



RIB Commands on Cisco ASR 9000 Series Router

This module describes the commands used to display and clear information in the Routing Information Base (RIB) on Cisco ASR 9000 Series Aggregation Services Routers.

For detailed information about RIB concepts, configuration tasks, and examples, see the *Implementing RIB on Cisco ASR 9000 Series Router* module in *Cisco ASR 9000 Series Aggregation Services Router Routing Configuration Guide*.

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address-family next-hop dampening disable

To disable Routing Information Base (RIB) next-hop dampening, use the **address-family next-hop dampening disable** command in router configuration mode. To enable RIB next-hop dampening, use the **no** form of this command.

address-family {ipv4| ipv6} next-hop dampening disable

no address-family {ipv4| ipv6} next-hop dampening disable

Syntax Description

ipv4	Specifies IP Version 4 (IPv4) address prefixes.
ipv6	Specifies IP Version 6 (IPv6) address prefixes.

Command Default

RIB next-hop dampening is enabled.

Command Modes

Router configuration

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes the proper task IDs. If you suspect user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operations
rib	read, write

Examples

The following example shows how to disable RIB next-hop dampening for IPv6 address families:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# router rib
RP/0/RSP0/CPU0:router(config-rib)# address-family ipv6 next-hop dampening disable
```

clear route

To clear routes from the IP routing table, use the **clear route** command in EXEC mode.

```
clear route [vrf {vrf-name| all}] {ipv4| ipv6| afi-all} {unicast| multicast| safi-all} [topology topo-name]
[ip-address mask]
```

Syntax Description

vrf { <i>vrf-name</i> all }	(Optional) Specifies a particular VPN routing and forwarding (VRF) instance or all VRF instances.
ipv4	Specifies IP Version 4 address prefixes.
ipv6	Specifies IP Version 6 address prefixes.
afi -all	Specifies IP Version 4 and IP Version 6 address prefixes.
unicast	Specifies unicast address prefixes.
multicast	Specifies multicast address prefixes.
safi-all	Specifies unicast and multicast address prefixes.
topology <i>topo-name</i>	(Optional) Specifies topology table information and name of the topology table.
<i>ip-address node-id</i>	(Optional) Clears hardware resource counters from the designated node. The <i>node-id</i> argument is entered in the <i>rack/slot/module</i> notation.
<i>ip-address</i>	Network IP address about which routing information should be displayed.
<i>mask</i>	Network mask specified in either of two ways: Network mask can be a four-part, dotted-decimal address. For example, 255.0.0.0 indicates that each bit equal to 1 means the corresponding address bit is a network address. Network mask can be indicated as a slash (/) and number. For example, /8 indicates that the first 8 bits of the mask are 1s, and the corresponding bits of the address are the network address.

Command Default

If a **vrf** *vrf-name* is not specified, routes are cleared from the default IPv4 unicast VRF.

Command Modes

EXEC

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes the proper task IDs. If you suspect user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **clear route** command to clear routes from an IP routing table to a specific network, a matching subnet address, or all routes.

Task ID

Task ID	Operations
rib	read, write

Examples

The following example shows how to remove all routes matching the subnet address 192.168.2.0 and mask 255.255.255.0 from the IPv4 unicast routing table:

```
RP/0/RSP0/CPU0:router# clear route ipv4 unicast 192.168.2.0 255.255.255.0
```

The following example shows how to remove all routes from the IPv4 unicast routing table:

```
RP/0/RSP0/CPU0:router# clear route ipv4 unicast
```

Related Commands

Command	Description
show route, page 49	Displays the current state of the routing table.

maximum prefix (RIB)

To set the prefix limit for the VPN routing and forwarding (VRF) instance, use the **maximum prefix** command in global VRF address family configuration mode. To set the prefix limits to the default values, use the **no** form of this command.

maximum prefix *maximum* [*mid-threshold*]

no maximum prefix

Syntax Description

<i>maximum</i>	Maximum number of prefixes allowed in the VRF instance. Range is 32 to 2000000.
<i>mid-threshold</i>	(Optional) Integer specifying at what percentage of the <i>maximum</i> argument value the software starts to generate a Simple Network Management Protocol (SNMP) trap. Range is 1 to 100.

Command Default

No default behavior or values

Command Modes

Global VRF address family configuration

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes the proper task IDs. If you suspect user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **maximum prefix** command to configure a maximum number of prefixes that a VRF instance is allowed to receive.

Task ID

Task ID	Operations
rib	read, write

Examples

The following example shows how to set the maximum number of prefixes allowed to 1000:

```
RP/0/RSP0/CPU0:router(config)# vrf vrf-A
RP/0/RSP0/CPU0:router(config-vrf)# address-family ipv4 unicast
RP/0/RSP0/CPU0:router(config-vrf-af)# maximum prefix 1000
```

Related Commands

Command	Description
show rib tables, page 41	Displays all tables known to the RIB.

rcc

To ensure consistency between centralized and distributed routing information bases (RIBs), use the **rcc** command in global configuration mode. To remove this function, use the **no** form of this command.

```
rcc {ipv4| ipv6} {unicast| multicast} [period {seconds}] count {entries}
no rcc {ipv4| ipv6} {unicast| multicast} {period| count}
```

Syntax Description

ipv4	Specifies IP Version 4 address prefixes.
ipv6	Specifies IP Version 6 address prefixes.
unicast	Specifies unicast address prefixes.
multicast	Specifies multicast address prefixes.
period { <i>seconds</i> }	(Optional) Specifies the period of checks in seconds. Range is 3 to 3600.
count { <i>entries</i> }	(Optional) Specifies the maximum number of entries to check for each scan. Range is 1 to 100000.

Command Default

No default behavior or values

Command Modes

Global configuration

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes the proper task IDs. If you suspect user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operations
ipv4	read, write

Examples

The following example shows how to configure RCC:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# rcc ipv4 unicast period 1200
```


recursion-depth-max

To set the maximum depth for route recursion checks, use the **recursion-depth-max** command in router configuration mode. To set the recursion checks to the default value, use the **no** form of this command.

recursion-depth-max *maximum*

no recursion-depth-max *maximum*

Syntax Description

<i>maximum</i>	Maximum depth for recursion checks. Range is 5 to 16.
----------------	---

Command Default

The default recursion depth is 128.

Command Modes

Router configuration

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes the proper task IDs. If you suspect user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **recursion-depth-max** command to configure a specific maximum number of recursion checks in the range of 5 to 16.

Task ID

Task ID	Operations
rib	read, write

Examples

The following example shows how to set the maximum depth for route recursion checks to 12:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# router rib
RP/0/RSP0/CPU0:router(config-rib)# recursion-depth-max 12
```

router rib

To enter Routing Information Base (RIB) configuration mode, use the **router rib** command in global configuration mode. To remove all RIB configurations and terminate the RIB routing process, use the **no** form of this command.

router rib

no router rib

Syntax Description This command has no arguments or keywords.

Command Default Router configuration mode is not enabled.

Command Modes Global configuration

Command History	Release	Modification
	Release 3.7.2	This command was introduced.

Usage Guidelines To use this command, you must be in a user group associated with a task group that includes the proper task IDs. If you suspect user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID	Task ID	Operations
	bgp	read, write
	ospf	read, write
	hsrp	read, write
	isis	read, write

Examples The following example shows how to enter RIB configuration mode:

```
RP/0/RSP0/CPU0:router(config)# router rib
```

rump always-replicate

To enable replication from uRIB to muRIB as usual even after features such as MTR are configured, use the **rump always-replicate** command in router configuration mode. To diable replication from uRIB to muRIB, use the **no** form of this command.

rump always-replicate [*access-list*]

no rump always-replicate [*access-list*]

Syntax Description	
	<i>access-list-name</i> (Optional) Name of the access list.

Command Default Replication from uRIB to muRIB is enabled.

Command Modes Router address family configuration

Command History	Release	Modification
	Release 3.9.0	This command was introduced.

Usage Guidelines To use this command, you must be in a user group associated with a task group that includes the proper task IDs. If you suspect user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Configuring the **rump always-replicate** command allows routers in a network to be upgraded to multitopology routing gradually without a flag day where all routers need to be configured at the same time without major service disruption. When **rump always-replicate** is configured, replicated routes are added into the muRIB with the lowest admin distance. So if protocols are populating the muRIB, they continue to do so. For the same route, protocol routes win over replicated routes because of higher admin distance.

If an unwanted more specific route comes from the uRIB, optionally provide an access list through which the replicated routes are run. If the route passes the access list, the route is replicated by RUMP.

Task ID	Task ID	Operations
	rib	read, write

Examples The following example shows how to enale replication from uRIB to muRIB:

```
RP/0/RSP0/CPU0:router(config)# router rib
RP/0/RSP0/CPU0:router(config-rib)# address-family ipv4
RP/0/RSP0/CPU0:router(config-rib-afi)# rump always-replicate
```

show rcc

To display route consistency checker (RCC) information, use the **show rcc** command in EXEC mode.

```
show rcc {ipv4|ipv6} unicast [log|prefix netmask vrf vrf-name]
```

Syntax Description

ipv4	Specifies IP Version 4 address prefixes.
ipv6	Specifies IP Version 6 address prefixes.
unicast	Specifies unicast address prefixes.
log	(Optional) Specifies the RCC log.
prefix	(Optional) Starting prefix.
netmask	(Optional) Network mask.
vrf <i>vrf-name</i>	(Optional) Specifies a particular VPN routing and forwarding (VRF) instance or all VRF instances.

Command Default

No default behavior or values

Command Modes

EXEC

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes the proper task IDs. If you suspect user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operations
ipv4	read

Examples

The following is sample output from the **show rcc** command:

```
RP/0/RSP0/CPU0:router# show rcc ipv4 unicast log
ipv4-unicast: disabled, count = 1000, period = 60, table wraps = 0
```

```
-----  
node                checks performed          errors  
0/6/CPU0            0                          0  
0/4/CPU1            30                         0  
0/4/CPU0            0                          0  
0/1/CPU0            0                          0  
0/RP1/CPU0         120                        0  
0/RSP0/CPU0        z 0                        0
```

show rib

To display Routing Information Base (RIB) data, use the **show rib** command in EXEC mode.

```
show rib {ipv4|ipv6} {unicast|multicast} [firsthop] [ type interface-path-id] next-hop [ type interface-path-id] opaques | {attribute | ip-nexthop| ipfr| safi-tunnel| summary | tunnel-nexthop}}| protocols [ standby] statistics [name] [ standby] topology {topo-name| all}
```

Syntax Description

ipv4	(Optional) Specifies IP Version 4 address prefixes.
ipv6	(Optional) Specifies IP Version 6 address prefixes.
unicast	(Optional) Specifies unicast address prefixes. This is the default.
multicast	(Optional) Specifies multicast address prefixes.
firsthop	(Optional) Specifies registered first-hop notification addresses.
type	Interface type. For more information, use the question mark (?) online help function.
interface-path-id	Identifies a physical interface or a virtual interface. Note Use the show interfaces command to see a list of all possible interfaces currently configured on the router. For more information about the syntax for the router, use the question mark (?) online help function.
next-hop	(Optional) Specifies registered next-hop notification addresses.
opaques	(Optional) Specifies opaque data installed in the RIB.
attribute	(Optional) Specifies opaque attributes installed in the RIB.
ip-nexthop	(Optional) Specifies P next-hop data installed in the RIB.
safi-tunnel	(Optional) Specifies subaddress family (SAFI) tunnel opaque data installed in the RIB.
summary	(Optional) Specifies a summary of opaque data installed in the RIB.
tunnel-nexthop	(Optional) Specifies tunnel next-hop opaque data installed in the RIB.
protocols	(Optional) Specifies registered protocols.
statistics <i>name</i>	(Optional) Specifies RIB statistics of a given name.
standby	(Optional) Specifies standby information.
all	(Optional) Specifies that all topology table information should be displayed.

Command Default No default behavior or values

Command Modes EXEC

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines To use this command, you must be in a user group associated with a task group that includes the proper task IDs. If you suspect user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID	Operations
ipv4	read

Examples The following example illustrates the **show rib** command:

```
RP/0/RSP0/CPU0:router# show rib
      ipv4 multicast
      topology
        BLUE
RP/0/RSP0/CPU0:router# show rib topology BLUE ipv4 multicast protocols
Protocol  Handle  Instance
isis      0         mt
```

Related Commands

Command	Description
show rib afi-all, page 17	Displays both IPv4 and IPv6 RIB information.

show rib afi-all

To display Routing Information Base (RIB) data for both IPv4 and IPv6 address families, use the **show rib afi-all** command in EXEC mode.

show rib afi-all [**attributes**] [**client-id**] [**clients**] [**extcomms**] [**firsthop**] [**history**] [**multicast**] [**next-hop**] [**opaques**] [**protocols**] [**recursion-depth-max**] [**safi-all**] [**statistics**] [**tables**] [**trace**] [**unicast**] [**vpn-attributes**]

Syntax Description

attributes	(Optional) Displays all BGP attributes installed in RIB.
client-id	(Optional) Displays RIB client ID for longer history of redistributed routes sent to the client.
clients	(Optional) Displays RIB clients.
extcomms	(Optional) Displays all extended communities installed in RIB.
firsthop	(Optional) Displays registered firsthop notification addresses.
history	(Optional) Displays redistributed routes sent to RIB clients.
multicast	(Optional) Displays multicast commands.
next-hop	(Optional) Displays registered next-hop notification addresses.
opaques	(Optional) Displays opaque data installed in RIB.
protocols	(Optional) Displays registered protocols.
recursion-depth-max	(Optional) Displays maximum recursion depth in RIB.
safi-all	(Optional) Displays unicast and multicast commands.
statistics	(Optional) Displays RIB statistics.
tables	(Optional) Displays a list of tables known to RIB.
trace	(Optional) Displays RIB trace entries.
unicast	(Optional) Displays unicast commands.
vpn-attributes	(Optional) Displays all VPN attributes installed in RIB.

Command Default

No default behavior or values

Command Modes

EXEC

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes the proper task IDs. If you suspect user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operations
ipv4	read

Examples

The following example illustrates the **show rib afi-all attributes** command:

```
RP/0/RSP0/CPU0:router# show rib afi-all attributes
BGP attribute data in IPv4 RIB:
0 Attributes, for a total of 0 bytes.
BGP attribute data in IPv6 RIB:
0 Attributes, for a total of 0 bytes.
```

Related Commands

Command	Description
show rib, page 15	Displays RIB information.

show rib attributes

To display Border Gateway Protocol (BGP) attributes installed in the Routing Information Base (RIB), use the **show rib attributes** command in EXEC mode.

show rib attributes [summary] [standby]

Syntax Description

summary	(Optional) Displays a summary of BGP attribute data installed in the RIB.
standby	(Optional) Displays standby information.

Command Default

No default behavior or values

Command Modes

EXEC

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes the proper task IDs. If you suspect user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operations
rib	read

Examples

The following is sample output from the **show rib attributes** command:

```
RP/0/RSP0/CPU0:router# show rib attributes
BGP attribute data in IPv4 RIB:
Attribute ID (0x2):size (68)
Attribute ID (0x3):size (52)
Attribute ID (0x4):size (68)
Attribute ID (0x5):size (52)

4 Attributes, for a total of 240 bytes.

Attribute ID : ID assigned for the attribute by BGP
size : size of the attribute data.
```

show rib client-id

To display Routing Information Base (RIB) redistribution histories, use the **show rib client-id** command in EXEC mode.

show rib client-id *id* redistribution history [**standby**]

Syntax Description

<i>id</i>	ID of the client. Range is 0 to 4294967295.
redistribution history	Displays longer history of redistributed routes sent to RIB clients.
standby	(Optional) Displays standby information.

Command Default

No default behavior or values

Command Modes

EXEC

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes the proper task IDs. If you suspect user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **show rib client-id** command to display a history of the route additions, deletions, and updates sent from RIB to the client across VRFs.

Task ID

Task ID	Operations
rib	read

Examples

The following is sample output from the **show rib client-id** command:

```
RP/0/RSP0/CPU0:router# show rib client-id 13 redistribution history

PID      JID      Client          Location
151630   113     bcd1_agent     node0_5_CPU0
  Table ID: 0xe0000000
    S 80.80.80.0/24[1/0]      update, 5 path(s), 0x0   Jan 31 09:54:57.224
    S 80.80.80.0/24[1/0]      update, 6 path(s), 0x0   Jan 31 09:53:39.736
    S 140.140.140.0/24[1/0]    update, 1 path(s), 0x0   Jan 31 09:53:39.729
    S 80.80.80.0/24[1/0]      update, 5 path(s), 0x0   Jan 30 22:08:38.551
    S 140.140.140.0/24        deleted,                  Jan 30 22:08:38.543
    S 80.80.80.0/24[1/0]      update, 6 path(s), 0x0   Jan 30 22:03:05.889
```

```
S 100.100.100.0/24[1/0]          update, 1 path(s), 0x0   Jan 30 22:03:05.880
```

This table describes the significant fields shown in the display.

Table 1: show rib client-id Field Descriptions

Field	Description
PID	Process ID of the client.
JID	Job ID of the client.
Client	Client name.
Location	Location node on which the client is present.

Related Commands

Command	Description
show rib clients, page 22	Displays RIB clients.

show rib clients

To display Routing Information Base (RIB) clients, use the **show rib clients** command in EXEC mode.

```
show rib [afi-all| ipv4| ipv6] clients [protocols| redistribution [history]] [standby]
```

Syntax Description

afi-all	(Optional) Specifies all address families.
ipv4	(Optional) Specifies IP Version 4 address prefixes. This is the default.
ipv6	(Optional) Specifies IP Version 6 address prefixes.
protocols	(Optional) Specifies client protocols.
redistribution	(Optional) Specifies protocols redistributed by clients
history	(Optional) Specifies redistributed routes sent to RIB clients.
standby	(Optional) Displays standby information.

Command Default

No default behavior or values

Command Modes

EXEC

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes the proper task IDs. If you suspect user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **show rib clients** command to display the list of clients who have registered with RIB, what protocol routes they are redistributing, and a history of the routes sent to the client.

The maximum number of redistribution entries is 5000 for Bulk Content Downloader (BCDL) and 500 for other protocols.

Task ID

Task ID	Operations
rib	read

Examples

The following is sample output from the **show rib clients** command:

```
RP/0/RSP0/CPU0:router# show rib clients

Process          Location          Client ID  Redist  Proto
isis             node0_5_CPU0     0          insync  insync
ospf             node0_5_CPU0     2          insync  insync

RP/0/RSP0/CPU0:router# show rib clients redistribution

isis node0_5_CPU0
  ipv4 uni         vrf default      insync           route
  static           insync
ospf node0_5_CPU0
  ipv4 uni         vrf default      insync           route
  static           insync
  local            insync
bgp node0_5_CPU0
  ipv4 uni         vrf abc          insync           route
  static           insync
bcdl_agent node0_5_CPU0
  ipv4 uni         vrf default      insync           rib_fib
  ipv4 uni         vrf bar          insync           rib_fib
  ipv4 uni         vrf abc          insync           rib_fib
  ipv4 uni         vrf test         insync           rib_fib
```

This table describes the significant fields shown in the display.

Table 2: show rib clients Field Descriptions

Field	Description
Process	Client process name.
Location	Location where the client process is running.
Client ID	ID assigned to the client by RIB.
Redist	Whether the client is redistributing any protocols or not and whether it has read all routes from RIB or not. <ul style="list-style-type: none"> • insync—read • outsync—not read.
Proto	Whether the protocol has sent all its routes to RIB and signaled update complete or not. <ul style="list-style-type: none"> • insync—read • outsync—not read.

show rib extcomms

To display all extended communities installed in the Routing Information Base (RIB), use the **show rib extcomms** command in EXEC mode.

show rib [afi-all] ipv4|ipv6] extcomms [summary] [standby]

Syntax Description

afi-all	(Optional) Specifies all address families.
ipv4	(Optional) Specifies IP Version 4 address prefixes. This is the default.
ipv6	(Optional) Specifies IP Version 6 address prefixes.
summary	(Optional) Specifies a summary of all extended communities in the RIB.
standby	(Optional) Displays standby information.

Command Default

No default behavior or values

Command Modes

EXEC

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes the proper task IDs. If you suspect user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operations
rib	read

Examples

The following is sample output from the **show rib extcomms** command:

```
RP/0/RSP0/CPU0:router# show rib extcomms
Extended community data in RIB:

Extended community           Ref count
COST:128:128:41984           1
EIGRP route-info:0x8000:0    1
EIGRP AD:1:25600             1
```



```
EIGRP RHB:255:0:16384      1
EIGRP LM:0x0:1:4470       1
```

This table describes the significant fields shown in the display.

Table 3: show rib extcomms Field Descriptions

Field	Description
Extended Community	Type of extended communities. Different protocols can add different extended communities.
Ref Count	Number of routes referring to the Extended community.

show rib firsthop

To display registered first-hop notification addresses, use the **show rib firsthop** command in EXEC mode.

show rib [**vrf** {*vrf-name* | **all**}] [**afi-all** **ipv4**| **ipv6**] [**unicast**| **multicast**| **safi-all**] **firsthop** [*client-name*] [*type interface-path-id*] *ip-address* [*prefix-length*] *ip-address mask* [**resolved**| **unresolved**| **damped**] [**summary**] [**standby**]

Syntax Description

vrf { <i>vrf-name</i> all }	(Optional) Specifies a particular VPN routing and forwarding (VRF) instance or all VRF instances.
afi-all	(Optional) Specifies all address families.
ipv4	(Optional) Specifies IP Version 4 address prefixes. This is the default.
ipv6	(Optional) Specifies IP Version 6 address prefixes.
unicast	(Optional) Specifies unicast address prefixes. This is the default.
multicast	(Optional) Specifies multicast address prefixes.
safi-all	(Optional) Specifies unicast and multicast address prefixes.
<i>client-name</i>	(Optional) Name of the RIB client.
<i>type</i>	Interface type. For more information, use the question mark (?) online help function.
<i>interface-path-id</i>	Physical interface or virtual interface. 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.
<i>ip-address</i>	(Optional) Network that BGP advertises.
<i>/ prefix-length</i>	(Optional) Length of the IP address prefix. A decimal value that indicates how many of the high-order contiguous bits of the address compose the prefix (the network portion of the address). A slash (/) must precede the decimal value.
<i>ip-address mask</i>	(Optional) Network mask applied to the <i>ip-address</i> argument.
resolved	(Optional) Specifies resolved next-hops.
unresolved	(Optional) Specifies unresolved next-hops.
damped	(Optional) Specifies next-hops that are damped.

summary	(Optional) Specifies a summary of the next-hop information.
standby	(Optional) Displays standby information.

Command Default If a **vrf** *vrf-name* is not specified, the registered first-hop notifications addresses are displayed for the default IPv4 unicast VRF.

Command Modes EXEC

Command History	Release	Modification
	Release 3.7.2	This command was introduced.

Usage Guidelines To use this command, you must be in a user group associated with a task group that includes the proper task IDs. If you suspect user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **show rib firsthop** command to display the list of first hops registered by various clients with RIB and the address and interface through which they are resolved.

Task ID	Task ID	Operations
	rib	read

Examples The following is sample output from the **show rib firsthop** command:

```
RP/0/RSP0/CPU0:router# show rib firsthop

Registered firsthop notifications:
0.0.0.0/0 via 1.1.0.1 - MgmtEth0/5/CPU0/0, ospf/node0_5_CPU0
1.1.0.1/32 via 1.1.0.1 - MgmtEth0/5/CPU0/0, ipv4_static/node0_5_CPU0
1.1.1.1/32 via 1.1.1.1 - MgmtEth0/5/CPU0/0, ipv4_static/node0_5_CPU0
10.10.10.1/32 via 10.10.10.1 - Loopback0, ipv4_static/node0_5_CPU0
10.10.10.3/32 via 10.10.10.3 - Loopback0, ipv4_static/node0_5_CPU0
15.15.15.1/32 via 10.10.10.1 - Loopback0, ipv4_static/node0_5_CPU0
20.20.20.1/32 via 1.1.1.1 - MgmtEth0/5/CPU0/0, ipv4_static/node0_5_CPU0
30.30.30.1/32 via 1.1.1.2 - MgmtEth0/5/CPU0/0, ipv4_static/node0_5_CPU0
```

show rib history

To display history information for Routing Information Base (RIB) clients, use the **show rib history** command in EXEC mode.

show rib [**afi-all**] **ipv4**|**ipv6**] **history** [**client-id** *client-id*] [**standby**]

Syntax Description

afi-all	(Optional) Specifies all address families.
ipv4	(Optional) Specifies IP Version 4 address prefixes. This is the default.
ipv6	(Optional) Specifies IP Version 6 address prefixes.
client-id <i>client-id</i>	(Optional) Specifies the ID of the client. Range for <i>client-id</i> argument is 0 to 4294967295.
standby	(Optional) Displays standby information.

Command Default

No default behavior or values

Command Modes

EXEC

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes the proper task IDs. If you suspect user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **show rib history** command to display the list of routes that RIB has sent to various clients.

Task ID

Task ID	Operations
rib	read

Examples

The following is sample output from the **show rib history** command:

```
RP/0/RSP0/CPU0:router# show rib history

JID   Client           Location
229   isis             node0_5_CPU0
Table ID: 0xe0000000
```

```

      S 80.80.80.0/24[1/0]      update, 6 path(s),      04:32:09
      S 100.100.100.0/24[1/0]  update, 1 path(s),      04:32:09
      S 40.40.40.0/24[1/0]    update, 1 path(s),      04:32:09
      S 15.15.15.0/24[1/0]    update, 1 path(s),      04:32:09
JID   Client      Location
260   ospf         node0_5_CPU0
      Table ID: 0xe0000000
      S 80.80.80.0/24[1/0]      update, 6 path(s),      04:32:09
      S 100.100.100.0/24[1/0]  update, 1 path(s),      04:32:09
      S 40.40.40.0/24[1/0]    update, 1 path(s),      04:32:09
      S 15.15.15.0/24[1/0]    update, 1 path(s),      04:32:09

```

This table describes the significant fields shown in the display.

Table 4: show rib history Field Descriptions

Field	Description
JID	Job ID of the client process.
Client	Name of the client process.
Location	Information about where the client process is running.

show rib next-hop

To display registered next-hop notification addresses, use the **show rib next-hop** command in EXEC mode.

```
show rib [vrf {vrf-name| all}] [afi-all ipv4 ipv6] [unicast| multicast| safi-all] next-hop [ client-name ]
[type interface-path-id] ip-address /prefix-length| ip-address mask] resolved| unresolved| damped] [summary]
[standby]
```

Syntax Description

vrf { <i>vrf-name</i> all }	(Optional) Specifies a particular VPN routing and forwarding (VRF) instance or all VRF instances.
afi-all	(Optional) Specifies all address families.
ipv4	(Optional) Specifies IP Version 4 address prefixes. This is the default.
ipv6	(Optional) Specifies IP Version 6 address prefixes.
unicast	(Optional) Specifies unicast address prefixes. This is the default.
multicast	(Optional) Specifies multicast address prefixes.
safi-all	(Optional) Specifies unicast and multicast address prefixes.
<i>client-name</i>	(Optional) Name of the RIB client.
<i>type</i>	Interface type. For more information, use the question mark (?) online help function.
<i>interface-path-id</i>	Physical interface or virtual interface. 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.
<i>ip-address</i>	(Optional) Network IP address about which routing information should be displayed.
<i>mask</i>	(Optional) Network mask specified in either of two ways: <ul style="list-style-type: none"> • Network mask can be a four-part, dotted-decimal address. For example, 255.0.0.0 indicates that each bit equal to 1 means the corresponding address bit is a network address. • Network mask can be indicated as a slash (/) and number. For example, /8 indicates that the first 8 bits of the mask are 1s, and the corresponding bits of the address are the network address.

<i>/ prefix-length</i>	(Optional) Length of the IP address prefix. A decimal value that indicates how many of the high-order contiguous bits of the address compose the prefix (the network portion of the address). A slash (/) must precede the decimal value.
resolved	(Optional) Specifies resolved next-hops.
unresolved	(Optional) Specifies unresolved next-hops.
damped	(Optional) Specifies next-hops that are damped.
summary	(Optional) Specifies a summary of the next-hop information.
standby	(Optional) Displays standby information.

Command Default No default behavior or values

Command Modes EXEC

Command History	Release	Modification
	Release 3.7.2	This command was introduced.

Usage Guidelines To use this command, you must be in a user group associated with a task group that includes the proper task IDs. If you suspect user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **show rib next-hop** command to display the list of next-hops registered by various clients with the RIB and the address and interface through which they are resolved.

Task ID	Task ID	Operations
	rib	read

Examples The following is sample output from the **show rib next-hop** command:

```
RP/0/RSP0/CPU0:router# show rib next-hop
Registered nexthop notifications:
0.0.0.0/0 via 172.29.52.1 - MgmtEth0/RP1/CPU0/0, ospf/node0_RP0_CPU0
172.29.52.1/32 via 172.29.52.1 - MgmtEth0/RP1/CPU0/0, ipv4_static/node0_RP0_CPU0
```

show rib opaques

To display opaque data installed in the Routing Information Base (RIB), use the **show rib opaques** command in EXEC mode.

```
show rib [vrf {vrf-name| all}] [afi-all ipv4| ipv6] [unicast| multicast| safi-all] opaques {attribute| ip-nexthop| safi-tunnel| summary| tunnel-nexthop} [ rib-client-name ] [standby]
```

Syntax Description

vrf { <i>vrf-name</i> all }	(Optional) Specifies a particular VPN routing and forwarding (VRF) instance or all VRF instances.
afi-all	(Optional) Specifies all address families.
ipv4	(Optional) Specifies IP Version 4 address prefixes. This is the default.
ipv6	(Optional) Specifies IP Version 6 address prefixes.
unicast	(Optional) Specifies unicast address prefixes. This is the default.
multicast	(Optional) Specifies multicast address prefixes.
safi-all	(Optional) Specifies unicast and multicast address prefixes.
attribute	Displays opaque attributes installed in the RIB.
ip-nexthop	Displays IP next-hop data installed in the RIB.
safi-tunnel	Displays subaddress family (SAFI) tunnel opaque data installed in the RIB.
summary	Displays a summary of opaque data installed in the RIB.
tunnel-nexthop	Displays tunnel next-hop opaque data installed in the RIB.
<i>rib-client-name</i>	(Optional) Name of the RIB client.
standby	(Optional) Displays standby information.

Command Default

No default behavior or values

Command Modes

EXEC

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes the proper task IDs. If you suspect user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

If information is not used by the RIB server process, it is viewed as opaque data. Use the **show rib opaques** command to display opaque data installed in the RIB.

Task ID

Task ID	Operations
rib	read

Examples

The following is sample output from the **show rib opaques** command:

```
RP/0/RSP0/CPU0:router# show rib opaques safi-tunnel

Summary of safi tunnel opaque data in IPv4 RIB:

Opaque key: 1:10.1.0.2
Opaque data:
Tunnel Encap - ifhandle=0x1000180, type=L2TPv3, Params=[Session-id=0x1EB1127C, `
CookieIen=8, Cookie=0xA73A3E0AFCD419A6] Opaque key: 65535:10.0.101.1 Opaque data:

RP/0/RSP0/CPU0:router# show rib ipv6 opaques tunnel-nexthop

Summary of 6PE/6VPE IP over tunnel nexthop opaque data in IPv6 RIB:

Opaque key: 1::ffff:10.1.0.2
Opaque key: 65535::ffff:10.0.101.1
Opaque key: 65535::ffff:10.0.101.2
Opaque key: 65535::ffff:10.0.101.3
Opaque key: 65535::ffff:10.0.101.4
Opaque key: 65535::ffff:10.0.101.5
```

This table describes the significant fields shown in the display.

Table 5: show rib opaques Field Descriptions

Field	Description
Opaque key	Unique key for the opaque data as populated by the protocol client.
Opaque data	Data for the given key.

show rib protocols

To display protocols registered for route addition, use the **show rib protocols** command in EXEC mode.

show rib [**vrf** {*vrf-name*| **all**}] [**afi-all**| **ipv4**| **ipv6**] [**unicast**| **multicast**| **safi-all**] **protocols** [**standby**]

Syntax Description

vrf { <i>vrf-name</i> all }	(Optional) Specifies a particular VPN routing and forwarding (VRF) instance or all VRF instances.
afi-all	(Optional) Specifies all address families.
ipv4	(Optional) Specifies IP Version 4 address prefixes. This is the default.
ipv6	(Optional) Specifies IP Version 6 address prefixes.
unicast	(Optional) Specifies unicast address prefixes. This is the default.
multicast	(Optional) Specifies multicast address prefixes.
safi-all	(Optional) Specifies unicast and multicast address prefixes.
standby	(Optional) Displays standby information.

Command Default

If a **vrf** *vrf-name* is not specified, the registered first-hop notification addresses are displayed for the default IPv4 unicast VRF.

Command Modes

EXEC

Command History

Release	Modification
Release 3.7.2	This command was introduced.
Release 3.9.0	Asplain format for 4-byte Autonomous system numbers notation was supported. The input parameters and output were modified to display 4-byte autonomous system numbers and extended communities in either asplain or asdot notations.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes the proper task IDs. If you suspect user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operations
rib	read

Examples

The following is sample output from the **show rib protocols** command:

```
RP/0/RSP0/CPU0:router# show rib protocols

Protocol  Handle  Instance
isis      0       rib
connected 1
static    2
local     3
bgp       4       102
ospf      5       1
```

This table describes the significant fields shown in the display.

Table 6: show rib protocols Field Descriptions

Field	Description
Protocol	Name of the protocol.
Handle	Handle assigned to the protocol instance.
Instance	Protocol instance.

show rib recursion-depth-max

To display the maximum recursion depth in the Routing Information Base (RIB), use the **show rib recursion-depth-max** command in EXEC mode.

show rib [afi-all| ipv4| ipv6] recursion-depth-max [standby]

Syntax Description

afi-all	(Optional) Specifies all address families.
ipv4	(Optional) Specifies IP Version 4 address prefixes. This is the default.
ipv6	(Optional) Specifies IP Version 6 address prefixes.
standby	(Optional) Displays standby information.

Command Default

No default behavior or values

Command Modes

EXEC

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes the proper task IDs. If you suspect user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **show rib recursion-depth-max** command to display the maximum recursion depth for RIB. Recursion depth is the number of next-hops that can be specified.

Task ID

Task ID	Operations
rib	read

Examples

The following is sample output from the **show rib recursion-depth-max** command:

```
RP/0/RSP0/CPU0:router# show rib recursion-depth-max
IPv4:
-----
Maximum recursion depth in RIB:
    Configured: 12
    In Use: 128
```

```
IPv6:
-----
Maximum recursion depth in RIB:

    Configured: 12
      In Use: 128
```

This table describes the significant fields shown in the display.

Table 7: show rib recursion-depth-max Field Descriptions

Field	Description
Configured	Value of maximum recursion depth currently configured.
In Use	Value of maximum recursion depth RIB is using. This value can be different from the configured value because RIB has to be restarted after the configuration is changed for the new configuration to be effective.

show rib statistics

To display Routing Information Base (RIB) statistics, use the **show rib statistics** command in EXEC mode.

```
show rib [vrf {vrf-name| all}] [afi-all| ipv4| ipv6] [unicast| multicast| safi-all] statistics [ client-name ]
[standby]
```

Syntax Description

vrf { <i>vrf-name</i> all }	(Optional) Specifies a particular VPN routing and forwarding (VRF) instance or all VRF instances.
afi-all	(Optional) Specifies all address families.
ipv4	(Optional) Specifies IP Version 4 address prefixes. This is the default.
ipv6	(Optional) Specifies IP Version 6 address prefixes.
unicast	(Optional) Specifies unicast address prefixes. This is the default.
multicast	(Optional) Specifies multicast address prefixes.
safi-all	(Optional) Specifies unicast and multicast address prefixes.
<i>client-name</i>	(Optional) Name of the RIB client.
standby	(Optional) Displays standby information.

Command Default

If **vrf** *vrf-name* is not specified, the registered first-hop notification addresses are displayed for the default IPv4 unicast VRF.

Command Modes

EXEC

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes the proper task IDs. If you suspect user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **show rib statistics** command to display RIB statistics. The statistics include requests sent from the clients to the RIB and the information redistributed to the client.

RIB maintains counters for all requests sent from a client including

- Route operations

- Table registrations
- Next-hop registrations
- Redistribution registrations
- Attribute registrations
- Synchronization completion

RIB also maintains the results of the requests.

Task ID

Task ID	Operations
rib	read

Examples

The following is sample output from the **show rib statistics** command:

```
RP/0/RSP0/CPU0:router# show rib statistics

RIB Statistics:
  Received 142 batch messages
    137 route operations, 0 attribute operations
    0 opaque operations
    11 complete operations, 0 convergent operations
  Results of the batch message received:
    142 successes
    0 forward references, 0 invalid client id, 0 unknown errors
    0 memory allocation errors, 0 client lookup errors, table lookup errors 0
    0 proto lookup errors, 0 client proto lookup errors
    ipv4_connected/node0_RP0_CPU0 last performed route operation
    with status BATCH_SUCCESS at Jun 26 21:43:33.601

  Received 217422 light weight messages
    4 route add requests, 2 route delete requests
    10 protocol registered, 1 protocol unregistered
    0 protocol modify, 0 protocol purged
    14 protocol redistributions, 0 unregistered protocol redistributions
    0 reset protocol redistributions
    3 first hop registered, 1 first hop unregistered
    3 advertisements, 0 unregistered advertisement
    57 bind data, 97 update completes, 217230 other requests
    udp/node0_RP0_CPU0 last performed firsthop lookup operation
    with status success at Jun 27 10:09:59.990

  Received 0 nexthop batch messages
    0 successes
    0 inits
    0 registers, 0 unregisters
    0 register complete, 0 sync unregistered, 0 batch finished
```

This table describes the significant fields shown in the display.

Table 8: show rib statistics Field Descriptions

Field	Description
Received	Statistics received including batch messages and route, attribute, complete, and convergent operations.

Field	Description
Results of the batch message received	Batch message results.
Received <i>n</i> light weight messages	Number of lightweight API messages sent from RIB clients.
Received <i>n</i> nexthop batch messages	Number of batch API messages sent from RIB clients received by the RIB.

show rib tables

To display all tables known to the Routing Information Base (RIB), use the **show rib tables** command in EXEC mode.

```
show rib [afi-all| ipv4| ipv6] tables [summary] [standby]
```

Syntax Description	
afi-all	(Optional) Specifies all address families.
ipv4	(Optional) Specifies IP Version 4 address prefixes. This is the default.
ipv6	(Optional) Specifies IP Version 6 address prefixes.
summary	(Optional) Displays summary table information.
standby	(Optional) Displays standby information.

Command Default No default behavior or values

Command Modes EXEC

Command History	Release	Modification
	Release 3.7.2	This command was introduced.

Usage Guidelines To use this command, you must be in a user group associated with a task group that includes the proper task IDs. If you suspect user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **show rib tables** command to display all tables known to the RIB, including table attributes. Attributes include VPN routing and forwarding (VRF) instance, address family, and maximum prefix information.

Task ID	Task ID	Operations
	rib	read

Examples The following is sample output from the **show rib tables** command when entered without an address:

```
RP/0/RSP0/CPU0:router# show rib tables

Codes: N - Prefix Limit Notified, F - Forward Referenced
       D - Table Deleted, C - Table Reached Convergence
```

show rib tables

```

VRF          SAFI  Table ID      PrfxLmt  PrfxCnt  TblVersion  N  F  D  C
default     uni   0xe0000000  2000000  72       137        N  N  N  Y
default     multi 0xe0100000  2000000  0        0         N  N  N  Y

```

This table describes the significant fields shown in the display.

Table 9: show rib tables Field Descriptions

Field	Description
VRF	Name of the VRF instance.
SAFI	Subaddress family instance.
Table ID	ID of the RIB table.
PrfxLmt	Configured prefix limit for the RIB table.
PrfxCnt	Number of configured prefixes in the RIB table.
TblVersion	Tables version number.
N	Message sent when prefix limit is exceeded.
F	Forward referenced. If Y is indicated, a table has been created by RIB because a client has registered for the table, but RIB has not heard from the router space infrastructure (RSI) about the table. RSI manages the tables.
D	If Y is indicated, the table has been deleted in the RSI but RIB has not cleared the information.
C	Table reached convergence.

show rib trace

To display all Routing Information Base (RIB) library call tracer (ltrace) entries, use the **show rib trace** command in EXEC mode.

```
show rib [afi-all| ipv4| ipv6] trace [clear| counts| event-manager| startup| sync| timing] [unique| wrapping]
[last entries] [hexdump] [reverse] [tailif] [stats] [verbose] [file name original location node-id] location
{all| node-id}
```

Syntax Description

afi-all	(Optional) Specifies all address families.
ipv4	(Optional) Specifies IP Version 4 address prefixes. This is the default.
ipv6	(Optional) Specifies IP Version 6 address prefixes.
counts clear	(Optional) Displays route clear trace entries.
counts	(Optional) Displays counts trace entries.
event-manager	(Optional) Displays RIB event manager trace entries.
startup	(Optional) Displays RIB startup trace entries.
sync	(Optional) Displays client synchronization trace entries.
timing	(Optional) Displays timing trace entries.
unique	(Optional) Displays unique entries with counts.
wrapping	(Optional) Displays wrapping entries.
last entries	(Optional) Displays a specified number of the last entries. Range is 1 to 4294967295.
hexdump	(Optional) Displays traces in hexadecimal format.
reverse	(Optional) Displays the latest traces first.
tailif	(Optional) Displays new traces as they are added.
stats	(Optional) Displays statistics.
verbose	(Optional) Displays internal debugging information.
file name original location node-id	(Optional) Displays trace entries for a specific file for the designated node. The <i>node-id</i> argument is entered in the <i>rack/slot/module</i> notation.

show rib trace

location { **all** | *node-id* } (Optional) Displays ltrace entries for the designated node. The *node-id* argument is entered in the *rack/slot/module* notation. The **all** keyword displays ltrace entries for all nodes.

Command Default No default behavior or values

Command Modes EXEC

Command History	Release	Modification
	Release 3.7.2	This command was introduced.

Usage Guidelines To use this command, you must be in a user group associated with a task group that includes the proper task IDs. If you suspect user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID	Task ID	Operations
	rib	read

Examples The following is sample output from the **show rib trace** command

```
RP/0/RSP0/CPU0:router# show rib trace

1784 wrapping entries (13312 possible, 0 filtered, 1784 total)
Mar 16 14:59:27.947 rib/ipv4_rib/rib-startup 0/RSP0/CPU0 t1 Create: Management thread
Mar 16 14:59:27.959 rib/ipv4_rib/rib-startup 0/RSP0/CPU0 t2 Create: Management event
manager
Mar 16 14:59:28.346 rib/ipv4_rib/rib-io 0/RSP0/CPU0 t1 Initialise: RIB server
Mar 16 14:59:28.346 rib/ipv4_rib/rib-io 0/RSP0/CPU0 t1 Initialise: Client collection
Mar 16 14:59:28.676 rib/ipv4_rib/rib-io 0/RSP0/CPU0 t1 Initialise: DB collection
Mar 16 14:59:28.693 rib/ipv4_rib/rib-io 0/RSP0/CPU0 t1 Initialise: Timer tree
Mar 16 14:59:28.694 rib/ipv4_rib/rib-io 0/RSP0/CPU0 t1 RUMP: Bind to sysdb
/ipc/gl/ipv4-rib/ for protocol notification
Mar 16 14:59:29.102 rib/ipv4_rib/rib-startup 0/RSP0/CPU0 t2 Initialise: Debugging routine

Mar 16 14:59:29.128 rib/ipv4_rib/rib-io 0/RSP0/CPU0 t1 Register: read, select cb functions

Mar 16 14:59:29.137 rib/ipv4_rib/rib-startup 0/RSP0/CPU0 t1 Register: cernno DLL name
lib_rib_error.dll
.
.
.
```

show rib vpn-attributes

To display all VPN attributes installed in the Routing Information Base (RIB), use the **show rib vpn-attributes** command in EXEC mode.

```
show rib [afi-all| ipv4| ipv6] vpn-attributes [summary] [standby]
```

Syntax Description	
afi-all	(Optional) Specifies all address families.
ipv4	(Optional) Specifies IP Version 4 address prefixes.
ipv6	(Optional) Specifies IP Version 6 address prefixes.
summary	(Optional) Displays VPN attribute information.
standby	(Optional) Displays standby information.

Command Default The default is IPv4 address prefixes.

Command Modes EXEC

Command History	Release	Modification
	Release 3.7.2	This command was introduced.

Usage Guidelines To use this command, you must be in a user group associated with a task group that includes the proper task IDs. If you suspect user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID	Task ID	Operations
	rib	read

Examples The following is sample output from the **show rib vpn-attributes** command:

```
RP/0/RSP0/CPU0:router# show rib vpn-attributes
Extended community data in RIB:

Extended community                               Ref count
COST:128:128:41984                               2
COST:128:129:42240                               2
COST:128:129:44544                               1
COST:128:129:169984                              2
```

show rib vpn-attributes

```

COST:128:129:307200                                1
EIGRP route-info:0x0:0                             6
EIGRP route-info:0x8000:0                          2
EIGRP AD:444:25600                                  2
EIGRP AD:444:25856                                  2
EIGRP AD:444:28160                                  1
EIGRP AD:444:51200                                  1
EIGRP AD:444:153600                                 2
EIGRP RHB:255:0:16384                              2
EIGRP RHB:255:1:16384                              5
EIGRP RHB:255:1:256000                             1
EIGRP LM:0x0:1:1500                                 3
EIGRP LM:0x0:1:1514                                 2
EIGRP LM:0x0:1:4470                                 3
EIGRP AR:0:192.168.0.13                            6
EIGRP PM:11:0                                       6

```

MVPN attribute data in RIB:

```

MVPN Attribute                                     Ref count
0:0:1:f4:0:0:0:1:1:1:1:1                         1
0:0:2:bc:0:0:0:1:3:3:3:3                         10
0:0:2:bc:0:0:0:1:3:3:3:4                         2

```

This table describes the significant fields shown in the display.

Table 10: show rib vpn-attributes Field Descriptions

Field	Description
Extended Community	Extended community added by the protocol clients.
Ref Count	Number of routes referring to the same extended community.
MVPN Attribute	Connector attribute added by BGP to support MVPNs.
Ref Count	Number of routes referring to the same extended community.

show rib vrf

To display all VRF table information in the Routing Information Base (RIB), use the **show rib vrf** command in EXEC mode.

```
show rib vrf {vrf-name| all} [ipv4] [ipv6] [afi-all] [firsthop] [next-hop] [opaques] [protocols] [statistics name]
```

Syntax Description

vrf { <i>vrf-name</i> all }	(Optional) Specifies a particular VPN routing and forwarding (VRF) instance or all VRF instances.
ipv4	(Optional) Specifies IP Version 4 address prefixes.
ipv6	(Optional) Specifies IP Version 6 address prefixes.
afi-all	(Optional) Specifies all address families.
firsthop	(Optional) Specifies registered first-hop notification addresses
next-hop	(Optional) Specifies registered next-hop notification addresses.
opaques	(Optional) Specifies opaque data installed in the RIB.
protocols	(Optional) Specifies registered protocols.
statistics <i>name</i>	(Optional) Specifies RIB statistics for the given name.

Command Default

No default behavior or values

Command Modes

EXEC

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes the proper task IDs. If you suspect user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operations
ipv4	read

Examples

The following example shows output from the **show rib vrf all statistics** command:

```
RP/0/RSP0/CPU0:router# show rib vrf all statistics
RP/0/RSP0/CPU0:router#
```

Related Commands

Command	Description
show rib, page 15	Displays RIB information.

show route

To display the current routes in the Routing Information Base (RIB), use the **show route** command in EXEC mode.

```
show route [vrf {vrf-name| all}] [afi-all ipv4| ipv6] [unicast| multicast| {topology topo-name}] safi-all
[protocol] [{instanceip-addressmask}][ip-address [mask] | ip-address /| prefix-length] ][standby][detail]
```

Syntax Description

vrf { <i>vrf-name</i> all }	(Optional) Specifies a particular VPN routing and forwarding (VRF) instance or all VRF instances.
afi-all	(Optional) Specifies all address families.
ipv4	(Optional) Specifies IP Version 4 address prefixes. This is the default.
ipv6	(Optional) Specifies IP Version 6 address prefixes.
unicast	(Optional) Specifies unicast address prefixes. This is the default.
multicast	(Optional) Specifies multicast address prefixes.
safi-all	(Optional) Specifies unicast and multicast address prefixes.
<i>protocol</i>	(Optional) Name of a routing protocol. If you specify a routing protocol, use one of the following keywords: <ul style="list-style-type: none"> • bgp • eigrp • isis • ospf • rip • static • local • connected
instance	(Optional) Number or name used to identify an instance of the specified protocol.
<i>ip-address</i>	(Optional) Network IP address about which routing information should be displayed.
<i>mask</i>	(Optional) Network mask specified in either of two ways: <ul style="list-style-type: none"> • Network mask can be a four-part, dotted-decimal address. For example, 255.0.0.0 indicates that each bit equal to 1 means the corresponding address bit is a network address.

- Network mask can be indicated as a slash (/) and number. For example, /8 indicates that the first 8 bits of the mask are 1s, and the corresponding bits of the address are the network address.

<i>/prefix-length</i>	(Optional) Length of the IP address prefix. A decimal value that indicates how many of the high-order contiguous bits of the address compose the prefix (the network portion of the address). A slash (/) must precede the decimal value.
standby	(Optional) Displays standby information.
detail	(Optional) Displays detailed information for the specified prefix.

Command Default

If a **vrf** *vrf-name* is not specified, routes are displayed for the default IPv4 unicast VRF.

Command Modes

EXEC

Command History

Release	Modification
Release 3.7.2	This command was introduced.
Release 3.9.0	Asplain format for 4-byte Autonomous system numbers notation was supported. The input parameters and output were modified to display 4-byte autonomous system numbers and extended communities in either asplain or asdot notations.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes the proper task IDs. If you suspect user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

When the **afi-all** keyword is used, the *ip-address* and *mask* arguments are not available.

The **topology** keyword must be accompanied by the **ipv4 multicast** keywords, except when the **afi-all** keyword or the **safi-all** keyword is specified.

Task ID

Task ID	Operations
rib	read

Examples

The following is sample output from the **show route** command when entered without an address:

```
RP/0/RSP0/CPU0:router# show route
```

```
Codes: C - connected, S - static, R - RIP, M - mobile, B - BGP
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
       E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
       i - ISIS, L1 - IS-IS level-1, L2 - IS-IS level-2
```

```

ia - IS-IS inter area, su - IS-IS summary null, * - candidate default
U - per-user static route, o - ODR, L - local

Gateway of last resort is 1.0.0.1 to network 0.0.0.0

S* 0.0.0.0/0 [1/0] via 1.0.0.1, 13:14:59
C 1.0.0.0/16 is directly connected, 13:14:59, MgmtEth0/5/CPU0/0
L 1.0.14.15/32 is directly connected, 13:14:59, MgmtEth0/5/CPU0/0
C 3.2.3.0/24 is directly connected, 00:04:39, GigabitEthernet0/3/0/0
L 3.2.3.2/32 is directly connected, 00:04:39, GigabitEthernet0/3/0/0
O E2 5.2.5.0/24 [110/20] via 3.3.3.1, 00:04:20, GigabitEthernet0/3/0/0
O E2 6.2.6.0/24 [110/20] via 3.3.3.1, 00:04:20, GigabitEthernet0/3/0/0
C 7.2.7.0/24 is directly connected, 00:04:20, GigabitEthernet0/3/0/7
L 7.2.7.2/32 is directly connected, 00:04:20, GigabitEthernet0/3/0/7
O E2 8.2.8.0/24 [110/20] via 3.3.3.1, 00:04:20, GigabitEthernet0/3/0/0

C 10.3.0.0/16 is directly connected, 13:14:59, GigabitEthernet0/0/0/0
L 10.3.0.2/32 is directly connected, 13:14:59, GigabitEthernet0/0/0/0

```

This table describes the significant fields shown in the display.

Table 11: show route Field Descriptions

Field	Description
S*	Code indicating how the route was derived. See the code legend preceding the output. In this case, the route was derived from a static (candidate default).
[1/0]	First number in the brackets is the administrative distance of the information source; the second number is the metric for the route.
1.0.0.0/16	Address and prefix length of the remote network.
MgmtEthernet 0/5/CPU0/0	Specifies the interface through which the specified network can be reached.
C	Code indicating how the route was derived. See the code legend preceding the output. In this case, the route was connected.
L	Code indicating how the route was derived. See the code legend preceding the output. In this case, the route was local.
O	Code indicating how the route was derived. See the code legend preceding the output. In this case, the route was on-demand routing (ODR).
E2	Code indicating how the route was derived. See the code legend preceding the output. In this case, the route was OSPF external type 2.
8.2.8.0/24	Address and prefix length of the remote network connected to the static route.

Field	Description
via 3.3.3.1	Specifies the address of the next router to the remote network.
13:14:59	Specifies the last time the route was updated.

When you specify that you want information about a particular network, more detailed statistics are displayed. The following is sample output from the **show route** command when entered with an IP address:

```
RP/0/RSP0/CPU0:router# show route 10.0.0.0

Routing entry for 10.0.0.0/16
  Known via "connected", distance 0, metric 0 (connected)
  Installed Mar 22 22:10:20.906
  Routing Descriptor Blocks
    directly connected, via GigabitEthernet0/0/0/0
    Route metric is 0
  No advertising protos.
```

Intermediate System-to-Intermediate System (IS-IS) includes an IP address typed length value (TLV) in its link-state packet (LSP) that helps identify the node injecting the route into the network. The IS-IS node uses one of its own interface addresses in this TLV. A loopback address is preferred among interfaces configured under IS-IS. When other networking devices calculate IP routes, they can store the IP address as the originator address with each route in the routing table.

The following example shows the output from the **show route** command for a specific IP address on a router configured with IS-IS. Each path that is shown under the Routing Descriptor Blocks report displays two IP addresses. The first address (10.0.0.9) is the next-hop address; the second is the originator IP address from the advertising IS-IS router.

```
RP/0/RSP0/CPU0:router# show route 10.0.0.1

Routing entry for 10.0.0.0/8
  Known via "isis", distance 115, metric 10, type level-2
  Installed Jan 22 09:26:56.210
  Routing Descriptor Blocks:
    * 10.0.0.9, from 10.0.0.9, via GigabitEthernet2/1
    Route metric is 10
  No advertising protos.
```

This table describes the significant fields shown in the display.

Table 12: show route with IP Address Field Descriptions

Field	Description
Routing entry for	Network address and mask.
Known via	Indicates how the route was derived.
distance	Administrative distance of the information source.
metric	Route value assigned by the routing protocol.

Field	Description
type	IS-IS type level.
Routing Descriptor Blocks:	Displays the next-hop IP address followed by the information source.
from ... via ...	First address is the next-hop IP address, and the other is the information source. This report is followed by the interface for this route.
Route metric	Best metric for this Routing Descriptor Block.
No advertising protos.	Indicates that no other protocols are advertising the route to their redistribution consumers. If the route is being advertised, protocols are listed in the following manner: Redist Advertisers: isis p ospf 43

The following example illustrates the **show route** command with the **topology** *topo-name* keyword and argument specified:

```
RP/0/RSP0/CPU0:router# show route ipv4 multicast topology green

Codes: C - connected, S - static, R - RIP, M - mobile, B - BGP
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
       E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
       i - ISIS, L1 - IS-IS level-1, L2 - IS-IS level-2
       ia - IS-IS inter area, su - IS-IS summary null, * - candidate default
       U - per-user static route, o - ODR, L - local

Gateway of last resort is not set

i L1 10.1.102.0/24 [115/20] via 10.1.102.41, 1w4d, GigabitEthernet0/1/0/0.1
i L1 10.3.3.0/24 [115/20] via 10.1.102.41, 1w4d, GigabitEthernet0/1/0/0.1
i L1 192.168.0.40/32 [115/20] via 10.1.102.41, 1w4d, GigabitEthernet0/1/0/0.1
```

Related Commands

Command	Description
show interfaces	Lists interface information.
show route summary, page 76	Displays the current contents of the routing table in summary format.

show route backup

To display backup routes from the Routing Information Base (RIB), use the **show route backup** command in EXEC mode.

```
show route [vrf {vrf-name| all}] [afi-all ipv4| ipv6] [unicast| multicast| {topology topo-name}| safi-all]
backup [ip-address [mask] | ip-address /| prefix-length] ][standby]
```

Syntax Description

vrf { <i>vrf-name</i> all }	(Optional) Specifies a particular VPN routing and forwarding (VRF) instance or all VRF instances.
afi-all	(Optional) Specifies all address families.
ipv4	(Optional) Specifies IP Version 4 address prefixes.
ipv6	(Optional) Specifies IP Version 6 address prefixes.
unicast	(Optional) Specifies unicast address prefixes.
multicast	(Optional) Specifies multicast address prefixes.
safi-all safi-all	(Optional) Specifies unicast and multicast address prefixes.
<i>ip-address</i>	(Optional) Network IP address about which backup routing information should be displayed.
<i>mask</i>	(Optional) Network mask specified in either of two ways: <ul style="list-style-type: none"> • Network mask can be a four-part, dotted decimal address. For example, 255.0.0.0 indicates that each bit equal to 1 means the corresponding address bit is a network address. • Network mask can be indicated as a slash (/) and number. For example, /8 indicates that the first 8 bits of the mask are ones, and the corresponding bits of the address are the network address.
<i>/prefix-length</i>	(Optional) Length of the IP address prefix. A decimal value that indicates how many of the high-order contiguous bits of the address compose the prefix (the network portion of the address). A slash (/) must precede the decimal value.
standby	(Optional) Displays standby information.

Command Default

If a **vrf** *vrf-name* is not specified, the backup routes from the RIB are displayed for the default IPv4 unicast VRF.

Command Modes

EXEC

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes the proper task IDs. If you suspect user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **show route backup** command to display information about routes that have been installed into the RIB as backup routes. This command also displays information about the currently selected active route for which there is a backup.

When the **afi-all** keyword is used, the *ip-address* and *mask* arguments are not available.

The **topology** keyword must be accompanied by the **ipv4 multicast** keywords, except when the **afi-all** keyword or the **safi-all** keyword is specified.

Task ID

Task ID	Operations
rib	read

Examples

The following is sample output from the **show route backup** command:

```
RP/0/RSP0/CPU0:router# show route backup

Codes: C - connected, S - static, R - RIP, M - mobile, B - BGP
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
       E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
       i - ISIS, L1 - IS-IS level-1, L2 - IS-IS level-2
       ia - IS-IS inter area, su - IS-IS summary null, * - candidate default
       U - per-user static route, o - ODR, L - local
S      172.73.51.0/24 is directly connected, 2d20h, GigabitEthernet 4/0/0/1
      Backup O E2 [110/1] via 10.12.12.2, GigabitEthernet 3/0/0/1
```

This table describes the significant fields shown in the display.

Table 13: show route backup Field Descriptions

Field	Description
S	Code indicating how the route was derived. See the legend of the codes preceding the output.
172.73.51.0/24	IP address and length of the route.
2d20h	Time (in hh:mm:ss) since the route was installed in the RIB.
GigabitEthernet4/0/0/1	Outbound interface for the route.

Field	Description
Backup	Identifies the entry as a backup version of the route, typically installed by a different routing protocol.
O	Code indicating how the route was derived. See the code legend preceding the output.
E2	Code for the type of route. This code is relevant only for OSPF and IS-IS routes. The codes for an OSPF route can be: none—intra-area route IA—interarea route E1—external type 1 E2—external type 2 N1—NSSA external type 1 N2—NSSA external type 2 The codes for an IS-IS route can be: L1—level 1 L2—level 2 ia—interarea su—summary route
[110/1]	Distance and metric for the route.
10.12.12.2	IP address of next-hop on the route.
GigabitEthernet3/0/0/1	Outbound interface for the OSPF version of the route.

Related Commands

Command	Description
show route , page 49	Displays the current routes in the RIB.

show route best-local

To display the best local address to use for return packets from the given destination, use the **show route best-local** command in EXEC mode.

```
show route [vrf {vrf-name| all}] [ipv4| ipv6] [unicast| multicast| {topology topo-name}| safi-all] best-local ip-address [ standby]
```

Syntax Description

vrf { <i>vrf-name</i> all }	(Optional) Specifies a particular VPN routing and forwarding (VRF) instance or all VRF instances.
ipv4	(Optional) Specifies IP Version 4 address prefixes.
ipv6	(Optional) Specifies IP Version 6 address prefixes.
unicast	(Optional) Specifies unicast address prefixes.
multicast	(Optional) Specifies multicast address prefixes.
safi-all	(Optional) Specifies unicast and multicast address prefixes.
<i>ip-address</i>	IP address about which best local information should be displayed.
standby	(Optional) Displays standby information.

Command Default

If a **vrf** *vrf-name* is not specified, the best local address is displayed for the default IPv4 unicast VRF.

Command Modes

EXEC

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes the proper task IDs. If you suspect user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **show route best-local** command to display information about the best local routes in the routing table.

The **topology** keyword must be accompanied by the **ipv4 multicast** keywords, except when the **afi-all** keyword or the **safi-all** keyword is specified.

Task ID

Task ID	Operations
rib	read

Examples

The following is sample output from the **show route best-local** command:

```
RP/0/RSP0/CPU0:router# show route best-local 10.12.12.1/32
Routing entry for 10.12.12.1/32
  Known via "local", distance 0, metric 0 (connected)
  Routing Descriptor Blocks
    10.12.12.1 directly connected, via GigabitEthernet3/0/0/1
    Route metric is 0
```

This table describes the significant fields shown in the display.

Table 14: show route best-local Field Descriptions

Field	Description
Routing entry for	Identifies the requested IP address.
Known via	Indicates how the route was derived.
distance	Administrative distance of the information source.
metric	Route value assigned by the routing protocol.
Routing Descriptor Blocks:	Displays the next-hop IP address followed by the information source.
10.12.12.1 Directly connected ... via ...	First address is the next-hop IP address, followed by a report that it is directly connected. This report is followed by the interface for this route.

Related Commands

Command	Description
show route local , page 61	Displays local addresses installed in the RIB as a receive entry.

show route connected

To display the current connected routes of the routing table, use the **show route connected** command in EXEC mode.

```
show route [vrf {vrf-name| all}] [afi-all| ipv4| ipv6] [unicast| multicast| {topology topo-name}] safi-all
connected [ standby]
```

Syntax Description

vrf { <i>vrf-name</i> all }	(Optional) Specifies a particular VPN routing and forwarding (VRF) instance or all VRF instances.
afi-all	(Optional) Specifies all address families.
ipv4	(Optional) Specifies IP Version 4 address prefixes.
ipv6	(Optional) Specifies IP Version 6 address prefixes.
unicast	(Optional) Specifies unicast address prefixes.
multicast	(Optional) Specifies multicast address prefixes.
safi-all	(Optional) Specifies unicast and multicast address prefixes.
standby	(Optional) Displays standby information.

Command Default

If a **vrf** *vrf-name* is not specified, the current connected routes of the routing table are displayed for the default IPv4 unicast VRF.

The **topology** keyword must be accompanied by the **ipv4 multicast** keywords, except when the **afi-all** keyword or the **safi-all** keyword is specified.

Command Modes

EXEC

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes the proper task IDs. If you suspect user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **show route connected** command to display information about connected routes in the routing table.

Task ID

Task ID	Operations
rib	read

Examples

The following is sample output from the **show route connected** command:

```
RP/0/RSP0/CPU0:router# show route connected
C    1.68.0.0/16 is directly connected, 13:43:40, MgmtEth0/5/CPU0/0
C    3.3.3.0/24 is directly connected, 00:23:23, GigabitEthernet0/3/0/0
C    7.7.7.0/24 is directly connected, 00:33:00, GigabitEthernet0/3/0/7
C    10.0.0.0/16 is directly connected, 13:43:40, GigabitEthernet0/0/0/0
C    10.10.10.0/30 is directly connected, 13:43:40, Loopback0
C    11.11.11.0/24 is directly connected, 13:43:40, Loopback11
```

This table describes the significant fields shown in the display.

Table 15: show route connected Field Descriptions

Field	Description
C	Code to indicate the route is connected.
1.68.0.0/16	IP address and length of the route.
13:43:40	Time (in hh:mm:ss) since the route was installed in the RIB.
MgmtEth0/5/CPU0/0	Outbound interface for the route.

Related Commands

Command	Description
show route summary, page 76	Displays the current contents of the RIB.

show route local

To display local routes receiving routing updates from the Routing Information Base (RIB), use the **show route local** command in EXEC mode.

```
show route [vrf {vrf-name| all}] [afi-all| ipv4| ipv6] [unicast| multicast| {topology topo-name}] safi-all
local [type interface -path-id] [ standby]
```

Syntax Description

vrf { <i>vrf-name</i> all }	(Optional) Specifies a particular VPN routing and forwarding (VRF) instance or all VRF instances.
afi-all	(Optional) Specifies all address families.
ipv4	(Optional) Specifies IP Version 4 address prefixes.
ipv6	(Optional) Specifies IP Version 6 address prefixes.
unicast	(Optional) Specifies unicast address prefixes.
multicast	(Optional) Specifies multicast address prefixes.
safi-all	(Optional) Specifies unicast and multicast address prefixes.
<i>type</i>	Interface type. For more information, use the question mark (?) online help function.
<i>interface-path-id</i>	Physical interface or virtual interface. 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.
standby	(Optional) Displays standby information.

Command Default

If a **vrf** *vrf-name* is not specified, the local routes receiving updates from the RIB are displayed for the default IPv4 unicast VRF.

Command Modes

EXEC

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes the proper task IDs. If you suspect user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **show route local** command to display information about local routes in the routing table.

The **topology** keyword must be accompanied by the **ipv4 multicast** keywords, except when the **afi-all** keyword or the **safi-all** keyword is specified.

Task ID

Task ID	Operations
rib	read

Examples

The following is sample output from the **show route local** command:

```
RP/0/RSP0/CPU0:router# show route local
L   10.10.10.1/32 is directly connected, 00:14:36, Loopback0
L   10.91.36.98/32 is directly connected, 00:14:32, GigabitEthernet6/0/0/1
L   172.22.12.1/32 is directly connected, 00:13:35, GigabitEthernet3/0/0/1
L   192.168.20.2/32 is directly connected, 00:13:27, GigabitEthernet4/0/0/1
L   10.254.254.1/32 is directly connected, 00:13:26, GigabitEthernet5/0/0/1
```

This table describes the significant fields shown in the display.

Table 16: show route local Field Descriptions

Field	Description
L	Code to indicate the route is local.
10.10.10.1/32	IP address and length of the route.
00:14:36	Time (in hh:mm:ss) since the route was installed in the RIB.
Loopback0	Outbound interface for the route.

Related Commands

Command	Description
show route connected , page 59	Displays information about all clients that have registered with the RIB as protocols.

show route longer-prefixes

To display the current routes in the Routing Information Base (RIB) that share a given number of bits with a given network, use the **show route longer-prefixes** command in EXEC mode.

```
show route [vrf {vrf-name| all}] [ipv4| ipv6] [unicast| multicast| {topology topo-name}] safi-all]
longer-prefixes {ip-address mask | ip-address/prefix-length} [ standby]
```

Syntax Description

vrf { <i>vrf-name</i> all }	(Optional) Specifies a particular VPN routing and forwarding (VRF) instance or all VRF instances.
ipv4	(Optional) Specifies IP Version 4 address prefixes.
ipv6	(Optional) Specifies IP Version 6 address prefixes.
unicast	(Optional) Specifies unicast address prefixes.
multicast	(Optional) Specifies multicast address prefixes.
safi-all	(Optional) Specifies unicast and multicast address prefixes.
<i>ip-address</i>	Network IP address about which routing information should be displayed.
<i>mask</i>	Network mask specified in either of two ways: <ul style="list-style-type: none"> • Network mask can be a four-part, dotted-decimal address. For example, 255.0.0.0 indicates that each bit equal to 1 means the corresponding address bit is a network address. • Network mask can be indicated as a slash (/) and number. For example, /8 indicates that the first 8 bits of the mask are 1s, and the corresponding bits of the address are the network address.
<i>/ prefix-length</i>	Length of the IP address prefix. A decimal value that indicates how many of the high-order contiguous bits of the address compose the prefix (the network portion of the address). A slash (/) must precede the decimal value.
standby	(Optional) Displays standby information.

Command Default

If a **vrf** *vrf-name* is not specified, the current routes in the RIB sharing a specified number of bits with a network are displayed for the default IPv4 unicast VRF.

Command Modes

EXEC

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes the proper task IDs. If you suspect user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **show route longer-prefixes** command to troubleshoot forwarding problems whose cause may be a long prefix.

The **topology** keyword must be accompanied by the **ipv4 multicast** keywords, except when the **afi-all** keyword or the **safi-all** keyword is specified.

Task ID

Task ID	Operations
rib	read

Examples

The following is sample output from the **show route longer-prefixes** command:

```
RP/0/RSP0/CPU0:router# show route longer-prefixes 172.16.0.0/8

Codes: C - connected, S - static, R - RIP, M - mobile, B - BGP
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
       E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
       i - ISIS, L1 - IS-IS level-1, L2 - IS-IS level-2
       ia - IS-IS inter area, su - IS-IS summary null, * - candidate default
       U - per-user static route, o - ODR, L - local

L   172.29.52.70/32 is directly connected, 4d15h, MgmtEth0/RSP0/CPU0/0
L   172.29.52.71/32 is directly connected, 4d15h, MgmtEth0/RP1/CPU0/0
L   172.29.52.72/32 [0/0] via 172.29.52.72, 4d15h, MgmtEth0/RSP0/CPU0/0
```

This table describes the significant fields shown in the display.

Table 17: show route longer-prefixes Field Descriptions

Field	Description
172.29.52.70/32	IP address and length of the route.
4d15h	Time (in hh:mm:ss or <i>ndnh</i>) since the route was installed in the RIB.
MgmtEth0/RSP0 /CPU0/0	Outbound interface for the route.

Related Commands

Command	Description
router static	Establishes a static route.
show interfaces	Lists interface information.
show route summary, page 76	Displays the current contents of the routing table in summary format.

show route next-hop

To filter routes by the next-hop address or interface, use the **show route next-hop** command in EXEC mode.

```
show route [vrf {vrf-name| all}] [ipv4| ipv6] [unicast| multicast| {topology topo-name}| safi-all] next-hop
[ip-address][[standby]]
```

Syntax Description

vrf { <i>vrf-name</i> all }	(Optional) Specifies a particular VPN routing and forwarding (VRF) instance or all VRF instances.
ipv4	(Optional) Specifies IP Version 4 address prefixes.
ipv6	(Optional) Specifies IP Version 6 address prefixes.
unicast	(Optional) Specifies unicast address prefixes.
multicast	(Optional) Specifies multicast address prefixes.
safi-all	(Optional) Specifies unicast and multicast address prefixes.
<i>ip-address</i>	(Optional) IP address about which next-hop information is to be displayed.
standby	(Optional) Displays standby information.

Command Default

If a **vrf** *vrf-name* is not specified, the next-hop gateway or host is displayed for the default IPv4 unicast VRF.

Command Modes

EXEC

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes the proper task IDs. If you suspect user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **show route next-hop** command to find all routes going through a next-hop address or interface.

The **topology** keyword must be accompanied by the **ipv4 multicast** keywords, except when the **afi-all** keyword or the **safi-all** keyword is specified.

Task ID

Task ID	Operations
rib	read

Examples

The following is sample output from the **show route next-hop** command filtering routes on the next-hop address:

```
RP/0/RSP0/CPU0:router# show route next-hop 1.68.0.1

Codes: C - connected, S - static, R - RIP, M - mobile, B - BGP
D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
i - ISIS, L1 - IS-IS level-1, L2 - IS-IS level-2
ia - IS-IS inter area, su - IS-IS summary null, * - candidate default
U - per-user static route, o - ODR, L - local

Gateway of last resort is 1.68.0.1 to network 0.0.0.0

S* 0.0.0.0/0 [1/0] via 1.68.0.1, 15:01:49
S 223.255.254.254/32 [1/0] via 1.68.0.1, 15:01:49
```

The following is sample output from the **show route next-hop** command filtering routes on the next-hop interface:

```
RP/0/RSP0/CPU0:router# show route next-hop GigabitEthernet 0/1/0/2

Codes: C - connected, S - static, R - RIP, M - mobile, B - BGP
D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
i - ISIS, L1 - IS-IS level-1, L2 - IS-IS level-2
ia - IS-IS inter area, su - IS-IS summary null, * - candidate default
U - per-user static route, o - ODR, L - local

Gateway of last resort is 1.68.0.1 to network 0.0.0.0

C 11.1.1.0/24 is directly connected, 15:01:46, GigabitEthernet0/1/0/2
L 11.1.1.2/32 is directly connected, 15:01:46, GigabitEthernet0/1/0/2
```

This table describes the significant fields shown in the display.

Table 18: show route next-hop Field Descriptions

Field	Description
11.1.1.0/24	IP address and length of the route.
15:01:46	Time (in hh:mm:ss or <i>ndnh</i>) since the route was installed in the RIB.
GigabitEthernet0/1/0/2	Outbound interface for the route.

Related Commands

Command	Description
show route, page 49	Displays the current contents of the routing table.

show route quarantined

To display mutually recursive (looping) routes, use the **show route quarantined** command in EXEC mode.

```
show route [vrf {vrf-name| all}] [ipv4|ipv6] [unicast|multicast] {topology topo-name}| safi-all] quarantined
[ip-address/prefix-length] ip-address mask] [standby]
```

Syntax Description

vrf { <i>vrf-name</i> all }	(Optional) Specifies a particular VPN routing and forwarding (VRF) instance or all VRF instances.
ipv4	(Optional) Specifies IP Version 4 address prefixes.
ipv6	(Optional) Specifies IP Version 6 address prefixes.
unicast	(Optional) Specifies unicast address prefixes.
multicast	(Optional) Specifies multicast address prefixes.
safi-all	(Optional) Specifies unicast and multicast address prefixes.
<i>ip-address</i>	(Optional) IP address about which looping routes information is to be displayed.
<i>/ prefix-length</i>	(Optional) Length of the IP address prefix. A decimal value that indicates how many of the high-order contiguous bits of the address compose the prefix (the network portion of the address). A slash (/) must precede the decimal value.
<i>ip-address mask</i>	(Optional) Network mask applied to the <i>ip-address</i> argument.
standby	(Optional) Displays standby information.

Command Default

If a **vrf** *vrf-name* is not specified, the next-hop gateway or host is displayed for the default IPv4 unicast VRF.

Command Modes

EXEC

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes the proper task IDs. If you suspect user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

RIB quarantining detects mutually recursive routes and quarantines the last route that actually completes the mutual recursion. The quarantined route is periodically evaluated to see if the mutual recursion has gone away. If the recursion still exists, the route remains quarantined. If the recursion has gone away, the route is released from quarantine.

Use the **show route quarantined** command to display mutually recursive (looping) routes.

The **topology** keyword must be accompanied by the **ipv4 multicast** keywords, except when the **afi-all** keyword or the **safi-all** keyword is specified.

Task ID

Task ID	Operations
rib	read

Examples

The following is sample output from the **show route quarantined** command:

```
RP/0/RSP0/CPU0:routerr# show route quarantined

Codes: C - connected, S - static, R - RIP, M - mobile, B - BGP
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
       E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
       i - ISIS, L1 - IS-IS level-1, L2 - IS-IS level-2
       ia - IS-IS inter area, su - IS-IS summary null, * - candidate default
       U - per-user static route, o - ODR, L - local

S   10.10.109.1/32 [1/0] via 10.10.34.1, 00:00:01 (quarantined)
                        [1/0] via 10.10.37.1, 00:00:01 (quarantined)
                        [1/0] via 10.10.60.1, 00:00:01 (quarantined)
                        [1/0] via 10.10.68.1, 00:00:01 (quarantined)
                        [1/0] via 10.10.91.1, 00:00:01 (quarantined)
                        [1/0] via 10.10.93.1, 00:00:01 (quarantined)
                        [1/0] via 10.10.97.1, 00:00:01 (quarantined)
S   10.0.0.0/8 [1/0] via 11.11.11.11, 00:01:29 (quarantined)
S   10.10.0.0/16 [1/0] via 11.11.11.11, 00:01:29 (quarantined)
S   10.10.10.0/24 [1/0] via 11.11.11.11, 00:01:29 (quarantined)
S   10.10.10.10/32 [1/0] via 11.11.11.11, 00:00:09 (quarantined)
```

This table describes the significant fields shown in the display.

Table 19: show route quarantined Field Descriptions

Field	Description
10.10.109.1/32	IP address and length of the route.
[1/0]	Distance and metric for the route.
via 10.10.34.1	IP address of next-hop on the route.
00:00:01	Time (in hh:mm:ss or ndnh) since the route was installed in the RIB.
(quarantined)	Shows that the route is quarantined.

Related Commands

Command	Description
show route , page 49	Displays the current contents of the routing table.

show route resolving-next-hop

To display the next-hop gateway or host to a destination address, use the **show route resolving-next-hop** command in EXEC mode.

```
show route [vrf {vrf-name| all}] [ipv4| ipv6] [unicast| multicast] {topology topo-name}| safi-all]
resolving-next-hop ip-address [ standby]
```

Syntax Description

vrf { <i>vrf-name</i> all }	(Optional) Specifies a particular VPN routing and forwarding (VRF) instance or all VRF instances.
ipv4	(Optional) Specifies IP Version 4 address prefixes.
ipv6	(Optional) Specifies IP Version 6 address prefixes.
unicast	(Optional) Specifies unicast address prefixes.
multicast	(Optional) Specifies multicast address prefixes.
safi-all	(Optional) Specifies unicast and multicast address prefixes.
<i>ip-address</i>	IP address about which resolved next-hop information is to be displayed.
standby	(Optional) Displays standby information.

Command Default

If a **vrf** *vrf-name* is not specified, the next-hop gateway or host is displayed for the default IPv4 unicast VRF.

Command Modes

EXEC

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes the proper task IDs. If you suspect user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **show route resolving-next-hop** command to perform a recursive route lookup on the supplied destination address and return information on the next immediate router (next hop) to the destination.

The **topology** keyword must be accompanied by the **ipv4 multicast** keywords, except when the **afi-all** keyword or the **safi-all** keyword is specified.

Task ID

Task ID	Operations
rib	read

Examples

The following is sample output from the **show route resolving-next-hop** command:

```
RP/0/RSP0/CPU0:router# show route resolving-next-hop 10.1.1.1

NextHop matches 10.1.1.1/32
  Known via "local", distance 0, metric 0 (connected)
  Installed Aug 22 01:57:08.514
  Directly connected nexthops
    10.1.1.1 directly connected, via Loopback0
    Route metric is 0
```

This table describes the significant fields shown in the display.

Table 20: show route resolving-next-hop Field Descriptions

Field	Description
Known via	Name of the routing protocol that installed the matching route.
Route metric is	Metric of the route.

Related Commands

Command	Description
show route , page 49	Displays the current contents of the routing table.

show route static

To display the current static routes of the Routing Information Base (RIB), use the **show route static** command in EXEC mode.

```
show route [vrf {vrf-name| all}] [afi-all| ipv4| ipv6] [unicast| multicast| {topology topo-name}| safi-all]
static [ standby]
```

Syntax Description

vrf { <i>vrf-name</i> all }	(Optional) Specifies a particular VPN routing and forwarding (VRF) instance or all VRF instances.
afi-all	(Optional) Specifies all address families.
ipv4	(Optional) Specifies IP Version 4 address prefixes.
ipv6	(Optional) Specifies IP Version 6 address prefixes.
unicast	(Optional) Specifies unicast address prefixes.
multicast	(Optional) Specifies multicast address prefixes.
safi-all	(Optional) Specifies unicast and multicast address prefixes.
standby	(Optional) Displays standby information.

Command Default

If a **vrf** *vrf-name* is not specified, the current static routes of the RIB are displayed for the default IPv4 unicast VRF.

Command Modes

EXEC

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes the proper task IDs. If you suspect user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **show route static** command to display information about static routes in the routing table.

The **topology** keyword must be accompanied by the **ipv4 multicast** keywords, except when the **afi-all** keyword or the **safi-all** keyword is specified.

Task ID

Task ID	Operations
rib	read

Examples

The following is sample output from the **show route static** command:

```
RP/0/RSP0/CPU0:router# show route static
S    10.1.1.0/24 is directly connected, 00:54:05, GigabitEthernet3/0/0/1
S    192.168.99.99/32 [1/0] via 10.12.12.2, 00:54:04
```

This table describes the significant fields shown in the display.

Table 21: show route static Field Descriptions

Field	Description
S	Code to indicate the route is static.
10.1.1.0/24	IP address and distance for the route.
00:54:05	Time (in hh:mm:ss) since the route was installed in the RIB.
GigabitEthernet3/0/0/1	Outbound interface for the route.
[1/0]	Distance and metric for the route.

Related Commands

Command	Description
show route, page 49	Displays the current contents of the routing table.

show route summary

To display the current contents of the Routing Information Base (RIB), use the **show route summary** command in EXEC mode.

```
show route [vrf {vrf-name| all}] [afi-all| ipv4| ipv6] [unicast| multicast| {topology topo-name}| safi-all]
summary [detail] [standby]
```

Syntax Description

vrf { <i>vrf-name</i> all }	(Optional) Specifies a particular VPN routing and forwarding (VRF) instance or all VRF instances.
afi-all	(Optional) Specifies all address families.
ipv4	(Optional) Specifies IP Version 4 address prefixes.
ipv6	(Optional) Specifies IP Version 6 address prefixes.
unicast	(Optional) Specifies unicast address prefixes.
multicast	(Optional) Specifies multicast address prefixes.
safi-all	(Optional) Specifies unicast and multicast address prefixes.
detail	(Optional) Displays a detailed summary of the contents of the RIB, including the number of paths and some protocol-specific route attributes.
standby	(Optional) Displays standby information.

Command Default

If a **vrf** *vrf-name* is not specified, the contents of the RIB are displayed for the default IPv4 unicast VRF.

Command Modes

EXEC

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes the proper task IDs. If you suspect user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **show route summary** command to display information about routes in the routing information base.

When a route summary is needed frequently—for instance, in a polling situation—use the **show route summary** command without the **detail** keyword. The **detail** keyword is used less frequently for verification purposes, because it is much more expensive (in bandwidth), requiring a scan of the entire routing database.

The **topology** keyword must be accompanied by the **ipv4 multicast** keywords, except when the **afi-all** keyword or the **safi-all** keyword is specified.

Task ID

Task ID	Operations
rib	read

Examples

The following is sample output from the **show route summary** command:

```
RP/0/RSP0/CPU0:router# show route summary

Route Source    Routes    Backup    Deleted    Memory (bytes)
static          1         0         0          136
connected       2         1         0          408
local           3         0         0          408
ospf            1673     2         0          272
isis            2         0         0          272
Total           10        1         0          1496
```

The following is sample output from the **show route summary** command with the **detail** keyword:

```
RP/0/RSP0/CPU0:router# show route summary detail

Route Source    Active Route    Active Path    Backup Route    Backup Path
static          1                1                0                0
connected       2                2                1                1
local           3                3                0                0
isis            1                1                1                1
Level 1:        0                0                1                1
Level 2:        1                1                0                0
ospf 1673       6                12               0                0
Intra-Area:     3                6                0                0
Inter-Area:     3                6                0                0
External-1:     0                0                0                0
External-2:     0                0                0                0
bgp 100         10               20               4                8
External:       5                10               4                8
Internal:       5                10               0                0
local:          0                0                0                0
Total           7                7                2                2
```

This table describes the significant fields shown in the display.

Table 22: show route summary Field Descriptions

Field	Description
Route Source	Routing protocol name.
Routes	Number of selected routes that are present in the routing table for each route source.
Backup	Number of routes that are not selected (are backup to a selected route).

Field	Description
Deleted	Number of routes that have been marked for deletion in the RIB, but have not yet been purged.
Memory	Number of bytes allocated to maintain all routes for the particular route source.

Related Commands

Command	Description
show route, page 49	Displays the current contents of the routing table.