page 6	Configures an interface as an inband or out-of-band interface to allow all peer addresses for a specified protocol or all protocols.
	control-plane, on page 10	Configures the control plane.
	inband, on page 11	Configures an inband interface or protocol.
	interface (MPP), on page 12	Configures a specific inband or out-of-band interface or all inband or out-of-band interfaces.
	management-plane, on page 14	Configures management plane protection to allow and disallow protocols.
	out-of-band, on page 15	Configures out-of-band interfaces or protocols and enters management plane protection out-of-band configuration mode.
	show mgmt-plane, on page 17	Displays the management plane.

allow

To configure an interface as an inband or out-of-band interface to allow all peer addresses for a specified protocol or all protocols, use the **allow** command in management plane protection inband interface configuration mode or management plane protection out-of-band interface configuration. To disallow a protocol on an interface, use the **no** form of this command.

allow {*protocol* | **all**} [**peer**]

Syntax Description

protocol Interface configured to allow peer-filtering for the following specified protocol's traffic:

- HTTP(S)
- SNMP (also versions)
- Secure Shell (v1 and v2)
- TFTP
- Telnet
- XML

all Configures the interface to allow peer-filtering for all the management traffic that is specified in the list of protocols.

peer (Optional) Configures the peer address on the interface. Peer refers to the neighboring router interface in which traffic might arrive to the main router.

Command Default

By default, no management protocol is allowed on any interface except the management interfaces.

Command Modes

Management plane protection inband interface configuration

Command History

Release	Modification
Release 3.7.2	This command was introduced.
Release 4.0.0	The XML keyword was added.

Usage Guidelines

If you permit or allow a specific protocol to an interface, traffic is allowed only for that protocol, and all other management traffic is dropped.

After you configure the interface as inband or out-of-band, the specified protocol's traffic, or all protocol traffic, is allowed on the interface. Interfaces that are not configured as inband or out-of-band interfaces, drop the protocol traffic.

The IOS XR XML API provides a programmatic interface to the router for use by external management applications. This interface provides a mechanism for router configuration and monitoring utilizing XML formatted request and response streams. As one of the management services, XML should be capable of applying MPP. To secure XML MPP data, XML keyword has been added to the command.

Task ID	Task ID	Operations
	system	read, write

Examples

The following example shows how to configure all management protocols for all inband interfaces:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# control-plane
RP/0/RSP0/CPU0:router(config-ctrl)# management-plane
RP/0/RSP0/CPU0:router(config-mpp)# inband
RP/0/RSP0/CPU0:router(config-mpp-inband)# interface all
RP/0/RSP0/CPU0:router(config-mpp-inband-all)# allow all
```

The following example shows how to configure peer interface for the TFTP protocol for out-of-band interfaces:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# control-plane
RP/0/RSP0/CPU0:router(config-ctrl)# management-plane
RP/0/RSP0/CPU0:router(config-mpp)# out-of-band
RP/0/RSP0/CPU0:router(config-mpp-outband)# interface GigabitEthernet 0/1/1/2
RP/0/RSP0/CPU0:router(config-mpp-outband-GigabitEthernet0_1_1_2)# allow TFTP peer
RP/0/RSP0/CPU0:router(config-tftp-peer)#
```

The following example shows how to configure MPP support on an XML peer in-band interface:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# control-plane
RP/0/RSP0/CPU0:router(config-ctrl)# management-plane
RP/0/RSP0/CPU0:router(config-ctrl-mpp)# inband interface all allow xml peer address ipv4
172.10.10.1
```

Related Commands

Command	Description
control-plane, on page 10	Configures the control plane.
inband, on page 11	Configures an inband interface or protocol.
interface (MPP), on page 12	Configures a specific inband or out-of-band interface or all inband or out-of-band interfaces.
management-plane, on page 14	Configures management plane protection to allow and disallow protocols.
out-of-band, on page 15	Configures out-of-band interfaces or protocols and enters management plane protection out-of-band configuration mode.
show mgmt-plane, on page 17	Displays the management plane.

allow local-port

To configure a local port and third-party application protocols for management plane protection (MPP) on an interface, use the **allow local-port** command in management plane protection TPA mode. To disallow a protocol on an interface, use the **no** form of this command.

allow local-port *port-number* **protocol** *protocol-number* **interface** *interface-name* **local-address** *IP local address* **remote-address** *IP remote address*

Syntax Description	
local-port	Specifies local L4 port of an interface.
protocol	Specifies the L4 protocol to be configured on MPP.
<i>Protocol number</i>	Enter the protocol number corresponding to different protocols. You can choose a value from range 1 to 255. Following are some of the protocol numbers dedicated to different protocols: <ul style="list-style-type: none"> • gre - Generic Routing Encapsulation. (47) • udp - User Datagram Protocol, RFC 768. (17) • tcp - Transmission Control Protocol, RFC 793. (6) • pptp - Point-to-Point Tunneling Protocol. Entering the pptp protocol literal is equivalent to entering the gre protocol literal. (47) • pim - Protocol Independent Multicast. (103) • ospf - Open Shortest Path First routing protocol, RFC 1247. (89) • ipsec - IP Security. Entering the ipsec protocol literal is equivalent to entering the esp protocol literal. (50) • ipinip - IP-in-IP encapsulation. (4) • icmp6 - Internet Control Message Protocol for IPv6, RFC 2463. (58) • igmp - Internet Group Management Protocol, RFC 1112. (2) • igmp - Interior Gateway Routing Protocol. (9) <p>Note In IOS XR release 6.5.2, protocol number is replaced by protocol names. The supported protocols are <i>tcp</i> and <i>udp</i>.</p>
interface	Specify the MPP interface on which the protocol has to be configured.
local-address	Specify the local IP address of the host or client.
remote-address	Specify the remote IP address of the host or client.
Command Default	Not Applicable
Command Modes	Management plane protection TPA

Command History	Release	Modification
	Release 6.3.2	This command was introduced.

Example

```
Router(config)# control-plane
Router(config-ctrl)# management-plane
Router(config-mpp)# tpa vrf default address-family [ipv4 | ipv6]
Router(config-mpp-tpa-vrf-afi)# allow local-port 57600 protocol tcp interface mgmtEth
0/RP0/CPU0/0 local-address 10.1.1.1/32 remote-address 10.2.2.2/32
```

control-plane

To enter the control plane configuration mode, use the **control-plane** command in Global Configuration mode. To disable all the configurations under control plane mode, use the **no** form of this command.

control-plane

Syntax Description This command has no keywords or arguments.

Command Default None

Command Modes Global Configuration mode

Command History	Release	Modification
	Release 3.7.2	This command was introduced.

Usage Guidelines Use the **control-plane** command to enter control plane configuration mode.

Task ID	Task ID	Operations
	system	read, write

Examples The following example shows how to enter control plane configuration mode using the **control-plane** command:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# control-plane
RP/0/RSP0/CPU0:router(config-ctrl)#
```

Related Commands	Command	Description
	management-plane, on page 14	Configures management plane protection to allow and disallow protocols.

inband

To configure an inband interface and to enter management plane protection inband configuration mode, use the **inband** command in management plane protection configuration mode. To disable all configurations under inband configuration mode, use the **no** form of this command.

inband

Syntax Description This command has no keywords or arguments.

Command Default None

Command Modes Management plane protection configuration

Command History	Release	Modification
	Release 3.7.2	This command was introduced.

Usage Guidelines Use the **inband** command to enter management plane protection inband configuration mode.

Task ID	Task	Operations
	system read, write	

Examples

The following example shows how to enter management plane protection inband configuration mode using the **inband** command:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# control-plane
RP/0/RSP0/CPU0:router(config-ctrl)# management-plane
RP/0/RSP0/CPU0:router(config-mpp)# inband
RP/0/RSP0/CPU0:router(config-mpp-inband)#
```

Related Commands	Command	Description
	control-plane, on page 10	Configures the control plane.
	interface (MPP), on page 12	Configures a specific inband or out-of-band interface or all inband or out-of-band interfaces.
	management-plane, on page 14	Configures management plane protection to allow and disallow protocols.
	out-of-band, on page 15	Configures out-of-band interfaces or protocols and enters management plane protection out-of-band configuration mode.
	show mgmt-plane, on page 17	Displays the management plane.

interface (MPP)

To configure a specific interface or all interfaces as an inband or out-of-band interface, use the **interface** command in management plane protection inband configuration mode or management plane protection out-of-band configuration mode. To disable all the configurations under an interface mode, use the **no** form of this command.

interface {*type interface-path-id* | **all**}

Syntax Description	<i>type</i>	Interface type. For more information, use the question mark (?) online help function.
	<i>interface-path-id</i>	Virtual interface instance. Number range varies depending on interface type.
	Note	Use the show interfaces command in EXEC mode to see a list of all interfaces currently configured on the router.
		For more information about the syntax for the router, use the question mark (?) online help function.
	all	Configures all interfaces to allow for management traffic.

Command Default None

Command Modes Management plane protection out-of-band configuration

Command History	Release	Modification
	Release 3.7.2	This command was introduced.

Usage Guidelines Use the **interface** command to enter management plane protection inband interface configuration mode or management plane protection out-of-band interface configuration mode.

For the *instance* argument, you cannot configure Management Ethernet interfaces as inband interfaces.

Task ID	Task ID	Operations
	system	read, write

Examples

The following example shows how to configure all inband interfaces for MPP:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# control-plane
RP/0/RSP0/CPU0:router(config-ctrl)# management-plane
RP/0/RSP0/CPU0:router(config-mpp)# inband
RP/0/RSP0/CPU0:router(config-mpp-inband)# interface all
RP/0/RSP0/CPU0:router(config-mpp-inband-all)#
```

The following example shows how to configure all out-of-band interfaces for MPP:

```

RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# control-plane
RP/0/RSP0/CPU0:router(config-ctrl)# management-plane
RP/0/RSP0/CPU0:router(config-mpp)# out-of-band
RP/0/RSP0/CPU0:router(config-mpp-outband)# interface all
RP/0/RSP0/CPU0:router(config-mpp-outband-all)#

```

Related Commands

Command	Description
allow, on page 6	Configures an interface as an inband or out-of-band interface to allow all peer addresses for a specified protocol or all protocols.
control-plane, on page 10	Configures the control plane.
inband, on page 11	Configures an inband interface or protocol.
management-plane, on page 14	Configures management plane protection to allow and disallow protocols.
out-of-band, on page 15	Configures out-of-band interfaces or protocols and enters management plane protection out-of-band configuration mode.
show mgmt-plane, on page 17	Displays the management plane.

management-plane

To configure management plane protection to allow and disallow protocols, use the **management-plane** command in control plane configuration mode. To disable all configurations under management-plane mode, use the **no** form of this command.

management-plane

Syntax Description This command has no keywords or arguments.

Command Default None

Command Modes Control plane configuration

Command History	Release	Modification
	Release 3.7.2	This command was introduced.

Usage Guidelines Use the **management-plane** command to enter the management plane protection configuration mode.

Task ID	Task ID	Operations
	system	read, write

Examples The following example shows how to enter management plane protection configuration mode using the **management-plane** command:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# control-plane
RP/0/RSP0/CPU0:router(config-ctrl)# management-plane
RP/0/RSP0/CPU0:router(config-mpp)#
```

out-of-band

To configure out-of-band interfaces or protocols and to enter management plane protection out-of-band configuration mode, use the **out-of-band** command in management plane protection configuration mode. To disable all configurations under management plane protection out-of-band configuration mode, use the **no** form of this command.

out-of-band

Syntax Description	This command has no keywords or arguments.				
Command Default	None				
Command Modes	Management plane protection out-of-band configuration				
Command History	<table border="1"> <thead> <tr> <th>Release</th> <th>Modification</th> </tr> </thead> <tbody> <tr> <td>Release 3.7.2</td> <td>This command was introduced.</td> </tr> </tbody> </table>	Release	Modification	Release 3.7.2	This command was introduced.
Release	Modification				
Release 3.7.2	This command was introduced.				

Usage Guidelines Use the **out-of-band** command to enter management plane protection out-of-band configuration mode. *Out-of-band* refers to an interface that allows only management protocol traffic to be forwarded or processed. An *out-of-band management interface* is defined by the network operator to specifically receive network management traffic. The advantage is that forwarding (or customer) traffic cannot interfere with the management of the router.

Task ID	Task ID	Operations
	system	read, write

Examples The following example shows how to enter management plane protection out-of-band configuration mode using the **out-of-band** command:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# control-plane
RP/0/RSP0/CPU0:router(config-ctrl)# management-plane
RP/0/RSP0/CPU0:router(config-mpp)# out-of-band
RP/0/RSP0/CPU0:router(config-mpp-outband)#
```

Related Commands	Command	Description
	control-plane, on page 10	Configures the control plane.
	inband, on page 11	Configures an inband interface or protocol.
	interface (MPP), on page 12	Configures a specific inband or out-of-band interface or all inband or out-of-band interfaces.

Command	Description
management-plane, on page 14	Configures management plane protection to allow and disallow protocols.
show mgmt-plane, on page 17	Displays the management plane.
vrf (MPP), on page 20	Configures a Virtual Private Network (VPN) routing and forwarding (VRF) reference of an out-of-band interface.

show mgmt-plane

To display information about the management plane such as type of interface and protocols enabled on the interface, use the **show mgmt-plane** command in EXEC mode.

```
show mgmt-plane [{inband | out-of-band}] [{interface type interface-path-id | vrf}]
```

Syntax Description		
inband	(Optional) Displays the inband management interface configurations that are the interfaces that process management packets as well as data-forwarding packets. An inband management interface is also called a <i>shared management interface</i> .	
out-of-band	(Optional) Displays the out-of-band interface configurations. Out-of-band interfaces are defined by the network operator to specifically receive network management traffic.	
interface	(Optional) Displays all the protocols that are allowed in the specified interface.	
type	Interface type. For more information, use the question mark (?) online help function.	
interface-path-id	Interface instance. Number range varies depending on interface type.	
	Note	Use the show interfaces command to see a list of all interfaces currently configured on the router.
		For more information about the syntax for the router, use the question mark (?) online help function.
vrf	(Optional) Displays the Virtual Private Network (VPN) routing and forwarding reference of an out-of-band interface.	

Command Default None

Command Modes EXEC mode

Command History	Release	Modification
	Release 3.7.2	This command was introduced.

Usage Guidelines The **vrf** keyword is valid only for out-of-band VRF configurations.

Task ID	Task ID	Operations
	system	read

Examples

The following sample output displays all the interfaces that are configured as inband or out-of-band interfaces under MPP:

```
RP/0/RSP0/CPU0:router# show mgmt-plane
```

```

Management Plane Protection

inband interfaces
-----

interface - GigabitEthernet0_1_1_0
  ssh configured -
    All peers allowed
  telnet configured -
    peer v4 allowed - 10.1.0.0/16
  all configured -
    All peers allowed
interface - GigabitEthernet0_1_1_0
  telnet configured -
    peer v4 allowed - 10.1.0.0/16

interface - all
  all configured -
    All peers allowed

outband interfaces
-----

interface - GigabitEthernet0_1_1_0
  tftp configured -
    peer v6 allowed - 33::33

```

The following sample output displays the Virtual Private Network (VPN) routing and forwarding (VRF) reference of an out-of-band interface:

```

RP/0/RSP0/CPU0:router# show mgmt-plane out-of-band vrf

Management Plane Protection -
  out-of-band VRF - my_out_of_band

```

Related Commands

Command	Description
management-plane, on page 14	Configures management plane protection to allow and disallow protocols.

tpa (MPP)

To configure a third-party application protocol for Management Plane Protection (MPP), use the **tpa** command in management plane protection configuration mode. To disable all configurations related to the third-party application, use the **no** form of this command.

tpa vrf default address-family [ipv4 | ipv6]

Syntax Description	vrf	Configures a Virtual Private Network (VPN) routing and forwarding (VRF) reference.
	address-family	Enables support for various address family configuration modes while configuring TPA.
	ipv4	Specifies IP Version 4 address prefixes.
	ipv6	Specifies IP Version 6 address prefixes.
Command Default	Not Applicable	
Command Modes	Management plane protection configuration	
Command History	Release	Modification
	Release 6.3.2	This command was introduced.
Usage Guidelines	Only default vrf is supported for TPA configuration.	

Example

```
Router(config)# control-plane
Router(config-ctrl)# management-plane
Router(config-mpp)# tpa vrf default address-family [ipv4 | ipv6]
```

vrf (MPP)

To configure a Virtual Private Network (VPN) routing and forwarding (VRF) reference of an out-of-band interface, use the **vrf** command in management plane protection out-of-band configuration mode. To remove the VRF definition before the VRF name is used, use the **no** form of this command.

vrf *vrf-name*

Syntax Description

vrf-name Name assigned to a VRF.

Command Default

The VRF concept must be used to configure interfaces as out-of-band. If no VRF is configured during an out-of-band configuration, the interface goes into a default VRF.

Command Modes

Management plane protection out-of-band configuration

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

If the VRF reference is not configured, the default name MPP_OUTBAND_VRF is used.

If there is an out-of-band configuration that is referring to a VRF and the VRF is deleted, all the MPP bindings are removed.

Task ID

Task ID	Operations
system	read

Examples

The following example shows how to configure the VRF:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# vrf my_out_of_band
RP/0/RSP0/CPU0:router(config-vrf)# address-family ipv4 unicast
RP/0/RSP0/CPU0:router(config-vrf-af)# exit
RP/0/RSP0/CPU0:router(config-vrf)# address-family ipv6 unicast
RP/0/RSP0/CPU0:router(config-vrf-af)# commit
RP/0/RSP0/CPU0:router(config-vrf-af)# end
RP/0/RSP0/CPU0:router#
```

The following example shows how to configure the VRF definition for MPP:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# control-plane
RP/0/RSP0/CPU0:router(config-ctrl)# management-plane
RP/0/RSP0/CPU0:router(config-mpp)# out-of-band
RP/0/RSP0/CPU0:router(config-mpp-outband)# vrf my_out_of_band
```

Related Commands	Command	Description
	control-plane, on page 10	Configures the control plane.
	interface (MPP), on page 12	Configures a specific inband or out-of-band interface or all inband or out-of-band interfaces.
	management-plane, on page 14	Configures management plane protection to allow and disallow protocols.
	out-of-band, on page 15	Configures out-of-band interfaces or protocols and enters management plane protection out-of-band configuration mode.
	show mgmt-plane, on page 17	Displays the management plane.

